学位申請論文
(主論文)

小野展嗣

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1. Thomisidae aus Japan. I. Das Genus Tmarus Simon (Arachnida: Araneae). Acta arachnol., 27 (spec. no.): 61-84 (1977).
2. Thomisidae aus Japan. II. Das Genus Oxytate L.Koch 1878 (Arachnida: Araneae). Senckenb. biol., 58: 245-251 (1978).
3. Thomisidae aus dem Nepal-Himalaya. I. Das Genus Xysticus C.L.Koch 1835 (Arachnida: Araneae). Senckenb. biol., 59: 267-288 (1978).
4. Thomisidae aus dem Nepal-Himalaya. II. Das Genus Lysiteles Simon 1895 (Arachnida: Araneae). Senckenb. biol., 60: 91-108 (1979).
5. Fossile Spinnen aus miozänen Sedimenten des Randecker Maars in SW-Deutschland (Arachnida: Araneae). Jh. Ges. Naturkde. Württemberg, 134: 133-141 (1979). (W.Schawaller と共著)
6. Thomisidae aus Japan. III. Das Genus Lysiteles Simon 1895 (Arachnida: Araneae). Senckenb. biol., 60: 203-217 (1980).
7. Thomisidae aus dem Nepal-Himalaya. III. Das Genus Stiphropus Gerstaecker 1873, mit Revision der asiatischen Arten (Arachnida: Araneae). Senckenb. biol., 61: 57-76 (1980).
8. Erstnachweis einer Krabbenspinne (Thomisidae) in dominikanischem Bernstein (Stuttgarter Bernsteinsammlung: Arachnida, Araneae). Stuttgart. Beitr. Naturk., B, (73): 1-13 (1981).
9. Revision japanischer Spinnen. I. Synonymie einiger Arten der Familien Theridiidae, Araneidae, Tetragnathidae und Agelenidae (Arachnida: Araneae). Acta arachnol., 30: 1-7 (1981).
10. Verwandtschaft von Tetrablemma phulchoki Lehtinen 1981 (Araneae: Tetrablemmidae). Senckenb. biol., 62: 349-353 (1982).

11. Zodariidae aus dem Nepal-Himalaya. I. Neue Arten der Gattung Storena Walckenaer 1805 (Arachnida: Araneae). Senckenb. biol., 63: 211-217 (1983).

12. Eine neue japanische Synaema-Art (Araneae, Thomisidae). Acta arachnol., 31: 59-63 (1983).

13. The Thomisidae of Japan. IV. Boliscus Thorell, 1891 (Arachnida, Araneae), a genus new to the Japanese fauna. Bull. natn. Sci. Mus., Tokyo, (A), 10: 63-71 (1984).

14. Revision einiger Arten der Familie Thomisidae (Arachnida, Araneae) aus Japan. Bull. natn. Sci. Mus., Tokyo, (A), 11: 19-39 (1985).

15. The Thomisidae of Japan. V. Monaeses Thorell, 1869, and its new junior synonym, Mecostrabus Simon, 1903 (Arachnida, Araneae). Bull. natn. Sci. Mus., Tokyo, (A), 11: 91-97 (1985).

16. Eine neue Art der Gattung Misumenops F.O.Pickard-Cambridge, 1900, aus Japan (Araneae: Thomisidae). Proc. Jpn. Soc. syst. Zool., Tokyo, (31): 14-19 (1985).

17. A new spider of the group of Clubiona corticalis (Araneae, Clubionidae) found in Japan. Ent. Pap. pres. Kurosawa, Tokyo, pp.19-25 (1986).

18. A new Sino-Japanese species of the genus Cupa (Araneae, Thomisidae) from the coastal areas of the East China Sea. Bull. natn. Sci. Mus., Tokyo, (A), 12: 25-29 (1986). (D.-X. Song と共著)

19. Little-known Japanese spider, Clubiona zilla (Araneae, Clubionidae)—Representative of a new and peculiar species-group. Bull. natn. Sci. Mus., Tokyo, (A), 12: 117-121 (1986).

20. Spiders of the families Clubionidae, Gnaphosidae and Thomisidae from the Noto Peninsula and the southern part of Ishikawa Prefecture, Japan. Mem. natn. Sci. Mus., Tokyo, (19): 167-174 (1986).

21. Two new species of the family Zodariidae from Saudi Arabia (Arachnida: Araneae). Fauna Saudi Arabia, 8: 6–11 (1986). (R.Jocqué ㄣ共著)

22. A new Japanese castianeirine genus (Araneae, Clubionidae) with presumptive prototype of salticoid eyes. Bull. natn. Sci. Mus., Tokyo, (A), 13: 13–19 (1987).

A Revisional Study of the Spider Family Thomisidae (Arachnida, Araneae) of Japan

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Contents

Introduction

The purpose of this study is to present the natural history of thomisid spiders in Japan by investigating through comparative morphology, taxonomy and partly zoogeography.

In order to pursue this subject, it was necessary first to read through literature referring to the thomisid spiders not only from Japan and her adjacent regions but from all parts of the world, because very little has been made generally on the family Thomisidae in the sense of modern biological sciences.

Since L. Koch (1878c) described the first thomisid spider from Japan, more than 70 specific and subspecific names excluding philodromids have been reported from this country (details are given in a later chapter). However, some records were based on doubtful identification or inappropriate naming; some species were placed in wrong taxonomic positions and many have never been recognized since their original descriptions. Re-examination of the original specimens of most species described from Japan and her adjacent countries became inevitable. I spent several years for studying spiders at the Zoological Institute of the University of Mainz in Germany. During my stay in Europe, I visited other institutions as well, and communicated with curators of many museums for examining those old collections on loan.

Other than the type specimens, general and comparative material used in this study consists of the specimens personally collected by myself from various places in Japan since 1966 and those

obtained from or loaned from several institutions, friends and colleagues. Total number of these specimens may exceed 3,000. A large quantity of them are deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo, where I have prepared this paper.

Based upon the preliminary research of records hitherto published and actual examination of material, each taxon of the family Thomisidae in Japan will be systematically revised and diagnosed in this paper, that is, 4 subfamilies, 22 genera and 53 species including 6 new ones. Then, the peculiarity of the thomisid fauna of Japan is delineated and the relationship of the Japanese fauna will be discussed in comparison with the world fauna, especially Eurasian, to which attaches the Japanese one. The relationship among subfamilies of the Thomisidae will be phylogenetically analysed.

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A Brief History of the Study in Japanese Thomisid Spiders

The first araneologist who studied thomisid spiders from Japan was L. Koch in Nürnberg, Germany. In the work "Japanische Arachniden und Myriapoden" (1878c), he described two new species, Oxytate (new genus) striatipes and Diaea nitida, from the material collected in Japan by A. v. Roretz. The latter was replaced by a new name, Diaea kochi, by Thorell (1881) in the "Studi sui Ragni Malesi e Papuani, III" because it was preoccupied by Diaea nitida (Thorell, 1877). Mello-Leitão also proposed a new name, Diaea nitidula, for Koch's nitida in "Aphantochilidas e Thomisidas do Brasil" (1929). In 1879, Karsch in Berlin described five new thomisid spiders obtained by F. M. Hilgendorf

and W. Dönitz in the work "Baustoffe zu einer Spinnenfauna von Japan:" Oxytate setosa, Synema japonica, Oxyptila decorata, O. fulvipes and Pistius undulatus. In the "Diagnoses Arachnoidarum Japoniae", he (1881) added one more new species, Thomisus labefactus. A small collection made by A. Mellottée, who had been appointed as an official interpreter at the Franch Consulate in Yokohama, was studied by Simon in Paris. It contains two new species of the family Thomisidae, Coriarachne japonica and Heriaeus Mellottei, described in "Espèces et genres nouveaux de la famille des Thomisidae" (1886b). He also published some notes on Japanese thomisids in the second edition of the "Histoire Naturelle des Araignées" (1895a). Chyzer and Kulczyński (1891) included Japan, probably by lapsus calami, in the distributional range of Thomisus albus (Gmelin, 1789) in "Araneae Hungariae, Tomus I."

The progress in the study of Japanese spiders is obviously due to W. Dönitz. The invited doctor by the Japanese Government extensively collected spiders during his eleven-year stay (1873-1884) in Japan and presented the valuable specimens to the Senckenberg Museum in Frankfurt am Main, though a small part of his collection studied by Karsch is deposited in the Berlin Museum. This collection was first studied and illustrated by Bösenberg, then re-examined and arranged by Strand because of Bösenberg's death. In the form of a joint study by both authors, the result was published in 1906 with the titel "Japanische Spinnen." It describes more than 400 species of spiders from Japan including the following species of the family Thomisidae. Twelve known species; six species new to the Japanese fauna: Tmarus piger (Walckenaer, 1802),

Pistius truncatus (Pallas, 1772), Misumena tricuspidata (Fabricius, 1775), M. calycina (Linné, 1758), Xysticus pini (Hahn, 1831) and X. ephippiatus (Simon, 1880); 14 new species: Dieta japonica, Thomisus onustoides, Runcinia albostriata, Misumena japonica, M. yunohamensis, M. munitissima, Diaea subadulta, Oxyptila truciformis, Xysticus insulicola, X. saganus, X. tunicatus, X. transversomaculatus, X. cetrariae and Cupa (new genus by Strand) typica, one new subspecies, Xysticus lateralis atrimaculatus, and one new variety, Thomisus labefactus bimaculatus. Of these, Misumena munitissima and Xysticus cetrariae were named by "Dönitz and Strand, ad int." Strand (1907b) described further new species from Japan in "Süd-und ostasiatische Spinnen": Thomisus okinawensis, Xysticus mojensis and X. kurilensis. He also reported on Thomisus onustoides Bösenberg et Strand, 1906, in the work "Zur Kenntnis japanischer Spinnen, I" (1918). Dahl (1907) regarded Synema japonica Karsch, 1879, as a subspecies of S. globosum (Fabricius, 1775).

The period from L. Koch (1878c) to Strand (1918) can be regarded as the "period of German researchers" in the history of the study of Japanese spiders. About the same period, the years 1878-1912, was called "the period of pioneers" by Yaginuma in the article "A historical review of studies on Japanese spiders" (1961b).

The second period dawned with a series of articles, "Japanese Spiders," written by Kishida (1909-'14). In the work, he described some thomisid spiders and proposed new names, Monaeses simoni and Eremita typica, hitherto regarded as nomina nuda. He (1924) used Misumena vatia (Clerck, 1758) instead of M. calycina (Linné, 1758). Kishida also

reported and described some known thomisid spiders in "Figuraro de Japanej Bestoj" (1927) and "Idiobiologia Arnearum " (1933).

Most studies made by other contemporary Japanese araneologists were revised by Kishida, for example, Yuhara's "The Study of Spiders" (1931), S. Komatsu's "Iconographia Colorata Vivida Aranearum Japonicarum, Vol. I" (1936) and Chikuni's "Spiders of the Japanese Alps" (1941) and "Five Interesting Spiders from Japan Highlands" (1955). Yuhara (1931) described and illustrated twelve species, both determined and undetermined, of Thomisidae from Wakayama Prefecture. Of these, Tmarus amoenus Kishida is a nomen nudum. In the work of S. Komatsu, 21 known species were illustrated. Chikuni (1941) recorded and illustrated by photographs 14 thomisid spiders from Nagano Prefecture. He (1955) described one new species, Phrynarachne katoi, and recorded Diaea dorsata (Fabricius, 1777) for the first time from Japan. Other than these larger works, many reports published mainly in the "Acta Arachnologica" were revised by Kishida. For example, his successor, Uyemura (1937) described a new species, Oxyptila takashimai, in "Two new spiders from Mt. Amagi, Izu Province." On the other hand, however, many new names without descriptions were unfortunately made by Kishida and cited in checklists and short reports written by various authors, as was noted by Annen (1941) on Xysticus trizonatus Kishida, nomen nudum.

S. Saito studied spiders from an independent standpoint at Hokkaido University. In 1934, he published "Spiders from Hokkaido" and described eight known and two new species of the family Thomisidae, that is, Oxyptila nigrifrons and Xysticus sapporensis. In a later work

entitled "On the Spiders from Tohoku (northernmost part of the main island), Japan," published in 1939, nine known and one new species were described by the same author. For the new species, Misumena oblonga, which was preoccupied by O. Pickard-Cambridge (1885), Roewer (1951) proposed a new name, Misumena saitoi. Based on these two works, S. Saito set up a comprehensive work on Japanese spiders under the title of "The Spider Book Illustrated in Colours." The book deals with descriptions and illustrations of 19 thomisid spiders from Japan and its adjacent regions. He also studied with Peelle (1933) spiders from the Kurile Islands and recorded Misumena alaetoria (Hentz, 1847) and Xysticus triguttatus Keyserling, 1880, both new to the Japanese fauna, and described a new species, Misumena lutea, in "Spiders from the southern Kurile Island, II. Araneida from Shikotan." He (1932, '33a, '33b, '34b, '35, '36a, '36b, '37, '38) published some papers on the spiders from the northern Kurile Islands, Sakhalin, Manchoukuo and Taiwan. This is the second period, in the history of the Japanese araneology, in which Kishida and S. Saito were active. Yaginuma (1961b) divided it into the period of independence (1913-'35) and that of development (1936-'43).

The third period in the study of Japanese thomisid spiders, based upon modern sciences, may be traced back to the work presented by Nakatsuji. He made his studies at the Tokyo University of Agriculture and published several interesting articles based on the material from Japan, Manchuria, and Micronesia in a short period before killed in the World War II. In "Some Arachnida from Is. Okinawa and Is. Amami-Osima" (1943), he described a new thomisid spider, Thomisus kitamurai, from

Amami-Oshima Island.

After the war, Yaginuma (1956, '60, '61a, '67, '68, '77) dealt with thomisids as a part of his study on Japanese spiders. In 1967, he re-examined the so-called Xysticus ephippiatus Simon, 1880. As Fox (1937) pointed out and gave a new name, Xysticus croceus, for the Japanese species, the spider previously recorded from Japan under the name of X. ephippiatus was misidentified by Bösenberg and Strand (1906) and true X. ephippiatus was believed to occur only in China. However, Yaginuma recognized the occurrence of both the species in Japan. His "Spiders of Japan in Colour" (1960) is a classical work describing 20 common species of the family Thomisidae in Japan with coloured illustrations. This book was revised in 1968 and thoroughly rewritten in 1986. Yaginuma (1977) used Thomisus onustus (Walckenaer, 1805) instead of T. albus (Gmelin, 1789) in his list of Japanese spiders.

In guide books to spiders published by Matsumoto and others (1976) and Shinkai and Takano (1984), some known thomisid spiders from Japan were shown with coloured pictures.

I began my study on spiders in 1966 and more and more specialized in the Thomisidae. First, I dealt with the genus Tmarus and recorded T. rimosus Paik, 1973, and T. hanrasanensis Paik, 1973, newly for the Japanese fauna and described a new species, T. yaginumai. Then, up to the present, I reported on the three genera, Boliscus Thorell, 1891, Monaeses Thorell, 1869, (Ono, 1984, 1985b), and Lysiteles Simon, 1895, (Ono, 1979, 1980a), hitherto unknown in Japan. Revised and newly recorded species from Japan are as follows: Lysiteles maius (Ono, 1979),

Xysticus dichotomus Paik, 1973, X. bifidus Paik, 1973, Boliscus tuberculatus (Simon, 1886), Lysiteles coronatus (Grube, 1861), Monaeses aciculus (Simon, 1903). I described a new genus Takachihoa and seven new species, Oxytate hoshizuna, Lysiteles okumae, L. miniatus, Synaema chikunii, Diaea gyoja, Oxyptila nipponica, and Misumenops kumadai (Ono, 1977, 1978a, 1978b, 1980a, 1981b, 1983, 1985a, 1985c, 1986). In a joint paper with Song, I recently described one new species, Cupa zhengi, which occurs in Japan and China (Ono & Song, 1986).

In the present paper, I will revise most of the species hitherto known from Japan and describe further new species. I hope this report will serve as a stepping-stone to the coming period in the study of thomisid spiders of Japan.

Material and Methods

The general and comparative material consists of the specimens collected by myself and obtained from or loaned from many institutions, friends and colleagues. These are not only from Japan but from China, Korea, India, Sri Lanka, Nepal, Bhutan, Burma, Thailand, Vietnam, Malaysia, Indonesia, New Guinea, Taiwan, Philippines, Mongolia, USSR, Turkey, Iran, Finland, Germany and France.

The spiders of the family Thomisidae build no webs and capture small insects by lying in wait. They are found in leaf litter and under stones on the ground, as well as on trees, shrubs and grasses, especially

on flowering plants. The material used in this paper was collected from those habitats by hand sorting, sweeping, beating, sifting, extracting by Tullgren funnels and pitfall-trapping.

The original materials of the species described and recorded from Japan have been re-examined as far as possible on loans from some museums, though the types of the species described in earlier period were unavailable, e.g., Araneus vatius Clerck, 1758, Aranea globosa Fabricius, 1775, Aranea pigra Walckenaer, 1802, Aranea audax Schrank, 1803, etc. The type depository is unknown for the two species described from Japan, Misumena munitissima Dönitz et Strand, 1906, and Xysticus cetrariae Dönitz et Strand, 1906.

The spiders used for this study are preserved in 75% ethyl alcohol and observed under stereoscopic microscope in steeping condition. Pro- and opisthosoma of each species are illustrated. Left male palp is cut between its patella and tibia and is illustrated in ventral and retrolaterial views. After the epigynum is illustrated and examined, female genital region is separated from opisthosoma and cleared in 10% KOH solution. The half-dissolved muscular part is carefully removed by fine needle under microscope. Then, the remaining sclerotized organ is preserved in distilled water and dehydrated through a series of 10%-100% ethyl alcohol. Internal organ of female genitalia is also illustrated.

Ocular micrometer accurate to 0.01mm is used for measurement. All the segments of legs excluding coxa and trochanter are measured at one representative pair of each species. Measurement of the other parts

is usually made on the basis of more than ten selected individuals including the smallest and the largest one of each species.

Changes of the scientific names of each taxon and synonymies are listed. Etymology of generic and specific names is given. Characters used in description and diagnosis of each taxon were taken up according to systematic importance as will be seen in the following chapter. Distribution of some species is presented by plotting collecting records on a map of Japan. Natural history of the thomisid spiders of Japan and its adjacent regions presented by these descriptions will be discussed in the last chapter of this paper.

Type Depository of the Thomisid Species Recorded from Japan
(in alphabetical order of abbreviations of the collections)

AN USSR Institute of Zoology, National Academie, Leningrad, SSR

Synaema globosum daghestanicum Utochkin, 1960, syntypes: ♀♀♂♂

Xysticus jacuticus Utochkin, 1968, syntypes: ♀♀♂♂

Xysticus transsibiricus Utochkin, 1968, syntypes: ♀♀♂♂

ASB Institute of Zoology, Academia Sinica, Beijing, China

Cupa zhengi One et Song, 1986, allotype: ♀, paratype: 1♀

ASEA Arachnological Society of East Asia, Osaka, Japan

Tmarus yaginumai Ono, 1979, paratypes: 2♂♂

Lysiteles okumae Ono, 1980, paratypes: 6♀♀

Synaema chikunii Ono, 1983, holotype: ♀, paratypes: 2♀♀1♂

BM(NH) British Museum (Natural History), London, England

Oxytate striatipes L. Koch, 1878, holotype: ♀

Diaea nitida L. Koch, 1878, (= Diaea kochi Thorell, 1881), holotype: ♂

Boliscus segnis Thorell, 1891, syntypes: 3 juv. ♀, 1 juv. ♂

HDEO Hope Department of Entomology, Oxford, England

Ornithoscatoides ceylonica O. Pickard-Cambridge, 1884, syntypes: ♀♀

HUS Faculty of Agriculture, Hokkaido Imperial University, Sapporo, Japan

Misumena lutea Peelle et S. Saito, 1933, syntypes: 2♀♀1♂, lost

Oxyptila nigrifrons S. Saito, 1934, holotype: ♂, lost

Xysticus sapporensis S. Saito, 1934, holotype: ♀, lost

Misumena oblonga S. Saito, 1939 (= Misumena saitoi Roewer, 1951), holotype: ♀, lost

KKT Collection of Kyukichi Kishida, Tokyo

Phrynarachne katoi Chikuni, 1955, holotype: ♀, lost

KNUT Kyungpook National University, Taegu, Korea

Tmarus hanrasanensis Paik, 1973, holotype: ♀, paratype: 1♀

Tmarus rimosus Paik, 1973, holotype: ♀, paratypes: many ♀♀♂♂

Xysticus dichotomus Paik, 1973, holotype: ♂, paratype: 1♂

Xysticus bifidus Paik, 1973, holotype: ♂, paratypes: many ♀♀♂♂

Xysticus bifurcus Paik, 1973, holotype: ♂, paratypes: many ♀♀♂♂

MNHN Muséum National d'Histoire Naturelle, Paris, France

Alchimochtes limbatus Simon, 1885, syntypes: 1♀1♂

Xysticus ephippiatus Simon, 1880, syntypes: 1♀ 3 juv.

Coriarachne japonica Simon, 1886, syntypes: 2♀♀3♂♂ 7 juv.

Corynethrix tuberculatus Simon, 1886, holotype: juv. ♀

Heriaeus Mellottei Simon, 1886, holotype: ♀

Mecostrabus aciculus Simon, 1903, syntypes: 6♀♀

Thomisus picaceus Simon, 1908, holotype: ♂

MPUW Muzeum Przyrodnicze Uniwersytet Wrocawski, Poland

Thomisus coronatus Grube, 1861, holotype: ♀

MSO Collection of Matsuei Shimojana, Okinawa

NSMT National Science Museum (Natural History), Tokyo, Japan

Diaea gyoja Ono, 1985, holotype: ♂, paratype: ♀

Oxyptila nipponica Ono, 1985, holotype: ♂, allotype: ♀, paratypes: 22♀♀8♂♂

Misumenops kumadai Ono, 1985, holotype: ♀, paratypes: 1♀, 1♂

Cupa zhengi Ono et Song, 1986, holotype: ♂, paratypes: 1♀, 1♀, 1♀

Loxobates daitoensis sp. nov., holotype: ♂, allotype: ♀, paratypes: 2♀♀, 1♂

Oxyptila matsumotoi sp. nov., holotype: ♂, allotype: ♀, paratypes: 3♀♀, 1♀, 1♂

Tmarus makiharai sp. nov., holotype: ♂, paratype: ♂

Xysticus daisetsuzanus sp. nov., holotype: ♀, paratypes: 1♀, 1♂, 1♂

Xysticus rostratus sp. nov., holotype: ♂, paratypes: 1♀, 1♀, 1♂

Xysticus trizonatus sp. nov., holotype: ♀

SMF Senckenberg Museum Frankfurt am Main, F.R. Germany

Cupa typica Bösenberg et Strand, 1906, holotype: ♀

Diaea subadulta Bösenberg et Strand, 1906, holotype: juv. ♂

Misumena japonica Bösenberg et Strand, 1906, holotype: ♀

Misumena yunohamensis Bösenberg et Strand, 1906, holotype: ♀

Runcinia albostriata Bösenberg et Strand, 1906, holotype: ♀

Thomisus onustoides Bösenberg et Strand, 1906, syntypes: ♀♀♂♂

Xysticus lateralis atrimaculatus Bösenberg et Strand, 1906, holotype: ♀

Xysticus saganus Bösenberg et Strand, 1906, holotype: ♂

Xysticus transversomaculatus Bösenberg et Strand, 1906, holotype: ♀

Xysticus tunicatus Bösenberg et Strand, 1906, holotype: ♀

Tmarus yaginumai Ono, 1977, holotype: ♂

Oxytate hoshizuna Ono, 1978, holotype: ♂, paratype: 1♀

Lysiteles maius Ono, 1979, holotype: ♂

Lysiteles miniatus Ono, 1979, holotype: ♀

Lysiteles okumae Ono, 1979, holotype: ♀, paratypes: 5♀♀

TUA Zoological Institute of the Tokyo University of Agriculture, Tokyo, Japan

Thomisus kitamurai Nakatsuji, 1943, holotype: ♂, lost

TUT Collection of Toshio Uyemura, Tokyo

Oxyptila takashimai Uyemura, 1937, holotype: +, allotype: juv. ♂, paratypes; 2 juv. ♀♀, all lost

TYO Collection of Takeo Yaginuma, Osaka

USNM National Museum, United States of America, Washington, DC

Xysticus croceus Fox, 1937, holotype: ♀

YNO Collection of Yoshiaki Nishikawa, Osaka

ZMB Zoologisches Museum an der Humboldt-Universität zu Berlin, German Democlatic Republic

Oxyptila decorata Karsch, 1879, syntypes: 2♀♀ 7 juv.♀♀ 8 juv.♂♂

Oxyptila fulvipes Karsch, 1879, syntypes: 2 juv.

Oxytate setosa Karsch, 1879, syntypes: 1♀1♂

Pistius undulatus Karsch, 1879, holotype: ♀

Synema japonica Karsch, 1879, syntypes: 2♀♀1♂

Thomisus labefactus Karsch, 1881, holotype: ♀

ZMH Zoologisches Museum der Universität, Hamburg, F.R. Germany

Oxyptila truciformis Bösenberg et Strand, 1906, syntypes: 2♀♀

Thomisus labefactus bimaculatus Bösenberg et Strand, 1906, holotype: ♀

Thomisus okinawensis Strand, 1907, holotype: ♀

Thomisus Formosae Strand, 1907, holotype: ♀

Xysticus mojensis Strand, 1907, holotype: ♀

Misumena elongata L. Koch, 1874, (= Pistius acuminatus Thorell, 1881), syntypes: ♀♀

ZMM Zoological Museum of the Moscow State University, USSR

ZMS Zoologisches Museum Stuttgart, F.R. Germany

Dieta japonica Bösenberg et Strand, 1906, syntypes: 1♀1♂, lost

Xysticus insulicola Bösenberg et Strand, 1906, holotype: ♀, lost

ZSI Zoological Survey of India, Calcutta

Xysticus sujatai Tikader, 1962, holotype: ♀, allotype: ♂, paratypes: 3♀♀

ZSM Zoologische Staatssammlung München, F.R. Germany

Xysticus kurilensis Strand, 1907, holotype: ♀

Terminology

Definition of terms and characters used for describing the thomisid taxa are as follows:

Body length is measured from the anterior margin of prosoma to the posterior end of opisthosoma including caudal extension or granulations but excluding chelicerae and spinnerets. Body consists of prosoma and opisthosoma; these terms are used as same as cephalothorax and abdomen. If not specially mentioned, prosoma means its dorsum (Fig. 1).

Prosoma: shape, ratio of its length to width, height, colour and pattern, condition of its surface, whether with projection or small granulations, condition, type and length of setae and hairs are significant. Chaetotaxy of prosoma see Schick (1965).

Eyes (Fig. 2): size, ratio of diameter of anterior lateral eye to anterior median eye (ALE/AME), the same of posterior lateral to posterior median (PLE/PME), ratio of distance between the anterior median eyes to that between anterior median eye and anterior lateral eye (AME-AME/AME-ALE), the same in posterior eye row (PME-PME/PME-PLE), ratio of anterior width to posterior width of median ocular area (MOA-AW/PW), ratio of length to width of median ocular area (MOA-L/W), ratio of

clypeus width to distance between both the anterior median eyes (clypeus/AME-AME), condition of tubercles of eyes, especially of lateral eyes, existence of granulations or projection in eye area.

Chelicerae: presence of scopula, modified hairs, teeth on margins of fang furrow; maxillae: distally truncated or pointed; sternum: shape, colour, ratio of its length to width.

Male palp (Fig. 3): shape of ventral tibial apophysis, presence of intermediate tibial apophysis, shape of retrolateral tibial apophysis, presence of dorsal tibial apophysis, shape of bulb, presence of tegular apophysis, length and shape of embolus, presence of tutacular apophysis.

Legs: lengths of femur, patella, tibia, metatarsus and tarsus, leg formula, ratio of length of leg I to that of leg IV, number of teeth on claws, presence of scopula and claw tuft, condition of hairs, shape of hairs.

Spiniformation (spination) of legs: as shown in Fig. 5. Spines of legs of thomisid spiders are present on dorsal, prolateral and retrolateral surfaces of femur and patella, on dorsal, pro- and retrolateral and ventral surfaces of tibia and metatarsus, and lacking on tarsus. Some groups do not have any spines on legs. The spines are standing usually in row; e.g., a row with three spines, if the positions of basal part of each spines are arranged equidistantly, is explained as 1-1-1.

Opisthosoma: shape, colour and markings, condition of integument, whether with granulations or caudal extention, its hairs and bristles, size and ratio of its length to width.

Female genitalia: Terminology of female genitalia of thomisid spiders is in confused situation. Having considered their function, each part was named as in Fig. 4. The difference between some terminologies hitherto published and that here proposed is shown in the following table.

Ono at the present paper	Different terminology
vestibulum	atrium (Gering, 1953; Dondale & Redner, 1978)
intromittent orifice	opening of spermatheca (Comstock, 1940), opening of epigynum (Kaestner, 1968), epigynal opening (Reiskind, 1969), copulatory opening (Dondale & Redner, 1978), genital opening (Foelix, 1982)
intromittent canal	bursa copulatrix (Gering, 1953; Schick, 1965; Reiskind, 1969), connecting duct (Kaestner, 1968), copulatory tube (Dondale & Redner, 1978), copulatory duct (Foelix, 1982)
spermatheca	spermathecum (Gering, 1953), receptaculum seminis (Wiehle, 1965; Braun, 1965), seminal receptacle (Kaestner, 1968; Foelix, 1982)
gland of spermatheca	spermathecal organ (Schick, 1965),

	accessory gland (Kaestner, 1968)
Spermathecal cock	spermathecal apophysis (Schick, 1965), neck of spermatheca (Reiskind, 1969)
fertilization tube	tube leading from spermatheca to vagina (Comstock, 1940), fertilization duct (Kaestner, 1968; Foelix, 1982)

Abbreviations

ALE	Anterior lateral eye
AME	Anterior median eye
AME-ALE	Distance between AME and ALE
AME-AME	Distance between AMEs
DTA	Distal tibial apophysis of male palp
ITA	Intermediate tibial apophysis of male palp
MOA	Median ocular area
MOA-L	Length of MOA
MOA-WA	Anterior width of MOA
MOA-WP	Posterior width of MOA
PLE	Posterior lateral eye
PME	Posterior median eye
PME-PLE	Distance between PME and PLE
PME-PME	Distance between PMEs
RTA	Retrolateral tibial apophysis of male palp

VTA Ventral tibial apophysis of male palp

Taxonomy

Family Thomisidae Sundevall, 1833

[Japanese name: Kanigumo-ka]

Laterigrades: Latreille, 1802, Hist. nat. Fourmis, Abeilles, Araignées, Faucheurs, Insectes, p. 351 (partim).

Laterigradae: Latreille, 1825, Fam. nat. Règn. Anim., p. 315 (partim).

Thomisides Sundevall, 1833, Conspectus Arachnidum, p. 27 (partim) --- C.L. Koch, 1837, Übersicht Arachn.-syst., 1, p.24; 1851, ibid., 5, p. 36. --- Prach, 1866, Verh. zool.-bot. Ges. Wien, 16, p. 597 --- Taczanowski, 1873, Horae Soc. ent. Ross., 9, p. 72 --- Planet, 1905, Hist. nat. France, 14, p. 163.

Thomisidae: Prach, 1860, Živa, 8, p. 89 (partim; including Philodromidae). --- Staveley, 1866, Brit. Spiders, p. 67 --- Stoliczka, 1869, J. Asiat. Soc. Bengal, 38, P. 224. --- Simon, 1874, Arachn. France, 1, p. 14; 1875, ibid., 2, p. 146; 1895, Hist. nat. Araign., éd. 2, 1, p. 949; 1897, ibid., 2, p. 5; 1903, ibid., 2, p. 1008; 1914, Arachn. France, 6, p. 117; 1932, ibid., 6, p. 778. --- Lebert, 1877, N. D.-S. schw. naturf. Ges., 23, P. 78. --- Becker, 1878, Ann. Soc. ent. Belg., 21, p. 52; 1882, Ann. Mus. roy. Hist. nat. Belg., 10, P. 159 --- F.O. Pickard-Cambridge, 1900, Biol.

Centr.-Amer., Zool., Arachn. Araneida, 2, p. 127. --- Chyzer & Kulczyński, 1897, Aran. hung., 2, p. 299. --- Comstock, 1913, Spider Book, p. 521; 1948, ibid., p. 534. --- Kishida, 1914, Kagaku Sekai, Tokyo, 7(13), p. 36. --- Petrunkevitch, 1928, Trans. Conn. Acad. Arts Sci., 29, p. 29, 55. --- Roewer, 1928, Tierw. Mitteleur., 3(2), P.VI-18. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p. 15. --- Dyal, 1935, Bull. Dept. Zool. Panjab Univ., 1, p. 198. --- S. Saito, 1934, J. Fac. Agr. Hokkaido imp. Univ., 33, p. 272; 1936, Rept. Sci. Exped. Manchoukuo, (5), 1(3), p. 6; 1939, Saito Hoon-kai Mus. Res. Bull., 3, p. 78; 1959, Spider Book Illustr. Col., p. 122. --- Gertsch, 1939, Bull. Amer. Mus. nat. Hist., 76, p. 295. --- Kaston, 1948, Spiders of Conn., p. 409; 1953, How to Know the Spiders, p. 95. --- Yaginuma, 1956, Atypus, Osaka, (10), p. 25; 1960, Spiders Japan Col., Osaka, p. 95; 1968, ibid., (rev. ed.), p. 97. --- Schick, 1965, Bull. Amer. Mus. nat. Hist., 129, p. 36. --- Zhu & Wang, 1963, Jilin Yike Daxue, Xue Bao, 5, p. 471. --- Locket & Millidge, 1951, British Spiders, 1, p. 168. --- H.W. & L.R. Levi, 1968, Guide to Spiders and their Kin, p. 94. --- Tikader, 1970, Rec. zool. Surv. India, 64, p. 46; 1971, Mem. zool. Surv. India, 15(3), p. 12; 1980, Fn. India, Spiders, 1, p. 26. --- Mascord, 1970, Austr. Spiders Col., p. 44; 1980, Spiders Australia, p. 92. --- Suman, 1970, Pacif. Ins., 12, p. 792. --- Tyshchenko, 1971, Opredel. pauk. evrop. casti SSSR, p. 103. --- Miller, 1971, Klic. zvireny CSSR, 4, p. 112. --- R.R. & L.M.

Forster, 1973, New Zealand Spiders, p. 138. --- Hubert, 1979, Araignées, p. 165. --- Song et al., 1979, Zool. Mag., Beijing, 1979, p. 16; 1980, Farm Spiders, p. 188. --- Sauer & Wunderlich, 1982, Schönste Spinnen Europas, p. 23. --- M.-S. Zhu, 1983, Spiders Paddy Fields, Shanxi, p. 167; --- Hu, 1984, Chinese Spiders Field Forests, p. 313. --- Roberts, 1985, Spiders Great Britain and Ireland, 1, p. 97.

Thomisiformes Simon, 1864, Hist. nat. Araign. (Aranéides), p.391 (partim).

Thomisiens Simon, 1864, Hist. nat. Araign. (Aranéides), p.418 (partim). (Tribe within the family Thomisiformes.)

Thomisoidae Thorell, 1870, Nova Acta reg. Soc. Sci. Upsal., (3), 7, p. 170 (partim; including Philodrominae and Anetinae). --- Keyserling, 1880, Spinnen Americas, laterigradae, 1, p. 2.

Misumenoidae Thorell, 1887, Ann. Mus. civ. Stor. nat. Genova, (2), 5, p. 10. --- Chyzer & Kulczyński, 1891, Aran. hung., 1, p. 80. --- Bösenberg, 1901, Zoologica, Stuttgart, 14, p. 6,7,17; 1902, ibid, 14, p. 324.

Thomisinae Thorell, 1870, Ann. Mus. cir. Stor. nat. Genova, (3), 7, p. 181. (Subfamily within the family Thomisidae.)

Thomisidae (excluding Philodromidae): Holm, 1940, Zool. Bidr. Uppsala, 19, p. 94. --- Tullgren, 1944, Svensk Spindelfauna, 3, p. 64. --- Homann, 1975, Z. Morph. Tiere, 80, p. 181. --- Dondale & Redner, 1978, Ins. & Arachn. Canada, 5, p. 122. --- Jones, 1983, Spiders, p. 106. --- Yaginuma, 1986, Spiders Japan Col., Osaka, (n. ed.), p. 201.

Xysticidae: Vilbaste, 1969, Eesti Ämblikud, 1, p. 31.

Notes. Most previous araneologists since Simon (1895a) have regarded the Thomisidae as a family including the philodromine spiders. In view of the morphological differences between the Philodrominae and the other thomisid subfamilies, however, I am going to recognize an independent family for the philodromine spiders in this paper and define the family Thomisidae in a strict sense. It is doubtless that the two families are phylogenetically apart from each other, as was demonstrated by the embryological study of Holm (1940) and the histological study of Homann (1975).

Type genus. Thomisus Walckenaer, 1805, Tabl. Aranéid., p. 28 (type species: Thomisus onustus Walckenaer, 1805, Tabl. Aranéid., p. 32, described from Lyon, France).

Diagnosis. Legs I-II specialized for catching insects, much longer and thicker than legs III-IV. Lateral eyes lying respectively on tubercles, larger and much more developed than median eyes (anatomical characteristics of eyes were diagnosed by Homann (1975)). Epigynum usually with hood or guide pocket. Tibia of male palp with VTA and RTA; tegulum disc-shaped, with ridge; siminal duct not meandering but winding along tegular ridge to embolus.

Remarks. Current hypotheses explain that the family Thomisidae (including Philodromidae) is related to the Eusparassidae, Platoridae and Selenopidae, and has its origin in a certain dionychan group consisting of the above families and the Clubionidae, Gnaphosidae, Salticidae, etc.

On the basis of the study of post-embryonic development, however, Holm (1940) pointed out that the Thomisidae and Philodromidae are different at familial level. Lehtinen (1967) dismembered the dionychan spiders and placed the Thomisoidea (Thomisidae + Aphantochilidae) in the group of "Zodariides" including the Zodarioidea, Salticoidea and Eresidae. Having made an anatomical study of eyes, Homann (1975) reached the conclusion that the families Thomisidae and Philodromidae are not closely related to each other; the Thomisidae is a sister group of the Lycosoidea, a trionychan group, and the Philodromidae that of the Eusparassidae.

I agree with the opinion to regard the Philodromidae as an independent family separated from the Thomisidae. They are remarkably different from each other not only in external features but also in genitalic structure. I was, however, unable to clarify the phylogenetic problem if the Thomisidae is derived from such a trionychan spider as the Lycosoidea. Though the family Thomisidae is peculiar in the Dionycha, it also has some features common with the other dionychan families. Since the spider fauna of the tropic regions is not yet satisfactorily studied, it is highly possible that certain groups closely related to thomisids will be found in future.

The Aphantochilidae Thorell, 1873, is regarded herewith as an independent abberrant sub-family derived from the subfamily Strophiinae.

The Thomisidae includes 7 subfamilies, about 160 genera and 2,000 species.

Subfamilies included. Stephanopinae O. Pickard-Cambridge, 1871, Strophiinae Simon, 1895, Aphantochilinae Thorell, 1873, Thomisinae

Sundevall, 1833, Dietinae Simon, 1895, Bominae Simon, 1886, Stiphropodinae Simon, 1886.

Key to the Subfamilies

1(2) Chelicerae with strong teeth on both the margins of fang furrow .... Stephanopinae O. Pickard-Cambridge, 1871.

2(1) Chelicerae without teeth, rarely with a vestigial small tooth

3(6) Maxillae long and pointed; labium very long, more than twice as long as wide.

4(5) Body ant-mimicing ..... Aphantochilinae Thorell, 1873*

5(4) Body not ant-mimicing ..... Strophiinae Simon, 1895*

6(3) Maxillae truncated; labium slightly longer than wide, rarely wider than long.

7(8) Legs and palps covered very thickly with branched hairs; tarsi I-II clavate, longer than metatarsi I-II, respectively ..... Stiphropodinae Simon, 1886*.

8(7) Hairs of legs and palps not branched; tarsi I-II shorter than metatarsi I-II, respectively.

9(10) Legs short and thick, without strong spines; patellae long, nearly as long as tibiae, longer than metatarsi ..... Bominae Simon, 1886.

10(9) Legs long, with strong spines; patellae short, shorter than tibiae or metatarsi.

11(12) Tarsi with claw tufts formed by tenent hairs ..... Dietinae Simon, 1895.

12(11) Tarsi without claw tufts or with undeveloped tufts formed by simple hairs ..... Thomisinae Sundevall, 1833.

Note: Subfamilies with asterisks have not been found in Japan.

Subfamily Stephanopinae O. Pickard-Cambridge, 1871

[Japanese name: Hakanigumo-aka]

Stephanopides O. Pickard-Cambridge, 1871, Zool. Rec., 7, (for 1870), p. 219. (Type genus: Stephanopis O. Pickard-Cambridge, 1869, Ann. Mag. nat. Hist., (4), 3, p. 60.)

Stephanopini: Simon, 1886, Act. Soc. linn. Bordeaux, 40, p. 169. (Section within the family Thomisidae.)

Stephanopsinae Simon, 1895, Hist. nat. Araign., éd. 2, 1, p. 1037; 1897, ibid., 2, p. 5; 1903, ibid., 2, p. 1015. --- Petrunkevitch, 1928, Trans. Conn. Acad. Arts Sci., 29, p. 55.

Hedaneae Simon, 1895, Hist. nat. Araign. éd. 2, 1, p. 1038. (Genus-group within the subfamity Stephanopsinae; type genus: Hedana L. Koch, 1874.) --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), P. 746.

Stephanopoideae Simon, 1895, Hist. nat. Araign., ed. 2, 1, p. 1041. (Genus-group within the subfamily Stephanopsinae; type genus: Stephanopoides Keyserling, 1880.) --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 748.

Phrynarachneae Simon, 1895, Hist. nat. Araign., éd. 2, 1, p. 1043

(Genus-group within the subfamily Stephanopsinae; type genus: Phrynarachne Thorell, 1870.); 1903, ibid., 2, p. 1015. --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 749.

Stephanopseae: Simon, 1895, Hist. nat. Araign., ed. 2, 1, p. 1046. (Genus-group within the subfamily Stephanopsinae.); 1897, ibid., 2, p. 5; 1903, ibid., 2, p. 1017.

Stephanopidae: Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p. 372; 1913, Vergl. Physiol. Morphol. Spinnentiere, p. 19.

Stephanopsinas Mello-Leitão, 1929, Archiv. Mus. nac. Rio de Janeiro, 31, p. 37.

Stephanopinae: Mello-Leitão, 1929, Archiv. Mus. nac. Rio de Janeiro, 31, p. 246. — Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 746. --- Brignoli, 1983, Cat. Aran., Manchester, p. 604.

Stephanopeae: Roewer, 1954, Kat. Aran., Bruxelles, p. 751. (Genus-group within the sub-family Stephanopinae.)

Notes. O. Pickard-Cambridge (1869) described the curious spider genus Stephanopis from Australia, which was included in the family Thomisidae by Thorell (1870). Against Thorell's dispostion, O. Pickard-Cambridge established a new family for the genus in the next year. Simon (1886b) first regarded it as a section of the family Thomisidae, but later in the revision of the whole family Thomisidae (1895a), he raised it to an independent subfamily including four genus-groups, that is, Hedaneae, Stephanopoideae, Phrynarachneae and Stephanopseae. Spiders of this subfamily possess some teeth on both the

pro- and retromargin of cheliceral fang furrow.

Stephanopsis and Stephanopsinae are frequently used, but the original spelling was Stephanopis, so that the subfamilial name should be Stepanopinae and the other names are to be regarded as synonyms.

Type genus. Stephanopis O. Pickard-Cambridge, 1869, Ann. Mag. nat. Hist., (4), 3, p. 60 (type species: S. altifrons O. Pickard-Cambridge, 1869, ibid., p. 61, from Australia).

Diagnosis. Carapace with setae often strongly developed, PME not small, in some cases larger than PLE. Both the margins of fang furrow on chelicerae with strong teeth: promargin with 2-4, retromargin with 1-3. Labium and maxillae truncated. Legs with strong setae; tarsi normal, not very wide at the base, without true claw tufts. Hairs of integument not branched.

Genera included. Angaeus Thorell, 1881, Ascurisoma Strand, 1928, Borboropactus Simon, 1884, Carcinarachne Schmidt, 1956, Cebrenninus Simon, 1887, Coenypha Simon, 1895, Cupa Strand, 1906, Ebrechtella Dahl, 1907, Epicadinus Simon, 1895, Epicadus Simon, 1895, Epidius Thorell, 1877, Erissoides Mello-Leitão, 1929, Erissus Simon, 1895, Geraesta Simon, 1889, Haedanula Caporiacco, 1941, Hedana L. Koch, 1874, Iphoctesis Simon, 1903, Isala L. Koch, 1876, Isaloides F.O. Pickard-Cambridge, 1900, Onocolus Simon, 1895, Parastephanops F.O. Pickard-Cambridge, 1900, Paronocolus Mello-Leitao, 1929, Pharta Thorell, 1891, Phrynarachne Thorell, 1869, Pothaeus Thorell, 1895, Prepotelus Simon, 1898, Pycnaxis Simon, 1895, Reinickella Dahl, 1907, Rhaebobates Thorell, 1881 (included by Petrunkevitch (1928) in the subfamily Misumeninae (=Thomisinae)),

Sidymella Strand, 1942, Stephanopoides Keyserling, 1880, Stephanopis O. Pickard-Cambridge, 1869, Synalus Simon, 1895, Tharrhalea L. Koch, 1875, Tobias Simon, 1895, Trichopagis Simon, 1886. (Not carefully studied excepting the following Japanese genera.)

Key to the Japanese Genera

1(2) Large-sized; body length about 10mm or more in female (male one-third the size of female); prosoma and opisthosoma with granulations and tubercles on dorsum; labium longer than wide

..... Phrynarachne Thorell, 1869.

2(1) Medium-sized; body length less than 5mm in female; pro- and opisthosoma smooth; labium wider than long

..... Cupa Strand, 1906.

Genus Cupa Strand, 1906

[Japanese name; Tarugumo-zoku]

Cupa Strand, 1906, in Bösenberg & Strand, Abh. senckenb. naturf. Ges., 30, p. 265 --- Yaginuma, 1956, Atypus, Osaka, (10), p. 30; 1960, Spiders Japan Col., Osaka, p. 102; 1968, ibid. (rev. ed.), p. 102.

Type species. Cupa typica Bösenberg et Strand, 1906,

Abh. senckenb. naturf. Ges., 30, p. 266; by monotypy.

Etymology. From Latin meaning vat; feminine.

Diagnosis. Medium-sized thomisids. Prosoma smooth, nearly as long as wide, poorly haired, head narrow, with setae. Lateral eyes much developed, AME small, smaller than PME, MOA nearly as long as wide, anteriorly narrower, clypeus wider than AME-AME. Chelicerae with two teeth on promargin and three teeth on retromargin of fang furrow. Labium wider than long, sternum almost as long as wide. Legs with setae; leg formula I-II-IV-III. Bulb of male palp simple, longer than wide, with a large conductor. Opisthosoma nearly as long as wide, without tubercles or granulations. Epigynum simple, small, without hood, intromittent canal short, spermathecae small, oval.

Range. Known only from Japan and China.

Biology. Unknown.

Species included. Two known species: C. typica Strand, 1906, and C. zhengi Ono et Song, 1986.

Key to the Japanese Species

1(2) Leg I six times as long as prosomal width; tibiae I-II with three pair of ventral spines, metatarsi I-II with two pair of ventral spines; AME-AME narrower than AME-ALE, PME-PME wider than PME-PLE, clypeus very wide, about five times as wide as AME-AME

..... Cupa typica Bösenberg et Strand, 1906.

2(1) Leg I about four times as long as prosomal width; tibiae I-II with five pair of ventral spines, metatarsi I-II with three pair of ventral spines; AME-AME wider than AME-ALE, PME-PME narrower than PME-PLE, clypeus/AME-AME 1.25-1.58 ..... Cupa zhengi Ono et Song, 1986.

Cupa typica Bösengerg et Strand, 1906

[Japanese name: Tarugumo]

(Figs. 6-10)

Cupa typica Bösenberg et Strand, 1906, Abh. senckenb. naturf. Ges., 30, p. 266. Female holotype from Saga, Japan, Dönitz leg., in SMF, examined. --- Kishida, 1913, Kagaku-sekai, Tokyo, 7(13), p. 38 --- S. Komatsu, 1936, Incon. col. vivid. Aran. Japon. Tokyo, 1, p. 86. --- Yaginuma, 1960, Spiders Japan Col., Osaka, p. 102; 1968, ibid., (rev. ed.), p. 102; 1986, ibid., (n.ed.), p.214.

Notes. The type species of the genus has never been rediscovered since the original description.

Etymology. Specific name from Latin meaning typical.

Specimen examined. 1♀(holotype), "Yunohama Berge bei Saga, Japan," Dönitz leg. (SMF 4246).

Redescription of the holotype. Measurement. Body length 4.41mm; prosoma length 1.78mm, width 1.63mm; opisthosoma length 2.63mm, width

2.25mm; lengths of legs (in mm):

Leg	Tarsus	Metatarsus	Tibia+Patella	Femur	Total
I	0.95	2.32	3.68	2.82	9.77
II	lost	2.32	3.79	2.74	----
III	0.47	1.05	1.89	1.47	4.88
IV	0.53	1.16	2.11	1.79	5.59

(Total lengths of legs in the original description by Bösenberg & Strand (1906): I 11mm, II 10.2mm, III 5.2mm, IV 6.2mm).

Prosoma longer than wide (length/width 1.09), poorly haired, somewhat flattened, head with setae. Posterior row of eyes slightly procurved (Figs. 6-7), ALE > PLE > PME > AME, ALE/AME 2.00, PLE/PME 1.13, AME-AME/AME-ALE 0.86, PME-PME/PME-PLE 1.82, MOA as long as wide, anteriorly narrower (WA/WP 0.54), clypeus/AME-AME 5.33. Chelicerae vertical, with scopula; two conical teeth on promargin and three on retromargin of fang furrow (Fig. 8). Labium (Fig. 9), wider than long (length/width 0.92), barely extending beyond the mid-point of maxillae, sternum slightly longer than wide (length/width 1.11). Legs with setae; leg formula I-II-IV-III.

Spiniformation of legs. Formora I-IV dorsal 1-1-1, I prolateral 1-1-1-1, II prolateral 1-1-0-1; tibiae I-II pro- and retrolateral 1-1-1-2 ap, ventral 2-2-2, III pro- and retrolateral 1-0-0, ventral 0-2-2, IV pro- and retrolateral 1-1-1, ventral 0-1-2; metatarsi I-II pro- and

retrolaterial 1-1-2 ap, ventral 2-2, III pro- and retrolateral 1-1-1 ap, ventral 0-1-2, IV pro- and retrolateral 1-0-1 ap, ventral 0-2-2.

Opisthsoma longer than wide (length/width 1.17).

Female genitalia (Fig. 10). Epigynum simple and small, without hood, internal apparatus visible through integument; intromittent canal short, spermathecae small oval.

Coloration and markings. Prosoma: Carapace and chelicera orange-brown, labium and maxillae light yellowish brown, sternum yellowish white, legs light yellowish white. Dorsum of opisthosoma yellowish white, without any marking, underside also yellowish white, spinnerets white. (For coloration and markings of the specimen in a better condition, refer to the original description by Bösenberg and Strand (1906).)

Range. Japan (Kyushu); known only from the type locality.

Biology. Unknown.

Remarks. This species is distinguished from the next one, Cupa zhengi, by the arrangement of eyes, spiniformation of legs and the structure of female genitalia.

Male is unknown.

Cupa zhengi Ono et Song, 1986

[Japanese name: Minami-tarugumo]

Cupa zhengi Ono et Song, 1986, Bull. natn. Sci. Mus., Tokyo, (A), 11,

p.26. Male holotype and female allotype from Sanmen County, Zhejiang, China, 5-X-1977, S.-X. Zheng leg., 2♀♀ paratypes from Okinawa Island, Okinawa Pref., Japan, 5-VI-1977, Y. Chikuni leg., 1♀ paratype from Nishinakama, Amami-oshima Island, Kagoshima Pref., Japan, 24-26-V-1978, H. Makihara leg., 1♀ paratype from Tokunoshima Island, Kagoshima Pref., Japan, 14-VII-1983, K. Sakai leg.; types in ASB and NSMT, examined.

Etymology. Named after Zheng Shao-xiong, Sanmen, China.

Specimens examined. Type series: Holotype: ♂ (NSMT-Ar 1122), allotype: ♀ (ASB), Sanmen County, Zhejiang, China, 5-X-1977, Zheng S.-X. leg.; paratypes: 1♀, Nishinakama, Amami-oshima Island, Amami Islands, Kagoshima Pref., 24-26-V-1978, H. Makihara leg. (NSMT-Ar 1123), 1♀, Tokunoshima Island, Amami Islands, Kagoshima Pref., 14-VII-1983, K. Sakai leg. (NSMT-Ar 1124), 2♀♀, Okinawa Island, Okinawa Islands, Okinawa Pref., 5-VI-1977, Y. Chikuni leg. (1♀, NSMT-Ar 1125; 1♀, ASB).

Description. Measurement. Body length ♀ 3.04-4.67mm, ♂ 3.18mm; prosoma length ♀ 1.48-1.78mm, ♂ 1.56mm, width ♀ 1.56-1.78mm, ♂ 1.48mm; opisthosoma length ♀ 1.70-2.96mm, ♂ 1.68mm, width ♀ 1.78-3.00mm, ♂ 1.41mm. Lengths (in mm; ♀/♂) of legs of 1♀ from Okinawa Island and 1♂ from Sanmen are as follows:

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.48/0.55	1.41/1.43	1.85/1.81	0.89/0.75	2.15/1.91	6.78/6.45
II	0.48/0.54	1.38/1.40	1.85/1.81	0.89/0.73	2.15/1.94	6.75/6.42

III	0.38/0.36	0.58/0.61	0.83/0.80	0.63/0.50	1.20/1.04	3.62/3.31
IV	0.38/0.37	0.75/0.70	1.03/0.95	0.60/0.49	1.35/1.18	4.11/3.69

Prosoma nearly as long as wide (length/width ♀ 0.94-1.03, ♂ 1.05), poorly haired; head narrow, with setae. Posterior row of eyes recurved, ALE ≧ PLE > PME > AME, ALE/AME ♀ 2.50-3.33, ♂ 2.57, PLE/PME ♀ 1.33-1.67, ♂ 1.23, AME-AME/AME-ALE ♀ 1.33-2.00, ♂ 1.33, PME-PME/PME-PLE ♀ 0.81-0.95, ♂ 0.75, MOA nearly as long as wide (L/W ♀ 1.00-1.05, ♂ 1.12), wider behind than in front (WA/WP ♀ 0.54-0.67, ♂ 0.70), clypeus/AME-AME ♀ 1.25-1.58, ♂ 1.67. Chelicera vertical, with scopula, furnished with two teeth on promargin and three teeth on retromargin of fang furrow. Labium wider than long (length/width ♀ 0.66-0.83, ♂ 0.78); sternum as long as or slightly longer than wide (length/width ♀ 1.00-1.10, ♂ 1.06). Leg formula I-II-IV-III.

Spiniformation of legs. ♀ (Okinawa Island): Femur: I-IV dorsal 0-1-1, I prolateral 0-1-2-2-0-1-0 (on the right leg 0-1-2-0-1-0); patella: I-IV dorsal 1-0-1, IV retrolateral 1; tibia: I-IV dorsal 1-0-1, I-II prolateral 1-1-1, retrolateral 0-1-1, ventral 2-2-2-2-2, III-IV prolateral 1-1, ventral 0-2-2 ap, IV retrolateral 1-1; metatarsus: I-II pro- and retrolateral 1-0-2 ap, ventral 2-2-2, III-IV prolateral 1-2 ap, retrolateral 0-2 ap, III ventral 1.

♂ (Sanmen): Femur: I dorsal 0-1-1, prolateral 0-1-2-1-1, retrolateral 0-1-1-1-1, II dorsal 0-1-1-0-1, prolateral 0-0-1-1-1, retrolateral 0-1-1-1-1, III dorsal 0-1-0-1, prolateral 0-1-0-0, retrolateral 0-0-0-1, IV dorsal 0-1-0-1, retrolateral 0-0-0-1; patella:

I-IV dorsal 1-0-1 (weak), retrolateral 1; tibia: I-IV dorsal 1-0-1 (weak), I-II pro- and retrolateral 1-1-1, ventral 2-2-2-2-2, III-IV pro- and retrolateral 1-1, ventral 2 ap; metatarsus: I-II pro- and retrolateral 1-0-2 ap, ventral 2-2-2-0, III-IV pro- and retrolateral 0-1-2 ap, ventral 0.

Male palp (Ono & Song, 1986, figs. 5-6). Tibia with VTA and RTA; VTA digitiform, RTA very wide, furnished with short strong hairs. Bulb longer than wide, simple, with a large conductor; embolus long, spiniform.

Opisthosoma as wide as or wider than long in the female (length/width 0.91-1.00), longer than wide in the male (length/width 1.19), with short hairs.

Female genitalia (Ono & Song, 1986, figs. 2-3). Epigynum small, without hood; intromittent orifices situated in the anterior part. Internal apparatus visible through integument; intromittent canal long; spermathecae oval.

Coloration and markings. ♀: Prosoma light yellowish brown to light greyish brown, mottled with brown or blackish brown; chelicerae, maxillae, labium, sternum and femora I-II light yellowish brown, other parts of legs I-II brown, legs III-IV yellow. Opisthosoma yellowish brown or light beige, with a pair of dark-coloured spots in the anterior part, indistinct markings at the middle and some transverse lines in the posterior part.

♂: Prosoma yellowish brown mottled with dark brown; chelicerae yellowish brown, maxillae, labium and sternum lemon-yellow; legs I yellowish brown, II lighter, III-IV yellow. Opisthosoma light beige on

dorsum with a pair of black spots at the middle, venter light beige.

Range. Japan (Nansei Islands), China (Zhejiang).

Biology. Unknown.

Remarks. The difference between the two Cupa species is so conspicuous that they cannot be simply placed in the same genus, but I was unable to find any other genus appropriately receiving C. zhengi. When the male of C. typica is found in future, this problem can be solved on a sound basis.

Genus Phrynarachne Thorell, 1869

[Japanese name: Tsukeogumo-zoku]

Phrynoides Simon, 1864, Hist. nat. Araign. (Aranéides), p. 437; preoccupied by Phrynoides Fitzinger., 1843, Reptilia.

Phrynarachne Thorell, 1869, Nova Acta reg. Soc. sci. Upsal., (3), 7, p. 37; nom. nov. for Phrynoides Simon, 1864. --- Simon, 1895, Hist. nat. Araign., éd. 2, 1, p.1045. --- Yaginuma, 1960, Spiders Japan Col., Osaka, p.98; 1968, ibid. (rev. ed.), p.98; 1986, ibid. (n.ed.), p.210.

Cladonotus Thorell, 1877, Ann. Mus. civ. Stor. nat. Genova, 9, p. 305.

Ornithoscathoides O. Pickard-Cambridge, 1884, Proc. zool. Soc. London, 1884, p. 198.

Notes. Simon (1864) first established this genus as Phrynoides with two species, Thomisus rugosus Walckenaer, 1805, and T. foka Vinson,

1863; the latter was later regarded by the same author (1895a) as a synonym of the former. Thorell (1869) found that the generic name was preoccupied by Reptilian Phrynoides Fitzinger, 1843, and proposed the new name Phrynarachne. Cladonotus Thorell, 1877, with C. jobiensis Thorell, 1877, from New Guinea as the type species, and Ornithoscathoides O. Pickard-cambridge, 1884, with Thomisus decipiens Forbes, 1883, from Sumatra as the type species, were already synonymized with Phrynarachne by Simon (1895a).

A problem was posed by Roewer (1954). He transferred Botryogaster coerulescens Doleschall, 1859, described from Java, to Phrynarachne without comment. If this species, which is the type species of the genus, is actually a member of Phrynarachne, the generic name Botryogaster Doleschall, 1859, will have to be used instead of Phrynarachne, because it has the priority over the latter. Judging from the original description and figures given by Doleschall, it is possible that the forgotten generic name may rise from obscurity to the science. Though Simon (1895a) noted "le P. cucllata E. Sim. répond complètement à la figure donnée par Doleschall de son Bothryogaster caerulescens, sauf en ce qui concerne la disposition oculaire qui serait, d'apres Doleschall, très différente de celle de tous les autres Thomisides.", re-examination of the type specimen, which is probably deposited in the Rijksmuseum von Natuurlijke Historie, Leiden, is required. The illustration of the eye arrangement given by Doleschall may show a frontal view; if so, the genus may not be basically different from the other genera of the Thomisidae.

Type species. Thomisus rugosus Walckenaer, 1805, Tabl. Aranéid.,

p. 33.

Etymology. Greek φρύνη + ἀράχνη meaning toad spider; feminine.

Diagnosis (based mainly on the Japanese species). Large-sized thomisids; male one-third the size of female. Prosoma nearly as long as wide, with granulations. Eyes small, subequal in size, AME-AME > AME-ALE, PME-PME ≧ PME-PLE, MOA nearly square, clypeus slightly longer than AME-AME. Chelicerae with two teeth on promargin and one large tooth on retromargin of fang furrow. Labium longer than wide, sternum oval, longer than wide. Tibia of male palp much developed, long. Opisthosoma with many tubercles. Epigynum simple, with a sclerotized plate, spermathecae reniform.

Range. Southeast Asia, Australia, Africa.

Biology. Living on plants. The appearance and coloration of Phrynarachne spiders look like bird's excrement. Pocock and Rothschild (1903) supposed that the bird's dung imitation is not only for purpose of allurement but a factor serving to protect the spiders from enemies, especially the pompilid wasps. Mascord (1980) described that a common Australian species (?P. tuberosa (O. Pickard-cambridge, 1884)) feeds on flying and crawling insects inhabiting grass. It is expected that the spiders secrete a substance to attract flies.

Species included. 28 species were described (cf. Roewer (1954), Brignoli (1983)), 15 from the Oriental subregion, 11 from the Ethiopian and Malagasy subregions and 2 from Australian subregion. Other than these, Mascord (1980) reported P. decipiens (Forbes, 1883) originally described from Sumatra and two undetermined species from Australia. Two

species occur in Japan.

Key to the Japanese Species

1(4) Females.

2(3) Prosoma marginated with white; opisthosoma longer than wide, with strong setae ..... Phrynarachne ceylonica (O. Pickard-Cambridge, 1884).

3(2) Prosoma not marginated with white; opisthosoma wider than long, with weak setae ..... P. katoi Tikuni, 1955.

4(1) Males.

5(6) Prosoma longer than wide, without vertical white stripes; opisthosoma longer than wide; palpal cymbium retrolaterally expanded ..... P. ceylonica (O. Pickard-Cambridge, 1884).

6(5) Prosoma wider than long, with a pair of vertical white stripes; opisthosoma wider than long; palpal cymbium retrolaterally not expanded ..... P. katoi Tikuni, 1955.

Phrynarachne ceylonica (O. Pickard-Cambridge, 1884)

[Japanese name: Herijiro-tsukeogumo]

(Figs. 11-17)

Ornithoscatoides ceylonica O. Pickard-Cambridge, 1884, Proc. zool. Soc.

London, 1884, p. 201. Some female syntypes from Ceylon, G.H.K. Thwaites leg., in HDEO, not examined.

Ornithoscatoides nigra O. Pickard-Cambridge, 1884, Proc. zool. Soc. London, 1884, p. 202. Two male syntypes from Ceylon and India, G.H.K. Thwaites leg., in HDEO, not examined. (New synonymy.)

Phrynarachne Ceylonica: Thorell, 1891, Kongl. Svenska Vet.-Akad. Handl., 24, p. 97; 1892, Ann. Mus. civ. Stor. nat. Genova, 31, pp.91, 469.

Phrynarachne ceylonica: Simon, 1895, Hist. nat. Araign., éd. 2, 1, pp. 1043, 1045. --- Reimoser, 1925, Suppl. ent. 10, p. 92; 1927, Misc. zool. Sumatra, 13, p.4.

Phrynarachne nigra: Simon, 1895, Hist. nat. Araign., éd.2, 1, p. 1045.

Notes. As O. Pickard-Cambridge noted in the original description ("It is possible that this spider may only be the male of O. ceylonica") Ornithoscatoides nigra should be regarded as a junior synonym of Phrynarachne ceylonica. This species is sexually dimorphic; the male is remarkably different from the female not only in the body length but also in the condition of eyes and labium.

Etymology. Specific name from the country of Ceylon, Sri Lanka.

Specimens examined. Japan: 1 juv. ♀, Mt. Omotodake, Ishigakijima Island, Yaeyama Islands, Okinawa Pref., 9-IV-1979, H. Makihara leg. (NSMT-Ar 1131); 1♀, Iriomotejima Island, Yaeyama Islands, Okinawa Pref., 17-VIII-1985, A. Tanikawa leg. (NSMT-Ar 1132); 1♂, Komi, Iriomotejima Islands, Yaeyama Islands, Okinawa Pref., 29-III-1986 (subadult), 13-V-1986 (adult after breeding), A Tanikawa leg. (NSMT-Ar 1141).

Description. Measurement. Body length ♀ 7.63mm, ♂ 2.87mm; prosoma length ♀ 3.70mm, ♂ 1.40mm, width ♀ 3.56mm, ♂ 1.35mm; opisthosoma length ♀ 4.44mm, ♂ 1.71mm, width ♀ 4.15mm, ♂ 1.63mm. Lengths of legs of 1♀1♂ from Iriomotejima Island (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.30/0.66	2.67/0.89	3.85/1.17	2.15/0.69	4.96/1.62	14.93/5.03
II	1.41/0.58	2.37/0.85	3.56/1.16	2.00/0.70	4.81/1.64	14.15/4.93
III	0.77/0.33	0.93/0.40	1.44/0.53	1.22/0.46	2.44/0.87	6.80/2.59
IV	0.77/0.33	1.04/0.41	1.77/0.69	1.11/0.43	2.74/0.91	7.43/2.77

Prosoma longer than wide (length/width ♀♂ 1.04); head with granulations respectively furnished with a seta on the top, granulations in MOA of female (Fig. 12) much more developed than those in P. katoi; cephalic part without developed granulations. Eyes small, subequal in size, ALE > PLE > AME > PME, ALE/ALE ♀ 1.44, ♂ 1.33, PLE/PME ♀ 1.25, ♂ 1.20, AME-AME/AME-ALE ♀ 1.41, ♂ 1.33, PME-PME/PME-PLE ♀ 1.07, ♂ 1.03, MOA-WA/WP ♀ 0.84, ♂ 0.85, L/W ♀ 0.93, ♂ 0.96, clypeus/AME-AME ♀ 1.33, ♂ 1.08. Chelicera with scopula, promargin of fang furrow with two teeth, retromargin with one; labium longer than wide in female, wider than long in male (length/width ♀ 1.21, ♂ 0.88); sternum shield-shaped, longer than wide (length/width ♀ 1.27, ♂ 1.07). Leg formula I-II-IV-III; legs I-II much longer than legs III-IV (length of leg I / length of leg IV ♀ 1.21, ♂ 1.82); tibiae of legs I-II respectively curved. Claws of legs: ♀: I-II with 10-12 teeth, III-IV with 5-6 teeth; ♂: I-IV with 5-6 teeth.

Spiniformation of legs of 1♀1♂ from Iriomotejima Island. ♀: Femur I dorsal 0-1-1 (short), prolateral 6 (short, irregularly), ventral many, II dorsal 1-1-0-1 (short), ventral many, III-IV dorsal 0-1-0-1 (short); patella: I-IV dorsal 1-0 (weak), pro- and retrolateral 0-1 (weak); tibia: I-II dorsal 1-1-0 (respectively on granulation), pro- and retrolateral each 0-1-1, I ventral 9 pair, II ventral 8 pair, III-IV dorsal 1-1, prolateral 0-1, III ventral 2-2-2 ap, IV ventral 0-1-1 ap; metatarsus: I-II dorsal 0-1-1-0, prolateral 1-1-1-1, retrolateral 1-1-0, 6 pair (4 pair long, 2 pair short), III dorsal 1-1, prolateral 1-1-1 ap, IV dorsal 0-1, prolateral 1-1.

♂: Femur: I-IV dorsal 0-1-1, I prolateral 7 irregularly, ventral several strong setae; patella: I-IV dorsal 1 (weak), I-II prolateral 0-1 (weak); tibia: I-IV dorsal 1-1 (weak), I-II prolateral several setae, ventral 2-2-2; metatarsus: I-II pro- and retrolateral each 1 ap, ventral 2-2.

Male palp (Figs. 16-17). Tibia with VTA and RTA; VTA digitiform and distally curved, RTA spiniform and long. Bulb simple, embolic division winding around tegulum, embolus filiform; cymbium retrolaterally expanded.

Opisthosoma longer than wide (length/width ♀ 1.07, ♂ 1.05), with many tubercles each furnished with a long seta on the top.

Female genitalia (Figs. 13-14). Epigynum with a scrolotized plate; central hood present under the plate. Spermathecae kidney-shaped, with gland in anterior part.

Coloration and markings. ♀ (Fig. 11): Prosoma dark grey,

marginated with white; chelicerae and maxillae white; labium proximally black, distally greyish white; sternum anteriorly white, posteriorly black. Legs I-II: femora white with light green markings; patellae white; tibiae proximally white, distally black; metatarsi black mottled with white; tarsi proximally white, distal part prolaterally white, retrolaterally black. Legs III-IV light green with dark-coloured markings. Opisthosomal dorsum dark grey, caudally black with a white spot, with a vertical white line at the middle; venter black.

♂ (Fig. 15): Prosoma blackish brown; head with white spots; chelicerae blackish brown proximally mottled with white; maxillae, labium and sternum black; legs black, femora I-II with white spots, tarsi I-IV proximally, I-II distally, femora III-IV proximally with a white ring, respectively. Opisthosoma black.

Range. Japan, Sumatra, Nicobar Islands, India, Sri Lanka.

Biology. Unknown.

Remarks. This species is newly recorded from Japan. It may be identical with P. honsiensis or P. formosensis, both nom. nud., reported by Uyemura (1935, 1936).

Phrynarachne ceylonica can be easily distinguished from another Japanese species of the genus, P. katoi, not only by the external features but also by the structure of genital organs.

Phrynarachne katoi Tikuni, 1955

[Japanese name: Katô-tsukeogumo]

(Fig. 18-26)

Phrynarachna [sic] katoi Kishida, in Tikuni (= Chikuni), 1955, Acta arachnol., 14, p. 35. Female holotype from Tôjigami, 470m alt., Daisan-ku, Kawajimura, Iida-shi, Shimoina-gun, Nagano Pref., 7-IX-1953, S. Sekigawa leg., in KKT, lost (Chikuni in litt.).

Phrynarachne katoi: Yaginuma, 1960, Spiders Japan Col., Osaka, p. 98; 1968, ditto (rev. ed.), p.98; 1986, ditto (n. ed.), p.210 --- Shinkai, 1969, Spiders Tokyo, p.40. --- Yaginuma et al., 1976, Fauna Flora Tsushima Isls., p. 828. --- Shinkai & Takano, 1984, Field Guide to Spiders Japan, p.135.

Notes. With excellent illustrations, Chikuni (1955) described this species under the name of "Phrynarachna [sic] katoi Kishida, 1936," though it had never been described by Kishida himself. Tikuni (= Chikuni) has been recognized as the author both by Yaginuma (1960) and Brignoli (1983).

Etymology. Named after the deceased entomologist, Masayo Katô.

Specimens examined. Japan. 1♀, Urushidani, Suwara, Mino-shi, Gifu Pref., 12-VII-1980, M. Isono leg. (TYO); 1♂, Akasaka-machi, Akaiwa-gun, Okayama Pref., 18-IX-1985, N. Suzuki leg. (NSMT-Ar 1143); 1♀, Sago, Kamiagata-machi, Tsushima Island, Nagasaki Pref., 29-IV-1975, S. Takano leg. (NSMT-Ar 1140); 1 juv., Shiiba-mura, Higashiusuki-gun,

Miyazaki Pref., 15-VIII-1957, T. Hidaka leg. (NSMT-Ar 474); 1♀, Minamata-shi, Kumamoto Pref., 25-IX-1967, R. Hamada leg. (TYO); 1♀, Motobu-machi, Kunigami-gun, Okinawa Island, Okinawa Pref., 22-X-1977, M. Shimojina leg. (MSO).

Korea: 1♀, Dongmyung, near Taegue, 15-IX-1979, K. Yamaguchi leg. (NSMT-Ar 475).

Description. Measurement. Body length ♀ 8.67-12.59mm, ♂ 2.43mm; prosoma length ♀ 4.15-5.78mm, ♂ 1.09mm, width ♀ 4.22-5.85mm, ♂ 1.15mm; opisthosoma length ♀ 4.96-6.96mm, ♂ 1.43mm, width ♀ 5.93-7.11mm, ♂ 1.53mm. Lengths of legs of 1♀ from Tsushima Island and 1♂ from Okayama Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.27/0.64	2.60/0.91	2.86/1.06	2.03/0.55	4.25/1.38	13.01/4.54
II	1.27/0.63	2.54/0.90	2.86/1.06	1.90/0.50	4.44/1.40	13.01/4.49
III	0.83/0.33	1.21/0.43	1.59/0.48	1.27/0.34	2.48/0.70	7.38/2.28
IV	0.83/0.30	1.27/0.40	1.52/0.54	1.21/0.35	2.60/0.78	7.43/2.37

Prosoma nearly as long as wide (length/width ♀ 0.98-1.00, ♂ 0.95), with granulations each furnished with a short seta on the top, an elevation present between ALE and PLE (Fig. 19). Eyes small, subequal in size, ALE/AME ♀ 1.50, ♂ 1.75, PLE/PME ♀ 1.25-1.33, ♂ 1.10, AME-AME/AME-ALE ♀ 1.53-1.62, ♂ 1.43, PME-PME/PME-PLE ♀ 1.00-1.20, ♂ 1.17, MOA-WA/WP ♀ 0.86-1.00, ♂ 0.82, L/W ♀ 0.91-1.08, ♂ 0.86, clypeus/AME-AME ♀ 1.09-1.21, ♂ 0.90. Chelicera with scopula; promargin of fang furrow with two teeth,

retromargin with one large tooth; labium longer than wide in female, wider than long in male (length/width ♀ 1.11-1.25, ♂ 0.84); sternum oval, longer than wide in female, as wide as long in male (length/width ♀ 1.19-1.23, ♂ 1.00). Leg formula I-II-IV-III.

Spiniformation of legs of 1♀ from Tsushima Island and 1♂ from Okayama Pref. ♀: Femur: I dorsal 0-1-1, prolateral 1-1-0-1-0-1-0, II dorsal 1-1-1, III-IV dorsal 0-1-0-1, I-II ventral 2-2-2-2-2, III-IV ventral 2-2-2; patella I-II dorsal 1-1, III-IV dorsal 1; tibia I-II dorsal 1-1-0, prolateral 1-1-1-1, retrolateral 0-1-1-0, I ventral 0-0-1-2-2-2-2-2 ap, II ventral 1-0-2-2-2-2-2-2 ap, III-IV dorsal 1-1, III prolateral 1-1-1, retrolateral 0-1-0, ventral 1-2-1-2 ap, IV pro- and retrolateral each 0-1, ventral 1-1-2-2 ap; metatarsus I-II dorsal 2-2-1, I pro- and retrolateral each 1-1-1-1-1-1 ap, ventral 26 disorderly, II prolateral 1-2-1-1-1-1 ap, retrolateral 1-1-1-1-0-1 ap, ventral 23 disorderly, III-IV dorsal 0-2-2-0, III prolateral 0-1-1-1 ap, IV prolateral 0-1-1-0, III-IV retrolateral 0-1-1-0, ventral 1-2-2 ap.

♂: Femur: I-IV dorsal 0-1-1, I prolateral 0-1-1; patella: I-IV pro- and retrolateral each 0-1 (weak); tibia: I-IV dorsal 1-1-0 (weak), I-II ventral 2-2-2; metatarsus: I-II pro- and retrolateral each 1 ap, ventral 2-2.

Male palp (Figs. 25-26). Tibia with VTA and RTA; VTA digitiform, distally not curved, RTA spiniform, shorter than that of P. ceylonica. Bulb simple, embolus filiform; cymbium without retrolateral expansion.

Opisthosoma wider than long (length/width ♀ 0.86-0.96, ♂ 0.93), with many tubercles each covered with a sclerotized plate, which is

furnished with some hairs and a seta on the top (Fig. 21).

Female genitalia (Fig. 22-23). Epigynum slightly convex, intromittent orifices covered with a sclerotized plate. Spermathecae kidney-shaped.

Coloration and markings. ♀ (Fig. 18). Carapace brown with a pair of black markings on the posterior declivity, clypeus white; chelicerae proximally white, distally light brown, maxillae, labium and sternum black; femora, patellae and tibiae I-II proximally white, the other parts of legs I-II black, legs III-IV and palpi light brown. Opisthosoma light brown to brown, without any marking, the underside white.

♂ (Fig. 24): Prosoma dark amber with a pair of vertical white stripes; chelicerae dark amber mottled with white; maxillae, labium and sternum black; legs blackish brown, femora I-IV proximally, tibiae I-IV proximally, tarsi I-IV proximally and distally with a white ring. Opisthosomal dorsum dark amber, tubercles white; venter black, lighter at the middle.

Range. Japan (Honshu, Kyushu, Nansei Islands), Korea.

Biology. A female was found on a leaf of Deutzia scabra (Saxifragaceae) on the Island of Tsushima (Takano, 1976).

Remarks. This species seems rare. Other than the records listed in the present paper, Yaginuma (1970) cited Tokyo, Saitama, Mie, Wakayama, Kumamoto and Fukuoka Prefectures for the habitats of this species. P. huangshanensis Li, Chen et Song, 1985, recently described from Anhui Province in China seems very closely related to P. katoi.

The male of this species is described and illustrated herewith for the first time.

Subfamily Dietinae Simon, 1895

[Japanese name: Wakabagumo-aka]

Amyciaeeae Simon, 1895, Hist. nat. Araign. éd. 2, 1, pp. 969, 986. (Genus-group within the subfamily Misumeninae; type genus: Amyciaea Simon, 1885, Bull. Soc. zool. France, 10, p. 447.) --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 809.

Mystarieae Simon, 1895, Hist. nat. Araign., éd. 2, 1, pp. 969, 988. (Genus-group within the subfamily Misumeninae; type genus: Mystaria Simon, 1895, ditto, p. 989.)

Dieteae Simon, 1895, Hist. nat. Araign., éd. 2, 1, p. 980. (Genus-group within the subfamily Misumeniae; type genus of the original designation: Dieta Simon, 1880, Ann. Soc. ent. France, (5), 10, p. 108; synonymized with Oxytate L. Koch, 1878, by Song et at. (1982).) --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 806.

Taguleae Simon, 1895, Hist. nat. Araign., éd. 2, 1, p. 971. (Genus-group within the subfamily Misumeninae; type genus: Tagulis Simon, 1895, ditto, p. 973.) --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 803.

Apyreae Simon, 1895, Hist. nat. Araign., éd. 2, 1, p. 974. (Genus-group within the subfamily Misumeninae; type genus of the original designation: Apyre Simon, 1895, ibid., p. 975, preoccupied (nec Apyre Walker, 1854; Lepidoptera); replaced by Apyretina Strand, 1929.)

Alcimochtheae Simon, 1895, Hist. nat. Araign., éd. 2, 1, pp. 970, 977.
(Genus-group within the subfamily Misumeninae; type genus: Alcimochthes Simon, 1885, Bull. Soc. zool. France, 10, p. 447.) --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 805.

Misumeninae (partim): Thorell, 1895, Descr. Cat. Spiders Burma, p. 283.

Empesiogoneae Simon, 1903, Hist. nat. Araign., éd. 2, 2, p. 1009.
(Genus-group within the subfamily Misumeninae; type genus: Emplesiogonus Simon, 1903, Bull. Soc. ent. France, 1903(6), p. 123.) --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 804.

Diaeidae: Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p. 372; 1913, Vergl. Physiol. Morphol. Spnnentiere, p. 17 (partim).

Amyciaeidae: Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p. 372; 1913, Vergl. Physiol. Morphol. Spinnentiere, p. 18.

Mystariidae: Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p. 372; Vergl. Phsiol. Morphol. Spinnentiere, p. 18.

Dietinae: Petrunkevitch, 1928, Trans. Conn. Acad. Arts Sci., 29, p. 55. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p. 273. --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 803.

Apyretineae Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 804.
(Genus-group within the subfamily Dietinae; type genus: Apyretina Strand, 1929.)

Notes. Simon (1895a) classifed the family Thomisidae into six subfamilies, each including a number of genus-groups newly established by himself. He placed the six genus-groups, Taguleae, Apyreae,

Alcimochtheae, Dieteae, Amyciaeeae and Mystarieae -- later in 1903 Emplesiogoneae was added --, in the subfamily Misumeninae (=Thomisinae). Dahl (1907, 1913) raised two of these groups to the familial rank and arranged the others in the family Diaeidae, though his splitting classification has never been accepted. Petrunkevitch (1928) regarded the presence of true claw-tufts on the tarsi as the diagnostic feature and recognized the subfamily Dietinae for Simon's genus-groups mentioned above. Though Amyciaeeae has the precedence of position in Simon's work, I follow the action of Petrunkevitch, the first reviser.

Dieta Simon, 1880, the type genus of this subfamily originally designated by Simon, was synonymized with Oxytate L. Koch, 1878, by Song et al. (1982). Song and Hubert (1983) re-examined the type specimens of Dieta parallela Simon, 1880, from Beijin, China, the type species of the genus, and confirmed this synonymy. I also examined the same specimens and recognized that Dieta parallera belongs without doubt to the genus Oxytate.

Type genus: Oxytate L. Koch, 1878, Verh. zool.-bot. Ges. Wien, 27, p. 704 (=Dieta) (type species: Oxytate striatipes L. Koch, 1878, ibid., p. 764, from Japan).

Diagnosis. Carapace flat to convex, with setae. Eyes much developed, lateral eyes on large tubercles, respectively. Chelicerae with no teeth, labium longer than wide, truncated. Legs long, not remarkably thick, setaceous; patellae short, shorter than tibiae or metatarsi; tarsi with claw-tufts formed by tenent hairs. Hairs of integument not branched.

Genera included. Alcimochthes Simon, 1885, Amyciaea Simon, 1885, Apyretina Strand, 1929, Browningella Mello-Leitão, 1948, Cetratus Kulczyński, 1911, (sensu Roewer (1954); placed by Petrunkevitch (1928) in Misumeninae), Dietopsa Strand, 1932, Diplotychus Simon, 1903, Domatha Simon, 1895, Emplesiogonus Simon, 1903, Hewittia Lessert, 1928, Lampertia Strand, 1907, Loxobates Thorell, 1877, Lycopus Thorell, 1895, Mystaria Simon, 1895, Nyctimus Thorell, 1877, Ostanes Simon, 1895, Oxytate L. Koch, 1878, Paramystaria Lessert, 1919, Pasias Simon, 1895, Pasiasula Roewer, 1942, Peritraeus Simon, 1895, Phaenopoma Simon, 1895, Plastonomus Simon, 1903, Pseudamyciaea Simon, 1905, Pseudoporrhopis Simon, 1886, Scopticus Simon, 1895, Sylligma Simon, 1895, Tagulinus Simon, 1903, Tagulis Simon, 1895, Tarrocanus Simon, 1895, Zametopias Thorell, 1892, Zametopina Simon, 1908.

Key to the Japanese Genera

1(2) Prosoma with setae not only on head but at the middle; eye area very wide, almost as wide as prosoma; opisthosoma pyriform ..... Alcimochthes Simon, 1885.

2(1) Prosoma with setae only on head; eye area half as wide as prosoma; opisthosoma long oval.

3(4) Tubercles of ALE and PLE separated from each other; embolus short, spiniform, VTA normal, ITA absent, RTA much developed; opisthosoma much longer than wide (L/W more than 2.00); epigynum with a pair of guide-pocket

..... Oxytate L. Koch, 1878.

4(3) Tubercles of ALE and PLE touching; embolus long, filiform, VTA much developed, ITA present, RTA normal; opisthosoma not conspicuously long (L/W less than 2.00); epigynum with a central hood ..... Loxobates Thorell, 1877.

Genus Oxytate L. Koch, 1878

[Japanese name: Wakabagumo-zoku]

Oxytate L. Koch, Verh. zool.-bot. Ges. Wien, 27, p.764. --- Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p.374. --- S. Saito, 1934, J. Fac. Agr. Hokkaido imp. Univ., 33, p.272. --- Ono, 1978, Senckenbergiana biol., 58, p.246. --- Song et al., 1982, Acta zootaxon. sinica, 7, p.257. --- Hu, 1984, Chinese Spiders Fields Forrests, p.325. --- Paik, 1985, Korean Arachnol., Seoul, 1(2), p.29.

Dieta Simon, 1880, Ann. Soc. ent. France, 5(10), p.108; 1895, Hist. nat. Araign., éd. 2, 1, p.984. --- Yaginuma, 1956, Atypus, Osaka, (10), p.30; 1960, Spiders Japan Col., Osaka, p.99; 1968, ibid. (rev. ed.), p.99. --- Tikader, 1980, Fn. India, Araneae, 1(1), p.233.

Orus Thorell, 1891, Kongl. Svensk. Vet.-Akad. Handl., 24(2), p.91.

Rhytidura Thorell, 1895, Descr. Cat. Spiders Burma, p.286. (New synonymy.)

Notes. The genus Oxytate was established by L. Koch (1878c) in

the work "Japanische Arachniden und Myriapoden," which is the first report on the systematics of Japanese spiders. Two years later, Simon (1880a) studied the spiders from China and described a new genus Dieta. Simon (1895a) revised the whole family Thomisidae and classified it into six subfamilies, each containing many new genus-groups. In the revision, a genus group Dieteae belonging to the subfamily Misumeninae (= Thomisinae) was established with the type genus Dieta. Oxytate was included in this genus-group. Finally Petrunkevitch (1928) raised Simon's Dieteae to the subfamilial rank.

Simon (1895a) defined that the prosoma of Oxytate is "convex" and that of Dieta "humilis", but the prosoma of Oxytate striatipes, the type species of the genus, is flattened. In 1978, I was able to examine the type specimens of Dieta parallela Simon, 1880, the type species of the genus, and Oxytate castetsi Simon, 1906, and confirmed Simon's misinterpretation of L. Koch's Oxytate. He established the genus Dieta for a true Oxytate species. This fact was already pointed out by Song et al. (1982), who redescribed Oxytate parallela from new material. Song and Hubert (1983) also examined the type specimens of Dieta (= Oxytate) parallela and recognized the synonymy of Oxytate with Dieta.

After the examination of the type specimen of Oxytate castetsi, I came to the conclusion that Oxytate sensu Simon is nothing but the genus Loxobates Thorell, 1877.

The genus Orus Thorell, 1891, synonymized with Dieta by Simon (1895), is accepted herewith as a synonym of Oxytate, but the genus Musaeus Thorell, 1890, synonymized with Oxytate also by Simon (1895), is

provisionally desynonymized because the revision by Simon was not reliable and since its type species Musaeus politus Thorell, 1890, has never been rediscovered and re-examined.

Simon (1895a) suggested that the genus Rhytidura Thorell, 1895, may be a synonym of Dieta. I examined the male holotype of the type species, Rhytidura attenuata Thorell, 1895, from Burma, E. W. Oates leg. (BMNH 1895. 9.21., 881-4, 1971-218), and recognized no difference between the two genera, Oxytate and Rhytidura are synonymous.

Type species. Oxytate striatipes L. Koch, 1878, Verh. zool.-bot. Ges. Wien, 27, p.764.

Etymology. Greek ὀξύτης (sharpness, pointedness, quickness) + ατε (just as, as if); feminine; probably derived from sharpened anterior margin of opisthosomal dorsum in the type specimen of the type species, Oxytate striatipes.

Diagnosis. Medium- to large-sized thomisids; male slightly smaller than female. Prosoma longer than wide, flattened, poorly haired, head and clypeus with setae. Lateral eyes on tubercles separated from each other, AME > PLE > AME ≧ PME, AME-AME > AME-ALE, PME-PME < PME-PLE, MOA longer than wide, WA ≦ WP, clypeus much longer than AME-AME (clypeus/AME-AME more than 2.00). Leg formula II-I-IV-III. Male palp with VTA and RTA seldom with ITA; VTA normal; RTA much developed, long, distally with a sclerotized hook or dentiform apophysis; embolus short, spiniform; bulb without apophysis. Chelicera toothless, labium longer than wide, sternum longer than wide. Opisthosoma much longer than wide, L/W more than 2.00, with long bristles, dorsum rather sclerotized in adult

male, forming scutum caudally split like segments. Epigynum small, with a pair of guide pocket, intromittent canal short, spermathecae ovate.

Range. East and Central Asia, West Australia, East and Central Africa.

Biology. Japanese species are found on foliage of shrubs and trees.

Species included. O. argenteooculata (Simon, 1886), comb. nov. (Southeast and Central Africa), O. attenuata (Thorell, 1895), comb. nov. (Burma), O. chlorion (Simon, 1906), comb. nov. (India), O. concolor (Caporiacco, 1947), comb. nov. (Ethiopia), O. elongata (Tikader, 1980), comb. nov. (India), O. greenae (Tikader, 1980), comb. nov. (India), O. hoshizuna Ono, 1978 (Japan), O. isolata (Hogg, 1914), comb. nov. (West Australia), O. jannonei (Caporiacco, 1940), comb. nov. (Ethiopia), O. leruthi (Lessert, 1943), comb. nov. (Congo), O. parallela (Simon, 1880) (China), O. phaenopomatiformis (Strand, 1907), comb. nov. (Tanzania), O. ribes (Jézéquel, 1964), comb. nov. (Ivory Coast), O. striatipes L. Koch, 1878 (Japan), O. subvirens (Strand, 1907), comb. nov. (Sri Lanka), O. virens (Thorell, 1891), comb. nov. (Singapore).

Remarks. On the basis of the above-mentioned reasons, O. castetzi Simon, 1906, is transferred to the genus Loxobates, and O. polita (Thorell, 1890) is referred back to Musaeus politus, as was done in the original description. Judging from the original description and illustration, Dieta kapuri Tikader, 1980, may be a member of Loxobates. Roewer (1954) listed "Dieta placata O. Pickard-Cambridge, 1899" in the genus Dieta, but this is evidently Roewer's error as the original naming

is Oiaea placata.

Key to the Japanese Species

1(2) PME-PME/PME-PLE 0.36-0.50, MOA-L/W 1.28-1.40; RTA thick, shaped like the silhouette of flamingo-head, distal part of prosoma, palps, coxa I and trochanter I rose-coloured to red in male; intromittent orifices of epigynum covered with chitin ..... O. striatipes L. Koch, 1878.

2(1) PME-PME/PME-PLE 0.56-0.66, MOA-L/W 1.13-1.26; RTA slender, distally hook-shaped; distal part of prosoma, palps, coxa I and trochanter I same coloured as the other part of prosoma; intromittent orifices uncovered ..... O. hoshizuna Ono, 1978.

Oxytate striatipes L. Koch, 1878

[Japanese name: Wakabagumo]

Oxytate striatipes L. Koch, 1878, Verh. zool.-bot. Ges. Wien, 27, p.764. Female holotype from Japan, A. von Roretz leg., probably in BMNH, not examined. --- Simon, 1895, Hist. nat. Araign., éd. 2, 1, p.985. --- Kishida, 1914, Kagaku-sekai, Tokyo, 7(13), p.37; 1927, in Hirase et al., Figuraro de Japanej Bestoj, p.969; 1933, Idiobiol. Aran., Tokyo, p. 74. --- Yuhara, 1931, Study of Spiders,

p.182. --- S. Saito, 1937, Annot. zool. japon., 16, p.150; 1959, Spider Book illustr. Col., p. 129; 1960, in Okada et al. (eds.), Encycl. zool. illustr. Col., Tokyo, 4, p.21. --- Chikuni, 1941, Spiders of the Japanese Alps, p.139. --- Yaginuma, 1956, Atypus, Osaka (10), p.30; 1960, Spiders Japan Col., Osaka, p.99; 1961, Rev. Fam. Gen. Sp. Jap. Spiders, p.38; 1962, Spider Fauna of Japan, p.43; 1968, Spiders Japan Col., Osaka, (rev. ed.), p.99; 1970, Bull. nat. Sci. Mus., Tokyo, 13, p.669; 1986, Spiders Japan Col., (n. ed.), p.209. --- Ono, 1978, Senckenbergiana biol., 58, p.247. --- Shinkai and Takano, 1984, Field Guide to Spiders of Japan, p.140. --- Paik, 1985, Korean Arachnol., Seoul, 1(2), p.30.

Oxytate setosa Karsch, 1879, Verh. naturf. Ver. preuss. Rheinl. Westfalens, 36, p.78. Female and male syntypes from Japan, W. Dönitz and F.M. Hilgendorf leg., probably in ZMB, not examined. --- Bösenberg and Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.247. --- Strand, 1907, Zool. Anz., 31, p.851. --- S. Saito, 1934, J. Fac. Agr. Hokkaido imp. Univ., Sapporo, 33, p.272; 1939, Saito Hoon-kai Mus. Res. Bull., 3, p.78; 1959, Spider Book illustr. Col., p.129. --- S. Komatsu, 1936, Iconogr. col. viv. Aran. japon., 1, p.33, 79, 121. --- Yaginuma, 1956, Atypus, Osaka, (10), p.30; 1961, Rev. Fam., Gen. Sp. Jap. Spiders, p.38.

Dieta japonica Bösenberg et Strand, 1906, Abh. senckenberg. naturf. Ges., 30, p.246. Female and male syntypes from Yokohama, Japan, in ZMS, lost during the World War II. --- S. Komatsu, 1936, Iconogr. col. viv. Aran. japon., 1, p.44, 105. --- Yaginuma, 1956, Atypus,

Osaka, (10), p.30; 1960, Spiders Japan Col., Osaka, p.99; 1961, Rev. Fam. Gen. Sp. Jap. Spiders, p.38; 1962, Spider Fauna of Japan, p.42; 1968, Spiders Japan Col., Osaka,(rev. ed.), p.99.

Notes. Dieta japonica was tentatively synonymized by Strand (1907b) with Oxytate setosa. Bonnet (1958) supported his opinion and listed only Oxytate setosa and O. striatipes in his "Bibliographia Araneorum"; on the other hand, Roewer (1954) listed Dieta japonica, O. setosa and O. straiatipes as valid in his "Katalog der Araneae". On the other hand, Kishida (1914) already synonymized O. setosa with O. striatipes. These synonymies were, however, not recognized for a long time before Yaginuma (1960, 1970).

Etymology. Specific name from Latin striati + pes meaning striped leg; derived from yellow striped femora and tibiae I-II.

Specimens examined. 1♀, Koshiji Pass, Kamikawa-cho, Kamikawa-gun, Hokkaido, 14-VI-1980, N. Yasuda leg. (NSMT-Ar 1339); 1 juv., Nopporo, Sapporo-gun, Hokkaido, 2-VIII-1984, M. Tomokuni leg. (NSMT-Ar 1440); 1♀, Yunomata, Ôhata-machi, Shimokita-gun, Aomori Pref., 9-VII-1956, C. Okuma leg. (NSMT-Ar 1441); 1 juv., Mt. Atagoyama, Kurokawa-gun, Miyagi Pref., 13-VI-1981, K. Sasaki leg. (NSMT-Ar 489); 1 juv., Dainohara Shinrin-koen, Sendai-shi, Miyagi Pref., 18-VII-1981, K. Sasaki leg. (NSMT-Ar. 488); 1♂, Yaotome, Sendai-shi, Miyagi Pref., 23-V-1982, K. Sasaki leg. (NSMT-Ar. 1442); 1 juv., Kôtoku, Oku-Nikko, Tochigi Pref., 30-VIII-1961, J. Aoki leg. (NSMT-Ar 43); 1♀, Mt. Izugatake, Iruma-gun, Saitama Pref., 19-V-1974, K. Arima and H. Ono leg. (NSMT-Ar 1443); 1 juv., Ichihara-shi, Chiba

Pref., 22-I-1968, J. Aoki leg. (NSMT-Ar 44); 1 ♀, Hie Shrine, Kisarazu-shi, Chiba Pref., 27-VI-1976, M. Tomokuni leg. (NSMT-Ar 1444); 1♂, Meguro-ku, Tokyo, 4-V-1975, H. Ono leg. (SMF 29439); 1♂, Takiyamajoshi, Hachioji-shi, Tokyo, 10-X-1975, H. Ono leg. (NSMT-Ar 1445); 1♂, Kodaira-shi, Tokyo, 27-V-1975, S. Matsumoto leg. (NSMT-Ar 1446); 1♀, Kosugi-cho, Nahakara-ku, Kawasaki-shi, Kanagawa Pref., 11-VI-1975, F. Matsuzawa leg. (NSMT-Ar 1447); 1♀, Onshi-kôen, Hakone-machi, Ashigarashimo-gun, Kanagawa Pref., 30-VII-1972, H. Ono leg. (NSMT-Ar 1448); 1♀, Fuezuka, Hakone-machi, Ashigarashimo-gun, Kanagawa Pref., 29-VII-1972, H. Ono leg. (NSMT-Ar 1449); 1♀2♂♂, Isehara-shi, Kanagawa Pref., 18-V-1975, H. Ono leg. (NSMT-Ar 1450); 3 juv., Iiyama, Atsugi-shi, Kanagawa Pref., 10-X-1973, H. Ono leg. (NSMT-Ar 1451); 1♀, Sengen Shrine, Fujiyoshida-shi, Yamanashi Pref., 3-VIII-1974, S. Matsumoto leg. (NSMT-Ar 1452); 1 juv. ♀ 1 juv. ♂, Lake Misuzu, Matsumoto-shi, Nagano Pref., 13-VIII-1974, S. Matsumoto leg. (NSMT-Ar 1453); 2 juv., Kôzu-bokujo, Nagano Pref., 25-VI-1972, A. Matsumoto leg. (NSMT-Ar 1454); 1♀, same locality, 7-VI-1975, A. Matsumoto leg. (SMF 29440); 1♀1♂, Sugadaira, Chiisagata-gun, Nagano Pref., VIII-1975 (adult 10-X-1975), H. Ono leg. (NSMT-Ar 1455); 1 juv., same locality, 1-VIII-1975, H. Ono leg. (NSMT-Ar 1456); 1 juv., Osugidani-rindo, 500-700m alt., Shiramine-mura, Ishikawa-gun, Ishikawa Pref., 3-V-1972, K. Harusawa leg. (YNO); 1 juv. ♀, Ichinose, 820-1,300m alt., Shiramine-mura, Ishikawa-gun, Ishikawa Pref., 4-V-1972, K. Harusawa leg. (YNO); 4♀♀4 juv., Nagano, 80-90m alt., Kumihara-cho, Kumano-gun, Kyoto Pref., 1-VIII-1978, Y. Nishikawa leg. (YNO); 1 juv., Mt. Oéyama, Oé-cho, Kasa-gun, Kyoto Pref., 17-IX-1984, T.

Yamasaki leg. (NSMT-Ar 1457); 2♀♀1♂, Mt. Iwawakiyama, Osaka Pref., 14-V-1967, T. Yaginuma leg. (NSMT-Ar 289); 1♀, Saho, 200m alt., Ibaraki-shi, Osaka Pref., Y. Nishikawa leg. (YNO); 3 juv., Misen, 1,600-1,400m alt., Amakawa-mura, Yoshino-gun, Nara Pref., 4-V-1969, Y. Nishikawa leg. (YNO); 1 juv. ♂, Yokotemichi, Mt. Daisen, 14-IX-1984, Tottori Pref., M. Tomokuni leg. (NSMT-Ar 1458); 1 juv., Masumizuhara, Mt. Daisen, Tottori Pref., 14-IX-1984, M. Tomokuni leg. (NSMT-Ar 1459); 1 juv. ♂, Sannosawa, Mt. Daisen, Tottori Pref., 15-IX-1984, T. Yamasaki leg. (NSMT-Ar 1460); 1♀1 juv. ♀, Ninosawa, Mt. Daisen, Tottori Pref., 14-IX-1984, T. Yamasaki leg. (NSMT-Ar 1461); 1♀2 juv., Masuharaué, Mt. Daisen, Tottori Pref., 13-IX-1984, T. Yamasaki leg. (NSMT-Ar 1462); 2♂♂, Mt. Daisen, Tottori Pref., 25-V-1976, Y. Yoneda leg. (NSMT-Ar 1463); 1 juv., Mt. Daimanji, 70-90m alt., Saigo-cho, Dogo, Oki Islands, Oki-gun, Shimane Pref., 31-VIII-1984, Y. Nishikawa leg. (YNO); 1 juv. ♀, same locality, 12-IX-1984, T. Yamasaki leg. (NSMT-Ar 1464); 2 juv., Fuse, Saigo-cho, Dôgo, Oki Islands, Oki-gun, Shimane Pref., 11-IX-1984, T. Yamasaki leg. (NSMT-Ar 1465); 1 juv., Mt. Kinpozan, Dôgo, Oki Islands, Oki-gun, Shimane Pref., 10-IX-1984, T. Yamasaki leg. (NSMT-Ar 1466); 1 juv., Omogo, Kamiukena-gun, Ehime Pref., 15-VII-1974, S. Matsumoto leg. (NSMT-Ar 1467); 1 juv. ♂, Ou, Otoyo-cho, Nagaoka-gun, Kochi Pref., 24-XII-1974, Y. Nishikawa leg. (YNO); 3 juv., Yakushima Island, Kagoshima Pref., 21~22-VIII-1977, M. Shimojana leg. (MSO).

Description. Measurement. Body length ♀ 9.26-11.48mm, ♂ 6.96-10.59mm; prosoma length ♀ 3.40-3.96mm, ♂ 2.89-4.07mm, width ♀ 2.81-3.63mm, ♂ 2.74-3.78mm; opisthosoma length ♀ 6.30-7.41mm, ♂

4.44-6.67mm, width ♀ 2.22-3.00mm, ♂ 1.33-2.00mm; lengths of legs of 1♀1♂ from Sugadaira, Nagano Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.19/1.41	2.37/2.85	3.63/3.63	1.85/1.70	4.07/4.00	13.11/13.59
II	1.19/1.28	2.59/2.89	3.40/3.56	1.85/1.70	4.15/4.15	13.18/13.58
III	0.89/0.81	1.67/1.78	2.00/2.07	1.11/1.15	2.70/2.70	8.37/ 8.51
IV	0.89/0.96	1.63/1.78	2.00/2.11	0.96/1.07	2.96/2.96	8.44/ 8.88

Prosoma longer than wide (length/width ♀ 1.06-1.22, ♂ 1.03-1.18), flattened, poorly haired; head narrow, with setae. Median eyes much developed, on low tubercles, ALE > PLE > PME ≒ AME, ALE/AME ♀♂ 1.42-1.72, PLE/PME ♀ 1.20-1.38, ♂ 1.12-1.29, AME-AME/AME-ALE ♀ 1.18-1.27, ♂ 1.21-1.37, PME-PME/PME-PLE ♀ 0.40-0.48, ♂ 0.36-0.50, MOA longer than wide (length/width ♀♂ 1.28-1.38), WA/WP ♀ 1.00-1.08, ♂ 0.98-1.12, clypeus very wide (clypeus/AME-AME ♀ 1.89-2.71, ♂ 2.06-2.44). Chelicerae with no teeth, maxillae distally convergent, labium longer than wide (length/width ♀ 1.32-2.00, ♂ 1.42-2.63), sternum longer than wide (length/width ♀ 1.18-1.30, ♂ 1.07-1.18). Leg formura II-I-IV-III; tarsi of legs with claw tufts; claws of legs and female palps with teeth.

Spiniformation of legs of 1♀1♂ from Sugadaira, Nagano Prefecture. ♀: Femur: I-II dorsal 0-1-1-1, I prolateral 1-1-1-1, II prolateral 0-0-0-1, III-IV dorsal 0-1-1; patella: I-IV dorsal 1-0-1 (weak), pro- and retrolateral each 1 (weak); tibia: I-II dorsal 1-0-1, pro- and retrolateral each 1-1-1, ventral 2-2-2, III-IV dorsal 1-1-0, prolateral 1-1, III

retrolateral 0-1, ventral 1; metatarsus: I-II pro- and retrolateral 1-1-0-1 ap, ventral 2-2, III-IV prolateral 1-1, III retrolateral 1-1, ventral 2.

♂: Femur: I-IV dorsal 1-1-1-1-1, I prolateral 1-1-1, I retrolateral, II-IV pro- and retrolateral each 0-0-0-0-1; patella: I-IV dorsal 1-0-1, pro- and retrolateral each 1; tibia: I-II dorsal 1-0-1, pro- and retrolateral each 1-1-1, ventral 2-2-2, III-IV dorsal 1-1-0, pro- and retrolateral each 1-1, III ventral 2, IV ventral 1; metatarsus: I-II pro- and retrolateral 1-1-0-1 ap, ventral 2-2, III-IV pro- and retrolateral each 1-1, III ventral 2, IV ventral 2-1.

Male palp (Ono, 1978a, figs. 12-13). Tibia with VTA and RTA; RTA very large, similar in appearance to the silhouette of flamingo-head, distally strongly sclerotized; ITA absent. Bulb simple, embolic division short, embolus short, spiniform.

Opisthosoma very long (length/width ♀ 2.10-3.18, ♂ 2.82-3.46), dorsum moderately sclerotized in male, forming scutum caudally split into segment-like portions and furnished with long bristles (Ono, 1978a, figs. 4a-b).

Female genitalia (Ono, 1978a, figs. 14-19). Epigynum with a pair of guide pockets, intromittent orifices covered with chitin, intromittent canal short, spermathecae small, ovate.

Coloration and markings. ♂: Carapace yellow to yellowish-white, head, clypeus, chelicerae, maxillae, labium posterior part of sternum, palps, coxa I and trochanter I reddish brown, legs yellow, opisthosoma yellow without any marking, underside brown. ♀: whole body yellow. Color in life fresh verdure.

Range. Japan (Hokkaido, Honshu, Shikoku, Kyushu, Island of Yakushima), Korea (Paik and Kim, 1985), China (Zhu, 1983).

Biology. This species is found very commonly on foliage of shrubs and trees.

Remarks. Oxytate striatipes is so similar to O. hoshizuna, especially in juveniles and females, that it is difficult to separate the two, but the former is distinguished from the latter by the shape of RTA of male palp and the structure of female genitalia, as well as by the characteristics given in the key. They seem to be very closely related and are geographically segregated by the strait north of the Tokara Islands. The range of O. striatipes extends to Hokkaido, though it is a member of the tropical element; it is the northernmost living species not only within the genus but also in the whole subfamily Dictinae. I made the remark that this extention might have been only possible in consequence of speciation in the boundary region between the subtropical and temperate zones (Ono, 1978a).

Judging from the known distributional range, this species may not occur in Taiwan, though there are some records from that island (Yaginuma (1960), Shimojana (1967), etc.). Of the three Taiwanese specimens I have examined, 1♀ from Chu-chi and 1♂ from Li-shan are O. hoshizuna and 1♀ from Wu-lai (4-VII-1977, H. Yoshida leg.) was an unknown species.

Oxytate hoshizuna Ono, 1978

[Japanese name: Hoshizuna-wakabagumo]

Oxytate hoshizuna Ono, 1978, Senckenbergiana biol., 58, p.248. Male holotype from Sonai, Iriomote Island, Yaeyama Islands, Okinawa Pref., Japan, 21-III-1975, M. Naruse and T. Tsutsumi leg., 1 female paratype from Funaura of the same island as the holotype, 30-III-1975, K. Arima and H. Ono leg.; both in SMF, examined. --- Song et Liu, 1982, Acta zootax. sin., 7, p.449. --- Hu, 1984, Chinese Spiders Field Forests, p.327 (identification?).

Etymology. From Japanese "hoshizuna" meaning star-like sand, used in apposition. The Sand composed of countless remains mostly of foraminiferan protozoans thrown up on the shore is commonly found on the southwestern islands of Japan.

Specimens examined. 1♂ (holotype), Sonai, Iriomote Island, Yaeyama Islands, Okinawa Pref., 21-III-1975, N. Naruse and T. Tsutsumi leg. (SMF 29399); 1♀ (paratype), Funaura, same island, 30-III-1975, K. Arima and H. Ono leg. (SMF 29400); 2♀♀1♂, ditto, 27-III-1973, M. Shimojana leg. (NSMT-Ar 1377); 1♀, Hateruma-mori, same island, 24-III-1973, M. Shimojana leg. (NSMT-Ar 1378); 1♀, upper basin of the Kuira River, same island, 27-III-1973, M. Shimojana leg. (NSMT-Ar 1379); 2♀♀ 1 juv. ♀, Mt. Omoto-dake, Ishigaki Island, Yaeyama Islands, Okinawa Pref., 29-III-1973, M. Shimojana leg. (NSMT-Ar 1380); 1 juv., Karimata, Hirara-shi, Miyakojima Island, Yaeyama Islands, Okinawa Pref., 22-VII-1971, M. Shimojana leg. (MSO); 4 juv., Zamamijima Island, Okinawa Islands, Okinawa Pref., 18-VIII-1980, M. Shimojana leg. (MSO); 2 juv., Kumejima Island, Okinawa Islands, Okinawa Pref., 24-VII-1970, M. Shimojana leg. (MSO); 1♀, Yagachijima Island, Okinawa

Island, Okinawa Pref., 5-VI-1984, M. Shimojana leg. (MSO); 1♀, Kayauchi-Banata-Hentona, Okinawa Island, Okinawa Pref., 28-IV-1965, Y. Hirashima leg. (NSMT-Ar 1381); 1♀, Nago-shi, Kunigami-gun, Okinawa Island, Okinawa Pref., 12-VII-1984, M. Shimojana leg. (NSMT-Ar 1382); 1♀, Izumi, Motobu-cho, Kunigami-gun, Okinawa Islands, Okinawa Pref., 23-III-1969, M. Shimojana leg. (NSMT-Ar 1383); 1♂, Iha, Ishikawa-shi, Okinawa Island, Okinawa Pref., 16-V-1964, M. Shimojana leg. (NSMT-Ar 1384); 1 juv., Oyama, Ginowan-shi, Okinawa Island, Okinawa Pref., 6-X-1977, M. Shimojana leg. (MSO); 1♀, Hatsuno, Amamiôshima Island, Amami Islands, Kagoshima Pref., 18-IV-1974, H. Makihara leg. (NSMT-Ar 1385); 1 juv., Takarajima Island, Tokara Islands, Kogoshima Pref., 3-VIII-1976, M. Shimojana leg. (MSO); 2 juv., Tairajima Island, Tokara Islands, Kagoshima Pref., 10-VIII-1976, M. Shimojana leg. (MSO); 2 juv., Nakanoshima Island, Tokara Islands, Kagoshima Pref., 5-VIII-1976, M. Shimojana leg. (MSO).

1♀, Chu-chi, 120m alt., Taiwan, 13-IV-1965, Y. Hirashima leg. (NSMT-Ar 1386); 1♂, Li-shan, Taiwan, 22~24-VI-1976, H. Makihara leg. (NSMT-Ar 1387).

Description. Measurement. Body length ♀ 9.11-11.30mm, ♂ 7.11-8.96mm; prosoma length ♀ 3.11-3.48mm, ♂ 2.81-3.41mm, width ♀ 2.81-3.20mm, ♂ 2.65-3.11mm; opisthosoma length ♀ 5.93-7.90mm, ♂ 4.44-5.70mm, width ♀ 1.78-2.90mm, ♂ 1.40-2.00mm; lengths of legs of 1♀ from Hatsuno, Amamioshima Island, and 1♂ from Ishikawa-shi, Okinawa Island, (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.19/1.33	2.48/2.81	3.33/3.41	1.63/1.48	3.85/3.78	12.48/12.81

II	1.07/1.33	2.37/2.78	3.26/3.30	1.70/1.44	3.85/3.74	12.25/12.59
III	0.70/0.81	1.48/1.49	1.85/1.78	0.96/0.96	2.07/1.96	7.06/ 7.00
IV	0.70/0.78	1.44/1.41	1.78/1.71	0.89/0.78	2.63/2.37	7.44/ 7.05

Prosoma longer than wide (length/width ♀ 1.10-1.21, ♂ 1.05-1.14), almost same as in O. striatipes. Eyes on tubercles, ALE > PLE > AME ≧ PME, ALE/AME ♀ 1.41-1.67, ♂ 1.60-2.00, PLE/PME ♀ 1.25-1.46, ♂ 1.33-1.60, AME-AME/AME-ALE ♀ 1.28-1.55, ♂ 1.20-1.45, PME-PME/PME-PLE larger than in O. striatipes, ♀ 0.60-0.66, ♂ 0.56-0.66, MOA longer than wide, though much wider than in O. striatipes, MOA-L/W ♀ 1.13-1.19, ♂ 1.23-1.26, WA/WP ♀ 0.93-1.00, ♂ 0.95-1.00, clypeus/AME-AME ♀ 2.05-2.95, ♂ 1.66-2.16, slope of clypeus more gentle in male than in O. striatipes. Chelicerae with no teeth, labium longer than wide (length/width ♀ 1.44-2.20, ♂ 1.40-2.00), sternum longer than wide (length/width ♀ 1.12-1.30, ♂ 1.16-1.25). Leg formura II-I-IV-III; tarsi of legs with claw tufts; claws of legs and female palps with teeth.

Spiniformation of legs of 1♀ from Hatsuno, Amami-oshima Island, and 1♂ from Ishikawa-shi, Okinawa Island. ♀: Femur: I-II dorsal 0-1-1-1-1, I prolateral 1-1-1-1, I-II retrolateral, II-IV prolateral 0-0-0-1; patella: I-IV dorsal 1-0-1, prolateral 1, I-II retrolateral 1; tibia: I-II dorsal 1-0-1, pro- and retrolateral 1-1-1, ventral 2-2-2, III-IV dorsal 1-1-0, III-IV prolateral 1-1, III retrolateral 0-1, ventral 1; metatarsus: I-II pro- and retrolateral 1-1-0-1 ap, ventral 2-2, III-IV prolateral 1-1, III retrolateral 1-1, ventral 2.

♂: Femur: I and IV dorsal 1-1-1-1-1, II dorsal 1-1-1-1-2, III dorsal

1-1-1-1, I-II prolateral 1-1-1-1, I-IV retrolateral 0-0-0-1, III-IV prolateral 0-0-0-1; patella: I-IV dorsal 1-0-1, pro- and retrolateral 1; tibia: I-IV dorsal 1-1, I-II pro- and retrolateral 1-1-1, ventral 2-2-2, III-IV pro- and retrolateral 1-1, III ventral 2; metatarsus: I-II pro- and retrolateral 1-1-0-1 ap, ventral 2-2, III-IV pro- and retrolateral 1-1, ventral 2.

Male palp (Ono, 1978a, figs. 5-6). Tibia with VTA and RTA; RTA less sclerotized than in O. striatipes, distally curved, but not so strongly sclerotized as in O. striatipes. Bulb simple, very similar to that of O. striatipes, embolic division short, embolus spiniform, undulate.

Opisthosoma longer than wide (length/width ♀ 2.71-3.75, ♂ 2.84-3.72), dorsum of male as in O. striatipes, but less sclerotized (Ono, 1978, figs. 1a-b).

Female genitalia (Ono, 1978a, figs. 9-11). Epigynum small, with a pair of guide pockets, intromittent orifices not covered, intromittent canal short, spermathecae small, ovoid.

Coloration and markings. ♀: whole body yellowish white, without any marking. ♂: sternum and underside of opisthosoma yellowish white, the other part light yellowish brown, with no red-coloured parts as in O. striatipes. Colour of both the sexes in life light green.

Range. Japan (Nansei Islands), Taiwan. Song et Liu (1982) recorded this species from Gui-lin, Guang-xi, China.

Biology. Unknown. I collected 1♀ by beating method from a tree 4m high.

Remarks. This species is very similar to O. striatipes; differences

of the two species are discussed in the description of O. striatipes and in the key. Oxytate species collected on Minami-daitôjima Island lying on the Pacific Ocean, ca. 300 km west of Okinawa Island, seems referable to O. hoshizuna, but cannot be determined with certainty, because all the specimens obtained are immature (3 juv., 3-VIII-1977, M. Shimojana leg. (MSO)).

Genus Loxobates Thorell, 1877

[Japanese name: Marugata-wakabagumo-zoku]

Loxobates Thorell, 1877, Ann. Mus. civ. Stor. nat. Genova, 10, p. 495.

--- Simon, 1895, Hist. nat. Araign., éd. 2, 1, p. 985.

Notes. This is a little-known genus in the family Thomisidae, and almost nothing has been reported since Workman (1896) redescribed L. ornatus Thorell, 1891, from Malaysia.

Type species. Loxobates ephippiatus Thorell, 1877, Ann. Mus. civ. Stor. nat. Genova, 10, p. 495, by original designation.

Etymology. Greek λοξο (oblique) + βάτης (one that treads) meaning oblique walker; masculine.

Diagnosis. Medium-sized thomisids; male considerably smaller than female. Prosoma as long as or slightly longer than wide, convex, poorly haired; head and clypeus with short setae. All eyes on tubercles, tubercles of ALE and PLE touching, ALE > PLE > AME > PME, AME-AME > AME-ALE, PME-PME <

PME-PLE, MOA slightly longer than wide, WA ≒ WP, clypeus much longer than AME-AME (clypeus/AME-AME more than 2.00). Chelicerae toothless, labium longer than wide, sternum almost as long as wide. Leg formula II-I-IV-III. Male palp with VTA, ITA and RTA; VTA much developed, RTA normal, not so long as in Oxytate; bulb simple, without apophysis, embolus short, filiform, much longer than in Oxytate. Opisthosoma with short hairs, length/width usually less than 2.00, dorsum normal in male, without scutum. Epigynum with a central hood, intromittent canal short, spermathecae kidney-shaped.

Range. Southeast Asia (Japan, Indonesia, Malaysia, Burma, Nepal and India).

Biology. Unknown.

Species included. L. castetzi (Simon, 1906), comb. nov. (India), L. diatoensis sp. nov. (Japan), L. ephippiatus Thorell, 1877 (Celebes), L. kapuri (Tikader, 1980), comb. nov. (India), L. ornatus Thorell, 1891 (Pinang), L. quinquenotatus Thorell, 1895 (Burma). New combinations are explained in the "Notes" of the genus Oxytate.

Only one Japanese species.

Loxobates daitoensis sp. nov.

[Japanese name: Daitô-marugata-wakabagumo]

(Figs. 27-33)

Etymology. Named after the Daitô Islands.

Type series. Holotype: ♂, Kita-daitôjima Island, Okinawa Pref.,

Japan, 27-VII-1977, M. Shimojana leg. (NSMT-Ar. 1396); allotype: ♀, same data as holotype (NSMT-Ar 1397). Paratypes: 2♀♀, same data as holotype (NSMT-Ar 1398); 1♂, Nishiminato, Kita-daitôjima Island, Okinawa Pref., 29-VII-1977, M. Shomojana leg. (NSMT-Ar 1399).

Further specimens examined. 1♀, Kita-daitôjima Island, Okinawa Pref., 29-VII-1977, M. Shomojana leg. (NSMT-Ar. 1400); 1 juv., ditto, 25-VII-1977, M. Shimojana leg. (MSO); 3 juv., ditto, 29-VII-1977, M. Shimojana leg. (MSO); 1♀ 2 juv. ♀ 1 juv. ♂, Minami-daitôjima Island, Okinawa Pref., 3-VIII-1977, M. Shimojana leg. (MSO); 1♀, ditto, 12-VI-1974, M. Shimojana leg. (NSMT-Ar. 1401).

Description. Measurement. Body length ♀ 5.63-7.63,mm, ♂ 3.19-3.33mm; prosoma length ♀ 2.33-2.81mm, ♂ 1.41-1.48mm, width ♀ 2.22-2.81mm, ♂ 1.37-1.44mm; opisthosoma length ♀ 3.48-4.81mm, ♂ 1.85-1.93mm, width ♀ 1.78-2.52mm, ♂ 0.89-1.04mm; lengths of legs of holotype and allotype (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.83/0.84	1.74/1.63	2.18/1.70	1.05/0.75	2.52/2.00	8.32/6.92
II	0.85/0.83	1.76/1.65	2.18/1.81	1.08/0.75	2.59/2.14	8.46/7.18
III	0.55/0.43	0.86/0.69	1.00/0.73	0.65/0.40	1.44/0.98	4.50/3.23
IV	0.54/0.41	1.03/0.73	1.18/0.81	0.63/0.43	1.63/1.09	5.01/3.47

Prosoma as long as or slightly longer than wide (length/width ♀ 1.00-1.07, ♂ 1.02-1.03), convex, head with short setae. Eyes on tubercles, tubercles of ALE and PLE much developed, touching, ALE > PLE > AME > PME,

ALE/AME ♀ 1.37-1.60, ♂ 1.41-1.60, PLE/PME ♀ 1.25-1.50, ♂ 1.44-2.00, AME-AME/AME-ALE ♀ 1.21-1.50, ♂ 1.22-1.25, PME-PME/PME-PLE ♀ 0.51-0.59, ♂ 0.57-0.60, MOA slightly longer than wide, MOA-L/W ♀ 1.02-1.10, ♂ 1.15-1.20, WA/WP ♀ 0.96-1.07, ♂ 1.00, clypeus/AME-AME ♀ 2.11-2.37, ♂ 2.20-2.28. Chelicerae with no teeth, labium longer than wide (length/width ♀ 1.13-1.38, ♂ 1.25-1.45), sternum nearly as long as wide (length/width ♀ 1.02-1.17, ♂ 0.96-1.00). Leg formula II-I-IV-III; tarsi of legs with claw tufts; number of teeth on claws of legs I-II 7, III 5, IV 3, female palp 5.

Spiniformation of legs of holotype and allotype. ♀: Femur: I-II dorsal 0-1-1, prolateral 1-1-1; patella: without setae; tibia: I-IV dorsal 1-1 (weak), I-II prolateral 1-1-1, I retrolateral 1-1-1, ventral 2-2-2-2 (at the right leg 2-2-2-2-2), II retrolateral 0-1-1, ventral 2-2 (right 2-2-2), III prolateral 0-1; metatarsus: I-II pro- and retrolateral each 1-1-0-1 ap, I ventral 2-2-2-2, II ventral 1-2-1-2 (right 2-2-1-2), III prolateral 1-0-1-1 ap, retrolateral 1-1, ventral 2, IV prolateral 1-1.

♂: Femur: I-II dorsal 1-1-1-1-1, I prolateral 1-0-1-1-1-1-0-1, retrolateral 0-0-0-0-1-1, II prolateral 0-0-0-0-0-1, retrolateral 0-0-0-0-0-1, III dorsal 0-1-1-1-1, IV dorsal 0-1-0-1-2 (right 0-1-1-1-1); patella: I-IV dorsal 1-0-1 (weak); tibia: I-II dorsal 0-1-1, pro- and retrolateral 1-1-1, I ventral 1-2-2-2-1, II ventral 1-2-2, III-IV dorsal 1-1, pro- and retrolateral 0-1; metatarsus: I-II pro- and retrolateral 1-1-1 ap, ventral 2-1-0-2, III-IV prolateral 1-1, III retrolateral 0-1, IV retrolateral 1-1, III ventral 2.

Male palp (Fig. 31-33). Tibia with VTA, ITA and RTA; VTA much developed, ax-shaped, ITA soft, RTA sclerotized, short. Bulb simple,

without any apophysis, embolus short, filiform.

Opisthosoma longer than wide (length/width ♀ 1.70-2.08, ♂ 1.77-2.17), with short hairs.

Female genitalia (Figs. 28-29). Epigynum small, with a central hood situated between the intromittent orifices, intromittent canal short, spermathecae kidney-shaped.

Coloration and markings (Figs. 27, 30). ♀♂: Prosoma yellowish brown, head white, chelicerae, labium, sternum, legs and palps yellow. Opisthosoma yellow with indistinct white markings; three of the six females examined with some pair of rose-coloured markings on the opisthosoma.

Range. Japan (Kita- and Minamidaitôjima Islands).

Biology. Unknown.

Remarks. The species of this genus are very similar in appearance to each other and therefore it is necessary to compare their genital structures for identification. From L. ornatus and L. kapuri, the Japanese species is different in the shape of epigynum (judging from the illustrations given by Workman (1896) and Tikader (1980)). It seems more closely related to L. ephippiatus and an unknown species collected from the Nepal Himalayas. I examined 1♀ of the former identified by Simon (MNHN 11156). The intromittent orifices of L. ephippiatus are widely separated from each other, and between the orifices are situated spermathecal cocks which are visible through the integument. The unknown species from Nepal has a close resemblance to L. diatoensis, especially in the structure of male palp, but its embolus is longer and the tibial apophyses are differently shaped. L. castetzi described by Simon (1906a) from "bas pl. de

l'Himalaya" (MNHN 23613) is similar in habitus to this unknown species, but the syntypes of L. castetzi are three juveniles and do not serve for a definite identification.

Genus Alcimochthes Simon, 1885

[Japanese name: Zudaka-kanigumo-zoku]

Alcimochthes Simon, 1885, Bull. Soc. zool. France, 10, p. 447; 1895, Hist. nat. Araign., éd. 2, 1, p. 979.

Notes. This genus was established by Simon for a single species, Alcimochthes limbatus, collected from the Malay Peninsula. Simon (1908) recorded it from Hanoi. Further, a second species of the genus, A. melanophthalmus, was described from Annam by the same author (Simon, 1903b). Since then, however, nothing has been reported on the genus and its constituents, except for several citations in catalogue works (Petrunkevitch, 1928; Mello-Leitão, 1929; Roewer, 1954; Bonnet, 1955).

In the present material, I found several individuals of A. limbatus, the type species of the genus, collected on Iriomotejima Island of Southwest Japan and from Taiwan. The following description was prepared on the basis of re-examination of the type series and observation of the material newly obtained.

Type species. Alcimochthes limbatus Simon, 1885, Bull. Soc. zool. France, 10, p. 448.

Etymology. Greek αλκίμοχθος; stout hump.; masculine.

Diagnosis. Small-sized thomisids; male slightly slenderer than female. Prosoma longer than wide, very high, haired; head wide, almost as wide as prosoma, with setae. Lateral eyes on strongly developed tubercles; tubercles of ALE and PLE touching; ALE > PLE > PME ≒ AME, AME-AME > AME-ALE, PME-PME ≒ PME-PLE, MOA wider than long, WA < WP, clypeus very wide, wider than AME-AME (clypeus/AME-AME lower than 2.00). Chelicera without teeth; maxillae distally with scopula; labium longer than wide; sternum longer than wide. Leg formula I-II-IV-III; coxa of both legs IV close to each other; tarsi with claw tufts consisting of tenent hairs; spines of legs poorly developed. Male palp with VTA and RTA; RTA not much developed; bulb simple, without apophysis, embolus filiform, not long. Opisthosoma slightly longer than wide, pyriform, with short hairs. Epigynum with a sclerotized guide pocket; intromittent orifices situated in front of guide pocket; intromittent canal extending in posterior direction; spermathecae small, kidney-shaped.

Range. Southeast Asia (Japan, Taiwan, Vietnum, Malay Peninsula).

Biology. Unknown.

Species included. Only two species: A. limbatus Simon, 1885, and A. melanophthalmus Simon, 1903; the former occurs in Japan.

Remarks. This genus is closely related to Domatha Simon, 1895, and Lycopus Thorell, 1895, both distributed in Southeast Asia.

Alcimochthes limbatus Simon, 1885

[Japanese name: Zudaka-kanigumo]

(Figs. 34-45)

Alcimochthes limbatus Simon, 1885, Bull. Soc. zool. France, 10, p. 448.

1+2oo syntypes from "la Presqu'ile de Malacca," 1884, M. J. de Morgan leg., in MNHN, examined; 1895, Hist. nat. Araign., éd. 2, 1, p. 979; 1908, Bull. Sci. France Belgique, 42, p. 123.

Notes. This species is new to the Japanese fauna.

Etymology. Specific name from Latin meaning bordered.

Type series. Syntypes: 1♀2♂♂, "la Presqu'ile de Malacca," 1884, M. J. de Morgan leg. (MNHN 7856).

Further specimens examined. Japan: 1♀1♂, Iriomotejima Island, Yaeyama Islands, Okinawa Pref., 10-VIII-1985, A. Tanikawa leg. (NSMT-Ar. 1133).

Taiwan: 2♀♀2♂♂ 1 juv. ♂, Yang-ming Shan, Taipei, 28-VII-1977, H. Yoshida leg. (NSMT-Ar. 1134); 1♀3♂♂ 1 juv. ♀ 2 juv. ♂, Wu-lai, Taipei, 4-VII-1977, H. Yoshida leg. (NSMT-Ar. 1135).

Description. Measurement. Body length ♀ 3.78-4.37mm, ♂ 2.96-3.48mm; prosoma length ♀ 1.63-1.90mm, ♂ 1.41-1.63mm, width ♀ 1.44-1.80mm, ♂ 1.26-1.44mm; opisthosoma length ♀ 2.07-2.80mm, ♂ 1.63-2.00mm, width ♀ 1.56-2.21mm, ♂ 1.15-1.44mm. Lengths of legs of 1♀1♂ from the syntype series (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.50/0.56	0.92/0.88	1.08/1.00	0.64/0.60	1.40/1.28	4.54/4.32
II	0.56/0.52	0.84/0.92	0.88/1.08	0.56/0.60	1.28/1.28	4.12/4.40
III	0.40/0.36	0.60/0.56	0.72/0.64	0.52/0.48	1.08/0.92	3.32/2.96
IV	0.40/0.40	0.68/0.60	0.84/0.72	0.52/0.44	1.28/1.08	3.72/3.24

Prosoma longer than wide (length/width ♀ 1.05-1.15, ♂ 1.10-1.19), convex, very high, haired; head very wide, with setae. Lateral eyes on tubercles strongly developed and touching each other; ALE > PLE > PME ≒ AME, ALE/AME ♀ 1.50-1.80, ♂ 1.54-2.00, PLE/PME ♀ 1.23-1.34, ♂ 1.25-1.34, AME-AME/AME-ALE ♀ 1.33-1.65, ♂ 1.42-1.60, PME-PME/PME-PLE ♀ 0.91-1.06, ♂ 0.79-1.00, MOA-L/W ♀ 0.70-0.95, ♂ 0.75-0.83, MOA-WA/WP ♀ 0.77-0.88, ♂ 0.80-0.85, clypeus/AME-AME ♀ 1.14-1.36, ♂ 1.33-1.60. Chelicera without teeth, with some strong black hairs on promargin of fang furrow; maxilla distally with scopula; labium longer than wide (length/width ♀ 1.58-2.20, ♂ 1.71-2.00); sternum heart-shaped, longer than wide (length/width ♀ 1.22-1.47, ♂ 1.18-1.42). Leg formula ♀ I-II-IV-III, ♂ II-I-IV-III; tarsi of legs with claw-tufts consisting of tenent hairs; claws with 5-8 teeth.

Spiniformation of legs. ♀ (syntype): Femur: III-IV dorsal 1-1; patella: I-IV dorsal 1-1; tibia: I-IV dorsal 1-1 (weak), I ventral 1-2, IV prolateral 0-1; metatarsus: I-II pro- and retrolateral respectively 0-1 ap, I ventral 2-2, II ventral 0-2, III-IV prolateral 0-1, III ventral 2, IV ventral 1.

♂(one of the syntypes): Femur: I-IV dorsal 0-1-1-1, I prolateral 0-0-1; patella: I-IV dorsal 1-1, pro- and retrolateral each 1 (weak); tibia: I-IV dorsal 1-1, I-II prolateral 1-1-0-1, retrolateral 1-1-1, I ventral 2-1-2, II ventral 0-1-2, III-IV prolateral 1-1, retrolateral 1-1-1; metatarsus: I-II pro- and retrolateral each 0-1-1 ap, ventral 2-2, III-IV pro- and retrolateral each 1, ventral 2.

Male palp (Figs. 41-42, 44-45). Tibia with VTA and RTA; RTA sclerotized, with a spine-shaped dorsal tooth; the tooth variable in shape (Figs. 42 and 44), rarely broken. Bulb simple, embolus filiform, curved (Figs. 42, 45).

Opisthosoma pyriform, longer than wide (length/width ♀ 1.20-1.34, ♂ 1.29-1.59), covered with short hairs.

Female genitalia (Figs. 36, 38-39). Epigynum small, with a sclerotized guide pocket in the anterior part; intromittent orifices situated in front of guide pocket. Intromittent canal soft, extending posteriorly, curved around spermathecae; spermathecae kidney-shaped.

Coloration and markings. ♀♂: Prosoma yellowish to reddish brown, rarely darker at the middle, tubercles of lateral eyes white; chelicerae, maxillae, labium and sternum yellow to light yellowish brown, without any markings; legs and palps yellow. Opisthosoma white to yellowish brown, with variable markings in black (Figs. 34, 37, 40, 43), its undewrside brown, lighter at the middle.

Range. Japan (Iriomotejima Island), Taiwan, Vietnum, Malay Peninsula.

Biology. Unknown.

Remarks. Simon (1903b) noted that the other member of the genus, A. melanophthalmus, is distinguished from A. limbatus by the tubercles of lateral eyes coloured black.

Subfamily Thomisinae Sundevall, 1833

[Japanese name: Kanigumo-aka]

Thomisides Sundevall, 1833, Conspect. arachn., p. 27 (partim).

Thomisinae: Simon, 1875, Arachn. France, 2, p. 147. --- Keyserling, 1880, Spinnen Amerikas, Laterigradae, 1, p. 1. --- Schick, 1965, Bull. Amer. Mus. nat. Hist., 129, p. 103.

Porrhopini Simon, 1886, Act. Soc. linn. Bordeaux, 40, p. 171 (section within the family Thomisidae; type genus: Porropis (sic) L. Koch, 1876, Arachn. Austr., p. 807).

Thomisini: Simon, 1886, Act. Soc. linn. Bordeaux, 40, p. 174.

Misumeninae Simon, 1895, Hist. nat. Araign., éd. 2, 1, p. 968; 1932, Arachn. France, 6, p. 779. (Type genus: Misumena Latreille, 1804, Dict. (N.) Hist. nat., 24, p. 135.) --- F. O. Pickard-Cambridge, 1900, Biol. Centr.-Amer., Zool., Arachn. Araneida, 2, p. 129, 133. --- Comstock, 1913, Spider Book, p. 523; 1940, ibid., p. 536. --- Petrunkevitch, 1928, Trans. Conn. Acad. Arts Sci., 29, p. 53. --- Roewer, 1928, Tierw. Mitteleur., 3(2), p. VI-18; 1954, Kat. Aran., Bruxelles, 2 (a), p. 810. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p. 18. --- S. Saito, 1934, J. Fac. Agr. Hokkaido imp. Univ., 33, p. 272; 1939, Saito Hoon-kai Mus. Res. Bull., 3, p. 78. --- Gertsch, 1939, Bull. Amer. Mus. nat. Hist., 76, p. 296. ---

Kaston, 1948, Spiders Conn., p. 410. --- Locket & Millidge, 1951, Brit. Spiders, 1, p. 169. --- Tikader, 1970, Rec. zool. Surv. India, 15(3), p. 12; 1980, Fn. India, Spiders, 1, p. 27. --- Suman, 1970, Pacif. Ins., 12, p. 792. --- Dippenaar-Schoeman, 1983, Ent. Mem. Dept. Agr. S. Afr., (55), p. 7. --- Roberts, 1985, Spiders Great Britain & Ireland, 1, p. 97.

Tmareae Simon, 1895, Hist. nat. Araign., éd. 2, 1, pp. 970, 990 (genus-group within the subfamily Misumeninae; type genus: Tmarus Simon, 1875, Arachn. France, 2, p. 259); 1903, ibid., 2, p. 1011; 1907, Ann. Mus. civ. Stor. nat. Genova, (3), 3, p. 312; 1908, Bull. sci. France Belg., 42, p.124. --- Roewer, 1954, Kat. Aran. Bruxelles, 2 (a), p. 810.

Coriarachneae Simon, 1895, Hist. nat. Araign., éd. 2, 1, pp. 970, 1013 (genus-group within the subfamily Misumeninae; type genus: Coriarachne Thorell, 1870, Nova Acta reg. Soc. Sci. Upsal., (3), 7, p. 186). --- Roewer, 1954, Kat. Araneae, Bruxelles, 2 (a), p. 831.

Cymbacheae Simon, 1895, Hist. nat. Araign., éd. 2, 1, pp. 970, 1008 (genus-group within the subfamily Misumeninae; type genus: Cymbacha L. Koch, 1874, Arachn. Austr., p. 538). --- Roewer, 1954, Kat. Aran., Bruxelles, 2 (a), p. 829.

Porrhopideae: Simon, 1895, Hist. nat. Araign., éd. 2, 1, p. 970.

Pagideae Simon, 1895, Hist. nat. Araign., éd. 2, 1, pp. 970, 998 (genus-group within the subfamily Misumeninae; type genus: Pagida Simon, 1895, ibid., 1, p. 1000). --- Roewer, 1954, Kat. Aran., Bruxelles, 2 (a), p. 826.

Camariceae Simon, 1895, Hist. nat. Araign., éd. 2, 1, pp. 970, 1010 (genus-group within the subfamily Misumeninae; type genus: Camaricus Thorell, 1887, Ann. Mus. civ. Stor. nat. Genova, 25, p. 261); 1908, Bull. sci. France Belg., 42, p. 129. --- Roewer, 1954, Kat. Aran. Bruxelles, 2 (a), p. 830.

Talaeae Simon, 1895, Hist. nat. Araign., éd. 2, pp. 970, 996 (genus-group within the subfamily Misumeninae; type genus: Talaus Simon, 1886, Act. Soc. linn. Bordeaux, 40, p. 172); 1908, Bull. sci. France Belg., 42, p. 128. --- Roewer, 1954, Kat. Aran., Bruxelles, 2 (a), p. 825.

Platythomiseae Simon, 1895, Hist. nat. Araign., éd. 2, 1, pp. 970, 1015 (genus-group within the subfamily Misumeninae; type genus: Platythomisus Doleschall, 1859, Act. Soc. Sci. Ind.-Neerl., 5, p. 59); 1903, ibid., 2, p. 1011; 1907, Ann. Mus. civ. Stor. nat. Genova, (3), 3, p. 315. --- Roewer, 1954, Kat. Aran., Bruxellers, 2 (a), p. 835.

Dieeae (sic): Simon, 1895, Hist. nat. Araign., éd. 2, 1, p. 970.

Misumeneae: Simon, 1895, Hist. nat. Araign., ed.2, 1, p. 970, 1018; 1903, ibid., 2, p. 1012; 1907, Ann. Mus. civ. Stor. nat. Genova, (3), 3, p. 315; 1908, Bull. sci. France Belg., 42, pp. 122, 130; 1932, Arachn. France, 6, pp. 780, 786. --- Roewer, 1954, Kat. Aran., Bruxelles, 2 (a), p. 836.

Platyarachneae Simon, 1895, Hist. nat. Araign., éd. 2, 1, pp. 970, 1026 (genus-group within the subfamily Misumeninae; type genus: Platyarachne Keyserling, 1880, Spinnen Amerikas, Laterigradae, 1, p. 46). --- Roewer, 1954, Kat. Aran., Bruxelles, 2 (a), p. 863.

Porrhopeae: Simon, 1895, Hist. nat. Araign., éd. 2, 1, p. 1001. --- Roewer, 1954, Kat. Aran., Bruxelles, 2 (a), p. 827.

Diaeeae Simon, 1895, Hist. nat. Araign., éd. 2, 1, p. 1028 (genus-group within the subfamily Misumeninae; type genus: Diaea Thorell, 1869, Nova Acta reg. Soc. Sci. Upsal., (3), 7, p. 37); 1903, ibid., 2, p. 1013; 1932, Arachn. France, 6, pp. 780, 792. --- Roewer, 1954, Kat. Aran., Bruxelles, 2 (a), p. 866.

Heriaeeae Simon, 1903, Hist. nat. Araign., éd. 2, 2, p. 1012 (genus-group within the subfamily Misumeninae; type genus: Heriaeus Simon, 1875, Arachn. France, 2, p. 203). --- Roewer, 1954, Kat. Aran., Bruxelles, 2 (a), p. 864.

Diaeae: Simon, 1907, Ann. Mus. civ. Stor. nat. Genova, (3), 3, p. 316.

Platythomisidae: Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p. 372; 1913, Vergl. Physiol. Morphol. Spinnentiere, p. 17.

Misumenidae: Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p. 372; 1913, Vergl. Physiol. Morphol. Spinnentiere, p. 17.

Cymbachidae: Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p. 372.

Xysticidae: Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p. 373; 1913, Vergl. Physiol. Morphol. Spinnentiere, p. 18. --- Vilbaste, 1969, Eesti Ämblikud, 1, p. 31.

Diaeidae: Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p. 373; 1913, Vergl. Physiol. Morphol. Spinnentiere, p. 17.

Urarachnidae Dahl, 1913, Vergl. Physiol. Morphol. Spinnentiere, p. 18 (type genus: Uraarachne Keyserling, 1880, Spinnen Amerikas, Laterigradae, 1, p. 130).

Uraarachneae: Roewer, 1954, Kat. Aran., Bruxelles, 2 (a), p. 863.

Misumenae: Yaginuma, 1956, Atypus, Osaka, (10), p. 25.

Type genus. Thomisus Walckenaer, 1805, Tableaux Aranéides, p. 28 (type species: Thomisus onustus Walckenaer, 1805, ibid., p. 32, described from Lyon, France).

Diagnosis. Carapace flat to convex, without tubercles or granulations; head with developed setae. Eyes much developed, lateral eyes respectively on tubercles. Chelicera without teeth, rarely with one small tooth. Labium longer than wide. Legs long, not remarkably thick, at least with ventral spines; patella shorter than tibia and metatarsus; tarsus with claw-tuft formed by simple hairs; hairs of legs and palps not branched.

Genera included. About 70 genera have been described (Petrunkevitch, 1928; Mello-Leitão, 1929; Roewer, 1954; Bonnet, 1955-'59; Brignoli, 1983). Based on the classification by Simon (1895a), these genera were divided into 14 genus-groups (Roewer, 1954). I raised one of those, Bomeae, to the subfamilial rank (Ono, 1984), but the other groups have never been revised since Simon (1895a). Therefore, I will regard the subfamily Thomisinae in a broad sense as a complex of some tribes.

Seventeen genera of this subfamily have been recorded in Japan.

Key to the Japanese Genera

1(4) Clypeus wide; tubercles of PLE larger than those of ALE; (Tmarini Simon, 1895).

2(3) Prosoma with short setae; opisthosoma long and slender, legth/width about 3.00 ..... Monaeses Thorell, 1869.

3(2) Prosoma with long setae; opisthosoma not so long, length/width less than 2.00 ..... Tmarus Simon, 1875.

4(1) Clypeus narrow; tubercles of PLE smaller than those of ALE.

5(12) Body and legs somber-coloured, yellowish to blackish brown; leg I relatively short, leg I/IV usually 1.10-1.60; spiders inhabiting ground and low herbs or under tree barks; (Coriarachnini Simon, 1895, stat. nov.).

6(7) Body and legs covered with clavate or spatulate hairs; tibia and metatarsus of legs I and II each with two pair of ventral spines; small soil spiders ..... Oxyptila Simon, 1864.

7(6) Body and legs covered with simple hairs, rarely with blunt hairs; tibia and metatarsus of legs I and II each with more than three pair of ventral spines.

8(9) Body normal; prosoma with thoracic setae; male opisthosoma longer than wide ..... Xysticus C. L. Koch, 1835

9(8) Body flattened; prosoma without thoracic setae; make opisthosoma as wide as or wider than long.

10(11) Body extremely flattened; legs III and IV subequal, the former slightly longer than the latter; spiders living under tree barks ..... Coriarachne Thorell, 1870.

11(10) Body not extremely flattened; leg III longer than leg IV; spiders found under tree barks and in leaf litter ..... Bassaniana Strand, 1928.

12(5) Body and legs bright-coloured, white, yellow, green or light brown, rarely red or black; leg I much longer than leg IV, leg I/IV 1.50-3.00; spiders inhabiting plants.

13(18) Prosoma with long thoracic setae; RTA of male palp simple and sclerotized; body and legs relatively somber; (Talaini Simon, 1895, stat. nov.).

14(15) Female opisthosoma longer than wide; embolus of male palp short, thick and twisted; female genitalia with simple and hard intromittent canal and large globular spermatheca .... Lysiteles Simon, 1895.

15(14) Female opisthosoma as wide as or wider than long; embolus of male palp filiform, long and winding around tegulum; intromittent canal of female genitalia soft, long and winding; spermatheca small and kidney-shaped or globular.

16(17) Epigynum without sclerotized plate; spermatheca globular; VTA of male palp very large and securiform ..... Takachihoa Ono, 1985.

17(16) Epigynum with sclerotized plate; spermatheca kidney-shaped; VTA of male palp simple and digitiform ..... Synaema Simon, 1864.

18(13) Thoracic setae usually short or lacking, rarely long; male palp with much developed RTA and frequently with ITA; RTA basally not sclerotized and with spines, apically sclerotized, frequently with a dorsal tooth; body and legs usually green-coloured.

19(22) Conical protuberance present between ALE and PLE; male much smaller than female; (Thomisini Sundevall, 1833).

20(21) Opisthosoma as wide as or wider than long; protuberance between ALE and PLE much developed; sexual dimorphism remarkable, male extremely smaller and darker than female ..... Thomisus Walckenaer, 1805.

21(20) Opisthosoma much longer than wide; protuberance between ALE and PLE small; male smaller than female but not darker .. Runcinia Simon, 1875.

22(19) Head without protuberance between ALE and PLE; male smaller than female but not so small as in Thomisini; (Misumenini Simon, 1895).

23(24) Body and legs densely covered with long and strong hairs ....Heriaeus Simon, 1875.

24(23) Hairs on body and legs usually short and sparse.

25(30) Prosoma without thoracic setae; female leg I without prolateral spines; embolus of male palp short, basally thickened; intromittent canal of female genitalia tube-shaped and short.

26(27) Body and legs blackish brown in nature; epigynum with a large and soft protuberance and a pair of guide pockets ..... Pistius Simon, 1875.

27(26) Body and legs white, yellow or green; epigynum with a slightly sclerotized plate and one guide pocket.

28(29) Clypeus with white transverse ridge (carina); apical part of embolus of male palp spiniform; tibia of male palp without ITA; spermatheca small and reniform ..... Misumenoides F. O. Pickard-Cambridge, 1900 (doubtfully recorded from the Kurile

Islands by Peelle and Saito (1933); see the chapter "Species Incertae Sedis").

29(28) Clypeus without carina; apical part of embolus of male palp spiraled; male palp with ITA; spermatheca relatively large and globular ..... Misumena Laterille, 1805.

30(25) Prosoma usually with developed thoracic setae, rarely with greatly reduced setae; embolus of male palp filiform or spiniform, basally not remarkably thickened; leg I with several prolateral spines in both sexes; intromittent canal of female genitalia soft, long and winding.

31(32) Prosoma with developed thoracic setae; tubercles of lateral eyes touching but not confluent; MOA longer than wide; embolic division of male palp winding around tegulum; epigynum with soft protuberance; central hood situated on protuberance ..... Diaea Thorell, 1869.

32(31) Prosoma with developed or reduced thoracic setae or without cephalic setae; tubercles of lateral eyes usually confluent, rarely not confluent in male; MOA wider than long; embolic division winding around tegulum or very short with basal structure; epigynum with central hood, rarely with undeveloped protuberance ..... Misumenops F. O. Pickard-Cambridge, 1900.

Genus Tmarus Simon, 1875

[Japanese name: Torafukanigumo-zoku]

Tmarus Simon, 1875, Arachn. France, 2, p. 259; 1895, Hist. nat. Araign., éd. 2, 1, p. 994; 1932, Arachn. France, 6, p. 782. --- Becker, 1882, Ann. Mus. roy. Hist. nat. Belg., 10, p. 219. --- Chyzer and Kulczyński, 1891, Aran. hung., 1, p. 101. --- F. O. Pickard-Cambridge, 1900, Biol. Centr. Amer., Arachnida-Araneidea, 2, p. 153. --- Bösenberg, 1901, Zoologica, Stuttgart, 14, p. 17. --- Comstock, 1913, Spider Book, p. 524; 1948, ibid., rev. ed., p. 537. --- Planet, 1905, Araignées, p. 166. --- Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p. 375. --- Lessert, 1910, Cat. Invertéb. Suisse, Fasc. 3-Araignées, p. 348. --- Roewer, 1928, Tierw. Mitteleur., 3(2), p. 19. --- Petrunkevitch, 1928, Trans. Conn. Acad. Arts. Sci., 29, p. 170. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p. 128. --- S. Saito, 1934, J. Fac. Agr. Hokkaido imp. Univ., 33, p. 272; 1936, Arachn. Jehol, Araneina, p.11. --- Gertsch, 1939, Bull. Amer. Mus. nat. Hist., 76, p. 302. --- Chickering, 1940, Pap. Mich. Acad. Sci., 25, p. 201; 1950, Bull. Mus. comp. Zoöl., Harvard Coll., 103, p. 213; 1965, Bull. Mus. comp. Zool., Harvard Univ., 133, p. 340. ---Kaston, 1948, Spiders Conn., p. 416; 1953, How to Know the Spiders, p. 96. --- Comellini, 1955, Rev. Zool. Bot. afr., 51, p. 117. --- Yaginuma, 1956, Atypus, Osaka, (10), p. 29; 1960, Spiders Japan Col., Osaka, p. 97; 1968, ibid., rev. ed., p. 97; 1986 ibid, n.ed., p. 209. --- Zhu & Wang, 1963, Jilin Yike Daxue, Xue Bao, 5, p. 484. --- Schick, 1965, Bull. Amer. Mus. nat. Hist., 129, p. 37. --- Tikader, 1971, Mem. zool. Surv. India, 15(3), p. 57; 1980, Fn. India, Araneae, 1, p. 147. --- Tyshchenko, 1971, Opredel.

pauk. evrop. casti SSSR, p. 107. --- Miller, 1971, Klic. zvireny CSSR, 4, p. 113. --- Levy, 1973, Israel J. Zool., 22, p. 114. --- Ono, 1977, Acta arachnol., 27 (spec. no.), p. 65. --- Hubert, 1978, Araignees, p. 168. --- Dondale & Redner, 1978, Crab Spiders Canada & Alaska, p. 127. --- Zhu and Wen, 1981, J. Bethune med. Univ., 7(4), p. 24. --- Hu, 1984, Chinese Spiders Fields Forests, p. 342.

Tmarsus (lapsus): Keyserling, 1880, Spinnen Amerikas. Laterigradae, p. 137.

Type species. Aranea pigra Walckenaer, 1802, Fn. Paris., Ins. 2, p. 229.

Etymology. From Latin proper name; masculine. Tmarus, also called Tmaros, is originally Greek Τόμαρος, Mt. Tomaros in the province of Epirus, Greece.

Diagnosis. Medium-sized thomisids; male thinner than female. Prosoma longer than wide, highest at head, with long setae; lateral margin arcuate; clypeus wide. Tubercles of lateral eyes developed, ALE > PLE > PME > AME, lateral eyes much larger than median eyes, MOA nearly as long as wide. Chelicerae without tooth; labium longer than wide; sternum shield-shaped, slightly longer than wide. Legs long, setaceous; leg formula II-I-IV-III. Female palp with a claw. Male palp with VTA and RTA, frequently with ITA and DTA; bulb simple, without any apophysis, embolus usually short and thick. Opisthosoma longer than wide, pyriform, the posterior end occasionally extending beyond spinnerets. Epigynum usually with a median hood; intromittent orifices uncovered; intromittent canal short and thick; spermathecae small, globular, oval or reniform.

Range. Cosmopolitan, but mainly the Temperate and Tropic Zones.

Species included. About 170 species are known in the world.

Biology. Living on grasses and shrubs. Females build brood chambers with leaves or blades of grasses. Food consists of wandering insects including ants.

Remarks. The related genus Monaeses Thorell, 1869, is distinguished from this genus by the longer opisthosoma, longer embolus of male palp, lateral margins of prosoma parallel and not arcuate.

Key to the Japanese Species

1(4) Opisthosoma extending backwards, frequently forming conical protuberance.

2(3) Clypeus vertical; epigynum with a pair of guide pockets; embolus of male palp thinner ..... Tmarus piger (Walckenaer, 1802).

3(2) Clypeus gently sloping; epigynum with a central hood; embolus of male palp thicker ..... T. hanrasanensis Paik, 1973.

4(1) Opisthosoma caudad steeply sloping to the spinnerets.

5(8) Females.

6(7) Epigynum with a median septum; intromittent direction 6:00-7:00 .... T. yaginumai Ono, 1977.

7(6) Epigynum without a median septum; intromittent direction 5:00. ..... T. rimosus Paik, 1973.

8(5) Males.

9(10) DTA of male palp small; embolus distally thinned ..... T. yaginumai Ono, 1977.

10(9) DTA developed; embolus distally not thinned.

11(12) DTA bifurcated; ITA absent; embolus thick

.....T. rimosus Paik, 1973.

12(11) DTA not bifurcated; ITA present; embolus thin .. T. makiharai sp. nov.

Tmarus piger (Walckenaer, 1802)

[Japanese name: Torafukanigumo]

Aranea pigra Walckenaer, 1802, Fn. Paris., Ins., 2, p. 229. --- Latreille, 1804, Hist. nat. gén. Crust. Ins., 7, p. 283.

Aranea bilineata Walckenaer, 1802, Fn. Paris., 2, p. 229. --- Latreille, 1804, Hist. nat. gen. Crust. Ins., 7, p. 283.

Thomisus pigrus: Walckenaer, 1805, Tabl. Aranéid., p. 34; 1826, Fn. fr., 11/12, p. 86. --- Hahn, 1820, Monogr. Spinnen, 1, p. 8.

Thomisus bilineatus: Walckenaer, 1805, Tabl. Aranéid., p. 34; 1826, Fn. fr., 11/12, p. 86. --- Hahn, 1820, Monogr. Spinnen, 1, p. 8. --- Canestrini & Pavesi, 1868, Atti. Soc. ital. sci. nat., 11, p. 827; 1870, Arch. zool. anat. fisiol., (2), 2, p. 37.

Xysticus cuneolus C. L. Koch, 1836, Fn. Ins. Germ. init., (134), pl. 14; 1838, Arachn., 4, p. 79; 1847, Syst. Myria. Verz. Ber. Dtschl. Crust. Myria. Arachn., p. 231; 1851, Ubers. Arachnidensyst., (5), p. 40. --- Prach, 1866, Verh. zool.-bot. Ges. Wien, 16, p. 621. --- Ausserer, 1867, Verh. zool.-bot. Ges. Wien, 17, p. 157. --- Canestrini & Pavesi, 1868, Atti. Soc. ital. sci. nat., 11, p. 827; 1870, Arch. zool. anat. fisiol., (2), 2, p. 27. --- Hasselt, 1887, Tijdschr. Ent., 30, p. 31.

Thomisus piger: Walckenaer, 1837, Hist. nat. Ins. Apt., 1, p. 536. --- Lucas, 1840, Hist. nat. Anim. art., Annelid., Crust., Arachn., Myria., Ins., p. 388. --- Canestrini & Pavesi, 1868, Atti. Soc. ital. sci. nat. 11, p. 827; 1870, Arch. zool. anat. fisiol., (2), p. 37.

Thomisus cuneatus (lapsus): Walckenaer, 1847, Hist. nat. Ins. Apt., 4, p. 470.

Thomisus cuneolus: Doleschall, 1852, S.-b. Akad. Wiss. Wien, 9, p. 632. --- Blackwall, 1870, J. linn. Soc. London, 10, p. 420.

Xystica cuneola: Simon, 1864, Hist. nat. Araign. (Aranéides), p. 524.

Pachyptyla bilineata: Simon, 1864, Hist. nat. Araign., p. 526.

Monaeses cuneolus: Pavesi, 1873, Atti. Soc. ital. sci. nat., 16, p. 75. --- Thorell, 1875, Kongl. Svenska Vet.-Akad. Handl., (N.F.), 13(5), p. 96 --- L. Koch, 1876, Z. Ferdinand. Tirol Voralberg, (3), 19, p. 262; 1878, Abh. naturh. Ges. Nurnberg, 6, p. 37.

Monastes piger: Simon, 1874, Ann. Soc. ent. France, (5), 4, Bull., p. 141.

Monaeses piger: Pavesi, 1879, Atti. Soc. ital. sci. nat., 21, p. 807.

Tmarus piger: Simon, 1875, Arachn. France, 2, p. 262; 1882, Boll. Soc. ent. ital., 14, p. 359; 1895, Hist. nat. Araign., éd. 2, 1, p. 993; 1898, Ann. sci. nat., Porto, 5, p. 98; 1932, Arachn. France, 6, p. 782. --- Becker, 1882, Ann. Mus. roy. Hist. nat. Belg., 10, p. 219. --- Chyzer and Kulczyński, 1891, Aran. hung., 1, p. 101. --- Bösenberg, 1899, Verh. naturh. Ver. preuss. Rheinl. Westfalens, 56, p. 105; 1902, Zoologica, 14, p. 370. --- Planet, 1905, Hist. nat. France, 14, p. 167. --- Lessert, 1910, Cat. Invert. Suisse, 3. Araign., p.

348. --- Reimoser, 1919, Abh. zool.-bot. Ges. Wien, 10(2), p. 120. --- Petrunkevitch, 1928, Trans. Conn. Acad. Arts Sci, 29, p. 170. --- Roewer, 1928, Tierw. Mitteleur., 3(2), p. VI-20; 1932, Fn. Dtschl., p. 414. --- Giltay, 1932, Bull. Mus. roy. Hist. nat. Belg., 8(22), p. 35. --- Charitonow, 1932, Iejiegod. Zool. Muz. Akad. Nauk S.S.S.R., 32, p. 155. --- S. Saito, 1936, Rept. Sci. Exped. Manchoukuo, (5), 1(3), p. 11, 75. --- Caporiacoo, 1936, Festschr. Strand, 1. p. 337. --- Chikuni, 1941, Spid. Japan Alps, p. 135. --- Yaginuma, 1956, Atypus, Osaka, (10), p.29; 1960, Spid. Japan Col., Osaka, p. 97; 1968, ibid., (rev. ed.), p. 97; 1986, ibid.,(n.ed.), p. 209. --- Zhu & Wang, 1963, Jilin Yike Daxue, Xue Bao, 5, p. 484. --- Tyshchenko, 1971, Opredel. pauk. evrop. casti SSSR, p. 114. --- Miller, 1971, Klic zvireny CSSR, 4, p. 113. --- Paik, 1973, Theses Coll. Grad. School Kyungpook Univ., 4, p. 79. --- Ono, 1977, Acta arachnol., 27 (spec. no.), p. 68, 79. --- Zhu & Wen, 1981, J. Bethune med. Univ., 7(4), p. 25. --- Hubert, 1978, Araign., p. 168. --- Jones, 1983, Spid. Brit. N. Eur., p. 110. --- M.-S. Zhu, 1983, Spider Paddy Fields Shanxi, p. 190. --- Shinkai & Takano, 1984, Field Guide Spid. Japan, p. 140. --- Hu, 1984, Chinese Spiders Fields Forests, p. 342.

Tmarus amoenus Yuhara, 1931, Study Spid., p. 180.

Etymology. Specific name from latin meaning slow-moving.

Specimens examined. Japan: 2♀♀, Okushiri Island, Hokkaido, 28-VII-1964, M. Ohno leg. (TYO); 2♂♂, Yaotome, Izumi-shi, Miyagi Pref.,

17-V-1982, K. Sasaki leg. (NSMT-Ar 1046); 1♀, same locality, 23-V-1982, K. Sasaki leg. (NSMT-Ar 1060); 1 juv., Dainohara-shinrin-kôen, Sendai-shi, Miyagi Pref., 4-XII-1982, K. Sasaki leg. (NSMT-Ar 1045); 1 juv. ♂, Kuzuoka northern part of Miyagi Pref., 23-IX-1982, K. Sasaki leg. (NSMT-Ar 1047); 2 juv., Kurikawa-mura, Kitakanbara-gun, Niigata Pref., 27-IV-1973, K. Baba leg. (NSMT-Ar 1052); 2♀♀, same locality, 16-V-1973, K. Baba leg. (NSMT-Ar 1053); 1♂, Nikko-shi, Tochigi Pref., 30-V-1964, T. Hamamura leg. (TYO); 2♀♀, Mt. Harunasan, Gunma Pref., 20-VI-1961, M. Ohno leg. (TYO), 1♀, Kôzu-bokujô, Kanra-gun, Gunma Pref., 25-VI-1972, A. Matsumoto leg. (NSMT-Ar 1055); 1♀, Naguri-mura, Iruma-gun, Saitama Pref., 28-VII-1974, J. Shimada leg. (NSMT-Ar 1056); 1♀, Fudagô, 20km N of Amatsu-kominato-cho, Awa-gun, Chiba Pref., 11-VI-1971, S. Matsumoto leg. (NSMT-Ar 1054); 3♀♀, Kyôrin Univ., Hachiôji-shi, Tokyo, 19-VI-1971, S. Matsumoto leg. (NSMT-Ar 1051); 1♂, Isehara-shi, Kanagawa Pref., 18-V-1975, H. Ono leg. (NSMT-Ar 1048); 1♀4♂♂, Izuminosato, Karuizawa, Kitasaku-gun, Nagano Pref., 1-VI-1976, H. Ono leg. (NSMT-Ar 1044); 1♀, Umegashima, Shizuoka-shi, Shizuoka Pref., 28-VII-1965, M. Iwasaki leg. (TYO); 1 juv. ♀, Ôsugidani-rindô, 500-700m alt., Shiramine-mura, Ishikawa-gun, Ishikawa Pref., 3-V-1972, K. Harusawa leg. (YNO); 2♂♂, Hirakura-enshûrin, Kawakami, Misugi-mura, Ichishi-gun, Mie Pref., 3-V-1964, R. Hashimoto leg. (TYO); 1♀, Mt. Hieizan, Kyoto, 3-VIII-1954, T. Yaginuma leg. (TYO); 1♂, Mt. Hirasan, Shiga Pref., 27-V-1955, T. Yaginuma leg. (TYO); 1♀, Fujiidera, Osaka, 7-XI-1937, Y. Yaginuma leg. (TYO); 7 juv., Tonomine-kogen, 550-700m alt., Ôkôchi-cho, Kanzaki-gun, Hyogo Pref., 10-X-1976, Y. Nishikawa leg. (YNO); 2♂♂, Mt. Daisen, Tottori Pref., 25-V-1976, Y. Yoneda leg. (NSMT-Ar 1049); 5 ex., 27~

31-V-1959, Mt. Hikosan, Fukuoka Pref., C. Okuma leg. (TYO); 1♀, same locality, 27-VII 2-VIII-1959, C. Okuma leg. (NSMT-Ar 1058).

Europe: 1♀1♂, Geisenheim, Rheingau, F.R. Germany, 5~11-V-1953, Jakobi leg. (SMF 15355); 1♂, ibid., 6-V-1952, Jakobi leg. (SMF 26364); 1♀1♂, Teufelsgraben, Donnerkirchen, Leithagebirge, Austria, 3-V-1966, R. Braun et al. leg. (SMF 26416).

Description. Measurement. Body length ♀ 4.30-7.03, ♂ 3.41-4.07; prosoma length ♀ 1.70-2.22, ♂ 1.48-1.78, width ♀ 1.56-2.15, ♂ 1.41-1.63; opisthosoma length ♀ 2.67-4.37, ♂ 1.85-2.44, width ♀ 1.70-3.26, ♂ 1.04-1.26; lengths of legs of 1♀1♂ from Karuizawa, Nagano Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.81/0.95	1.36/1.78	1.59/1.96	0.76/0.81	1.98/2.30	6.50/7.80
II	0.81/0.93	1.33/1.78	1.56/1.93	0.74/0.81	1.93/2.33	6.37/7.78
III	0.52/0.59	0.59/0.81	0.93/1.11	0.52/0.59	1.16/1.39	3.72/4.49
IV	0.48/0.56	0.70/0.81	0.89/1.07	0.53/0.54	1.41/1.52	4.01/4.50

Promosa slightly longer than wide (length/width ♀ 1.03-1.15, ♂ 1.04-1.10), with long setae. Lateral eyes on much developed tubercles, ALE > PLE > PME > AME, ALE/AME ♀ 1.80-2.55, ♂ 2.00-2.50, PLE/PME ♀ 1.25-1.43, ♂ 1.33-1.50, AME-AME/AME-ALE ♀ 0.77-1.13, ♂ 0.85-0.93, PME-PME/PME-PLE ♀ 0.65-0.74, ♂ 0.64-0.67, MOA-WA/WP ♀ 0.66-0.74, ♂ 0.70-0.74, MOA-L/W ♀ 0.90-0.95, ♂ 1.00-1.04, clypeus/AME-AME ♀ 1.33-1.73, ♂ 1.57-2.17, clypeus almost vertical. Labium longer than wide (length/width ♀ 1.80-2.00, ♂ 1.50-1.86), sternum longer than wide (length/width ♀ 1.22-1.36, ♂ 1.10-1.35).

Spiniformation of legs of 1♀1♂ from Karuizawa, Nagano Pref. ♀: Femur: I-II dorsal 0-1-1, I prolateral 0-1-1-1, I retrolateral and II prolateral 0-0-1-1, III-IV dorsal 1, III prolateral 0-0-0-1; patella: I-IV dorsal 1-0-1; tibia: I-IV dorsal 1-1, I-II prolateral and II retrolateral 0-0-1, I retrolateral 0-1-1, I-II ventral 2-2, III ventral 1, IV retrolateral 0-1; metatarsus: I-II pro- and retrolateral 0-1-I ap, ventral 2-2, III-IV pro- and retrolateral 0-1, ventral 2.

♂: Femur: I dorsal 1-1-1-1-1, prolateral 0-1-1-1, retrolateral 0-0-1-1, II-IV dorsal 0-1-1-1-1, II prolateral 0-1-1, retrolateral 0-0-0-1, III-IV prolateral 0-0-1; patella: I-IV dorsal 1-0-1 ap, I-II pro- and retrolateral 1; tibia: I-IV dorsal 1-1, I-II pro- and retrolateral 1-1-1, I ventral 2-2-2-0 (at the right leg 1-2-2-0), II ventral 1-2-2-0 (at the right leg 0-2-2-0), III prolateral 0-1, III retrolateral and IV pro- and retrolateral 1-1, III-IV ventral 2; metatarsus: I-II prolateral 1-1-0-1 ap, retrolateral 1-1-1 ap, ventral 2-2, III-IV prolateral 0-1, retrolateral 1-1-0, ventral 2.

Malp palp (Ono, 1977a, figs. 5-6, 28-29). Tibia with VTA and RTA, without DTA; VTA developed, securiform, RTA sclerotized, sickle-shaped. Embolus thick and short, curved retrolaterally, its apical part strongly sclerotized and hook-shoped.

Opisthosoma longer than wide (length/width ♀ 1.34-1.60, ♂ 1.66-2.00), pyriform in female, long oval in male, pointed caudally.

Female genitalia (Ono, 1977a, figs. 3-4, 30-31). Epigynum with a pair of guide-pockets in the anterior part, intromittent orifices situated at the middle. Intromittent canal short and globular, spermathecae globular.

Coloration and markings. ♀♂: Prosoma yellowish brown, at the sides brown to blackish brown; chelicerae, maxillae, labium and sternum yellowish brown, legs yellowish brown excepting femora I-II distally, patellae I-II pro- and retrolaterally, tibiae I-II distally and metatarsi I-II distally black. Opisthosoma mottled grey with two light-coloured chevrons, darker caudally, the underside grey or brown with a longitudinal dark-coloured stripe, epigastric area of male black.

Range. Middle part of Eurasia from Spain to Japan (Hokkaido, Honshu, Kyushu).

Biology. Adult in May, June and July. The spiders prey frequently upon ants.

Remarks. This species is widely distributed from Europe to Japan. Having compared the Japanese individuals with the European, I was unable to find out any difference between them (Ono, 1977a). T. orientalis Schenkel, 1963, and T. hanrasanensis Paik, 1973, may stand next to T. piger, though no direct relationship is confirmed.

Tmarus hanrasanensis Paik, 1973

[Japanese name: Hananaga-torafukanigumo]

(Figs. 46-47)

Tmarus hanrasanensis Paik, 1973, Theses Coll. grad. School Educ. Kyungpook Univ., 4, p. 82. Female holotype and 1♀ paratype from Mt. Hanrasan, Jejoo Island, Korea, 28-VI-1964, K.Y. Paik leg., in KNUT,

not examined. --- Ono, 1977, Acta arachnol., 27 (spec. no.), p. 70; 1986, Mem. Natn. Sci. Mus., Tokyo, (19), p. 169. --- C.D. Zhu & Wen, 1981, J. Bethune med. Univ., 7(4), p. 24. --- Yaginuma, 1986, Spid. Japan Col., Osaka, (n.ed.), p. 209.

Notes. After Paik (1973a) originally described this species from Korea on the basis of two females, only two collecting records were known: 1♀ from Akita, Japan (Ono, 1977a) and 1♀ from Jirin, NE China (Zhu & Wen, 1981). Recently, I found the male of the spider from Japan (Ono, 1986). Its first description will be given in the following lines.

Etymology. Specific name from the type locality, Mt. Hanrasan, Jejoo Island, Korea.

Specimens examined. 1♀, Mt. Tegatayama, Akita-shi, Akita Pref., 1-VI-1962, J. Nagaki leg. (NSMT-Ar 1501); 2♂♂, Mt. Hikosan, Fukuoka Pref., 27~31-V-1959, C. Okuma leg. (NSMT-Ar 1502); 1♂, Chugu, 440m alt., Yoshinotani-mura, Ishikawa-gun, Ishikawa Pref., 5-VI-1985, H. Ono leg. (NSMT-Ar 1503).

Description. Measurement. Body length ♀ 6.07mm, ♂ 3.63-4.85mm; prosoma length ♀ 2.25mm, ♂ 1.44-1.96mm, width ♀ 2.00mm, ♂ 1.33-1.81mm; opisthosoma length ♀ 3.55mm, ♂ 2.22-3.04mm, width ♀ 2.00mm, ♂ 0.96-1.37mm. Lengths of legs of 1♀ from Akita Pref. and 1♂ from Ishikawa Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.16/1.10	1.96/2.14	2.12/2.33	1.12/0.98	2.60/2.71	8.96/9.26
II	1.11/1.10	1.85/2.08	2.07/2.30	1.02/0.98	2.44/2.65	8.49/9.11
III	0.59/0.60	0.87/0.88	1.30/1.15	0.67/0.60	1.78/1.51	5.21/4.74
IV	0.62/0.59	0.92/0.90	1.24/1.13	0.64/0.58	1.88/1.75	5.30/4.94

Prosoma longer than wide (length/width ♀ 1.13, ♂ 1.08-1.18), with long setae. Lateral eyes on much developed tubercles, ALE > PLE > PME > AME, ALE/AME ♀ 1.92, ♂ 2.25-2.50, PLE/PME ♀ 1.25, ♂ 1.33, AME-AME/AME-ALE ♀ 0.95, ♂ 1.00-1.04, PME-PME/PME-PLE ♀ 0.76, ♂ 0.69-0.77, MOA-WA/WP ♀ 0.72, ♂ 0.71-0.73, MOA-L/W ♀ 0.95, ♂ 0.96-1.00, clypeus gently sloping, clypeus/AME-AME ♀ 1.67, ♂ 1.72-2.30. Labium much longer than wide (length/width ♀ 1.74, ♂ 1.69-2.13), sternum longer than wide (length/width ♀ 1.39, ♂ 1.25-1.35). Tarsal claws of legs I-II with 6 teeth, III-IV with 3-4 teeth; those of female palp with 4 teeth.

Spiniformation of legs of the same ♀♂ used for measurement. ♀: Femur: I-II dorsal 0-1-1-1, prolateral 0-1-1-1, retrolateral 0-1-1, III-IV dorsal 0-1-1, prolateral 0-1-1; patella: I-IV dorsal 1-0-1 (weak), II retrolateral 1; tibia: I-IV dorsal 1-1 (weak), I-II pro- and retrolateral 1-1-1, I ventral 2-2-2-0, II ventral 1-2-2-0, III pro- and retrolateral 1-1 (weak), IV pro- and retrolateral 1-1, III-IV ventral; 2; metatarsus: I-II prolateral 0-1-1 ap, retrolateral 1-1-1 ap, ventral 1-2-0-2, III pro- and retrolateral 1-1 (weak), IV pro- and retrolateral 1-1, III-IV ventral 2.

♂: Femur: I-II dorsal 0-1-1-1-1, prolateral 0-1-1-1, retrolateral 0-0-1-1, III dorsal 1-1-0-1, prolateral 0-1, IV dorsal 1-1-1-1, prolateral 0-1; patella: I-II dorsal 1 ap, pro- and retrolateral 1, III-IV dorsal 0-1 ap; tibia: I-IV dorsal 1-0-1, I-II pro- and retrolateral each 1-1-1, ventral 2-2-2, III-IV pro- and retrolateral each 1-0-1-0, ventral 2; metatarsus: I-II prolateral 1-1-0-1 ap, retrolateral 1-0-1-0, ventral 2-2, III-IV prolateral 1-1-0, retrolateral 1-1-0, ventral 2-0.

Male palp (Ono, 1986, figs. 3-4). Tibia with VTA and RTA; RTA heavily sclerotized, large and uncinate. Embolus very large, expanded at the base, apically twisted.

Opisthosoma longer than wide (length/width ♀ 1.78, ♂ 1.93-2.32), caudally extending beyond spinnerets, with long hairs.

Female genitalia (Fig. 47; Ono, 1977a, fig. 14). Epigynum concave, with a median hood, intromittent orifices situated at the middle. Intromittent canal short, spermathecae small and globular.

Coloration and markings. ♀ (Fig. 46): Prosoma yellowish brown, darker at the middle; chelicerae, maxillae and labium yellowish brown; sternum dark brown with a vertical, oval, white marking at the middle; legs yellow. Opisthosomal dorsum greyish brown with a greyish white vertical band and three chevrons; venter greyish brown with a dark-coloured vertical stripe.

♂ (Ono, 1986, fig. 2): Prosoma dark yellowish brown to chestnut with many white lines, head lighter; chelicerae yellowish brown, labium and sternum chestnut, maxillae light yellowish or light greyish brown; legs light yellowish brown mottled with brown. Opisthosomal dorsum dark yellow or blackish brown, with a white band at the middle and a pair of black stripe at

the sides; venter blackish brown, white at the sides.

Range. Japan (Honshu, Kyushu), Korea, China.

Biology. Unknown.

Remarks. This species resembles Tmarus piger but differs from the latter in the clypeus gently sloping and the structure of sexual organs.

Tmarus rimosus Paik, 1973

[Japanese name: Semaru-torafukanigumo]

Tmarus piger: S. Saito, 1934, J. Fac. Agr. Hokkaido imp. Univ., Sapporo, 33, p.278; 1959, Spid. Book Illustr. Col., p.130. (Misidentification.)

Tmarus rimosus Paik, 1973, Theses Coll. grad. School Educ. Kyungpook Univ., 4, p. 83. Female holotype from Taegu, Korea, 15-VIII-1960, K.Y. Paik leg. and a number of ♀♂ paratypes from Korea, in KNUT, not examined. --- Ono, 1977, Acta arachnol., 27 (spec. no.), p.72. --- Shinkai, 1977, Acta arachnol., 27 (spec. no.), p.332. --- C. D. Zhu & Wen, 1981, J. Bethune med. Univ., 7(4), p.25. --- M.-S. Zhu, Spiders Paddy Fields Shanxi, p.191. --- Shinkai & Takano, 1984, Field Guide Spid. Japan, p.140. --- Yaginuma, 1986, Spid. Japan Col., Osaka, (n.ed.), p.209.

Etymology. Specific name from Latin meaning cracked; derived from the shape of RTA of male palp.

Specimens examined. 1♀, Lake Akan, Hokkaido, 11-VIII-1955, Sato leg.

(TYO); 1♀, Tomakomai-shi, Hokkaido, VIII-1971, Yanagizawa leg. (TYO); 1♀, Dainohara-shinrinkôen, Sendai-shi, Miyagi Pref., 23-IX-1981, K. Sasaki leg. (NSMT-Ar 1504); 1 juv., s.l., 12-VII-1981, K. Sasaki leg. (NSMT-Ar 492); 1 juv. ♂, Kenminno-mori, Rifu-cho, Miyagi-gun, Miyagi Pref., 10-VI-1982, K. Sasaki leg. (NSMT-Ar 1505); 1♀, Hasegama, Iwanuma-shi, Miyagi Pref., 7-VIII-1982, K. Sasaki leg. (NSMT-Ar 1506); 1♀1♂, Utsunomiya-shi, Tochigi Pref., 11-VI-1964, T. Hamamura leg. (TYO); 1♀, Mt. Myôgisan, Gunma Pref., 15-VII-1976, E. Shinkai leg. (NSMT-Ar 1507); 1♂, Kisarazu-shi, Chiba Pref., 27-VI-1976, M. Tomokuni leg. (NSMT-Ar 1508); 1♂, Kodaira-shi, Tokyo, 8-VI-1975, S. Matsumoto leg. (NSMT-Ar 1509); 2♀♀1♂84 juv., Tateshina-Kôgen, Nagano Pref., 2-4-VIII-1975, S. Takano, E. Shinkai & H. Ono leg. (NSMT-Ar 1510); 13♀♀3♂♂190 juv., Sugadaira, Nagano Pref., 1-2-VIII-1975, S. Takano, E. Shinkai & H. Ono leg. (NSMT-Ar 1511); 3♀♀, Mt. Shirouma, Nagano Pref., 15-VII-1973, K. Arima & H. Ono leg. (NSMT-Ar 1512); 1 juv., Izuminosato, Karuizawa, Kitasaku-gun, Nagano Pref., 1-VI-1976, H. Ono leg. (NSMT-Ar 1513); 1♀, Lake Kawaguchiko, Yamanashi Pref., 4-VIII-1974, S. Matsumoto leg. (NSMT-Ar 1514); 1♀, Fujiyoshida-shi, Yamanashi Pref., 6-VII-1974, S. Matsumoto leg. (NSMT-Ar 1515); 1♂, Atami-shi, Shizuoka Pref., 26-VII-1972, H. Ono leg. (NSMT-Ar 1516); 2♀♀, Mt. Hirasan, Shiga Pref., 4-VIII-1954, T. Yaginuma leg. (TYO); 1♀, s.l., 3-VIII-1955, T. Yaginuma leg. (TYO); 1♀, Mt. Yoshinoyama, Nara Pref., 29-VIII-1982, T. Yaginuma leg. (TYO); 1♀, Kasuga, Nara Pref., 25-VII-1947, T. Yaginuma leg. (TYO); 1♀, Ai, Ibaraki-shi, Osaka, 16-VII-1977, Y. Nishikawa leg. (YNO); 1 juv. ♀, Minoo-shi, Osaka, 18-VI-1967, T. Yaginuma leg. (NSMT-Ar 292); 1♀, Mt. Iwawakiyama, Osaka, 17-VIII-1943, T. Yaginuma leg. (TYO); 1♀, Inunakisan, Osaka, 14-VII-1968, T.

Yaginuma leg. (TYO); 1♀, Yamanakadani, Osaka, 29-VII-1958, T. Yaginuma leg. (TYO); 1♀, Mt. Nijosan, Osaka, 7-VIII-1939, T. Yaginuma leg. (TYO); 1♀, Mt. Koyasan, Ito-gun, Wakayama Pref., 17-VIII-1959, T. Yaginuma leg. (TYO); 1♀, Omogo, Kamiukena-gun, Ehime Pref., 15-VII-1974, S. Matsumoto leg. (NSMT-Ar 1517).

Description. Measurement. Body length ♀ 5.11-7.41mm, ♂ 3.41-5.19mm; prosoma length ♀ 2.15-2.52mm, ♂ 1.74-2.15mm, width ♀ 2.00-2.59mm, ♂ 1.60-2.22mm; opisthosoma length ♀ 2.96-4.81mm, ♂ 1.93-3.04mm, width ♀ 1.90-3.78mm, ♂ 1.11-1.70mm; lengths of legs of 1♀1♂ from Tateshina-kôgen, Nagano Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.96/1.33	2.00/3.16	2.19/3.19	1.07/1.11	2.67/3.61	8.89/12.40
II	1.00/1.29	2.07/2.96	2.30/3.26	1.07/1.11	2.59/3.59	9.03/12.21
III	0.67/0.62	1.11/1.30	1.33/1.78	0.67/0.74	1.81/2.00	5.59/ 6.44
IV	0.67/0.79	1.19/1.51	1.44/1.74	0.67/0.67	2.07/2.18	6.04/ 6.89

Prosoma nearly as long as wide (length/width ♀ 0.97-1.15, ♂ 0.96-1.05). Lateral eyes on much developed tubercles, ALE > PLE > PME > AME, ALE/AME ♀ 2.15-2.67, ♂ 2.00-2.20, PLE/PME ♀ 1.37-1.72, ♂ 1.58-1.75, AME-AME/AME-ALE ♀ 1.00-1.12, ♂ 1.00-1.16, PME-PME/PME-PLE ♀ 0.68-0.75, ♂ 0.62-0.67, MOA-WA/WP ♀ 0.72-0.79, ♂ 0.70-0.82, MOA-L/W ♀ 0.92-1.06, ♂ 1.02-1.15, clypeus/AME-AME ♀ 1.30-1.77, ♂ 1.46-1.75, clypeus nearly vertical. Labium longer than wide (length/width ♀ 1.72-2.10, ♂ 2.00-2.15), sternum longer than wide (length/width ♀ 1.27-1.36, ♂ 1.08-1.36), palpal femur and proximal part of maxilla of male expanded.

Spiniformation of legs of 1♀1♂ from Tateshina-kogen, Nagano Pref. ♀: Femur: I dorsal 0-0-1-1, prolateral 0-1-1-1, retrolateral 0-0-1-1, II dorsal 1-1-0-1, prolateral 0-0-1-1, retrolateral 0-0-0-1, III-IV dorsal 0-1-0-1, prolateral 0-0-0-1; patella: I-IV dorsal 1-0-1, I pro- and retrolateral, II retrolateral IV retrolateral each 1; tibia: I-IV dorsal 1-1, I-II pro- and retrolateral 1-1-1, I ventral 1-1-2-1-2-1 ap, II ventral 0-2-2, III-IV prolateral 1-1, retrolateral 0-1, III ventral 2, IV ventral 1; metatarsus: I-II pro- and retrolateral 1-1-1 ap, I ventral 2-1-2-1, II ventral 1-2-2-2, III-IV pro- and retrolateral 1-1, ventral 2.

♂: Femur: I-IV dorsal 1-1-1-1, I prolateral 1-1-1-1, retrolateral 0-0-1-1, II prolateral 0-1-1-1, retrolateral 0-1-0-1, III pro- and retrolateral, IV prolateral each 0-0-0-1; patella: I-IV dorsal 1-0-1, I-II pro- and retrolateral, III-IV retrolateral 1; tibia: I-IV dorsal 1-1, I-II pro- and retrolateral 1-1-1, ventral 2-2-2-0, III-IV pro- and retrolateral 1-1, ventral 2; metatarsus: I-II pro- and retrolateral 1-1-1 ap, ventral 2-2, III-IV pro- and retrolateral 1-1, ventral 2.

Male palp (Ono, 1977a, figs. 11-12). Tibia with VTA, RTA and DTA; DTA developed, bifurcated. Embolus thick, its distal part gently thinned.

Opisthosoma longer than wide (length/width ♀ 1.27-1.64, ♂ 1.43-1.87), caudally without protuberance and not extending beyond spinnerets.

Female genitalia (Ono, 1977a, figs. 9-10). Epigynum concave, without median septum, intromittent orifices situated at the middle. Intromittent direction 5:00, intromittent canal short, spermathecae globular.

Coloration and markings. ♀♂: Prosoma light grey or yellowish brown

mottled with brown; chelicerae, maxillae, labium, sternum, legs and palps dark-yellow to yellowish brown. Opisthosoma dorsum grey or brownish grey, rarely black, lighter at the middle, with three or four white or brown chevrons caudally, venter yellowish brown with a longitudinal blackish brown band.

Range. Japan (Hokkaido, Honshu, Kyushu), Korea, China (Zhu & Wen, 1981).

Biology. Adult in June, July and August. This spider is found especially in the graminaceous vegetation, e.g., Miscanthus sinensis Anderss., and is sitting upside-down and motionless on a leaf or a stalk (Ono, 1977a, fig. 32). Adult female produces its retreat with a living leaf and protects the egg-cocoon.

Remarks. The species is very closely related to T. stellio Simon, 1875, widely distributed from southern Europe to Central Asia. The shape of DTA of male palp and the intromittent direction of female genitalia are different between the two species.

Tmarus yaginumai Ono, 1977

[Japanese name: Yaginumano-semaru-torafukanigumo]

(Figs. 48-50)

Tmarus yaginumai Ono, 1977, Acta arachnol., 27 (spec. no.), p.73. Male holotype from Kajigamori, Kochi Pref., 17-VII-1975, S. Takano et al. leg., in SMF, examined; 2♂♂ paratypes from Irozaki, Izu

Penninsula, Shizuoka Pref., 2-VIII-1976, M. Ozawa et al., in ASEA, examined. --- Yaginuma, 1986, Spid. Japan Col., Osaka, (n.ed.), p.210.

Notes. The female previously unknown will be described herewith for the first time.

Etymology. Named after Prof. Takeo Yaginuma.

Specimens examined. Type series: Holotype: ♂, Kajigamori, Nagaoka-gun, Kochi Pref., 17-VII-1975, S. Takano et al. leg. (SMF 29394); 2♂♂ (paratypes), Irozaki, Izu Penninsula, Shizuoka Pref., 2-VIII-1976, M. Ozawa et al. leg. (ASEA).

1♂ 2 juv., Miyakejima Island, Tokyo, 6-VIII-1979, K. Suzuki leg. (NSMT-Ar 1518); 1♀, Tsubota, Miyakejima Island, Tokyo, 10-VII-1970, F. Fuwa and H. Ono leg. (NSMT-Ar 1519); 1♀, Nanasawa, Isehara-shi, Kanagawa Pref., 18-VII-1979, K. Kumada leg. (NSMT-Ar 1520); 1 juv., Kochi-shi, Kochi Pref., 28-VI-1964, K. Nakahira leg. (TYO); 1♀, Mt. Hikosan, Fukuoka Pref., 27-VII 2-VIII-1959, C. Okuma leg. (NSMT-Ar 1521); 1♀, Nakanoshima Island, Tokara Islands, Kagoshima Pref., 6-VIII-1976, M. Shimojana leg. (NSMT-Ar 1999).

Description. Measurement. Body length ♀ 4.89-5.15mm, ♂ 3.85-5.19mm; prosoma length ♀ 1.85-2.00mm, ♂ 1.63-2.04mm, width ♀ 1.70-1.85mm, ♂ 1.67-2.00mm; opistosoma length ♀ 2.96-3.30mm, ♂ 2.15-3.48mm, width ♀ 1.85-2.60mm, ♂ 1.26-2.07mm; lengths of legs of 1♀ from Miyakejima Island, Tokyo, and 1♂ (paratype) from Irozaki, Izu Penninsula, Shizuoka Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.88/1.13	1.64/2.60	2.00/2.96	0.96/1.14	2.40/3.28	7.88/11.11
II	0.88/1.22	1.64/2.65	2.00/2.88	0.92/1.14	2.32/3.30	7.76/11.19
III	0.56/0.68	0.80/1.25	1.24/1.63	0.64/0.70	1.60/1.88	4.84/ 6.14
IV	0.60/0.83	0.96/1.35	1.28/1.61	0.72/0.68	1.88/2.10	5.44/ 6.57

Prosoma nearly as long as wide (length/width ♀ 1.08-1.09, ♂ 0.97-1.06). Lateral eyes on much developed tubercles, ALE > PLE > PME > AME, ALE/AME ♀ 2.25-2.33, ♂ 1.98-2.17, PLE/PME ♀ 1.63-1.67, ♂ 1.57-1.67, AME-AME/AME-ALE ♀ 0.96-1.00, ♂ 0.81-1.00, PME-PME/PME-PLE ♀ 0.59, ♂ 0.61-0.74, MOA-WA/WP ♀ 0.70-0.74, ♂ 0.65-0.77, MOA-L/W ♀ 1.00-1.09, ♂ 1.05-1.13, clypeus/AME-AME ♀ 2.22-2.34, ♂ 1.44-2.00, clypeus nearly vertical. Labium longer than wide (length/width ♀ 1.83-2.50, ♂ 1.88-2.34), sternum longer than wide (length/width ♀ 1.18-1.25, ♂ 1.08-1.14), palpal femur and proximal part of maxilla in male expanded.

Spiniformation of legs of 1♀ from Miyakejima Island, Tokyo, and the holotype ♂. ♀: Femur: I-IV dorsal 0-1-1, I prolateral 0-0-1-1-1, retrolateral 0-1-1, II prolateral 0-1-1, retrolateral 0-0-1, III prolateral 0-0-1; patella: I-IV dorsal 1-1; tibia: I-IV dorsal 1-1, I-II pro- and retrolateral 1-1-1, ventral 2-2, III-IV pro- and retrolateral 0-1, ventral 1-1; metatarsus: I-II pro- and retrolateral 1-1-1 ap, I ventral 2-1-0-2, II ventral 1-2-1-2, III-IV pro- and retrolateral 1-1, ventral 2.

♂: Femur: I-II and IV dorsal 1-1-1-1, I prolateral 1-1-1-1, ventral 0-0-1-1, II pro- and retrolateral 0-0-1-1, III dorsal 1-1-0-1, prolateral

0-1-1, retrolateral 0-0-1, IV pro- and retrolateral 0-0-0-1; patella: I-IV dorsal 1-1, I-II and IV pro- and retrolateral 1; tibia: I-IV dorsal 1-1, I-II pro- and retrolateral 1-1-1, I ventral 2-2-2, II ventral 1-2-2, III-IV prolateral 1-1, III retrolateral 1-1, ventral 2-2, IV retrolateral 1-1-1, ventral 2; metatarsus: I-III pro- and retrolateral 1-1-1 ap, I-II ventral 1-1, III ventral 2, IV pro- and retrolateral 1-1, ventral 2.

Male palp (Ono, 1977a, figs. 15-17). Tibia with VTA, RTA and DTA; DTA very small. Embolus proximally thick as in T. rimosus but distally thinned, with the apical part needle-shaped.

Opisthosoma longer than wide (length/width ♀ 1.26-1.60, ♂ 1.66-2.00), caudally without protuberance and not extending beyond spinnerets.

Female genitalia (Figs. 49-50). Epigynum similar in appearance to that of T. rimosus, but with a median septum. Intromittent direction 6:30, intromittent canal short, spermathecae reniform.

Coloration and markings. ♀: Prosoma yellowish brown to brown with indistinct dark-brown markings; chelicerae, maxillae, labium, sternum, legs and palps dark-yellow. Opisthosoma dorsum grey or beige with three white chevrons caudally, ventrum grey with a longitudinal dark-coloured band.

♂: Prosoma light brown, darker at the sides; chelicerae, maxillae, labium, sternum, palps and legs yellowish brown. Opisthosomal dorsum yellowish brown with a longitudinal yellowish white stripe at the middle and three dark-coloured chevrons caudally, venter dark-brown with a longitudinal light-coloured band.

Range. Japan (Honshu, Shikoku, Kyushu).

Biology. Adult in July and August.

Remarks. This species is closely related to T. rimosus and T. makiharai, but the embolus is distally thinned, the DTA is very samll, and the epigynum bears a median septum.

Tmarus makiharai sp. nov.

[Japanese name: Amami-semaru-torafukanigumo]

(Figs. 51-53)

Etymology. Named after Mr. Hiroshi Makihara, Tsukuba.

Type series. Holotype: ♂, Nishinakama, Amamioshima Island, Amami Islands, Kagoshima Pref., 11-IV-1976, H. Makihara leg. (NSMT-Ar 1522); paratype: ♂, Yakkachi, Amamioshima Island, Amami Islands, Kagoshima Pref., 12-XI-1962, C. Okuma leg. (NSMT-Ar 1523).

Description (♀ unknown). Measurement. Body length 4.37-4.59mm; prosoma length 1.78-1.85mm, width 1.70-1.81mm; opisthosoma length 2.59-2.89mm, width 1.33-1.56mm; lengths of legs of the holotype:

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.03	2.36	2.72	0.98	2.99	10.08
II	1.06	2.30	2.61	1.05	2.80	9.82
III	0.60	1.00	1.48	0.65	1.66	5.39
IV	0.73	1.05	1.40	0.63	1.85	5.66

Prosoma longer than wide (length/width 1.02-1.05), with long setae. Lateral eyes very large in size, ALE > PLE > PME > AME, ALE/AME 2.40-2.55, PLE/PME 1.43-1.72, AME-AME/AME-ALE 1.00-1.09, PME-PME/PME-PLE 0.61-0.65, MOA-WA/WP 0.70-0.72, MOA-L/W 1.00-1.07, clypeus/AME-AME 1.84-2.33, clypeus rather steeply sloping. Maxillae proximally expanded, labium longer than wide (length/width 2.25-2.50), sternum longer than wide (length/width 1.13-1.15). Femur of male palp thick and expanded. Tarsal claws of legs I-II with 5 teeth, III-IV with 4 teeth.

Spiniformation of the holotype. Femur: I dorsal 1-1-1-1, prolateral 0-2-1-1, retrolateral 0-0-1-1, II dorsal 1-1-1-1-1, prolateral 0-0-1-0-1, retrolateral 0-0-0-0-1, III-IV dorsal 1-1-1-1, prolateral 0-1-1, retrolateral 0-0-1; patella: I-IV dorsal 1-1, I-II pro- and retrolateral 1; tibia: I-IV dorsal 1-0-1, I prolateral 1-1-1, retrolateral 1-0-1-1, ventral 2-2-2, II prolateral 1-1-0-1, retrolateral 1-0-1-1, ventral 1-1-1-0-0-0-2, III-IV pro- and retrolateral 1-1, ventral 2-2; metatarsus: I-II prolateral 1-1-0, I retrolateral 1-0-1-0, ventral 2-2-0-1-1-1-2, II retrolateral 1-1-0-0, ventral 1-2-0-1-1-2, III-IV pro- retrolateral 1-1, ventral 2.

Male palp (Figs. 51-53). Tibia with VTA, ITA, RTA and DTA; VTA large, DTA developed, not bifurcated. Bulb simple, embolus thinner than that in T. rimosus and T. yaginumai, apically sharpened.

Opisthosoma longer than wide (length/width 1.85-1.95), not extending beyond spinnerets.

Coloration and markings. Prosoma yellowish brown, darker at the sides, marginated with white; chelicerae, maxillae, labium, palps and legs yellowish brown. Opisthosomal dorsum light greyish brown, darker distally,

with three pairs of indistinct vertical white lines and a pair of yellow spots, venter greyish brown with a longitudinal, dark-coloured band.

Range. Japan (known only from Amamiôshima Island).

Bilogy. Unknown.

Remarks. This species is closely related to T. rimosus and T. yaginumai, but is distinguished from the two species by its large VTA and thinner embolus of the male palp. Though T. piger was recorded by Shimojana (1967) and Sakaguchi (1970) from the Nansei Islands, its occurrence in the subtropical region is doubtful. These records may have been based on this new species.

Genus Monaeses Thorell, 1869

[Japanese name: Dônagakanigumo-zoku]

Monastes Lucas, 1846, Explor. sci. Algér., 1, p.192. --- Walckenaer, 1847, Hist. nat. Ins., Aptères, 4, p.432. --- Simon, 1864, Hist. nat. Araign. (Aranéides), p.418; 1866, Ann. Soc. ent. France, (4), 6, p.286. (Preoccupied by Monastes Nitzsch, 1840; Aves.)

Monaeses Thorell, 1869, Nova Act. reg. Soc. sci. Upsal., (3), 7, p.37. (Nom. nov. pro Monastes Lucas, 1846.); 1870, ditto, p.182. --- L. Koch, 1874, Arachn. Austral., p.523; 1876, ditto, p.764. --- Simon, 1875, Arachn. France, 2, p.259; 1895, Hist. nat. Araign. éd. 2, 1, p.995; 1932, Arachn. France, 4, p.780. --- Chyzer and Kulczyński, 1891, Aran. hung., 1, p.101. --- Dahl, 1907, Mitt. zool. Mus.

Berlin, 3, p.375. --- Petrunkevitch, 1928, Trans. Conn. Acad. Arts Sci., 29, p.168. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p.300. --- Millot, 1941, Mem. Acad. Sci. Inst. France, 65, p.21. --- Tikader, 1971, Mem. zool. Surv. India, 15, p.55; 1980, Fn. India, Araneae, 1, p.143. --- Levy, 1973, Israel J. Zool., 22, p.109. --- Dippenaar-Schoeman, 1984, Phytophylactica, 16, p.101. --- Ono, 1985, Bull. natn. Sci. Mus., Tokyo, (A), 11, p.91.

Mecostrabus Simon, 1903, Ann. Soc. ent. France, 71, p.726. --- Petrunkevitch, 1928, Trans. Conn. Acad. Art Sci., 29, p.168.

Notes. Simon (1903) described the monotypic genus Mecostrabus related to the genus Monaeses. As the difference between the two genera, he gave the ratio of MOA-L/W and the spiniformation of legs. After an examination of the type specimens of Mecostrabus aciculus, the type species of the genus, and comparison of the descriptions of all the known species of Monaeses, I came to the conclusion that they are consecutive not only in the general appearance but also in the genital structure. Mecostrabus was regarded as a junior synonym of Monaeses, and the two known species of the genus were removed to Monaeses: Monaeses aciculus (Simon, 1903) (Mecostrabus aciculus Simon, 1903, Ann. Soc. ent. France, 71, p.727. 6 female syntypes fro Phuc Son, Annam, in MNHN, examined.), and Monaeses reticulatus (Simon, 1908) (Mecostrabus reticulatus Simon, 1908, Bull. sci. France Belg., 42, p.127. Jevenile male holotype from Hanoi, Tonkin, in MNHN, examined.) (Ono, 1985b).

The genus Rhynchognatha Thorell, 1887, was described also in the vicinity of the genus Monaeses (type species: R. cinerascens Thorell, 1887, from Burma). Simon (1895a) regarded it as a synonym of Monaeses. This synonymy was supported by most authors, e.g., Petrunkevitch (1928), Roewer (1954), Bonnet (1957), etc. Only Crome (1962c) considered them different and newly defined the genus Rhynchognatha. His study was insufficient, as the definition was based chiefly on the general appearance and as the examination of genitalic features was neglected. Though I have no material to comment on the question, the genus Rhynchognatha seems closer to the genus Tmarus than to Monaeses, so far as Thorell's original description is carefully examined.

Type species. Monastes paradoxus Lucus, 1846, Explor. sci. Algér., 1, p. 193

Etymology. From Greek proper name; masculine. Monaeses (Μοναίσης) is a general of the Parthians (southern part of Iran), who defeated the Romans.

Diagnosis. Medium-sized thomisids; male smaller than female. Prosoma longer than wide, flattened, with short stout setae, lateral margins almost parallel. Tubercles of eyes developed, lateral eyes situated on separate tubercles, ALE > PLE > PME > AME, MOA often wider than long, clypeus wide, almost horizontal. Chelicerae with no tooth, labium longer than wide, sternum oval, longer than wide. Legs long, setaceous, legs I-II much longer than III-IV. Male palp with VTA and RTA, bulb simple, without any apophysis, embolic division long, winding twice around tegulum, embolus long, fine, filiform. Opisthosoma elongated, caudally extending beyond

spinnerets. Epigynum usually with hood in the anterior part, intromittent orifices slit, slightly sclerotized, intromittent canal long, winding, atrium absent or modified to this tube, spermathecae small, twisted, tube-shaped.

Range. Mainly Africa and South Asia, but also South Europe, Australia and South America.

Species included. M. aciculus (Simon, 1903) (Southeast Asia), M. attenuatus O. Pickard-Cambridge, 1899 (Sri Lanka), M. austrinus Simon, 1910 (West and South Africa), M. brevicaudatus L. Koch, 1873 (Australia), M. fasciculigera Jézéquel, 1964 (Ivory Coast), M. fuscus Dippenaar-Schoeman, 1984 (South Africa), M. gibbus Dippenaar-Schoeman, 1984 (South Africa), M. greeni O. Pickard-Cambridge, 1899 (Sri Lanka), M. griseus Pavesi, 1897 (North, East and South Africa), M. guineensis Millot, 1941 (Guinea), M. israeliensis Levy, 1973 (Israel), M. lucasi (Taczanowski, 1873) (Guyana), M. mukundi Tikader, 1980 (India), M. nigritus Simon, 1908 (Vietnam), M. pachpediensis (Tikader, 1980), comb. nov. (India), M. paradoxus (Lucas, 1846) (South Europe, Africa), M. parvati Tikader, 1963 (India), M. pustulosus Pavesi, 1895 (Central and South Africa), M. quadrituberculatus Lawrence, 1928 (South Africa), M. reticulatus (Simon, 1908) (Vietnam), M. xiphosurus Simon, 1907 (Guinea-Bissau), M. xyphoides L. Koch, 1873 (Australia); total 22 species.

Remarks. This genus has a close resemblance to Tmarus Simon, 1875, but in Tmarus, the embolus is short and thick, the intromittent canal is short, lateral margins of prosoma is not parallel, opisthosoma is not so long as in Monaeses.

Only one Japanese species is known.

Monaeses aciculus (Simon, 1903)

[Japanese name: Dônagakanigumo]

Mecostrabus aciculus Simon, 1903, Ann. Soc. ent. France, 71, p.727.

6 female syntypes from Phuc Son, Annam (Vietnam), XI-XII-1899, H. Fruhstorfer leg., in MNHN, examined; 1908, Bull. sci. France Belg., 42, p.127.

Monaeses aciculus: Ono, 1985, Bull. natn. Sci. Mus., Tokyo, (A), 11, p.93.

Notes. Simon (1895a) cited Japan in the range of the genus Monaeses. However, because no detailed information was given, especially on which species, occurrence of a member of the genus in Japan was not confirmed for a long time. Kishida (1914) did report from Japan a thomisid named Monaeses simoni Kishida, 1914, nom. nud., with a few lines of explanation and illustrations of its prosoma and epigynum, but the illustration of prosoma only shows that the spider may not be a Monaeses but a member of the genus Tmarus. This spider has never been recognized since that time.

Recently, Mr. Chikuni sent to me an interesting female thomisid collected in Okinawa Island of Japan. This was Mecostrabus aciculus Simon, 1903, whose type specimens from Vietnam were once examined by myself at the museum in Paris. The species is, as I already noted, actually a member of

Monaeses, and the female specimen was the second record of the species. It was also the first Monaeses species from Japan.

Up to the present, I obtained total eight individuals of the species from Japan and Taiwan and also a male collected in Nepal by Mr. M. Hubert of MNHN. Paris.

Etymology. Specific name from Latin acus (needle) + culus (buttock); probably derived from the caudally pointed opisthosoma.

Specimens examined. Type specimens: 6♀♀ (syntypes), "Phuc Son, Annam," Vietnam, XI~XII-1899, H. Frustorfer leg. (MNHN 22140).

Japan: 2♀♀1♂, Nishinakama, Amami-ôshima Island, Amami Islands, Kagoshima Pref., 24~26-V-1978, H. Makihara leg. (NSMT-Ar 861); 1 juv., Kinsakubaru, Amami-ôshima Island, Amami Islands, Kagoshima Pref., 3-XI-1984, M. Tomokuni leg. (NSMT-Ar 862); 1♀, Okinawa Island, Okinawa Pref., 4-VI-1977, Y. Chikuni leg. (NSMT-Ar 863); 1 juv. ♀, Shuri, Naha-shi, Okinawa Island, Okinawa Pref., 2-VII-1976, H. Makihara leg. (NSMT-Ar 864); 1 juv. ♀, Zamamijima Island, Okinawa Islands, Okinawa Pref., 5-XII-1982, M. Shimojana leg. (MSO).

Taiwan: 1♂, Hung-yeh Wen-ch'uan, 13-VI-1976, H. Makihara leg. (NSMT-Ar 865).

Nepal: 1♂, Libang, Tuklidan, 23-IV-1970, M. Hubert leg. (MNHN).

Description. Measurement. Body length ♀ 6.15-8.59mm, ♂ 5.56-6.37mm; prosoma length ♀ 1.90-2.52mm, ♂ 1.93-2.26mm, width ♀ 1.40-1.85mm, ♂ 1.44-1.67mm; opisthosoma length ♀ 4.25-5.93mm, ♂ 3.48-3.92mm, width ♀ 1.40-1.63mm, ♂ 1.01-1.11mm; lengths of legs of 1♀1♂ from Amami-ôshima Island (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.88/1.08	2.15/2.58	2.65/3.05	1.25/1.25	3.25/3.28	10.18/11.24
II	0.80/0.95	1.88/2.23	2.40/2.64	1.13/1.05	2.93/3.10	9.14/ 9.97
III	0.48/0.53	0.65/0.68	1.35/1.20	0.70/0.53	1.55/1.44	4.73/ 4.38
IV	0.48/0.49	0.55/0.63	1.38/1.45	0.70/0.50	2.15/1.95	5.26/ 5.02

Prosoma longer than wide (length/width ♀ 1.33-1.44, ♂ 1.28-1.36), flattened, with short setae. Lateral eyes situated on much developed tubercles, ALE/AME ♀ 2.00-2.50, ♂ 2.12-2.50, PLE/PME ♀ 1.33, ♂ 1.33-1.64, AME-AME/AME-ALE ♀ 0.92-1.25, ♂ 1.00-1.20, PME-PME/PME-PLE ♀ 1.00-1.16, ♂ 0.84-1.09, MOA-WA/WP ♀ 0.62-0.75, ♂ 0.64-0.69, MOA-L/W ♀ 0.54-0.69, ♂ 0.63-0.75, clypeus/AME-AME ♀ 1.36-1.85, ♂ 1.54-1.84. Chelicerae without teeth, labium longer than wide (length/width ♀ 1.63-2.00, ♂ 1.88-2.25), sternum oval, longer than wide (length/width ♀ 1.55-1.75, ♂ 1.53-1.57). Leg formula I-II-IV-III, tarsal claws of legs with 5-7 teeth.

Spiniformation of legs. 1♀ (syntype): Femur: I prolateral 1-1-1, II prolateral 1-1-1-1, III dorsal 1, prolateral 1-1, IV prolateral 0-1; patella III-IV 1-1; tibia: I prolateral 1 ap, ventral 2-2-2-2, II prolateral 1-1-0-1 ap, ventral 2-2-2-2, III-IV prolateral 1-1, ventral 1; metatarsus: I prolateral 1-0-0-0, ventral 2-2-2-2-2, II prolateral 1-0-1-0, ventral 2-2-2-2-2, III prolateral 1-1, ventral 1, IV prolateral 0-1, ventral 1.

♀ (Japanese material): Femur: I prolateral 1-1-1-1, 1-1-1-1-1 or 1-1-2-1-1, II prolateral 1-1-1-1 or 0-1-1-1, III-IV prolateral 0-0-1 or none; tibia: I prolateral 0-0-0-1, 1-1-0-1, 0-1-1 or none, ventral 2-2-2-2

or 2-2-2-2-2, II prolateral 1-1-0-1 or 0-1-0-1, ventral 2-2-2-2, III prolateral 1-1 or 0-1, ventral 1, IV prolateral 0-1, ventral 1; metatarsus: I prolateral 1-1-0-0 or 1-0-0-0, ventral 2-2-2-2-2 ap, II prolateral 1-0-1-0, ventral 2-2-2-2-2 ap, III prolateral 1-1, ventral 1, IV prolateral 0-1 or 1-1, ventral 1.

1♂ (Amami-Ôshima Island): Femur: I-II prolateral 1-1-1-1, I retrolateral 0-0-1-1, II retrolateral 0-0-0-1, III-IV dorsal 0-1-1, prolateral 1-1-1 or 0-0-1; patella I-II pro- and retrolateral 1, III-IV pro- and retrolateral 1 (weak); tibia: I-II prolateral 1-1-1, ventral 2-2-2-2, I retrolateral 1-1-1 (right 1-1-0), II retrolateral 1-1, III prolateral 1-0-1 (right 1-1-1), ventral 1 (right 1-1-1), IV prolateral 1-0-1, ventral 1; metatarsus: I-II prolateral 1-1-0-0, ventral 2-2-2-2-2 ap, I retrolateral 1-0-0-0, III prolateral 1-1-0 (right 1-1-1), IV prolateral 1-1.

Male palp (Ono, 1985b, figs. 5-8). Tibia with VTA and RTA; VTA developed, digitiform, RTA wide and short with much sclerotized distal tooth. Bulb simple, embolic division long, winding twice around tegulum, embolus filiform, long, the apical part curved retrolaterally.

Opisthosoma very long and slender, length/width ♀ 3.00-3.81, ♂ 3.34-3.75, extending caudally beyond spinnerets, dorsally with stout hairs.

Female genitalia (Ono, 1985b, figs. 3-4). Epigynum with a sclerotized central hood, splitting, intromittent orifices situated between hood and epigastric furrow. Intromittent canal soft, long and winding, atrium tubular, spermathecae long, tubular.

Coloration and markings. ♀: Prosoma light yellowish brown or light orange mottled with brown, lateral margins and clypeus darker, chelicerae,

maxillae, labium and sternum yellow to yellowish brown, legs yellow to light yellowish brown. Opisthosoma white, grey or beige, occasionally with dark coloured markings.

♂: Prosoma yellowish brown darker at the middle and along lateral margins; chelicerae, maxillae, labium, sternum and legs light yellowish brown without any marking. Opisthosomal dorsum grey with longitudinal black stripe at the middle, venter beige, darker at the sides.

Range. Japan (Nansei Islands), Taiwan, Vietnam, Nepal.

Biology. Unknown.

Remarks. This species is similar in external structure to M. israeliensis, but has shorter "tail" of opisthosoma and different structure of male palp and female genitalia. In general appearance, M. reticulatus Simon, 1908, from Vietnam is the most closely similar species to M. aciculus. Unfortunately, however, its holotype (from Hanoi, P. Vauloger leg., in MNHN, examined) is a juvenile male and does not serve for a comparison of the palpal structure in male. There is a strong possibility of their synonymy.

Genus Coriarachne Thorell, 1870

[Japanese name: Kokanigumo-zoku]

Coriarachne Thorell, 1870, Nova Acta reg. Soc. Sci. Upsal., (3), 7, p.186.

--- Simon, 1875, Arachn. France, 2, p.209; 1895, Hist. nat. Araign., ed. 2, 1, 1015; 1932, Arach. France, 6, p.784. ---

Keyserling, 1880, Spinnen Amerikas, Laterigradae, p.4. --- Becker, 1881, Ann. Mus. roy. hist. nat. Belg., 10, p.192. --- Chyzer & Kulczyński, 1891, Aran. hung., 1, p.81, 96. --- Bösenberg, 1901, Zoologica, Stuttgart, 14, p.17. --- Planet, 1905, Hist. nat. France, 14, p.168. --- Lessert, 1910, Cat. Invertébr. Suisse, Araign., p.349. --- Comstock, 1913, Spid. Book, p.524; 1948, ibid, (rev. ed.), p.544. --- Roewer, 1928, Tierw. Mitteleur., 3(2), p.VI-19. --- Petrunkevitch, 1928, Trans. Conn. Acad. Arts Sci., 29, p.167. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p.282, 292. --- Gertsch, 1939, Bull. Amer. Mus. nat. Hist., 76, p.296, 298, 404; 1953, ibid, 102, p.456. --- Kaston, 1948, Spid. Conn., p.418; 1953, How to Know Spid., p.100. --- Yaginuma, 1956, Atypus, Osaka, (10), p.28; Spid. Japan Col., Osaka, p.96; 1968, ibid, (rev. ed.), p.96; 1986, ibid, (n.ed.), p.203. --- Schick, 1965, Bull. Amer. Mus. nat. Hist., 129, p.169. --- Tyshchenko, 1971, Oprédel. pauk. evrop. casti SSSR, p.118. --- Miller, 1971, Klíc. zvíreny CSSR, 4, p.117. --- Bowling and Sauer, 1975, J. Arachnol., 2, p.184. --- Dondale & Redner, 1978, Crab Spid. Canada Alaska, p.133 (partim). --- Hu, 1984, Chinese Spiders Fields Forests, p.315.

Platyxysticus Gertsch, 1932, Amer. Mus. Novit., (563), p.1 (partim).

Notes. The thomisids with extremely flattened body are regarded here as the genus Coriarachne in the strict sense. It does not include the genus Bassaniana as defined in Ono (1985a). Gertsch (1953) divided the

American "Coriarachne" species into two species-groups, that is, the group of depressus and that of versicolor. The former corresponds with the genus Coriarachne and the latter with Bassaniana. Bowling and Saucer (1975) and Dondale and Redner (1978) did not recognize the genus Bassaniana. The two genera are very closely related, but the Coriarachne spiders have much more specialized form to live under tree barks and should be distinguished from Bassaniana at the generic level.

Type species. Thomisus depressus C.L. Koch, 1937, Übersicht Arach.-syst., 1, p.25.

Etymology. From Greek χορίς (bug) +αραχνη (spider).

Diagnosis. Medium-sized thomisids with extremely flattened body; male as large as or a little smaller than female. Prosoma wider than long, very flat, without setae on thoracic part; head with setae. Anterior row of eyes straight in dorsal view; lateral eyes on tubercles; ALE > PLE > AME > PME, AME-AME > AME-ALE, PME-PME < PME-PLE, MOA wider than long, wider behind than in front, clypeus much narrower than AME-AME. Chelicerae without teeth; labium longer than wide; sternum rounded, nearly as long as wide. Leg formula II-I-IV-III; legs III and IV subequal in length, leg III slightly longer than leg IV; claws of legs with 2-4 teeth. Male palp with VTA and RTA; RTA with distal tooth spiniform and sclerotized; bulb simple, without tegular apophysis, embolus short, spiniform. Opisthosoma flat, nearly as long as wide, with short hairs. Epigynum with indistinct median septum, without hood; intromittent orifices uncovered, slit; intromittent canal not visible in dorsal view of female genitalia, spermathecae kidney-shaped, with folds.

Range. Holarctic.

Biology. Found under bark of trees.

Species included. Coriarachne depressa (C.L. Koch, 1837)(Europe), C. brunneipes Banks, 1893 (North America), C. melancholica Simon, 1880 (China), C. potanini Schenkel, 1963 (China), C. nigrostriata Simon, 1886 (Vietnam), C. fulvipes (Karsch, 1879)(Japan).

Remarks. The genitalic structure of this genus is basically not different from that of the genus Bassaniana and of some subgroups of the genus Xysticus. However, its body is highly adapted to living in narrow space under bark of trees.

Coriarachne fulvipes (Karsch, 1879)

[Japanese name: Kokanigumo]

(Figs. 54-60)

Oxyptila fulvipes Karsch, 1879, Verh. naturh. Ver. preuss. Rheinl. Westfalens, 36, p.77. Female holotype from Japan, W. Dönitz leg., in ZMB, examined. --- Bonnet, 1958, Bibliographia Araneorum, 2, p.3256.

Coriarachne fulvipes: Bösenberg and Strand, 1906, Abh. senckenberg. naturf. Ges., 30, p.249. --- Yuhara, 1931, Study of Spiders, p.183. --- S. Komatsu, 1936, Iconogr. Col. viv. aran. japon., 1, p.123. --- Yaginuma, 1956, Atypus, Osaka, (10), p.28; 1960, Spiders Japan Col., p.96; 1968, ibid, (rev. ed.), p.96; 1986, ibid, (n.ed.),

p.203. --- Ono, 1977, Kishidaia, Hino, (42), p.5. --- Shinkai & Takano, 1984, Field Guide Spid. Japan, p.135.

Etymology. Specific name from Latin fulvus (yellow) + pes (leg).

Specimens examined. Holotype: ♀, Japan, W. Dönitz leg. (ZMB). 1♀, Ninomiya, Funabashi-shi, Chiba Pref., 13~14-VII-1965, S. Matsumoto leg. (NSMT-Ar 1524); 1♂ 1 juv. ♂, Numazu-shi, Shizuoka Pref., 14-VII-1969, H. Ono leg. (NSMT-Ar 1525); 1 juv. ♀, Kochi-shi, Kochi Pref., 24-VI-1964, K. Nakahira leg. (NSMT-Ar 285).

Description. Measurement. Body length ♀ 3.70mm, ♂ 4.00mm; prosoma length ♀ 1.78mm, ♂ 1.85mm, width ♀ 2,00mm ♂ 2.07mm; opisthosoma length ♀ 2.24mm, ♂ 2.22mm, width ♀2.22mm, ♂ 2.30mm; lengths of legs (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.63/0.63	0.90/1.18	1.01/1.11	0.67/0.74	1.56/1.74	4.77/5.40
II	0.59/0.65	0.96/1.23	1.04/1.26	0.68/0.70	1.65/1.88	4.92/5.72
III	0.42/0.42	0.58/0.78	0.74/0.91	0.52/0.52	1.20/1.37	3.46/4.00
IV	0.36/0.48	0.59/0.78	0.79/0.94	0.48/0.50	1.04/1.26	3.26/3.96

Promosa wider then long (length/width ♀♂ 0.89), extremely flat, with short hairs; head with setae. Eyes small, ALE > PLE > AME > PME, ALE/AME ♀ 2.22, ♂ 1.82, PLE/PME ♀ 2.17, ♂ 2.00, AME-AME/AME-ALE ♀ 1.17, ♂ 1.19, PME-PME/PME-PLE ♀ 0.81, ♂ 0.83, MOA-WA/WP ♀ 0.92, ♂ 0.94, MOA-L/W ♀ 0.56, ♂ 0.63, clypeus/AME-AME ♀ 0.38, ♂ 0.42. Labium longer than wide (length/width ♀ 1.64, ♂ 1.78), sternum almost rounded, as long as or slightly longer than

wide (length/width ♀ 1.03, ♂ 1.00). Leg formula II-I-III-IV; number of teeth on tarsal claws of legs I-IV: ♀ 3-3-2-2, ♂ 4-4-3-3.

Spiniformation of legs. ♀: Femur: I-IV dorsal 1-0, I prolateral 1-1-0-0-0; patella: I-IV dorsal 1-0-1 (weak); tibia: I-IV dorsal 1-1-0 (weak), I-II ventral 2-2-2 ap; metatarsus: I-II prolateral 1 ap, retrolateral 0-1-2 ap, ventral 2-2, III retrolateral 1 ap.

♂: Femur: I-II dorsal 0-0-1-1-1-0-0, III dorsal 1-1-0, IV dorsal 1-0, I prolateral 1-1-1-0-0-0-0; tibia: I-IV dorsal 1-1-0 (weak), I-II ventral 2-2-2-2-2 ap, III ventral 0-2-2 ap, IV ventral 2 ap; metatarsus: I-II prolateral 1 ap, I retrolateral 1-1-2 ap (in the right leg 0-1-2 ap), II retrolateral 0-1-2 ap (in the right leg 1-1-2 ap), I-II ventral 2-2-2, III retrolateral 2 ap, ventral 2-1.

Male palp (Figs. 59-60). Tibia with VTA and RTA; RTA with dorsal tooth. Bulf simple, without tegular apophysis, embolus short, rostriform, not furrowed.

Opisthosoma rounded, nearly as long as wide (length/width ♀ 1.01, ♂ 0.97), with short hairs.

Female genitalia (Figs. 56-57). Epigynum without hood, intromittent orifices situated in the anterior part, uncovered. Intromittent canal very short, spermathecae reniform, with folds.

Coloration and markings. ♀♂: prosoma chestnut or light brown, polished, without any marking in the posterior part, chelicerae, maxillae, labium and sternum light yellowish brown, palps yellowish brown, legs chestnut, metatarsi and tarsi lighter. Opisthosomal dorsum light yellowish brown to blackish brown with white folds, the underside dirty yellow or light yellowish brown.

Range. Japan (Honshu, Shikoku, Kyushu), Korea.

Biology. This spider is found under the bark of living trees.

Remarks. This species is related to C. depressa (C.L. Koch, 1837) known from Europe, but the latter has winding embolus of male palp and wider intromittent orifices of female genitalia.

Genus Bassaniana Strand, 1928

[Japanese name: Kihadakanigumo-zoku]

Oxyptila: Karsch, 1879, Verh. naturh. Ver. preuss. Rheinl. Westfalens, 36, p.76. --- Bösenberg & Strand 1906, Abh. sencken. naturf. Ges., 30(1-2), p.258. --- Yaginuma, 1956, Atypus, Osaka, (10), p.27; 1960, Spid. Japan Col., Osaka, p.99; 1968, ibid., (rev. ed.), p.99. --- Zhu & Wang, 1963, Jilin Yike Daxue, Xue Bao, 5(3), p.474. --- Paik, 1974, Educ. J., 16, p.120. --- Hu, 1984, Chinese Spiders Fields Forests, p.321. (Partim.)

Coriarachne: Keyserling, 1880, Spinnen Amer., Laterigradae, p.53. --- Simon, 1886, Act. Soc. linn. Bordeaux, 40, p.183. --- Comstock, 1913, Spid. Book, p.544. --- Petrunkevitch, 1928, Trans. Conn. Acad. Arts Sci., 29, p.167. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p.292. --- Gertsch, 1934, Amer. Mus. Novit., (707), p.1; 1939, Bull. Amer. Mus. nat. Hist., 76, p.404; 1953, Bull. Amer. Mus. nat. Hist., 102, p.456. --- Kaston, 1948, Bull. Conn. Stat. geol. nat. Hist. Surv., (70), p.418; 1953, How to Know

Spid., p.100. --- Levi & Levi, 1968, Spid. their Kin, p.96. --- Schick, 1965, Bull. Amer. Mus. nat. Hist., 129, p.169. --- Bowling & Sauer, 1975, J. Arachnol., 2, p.184. (Partim.)

Bassania O. Pickard-Cambridge, 1898, Biol. Centr.-Amer., Arachn., Aran., 1, p.249 (type species by monotypy Bassania aemula O. Pickard-Cambridge 1898). --- F.O. Pickard-Cambridge, 1900, Biol. Centr.-Amer., Arachn., Aran. Opil., 2, p.148. --- Petrunkevitch, 1928, Trans. Conn. Acad. Arts Sci., 29, p.166. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p.291. (Preoccupied by Bassania Walker 1860; Insecta, Lepidoptera.)

Xysticus: Simon, 1895, Hist. nat. Araign., éd. 2, 1, p.1035. (Partim.)

Xysticus (Coriarachne): Emerton, 1902, Comm. Spid. Unit. Stat., p.34.

Eremita Kishida, 1914, Kagaku Sekai, Tokyo, 7(13), p.37. (Nomen nudum.)

Bassaniana Strand, 1928, Arch. Naturg., 92A, (8), p.42. (Nom. nov. pro Bassania O. Pickard-Cambridge, 1898.) --- Ono, 1985, Bull. natn. Sci. Mus., Tokyo, (A), 11, p.33. --- Yaginuma, 1986, Spid. Japan Col., Osaka, (n.ed.), p.203.

Platyxysticus Gertsch, 1932, Amer. Mus. Novit., (563), p.1 (type species: Coriarachne versicolor Keyserling, 1880). --- Ono, 1978, Senckenbergiana. biol., 59, p.285.

Notes. Karsch (1979a) described two new species of the genus Oxyptila Simon, 1864, from Japan, that is, O. decorata and O. fulvipes. Bösenberg and Strand (1906) recognized and redescribed the former but transferred the latter to the genus Coriarachne Thorell, 1870. The

recognition of the genus Oxyptila by Japanese authors has been based solely on the species, O. decorata, reported in these two works. Yaginuma (1960) also defined the genus upon O. decorata commonly found in Japan. Because of the presence of clavate setae and hairs on the body, O. decorata is easily recognized as an Oxyptila.

The Oxyptila species are small-sized thomisids with the body length up to 4mm and usually have a complicated structure of male palp and tibiae I-II furnished with two pairs of spines on the ventral side. O. decorata is nevertheless medium-sized and has simple male palp and more than three pairs of spines on the ventral side of tibiae I-II. The Japanese species seems very closely related to some North American species of the genus Coriarachne, that is, C. utahensis (Gertsch, 1932) and C. versicolor Keyserling, 1880. In my opinion, however, the group comprising O. decorata, C. utahensis and C. versicolor is an intermediate taxa between the genus Coriarachne, whose type species is C. depressa (C.L. Koch, 1837) occurring in Europe, and a subgroup of the heterogenous genus Xysticus. Therefore I recognized the genus Bassaniana Strand, 1928, which had been synonymized with Coriarachne since Bowling and Sauer (1975), for the three species mentioned above (cf. Ono, 1985a).

Type species. Bassania aemula O. Pickard-Cambridge, 1898 (= B. versicolor (Keyserling, 1880).)

Etymology. From Latin proper name Bassania and the suffix "-ana" meaning place or origin; Bassania was a town in Illyria, at present Elbasan in Albania.

Diagnosis. Medium-sized thomisids; male a little smaller than female. Prosoma wider than or as wide as long, somewhat flattened, with blunt or clavate setae. Lateral eyes on tubercles and larger than medians, ALE> PLE > AME≧ PME, AME-AME longer than AME-ALE, PME-PME shorter than PME-PLE, MOA wider than long, clypeus narrower than AME-AME. Chelicerae without tooth; labium longer than wide; sternum shield-shaped, slightly longer than wide. Legs setaceous, scopulae and claw tufts not much developed; leg formula II-I-IV-III; tarsal claws of legs with three teeth; female palp with one tarsal claw. Male palp with VTA and RTA, without ITA; VTA normal, curved prolaterally, RTA with distal tooth spiniform and sclerotized. Bulb simple, without tegular apophysis, tegular ridge not developed either, embolus short, spiniform. Opisthosoma wider than long, also in males, flattened, with clavate hairs, dark-coloured. Epigynum with median septum furnished with a hood, intromittent orifices uncovered, slit, intromittent canal usually short, spermathecae large, kidney-shaped, frequently with folds and minute surface pits.

Range. Northeast Asia (Japan, Korea, China) and North America from Alaska to Labrador and Nova Scotia, southward to Mexico and Florida.

Biology. Found under bark of trees and also in leaf litter.

Species included. Four species are known; B. versicolor (Keyserling, 1880), comb. nov., B. utahensis (Getsch, 1932), comb. nov., B. floridana (Banks, 1896), comb. nov. (these three species occur in North America), B. decorata (Karsch, 1879), comb. nov. from Northeast Asia.

Remarks. The genus Bassaniana is regarded as an intermediate group between the genera Xysticus and Coriarachne. Its body is somewhat adapted to living in narrow spaces under tree barks and in leaf litter.

Bassaniana decorata (Karsch, 1879)

[Japanese name: Kihadakanigumo]

Oxyptila decorata Karsch, 1879, Verh. naturh. Ver. preuss. Rheinl. Westfalens, 36, p.76. 2♀♀ 7 juv. ♀ 8 juv. ♂ syntypes from Japan, W. Dönitz and F.M. Hilgendorf leg., in ZMB, examined. --- Bösenberg & Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.258. --- S. Komatsu, 1936, Iconogr. Col. viv. aran. japon., 1, p.93. --- Chikuni, 1941, Spiders Jap. Alps, p.136. --- Yaginuma, 1960, Spiders Japan Col., Osaka, p.99; 1968, ibid., (rev. ed.), p.99. --- Zhu & Wang, 1963, Jilin Yike Daxue, Xue Bao, 5, p.474. --- Paik, 1974, Educ. J., 16, p.120. --- Matsumoto et al., Spiders, p.155. --- Shinkai and Takano, 1984, Field Guide Spiders Japan, p.135. --- Hu, 1984, Chinese Spiders Fields Forests, p.323.

Coriarachne japonica Simon, 1886, Act. Soc. linn. Bordeaux, 40, p.183. 2♀♀3♂♂ 7 juv. syntypes from Yokohama, Japan, A. Mellottée leg., in MNHN, examined.

Xysticus japonicus: Simon, 1895, Hist. nat. Araign., éd. 2, 1, p.1014. --- Bösenberg & Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.260.

Eremita typica Kishida, 1914, Kagaku Sekai, Tokyo, 7(13), p.38. Female specimen from Tango, Japan, IX-1906, K. Kishida leg., lost. (Nomen nudum.). --- Yuhara, 1931, Study of Spiders, p.188.

Ozyptila decorata: Roewer, 1954, Kat., Aran., Bruxelles, 2(a), p.876.

Bassaniana decorata: Ono, 1985, Bull. natn. Sci. Mus., Tokyo, (A), 11, p.33.

Notes. Having examined its type specimens deposited in MNHN, Paris, I have confirmed that Coriarachne japonica Simon, 1886, is a junior synonym of Bassaniana decorata. Eremita typica nom. nud. by Kishida (1914) seems also identical with this species (Ono, 1985a).

Etymology. Specific name from Latin meaning decorated.

Specimens examined. Type series: syntypes: 2♀♀ 7 juv. ♀♀ 8 juv. ♂♂, Japan, W. Dönitz & F.M. Hilgendorf leg. (ZMB 2910).

1♂, Nakasatsunai-mura, Kasai-gun, Hokkaido, 21-VII-1984, M. Tomokuni leg. (NSMT-Ar 646); 1♀, Aizuwakamatsu-shi, Fukushima Pref., 18-X-1960, T. Yaginuma leg. (NSMT-Ar 647); 1 juv. ♂, Kurokawa-mura, Kitakanbara-gun, Niigata Pref., 16-III-1973, K. Baba leg. (NSMT-Ar 654); 1 juv. ♀, Shukunegi, Ogi-machi, Sado Island, Niigata Pref., 7-VIII-1984, S.-I. Uéno leg. (NSMT-Ar 656); 2♀♀, Funabashi-shi, Chiba Pref., 16-V-1967, S. Matsumoto leg. (NSMT-Ar 648); 1♂, Iwasaka, Futtsu-shi, Chiba Pref., 6-VI-1981, T. Kawana leg. (NSMT-Ar 649); 1 juv., Emi, Kamogawa-shi, Chiba Pref., 30-VII-1970, S. Matsumoto leg. (NSMT-Ar 660); 1♀, Saitama Pref., date (?), J. Shimada leg. (NSMT-Ar 650); 1♂, Gakushuin Univ., Mejiro, Toshima-ku, Tokyo, 25-V-1972, H. Ono leg. (NSMT-Ar 651); 1 juv., same locality, 9-III-1970, H. Ono leg. (NSMT-Ar 657); 1 juv. ♀, same locality, 8-XII-1973, H. Ono leg. (NSMT-Ar 658); 2♀♀3♂♂ 7 juv., Yokohama-shi, Kanagawa Pref., A. Mellottée leg. (MNHN 7346; syntypes of Coriarachne japonica Simon, 1886); 2 juv. ♀♀, Kawasaki-shi, Kanagawa Pref., 20-IV-1976, Y. Matsuura leg. (NSMT-Ar 655), 1♀, Sengen-jinja, Fujiyoshida-shi, Yamanashi Pref., 3-VIII-1974, S. Matsumoto leg. (NSMT-Ar 652); 1♂, Ai, Ibaraki-shi, Osaka, 25-V-1975, Y. Nishikawa leg. (YNO); 3♂♂, Fukui, Ibaraki-shi, Osaka, 7 16-IV-1980, Y.

Nishikawa leg. (YNO); 1♀, Minoo-koen, Minoo-shi, Osaka, 30-V-1971, Y. Nishikawa leg. (YNO); 1 juv. ♀, Daito-shi, Osaka, 16-V-1981, O. Tominaga leg. (YNO); 1 juv., Shimonishi, Saigô-cho, Oki Islands, Shimane Pref., 9-IX-1984, M. Tomokuni leg. (NSMT-Ar 1526); 1 juv. ♀, Hachiman-jinja, Murata-machi, Tosu-shi, Saga Pref., 5-I-1976, Y. Nishikawa leg. (YNO); 1♀, Inohae, Nichinan-shi, Miyazaki Pref., 12-I-1963, K. Yamada leg. (TYO); 1♂, Nakanoshima Island, Tokara Islands, Kagoshima Pref., 26-VI-1973, H. Makihara leg. (NSMT-Ar 653).

Description. Measurement. Body length ♀ 3.70-7.04mm, ♂ 4.07-5.36mm; prosoma length ♀ 1.78-3.33mm, ♂ 2.22-2.72mm, width ♀ 1.78-3.48mm, ♂ 2.37-2.84mm; opisthosoma length ♀ 1.93-3.93mm, ♂ 2.24-2.81mm, width ♀ 2.00-4.74mm, ♂ 2.64-3.33mm; lengths of legs of 1♀1♂ from Yokohama, Kanagawa Pref. (MNHN 7346)(in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.76/0.88	1.32/1.84	1.44/1.68	1.16/1.00	2.08/2.24	6.67/7.64
II	0.76/0.86	1.40/1.84	1.48/1.64	1.20/1.04	2.32/2.32	7.16/7.70
III	0.52/0.64	0.92/1.04	1.08/1.12	0.80/0.76	1.60/1.68	4.92/5.24
IV	0.56/0.66	1.08/1.12	1.12/1.16	0.80/0.72	1.64/1.68	5.20/5.34

Prosoma slightly wider than or as wide as long (length/width ♀ 0.92-0.96, ♂ 0.91-1.00), with clavate or spatulate setae in females, normal or somewhat blunt setae in males, ALE > PLE > AME ≧ PME, ALE/AME ♀ 1.50-1.84, ♂ 1.66-1.85, PLE/PME ♀ 1.33-1.67, ♂ 1.33-1.60, AME-AME/AME-ALE ♀ 1.66-1.82, ♂

1.53-1.81, PME-PME/PME-PLE ♀ 0.87-0.95, ♂ 0.73-0.96, MOA-WA/WP ♀ 1.00-1.03, ♂ 0.97-1.06, MOA-L/W ♀ 0.77-0.85, ♂ 0.83-0.97, clypeus/AME-AME ♀ 0.64-0.71, ♂ 0.57-0.73. Labium length/width ♀ 1.27-1.39, ♂ 1.11-1.50, sternum length/width ♀ 1.15-1.27, ♂ 1.11-1.25. Tarsal claws of legs each with three teeth.

Spiniformation of legs of 1♀1♂ used in the measurements. ♀: Femur: I dorsal 0-1-1, prolateral 1-1-2-1-0, II dorsal 1-1, III-IV dorsal 1; patella: IV retrolateral 1; tibia: I-IV dorsal 1-1, I-II pro- and retrolateral 1-1, IV prolateral 1-1, I ventral 2-2-2, II ventral 1-2-2-2, III ventral 0-2-1 ap, IV ventral 1-1; metatarsus: I-II pro- and retrolateral 1-1-2 ap, I ventral 2-2-2, II ventral 1-2-2, III-IV prolateral 0-1-2 ap, III retrolateral 0-0-2 ap, III ventral 2.

♂: Femur: I dorsal 0-1-0-1-1-1-1, prolateral 8 irregularly, II dorsal 1-1-1-0-1-1-1, prolateral 0-0-1, III dorsal 1-1-1-0, IV dorsal 1-1-0-1-1-0; patella: I-IV pro- and retrolateral 1; tibia: I-IV dorsal 1-1, I pro- and retrolateral 1-1-1, ventral 1-1-2-2-2 ap, II ventral 2-2-2-2 ap, III-IV pro- and retrolateral 1-1, ventral 2-2-0-2 ap; metatarsus: I-IV pro- and retrolateral 1-1-2 ap, I-II ventral 2-2-0-2, III-IV ventral 0-2.

Male palp (Ono, 1985a, figs. 36-37). Tibia with VTA and RTA, without ITA; RTA with a distal tooth sclerotized. Bulb simple, without any apophysis, embolic division very short; embolus short, spiniform and curved, furrowed at the middle so that the margin of embolus seems to bear many minute tubercles.

Opisthosoma wider than long (length/width ♀ 0.80-0.83, ♂ 0.82-0.93), with clavate hairs.

Female genitalia (Ono, 1985a, figs. 41-43). Epigynum with median septum projecting and furnished with a hood, intromittent orifices slit, situated at the sides of the septum. Intromittent canal short, scarcely visible in dorsal view, spermathecae large, reniform, with numerous folds and small spots.

Coloration and markings. ♀: Prosoma brown, reddish brown or blackish brown, lighter at the sides, with indistinct white markings; chelicerae and labium brown, maxillae brown, distally lighter, sternum brown mottled with white, legs brown mottled with white. Opisthosoma brown to black without distinct marking, venter light yellowish brown, spotted with dark-brown.

♂: Similar in coloration to females but more polished, head white, opisthosoma blackish brown to black, with distinct white markings.

Range. Japan (Hokkaido, Honshu, Shikoku, Kyushu, Nansei Islands), China (Zhu, 1983), Korea (Paik, 1974).

Biology. Found under tree barks, especially from large oaks and chestnut trees, also under leaf litter. Females place their egg-cocoons under tree barks and guard them. Adult males wander on trunks of trees in April, May and June; females persist into September.

Remarks. This species is very similar in appearance and closely related to Bassaniana utahensis (Gertsch, 1932), comb. nov., widely distributed in North America. The embolus and female genitalia are only slightly different in shape between the two species, but I cannot help considering that these two are conspecific, because some variation and hybridization with another related species have been observed in B. utahensis (Bowling & Sauer, 1975; Dondale & Redner, 1978).

Genus Xysticus C.L. Koch, 1835, sensu lato

[Japanese name: Kanigumo-zoku]

Xysticus C.L. Koch, 1835, Fn. Insect. Ger. init., (129), pl. 16-17. --- Prach, 1866, Verh. zool.-bot. Ges. Wien, 16, p.611. --- Thorell, 1870, Nova Acta reg. Soc. sci. Upsal., 3(7), p.185; 1872, Rem. Syn. Eur. Spiders, (3), p.229. --- L.Koch, 1874, Arachn. Austral., p.554. --- Simon, 1875, Arachn. France, 2, p.150; 1895, Hist. nat. Araign., éd. 2, 1, p.1035; 1932, Arachn. France, 4, p.812. --- Keyserling, 1880, Spinnen Amer., Laterigradae, p.4. --- Chyzer & Kulczyński, 1891, Aran. hung., 1, pp.81, 87; 1894, ibid., 2, p.300. --- F.O. Pickard-Cambridge, 1900, Biol. Centr.-Amer., Zool., Arachn., Araneae, 2, p.146. --- Bösenberg, 1902, Zoologica, Stuttgart, 14, p.339. --- Emerton, 1902, Common Spiders Unit. Stat., p.30. --- Lessert, 1910, Cat. Invertébr. Suisse, 3, Araign., p.364. --- Comstock, 1913, Spider Book, p.545; 1948, ibid., (rev. ed.), p.545. --- Roewer, 1928, Tierw. Mitteleur., 3(2), p. 22. --- Petrunkevitch, 1928, Trans. Conn. Acad. Arts Sci., 29, p.170. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p.315. --- Gertsch, 1939, Bull. Amer. Mus. nat. Hist., 76, p.349; 1953, ibid., 102, p.420. --- Chickering, 1940, Pap. Mich. Acad. Sci., 25, p.202. --- Kaston, 1948, Bull. Conn. Stat. geol. nat. Hist. Surv., (70), p.420; 1953, How to Know Spiders, p.100. --- Tullgren, 1944, Svensk Spindelfauna, 3, p.80. --- Locket & Millidge, 1951, Brit. Spiders, 2, p.175. --- Yaginuma, 1956, Atypus, Osaka, (10), p.28; 1960,

Spiders Japan Col., Osaka, p.97; 1968, ibid.,(rev. ed.), p.97; 1986, ibid.,(n. ed.), p.201. --- Schick, 1965, Bull. Amer. Mus. nat. Hist., 129. p.138. --- Turnbull et al., 1965, Canad. Ent., 97, p.1234. --- Vilbaste, 1969, Eesti Ämblikud, 1, p.43. --- Utochkin, 1968, Pauki roda Xysticus Fauni SSR (Opredelitel), (Uchebnoe posobie), p.4. --- Levi & Levi, 1968, Spiders and their Kin, p.96. --- Hubert, 1979, Araign., p.178. --- Tyshchenko, 1971, Opredel. pauk. evrop. casti SSSR, p.118. --- Miller, 1971, Klic zvireny CSSR, 4, p.118. --- Levy, 1976, Israel J. Zool., 25, p.2. --- Tikader, 1970, Rec. zool. Surv. India, 64, p.50; 1971, Mem. zool. Surv. India, 15(3), p.44; 1980, Fn. India, Araneae, 1, p.107. --- Hu, 1984, Chinese Spiders Fields Forests, p.345.

Xystica: Simon, 1864, Hist. nat. Araign., p.427.

Spiracme Menge, 1876, Schr. naturf. Ges. Denzig, 3, p.449.

Psammitis Menge, 1876, Schr. naturf. Ges. Danzig, 3, p.449. --- Dalmas, 1922 Ann. Mus. civ. Stor. nat. Genova, 50, p.91.

Proxysticus Dalmas, 1922, Ann. Mus. civ. Stor. nat. Genova, 50, p.91.

Notes. Xysticus sensu lato contains more than 340 described species mainly from the Holarctic Region and is the largest genus in the family Thomisidae. However, the systematic status of the genus is still problematical, though a number of subdivisions have been proposed.

Since Thorell (1870a) separated the genus Coriarachne Thorell 1870 (type species; Xysticus depressus (C.L. Koch, 1837) from Xysticus, various revisions have been made on the genus. Having removed two species from

Xysticus, Menge (1876) established two new genera, namely Spiracme Menge, 1876, for Xysticus striatipes L. Koch, 1870, and Psammitis Menge, 1876, for Xysticus sabulosus (Hahn, 1831). These species have no tegular apophysis on their palps. Simon (1895a) regarded both the genera as synonyms of Xysticus. Dalmas (1922) divided Xysticus into three genera, Xysticus, Psammitis and Proxysticus Dalmas, 1922 (type species: Thomisus lalandi Audouin, 1826).

Modern araneologists have accepted Xysticus either as a great complex (Tullgren, 1944; Vilbaste, 1969) composed of many species-groups (Simon 1932; Gertsch 1939; Locket & Millidge, 1951; Turnbull et al., 1965) or as that divided into some subgenera respectively composed of species-groups (Gertsch, 1953; Schick, 1965).

I suggested a provisional classification of the Xysticus-Coriarachne-Oxyptila complex based mainly on the structure of male palp (Ono, 1978c). In the work, I regarded Psammitis Menge, 1876, and Proxysticus Dalmas, 1922, as full genera, Spiracme Menge, 1876, as a subgenus of Psammitis, and Platyxysticus Gertsch, 1932 (= Bassaniana Strand, 1928) as a subgenus of Coriarachne Thorell, 1870. However, since the Asian spiders of the genus have not been thoroughly investigated at the species level, I will treat the heterogenous genus Xysticus in the widest sense in this paper. Thus, Spiracme, Psammitis and Proxysticus are regarded as synonyms of Xysticus.

Type species. Aranes audax Schrank, 1803, Fn. Boica, 3, p.236.

Etymology. From Greek ξυστιχός, meaning scraping (Thorell, 1870a).

Diagnosis. Medium-sized thomisids; male thinner and darker than female. Prosoma nearly as long as wide, not flattened; head wide, with strong setae; thoracic part of prosoma with short setae. Tubercles of ALE and PLE connate; ALE > PLE > AME ≧ PME, AME-AME longer than AME-ALE, PME-PME usually shorter than PME-PLE, MOA usually wider than long, clypeus/AME-AME 0.50-1.00. Chelicerae without tooth; labium and sternum respectively longer than wide. Legs with developed spines, scopulae and claw tufts not much developed; leg-formula I-II-IV-III or II-I-IV-III. Male palp differentiated into various types (Ono, 1978c); generally with VTA and RTA, in some species-groups with ITA; tegulum in ancestral groups simple without any apophysis, in derivative groups with two or three apophyses; some steps can be recognized between the two extremities, e.g., tegulum with a small chink, with a ridge or with one apophysis. Opisthosoma as wide as long in female, longer than wide in male, not flattened, usually with distinct markings. Epigynum usually heavily sclerotized, without guide pocket, frequently with median septum. Intromittent canal short, spermathecae large, globular or reniform.

Range. Eurasia, northern Africa and North America.

Biology. Found on low plants, under stones and in leaf litter.

Species included. Roewer (1954) listed 252 species in this genus. Since then, more than 80 new species have been described from the world.

Remarks. In the temperate and cold zones of the Northern Hemisphere, this genus is most remarkable in the number of species and also of individuals. The genus is most highly adapted to the cold climate; some species occur in the Arctic Region and in such high alpine zones as the Himalayan Mountains more than 4,000m above sea-level.

Key to the Japanese species

1(26) Females.

2(13) Intromittent orifices separated by median septum.

3(4) Median septum large, crescent-shaped, furnished with a guide pocket (*triangulosus* group) ..... *Xysticus jacuticus* Utochkin, 1968.

4(3) Median septum not much developed.

5(10) Epigynum with vestibular sclerites (*locuples* group).

6((7) Vestibular sclerites oval, much developed, heavily sclerotized, expanded and covering intromittent orifices ..... *X. trizonatus* sp. nov.

7(6) Vestibular sclerites not much developed, foliated, narrow and covering only a part of intromittent orifices.

8(9) Vestibular sclerites anteriorly convergent; intromittent orifices much longer than wide ..... *X. kurilensis* Strand, 1907.

9(8) Vestibular sclerites widely separated from each other; intromittent orifices not so long, situated in anterior part of epigynum ..... *X. saganus* Bösenberg et Strand, 1906.

10(5) Epigynum without vestibular sclerites (*cristatus* group).

11(12) Intromittent orifices ovate, close to each other ..... *X. bifidus* Paik, 1973.

12(11) Intromittent orifices not ovate, separated from each other ..... *X. audax* (Schrank, 1803).

13(2) Intromittent orifices connected or situated in vestibulum.

14(15) Epigynum soft, expanded and not much sclerotized (labradorensis group) ..... X. daisetsuzanus sp. nov.

15(14) Epigynum sclerotized and not expanded.

16(17) Intromittent orifices much longer than wide (luctuosus group ..... X. rostratus sp. nov.

17(16) Intromittent orifices as long as wide or wider than long (luctans group).

18(23) Vestibulum large and as wide as epigynal width.

19(20) Vestibulum cordate ..... X. croceus Fox, 1937.

20(19) Vestibulum not cordate.

21(22) Vestibulum much wider than long, situated in anterior part of epigynum ..... X. ephippiatus Simon, 1880.

22(21) Vestibulum slightly wider than long or as wide as long, situated at the middle of epigynum ..... X. insulicola Bösenberg et Strand, 1906.

23(18) Vestibulum small, much smaller than epigynal plate.

24(25) Vestibulum wider than long; intromittent orifices visible in ventral view ..... X. atrimaculatus Bösenberg et Strand, 1906.

25(24) Vestibulum longer than wide; intromittent orifices not visible in ventral view ..... X. transversomaculatus Bösenberg et Strand, 1906.

26(1) Males.

27(44) Male palp with tegular apophysis.

28(31) Median tegular apophysis thin and bifid; apical part of tegulum projecting or forming a third tegular apophysis (cristatus group).

29(30) Apical ridge of tegulum pointed and forming a third tegular apophysis ..... X. audax(Schrank, 1803).

30(29) Apical ridge of tegulum not pointed ..... X. bifidus Paik, 1973.

31(28) Median tegular apophysis simple and hock-shaped, frequently with a retrolateral tooth; apical part of tegulum not projecting.

32(39) Median tegular apophysis lying across apical tegular apophysis; apical tegular apophysis usually much developed and as large as median tegular apophysis (luctans group).

33(34) Apical tegular apophysis bifid ..... X. insulicola Bösengerg et Strand, 1906.

34(33) Apical tegular apophysis simple.

35(36) Median tegular apophysis distally truncated and completely crossing apical tegular apophysis ..... X. ephippiatus Simon, 1880.

36(35) Median tegular apophysis distally blunt or pointed and not completely crossing apical tegular apophysis.

37(38) Both tegular apophyses pointed ..... X. croceus Fox, 1937.

38(37) Both tegular apophyses blunt ..... X. dichotomus Paik, 1973.

39(32) Median and apical tegular apophysis distant from each other; apical tegular apophysis smaller than median tegular apophysis (locuples group).

40(41) Tegular apophyses close to each other ..... X. kurilensis Strand, 1907.

41(40) Tegular apophyses distant from each other.

42(43) Median tegular apophysis securiform in ventral view; retrolateral tibial apophysis truncated ..... X. trizonatus sp. nov.

43(42) Median tegular apophysis not securiform in ventral view; retrolateral tibial apophysis blunt and not truncated ..... X. saganus Bösenberg et Strand, 1906.

44(27) Male palp without tegular apophysis.

45(46) Embolus thick and spiralled, frequently with spiniform accessory apophysis (labradorensis group); tegular ridge wide ..... X. daisetsuzanus sp. nov.

46(45) Embolus usually simple, spiniform or filiform; tegular ridge tooth-like or replaced by a small groove.

47(48) Tegular ridge replaced by a small groove (luctuosus group); embolus basally thick, distally spiniform ..... X. rostratus sp. nov.

48(47) Tegular ridge tooth-like (triangulosus group); embolus simple and filiform ..... X. jacuticus Utochkin, 1968.

Xysticus jacuticus Utochkin, 1968

[Japanese name: Tairiku-kanigumo]

(Figs. 61-63)

Xysticus jacuticus Utochkin, 1968, Pauki roda Xysticus Fauni SSSR (Opredelitel), (Uchebnoe posobie), p.40. ♀♀♂♂ syntypes from Yakutsk in Siberia, in AN USSR, not examined.

Notes. A single male of a Xysticus spider collected on Mts. Daisetsuzan, Hokkaido, by Mr. N. Yasuda, was identified with X. jacuticus,

which had originally been described by Utochkin from Siberia. Consequently, this species is a new addition to the Japanese fauna.

Etymology. Specific name derived from the type locality.

Specimen examined. 1♂, Mt. Kurodake, Daisetsuzan Range, 1980m alt., 17-IX-1981, N. Yasuda leg. (NSMT-Ar 1324).

Description based on the Japanese material. Measurement. Body length 5.81mm; prosoma length 2.67mm, width 2.63mm; opisthosoma length 3.41mm, width 2.74mm; lengths of legs (in mm):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.15	2.15	2.15	1.26	2.87	9.58
II	1.11	2.07	2.11	1.26	2.85	9.40
III	0.81	1.25	1.33	0.90	2.07	6.36
IV	0.89	1.36	1.48	0.85	2.15	6.37

Prosoma length/width 1.01, with blunt setae; ALE > PLE > PME > AME, ALE/AME 1.84, PLE/PME 1.13, AME-AME/AME-ALE 1.87, PME-PME/PME-PLE 0.90, MOA-WA/WP 1.00, MOA-L/W 1.09, clypeus/AME-AME 0.86. Labium length/width 1.42, sternum length/width 1.26. Tarsal claws of legs with 4 teeth.

Spiniformation of legs. Femur: I-IV dorsal 0-1-1-1-1, I prolateral 0-1-1-1; patella: I-II pro- and retrolateral 1, IV retrolateral 1; tibia: I-II pro- and retrolateral 1-1-1, ventral 2-2-2-2 ap, III-IV pro- and retrolateral 1-1, III ventral 1-2-2 ap (in the right leg 2-2-2 ap), IV ventral 2-2-2 ap; metatarsus: I-IV pro- and retrolateral 1-1-2 ap, I-II ventral 2-2-0-2, III ventral 1-2, IV ventral 1-2 (in the right leg 2).

Male palp (Figs. 62-63). Tibia with VTA and RTA; VTA not much developed, RTA obtuse, its distal part sclerotized and curved dorsally. Bulb without tegular apophysis, small tegular ridge present, embolus filiform, winding half around the tegulum.

Opisthosoma length/width 1.24, with blunt and strong hairs.

Coloration and markings. Prosoma brown, posteriorly darker, beige at the middle; chelicerae light yellowish brown; maxillae, labium, sternum and legs yellowish brown, femora not darker. Opisthosoma beige with paired distinct dark-brown areas separated by four white lines, venter light yellowish brown.

Range. Japan (Hokkaido), USSR (Siberia).

Biology. Unknown.

Remarks. This species is closely related to X. triangulosus Emerton, 1894, distributed in northern North America, but the condition of tegular ridge of male palp is different from that of the latter. Judging from the original illustration, X. vachoni Schenkel, 1963, described from China seems closely similar to this species.

Xysticus rostratus sp. nov.

[Japanese name: Shigi-kanigumo]

(Figs. 64-68)

Etymology. Specific name from Latin meaning beaked; derived from the shape of the beaked embolus of the male palp.

Specimens examined. Type series: Holotype: ♂, allotype: ♀, 900m alt., headwaters of the River Ishikarigawa, Kamikawa-cho, Kamikawa-gun, Hokkaido, late VI-1979, N. Yasuda leg. (NSMT-Ar 1301-1302); paratypes: 1♂, same data as the holotype (NSMT-Ar 1303); 1♀, Nukabira, Kamishihoro-cho, Katou-gun, Hokkaido, 27-VI-1981, M. Matsuda leg. (NSMT-Ar 1304); 1♂, same locality, 30-VI-1984, M. Matsuda leg. (NSMT-Ar 1305).

Description. Measurement. Body length ♀ 7.04-8.07mm, ♂ 4.96-5.70mm; prosoma length ♀ 2.74-2.89, ♂ 2.65-2.81mm, width ♀ 2.67-3.11mm, ♂ 2.52-2.74mm; opisthosoma length ♀ 4.15-5.19mm, ♂ 2.74-3.07mm, width ♀ 4.00-5.19mm, ♂ 2.44-2.70mm; lengths of legs of the allotype and the holotype (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.04/1.11	1.85/2.00	2.07/1.81	1.33/1.00	2.68/2.37	8.97/8.29
II	1.00/1.04	1.67/2.06	1.85/1.96	1.37/1.04	2.74/2.52	8.63/8.62
III	0.81/0.73	1.30/1.26	1.48/1.26	0.96/0.84	2.15/2.00	6.70/6.14
IV	0.67/0.74	1.48/1.41	1.63/1.56	1.11/0.81	2.15/2.00	7.13/6.52

Prosoma length/width ♀ 0.92-1.03, ♂ 1.02-1.06, with slightly blunt setae, ALE > PLE > AME > PME, ALE/AME ♀ 1.62-1.75, ♂ 1.50-1.60, PLE/PME ♀ 1.20-1.29, ♂ 1.26-1.29, AME-AME/AME-ALE ♀ 1.79-2.00, ♂ 1.87-2.00, PME-PME/PME-PLE ♀♂ 0.88-0.90, MOA-WA/WP ♀ 1.01-1.05, ♂ 1.00, MOA-L/W ♀ 0.89-0.92, ♂ 0.90-0.96, clypeus/AME-AME ♀ 0.74-0.78, ♂ 0.71-0.74. Labium length/width ♀ 1.44-1.65, sternum length/width ♀ 1.16-1.33, ♂ 1.17-1.23. Tarsal claws of legs with 4-5 teeth.

Spiniformation of legs. ♀ (allotype): Femur: I-IV dorsal 1, I prolateral 1-1-1 (in the right leg 1-1-1-1); patella: I-IV dorsal 1-0-1 (weak); tibia: I-IV dorsal 1-1-0, I ventral 1-2-1-2-2 ap (in the right leg 1-2-1-2-3 ap), II ventral 2-2-2-2 ap, III ventral 1-2-2 ap, IV ventral 1-1-2 ap, III-IV prolateral 0-1; metatarsus: I prolateral 1-1-2 ap (in the right leg 0-1-2 ap), II prolateral 1-1-2 ap, I-II retrolateral 0-1-2 ap, ventral 2-2-0-2, III-IV prolateral 0-1, retrolateral none, ventral 2; left leg II absent.

♂ (holotype): Femur: I-IV dorsal 0-1-1-1-1, I prolateral irregularly 8 (in the right leg 6); patella I-IV retrolateral 1, III-IV dorsal 1-0-1 (weak); tibia: I-IV dorsal 1-0-1 (weak), I-II pro- and retrolateral 1-1-1, I ventral 2-2-1-2-1-2 ap (in the right leg 2-2-2-2-2 ap), II ventral 2-2-2-2 ap, III-IV pro- and retrolateral 1-1, III ventral 2-2-0-2 ap (in the right leg 2-2-2-2 ap), IV ventral 2-1-1 (in the right leg 2-1-0-2 ap); metatarsus: I-II prolateral 1-0-1-2 ap, retrolateral 1-1-2 ap, ventral 2-2-0-2, III-IV pro- and retrolateral 1-1-2 ap, ventral 2.

Male palp (Figs. 67-68). Tibia with VTA and RTA; VTA normal, RTA distally sclerotized and pointed. Bulb without tegular apophyses, but with tegular ridge, embolus proximally thick, distally thinner, apically sharpened.

Opisthosoma length/width ♀ 0.99-1.06, ♂ 1.12-1.14.

Female genitalia (Figs. 64-65). Epigynum without median septum, vestibulum long oval, its margin strongly sclerotized, intromittent orifices large, strongly sclerotized. Intromittent canal short, thick, spermathecae ovate.

Coloration and markings. ♀: Prosoma yellowish brown or beige, dark-brown at the sides, with a pair of black lines at the middle and a pair of black spots on the posterior declivity; chelicerae, maxillae and labium yellowish brown, sternum yellowish brown mottled with white, legs I-II yellowish brown with dark-brown small spots, III-IV yellow, femora distally, patella and tibia distally brown. Opisthosoma yellowish brown or beige with indistinct blackish brown and white markings, venter yellowish brown.

♂: Prosoma beige, dark-brown to black at the sides, with a dark-brown marking at the middle; chelicerae, maxillae and labium light brown, sternum yellowish brown to light brown, legs I-II brown, III-IV yellowish brown, femora distally, patella and tibia distally darker. Opisthsosoma beige with distinct brown marking at each side, venter yellowish brown mottled with white.

Range. Japan (Hokkaido).

Biology. Unknown.

Remarks. This species is related to X. luctuosus (Blackwall, 1836) and X. acerbus Thorell, 1872, and is especially closer to the former, but is distinguishable from these species by the shape of VTA and RTA, as well as by the position of tegular ridge in the male palp.

Xysticus daisetsuzanus sp. nov.

[Japanese name: Daisetsu-kanigumo]

(Figs. 69-72)

Etymology. Specific name derived from the type locality of the species.

Specimens examined. Holotype: ♀, Kumonodaira, Mt. Daisetsuzan, Hokkaido, 16-VII-1980, N. Yasuda leg. (NSMT-Ar 1320). Paratypes: 1♀, Mt. Hiragatake, Hokkaido, Japan, 28-VII-1980, M. Matsuda leg. (NSMT-Ar 1321); 1♂, Mt. Kurodake, Daisetsu Range, Hokkaido, 19-VI-1978, N. Yasuda leg. (NSMT-Ar 1322); 1♂, Mt. Daisetsuzan, Hokkaido, 31-VII-1979, H. Tanaka leg. (NSMT-Ar 1323).

Specimens used for comparison. Xysticus albidus Grese, 1909 (Figs. 73-75): 1♀, Pieni Malla, Kilpisjarvi, Finland, 5-VIII-1961, Studentenexcursion, Xysticus labradorensis det. P. Palmgren; 1♀ 1 juv. ♂, same locality, 31-VII-1961; 1♀ 4 juv., same locality, 6-VII-1968; all specimens in the Zoological Museum of Helsinki, Finland.

Description. Measurement. Body length ♀ 4.44-4.52mm, ♂ 3.92-4.74mm; prosoma length ♀ 2.22-2.23mm, ♂ 1.48-2.00mm, width ♀ 2.07-2.14mm, ♂ 1.90-1.93mm; opisthosoma length ♀ 2.89-3.19mm, ♂ 2.22-2.51mm, width ♀ 2.30-2.60mm, ♂ 1.92-2.23mm. Lengths of legs of the holotype ♀ and 1♂ paratype (NSMT-Ar 1322) (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.65/0.72	1.20/1.40	1.15/1.28	0.95/0.88	1.65/1.80	5.60/6.08
II	0.70/0.72	1.15/1.40	1.15/1.28	0.90/0.88	1.75/1.80	5.65/6.08
III	0.60/0.64	0.75/0.92	0.80/0.96	0.65/0.68	1.25/1.40	4.05/4.60
IV	0.60/0.68	0.90/1.08	0.90/1.08	0.65/0.64	1.35/1.52	4.40/5.00

Prosoma length/width ♀ 1.03-1.08, ♂ 1.03-1.06, ♀ with blunt setae, ♂ with normal setae, ALE > PLE > AME = PME, ALE/AME ♀ 1.66-2.00, ♂ 1.66-1.84, PLE/PME ♀♂ 1.33-1.50, AME-AME/AME-ALE ♀ 1.65-1.75, ♂ 1.57-1.60, PME-PME/PME-PLE ♀ 1.00-1.03, ♂ 1.00-1.08, MOA-WA/WP ♀ 0.87-0.96, ♂ 0.72-0.90, MOA-L/W ♀ 0.75-0.91, ♂ 0.83-0.90, clypeus/AME-AME ♀ 0.75-0.82, ♂ 0.75-1.00. Labium length/width ♀ 1.23-1.50, ♂ 1.40-1.43, sternum length/width ♀ 1.11-1.36, ♂ 1.18-1.19. Tarsal claws of legs with 3-4 teeth.

Spiniformation of legs. Holotype ♀: Femur: I prolateral 0-1-1-1-0, II-IV dorsal 1; patella: none; tibia: I-IV dorsal 1-1-0, I-II ventral 2-2-2 ap, III ventral 0-2-2 ap (in the right leg 1-2-2 ap), IV ventral 0-0-1 ap (in the right leg 1-1-1 ap); metatarsus: I prolateral 0-1-2 ap (in the right leg 1-1-2 ap), retrolateral 0-1-2 ap, ventral 2-2, II prolateral 1-1-2 ap, retrolateral 0-1-1 ap, ventral 2-2, III prolateral 0-1-2 ap, retrolateral 0-1-1 ap, ventral 2, IV prolateral 0-1-2 ap, retrolateral none, ventral 1 (in the right leg none).

1♂ (NSMT-Ar 1323): Femur: I-II dorsal 0-0-1-1-1, I prolateral 0-1-1-1-0, III dorsal 0-1-1-1, IV dorsal 0-1-1-0 (in the right leg 1-1-1-1); patella: III-IV retrolateral 1; tibia: I-IV dorsal 1-1-0-0, I prolateral 1-1-1, II prolateral 1-0-1, I-II retrolateral 1-1-1, I ventral 2-2-2-2 ap, II ventral 0-2-2-2 ap, III prolateral 1-1, retrolateral 1-1-0, ventral 2-2-0-2 ap, IV prolateral 1-1-0, retrolateral 1-1, ventral 2-2-0-2 ap; metatarsus: I-II prolateral 1-1-0-2 ap, retrolateral 0-1-1-1 ap, ventral 0-2-2-0, III-IV prolateral 0-1-1-2 ap, ventral 2, III retrolateral 0-1-1-1 ap, IV retrolateral 1-1-1 ap.

Male palp (Figs. 71-72). Tibia with VTA, RTA and ITA; VTA retrolaterally expanded and forming ITA, ITA sclerotized and truncated, RTA obtuse. Bulb without any tegular apophysis, tegular ridge much sclerotized, wide, serrated, embolic division very short, embolus much sclerotized, winding, with a spiniform accessory apophysis scarcely visible in ventral view, tutacular apophysis less sclerotized, situated at the middle of cymbium.

Opisthosoma length/width ♀ 1.03-1.08, ♂ 1.03-1.06, much haired.

Female genitalia (Figs. 69-70). Epigynum convex, intromittent orifices slitting. Intromittent canal not visible in dorsal view of the genitalia, spermathecae furrowed, reniform and long.

Coloration and markings. ♀: Prosoma beige, at the sides brown, head light beige; chelicerae, maxillae, sternum and labium light yellowish brown mottled with brown, legs I-II yellowish brown mottled with brown, III-IV light yellowish brown, patellae and femora distally and tibiae proximally darker. Opisthosomal dorsum grey to greyish brown mottled with black, without marking, venter same as dorsum.

♂: Prosoma dirty yellow, chestnut at the sides, the posterior part white, head dirty yellow; chelicerae, maxillae, labium and sternum yellowish brown to light brown mottled, legs light-brown with small darker spots. Opisthosomal dorsum brown with paired dark coloured areas separated by diffuse white bands, venter light beige.

Range. Japan (Hokkaido).

Biology. Wandering among stones on the ground. Thirty-one eggs were found in the egg-sac of the holotype female; the diameter of the egg-sac was 7.0mm.

Remarks. This species is closely related to X. deichmanni, X. labradorensis, X. rugosus and X. albidus. The difference between these species and X. daisetsuzanus is shown in the following key.

Key to the Species of the Group of X. labradorensis

1(10) Females.

2(3) Margin of vestibulum of epigynum posteriorly closed ..... X. rugosus Buckle et Redner, 1964.

3(2) Margin of vestibulum of epigynum posteriorly not clearly closed.

4(7) Intromittent canal visible in dorsal view.

5(6) Intromittent canal visible at the lateral part of long spermatheca ..... X. labradorensis Keyserling, 1887.

6(5) Intromittent canal visible at the anterior part of short spermatheca ..... X. albidus Grese, 1909.

7(4) Intromittent canal not visible in dorsal view.

8(9) Vestibulum of epigynum wide, its margin anteriorly closed ..... X. deichmanni Sörensen, 1898.

9(8) Vestibulum of epigynum not so wide, its margin anteriorly not closed ..... X. daisetsuzanus sp. nov.

10(1) Males.

11(14) Axis (accessory spiniform apophysis) of embolus visible in ventral view.

12(13) Embolus short and thick ..... X. deichmanni Sörensen, 1898.

13(12) Embolus thin ..... X. labradorensis Keyserling, 1887.

14(11) Axis scarcely visible in ventral view.

15(16) Tutacular apophysis prominent and pointed .....

X. rugosus Buckle et Redner, 1964.

16(15) Tutacular apophysis neither prominent nor pointed.

17(18) Tip of embolus directed ventrad in retrolateral view .....

X. daisetsuzanus sp. nov.

18(17) Tip of embolus directed dorsad in retrolateral view .....

X. albidus Grese, 1909.

Xysticus croceus Fox, 1937

[Japanese name: Yamiiro-kanigumo]

(Figs. 76-79)

Xysticus ephippiatus: Bösenberg & Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.261. —— Kishida, 1914, Kagaku Sekai, Tokyo, 7(13), p.38. —— Yuhara, 1931, Study of Spiders, p.174. —— S. Saito, 1934, J. Fac. Agr. Hokkaido imp. Univ., Sapporo, 33, p.282; 1938, Trans. Sapporo nat. Hist. Soc., 15, p.193; 1939, Saito-Hoonkai Mus. Res. Bull., 3, p.79; 1959, Spider Book illustr. Col., p. 131. —— Chikuni, 1941, Spiders Jpn. Alps, p.134. (Nec Xysticus ephippiatus Simon, 1880.)

Xysticus croceus Fox, 1937, J. Wash. Acad. Sci., 27, p.19. Female holotype from "Suifu, Szechwan Privince, China," 1922, D.C. Graham leg., in USNM, not examined. —— Yaginuma, 1960, Spiders Japan Col., Osaka, p.97; 1961, Revis. Fam., Gen. Spp. Jpn. Spiders, p.38; 1968, Spiders Japan Col., Osaka, (rev. ed.), p.97; 1986, ibid.,

(n.ed.), p.201. --- Matsumoto et al., 1976, Spiders, p.159. --- Song et al., 1979, Zool. Mag., Beijing, for 1979(1), p.17. --- Song, 1980, Farm Spiders, p.192. --- Ono, 1981, Kishidaia, Hino, (47), p.70. --- Shinkai & Takano, 1984, Field Guide Spiders Japan, p.136. --- Hu, 1984, Chinese Spiders Fields Forests, p.345.

Xysticus sujatai Tikader, 1962, J. linn. Soc. London, 44, p.577. Female holotype, male allotype and 3♀♀ paratypes from Kench's Trace, Shilong, Assam, India, 10-III-1960, B.K. Tikader leg., in ZSIC, not examined; 1971, Mem. zool. Surv. India, 15(3), p.50; 1980, Fn. India, Araneae, 1(1), p.121. (New synonymy.)

Notes. Judging from the original description and illustrations by Tikader (1962), X. sujatai known from Assam, India, seems to be identical with X. croceus. Though I have been unable to examine any Indian specimen, it is considered that X. croceus is widespread in East Asia. Having compared 1o specimen collected in Nepal, west of Assam, with oo from Japan, I have found a slight difference in the shape of RTA and of median tegular apophysis of the palp between the Nepalese and Japanese males, but the difference may be due to geographical variation. The type locality of X. croceus, Suifu in Szechwan, lies between Assam and Japan.

Etymology. Specific name from Latin meaning saffron-coloured, yellow.

Specimens examined. Japan: 1♀, Dainohara-shinrin-kôen, Sendai-shi, Miyagi Pref., 28-V-1983, K. Sasaki leg. (NSMT-Ar 1415); 1♂, same locality, 6-V-1982, K. Sasaki (NSMT-Ar 914); 1♀, same locality, 2-X-1982, K. Sasaki

leg. (NSMT-Ar 1416); 1♀, Nobiru, Naruse-cho, Monou-gun, Miyagi Pref., 5-IX-1981, K. Sasaki leg. (NSMT-Ar 957); 1♀, Futawatashihama, Ajishima Island, Oshika-cho, Oshika-gun, Miyagi Pref., 5-VI-1983, K. Sasaki leg. (NSMT-Ar 911); 1♀, Yaotome, Izumi-shi, Miyagi Pref., 8-VI-1982, K. Sasaki leg. (NSMT-Ar 1417); 1♀, Mt. Aobayama, Sendai-shi, Miyagi Pref., 27-VIII-1983, K. Sasaki leg. (NSMT-Ar 1418); 2♂♂, Tagajô-shi, Miyagi Pref., 22-V-1983, K. Sasaki leg. (NSMT-Ar 1419); 1♀, Mt. Chitoseyama, Yamagata-shi, Yamagata Pref., 24-IX-1969, H. Yoshida leg. (NSMT-Ar 913); 1♀, Mt. Myôgisan, Gunma Pref., 15-VII-1976, E. Shinkai leg. (NSMT-Ar 934); 1♀, Kôzu-bokujô, Kanra-gun, Gunma Pref., 25-VI-1972, A. Matsumoto leg. (NSMT-Ar 952); 1♀, Mt. Tarôyama, Nikko, Tochigi Pref., 11-X-1958, J. Aoki leg. (NSMT-Ar 41); 1♀, Hannô-shi, Saitama Pref., 1973, Y. Matsumi leg. (NSMT-Ar 939); 2♀♀2♂♂, Mt. Izugatake, Chichibu, Saitama Pref., 9-VI-1974, M. Miyazaki leg. (NSMT-Ar 933); 1♀1♂, Inubôzaki, Chôshi-shi, Chiba Pref., 2-VI-1971, S. Matsumoto leg. (NSMT-Ar 941); 1♀, Fudagô, Kimitsu-shi, Chiba Pref., 11-VI-1971, S. Matsumoto leg. (NSMT-Ar 930); 1♀, Ôwada, Ichikawa-shi, Chiba Pref., 16-VI-1968, S. Matsumoto leg. (NSMT-Ar 946); 1♀, Futtsu-kaigan, Futtsu-shi, 27-VI-1976, M. Tomokuni leg. (NSMT-Ar 927); 1♀, Mt. Takaosan, Tokyo, 25-VIII-1968, S. Matsumoto leg. (NSMT-Ar 944); 1♀, Kogesawa, Uratakao, Tokyo, 27-IV-1975, S. Matsumoto leg. (NSMT-Ar 945); 1♀, Miyashita, Hachioji-shi, Tokyo, 19-VI-1971, S. Matsumoto leg. (NSMT-Ar 932); 1♂, same data (NSMT-Ar 942); 1♀, same locality, 28-VI-1971, S. Matsumoto leg. (NSMT-Ar 926); 1♀, same locality, 13-VI-1972, S. Matsumoto leg. (NSMT-Ar 917); 1♂, same locality, 29-V-1975, S. Matsumoto leg. (NSMT-Ar 943); 1♀1♂, Takiyama-joshi, Hachiôji-shi, Tokyo, 10-X-1975 (adult in spring, 1976), H.

Ono leg. (NSMT-Ar 938); 1♀1 juv. ♂ 1 juv., Hachiôji-joshi, Hachiôji-shi, Tokyo, 12-V-1974, H. Ono leg. (NSMT-Ar 923); 1♂, same locality, 12-V-1974, H. Ono leg. (NSMT-Ar 928); 2♀♀, same locality, 12-V-1974 (adult on 29-V-1973), M. Ozawa leg. (NSMT-Ar 919); 1♀, same locality, 12-V-1974 (adult on 23-V-1974), H. Ono leg. (NSMT-Ar 1420); 1♂, Kodaira-shi, Tokyo, 24-VI-1983, S. Matsumoto leg. (NSMT-Ar 924); 1 juv. ♂, Mejiro, Toshima-ku, Tokyo, 10-VI-1969, H. Ono leg. (NSMT-Ar 915); 1♀1 juv. ♂, same locality, 11-VI-1969, H. Ono leg. (NSMT-Ar 916); 2♀♀, Tokyo, 4-VII-1977, E. Shinkai leg. (NSMT-Ar 953, 954); 2♂♂ 1 juv., Isehara-shi, Kanagawa Pref., 29-IV-1972, K. Takabayashi leg. (NSMT-Ar 940); 6♀♀, same locality, 18-V-1975, H. Ono leg. (NSMT-Ar 921); 1♂, same locality, 18-V-1975 (adult on 3-VI-1975), H. Ono leg. (NSMT-Ar 925); 1♂, Shiroyama-cho, Tsukui-gun, Kanagawa Pref., 5-V-1967, S. Matsumoto leg. (NSMT-Ar 918); 1♀, Amagi-tôge between Tagata-gun and Kamo-gun, Shizuoka Pref., 2-VIII-1976, H. Ono leg. (NSMT-Ar 936); 1♂, Ichiyama, Amagiyugashima-machi, Tagata-gun, 4-III-1985, F. Inoue leg. (NSMT-Ar 1421); 1♀, Sanageyama, Sanage-cho, Toyota-shi, Aichi Pref., 28-V-1985, K. Ogata leg. (NSMT-Ar 1422); 2♀♀, Kanazawa-shi, Ishikawa Pref., VII-1984 (NSMT-Ar 956); 2♀♀, Ôtsu-shi, Shiga Pref., 16-VII-1976, Y. Nishikawa leg. (YNO); 1♀, Mt. Yoshinoyama, Nara Pref., 16-VIII-1968, T. Yaginuma leg. (NSMT-Ar 293); 1♀1♂, Uenoshiba, Sakai-shi, Osaka Pref., 28-V-1976, H. Yoshida leg. (NSMT-Ar 912); 1♂, Kisaichi-shokubutsuen, Katano-shi, Osaka Pref., 19-V-1974, Y. Nishikawa leg. (YNO); 1♀1♂, Zenihara, 430m alt., Ibaraki-shi, Osaka Pref., 3-VI-1978, Y. Nishikawa leg. (YNO); 1♂, ibid., 440m alt., 1-VII-1978, Y. Nishikawa leg. (YNO); 1♂ 2 juv. ♂, same locality, 13-V-1978, Y. Nishikawa leg. (YNO); 1♂, same data (YNO); 1♂, same

locality, 16-V-1978, Y. Nishikawa leg. (YNO); 1♂, Ôtemon Gakuin-University, Ai, Ibaraki-shi, Osaka Pref., 22-V-1982, Y. Nishikawa leg. (YNO); 1♀ 1 juv., same locality, 16-VII-1977, Y. Nishikawa leg. (NSMT-Ar 922); 4♂♂ 2 juv. ♀, Hidaka-cho, Kinosaki-gun, Hyogo Pref., 3~13-V-1977, Y. Nishikawa leg. (YNO); 1♀, Ôkôchi-machi, 550-700m alt., Kanzaki-gun, Hyogo Pref., 10-X-1976, Y. Nishikawa leg. (NSMT-Ar 920); 1♂, Utsu-Nagaonohana, 0-90m alt., Mishima Island, Hagi-shi, Yamaguchi Pref., 6-V-1978, Y. Nishikawa leg. (YNO); 1♂, Ashizurimisaki, Kochi Pref., 2-IV-1956, T. Hidaka leg. (NSMT-Ar 955); 5♀♀1♂, Kajigamori, Kochi Pref., 25-V-1967, C. Okuma leg. (NSMT-Ar 949); 1♂, Kochi-shi, Kochi Pref., 24-V-1967, C. Okuma leg. (NSMT-Ar 1423); 1♀, same locality, 16-VII-1975, H. Ono leg. (NSMT-Ar 937); 1♂, Nogouchi-keikoku, Mt. Sefuriyama, Fukuoka Pref., 2-VI-1968, C. Okuma leg. (NSMT-Ar 951); 1♀, Mt. Hikosan, Fukuoka Pref., 27-VII~2-VIII-1959, C. Okuma leg. (NSMT-Ar 948); 1♂, Mt. Inunakiyama, Fukuoka Pref., 5-V-1968, K. Kanmiya leg. (NSMT-Ar 947); 1♂ 1 juv. ♀, same locality, 4-V-1952, C. Okuma leg. (NSMT-Ar 950); 1♀, Mt. Sobosan, Nishiusuki-gun, Miyazaki Pref., 21~26-VII-1964, C. Okuma leg. (NSMT-Ar 935); 1♀, Shimohouri, Higashiusuki-gun, Miyazaki Pref., 18-VII-1974, E. Shinkai & S. Matsumoto leg. (NSMT-Ar 958).

Nepal: 1♂, Liphabung, 1,050-1,200m alt., Libang, 10km NW of Taplejung, 23-IV-1970, M. Hubert leg. (MNHN).

Description. Measurement. Body length ♀ 5.63-10.00mm, ♂ 4.15-6.89mm; prosoma length ♀ 2.59-3.85mm, ♂ 2.22-3.26mm, width ♀ 2.59-3.55mm, ♂ 2.22-3.11mm; opisthosoma length ♀ 2.80-6.44mm, ♂ 2.25-3.48mm, width ♀ 2.90-6.30mm, ♂ 2.07-3.33mm. Lengths of legs of 1♀1♂ from Tokyo (NSMT-Ar 938) (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.08/1.04	2.16/2.00	2.36/2.00	1.48/1.08	3.00/2.52	10.08/8.64
II	1.08/0.92	2.00/2.12	2.12/2.24	1.36/1.20	2.84/2.88	9.40/9.36
III	0.72/0.64	1.16/1.20	1.44/1.36	1.12/0.92	2.08/2.08	6.52/6.20
IV	0.92/0.80	1.32/1.40	1.60/1.72	1.00/0.80	2.28/2.16	7.12/6.88

Prosoma length/width ♀ 1.00-1.12, ♂ 0.97-1.12, with normal setae, ALE > PLE > PME≒AME, ALE/AME ♀ 1.68-2.00, ♂ 1.71-2.00, PLE/PME ♀ 1.20-1.60, ♂ 1.25-1.63, AME-AME/AME-ALE ♀ 1.57-1.91, ♂ 1.61-1.83, PME-PME/PME-PLE ♀ 0.76-0.91, ♂ 0.73-0.81, MOA-WA/WP ♀ 0.94-1.01, ♂ 0.95-1.00, MOA-L/W ♀ 0.82-0.95, ♂ 0.90-0.92, clypeus/AME-AME ♀ 0.62-0.91, ♂ 0.68-0.89. Labium length/width ♀ 1.33-1.62, ♂ 1.30-1.80, sternum length/width ♀ 1.17-1.36, ♂ 1.18-1.54.

Spiniformation of legs of 1♀1♂ (NSMT-Ar 938). ♀: Femur: I-IV dorsal 1, I prolateral 1-1-1; patella: I-IV dorsal 1-0-1 (weak); tibia: I-IV dorsal 1-1-0, I prolateral 1-1-1 (in the right leg none), II prolateral none (in the right leg 0-1-1), III-IV prolateral 1-1, I-II ventral 2-2-2-2 ap, III ventral 1-2, IV ventral 1-1; metatarsus: I prolateral 0-1-2 ap, II-IV prolateral 1-1-2 ap, I-III retrolateral 0-1-1 ap, I ventral 1-2-2-0-2 (in the right leg 1-2-0-2-2), II ventral 1-2-0-2-2, III ventral 2, IV ventral 1.

♂: Femur: I dorsal 0-0-1-1-1-1-1-1, prolateral irregularly 12, retrolateral 0-0-0-1, II dorsal 0-1-1-1-1-1 (in the right leg 0-1-1-1-0-1-1-1), prolateral 0-0-0-1 (in the right leg 0-1-0-1), III dorsal 1-1-1-1-1-1, IV dorsal 0-1-1-1-1; patella: I-IV dorsal 1-0-1 (weak), pro-

and retrolateral 1, tibia: I-II dorsal 1-1-0 (weak), III-IV dorsal 1-1-0, I-II pro- and retrolateral 1-1-1, III-IV pro- and retrolateral 1-1, I ventral 2-2-2-2-2 ap (in the right leg 2-2-2-2 ap), II ventral 2-2-2-2 ap, III-IV ventral 2-2-2 ap; metatarsus: I-II prolateral 1-1-2 ap, retrolateral 1-1-1 ap, ventral 2-2-0-2, III-IV pro- and retrolateral 1-1-1 ap, ventral 2.

Male palp (Figs. 78-79). Tibia with VTA and RTA; VTA normal, much developed, RTA distally sclerotized and pointed. Bulb with two tegular apophyses much developed; median apophysis beaked, with heel; apical apophysis curved, distally pointed; embolus long, filiform.

Opisthosoma length/width ♀ 0.95-1.16, ♂ 0.97-1.12, with normal hairs.

Female genitalia (Figs. 76-77). Epigynum without median septum, vestibulum cordate, its margin much sclerotized. Intromittent canals united at the mid line, short and thick, spermathecae reniform.

Coloration and markings. ♀: Prosoma yellowish brown with a pair of brown longitudinal stripes and brown spots at the middle, darker at the sides; chelicerae, labium, sternum, palps and legs yellowish brown mottled with brown. Opisthosomal dorsum yellowish brown to brown, rarely reddish brown with dark-brown marking discontinued to two latitudinal white lines in the posterior part, venter yellowish brown to brown or greyish brown.

Range. Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea (Paik, 1967, 1973b), China (Fox, 1937; Zhu, 1983, Song, 1980), Nepal and India.

Biology. This spider is commonly found in Honshu, Shikoku and Kyushu, on lower vegetation in fields and along forest paths, as well as in urban environment such as house gardens. Adult in spring; the female survive during most of the summer.

Remarks. This species is most closely related to X. emertoni Keyserling, 1880, and X. obscurus Collet, 1877, both widely distributed in the northern Holarctic Region, but is different from the latter two in the shape of median tegular apophysis of male palp and vestibulum in epigynum.

Xysticus ephippiatus Simon, 1880

[Japanese name: Shina-kanigumo]

(Figs. 80-85)

Xysticus ephippiatus Simon, 1880, Ann. Soc. ent. France, (5), 10, p.107. 1♀ 3 juv. syntypes from Peking, China, V. Collin de Plancy leg., in MNHN, examined. --- Fox 1937, J. Wash. Acad. Sci., 27, p.20. --- Yaginuma, 1961, Revis. Fam. Gen. Spp. Jpn. Spiders, p.38; 1962, Spider Fauna of Japan, p.45; 1967, Lit. Dept. Rev. Ohtemon-Gakuin Univ., (1), p.96; 1967, J. Toyo Univ., gen. Educ., (Nat. Sci.), (8), p.37; 1968, Spiders Japan Col., Osaka, (rev. ed.), p.129; 1986, ibid. (n.ed.), p.201. --- Zhu & Wang, 1963, Jilin Yike Daxue, Xue Bao, 5, p.485. --- Schenkel, 1963, Mem. Mus. Hist. nat., Paris, (A), 25, p.208. --- Suganami, 1971, Atypus, Osaka, (56), p.14. --- Song et al., 1979, Zool. Mag., Beijing, for, 1979, p.17. --- Song, 1980, Farm Spiders, p.191. --- Ono, 1981, Kishidaia, Hino, (47), p.69. --- Song & Hubert, 1983, J. Huizhou Teachers' Coll., 1983(2), p.11. --- M.-S. Zhu, 1983, Spiders Paddy Fields Shanxi, p.194. --- Shinkai & Takano, 1984, Field Guide Spider Japan, p.137. --- Hu,

1984, Chinese Spiders Fields Forests, p.347.

Xysticus tunicatus Bösenberg et Strand, 1906, Abh. senckenb. naturf. Ges., p.263. Female holotype from "Saga, Kompira," W. Dönitz leg. in SMF, examined. --- S. Saito, 1934, J. Fac. Agr. Hokkaido imp. Univ., Sapporo, 33, p.281; 1937, Annot. zool. japon., 16, p.150; 1939, Saito-Hoonkai Mus. Res. Bull., 3, p.80; 1959, Spider Book illustr. Col., p.132; 1960, in Okada et al., Encycl. zool. illustr. Col., Tokyo, 4, p.21. (New synonymy.)

Xysticus transsibiricus Utochkin, 1968, Pauki roda Xysticus Fauni SSSR (Operedelitel), (Uchebnoe posobie), p.26. Many ♀♂ syntypes from Siberia, USSR, in AN USSR, not examined. (New synonymy.)

Xysticus lateralis atrimaculatus: Kuribayashi, 1973, Insects of Okinawa, p.138. (Nec Xysticus lateralis atrimaculatus Bösenberg et Strand, 1906.)

Notes. Bösenberg and Strand (1906) identified a Xysticus species from Japan with X. ephippiatus originally described by Simon (1880a) from Peking in China. On the other hand, the authors described a new species from Japan under the name of X. tunicatus in the same work. Having studied some Chinese spiders, Fox (1937) pointed out the misidentification of Bösenberg and Strand on X. ephippiatus and newly established X. croceus on the basis of a female from Szechwan in China. Yaginuma (1962) introduced the process of the change of these names for Japanese arachnologists.

Xysticus tunicatus was already synonymized by Yaginuma (1966, 1967) with X. saganus Bösenberg et Strand, 1906. Having examined the type

specimens of X. tunicatus, X. saganus and X. ephippiatus, however, I have made clear that X. tunicatus is in fact a synonym of X. ephippiatus, not of X. saganus. Saito (1934a, 1959) illustrated the epigynum of true X. tunicatus.

Judging from the original illustration given by Utochkin, X. transsibiricus Utochkin, 1968, widespread in Siberia, is without doubt the same as X. ephippiatus and is regarded here as a junior synonym of the latter.

Etymology. Specific name from Latin meaning riding a saddled horse.

Specimens examined. Syntypes: 1♀ 3 juv., Peking, China, V. Collin de Plancy leg. (MNHN 3195).

Japan: 1♂ 1 juv. ♂, Kushiro-shi, Hokkaido, 4-VIII-?, T. Tsutsumi leg. (NSMT-Ar 1010); 1♀, Kamikawa-cho, Kamikawa-gun, Hokkaido, 8-VII-1983, N. Yasuda leg. (NSMT-Ar 1012); 1♂, same locality, 18-VI-1981, N. Yasuda leg. (NSMT-Ar 1024); 1♀, Ikutahara-machi, Monbetsu-gun, Hokkaido, 24-VII-1984, M. Tomokuni leg. (NSMT-Ar 1026); 2♂♂, Tokachimitsumata, Kamishihoro-cho, Katou-gun, Hokkaido, 26-VII-1984, M. Tomokuni leg. (NSMT-Ar 1034); 1♂ 1 juv., Nakasatsunai, Makubetsu-cho, Nakagawa-gun, Hokkaido, 21-VII-1984, M. Tomokuni leg. (NSMT-Ar 1013); 1♀1♂ 11 juv., Hiroo-cho, Hiroo-gun, Hokkaido, 27-VII-1984, M. Tomokuni leg. (NSMT-Ar 1027); 1♂, Jôzankei, Minami-ku, Sapporo-shi, Hokkaido, 3-VIII-1984, M. Tomokuni leg. (NSMT-Ar 1028); 1♀, Towada-shi, Aomori Pref., 14-VI-1976, K. Mori leg. (NSMT-Ar 1008); 1♀, Kanazawa, Nanyo-shi, Yamagata Pref., 18-VI-1961, S. Nishiki leg. (NSMT-Ar 1009); 1♂, Mt. Kinkazan, Oshika-gun, Miyagi Pref., 5-VII-1976, T. Sekishita leg. (NSMT-Ar 1017); 1♀ 33 juv., Takiyama-joshi, Hachioji-shi, Tokyo,

30-VII-1976, S. Takano leg. (NSMT-Ar 1014); 1♂, Miyashita, Hachioji-shi, Tokyo, 5-VII-1971, S. Matsumoto leg. (NSMT-Ar 1007); 1♂, same locality, 24-VI-1975, S. Matsumoto leg. (NSMT-Ar 1006); 3♀♀, Atsugi-shi, Kanagawa Pref., 26-VII-1979, K. Suzuki leg. (NSMT-Ar 1019); 2♀♀, Isehara-shi, Kanagawa Pref., 23-VII-1972, K. Takabayashi leg. (NSMT-Ar 1015); 1♀, same locality, 29-VII-1972, K. Takabayashi leg. (NSMT-Ar 1016); 1♀, Mt. Nyûgasayama, Kamiina-gun, Nagano Pref., 4-VIII-1975, H. Ono leg. (NSMT-Ar 1011); 2♂♂, Yashigamine, Tateshina-kôgen, Nagano Pref., 23-VII-1970, H. Ono leg. (NSMT-Ar 1022); 2♀♀, Lake Misuzuko, near Matsumoto-shi, Nagano Pref., 13-VIII-1974, S. Matsumoto & E. Shinkai leg. (NSMT-Ar 1020); 2♀♀1♂, Susado, Horigane-mura, Minamiazumi-gun, Nagano Pref., date?, Y. Chikuni leg. (NSMT-Ar 1029); 1♀, Okazaki-shi, Aichi Pref., VI-1960, M. Murakami leg. (NSMT-Ar 378); 1♀, Kanazawa-shi, Ishikawa Pref., VII-1984, F. Shibata leg. (NSMT-Ar 1031); 1♀, Minoo-shi, Osaka, 3-V-1961, Y. Niina leg. (NSMT-Ar 1023); 1♂, Nishikawatsu-cho, Matsue-shi, Shimane Pref., 14-VI-1965, S. Kageyama leg. (NSMT-Ar 1030); 1♂, Kochi-shi, Kochi Pref., 25-VIII-1949, K. Nakahira leg. (NSMT-Ar 1025); 1♀ (holotype of Xysticus tunicatus Bösenberg et Strand, 1906), Saga-shi, Saga Pref., W. Dönitz leg. (SMF 4456); 1♂, Taramajima Island, Miyako Islands, Okinawa Pref., 27-V-1974, H. Makihara leg. (NSMT-Ar 1018); 2♀♀, Ôhara, Iriomote Island, Yaeyama Islands, Okinawa Pref., 18-III-1975, N. Takeuchi leg. (NSMT-Ar 1021).

Mongolia: 1♀, Shamor, Selenga ajmak, 29-VII-1982, K. Mikhailov leg. (ZMM).

USSR: 1♀1♂, Priamurje, near Zeja, Soviet Far East, 3-4-VI-1978, V.V. Belov leg. (NMST-Ar 1035); 1♀, Pashkovo, Jewish ASSR, Priamurje, Soviet Far East, 13-VI-1978, S. Toms leg. (ZMM).

Description. Measurement. Body length ♀ 5.48-13.11mm, ♂ 5.11-7.26mm; prosoma length ♀ 2.81-4.96mm, ♂ 2.81-4.15mm, width ♀ 2.81-4.74mm, ♂ 2.67-4.00mm; opisthosoma length ♀ 3.04-8.00mm, ♂ 2.81-4.00mm, width ♀ 3.26-8.30mm, ♂ 2.59-3.41mm; lengths of legs of syntype ♀ and 1♂ from Tokyo (NSMT-Ar 1007) (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.15/1.32	2.40/2.48	2.40/2.60	1.60/1.48	3.30/3.40	10.85/11.28
II	1.20/1.24	2.20/2.80	2.50/2.76	1.60/1.60	3.10/3.56	10.60/11.96
III	0.85/0.84	1.35/1.48	1.70/1.60	1.20/1.20	2.30/2.44	7.40/ 7.56
IV	0.90/0.88	1.75/1.60	1.80/1.80	1.10/1.00	2.65/2.56	8.20/ 7.84

Prosoma length/width ♀ 1.00-1.11, ♂ 1.03-1.10, with normal setae, ALE > PLE > PME≒AME, ALE/AME ♀ 1.66-2.12, ♂ 1.75-1.82 PLE/PME ♀ 1.21-1.50, ♂ 1.20-1.50, AME-AME/AME-ALE ♀ 1.76-1.95, ♂ 1.63-1.90, PME-PME/PME-PLE ♀ 0.85-1.00, ♂ 0.90-0.97, MOA-WA/WP ♀ 0.93-1.03, ♂ 0.92-1.04, MOA-L/W ♀ 0.75-0.88, ♂ 0.74-0.91, clypeus/AME-AME ♀ 0.52-0.77, ♂ 0.65-0.70. Labium length/widgh ♀ 1.42-2.10, ♂ 1.34-1.56, sternum length/width ♀ 1.27-1.35, ♂ 1.16-1.39. Tarsal claws of legs of ♀♂ with 3-4 teeth.

Spiniformation of legs variable. Syntype ♀: Femur: I dorsal 1-1, prolateral 1-1-1-0-1-0, retrolateral 1, II-IV dorsal 1; patella: none; tibia: I-II prolateral 1-1-1, retrolateral 0-0-1, I ventral 2-1-2-1-2-2-2 ap, II ventral 1-2-1-2-2 ap, III prolateral 1-0-1, retrolateral 1-1, ventral 2-2-2 ap, IV prolateral 1-1-1; metatarsus: I-II prolateral 1-1-2 ap, retrolateral 1-1-1 ap, ventral 2-2-2-2-2, III-IV prolateral 1-1-2 ap,

retrolateral 1-1-2 ap, III ventral 2-2, IV ventral 2.

♂ (NSMT-Ar 1007): Femur: I dorsal 0-0-1-1-1, prolateral irregularly 10 (at the right leg 9), II-IV dorsal 0-1-1-1-1; patella: III-IV dorsal 1-0-1 (weak), I-IV pro- and retrolateral each 1; tibia: I-IV dorsal 1-1-0 (weak), I-II pro- and retrolateral 1-1-1, I ventral 2-1-1-2-1-2-2-2 ap (in the right leg 2-1-2-2-1-2-2 ap), II ventral 2-1-2-1-1-2-2 ap (in the right leg 2-0-2-1-2-2 ap), III-IV pro- and retrolateral 1-1, III ventral 1-2-2 ap, IV ventral 2-2-2 ap; metatarsus: I-IV prolateral 1-1-2 ap, I-II retrolateral 1-1-1 ap, IV retrolateral 1-1-2 ap, I-II ventral 2-2-0-2-2, III ventral 1-2, IV ventral 2.

Male palp (Figs. 84-85). Tibia with VTA and RTA; VTA normal, much developed, RTA distally sclerotized and pointed. Bulb with two tegular apophyses much developed; the basal one not beaked, truncated apically, with heel, the apical one developed, long, embolus long, filiform.

Opisthosoma length/width ♀ 0.93-1.20, ♂ 1.06-1.27, with normal hairs.

Female genitalia (Figs. 81-82). Epigynum without median septum, vestibulum oval, wider than long, situated at the anterior part of the epigynum. Intromittent canals not united at the mid-line, intromittent canal thick, spermathecae small, reniform.

Coloration and markings. ♀: Prosoma yellow to light yellowish brown mottled with white, with a dark-coloured longitudinal stripe on each side and a pair of black lines at the middle; chelicerae, maxillae, labium and sternum light yellowish brown mottled with brown and white, legs dark-yellow to light-brown. Opisthosomal dorsum grey, dark-yellow or brown

with paired dark-coloured areas separated by white lines; venter greyish white, yellow or brown with four pairs of small black spots.

♂: Prosoma blackish brown to black with a U-shaped white or brownish yellow marking at the middle, head yellowish brown; chelicerae, maxillae, labium and sternum brown to black; legs: femora I-IV and patellae I-II blackish brown to black, patellae III-IV brown, the other segments beige, yellow or light brown. Opisthosomal dorsum brown to black, marginated with white and furnished with a pair of white transverse bars at the middle and a vertical white line at the posterior part; venter blackish brown to black.

Range. Japan (Hokkaido, Honshu, Shikoku, Kyushu, Nansei Islands), Korea, China, Mongolia, USSR (Siberia).

Biology. Collected from shrubs and grasses. Adult usually in summer, from June to August.

Remarks. In the group of X. luctans, this species most closely resembles X. emertoni Keyserling, 1880, widely distributed from Siberia through North America to Texas. The two species are almost the same in the structure of male palp, with the exception of the basal tegular apophysis. The apophysis is apically truncated in X. ephippiatus but bluntly coned in X. emertoni. In the female, however, there is a distinct difference in the shape of epigynum. The vestibulum of X. emertoni is cordate and similar to that of X. croceus. Relationship and distribution of X. ephippiatus were discussed in Ono (1981b).

Xysticus atrimaculatus Bösenberg et Strand, 1906

[Japanese name: Honkuroboshi-kanigumo]

Xysticus lateralis atrimaculatus Bösenberg et Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.264. Female holotype from "Kompira, Saga," Japan, W. Dönitz leg., in SMF, examined.

Xysticus atrimaculatus: S. Komatsu, 1936, Iconogr. Col. viv. aran. japan., 1, p.81. --- Ono, 1985, Bull. natn. Sci. Mus., Tokyo, (A), 11, p.35.

Xysticus audax atrimaculatus: Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p.896. (Nec Xysticus audax(Schrank, 1803).)

Xysticus lanio: Bonnet, 1959, Bibliogr. Aran., 2, p.4883. (Nec Xysticus lanio C.L. Koch, 1835.)

Xysticus bifurcus: Paik, 1973, Res. Rev. Kyungpook natn. Univ., 17, p.418 (partim). Female paratypes of X. bifurcus Paik, 1973 designated in the original description.

Notes. Xysticus atrimaculatus was originally described by Bösenberg and Strand (1906) as a subspecies of the European species, X. lateralis (Hahn, 1831). However, X. lateralis is regarded as a synonym of X. audax(Schrank, 1803), at the present day. The two great catalogue-workers, Roewer and Bonnet differ in opinion on the name X. lateralis atrimaculatus. While Roewer (1954) regarded it as a subspecies of X. audax, Bonnet (1959) considered it to be a synonym of X. lanio C.L. Koch, 1835. The discrepancy seem to be based chiefly on literature, not on the original specimens. According to my examination of the specimens of the

three species cited above, X. atrimaculatus proved to be an independent species entirely different from either X. audax or X. lanio.

Judging from the original illustration, the specimen described as the females of X. bifurcus Paik, 1973, and designated as the paratype of the species seems to belong to this species.

The name lateralis atrimaculatus was incorrectly applied to other Japanese species by some author until my previous paper was published (Ono, 1985a). (See the descriptions of X. bifidus and X. trizonatus sp. nov.)

Etymology. Specific name from Latin ater (black) + maculatus (spotted), derived from a pair of black spots on the prosoma.

Specimens examined. Holotype: ♀, "Kompira, Saga," Japan, W. Dönitz leg (SMF 4439).

4♀♀, Nagano Pref., Y. Chikuni leg. (NSMT-Ar 760); 1♀, Susado, Horigane-mura, Minamiazumi-gun, Nagano Pref., 20-VI-1969, Y. Chikuni leg. (NSMT-Ar 761); 1♀, Mt.Hikosan, Fukuoka Pref., 5~9-VI-1958, C. Okuma leg. (NSMT-Ar 762); 1♀, same locality, 3~8-VIII-1951, C. Okuma leg. (NSMT-Ar 763); 3♀♀, Mt. Shiragadake, Ué-mura, Kuma-gun, Kumamoto Pref., 12-VIII-1979, T. Koumori leg. (NSMT-Ar 764).

Description (male unkown). Measurement. Body length 6.30-9.63mm; prosoma length 2.96-3.70mm, width 2.89-3.52mm; opisthosoma length 3.48-5.78mm, width 3.33-5.63mm; lengths of legs of 1♀ from Mt. Hikosan, Fukuoka Pref. (NSMT-Ar 762) (in mm):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.08	2.16	2.36	1.72	3.20	10.52
II	1.08	2.08	2.40	1.64	3.12	10.32
III	0.76	1.28	1.52	1.28	2.40	7.24
IV	0.84	1.64	1.84	1.24	2.84	8.40

Prosoma length/width ♀ 1.00-1.06, with slightly blunt setae, ALE > PLE > PME ≧ AME, ALE/AME 1.80-2.00, PLE/PME 1.30-1.40, AME-AME/AME-ALE 1.84-2.06, PME-PME/PME-PLE 0.80-0.88, MOA-WA-WP 0.96-1.01, MOA-L/W 0.86-0.94, clypeus/AME-AME 0.65-0.79. Labium length/width 1.27-1.50, sternum length/width 1.28-1.41. Leg formula I-II-IV-III; tarsal claws of legs with 3 teeth.

Spiniformation of legs of 1♀ (NSMT-Ar 762). Femur: I prolateral 1-1-1, II-IV dorsal 1; patella: I-IV dorsal 1-0-1 (weak); tibia: I-IV dorsal 1-1-0, I ventral 1-2-2-2-2 ap, II ventral 1-2-1-2-2 ap, III-IV retrolateral 1-1, III ventral 1-2-0-2 ap, IV ventral 1-1-0; metatarsus: I-IV prolateral 1-1-2 ap, I-II prolateral 1-1-1 ap, ventral 2-2-0-2-2, III-IV retrolateral 1-1-2 ap, ventral 2-0.

Opisthosoma length/width 0.95-1.05, with normal hairs.

Female genitalia (Ono, 1985a, figs. 45-47). Epigynum convex, without median septum, intromittent orifices strongly sclerotized. Intromittent canal very short, not visible in dorsal view, spermathecae large, expanded, spermathecal cock united.

Coloration and markings. Prosoma yellowish brown mottled with brown, head lighter, a pair of dark-brown spots at the posterior part; chelicerae, maxillae, labium and sternum yellowish brown, palps and legs yellowish brown mottled with brown. Opisthosomal dorsum yellowish brown to blackish brown, with two latitudinal white stripes at the posterior part, venter light-brown.

Range. Japan (Honshu, Kyushu), Korea.

Biology. Unknown.

Remarks. This species is very similar in appearance to X. croceus and X. ephippiatus, but the vestibulum of epigynum is smaller than in the other two species, intromittent orifices strongly sclerotized and spermathecae are differently shaped.

Xysticus dichotomus Paik, 1973 (? = X. atrimaculatus, ♂)

[Japanese name: Yamayamiiro-kanigumo]

(Figs. 86-87)

Xysticus dichotomus Paik, 1973, Res. Rev. Kyungpook natn. Univ., 17, p.111. Male holotype from Mt. Kaya, 700m alt., Korea, 17-VII-1962, K.Y. Paik leg., 1♂ paratype from Mt. Kaya, 10-VII-1970, K.Y. Paik leg., in Knut, not examined. --- Ono, 1981, Kishidaia, Hino, (47), p.70.

Notes. This species was recently described by Paik (1973b), based on 2♂♂ collected on Mt. Kaya, Korea, in July. I have in my material 3♂♂ specimens from Japan, which can be identified with this species. The female of this species has not yet been known in both the countries. In my opinion, there is a strong possibility of conspecifity of X. atrimaculatus (only ♀ known) and X. dichotomus (only ♂ known), because Paik mentioned many ♀♀ of X. bifurcus (= X. atrimaculatus) collected on Mt. Kaya, the type locality of X. dichotomus, between May and August (Paik, 1973b p.109)

Etymology. Specific name from Greek δίχοτόμος, meaning cut in two, halved; probably derived from the white marking on the prosoma.

Specimens examined. 1♂, Kôzu-bokujô, Shimonita-cho, Kanra-gun, Gunma Pref., 25-VI-1972, A. Matsumoto leg. (NSMT-Ar 1453); 1♂, Mt. Daisen, Tottori Pref., 25-VI-1976, Y. Yoneda leg. (NSMT-Ar 1454); 1♂, Mt. Sobosan, between Oita and Miyazaki Pref., 21~26-VII-1964, C. Okuma leg. (NSMT-Ar 1455).

Description (based on the Japanese material). Measurement. Body length 4.96-6.60mm; prosoma length 2.67-3.41mm, width 2.67-3.08mm; opisthosoma length 2.67-3.41mm, width 2.37-3.04mm; lengths of legs of 1♂ from Kôzu-bokujô, Gunma Pref. (in mm):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.19	2.52	2.67	1.52	3.44	11.34
II	1.19	2.48	2.67	1.54	3.33	11.21
III	0.81	1.52	1.85	1.11	2.67	7.96
IV	0.93	1.70	1.93	1.11	2.74	8.41

Prosoma length/width 1.00-1.11, with normal hairs, ALE > PLE > PME ≧ AME, ALE/AME 1.77-2.00, PLE/PME 1.20-1.28, AME-AME/AME-ALE 1.82-1.90, PME-PME/PME-PLE 0.76-0.85, MOA-WA/WP 0.94-1.00, MOA-L/W 0.91-0.94, clypeus/AME-AME 0.64-0.90. Labium length/width 1.30-1.47, sternum length/width 1.17-1.36.

Spiniformation of legs of 1♂ from Mt. Sobosan. Femur: I dorsal 0-0-0-1-1-1-1-1, prolateral 8 irregularly, II dorsal 0-1-1-1-0-1, III-IV dorsal 1-1-1-1; patella I-IV dorsal 1-0-1, pro- and retrolateral 1; tibia: I-IV dorsal 1-1-0, I-II pro- and retrolateral 1-1, I ventral 1-2-2-2-2-2 ap, II ventral 2-2-2-2-2 ap, III-IV pro- and retrolateral 1-1, ventral 2-2-2 ap; metatarsus: I-IV pro- and retrolateral 1-1-2 ap, I-II ventral 2-2-2-2, III-IV ventral 2.

Male palp (Figs. 86-87). Tibia with VTA and RTA; VTA developed, sclerotized, RTA pointed. Bulb with two tegular apophyses; the median one heeled, the apical one curved prolaterally.

Opisthosoma length/width 1.07-1.14, with normal hairs.

Coloration and markings. Prosoma dark-brown with a V-shaped white marking at middle and indistinct white band on each side, a pair of black longitudinal stripes posterior to PME's; chelicerae, maxillae, labium and sternum brown, legs brown mottled with dark-brown, femora and patellae I-II much darker. Opisthosomal dorsum brown to blackish brown with two latitudinal white stripes at the posterior part, venter brown.

Range. Japan (Honshu, Kyushu), Korea.

Biology. Unknown.

Remarks. This species is so closely related to X. croceus that it is almost impossible to distinguish one from the other in general appearance. However, the shape of tegular apophyses of male palp of this species is different from that of X. croceus.

Xysticus insulicola Bösenberg et Strand, 1906

[Japanese name: Azuma-kanigumo]

(Figs. 88-91)

Xysticus insulicola Bösenberg et Strand, 1906, Abh. senckenb. naturf. Ges., 30, p. 260. Female holotype from Yokohama, Japan, in the Museum of Stuttgart, F.R. Germany, lost. --- Yuhara, 1931, Study of Spiders, p. 173. --- Uyemura, 1965, J. Jônan High School, Tokyo, 2, p. 46. --- Yaginuma & Arita, 1966, Acta arachnol., 20, p. 18. --- Yaginuma, 1966, Yamaguchiken-no-shizen, (15), p. 10. --- Paik, 1973, Res. Rev. Kyungpook natn. Univ., 17, p. 418. --- Ono, 1977, Kishidaia, Hino, (42), p. 8. --- Shinkai & Takano, 1984, Field Guide Spider Japan, p. 137.

Xysticus bifurcus Paik, 1973, Res. Rev. Kyungpook natn. Univ., 17, p. 418. Male holotype from Jikchisa, Korea, 21-VI-1963, K.Y. Paik leg., 1♂ paratype from Mt. Apsan, Taegu, Korea, 26-IV-1958, K.Y. Paik leg., 2♂♂ paratypes from Meumwha, Kangwondo, Korea, 12-V-1962 and 20-IV-1964, Y.K. Kim leg., 1♂ paratype from Jikchisa, 23-IV-1968, K.Y. Paik leg., in KNUT, not examined (partim, only ♂; ♀ belongs to X. atrimaculatus Bösenberg et Strand, 1906). (New synonymy.)

Notes. Paik (1973b) described X. bifurcus on a series of specimens collected in Korea. It is, however, certain that the male

and female combined by Paik beong to two different species: the female is the same as that of X. atrimaculatus Bösenberg et Strand, 1906, and the male as that of X. insulicola Bösenberg et Strand, 1906. Since the male was designated as the holotype, X. bifurcus Paik, 1973, should be regarded as a new synonym of X. insulicola.

Etymology. Specific name from Latin meaning an inhabitant of an island.

Specimens examined. 1♀, Okushiri Island, off Hokkaido, 26-VII-1964, M. Ohno leg. (NSMT-Ar 1472); 1♀, Nopporo, Ebetsu-shi, Hokkaido, 2-VIII-1984, M. Tomokuni leg. (NSMT-Ar 1473); 1♀, Imozawa, Onoda-cho, Kami-gun, Miyagi Pref., 5-IX-1982, K. Sasaki leg. (NSMT-Ar 1474); 1♀, Mt. Harunasan, Gunma Pref., 20-VI-1961, M. Ohno leg. (NSMT-Ar 1475); 1♀, Kasugayama, Joetsu-shi, Niigata Pref., 29-V-1978, M. Mizusawa leg. (NSMT-Ar 1476); 2♀♀1♂, Mt. Nyugasayama, Kamiina-gun, Nagano Pref., 4-VIII-1975, H. Ono leg. (NSMT-Ar 1477); 1♀, Hachiôji-shi, Tokyo, VII-1976, E. Shinkai leg. (NSMT-Ar 1478); 1♂ 2 juv. ♂, Nara-shi, Nara Pref., 29-IV-1955, T. Yaginuma leg. (NSMT-Ar 1479); 1♀, Mt. Daisen, Tottori Pref., 15-VIII-1965 (NSMT-Ar 1480); 1♀, Koreizan, Matsue-shi, Shimane Pref., 14-VI-1965, S. Kageyama leg. (NSMT-Ar 1481); 1♀, Mishima Island, Hagi-shi, Yamaguchi Pref., 5-VII-1964, M. Ohno leg. (NSMT-Ar 379); 1♀, Utsu, Mishima Island, Hagi-shi, Yamaguchi Pref., 6-V-1978, Y. Nishikawa leg. (YNO); 1♀, same data, K. Tani leg. (YNO); 1♀, same data, I. Hiura leg. (YNO); 1♀ 1 juv. ♀ 1 juv. ♂, Honmura, Mishima Island, Hagi-shi, Yamaguchi Pref., T. Yoshimura leg. (YNO); 4♂♂, Mt. Hikosan, Fukuoka Pref., 27~31-V-1959, C.

Okuma leg. (NSMT-Ar 1482); 3♀♀, same loc., 5 9-VI-1958, C. Okuma leg. (NSMT-Ar 1483); 1♀1♂, Nanakuma, Fukuoka-shi, Fukuoka Pref., 5-XI-1952, C. Okuma leg. (NSMT-Ar 1484); 1♀, Uranokawa, Kishuku-cho, Fukuejima Island, Minamimatsuura-gun, Nagasaki Pref., 14-V-1968, M. Ohno leg. (NSMT-Ar 1485).

Description. Measurement. Body length ♀ 5.52-10.52mm, ♂ 3.93-5.26mm; prosoma length ♀ 2.67-3.93mm, ♂ 2.11-2.74mm, width ♀ 2.59-3.70mm, ♂ 2.07-2.74mm; opisthosoma length ♀ 3.26-6.52mm, ♂ 2.00-2.96mm, width ♀ 2.44-6.30mm, ♂ 1.81-2.59mm; lengths of legs of 1♀1♂ from Mt. Hikosan, Fukuoka Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.92/1.08	2.00/2.40	2.16/2.32	1.52/1.24	2.96/2.92	9.56/9.96
II	0.96/1.04	2.00/2.24	2.20/2.04	1.48/1.20	2.92/2.84	9.56/9.36
III	0.68/0.72	1.08/1.16	1.28/1.32	1.00/0.92	2.04/2.00	6.08/6.12
IV	0.76/0.68	1.32/1.24	1.36/1.40	0.84/0.88	2.20/2.08	6.48/6.28

Prosoma length/width ♀ 0.99-1.07, ♂ 1.00-1.07, with normal setae, ALE > PLE > PME ≒ AME, ALE/AME ♀ 1.60-1.78, ♂ 1.71-1.84, PLE/PME ♀ 1.20-1.36, ♂ 1.25-1.39, AME-AME/AME-ALE ♀ 1.72-2.00, ♂ 1.62-1.74, PME-PME/PME-PLE ♀ 0.74-1.04, ♂ 0.90-1.00, MOA-WA/WP ♀ 0.92-1.02, ♂ 0.90-0.97, MOA-L/W ♀ 0.72-0.86, ♂ 0.75-0.88, clypeus/AME-AME ♀ 0.68-0.75, ♂ 0.71-0.80. Labium length/width ♀ 1.33-1.50, ♂ 1.35-1.50, sternum length/width ♀ 1.14-1.30, ♂ 1.10-1.33. Tarsal claws of legs with 3-4 teeth.

Spiniformation of legs of the ♀♂ used in the measurements of legs.

♀: Femur: I prolateral 1-1-1, II-IV dorsal 1-0; patella: III-IV dorsal 1-0-1 (weak); tibia: I-IV dorsal 1-1-0, I ventral 2-2-2-1-2 ap, II ventral 1-2-2-2 ap, III prolateral 1-1, III-IV ventral 1-1-2 ap; metatarsus: I-II prolateral 1-1-2 ap, retrolateral 0-1-1 ap, ventral 2-2-2-2, III-IV prolateral 1-1-2 ap, retrolateral 1 ap, III ventral 2, IV ventral 1.

♂: Femur: I-II dorsal 0-1-1-1-1, I prolateral irregularly 7, III-IV dorsal 1-1-1-1; patella: III-IV dorsal 1-0-1 (weak), II-IV prolateral 1, I-IV retrolateral 1; tibia: I-IV dorsal 1-1-0, I-II pro- and retrolateral 1-1-1, ventral 2-2-2-2-2 ap, III-IV prolateral 1-1, retrolateral 1-1-0, ventral 2-2-2 ap; metatarsus: I-IV prolateral 1-1-2 ap, I retrolateral 1-1-1 ap, II-IV retrolateral 1-1-2 ap, I-II ventral 2-2-2-2, III-IV ventral 2.

Male palp (Figs. 90-91). Tibia with VTA and RTA; VTA normal, RTA distally pointed. Bulb with two tegular apophyses much developed; median apophysis long, apically pointed, the apical one developed, distally bifid. Embolic division long, embolus filiform.

Opisthosoma longer than wide, length/width ♀ 1.01-1.34, ♂ 1.05-1.31, with normal hairs.

Female genitalia (Figs. 88-89). Epigynum without median septum, vestibulum oval, very wide, concave, marginally sclerotized. Intromittent canal very short and thick, spermathecae reniform.

Coloration and markings. ♀: Prosoma light yellowish brown with a pair of dark-brown longitudinal bands; chelicerae, maxillae, labium, sternum, palps and legs also light yellowish brown mottled with brown. Opisthosomal dorsum blackish brown, beige at middle, with two latitudinal

white stripes at the posterior part, venter yellowish brown.

♂: Prosoma dark-brown to black with a pair of black stripes on mesodiscus, metadiscus white; head with a white stripe between the eye rows; chelicerae, maxillae, labium, sternum chestnut; legs blackish brown, tibiae, metatarsus and tarsus lighter. Opisthosomal dorsum dark-brown, lighter at middle, with two white stripes at the posterior part, laterally beige, venter brownish grey.

Range. Japan (Hokkaido, Honshu, Kyushu), Korea.

Biology. Found in grassland and on roadside plants.

Remarks. This species resembles X. soldatovi Utochkin, 1968, from USSR and X. ferruginoides Schenkel, 1963, from China in the structure of male palp and X. excavatus Schenkel, 1963, X. davidi Schenkel, 1963, X. hotingchiehi Schenkel, 1963, and X. szetschuanensis Schenkel, 1963, in the shape of epigynum. It is necessary to make detailed comparison of these species. From the other species of the group of X. luctans in Japan, this species can be distinguished by the shape of both the sexual organs, but in general appearance, it is almost impossible to detect difference between this and other species, especially X. croceus Fox, 1937, and X. ephippiatus Simon, 1880.

Xysticus transversomaculatus Bösenberg et Strand, 1906

[Japanese name: Yokofu-kanigumo]

(Figs. 92-94)

Xysticus transversomaculatus Bösenberg et Strand, 1906, Abh. senckenb. naturf. Ges., 30, p. 263. Female holotype from "Saga, Kompira," Japan, W. Dönitz leg., in SMF, examined.

Notes. A single female specimen in the present material was identified with Xysticus transversomaculatus, which had never been recorded since its original description. The male is unknown.

Etymology. Specific name from Latin meaning "with transverse markings."

Specimens examined. Holotype: ♀, "Saga, Kompira," Japan, W. Dönitz leg. (SMF 4452).

1♀, Hozumidai, Ibaraki-shi, Osaka Pref., Japan, 31-III-1982, K. Nishikawa leg. (NSMT-Ar 1325).

Description (♀). Measurement. Body length 5.78-7.40mm; prosoma length 2.70-2.74mm, width 2.63-2.74mm; opisthosoma length 3.47-4.52mm, width 3.68-4.30mm. Lengths of legs of 1♀ from Osaka Pref. (in mm):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.89	1.70	1.78	1.41	2.44	8.22
II	0.89	1.67	1.74	1.37	2.44	8.11
III	0.65	0.85	1.11	0.86	1.89	5.36
IV	0.70	1.11	1.32	0.88	1.92	5.93

Prosoma length/width 0.98-1.04, with slightly blunt setae; ALE > PLE > AME = PME, ALE/AME 1.71 (measurements of eyes, labium and sternum were

made only on 1♀ from Osaka Pref.), PLE/PME 1.43, AME-AME/AME-ALE 2.00, PME-PME/PME-PLE 0.89, MOA-WA/WP 1.00, L/W 0.92, clypeus/AME-AME 0.61. Labium length/width 1.58, sternum length/width 1.26. Leg formula I-II-IV-III; number of teeth on tarsal claws of legs I-IV: 4-4-3-3.

Spiniformation of legs of 1♀ from Osaka Pref. Femur: II-IV dorsal each 1, I prolateral 1-1-1; patella: III-IV dorsal 1-0-1 (weak); tibia: I-II dorsal 1-1-0-0 (weak), prolateral 0-1, I ventral 1-2-2-2-2 ap (in the right leg 2-1-2-2 ap), II ventral 0-2-1-2-2 ap (in the right leg 0-1-1-2-2 ap), III-IV dorsal 1-1-0, prolateral 0-1, III ventral 0-2-2-2 ap (in the right leg 0-2-1-2 ap), IV ventral 1-1-1 ap; metatarsus: I-II prolateral 1-1-2 ap, retrolateral 1-1-1 ap, ventral 2-2-2-2, III-IV prolateral 1-1-2 ap, ventral 2, III retrolateral 1-1-2 ap, IV retrolateral 0-0-2 ap.

Opisthosoma globular, length/width 0.94-1.06, with short hairs.

Female genitalia (Figs. 93-94). Epigynum small, without median septum; vestibulum small, sclerotized at the sides. Intromittent canal present, tubular; spermathecae reniform, with folds.

Coloration and markings. Prosoma yellow, darker at the middle, with a pair of blackish brown vertical stripes, and marginated with black. Chelicerae, maxillae, labium and sternum yellowish brown mottled with brown; legs yellowish brown with white and blackish brown small spots. Opisthosoma light beige with grey markings (Fig. 92), venter light beige.

Range. Japan (Honshu, Kyushu).

Biology. Unknown.

Remarks. This species can be easily distinguished from the other

Xysticus species from Japan by the shape of epigynum. I put this species provisionally in the group of X. luctans, but the systematic position should be clarified when the male is obtained in the future. Bösenberg and Strand (1906) noted that this species is reminiscent of X. erraticus (Blackwall, 1834) and X. ulmi (Hahn, 1831).

Xysticus saganus Bösenberg et Strand, 1906

[Japanese name: Ôyamiiro-kanigumo]

(Figs. 95-100)

Xysticus saganus Bösenberg et Strand, 1906, Abh. senckenb. naturf. Ges., 30, p. 261. Male holotype from "Yunohama-Bergen bei Saga," Japan, W. Dönitz leg., in SMF, examined. --- S. Komatsu, 1936, Iconogr. Col. viv. aran. japon., 1, p. 74. --- Yaginuma, 1960, Spiders Japan Col., Osaka, p. 97; 1966, Atypus, Osaka, (40), p. 34; 1967, Lit. Dept. Rev. Otemon-Gakuin Univ., (1), p. 90; 1968, Spiders Japan Col., Osaka, (rev. ed.), p.97; 1986, ibid., (n. ed.), p. 201. --- Matsumoto et al, 1976, Spiders, p. 155. --- Shinkai & Takano, 1984, Field Guide Spider Japan, p. 136.

Xysticus tunicatus: Yaginuma, 1960, Spiders Japan Col., Osaka, p. 97; 1966, Atypus, Osaka,(40), p. 34; 1967, Lit. Dept. Rev. Otemon-Gakuin Univ., (1), p. 90. (Nec Xysticus tunicatus Bösenberg et Strand, 1906.)

Xysticus bifidus: Paik, 1973, Res. Rev. Kyungpook natn. Univ., 17, p. 109.

(Partim.) Female paratypes designated for X. bifidus Paik, 1973; not conspecific with the holotype.

Notes. Yaginuma (1966, 1967, 1968) reported that Xysticus saganus and X. tunicatus, both described by Bösenberg and Strand (1906), are the same species, and the former was regarded as a junior synonym of the latter. However, the epigynum illustrated by Yaginuma (1960, 1968) seemed somewhat different from the illustration of original material given by Bösenberg and Strand. Having examined the holotype of X. tunicatus (SMF 4456), I have come to the conclusion that X. saganus is not identical with X. tunicatus but should be synonymized with X. ephippiatus Simon, 1880.

Paik (1973b) described a new species of Xysticus from Korea under the name of X. bifidus. As I already pointed out, the paratype females of the species designated by Paik are not conspecific with the holotype male; the real female of X. bifidus was illustrated (Ono 1985a). Judging from the original illustration of epigynum and female genitalia, the female described by Paik as that of X. bifidus is regarded as that of X. saganus.

Etymology. Specific name from the type locality Saga and the Latin suffix "-anus" meaning place.

Specimens examined. Holotype: ♂, "Yunohama-Bergen bei Saga," Japan, W. Dönitz leg. (SMF 4434; by some mistake labelled Xysticus japonicus, also in the file card; X. japonicus was described not by Bösenberg and Strand (1906) but by Simon (1886); see Ono, 1985a, p. 33).

1♂, Shirakawa, Kamikawa-cho, Kamikawa-gun, Hokkaido, 12-VII-1983, N. Yasuda leg. (NSMT-Ar 994); 1♂, Okushiri Island, off Hokkaido,

26-VII-1964, M. Ohno leg. (NSMT-Ar 985); 1♂, Aonae, Okushiri Island, off Hokkaido, 29-VII-1964, M. Ohno leg. (NSMT-Ar 982); 1♂, Matsushima-shi, Miyagi Pref., 10-VIII-1982, K. Sasaki leg. (NSMT-Ar 993); 1♀, Kenmin-no-mori, Rifu-cho, Miyagi-gun, Miyagi Pref., 23-VII-1981, K. Sasaki leg. (NSMT-Ar 998); 2♀♀, Nagaoka-shi, Niigata Pref., 6-VII-1978, M. Mizusawa leg. (NSMT-Ar 999); 2♀♀1♂, Ôshima Island, Nanatsujima Islands, Ishikawa Pref., 5-VIII-1983, H. Tokumoto leg. (NSMT-Ar 1000); 1♀, Abiko-shi, Chiba Pref., 19-VIII-1969, S. Matsumoto leg. (NSMT-Ar 972); 1♂, Kururi-cho, Kimitsu-shi, Chiba Pref., 12-VIII-1984, T. Arima leg. (NSMT-Ar 991); 1♀, Chikura-cho, Awa-gun, Chiba Pref., 12~14-VIII-1984, H. Ono leg. (NSMT-Ar 992); 1♀, Iwai, Sodegaura-cho, Kimitsu-gun, Chiba Pref., 6-X-1970, S. Matsumoto leg. (NSMT-Ar 973); 1♂, Mt. Takatoriyama, Kanagawa Pref., 5-VIII-1983, S. Matsumoto leg. (NSMT-Ar 979); 2♂♂, Isehara-shi, Kanagawa Pref., 23-VII-1972, K. Takabayashi leg. (NSMT-Ar 1003); 1♂, Ichiyama, Amagiyugashima-cho, Tagata-gun, Shizuoka Pref., 30-VII-1982, K. Sasaki leg. (NSMT-Ar 969); 4 juv., Numazu-shi, Shizuoka Pref., 10~17-VII-1969, H. Ono leg. (NSMT-Ar 978); 3♀♀5♂♂, Matsumoto-shi, Nagano Pref., 4-VII-1982, Y. Chikuni leg. (NSMT-Ar 988); 1♀, Azuma-ku, Nagoya-shi, Aichi Pref., 15-VIII-1959, H. Suga leg. (NSMT-Ar 986); 2♀♀, Mt. Yoshinoyama, Nara Pref., 13-VIII-1963, T. Yaginuma leg. (TYO); 1♂, Ohtemon-Gakuin Univ., Ai, Ibaraki-shi, Osaka Pref., 5-VIII-1974, Y. Nishikawa leg. (NSMT-Ar 1001); 1♀, Hozumidai, Ibaraki-shi, Osaka Pref., 15-X-1982, Y. Nishikawa leg. (YNO); 1♂, Higashi-sumiyoshi-ku, Osaka-shi, Osaka Pref., 28-VII-1955, T. Yaginuma leg. (TYO); 1♀, Inoko, Tottori-shi, Tottori Pref., 16-VIII-1961, T. Arita leg. (NSMT-Ar 983); 1♀, Mt. Daisen, Tottori Pref., 24-VII-1968, C. Okuma leg.

(NSMT-Ar 990); 1♀, Torigoe, Hagi-shi, Yamaguchi Pref., 1-VII-1961, K. Murai leg. (NSMT-Ar 380); 1♂ (palpi lost), Miyano, Yamaguchi-shi, Yamaguchi Pref., VIII-1958, T.Fujii leg. (TYO); 1♂, Kochi-shi, Kochi Pref., 25-VIII-1949, K. Nakahira leg. (NSMT-Ar 977); 1♀, s.l., 16-VII-1975, H. Ono leg. (NSMT-Ar 975); 5♂♂, Kochi Airport, Nangoku-shi, Kochi Pref., 19-VII-1975, H. Ono leg. (NSMT-Ar 974); 5♂♂, Mt. Hikosan, Fukuoka Pref., 11-VII-1968, K. Kanmiya leg. (NSMT-Ar 996); 1♀, Tatara, Higashi-ku, Fukuoka-shi, Fukuoka Pref., 19-VIII-1961, C. Okuma leg. (NSMT-Ar 989); 1♀, Oita Pref., VIII-1963, S. Sato leg. (NSMT-Ar 987).

Description. Measurement. Body length ♀ 5.78-9.48mm, ♂ 3.56-5.33mm; prosoma length ♀ 3.11-3.85mm, ♂ 2.07-3.04mm, width ♀ 2.93-3.70mm, ♂ 1.93-2.78mm; opisthosoma length ♀ 3.70-5.93mm, ♂ 1.78-2.81mm, width ♀ 3.48-5.70mm, ♂ 1.48-2.59mm; lengths of legs of 1♀ from Nagoya-shi, Aichi Pref., and 1♂ from Ai, Ibaraki-shi, Osaka Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.08/1.08	2.08/2.04	2.40/2.20	1.60/1.24	3.08/2.76	10.24/9.32
II	1.08/1.04	2.08/2.08	2.32/2.16	1.64/1.24	3.04/2.80	10.16/9.32
III	0.80/0.72	1.24/1.12	1.44/1.32	1.12/0.88	2.20/1.72	6.80/5.76
IV	0.84/0.72	1.48/1.20	1.72/1.40	1.04/0.80	2.60/1.92	7.68/6.04

Prosoma length/width ♀ 1.02-1.16, ♂ 1.03-1.11, with normal setae, ALE > PLE > AME ≒ PME, ALE/AME ♀♂ 1.80-2.20, PLE/PME ♀ 1.40-1.66, ♂ 1.29-1.59, AME-AME/AME-ALE ♀ 1.46-1.79, ♂ 1.40-1.69, PME-PME/PME-PLE ♀ 0.88-1.04, ♂ 0.88-0.95, MOA-WA/WP ♀ 0.91-0.95, ♂ 0.86-0.93, MOA-L/W ♀ 0.77-0.87, ♂

0.82-0.88, clypeus/AME-AME ♀ 0.60-0.80, ♂ 0.74-0.86. Labium length/width ♀ 1.30-1.50, ♂ 1.33-1.44, sternum length/width ♀ 1.18-1.42, ♂ 1.11-1.30. Leg formula I-II-IV-III or II-I-IV-III; number of teeth of tarsal claws of legs I-IV: ♀♂ 4-4-3-3.

Spiniformation of legs of the same ♀♂ used in the measurement of legs. ♀: Femur: I-IV dorsal 1, I prolateral 0-1-1-1-0; patella: III-IV dorsal 1-0-1 (weak); tibia: I-IV dorsal 1-1-0, I prolateral 0-0-1, II prolateral 1-1-1, III-IV prolateral 1-1, III retrolateral 0-1, IV retrolateral 1-1 (weak), I-II ventral 2-2-2-2-1-2 ap, III ventral 2-2-2 ap, IV ventral 1-1-2 ap; metatarsus: I-II prolateral 1-1-0-2 ap, retrolateral 1-1-0-1 ap, ventral 2-2-2-2, III-IV prolateral 1-1-2 ap, retrolateral 1-1-1 ap, ventral 2.

♂: Femur: I-IV dorsal 1-1-1-1, I prolateral 0-1-1-1-0; patella: I-IV dorsal 1-0-1; tibia: I-IV dorsal 1-1-0, I-II prolateral 1-1-1, retrolateral 0-1-1, ventral 2-2-2-2 ap, III-IV prolateral 1-1, ventral 1-2-2 ap, III retrolateral 0-1, IV retrolateral 1-1; metatarsus: I prolateral 0-1-2 ap, II prolateral 1-1-2 ap, I-II retrolateral 0-1-1 ap, ventral 2-2, III prolateral 1-1-2 ap, IV prolateral 0-1-2 ap, ventral 2, III retrolateral 0-1-1 ap, IV retrolateral 1-1-0, III-IV ventral 2.

Male palp (Figs. 99-100). Tibia with VTA and RTA; VTA normal, RTA obtuse, distally sclerotized. Bulb with two tegular apophyses; the median one short and not heeled, the apical one simple, uncinate. Embolus long, filiform.

Opisthosoma length/width ♀ 0.98-1.10, ♂ 1.08-1.27, with normal hairs.

Female genitalia (Figs. 96-97). Epigynum with median septum wide, vestibular sclerites present. Intromittent canal short, expanded, spermathecae small, reniform; the two internal organs separated from each other and not united at mid-line.

Coloration and markings. ♀ (Fig. 95): Prosoma yellowish brown with a pair of brown longitudinal stripes, both the lateral margins brown; chelicerae, maxillae, labium, sternum, palps and legs yellowish brown mottled with brown. Opisthosomal dorsum beige, not lighter at middle, laterally dirty white, venter light beige with some small black circles arranged lengthways in two rows.

♂ (Fig. 98): Prosoma brown with a pair of dark-brown longitudinal stripes, both the lateral margins darker, the stripe and the marginal dark-coloured area frequently united; chelicerae, maxillae, labium and sternum yellowish brown, femora and patellae of legs I-II blackish brown, the other part of legs and palps yellow. Opisthosomal dorsum chestnut with a pair of latitudinal darker bands at middle and a white stripe at the posterior part, laterally white, venter yellowish brown with black circles as in the female.

Range. Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea, China.

Biology. This spider is found on the ground and on very low grasses. Usually adult in July and August.

Remarks. This species is related to the species belonging to the group of X. locuples (cf. Turnbull et al., 1965), most closely to X. acquiescens Emerton, 1919, distributed in the Central Plains of North America.

Xysticus trizonatus sp. nov.

[Japanese name: Obiboso-kanigumo]

(Figs. 101-107)

"Xysticus trizonatus Kishida:" Annen, 1940, Acta arachnol., 5, p.90. (Nomen nudum.)

"Xysticus trizonatus Kishida (MS):" Annen, 1941, Acta arachnol., 6, p. 111.

"Xysticus trizonatus Annen, 1941;" Yaginuma, 1962, Spider Fauna of Japan, p. 45; 1970, Bull. natn. Sci. Mus., Tokyo, 13, p. 670; 1977, Acta arachnol., 27 (spec. no.), p. 397. --- Shinkai, 1969, Spiders of Tokyo, p. 42; 1978, Mem. Educ. Inst. Private Schools, Japan, 56, p. 99. --- Shinkai & Takano, 1984, Field Guide Spider Japan, p. 137.

"Xysticus trizonatus (a doubtful name):" Yaginuma, 1978, Atypus, Osaka, (73), p. 9.

"Xysticus trizonatus Kishida in Annen, 1941 (nom. nud.):" Brignoli, 1983. Cat. Aran., Manchester, p. 608.

Notes. This species was first reported and illustrated by Annen (1941) under the name of Xysticus trizonatus Kishida (MS), which had never been described by Kishida himself. The name was considered valid with Annen as its author (Yaginuma, 1962, 1970, 1977), and the spider was recognized by Shinkai (1969) based on a new materal. However, Yaginuma (1978) revised Annen's article and posed a question if the name is valid or not, because of the unreliability of the poor and frequently erroneous description by Annen. Referring to Yaginuma's opinion, Brignoli (1983) regarded it as a

nomen nudum. In view of these circumstances, the species is newly described in the present paper.

Etymology. Specific name from Latin tri- (three) + zonatus (zonated).

Specimens examined. Holotype: ♀, Ôminato-machi, Mutsu-shi, Aomori Pref., 17-VII-1978, H. Yoshida leg. (NSMT-Ar 1434).

Other specimens examined. 1 juv. ♂, Dainohara-shinrin-kôen, Sendai-shi, Miyagi Pref., 5-XII-1982, K. Sasaki leg. (NSMT-Ar 1435); 1 juv. ♂, Shinrin-kôen between Kumagaya-shi and Higashimatsuyama-shi, Saitama Pref., 9-XII-1974, J. Shimada leg. (NSMT-Ar 1436); 1♀, Mt. Miharayama, Ôhshima Island, Tokyo, 3-VI-1976, Y. Chikuni leg. (NSMT-Ar 1437); 1 juv. ♀, Lake Yogo, 160m alt., Ika-gun, Shiga Pref., 18-III-1975, Y. Nishikawa leg. (NSMT-Ar 1438); 1♀, Nakazu, Tokuyama-shi, Yamaguchi Pref., summer 1963, T. Ozaki leg. (TYO); 1 juv. ♂, Kochi-shi, Kochi Pref., 24-VI-1964, K. Nakahira leg. (TYO); 1♂, Mt. Sefuriyama, Fukuoka Pref., 10-VI-1956, H. Kanmiya leg. (NSMT-Ar 1439).

Description. Measurement. Body length ♀ 5.70-7.26mm, ♂ 4.22mm; prosoma length ♀ 2.04-3.33mm, ♂ 2.30mm, width ♀ 2.00-3.33mm, ♂ 2.22mm; opisthosoma length ♀ 3.56-4.37mm, ♂ 2.67mm, width ♀ 3.47-4.52mm, ♂ 2.00mm; length of legs of 1♀ from Yamaguchi Pref. and 1♂ from Fukuoka Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.92/0.89	1.72/1.81	2.04/1.83	1.52/1.16	2.80/2.47	9.00/8.16
II	0.92/0.89	1.68/1.73	1.96/1.85	1.40/1.16	2.76/2.43	8.72/8.06

III	0.60/0.59	0.84/0.93	1.20/1.15	0.84/0.76	1.92/1.63	5.40/5.06
IV	0.64/0.59	1.08/0.96	1.40/1.26	0.88/0.76	2.16/1.78	6.16/5.35

Prosoma length/width ♀ 0.96-1.02, ♂ 1.03, ♀ with blunt setae, ALE > PLE > AME ≒ PME, ALE/AME ♀ 1.75-1.80, ♂ 1.50, PLE/PME ♀ 1.25-1.50, ♂ 1.33, AME-AME/AME-ALE ♀ 1.46-1.54, ♂ 1.52, PME-PME/PME-PLE ♀ 1.02-1.05, ♂ 0.97, MOA-WA-WP ♀ 0.91-0.93, ♂ 0.87, MOA-L/W ♀ 0.77-0.80, ♂ 0.79, clypeus/AME-AME ♀ 0.55-0.66, ♂ 0.55. Labium length/width ♀ 1.27-1.30, ♂ 1.58, sternum length/width ♀ 1.22-1.33, ♂ 1.22. Leg formula I-II-IV-III; tarsal claws of legs I-II with 4-5 teeth, III-IV with 3-4.

Spiniformation of legs of same ♀♂ used for the measurements of legs. ♀: Femur: I prolateral 1-1-1-0-1-0-0, II dorsal 0-1-0-0, III-IV dorsal 1-0; patella: III-IV retrolateral 1 (weak); tibia: I-IV dorsal 1-1 (weak), I prolateral 0-0-1, ventral 2-2-1-2-2-2 ap, II ventral 2-2-2-2-2 ap, III-IV prolateral 0-1, III ventral 1-2-2 ap, IV ventral 1-1-1 ap metatarsus: I-II prolateral 1-1-2 ap, retrolateral 1-1-1 ap, ventral 2-2-2-2, III-IV prolateral 1-1-1 ap, III retrolateral 1 ap.

♂: Femur: I dorsal 0-1-1-1-1, prolateral irregularly 9, II dorsal 1-1-1-1-1, III-IV dorsal 0-1-1-1; patella: I-IV dorsal 1-0-1 (weak), III-IV retrolateral 1; tibia: I-IV dorsal 1-1-0 (weak), I-II pro- and retrolateral 1-1-1, I ventral 2-2-1-2-2-2 ap, II ventral 2-2-0-2-2 ap, III-IV pro- and retrolateral 1-1, III ventral 2-2-2 ap, IV ventral 1-2-2 ap; metatarsus: I-II prolateral 1-1-2 ap, retrolateral 1-1-1 ap, ventral 2-2-0-2, III-IV pro- and retrolateral 1-1-1 ap, III ventral 1.

Male palp (Figs. 105-107). Tibia with VTA and RTA; VTA normal, RTA

obtuse. Bulb with two tegular apophyses; median apophysis small, securiform; apical apophysis not much developed, uncinate, embolus long, filiform.

Opisthosoma length/width ♀ 0.96-1.14, ♂ 1.33, with stout hairs.

Female genitalia (Figs. 102-103). Epigynum with median septum, vestibular sclerites oval, raised and hard. Intromittent canal tubular, winding, spermathecae small, oval.

Coloration and markings. ♀♂: Prosoma dark yellow to yellowish brown, with the sides brown, a pair of black spots on the posterior declivity distinct; chelicerae, maxillae and labium light brown mottled with dark-brown, sternum golden yellow, legs and palps light brown mottled with dark-brown. Opisthosomal dorsum yellowish, purplish or dark-brown with indistinct white and dark-coloured markings, venter dark grey, white at the sides.

Range. Japan (Honshu, Shikoku, Kyushu).

Biology. Collected from soil and litter; frequently found under bark of trees.

Remarks. This species bears close resemblance to X. gulosus Keyserling, 1880, and X. pellax O. Pickard-Cambridge, 1894, occurring in North America, and X. lanio C. L. Koch, 1835, from Europe, but is distinguishable from them by the shape of tegular apophyses of male palp and female internal genitalia.

Xysticus kurilensis Strand, 1907

[Japanese name: Chishima-kanigumo]

(Figs. 108-116)

Xysticus kurilensis Strand, 1907, Abh. naturf. Ges. Görlitz, 25, p. 209. Female holotype from "Iterup (sic), Kurilen," in ZSM, missing. --- Ono, 1986, Mem. natn. Sci. Mus., Tokyo, (19), p. 170.

?Xysticus triguttatus: Peelle & S. Saito, 1933, J. Fac. Sci. Hokkaido imp. Univ., (6-Zool.), 2, p. 113. --- S. Saito, 1959, Spider Book Illustr. Col., p. 131. (Nec Xysticus triguttatus Keyserling, 1880.)

Notes. Xysticus kurilensis has never been correctly recognized since it was originally described by Strand (1907b) from Etorofu (Iturup) Island of the Kuriles. I have identified this with an unnamed Xysticus spider collected from various parts of Japan, based on the accordance of Strand's illustration with the shape of epigynum of the unnamed spider in question, though the type specimen of X. kurilensis was not available (Ono, 1986).

Peelle and Saito (1933) recorded the North American species, Xysticus triguttatus, from Shikotan Island of the Kuriles. However, the illustration of epigynum by Peelle and Saito (1933) and S. Saito (1959) shows that the species before them is no doubt identical with X. kurilensis, not with X. triguttatus. Since Saito's specimens were lost, it is impossible to ascertain the identity.

Etymology. Specific name from the Kurile Islands, Japan, + Latin suffix "-ensis."

Specimens examined. 1♀, Nukabira, Kamishihoro-cho, Katou-gun, Hokkaido, 11-VI-1984, M. Matsuda leg. (NSMT-Ar 1491); 1♂, same locality, 25-VI-1984, M. Matsuda leg. (NSMT-Ar 1492); 1♀, Sôunkyô, Kamikawa-gun, Hokkaido, 16-VI-1981, N. Yasuda leg. (NSMT-Ar 1493); 2♂♂, same locality, 24-VI-1981, N. Yasuda leg. (NSMT-Ar 1494); 1♂, Nopporo, Ebetsu-shi, Hokkaido, 2-VIII-1984, M. Tomokuni leg. (NSMT-Ar 1495); 1♀1♂, Ohata-machi, Shimokita-gun, Aomori Pref., 9-VII-1956, C. Okuma leg. (NSMT-Ar 1496); 2♀♀, Ônuma, Mt. Iwate, Iwate Pref., 15-VII-1974, H. Ono leg. (NSMT-Ar 1497); 1♀, Hôrainuma-Hachimannuma, Hachimantai, Iwate Pref., 14-VII-1974, H. Ono leg. (NSMT-Ar 1498); 1♀, Koiwai-nôjô, Shizukuishi-machi, Iwate-gun, Iwate Pref., 12-VII-1972, H. Ono leg. (NSMT-Ar 1499); 2♀♀, Ukishima, Iwate-machi, Iwate-gun, Iwate Pref., 10-VIII-1965, S. Kataoka leg. (NSMT-Ar 1500); 1♀, Mt.Oshiroyama, Sendai-shi, Miyagi Pref., 11-VII-1983, K. Sasaki leg. (NSMT-Ar 1501); 1♂, Mt. Asakusa-dake, 1,380-1,550m alt., Tadami-cho, Minamiaizu-gun, Fukushima Pref., 5-VIII-1984, S.-I. Uéno leg. (NSMT-Ar 1502); 4♀♀, Mt. Asakusadake, Kitauonuma-gun, Niigata Pref., 22-VII-1978, M. Mizusawa leg. (NSMT-Ar 1503); 2♀♀, Gongenzaki, Nô-machi, Nishikubiki-gun, Niigata Pref., 6-VIII-1984, S.-I. Uéno leg. (NSMT-Ar 1504); 1♀, Nikko, Tochigi Pref., 9-VII-1956, S. Kimoto leg. (NSMT-Ar 1505); 1♀1♂, Usuitoge, 1,000m alt., Usui-gun, Gunma Pref., 1-VII-1984, T. Hayashi leg. (NSMT-Ar 1506); 1♀1♂, Shinrin-kôen, 1,000m alt., Moyagi-mura, Seta-gun, Gunma Pref., 23-VI-1984, T. Hayashi leg. (NSMT-Ar 1507); 1♂, Mt. Kiyosumi, Chiba Pref., 6-VIII-1971, H. Ono leg. (NSMT-Ar 1508); 1♀1♂, Okuchichibu, Saitama Pref., 4 5-VIII-1979, H. Ono leg. (NSMT-Ar 1514); 1♂, Urayama, Chichibu-shi, Saitama Pref., 29-VII-1976, K. Suzuki leg. (NSMT-Ar 1515); 1♀ 2 juv., Mt.

Kurosaki-takaoyama, Mikurajima Island, Izu Islands, Tokyo, 13-VII-1970, F. Fuwa & H. Ono leg. (NSMT-Ar 1509); 1♀, Hatajuku, Hakone-machi, Ashigara-shimo-gun, Kanagawa Pref., 31-VII-1972, S. Matsumoto leg. (NSMT-Ar 1510); 3♀♀, Fuezuka, Hakone-machi, Ashigara-shimo-gun, Kanagawa Pref., 29-VII-1972, M. Ozawa leg. (NSMT-Ar 1511); 1♂, same locality, 29-VII-1972, S. Takano leg. (NSMT-Ar 1512); 1♀, Owaku-dani, Hakone-machi, Ashigara-shimo-gun, Kanagawa Pref., 13-IX-1983, S. Matsumoto leg. (NSMT-Ar 1513); 1♀1♂ 1 juv., Mt. Hôryuzan, S slope, 410m alt., Machino-machi, Wajima-shi, Ishikawa Pref., 29-V-1985, S.-I. Uéno, Y. Nishikawa & H. Ono leg. (NSMT-Ar 1520); 1♂, Mt. Yomurazukayama, NE slope, 100m alt., Notojima Island, Kashima-gun, Ishikawa Pref., 30-V-1985, same collector (NSMT-Ar 1521); 1♀, Sano-machi, 150-200m alt., Nanao-shi, Ishikawa Pref., 28-V-1985, same collector (NSMT-Ar 1522); 1♀1♂, Jôyama, 200-270m alt., Nanao-shi, Ishikawa Pref., 28-V-1985, same collector (NSMT-Ar 1523); 3♀♀3♂♂, Mt. Sekidozan, SW slope, 450-500m alt., Kashima-gun, Ishikawa Pref., 1-VI-1985, same collector (NSTM-Ar 1524); 1♀3♂♂, Mt. Hôdatsusan, NE slope, 600m alt., Oshimizu-machi, Hakui-gun, Ishikawa Pref., 31-V-1985, same collector (NSMT-Ar 1525); 2♀♀2♂♂, Mt. Sunagozenyama, W slope, 800-880m alt., Shiramine-mura, Ishikawa-gun, Ishikawa Pref., 4-VI-1985, H. Ono leg. (NSMT-Ar 1526); 1♂, Karuizawa-machi, Kitasaku-gun, Nagano Pref., 1-VI-1976, H. Ono leg. (NSMT-Ar 1517); 4♀♀5♂♂, Susado, Horigane-mura, Minamiazumi-gun, Nagano Pref., 10-VI-1982, Y. Chikuni leg. (NSMT-Ar 1518); 1♀, Irôzaki, Minamiizu-machi, Kamo-gun, Shizuoka Pref., 5-VIII-1976, H. Ono leg. (NSMT-Ar 1516); 1♀, Mt. Ibukisan, Kasuga-mura, 1,000-1,300m alt., Ibi-gun, Gifu Pref., 6~9-X-1974, Y. Nishikawa leg. (NSMT-Ar 1519).

Description. Measurement. Body-length ♀ 5.33-9.00mm, ♂ 4.52-5.78mm; prosoma length ♀ 2.41-3.70mm, ♂ 2.44-3.10mm, width ♀ 2.30-3.20mm, ♂ 2.22-2.80mm; opisthosoma length ♀ 2.89-5.41mm, ♂ 2.15-3.11mm, width ♀ 2.63-5.48mm, ♂ 2.00-3.19mm; lengths of legs of 1♀1♂ from Kanagawa Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.92/1.16	1.76/2.56	1.80/2.44	1.28/1.40	2.44/3.24	8.20/10.80
II	1.00/1.20	1.92/2.44	2.12/2.20	1.52/1.44	2.92/3.28	9.48/10.56
III	0.80/0.84	1.16/1.44	1.52/1.52	1.12/1.12	2.20/2.40	6.80/ 7.32
IV	0.88/0.92	1.52/1.76	1.72/1.84	1.00/1.00	2.40/2.52	7.52/ 8.04

Prosoma length/width ♀ 1.04-1.16, ♂ 1.01-1.13, with blunt setae, ALE > PLE > PME ≧ AME, ALE/AME ♀ 1.77-2.00, ♂ 1.75-2.00, PLE/PME ♀ 1.35-1.44, ♂ 1.29-1.63, AME-AME/AME-ALE ♀ 1.52-1.91, ♂ 1.63-1.77, PME-PME/PME-PLE ♀ 0.78-0.92, ♂ 0.78-0.95, MOA/WA-WP ♀ 0.91-1.00, ♂ 0.91-0.98, MOA/L/W ♀ 0.87-0.93, ♂ 0.85-0.95, clypeus/AME-AME ♀ 0.61-0.89, ♂ 0.56-0.84. Labium length/width ♀ 1.33-1.54, ♂ 1.38-1.60, sternum length/width ♀ 1.16-1.28, ♂ 1.12-1.28. Tarsal claws of legs I-IV ♀ ♂ with 3-4 teeth.

Spiniformation of legs of 1♀1♂ used in the measurements. ♀: Femur: I-IV dorsal 1, I prolateral irregularly 9 (in the right leg 10); patella: I-IV dorsal 1-0-1; tibia: I-IV dorsal 1-1-0, I-III prolateral 1-1-1, IV prolateral 1-1, I-II retrolateral none, III-IV retrolateral 0-1, I ventral 2-2-1-1-2-1-2 ap (at the right leg 2-2-2-2-2 ap), II ventral 2-1-2-2-2-2 ap, III ventral 1-2-2 ap, IV ventral 1-1-1 ap; metatarsus: I

prolateral 1-1-1-2 ap, retrolateral 1-1-1-1 ap, ventral 1-2-2, II prolateral 1-1-0-2 ap, retrolateral 1-1-0-1 ap, ventral 2-2-0-2-2, III-IV pro- and retrolateral 1-1-2 ap, ventral 2.

♂: Femur: I-IV dorsal 0-1-1-1-1, I prolateral 1-1-1-1 (in the right leg 1-1-1-1-1); patella: I-IV dorsal 1-0-1 (weak), retrolateral 1; tibia: I-IV dorsal 1-1-0, I-II pro- and retrolateral 1-1-1, ventral 2-2-2-2 ap, III-IV prolateral 1-1, retrolateral 1-0-1, ventral 2-2-0-2 ap; metatarsus: I-II prolateral 0-1-0-2 ap, retrolateral 0-1-0-1 ap, I ventral 2-0-2-0, II ventral 2-2, III-IV prolateral 1-1-0-2 ap, III retrolateral 1-1-1 ap, IV retrolateral 1-1-2 ap, III-IV ventral 2.

Male palp (Ono, 1986, figs. 5-6). Tibia with VTA and RTA; VTA normal, RTA distally pointed. Bulb with two tegular apophyses; the basal one beaked, with heel, the median one uncinate; embolus long, filiform. Basal tegular apophysis variable in shape (cf. Figs. 111-116).

Opisthosoma length/width ♀ 0.96-1.10, ♂ 0.97-1.15, with blunt hairs.

Female genitalia (Ono, 1986, figs. 7-8). Epigynum variable (cf. Figs. 109-110), with median septum not very wide, vestibulum oval, vestibular sclerite present. Intromittent canal thick, frequently expanded, spermathecae reniform.

Coloration and markings. ♀: Prosoma yellowish brown to brown with distinct dark-brown bands; chelicerae, maxillae, labium and sternum dark-yellow to yellowish brown mottled with brown, legs light-brown with dark-brown spots, femora darker. Opisthosomal dorsum brown, dark- or blackish brown without distinct markings, venter light-brown.

♂: Prosoma brown to black, lighter at the middle, laterally

darker; chelicerae, labium, maxillae light brown to blackish brown, sternum dark-brown, lighter at the middle, femora and patellae I-II blackish brown, the other segments of legs I-II and all segments of legs III-IV dark-yellow or light yellowish brown with dark-brown small spots. Opisthosoma brown or dark-brown with indistinct black and white markings, venter dark greyish brown, yellowish brown or dark-brown.

Range. Japan (Hokkaido, Honshu).

Biology. This species is found in forests, on the ground, in leaf litter or rarely collected from lower vegetations. Usually adult in June, July and August.

Remarks. Xysticus kurilensis is very similar to X. lesserti Schenkel, 1963, described from China in the structure of sexual organs of both the sexes. Since variations are observed in the shape of male palp and epigynum of Japanese specimens, it seems necessary to compare X. kurilensis with the continental species.

Xysticus audax (Schrank, 1803)

[Japanese name: Kita-kanigumo]

(Figs. 117-122)

Arenea audax Schrank, 1803, Fn. Boica, 3, p. 236. Type specimen from Germany, depository?

Thomisus pini Hahn, 1831, type specimen from Nürnberg, Germany, depository?

--- Lebert, 1877, N. Denkschr. schw. naturf. Ges., 23, p. 259.

Thomisus lateralis Hahn, 1831, Arachniden, 1, p. 40. Type specimen from Nürnberg, Germany, depository? --- Lebert, 1877, N. Denkschr. schw. natruf. Ges., 23, p. 267.

Xystica lateralis: Simon, 1864, Hist. nat. Araign. (Aranéides), p. 427.

Xysticus audax: C. L. Koch, 1835, in Panzer, Fn. ins. Germ., (129), pl. 16-17; 1837, Übersicht Arachnidensyst., (1), p. 35; 1840, in Fürnrohr, Naturh. Topogr. Regensberg, 3, p. 412; 1845, Arachniden, 12, p. 74; 1847, Syst. Myriapod. Verzeichn. Bericht. Dtschl. Crust., Myriapod. Arachn., p. 231; 1851, Übersicht Arachnidensyst., (5), p. 39. --- Prach, 1866, Verh. zool. bot. Ges. Wien, 16, p. 615. --- Simon, 1918, Bull. Soc. ent. France, for 1918, p. 52; 1932, Arachn. France, 6, p. 816, 828. --- Denis, 1933, Bull. Soc. Hist. nat. Toulouse, 65, p. 580; 1938, Proc. zool. Soc. London, (B), 107, p. 584. --- Schenkel, 1936, Rev. suisse Zool., 43, p. 310; 1939, ditto, 46, p. 97. --- Bristowe, 1939, Comity of Spiders, 1, p. 28. --- Tullgren, 1944, Svensk Spindelfauna, 3, p. 89. --- Locket & Millidge, 1951, British Spiders, 1, p. 179. --- Utochkin, 1968, Pauki roda Xysticus Fauni SSR, p. 12. --- Braun & Rabeler, 1969, Abh. senckenb. naturf. Ges., 522, p. 66. --- Tyshchenko, 1971, Operedel. pauk. evrop. casti SSSR, p. 120. --- Miller, 1971, Klic zvireny CSSR, 4, p. 119, 122. --- Holm, 1973, Zool. Scripta, 2, p. 106. --- Sauer & Wunderlich, 1982, Schönsten Spinnen Europas, p. 47. --- Palmgren, 1983, Ann. zool. fenn., 20, p. 204. --- Jones, 1984, Spiders Britain & N. Europe, p. 118. --- Roberts, 1985,

Spiders Great Britain & Ireland, 1, p. 100. --- Matsuda, 1985, Bull. Higashi Taisetsu Mus. nat. Hist., (7), p. 26.

Thomisus audax: Blackwall, 1854, Ann. Mag. nat. Hist., (2), 14, p. 29; 1861, History of Spiders Great Britain & Ireland, p. 70. --- Staveley, 1866, British Spiders, p. 70.

Xysticus pini: C.L. Koch, 1851, Übersicht Arachnidensyst., (5), p. 39. --- Thorell, 1856, Nova Acta reg. Soc. sci. Upsal., (3), 2, p. 171; 1873, Synonyms Eur. Spiders, p. 424. --- Pavesi, 1873, Ann. Mus. civ. Stor. nat. Genova, 4, p. 153. --- O. Pickard-Cambridge, 1881, Proc. Dorset nat. Hist. Field Club, for 1881, p. 299; 1885, Sci. Res. Second Yarkand Mission, p. 66. ---Simon, 1875, Arachn. France, 2, p. 164. --- Menge, 1876, Schr. naturf. Ges. Danzig, (N.F.), 3, p. 443. --- Kulczyński, 1881, Spraw. kom. fizyogr. Krakow, 15, p. 301. --- Becker, 1882, Ann. Mus. roy. Hist. nat. Belg., 10, p. 167. --- Chyzer & Kulczyński, 1891, Aran. hung., 1, p. 87, 90, 93. --- Bösenberg, 1902, Zoologica, Stuttgart, 14, p. 345. --- Planet, 1905, Araignées, p. 179. --- Bösenberg & Strand, 1906, Abh. senckenb. naturf. Ges., 30, p. 260. --- Lessert, 1910, Cat. Invertébr. Suisse, 3, Araignées, p. 369. --- Reimoser, 1919, Abh. zool. bot. Ges. Wien, 10, p. 130. --- Charitonow, 1923, Izw. biol. Inst. Perm, 2, p. 32; 1926, Iejiegod zool. Muz. Akad, Naouk. SSSR, 26, p. 120; 1926, Izw. biol. Inst. Perm, 5, p. 54; 1932, Iejiegod. Zool. Muz. Akad. Nauk. SSSR, 32, p. 160. --- Roewer, 1928, Tierw. Mitteleur., Araneae, 3, pp. VI-23, 25. --- Iermolaiew, 1937, Festschr. Strand, 2, p. 523. --- Kolosváry, 1934, Folia zool.

hydrobiol., 7, p. 41; 1936, ditto, 9, p. 95; 1937, Festschr. Strand, 3, p. 406. --- Nielsen, 1932, Biology of Spiders, 2, p. 41. --- S. Saito, 1935, Trans, Sapporo nat. Hist. Soc., 14, p. 52.

Xysticus cristatus: Palmgren, 1950, Acta zool. fenn., 62, p. 12. --- Vilbaste, 1969, Eesti Ämblikud, 1, p. 47. --- Prószyński & Starega, 1971, Pajaki, Katalog Fauny Polski, 33, p. 250. (Partim.) (For further literature cf. Roewer (1954) and Bonnet (1959).)

Notes. Strand (in Bösenberg & Strand (1906)) observed a specimen of a Xysticus spider in the museum of Munich and identified it with X. pini, which is at present considered a synonym of X. audax. However, as he noted in the work "Japanische Spinnen" that the specimen may have come from Japan, this record cannot be perfectly reliable. Since that time, no collecting record of this species has been made in Japan, while S. Saito (1935) reported its occurrence in southern Sakhalien.

Recently I obtained a few specimens of this species collected in Tohoku and Hokkaido and confirmed that the species actually occurs in Japan.

Etymology. Specific name from Latin meaning bold.

Specimens examined. 1♀, Nukabira, Kamishihoro-cho, Katou-gun, Hokkaido, 3-IX-1980, M. Matsuda leg. (NSMT-Ar 1326); 1♂, Otofukegawa, 720m alt., Kamishihoro-cho, Katou-gun, Hokkaido, 28-V-1984, M. Matsuda leg. (NSMT-Ar 1327); 1♂, Irohanuma, 1,400m alt., Mt. Zaôzan, Yamagata Pref., 28-VII-1984, H. Yoshida leg. (NSMT-Ar 1328).

Description (based on the Japanese material). Measurement. Body-length ♀ 4.81 mm, ♂ 4.66-4.69mm; prosoma length ♀ 2.37mm, ♂ 2.44mm,

width ♀ 2.26mm, ♂ 2.30-2.33mm; opisthosoma length ♀ 2.67mm, ♂ 2.44-2.67mm, width ♀ 2.44mm, ♂ 2.15-2.22mm; lengths of legs of 1♀1♂ from Hokkaido (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.89/1.04	1.56/2.15	1.60/2.00	1.15/1.11	2.22/2.52	7.42/8.82
II	0.81/1.04	1.54/2.07	1.63/2.00	1.11/1.11	2.22/2.67	7.31/8.89
III	0.62/0.71	0.89/1.19	1.01/1.26	0.81/0.81	1.70/1.89	5.03/5.86
IV	0.67/0.74	0.93/1.33	1.22/1.37	0.80/0.74	1.73/1.93	5.35/6.11

Prosoma length/width ♀ 1.04, ♂ 1.04-1.07, with slightly blunt setae, ALE > PLE > PME ≅ AME, ALE/AME ♀ 1.68, ♂ 1.60-1.74, PLE/PME ♀ 1.25, ♂ 1.25-1.38, AME-AME/AME-ALE ♀ 1.78, ♂ 1.77-1.87, PME-PME/PME-PLE ♀♂ 1.00, MOA-WA/WP ♀ 0.96, ♂ 0.93-1.00, MOA-L/W ♀ 0.87, ♂ 0.85-0.88, clypeus/AME-AME ♀ 0.64, ♂ 0.59-0.76. Labium length/width ♀ 1.24, ♂ 1.30-1.47, sternum length/width ♀ 1.21, ♂ 1.21-1.33. Tarsal claws of legs I-IV with 4 teeth in male, 3 in female.

Spiniformation of legs of 1♀1♂ used in the measurements. ♀: Femur: II-IV dorsal 1, I prolateral 0-1-1-1-0; patella: I-IV dorsal 1-0-1 (weak), III-IV retrolateral 1; tibia: I-IV dorsal 1-1-0-0, I-II ventral 2-2-2-2 ap, III ventral 0-2-2 ap (in the right leg 0-2-0), IV ventral 1; metatarsus: I-III prolateral 1-1-2 ap, IV prolateral 0-1-1 ap, I retrolateral 1-1-1 ap, ventral 2-2-0-2, II retrolateral 1-1-2 ap, ventral 2-2-0-2, III retrolateral 0-1-1 ap (in the right leg 0-0-1 ap), ventral 2, IV retrolateral none, ventral 1.

♂: Femur: I dorsal 0-0-1-1-1-1, prolateral irregularly 10, II dorsal 1-1-1-1-1, III dorsal 1-1-1-1 (in the right leg 1-1-1-1-1-1), IV dorsal 1-1-1-1-1-1; patella: I-IV dorsal 1-0-1 (weak), pro- and retrolateral 1; tibia: III-IV dorsal 1-1-0, I-II pro- and retrolateral 1-1-1, ventral 2-2-2-2 ap, III-IV pro- and retrolateral 1-1, ventral 2-2-0-2 ap; metatarsus: I-IV prolateral 1-1-2 ap, I-III retrolateral 1-1-1 ap, IV retrolateral 1-1-2 ap, I-II ventral 2-2-0-2, III-IV ventral 2.

Male palp (Figs. 121-122). Tibia with VTA and RTA; VTA much developed, RTA obtuse. Bulb with three tegular apophyses much developed; the basal one heeled, apically beaked and pointed, the apical one much developed, the median one small, spiniform; embolus long, the apical part curved retrolaterally.

Opisthosoma length/width ♀ 1.09, ♂ 1.13-1.21, with slightly blunt hairs.

Female genitalia (Figs. 118-119). Epigynum with median septum wide, vestibulum not oval, its medial margin sclerotized, vestibular sclerites present. Intromittent canal winding in an S-shape, longer than that of X. cristatus; spermatheca reniform, spemathecal cock normal.

Coloration and markings. ♀: Prosoma chestnut brown mottled with white, beige at middle; chelicerae, maxillae, labium and sternum beige mottled with brown, legs beige. Opisthosoma dirty yellowish brown with light-coloured markings, the underside yellowish brown.

♂: Prosoma blackish brown to black mottled with white, mesodiscus white or brown, head white; chelicerae, maxillae and labium yellowish brown to brown, sternum yellowish brown mottled with white, femora and patellae

I-IV brown to blackish brown, tibiae yellowish brown to brown, proximally darker, tarsi and metatarsi yellow or yellowish brown. Opisthosomal dorsum light-brown with a pair of longitudinal stripes brown to dark-brown and two pairs of latitudinal white lines at the posterior part, laterally white; venter brown.

Range. Japan (Hokkaido, Honshu); northern Eurasia, Iceland.

Biology. Jones (1983) described: "frequent on gorse and heather on heatherland, usually in higher vegetation than X. cristatus." Palmgren (1983) in Finnland: "X. audax (128 ♂) kommt auf Nadelbäumen, auch jungen, auf Juniperus und zweitweise (Überwinterung?) im Waldboden vor." Braun (1969) collected some observation on the habitat of this species from literature. Adult in spring and early summer in Europe, the collecting dates in Japan: May, July and September.

Remarks. This species is very closely related to X. cristatus (Clerck, 1758) and frequently confused with the latter because both the species are occasionally found in the same place. These two species are, however, distinguishable from each other by the shape of the distal part of embolus in the male palp and the intromittent canal in the female genitalia.

Xysticus bifidus Paik, 1973

[Japanese name: Kuroboshi-kanigumo]

(Fig. 123-125)

Xysticus lateralis atrimaculatus: Yaginuma, 1960, Spiders Japan Col., Osaka, p. 97; 1968, ibid. (rev. ed.), p. 97. (Nec Xysticus lateralis atrimaculatus Bösenberg et Strand, 1906.) --- Hu, 1984, Chinese Spiders Fields Forests, p. 348.

Xysticus bifidus Paik, 1973, Res. Rev. Kyungpook natn. Univ., 17, p. 109. Male holotype from Jinjoo, Korea, 22-VII-1964, K. Y. Paik leg., 3♂♂ paratypes, same data as holotype, 3♂♂ paratypes from Taegu, 14-VII-1956, E. I. Paik leg., 1♂ paratype from Seungseu, Taegu, 11-VII-1962, K. Y. Paik leg., in Knut, not examined (partim, only ♂; ♀ beongs to X. saganus Bösenberg et Strand, 1906). --- M.-S. Zhu, 1983, Spiders Paddy Fields Shanxi, p. 193 (♂). --- Ono, 1985, Bull. natn. Sci. Mus., Tokyo, (A), 11, p. 35. --- Yaginuma, 1986, Spiders Japan Col., (n. ed.), Osaka, p. 202.

Xysticus atrimaculatus: M.-S. Zhu, 1983, Spiders Paddy Fields Shanxi, p. 192 (♀).

Notes. Japanese Xysticus spiders carrying a pair of black patches at the posterior part of prosoma have hitherto been identified always with Xysticus lateralis atrimaculatus Bösenberg et Strand, 1906. Having examined abundant specimens of Xysticus spiders, however, I recognized at least four different species in Japan, all having the black patches on the prosoma.

One of these atrimaculated species was recently identified with X. bifidus originally described by Paik from Korea (Ono, 1985a). It is relatively common in Japan, especially in paddy fields. Though the male characteristics of the Japanese specimens exactly agree with the description

and illustrations of X. bifidus given by Paik, the female ones are considerably different from Paik's drawings. It is evident that the male (holotype) and female combined by Paik do not belong to the same species; the female possesses the characteristics of X. saganus Bösenberg et Strand, 1906.

Etymology. Specific name from Latin meaning bifid, forked; probably derived from the shape of basal tegular apophysis of male palp.

Specimens examined. Japan: 1♀, Akayu-machi, Nanyo-shi, Yamagata Pref., 8-X-1961, S. Nishiki leg. (NSMT-Ar 377); 1♂, Lake Hakuryu, Nanyo-shi, Yamagata Pref., 10-IV-1961, S. Nishiki leg. (NSMT-Ar 741); 1♀, Yaotome, Sendai-shi, Miyagi Pref., 5-VI-1982, K. Sasaki leg. (NSMT-Ar 742); 1♀1♂, same locality, 16-27-IV-1983, K. Sasaki leg. (NSMT-Ar 743); 1♀1♂, s.l., 7-VI-1983, K. Sasaki leg. (NSMT-Ar 744); 1♀, Kamiagari, Sendai-shi, Miyagi Pref., 20-IX-1981, K. Sasaki leg. (NSMT-Ar 745); 1♀1♂, Matsubushi, Kitakatsushika-gun, Saitama Pref., 27-V-1973, K. Suzuki leg. (NSMT-Ar 746); 1♀, Nishikawa, Futtsu-shi, Chiba Pref., 4-VIII-1978, T. Kawana leg. (NSMT-Ar 747); 1♀, Aoki, Futtsu-shi, Chiba Pref., 1-VIII-1978, T. Kawana leg. (NSMT-Ar 748); 1♀, Nagano Pref., Y. Chikuni leg. (NSMT-Ar 749); 1♂, Tamanoshima, Ibaraki-shi, Osaka, 28-VI-1981, Y. Nishikawa leg. (YNO); 1♀1♂, Mt. Daimanji, Dôgo, Oki Islands, Shimane Pref., 10-VII-1964, M. Ohno leg. (NSMT-Ar 750); 1♀, Yusato-cho, Shimane Pref., 19-VII-1959, K. Yaginuma leg. (TYO); 2♀♀, paddy field, Tokushima Pref., 6-VIII-1957 (TYO); 3♂♂ 3 juv., Tokushima Pref., V-1957, Kobayashi leg. (NSMT-Ar 751); 3♂♂ 1 juv. ♂, 4 juv. ♀, paddy field, Tokushima Pref., 6-VIII-1957 (NSMT-Ar 752).

Mongolia: 1♀, Selenga ajamak, Shamov, 19-VII-1980, K. Ulykpan leg.

(ZMM); 1♀, same locality, 26-VII-1980, K. Ulykpan leg. (ZMM).

Description. Measurement. Body length ♀ 5.70-8.89mm, ♂ 2.96-4.30mm; prosoma length ♀ 2.74-3.33mm, ♂ 1.63-2.22mm, width ♀ 2.74-3.41mm, ♂ 1.67-2.15mm; opisthosoma length ♀ 3.41-5.26mm, ♂ 1.56-2.30mm, width ♀ 3.41-5.11mm, ♂ 1.59-2.07mm; lengths of legs of 1♀1♂ from Mt. Daimanji, Dôgo, Oki Islands, Shimane Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.92/0.80	1.80/1.76	2.04/1.60	1.60/1.04	2.80/2.12	9.16/7.32
II	0.92/0.76	1.72/1.48	2.08/1.52	1.60/1.04	2.88/2.16	9.20/6.96
III	0.72/0.56	1.00/0.80	1.28/0.92	1.04/0.68	2.08/1.44	6.12/4.40
IV	0.68/0.68	1.16/0.76	1.52/0.96	1.04/0.64	2.32/1.44	6.72/4.48

Prosoma length/width ♀ 0.97-1.07, ♂ 0.97-1.05, with normal setae, ALE > PLE > AME ≧ PME, ALE/AME ♀ 1.50-1.78, ♂ 1.71-2.00, PLE/PME ♀ 1.25-1.43, ♂ 1.33-1.60, AME-AME/AME-ALE ♀ 1.39-1.82, ♂ 1.42-1.70, PME-PME/PME-PLE ♀ 0.92-1.00, ♂ 0.81-0.89, MOA-WA/WP ♀ 0.91-0.97, ♂ 0.87-1.00, MOA-L/W ♀ 0.81-0.87, ♂ 0.84-0.94, clypeus/AME-AME ♀ 0.55-0.72, ♂ 0.54-0.67. Labium length/width ♀ 1.27-1.43, ♂ 1.25-1.50, sternum length/width ♀ 1.12-1.38, ♂ 1.09-1.31. Leg formula I-II-IV-III or II-I-IV-III; tarsal claws of legs I-IV with 2-3 teeth.

Spiniformation of legs of the ♀ used in the measurement of legs. ♀: Femur: I prolateral 0-1-1-1-0, II-IV dorsal 1; patella: III-IV dorsal 1-0-1 (weak), pro- and retrolateral 1; tibia: I-IV dorsal 1-1-0, I retrolateral 1 ap, ventral 1-1-2-1-2-2-2 ap, II ventral 1-2-2-2-2 ap, III

prolateral 0-1, ventral 1-1, IV ventral 1; metatarsus: I-IV prolateral 1-1-2 ap, I retrolateral 0-1-1 ap, ventral 2-2-2-2, II retrolateral 0-1-2 ap, ventral 2-2-2-2, III retrolateral 1-1-2 ap, ventral 2, IV retrolateral 0-0-2 ap, ventral 1.

♂: Femur: I dorsal 0-0-1-1-1, II dorsal 0-1-1-1-1, III-IV dorsal 0-1-1-1; patella: III-IV dorsal 1-0-1 (weak), retrolateral 1; tibia: I-IV dorsal 1-1-0, I ventral 2-1-2-2 ap, II ventral 1-2-2-2 ap, III retrolateral 0-1, ventral 0-1-1 ap, IV pro- and retrolateral 1-1, ventral 0-1-1 ap; metatarsus: I-II prolateral 0-1-2 ap, ventral 2-2, I retrolateral 0-1-1 ap, II retrolateral 0-0-1 ap, III pro- and retrolateral 0-1-1 ap, ventral 1, IV prolateral 0-1-2 ap, retrolateral and ventral 1.

Male palp (Figs. 124-125). Tibia with VTA and RTA; VTA normal, RTA pointed. Bulb much longer than wide, with two tegular apophyses; the median one bifid, the apical one simple, uncinate. Embolic division long, embolus filiform.

Opisthosoma length/width ♀ 0.91-1.03, ♂ 0.98-1.14, with normal hairs.

Female genitalia (Ono, 1985a, figs. 49-51). Epigynum with median septum narrow and variable in width, margin of vestibulum sclerotized but forming no sclerite. Intromittent canal visible in dorsal view, thin and winding; spermathecae reniform, spermathecal cock developed.

Coloration and markings. ♀: Prosoma beige to light brown with a brown longitudinal bands, darker marginated, a pair of dark-brown spots on the posterior declivity; chelicerae, maxillae, labium, sternum, palps and legs beige or yellowish brown. Opisthosomeal dorsum beige or yellowish

brown with indistinct darker markings, venter beige or yellowish brown.

♂: Prosoma dark-brown, lighter at middle; chelicerae, maxillae, labium, sternum and palps yellowish brown mottled with brown, femora I-IV and tibia I-II dark-brown, the other parts of legs yellowish brown. Opisthosomal dorsum blackish brown with a large white marking at middle and two latitudinal white bands at the posterior part, venter dark-brown.

Range. Japan (Honshu, Shikoku), Korea, China, Mongolia.

Biology. On the ground and very low grasses. Collected frequently in paddy fields, Adult from April to October.

Remarks. This species is very closely related to X. ferrugineus Menge, 1876, distributed in South Europe, but is distinguished from the latter by the shape of median tegular apophysis of male palp and larger vestibulum of epigynum.

Genus Oxyptila Simon, 1864

[Japanese name: Ochibakanigumo-zoku]

Ozyptila Simon, 1864, Hist. Nat. Araign. (Aranéides), p. 439. --- Bryant, 1930, Psyche, 37, p. 376. --- Strand, 1934, Folia zool. hydrobiol., 6, p. 273. --- Gertsch, 1939, Bull. Amer. Mus. nat. Hist., 76, p. 340; 1953, ibid., 102, p. 463. --- Crome, 1962, Mitt. dtsch. ent. Ges., 21, p. 37. --- Schick, 1965, Bull. Amer. Mus. nat. Hist., 129, p. 171. --- Dondale & Redner, 1975, J. Arachnol., 2, p. 132; 1978, Ins. Arachn. Canada Alaska, 5, p. 149.

Oxyptila: Thorell, 1869, Nova Acta reg. Soc. Sci. Upsal., (3), 7, p. 36; 1970, ibid., p. 182. --- Simon, 1875, Arachn. France, 2, p. 211; 1895, Hist. nat. Araign., éd. 2, 1, p. 1035; 1932, Arachn. France, 4, p. 792. --- Keyserling, 1880, Spinnen Amerikas, Laterigradae, p. 4. --- Becker, 1882, Ann. Mus. roy. hist. nat. Belg., 10, p. 194. --- Chyzer & Kulczyński, 1891, Aran., hung., 1, p. 81, 97. --- Bösenberg, 1901, Zoologica, Stuttgart, 14, p. 17. --- Planet, 1905, Araignées, p. 175. --- Lessert, 1910, Cat. Invertéb. Suisse, Araign., p. 357. --- Comstock, 1913, Spider Book, p. 524; 1948, ibid., rev. ed., p. 543. --- Petrunkevitch, 1928, Trans. Conn.Acad. Arts Sci., 29, p. 168. --- Roewer, 1928, Tierw. Mitteleur., 3(2), p. VI-19. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p. 285, 301. --- S. Saito, 1936, Rept. 1st Sci. Exped. Manchoukuo, (5) 1(3), p. 13. --- Kaston, 1948, Spid. Conn., p. 419; 1953, How to Know Spid., p. 98. --- Locket & Millidge, 1951, Brit. Spid., 1, p. 187. --- Tikader, 1971, Mem. zool. Surv. India. 15(3), p. 35; 1980, Fn. Ind., Aran., 1, p. 79. --- Tyshchenko, 1971, Opredel. Pauk. Evrop. casti SSSR, p. 115. --- Miller, 1971, Klic. zvireny CSSR, 4, p. 114. --- Vilvaste, 1969, Eesti Ämblikud, 1, p. 76. --- Hubert, 1979, Araignées, p. 170. --- Roberts, 1985, Spid. Great Brit. Ireland, 1, p. 104. --- Yaginuma, 1986, Spiders Japan Col., Osaka, (n. ed.), p. 203.

Notes. Simon (1864) established this genus under the name of Ozyptila derived from Greek ὀξύς + πτίλον. However, the Latinization was

not correct; [xi] should be Latinized to "x." For this reason, Thorell (1869) amended the name to Oxyptila, which has been recognized by most authors mainly in Europe (Simon, 1875a, 1895a, 1932; Locket & Millidge, 1951; Bonnet, 1958, 1969). According to the rules of the International Code on Zoological Nomenclature, the original spelling should stand. American Araneologists proposed to use Ozyptila as the original (Gertsch, 1939, 1953; Schick, 1965; Dondale & Redner, 1975, 1978). I considered that this problem should be discussed and decided by the International Commission on Zoological Nomenclature and for the time being, used Oxyptila as the European tradition (Ono, 1977b).

Type species. In the original designation by Simon (1864), Thomisus claveatus Walckenaer, 1837, Hist. nat. Ins. Aptères, 1, p. 510. In the second edition of Histoire Naturelle des Araignees, however, Simon (1895) changed his former opinion and newly designated Oxyptila brevipes (Hahn, 1826) as its type species.

Etymology. From Greek $o\xi\upsilon\varsigma$ (piquant) + $\pi\tau\acute{\iota}\lambda o\nu$ (duvet).

Diagonosis. Small-sized thomisids; male slightly smaller and darker than female. Prosoma as wide as or slightly longer than wide, convex, covered with clavate and spatulate hairs and setae; head narrow. Lateral eyes on tubercles; ALE > PLE > AME > PME, PME very small, AME-AME > AME-ALE, PME-PME < PME-PLE, MOA nearly as long as wide, wider in front than behind, clypeus nearly as wide as AME-AME. Chelicerae toothless; labium longer than wide; sternum nearly as long as wide. Leg formula I ≒ II-IV-III; legs thick and short, without scopula and claw tufts; claws of tarsi with 2-3 teeth; tibia I-II with two pair of ventral setae.

Opisthosoma wider than long in both female and male, with clavate or spatulate hairs. Epigynum strongly sclerotized, with a central hood. Intromittent canal short, spermatheca usually globular. Male palp complicated; tibia with VTA and RTA, frequently with ITA; RTA with distal tooth sclerotized. Bulb usually with tegular apophysis, embolus usually short and spiniform.

Range. Holarctic.

Biology. The spiders of this genus are soil-dwellers and can be obtained from soil and litter by sifting and by extractions with Tullgren funnels.

Species included. About 80 species have been described.

Remarks. This genus is distinguished from the related genera Xysticus, Coriarachne and Bassaniana by its small size, shape of body, tibiae I-II with two pair of ventral spines and structure of male palp and female genitalia.

In Japan, three species have been recognized.

Key to the Japanese Species

1(2) Male palp without tegular apophysis, embolus long, filiform; epigynum with a central hood situated at the middle ..... O. nipponica Ono, 1985.

2(1) Male palp with tegular apophysis, embolus short, spiniform; epigynum with a central hood in the anterior part.

3(4) Tegular apophisis of male palp pointed; sclerotized ridge of

epigynum indistinct, distance between intromittent canals wider ..... O. sincera Kulczyński, 1926

4(3) Tegular apophysis of male palp blunt; sclerotized ridge of epigynum distinct, distance between intromittent canals narrower ..... O. matsumotoi sp. nov.

Oxyptila nipponica Ono, 1985

[Japanese name: Nippon-ochibakanigumo]

(Fig. 126)

Oxyptila sp. (B): Ono, 1977, Kishidaia, Hino, (42), p. 5.

Oxyptila nipponica Ono, 1985, Bull. natn. Sci. Mus., Tokyo, (A), 11, p. 29. Male holotype, female allotype, 22♀♀8♂♂ paratypes from Suwa-jinja, Nagasaki-shi, Nagasaki Pref., Japan, 9-IV-1983, S. Nomura leg., in NSMT, examined. —— Yaginuma, 1986, Spiders Japan Col., Osaka, (n. ed.), p. 204.

Etymology. Specific name derived from the native country of the species.

Specimens examined. Type series: Holotype: ♂, Suwa-jinja, Nagasaki-shi, Nagasaki Pref., Japan, 9-IV-1983, S. Nomura leg. (NSMT-Ar 703); allotype: ♀, same data as holotype (NSMT-Ar 704); paratypes: 22♀♀8♂♂, same data, (NSMT-Ar 705).

1♀, Oshoro, Otaru-shi, Hokkaido, datum unknown, Sakagami leg.

(TYO); 1♀, Dainohara Shinrin-kôen, Sendai-shi, Miyagi Pref., 5-XII-1982, K. Sasaki leg. (NSMT-Ar 706); 1♀ 2 juv. ♂, Yaotome, Izumi-shi, Miyagi Pref., 23-V-1982, K. Sasaki leg. (NSMT-Ar 707); 1♀ 2 juv., Kurokawa-mura, Kitakanbara-gun, Niigata Pref., 16-III-1973, K. Baba leg. (NSMT-Ar 709); 4♀♀3♂♂ 2 juv., Mt. Takadateyama, Mashiko-cho, Haga-gun, Tochigi Pref., 9-VI-1979, H. Saito leg. (NSMT-Ar 710); 2♀♀2♂♂, Matsuda, Ashikaga-shi, Tochigi Pref., 15-IX-1979, H. Saito leg. (NSMT-Ar 711); 1♀, Emi-cho, Chiba Pref., 30-VII-1970, S. Matsumoto leg. (NSMT-Ar 712); 1♀, Tokyo, datum and collector unknown (ZSM); 3♂♂, Machida-shi, Tokyo, 20-VI-1979, Y. Shibata leg. (NSMT-Ar 713); 2♀♀, Ôta-ku, Tokyo, 27-VI-1982, H. Sato leg. (NSMT-Ar 714); 2♀♀ 3 juv., Taba, 700m alt., Okutama-cho, Tokyo, 24-X-1982, H. Sato leg. (NSMT-Ar 715); 1♀2♂♂ 12 juv., Mabuse, Ôshima Island, Tokyo, 21-XI-1983, O. Nakamura & A. Ando leg. (NSMT-Ar 718); 2♂♂ 7 juv., Izumisaki, Miyakejima Island, Tokyo, 6-XII-1983, O. Nakamura leg. (NSMT-Ar 720); 6 juv., Airport, Hachijôjima Island, Tokyo, 7-XI-1983, O. Nakamura & Hagino leg. (NSMT-Ar 727); 2♀♀, Nagasawa, Miura-shi, Kanagawa Pref., 20-I-1978, K. Kumada leg. (NSMT-Ar 728); 10♀♀1♂ 1 juv., Shirahama-jinja, Shizuoka-shi, Shizuoka Pref., 2-IV-1980, Y. Taneguchi leg. (NSMT-Ar 729); 1♀ 2 juv., Miyamoto-jinja, Sauchi, Ise-shi, Mie Pref., 13-V-1984, Y. Nishikawa leg. (YNO); 1♂, Nara-shi, Nara Pref., 17-XII-1967, collector unknown (TYO); 1♀, Sakurai, Shimamoto-cho, Mishima-gun, Osaka Pref., 15-III-1980, Y. Nishikawa leg. (YNO); 2♀♀ 2 juv. ♂, Uyama, 410m alt., Toyonaga, Niimi-shi, Okayama Pref., 9-VII-1984, Y. Nishikawa leg. (YNO); 6♀♀1♂ 2 juv., Shiroyama, Matsuyama-shi, Ehime Pref., 23-X-1973, N. Tsuru leg. (NSMT-Ar 739); 1♀, Mt. Hikosan, Fukuoka Pref., 4-V-1983, S. Nomura leg. (NSMT-Ar 732); 1♀1♂, Mt.Inunakiyama,

Kurate-gun, Fukuoka Pref., 14-II-1960, K. Morimoto leg. (NSMT-Ar 734); 2♀♀, Mt. Seira, Imari-shi, Saga Pref., 8-IV-1983, S. Nomura leg. (NSMT-Ar 737); 2♀♀ 3 juv., Ueki-cho, Kumamoto-shi, Kumamoto Pref., 29-V-1983, S. Naomi leg. (NSMT-Ar 738).

Description. Measurement. Body length ♀ 2.00-3.33mm, ♂ 1.85-2.52mm; prosoma length ♀ 1.19-1.33mm, ♂ 1.04-1.30mm, width ♀ 1.26-1.44mm, ♂ 1.07-1.30mm; opisthosoma length ♀ 1.41-1.78mm, ♂ 0.99-1.19mm, width ♀ 1.70-2.07mm, ♂ 1.15-1.41mm; lengths of legs of the ♀ allotype and ♂ holotype (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.48/0.54	0.68/0.73	0.69/0.79	0.51/0.61	0.91/1.12	3.27/3.79
II	0.47/0.55	0.65/0.74	0.70/0.75	0.51/0.64	0.96/1.13	3.29/3.81
III	0.35/0.35	0.35/0.38	0.45/0.53	0.40/0.50	0.68/0.86	2.23/2.62
IV	0.34/0.38	0.36/0.48	0.49/0.53	0.40/0.48	0.68/0.83	2.27/2.70

Prosoma wider than long, rarely as long as wide (length/width ♀ 0.91-0.98, ♂ 0.93-1.00), with spatulate setae and hairs, ALE > PLE > AME > PME, PME very small, ALE/AME ♀ 1.87-2.13, ♂ 2.00-2.23, PLE/PME ♀ 2.40-3.00, ♂ 2.40-3.25, AME-AME/AME-ALE ♀ 1.33-1.67, ♂ 1.60-2.00, PME-PME/PME-PLE ♀ 0.50-0.57, ♂ 0.50-0.63, MOA-WA/WP ♀♂ 1.13-1.34, MOA-L/W ♀ 1.00-1.09, ♂ 1.00-1.15, clypeus/AME-AME ♀ 0.88-1.11, ♂ 0.88-1.00. Labium length/width ♀ 1.28-1.38, ♂ 1.28-1.34, sternum length/width ♀ 1.00-1.13, ♂ 0.97-1.07, cordate. Tarsal claws of legs I-II with three teeth, III-IV with two.

Spiniformation of legs. ♀ (allotype): Tibia: I-II ventral 2-2; metatarsus: I-II pro- and retrolateral each 1 ap, ventral 2-2.

♂(holotype): Femur: I prolateral 1, III dorsal 1; tibia: I-IV dorsal 1-1-0 (weak), I-II ventral 2-2; metatarsus: I-II pro- and retrolateral 1 ap, ventral 2-2.

Male palp (Ono, 1985a, figs. 27-29). Tibia with VTA and RTA; VTA digitiform, RTA with distal tooth. Bulb without tegular apophysis, embolus long, filiform.

Opisthosoma wider than long (length/width ♀ 0.76-0.86, ♂ 0.78-0.92), with spatulate hairs.

Female genitalia (Ono, 1985a, figs. 30-32). Epigynum strongly sclerotized, with a hood at the middle. Intromittent canal long and winding, spermathecae globular.

Coloration and markings. ♀: Prosoma yellowish brown, brown at the sides; chelicerae, maxillae, labium, sternum and legs III-IV yellowish brown, legs I-II brown. Opisthosoma yellowish brown with indistinct markings and dark-coloured spots, venter yellowish brown.

♂: Prosoma chestnut-brown, lighter at the middle, tubercles of eyes white; chelicerae, maxillae, labium, sternum and legs brown. Opisthosoma dark yellowish brown with dark-coloured spots, venter yellowish brown.

Range. Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Biology. This spider is a soil-inhabitant collected from leaf litter not only by hand sorting but also by sifting and sampling with Tullgren funnels. Adult ♀♀ are found all the year round, ♂♂ in February, April, June, September, November and December.

Remarks. The male palp of this species is similar in shape to that of O. blackwalli Simon, 1875, from Europe and the species of the group of floridana sensu Dondale and Redner (1975) known from North America. The bulb does not bear tegular apophysis; the embolus is very long and filiform. However, this species is easily distinguished from them by the shape of male palpal tibia and the female genitalia.

Oxyptila sincera Kulczyński, 1926

[Japanese name: Kita-Ochibakanigumo]

(Figs. 127-130)

Oxyptila sincera Kulczyński, 1926, Iejiegod. zool. Muz. Akad. Nauk SSSR, 27, p. 62. Female holotype from "Klutschevskoje" (Klyuchevskaya Sopka), Kamchatka, 31-V-1909, in MPUW, not examined (redescribed by Dondale & Redner (1975)). --- Schenkel, 1930, Ark. Zool., 21A, (15), p. 28.

Ozyptila sincera: Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 879. --- Dondale & Redner, 1975, J. Arachnol., 2, p. 149.

Notes. Having re-examined its type specimen, Dondale and Redner (1975) redescribed Oxyptila sincera originally known from Kamchatka, and recognized that the species had been wrongly identified with O. monroensis Keyserling, 1884, or O. bryantae Gertsch, 1939, both widely distributed in North America. They divided the species into three subspecies, O. sincera

sincera (Kamchatka), O. sincera canadensis Dondale et Redner, 1975 (from Alaska to Ontario) and O. sincera oraria Dondale et Redner, 1975 (Baltimore and Maryland). Judging from the description given by Dondale and Redner and from the features of some specimens from Japan, which I examined, it can be surmised that there are actually two good species, O. sincera widely distributed from Japan to North America and O. oraria occurring only on the East Coast of North America. I identified the Japanese specimens with the original species, because I was unable to examine any American specimen.

The species is newly recorded to the Japanese fauna.

Etymology. Specific name from Latin meaning untainted or real.

Specimens examined. 1♂, Oshidomari--Ponyama, Rishiri Island, Hokkaido, Japan, 8-VII-1984, N. Tsurusaki leg. (NSMT-Ar 1548); 1♀ 3 juv. ♀, Konuma, Mt. Akagisan, Gunma Pref., Japan, 16-IV-1979, H. Saito leg. (NSMT-Ar 1549); 1 juv., Shirakomaike, Mt. Yatsugatake, Minamisaku-gun, Nagano Pref., Japan, VIII-1975, H. Ono leg. (NSMT-Ar 1550).

Description. Measurement. Body length ♀ 4.30mm, ♂ 3.48mm; prosoma length ♀ 1.78mm, ♂ 1.52mm, width ♀ 1.70mm, ♂ 1.48mm; opisthosoma length ♀ 2.48mm, ♂ 1.63mm, width ♀ 2.59mm, ♂ 1.70mm. Lengths of legs of 1♀ from Gunma Pref. and 1♂ from Hokkaido (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.65/0.59	1.05/1.00	1.03/1.02	0.82/0.70	1.46/1.39	5.01/4.70
II	0.64/0.63	1.05/1.04	1.04/1.08	0.79/0.69	1.55/1.46	5.07/4.90
III	0.48/0.46	0.55/0.55	0.70/0.68	0.63/0.53	1.10/1.03	3.46/3.25
IV	0.50/0.56	0.71/0.63	0.75/0.73	0.61/0.53	1.18/1.10	3.75/3.55

Prosoma slightly longer than wide (length/width ♀ 1.05, ♂ 1.03), smooth, with clavate setae and hairs; head narrow. Lateral eyes developed, ALE > PLE > PME ≧ AME, ALE/AME ♀ 2.00, ♂ 1.78, PLE/PME ♀ 1.60, ♂ 1.40, AME-AME/AME-ALE ♀ 1.75, ♂ 1.43, PME-PME/PME-PLE ♀ 0.52, ♂ 0.59, MOA-WA/WP ♀ 1.09, ♂ 0.95, MOA-L/W ♀ 1.17, ♂ 1.20, clypeus/AME-AME ♀ 0.86, ♂ 1.20. Labium length/width ♀ 1.09, ♂ 1.33, sternum length/width ♀ 1.27, ♂ 1.07.

Spiniformation of legs. ♀ (Gunma Pref.): Femur: I prolateral 0-1-1-0, II-IV dorsal 1; tibia: I-IV dorsal 1-1-0-0, I-II ventral 2-2; metatarsus: I-II pro- and retrolateral each 1 ap, ventral 2-2.

♂ (Hokkaido): Femur: I prolateral 0-1-1-0, II-III dorsal 1; tibia: I-IV dorsal 1, ventral 2-2; metatarsus; I-II prolateral 0-1-0-1 ap, retrolateral 1 ap, ventral 2-2.

Male palp (Figs. 129-130). Tibia with VTA and RTA; VTA bifurcated (ITA?), RTA strongly sclerotized with a distal tooth finger-shaped. Bulb with a tegular apophysis pointed, embolus distally spiniform and curved.

Opisthosoma wider than long (length/width ♀♂ 0.96), with clavate hairs.

Female genitalia (Figs. 127-128). Epigynum with a wide central hood situated in the anterior part; intromittent orifices strongly sclerotized. Intromittent canal very short, strongly sclerotized, globular; spermathecae globular.

Coloration and markings. ♀: Prosoma yellowish brown with brown markings at the middle and the sides; head whitish; chelicerae and labium light brown; maxillae and sternum yellowish brown, sternum with 7 black spots along its margin; coxae and trochanter of legs marginated with

blackish brown; palp, legs I and II light brown, femora III-IV yellow distally dark brown, the other segments of legs III-IV light brown. Opisthosoma light yellowish brown with indistinct dark-coloured markings.

♂: Prosoma blackish brown, lighter at head, white at middle; chelicerae blackish brown; maxillae, labium and coxa of legs light beige, sternum brown without markings, legs I-II blackish brown, tibiae and patellae darker, III-IV femora proximally light yellowish brown, distally blackish brown, patella yellowish brown, tibia proximally blackish brown, distally yellowish brown, metatarsus and tarsus yellowish brown. Opisthosoma yellowish brown mottled with black, with white spots in the anterior part.

Range. Japan (Hokkaido, Honshu), USSR (Kamchatka), Alaska, Canada.

Biology. Found under dead leaves and stones.

Remarks. This species is distinguishable from the other species of the group of brevipes by the shape of male palp and female genitalia.

Oxyptila matsumotoi sp. nov.

[Japanese name: Matsumoto-ochibakanigumo]

(Figs. 131-136)

Oxyptila sp. (A): Ono, 1977, Kishidaia, Hino (42), p. 5.

Etymology. Named after Mr. Seiji Matsumoto, Tokyo.

Specimens examined. Type series: Holotype: ♂, Inogashira-kôen,

Mitaka-shi, Tokyo, Japan, 17-IX-1983, S. Matsumoto leg. (NSMT-Ar 1529); allotype: ♀, same data as holotype (NSMT-Ar 1530); paratypes: 1♀, same date, (NSMT-Ar 1531), 1♂, same locality, 10-V-1983 (NSMT-Ar 1532), 3♀♀, same locality, 16-X-1982 (NSMT-Ar 1533).

Other specimens examined: 1♀, "Tokio, Japan," date and collector unknown (ZSM); 1♀, Matsubushi, Kitakatsushika-gun, Saitama Pref., 29-IV-1978, K. Suzuki leg. (NSMT-Ar 1534).

Description. Measurment. Body length ♀ 2.74-3.26mm, ♂ 2.37-2.57mm; prosoma length ♀ 1.33-1.52mm, ♂ 1.26-1.33mm, width ♀ 1.44-1.56mm, ♂ 1.26-1.30mm; opisthosoma length ♀ 1.56-2.00mm, ♂ 1.19-1.26mm, width ♀ 1.81-2.30mm, ♂ 1.41-1.48mm; lengths of legs of the holotype and allotype (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.48/0.46	0.75/0.74	0.70/0.68	0.61/0.53	1.06/0.95	3.60/3.36
II	0.49/0.43	0.78/0.74	0.73/0.64	0.58/0.51	1.05/1.00	3.63/3.32
III	0.33/0.30	0.38/0.38	0.45/0.43	0.42/0.40	0.73/0.65	2.31/2.16
IV	0.30/0.35	0.50/0.40	0.52/0.43	0.39/0.38	0.83/0.68	2.54/2.24

Prosoma nearly as long as wide (length/width ♀ 0.89-0.98, ♂ 1.00-1.03), rough, covered with clavate setae and hairs, head narrow, lateral eyes developed, PME very small, ALE > PLE > AME > PME, ALE/AME ♀ 1.75-2.29, ♂ 2.00, PLE/PME ♀ 2.00-4.00, ♂ 2.00, AME-AME/AME-ALE ♀ 1.71-1.86, ♂ 1.57-1.84, PME-PME/PME-PLE ♀ 0.54-0.64, ♂ 0.50-0.55, MOA-WA/WP ♀ 1.11-1.29, ♂ 1.12-1.20, MOA-L/W ♀ 0.95-1.25, ♂ 1.11-1.25, clypeus/AME-AME ♀

0.85-1.17, ♂ 0.81-1.09. Labium length/width ♀ 1.17-1.25, ♂ 1.12-1.34, sternum length/width ♀ 1.16-1.20, ♂ 1.08-1.17.

Spiniformation of legs. ♀ (allotype): Femur: I prolateral 1-0; tibia: I-IV dorsal 1, I-II ventral 2-2; metatarsus I-II pro- and retrolateral 1 ap, ventral 2-2.

♂ (holotype): Femur: I prolateral 1; tibia: I-II dorsal 1 (weak), ventral 2-2; metatarsus: I-II pro- and retrolateral 1 ap, ventral 2-2.

Male palp (Figs. 135-136). Tibia with VTA and RTA; VTA bifurcated, RTA with a distal tooth. Bulb with a tegular apophysis, embolic division winding once around tegulum, embolus distally curved.

Opisthosoma wider than long (length/width ♀ 0.80-0.87, ♂ 0.84-0.86), with clavate hairs.

Female genitalia (Figs. 132-133). Epigynum with a hood situated in the anterior part. Intromittent canal extending posteriorly and curved towards spermatheca, spermathecae small, oval.

Coloration and markings. ♀♂: prosoma dark-brown to black, marginated with white, yellowish brown at the middle; chelicerae dark-brown, maxillae and labium brown, sternum brown with indistinct white markings at the middle, femora proximally yellowish white, tarsi yellowish brown, the other segments of legs and whole palps dark-brown mottled with white. Opisthosomal dorsum muddy light brown with indistinct white markings and three pair of latitudinal black lines, venter muddly light-brown.

Range. Japan (Honshu).

Biology. Found under dead leaves, also collected from leaf litter

by the Tullgren funnel. Adult spiders in April, May, September and October.

Remarks. This species has a close resemblance to O. nongae Paik, 1974, described from Korea, but is distinguished from the Korean species by the structure of male palp and female genitalia.

Genus Lysiteles Simon, 1895

[Japanese name: Ebisugumo-zoku]

Lysiteles Simon, 1895, Hist. Nat., Araign., éd. 2, 1, p. 998. --- Petrunkevitch, 1928, Trans. Conn. Acad. Arts Sci., 29, p. 168. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio-de-Janeiro, 31, p. 283. --- Ono, 1979, Senckenbergiana biol., 60, p. 93; 1980, ibid., 60, p. 204. --- Yaginuma, 1986, Spiders Japan Col., Osaka, (n. ed.), p. 212.

Diaea: Yaginuma, 1960, Spiders Japan Col., Osaka, p. 98. (Partim.)

Synaema: Yaginuma, 1968, Spiders Japan Col., Osaka, (rev. ed.), p. 98. (Partim.)

Type species. Lysiteles catulus Simon, 1895, Ann. Soc. ent. Belg., 39, p. 434.

Etymology. From Greek λυσιτελης meaning useful.

Diagnosis. Small thomisids, body length 2.0-4.5mm; male slightly smaller than female. Prosoma longer than wide, high, with long setae. Eyes much developed, ALE > PLE > AME ≧ PME, MOA wider than long, wider behind than

in front, clypeus nearly as wide as or wider than AME-AME. Chelicerae with a vestigial tooth. Labium longer than wide, sternum cordate, longer than wide, rarely as long as wide. Leg formula II-I-IV-III, rarely I-II-IV-III, claw tufts poorly developed; legs with spines much developed. Male palp with VTA and RTA; RTA strongly sclerotized; bulb without any apophysis, embolus short, thick and twisted. Opisthosoma longer than wide, with distinct markings. Epigynum with a sclerotized fold, intromittent orifices situated in the fold; intromittent canal usually short, spermathecae globular.

Range. East Asia (Japan to India).

Biology. The spiders live in the forests, and are collected from trees and lower vegetations, also from fallen leaves on the ground.

Species included. L. annapurnus Ono, 1979 (Nepal), L. brunettii (Tikader, 1962) (India), L. catulus Simon, 1895 (India), L. coronatus (Grube, 1861) (Northeast Asia), L. himalayensis Ono, 1979 (Nepal), L. lepusculus Ono, 1979 (Nepal), L. maius Ono, 1979 (Nepal, Japan), L. mandali (Tikader, 1966) (India), L. miniatus Ono, 1980 (Japan), L. minimus (Schenkel, 1953) (China), L. montivagus Ono, 1979 (Nepal), L. niger Ono, 1979 (Nepal), L. okumae Ono, 1980 (Japan), L. parvulus Ono, 1979 (Nepal), L. saltus Ono, 1979 (Nepal), L. silvanus Ono, 1980 (Taiwan).

Remarks. Other than the species mentioned above, there is a number of undescribed ones from the Nepal-, Bhutan- and Sikkim-Himalayas.

Key to the Japanese Species

1(8) Females.

2(3) Prosoma with a pair of longitudinal brown stripe or U-shaped brown marking; epigynal fold twice as wide as the diameter of spermatheca, intromittent canal rather long and curved ..... L. coronatus (Grube, 1861).

3(2) Prosoma without any distinct marking; epigynal fold as long as or narrower than the diameter of spermatheca, intromittent canal short.

4(5) Epigynal fold arched, intromittent orifices visible from the ventral side, intromittent canal globular, as large as spermatheca. ..... L. miniatus Ono, 1980.

5(4) Epigynal fold ligulate; intromittent orifices covered by fold and not visible from the ventral side; intromittent canal not much developed.

6(7) Spermatheca divided into two parts ..... L. okumae Ono, 1980.

7(6) Spermatheca large, globular and not divided into two parts ..... L. maius Ono, 1979.

8(1) Males.

9(10) Prosoma with distinct marking; embolus of male palp strongly curved ..... L. coronatus (Grube, 1861).

10(9) Prosoma without distinct marking; embolus of male palp short and not curved.

11(12) Tibia of male palp long, as long as tarsus ..... L. miniatus Ono, 1980.

12(11) Tibia of male palp shorter than tarsus.

13(14) RTA of male palp developed and apically bifid

..... L. okumae Ono, 1980.

14(13) RTA of male palp not much developed, apically pointed and not bifid

..... L. maius Ono, 1979.

Lysiteles coronatus (Grube, 1861)

[Japanese name: Amagi-ebisugumo]

Thomisus coronatus Grube, 1861, Bull. Acad. imp. Sci., St.-Pétersb., 4, p. 173. Female holotype from Amur District, USSR, R. Maack leg., in MPUW, examined.

Xysticus coronatus: Reimoser, 1919, Abh. zool. -bot. Ges. Wien, 10(2), p. 195. --- Charitonow, 1932, Iejiegod. Zool. Muz. Akad. Nauk. SSSR, 32, p. 157.

Oxyptila nigrifrons S. Saito, 1934, J. Fac. Agr. Hokkaido imp. Univ., 33, p. 279. Male holotype from Soranuma, Hokkaido, 8-IX-1931, S. Makino leg., in the Faculty of Agriculture, Hokkaido Imperial University, Sapporo, lost; 1959, Spider Book illustr. Col., p. 128. (New synonymy.)

Xysticus sapporensis S. Saito, 1934, J. Fac. Agr. Hokkaido imp. Univ., 33, p. 280. Female holotype from Sapporo-shi, Hokkaido, 5-VI-1930, S. Saito leg., deposited in the Faculty of Agriculture, Hokkaido Imperial University, Sapporo, lost; 1959, Spider Book illustr. Col., p. 131. --- M.-S. Zhu, 1983, Spiders Paddy Fields Shanxi, 1, p. 196. (New synonymy.)

Oxyptila takashimai Uyemura, 1937, Acta arachnol., 2, p. 153. Female holotype, subadult male allotype, 2 subadult females paratypes from Mt. Amagisan, Shizuoka Pref., Japan, H. Takashima leg., in the private collection of T. Uyemura, lost. --- Bonnet, 1958, Bibliogr. aran., 2, p. 3265.

Ozyptila takashimai: Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 880.

Diaea takashimai: Yaginuma, 1957, Acta arachnol., 14, p. 58; 1960, Spiders Japan Col., Osaka, p. 98. --- Namkung, 1964, Atypus, Osaka, (33/34), p. 42. --- Paik, 1967, Educ. J. Teachers Coll. Kyungpook Univ., 7/8, p. 64.

Synaema takashimai: Yaginuma, 1967, Lit. Dept. Rev. Otemon-Gakuin Univ., (1), p. 88; 1968, Spiders Japan Col., (rev. ed.), Osaka, p. 98. --- Kobayashi, 1974, Atypus, Osaka, (62), p. 46. --- Matsumoto et al., 1976, Spiders, p. 154.

Lysiteles takashimai: Ono, 1979, Senckenbergiana biol., 60, p. 106; 1980, ibid., 60, p. 204. --- Shinkai & Takano, 1984, Field Guide Spider Japan, p. 139.

Lysiteles coronatus: Ono, 1985, Bull. natn. Sci. Mus., Tokyo, (A), 11, p. 23. --- Yaginuma, 1986, Spiders Japan Col., (n. ed.), Osaka, p. 212.

Notes. Thomisus coronatus was described by Grube (1861) from East Siberia. Because no illustration was given, this species had never been recognized since the original description, excepting Reimoser (1919) and Charitonow (1932) who recorded it as Xysticus coronatus in the general lists

of spiders in the Palearctic Region and Russia. In 1980, I had an opportunity to examine tye type specimen of the species through the courtesy of Dr. W. Wesołowska, Wroclaw University, Poland, and found that Thomisus coronatus was exactly the same as Lysiteles takashimai (Uyemura, 1937) widely known in Japan. I already reported this synonymy with a redescription of the female holotype (Ono, 1985a).

Judging from the descriptions and illustrations by S. Saito (1934a), the two species, Oxyptila nigrifrons S. Saito, 1934, and Xysticus sapporensis S. Saito, 1934, are considered synonymous with Lysiteles coronatus. The types of the species were lost.

Etymology. Specific name from Latin meaning coronated; probably derived from the marking of prosoma.

Specimens examined. Holotype: ♀, "Mitt. Amur," the middle reaches of the Amur River, USSR, 1854-1856, R. Maack leg. (MPUW).

USSR: 8♀♀, Primorje, Ussuri Research Kamenushka, Soviet Far East, 6-27-VIII-1983, A.V. Antropov leg. (ZMM); 4♀♀, same locality, 6-VIII-1983, A.V. Antropov leg. (NSMT-Ar 665).

Japan: 2♀♀1♂, Yoshioka, Fukushima-cho, Matsumae-gun, Hokkaido, 23-V-1980, K. Kumada leg. (NSMT-Ar 666); 1♂, Shotoshibetsu, Rikunbetsu-cho, Ashoro-gun, Hokkaido, 24-VII-1984, M. Tomokuni leg. (NSMT-Ar 667); 3 juv., Iwaobetsu-Onsen, Shari-gun, Hokkaido, 23-VII-1984, M. Tomokuni leg. (NSMT-Ar 668); 1♀, Lake Akan, Akan-gun, Hokkaido, 11-VIII-1955, O. Sato leg. (TYO); 1 juv., Otashirogahara, Nikko, Tochigi Pref., 13-VIII-1971, H. Ono leg. (NSMT-Ar 1567); 1♀, Kôtoku, Nikko, Tochigi Pref., 12-17-VIII-1974, N. Takeuchi leg. (NSMT-Ar 1568); 1♀2♂♂, Yumoto, Nikko, Tochigi Pref., 28

29-V-1977, H. Saito leg. (NSMT-Ar 1569); 3♀♀1o, Izumi-no-sato, Karuizawa, Nagano Pref., 1-VI-1976, H. Ono leg. (NSMT-Ar 1570); 2♀♀, Urayama, Chichibu, Saitama Pref., 28-V-1978, K. Suzuki leg. (NSMT-Ar 1571); 1♀, Okuchichibu, Saitama Pref., 4-5-VIII-1979, K. Kumada leg. (NSMT-Ar 670); 6♀♀1♂, Yûshin, Tanzawa, Kanagawa Pref., 27-V-1976, K. Kumada leg. (SMF 30077); 3♀♀1♂, Fudakake, Tanzawa, Kanagawa Pref., 17-V-1978, K. Kumada leg. (NSMT-Ar 1572); 1♀1♂, Shiroyama, Tsukui-gun, Kanagawa Pref., 13-V-1979, K. Kumada leg. (NSMT-Ar 669); 4♀♀, Fuezuka, Hakone, Kanagawa Pref., 29-VII-1972, H. Ono leg. (NSMT-Ar 1573); 1♂, Honitayama, Okutama, Tokyo, 29-IV-1972, H. Ono leg. (NSMT-Ar 671); 1♀, Lake Kawaguchiko, Yamanashi Pref., 4-VIII-1974, S. Matsumoto & E. Shinkai leg. (NSMT-Ar 1574); 3♀♀1♂, Yoshidaguchi, Fujiyoshida-shi, Yamanashi Pref., 31-V-1978, K. Kumada leg. (NSMT-Ar 1575); 1 juv., 1,100m alt., foot of Mt. Fuji, Yamanashi Pref., 18-VIII-1975, E. Shinkai and others leg. (NSMT-Ar 1576); 1♀, Mt. Hakusan, Ishikawa-gun, Ishikawa Pref., 31-VII-1961, H. Tokumoto leg. (TYO); 1♀, Nakashidara-cho, Aichi Pref., 5-VIII-1967, K. Ushida leg. (NSMT-Ar 372); 1♀, Mt. Hirasan, Shiga-cho, Shiga Pref., 29-V-1977, H. Nagaoka and others leg. (YNO); 2♀♀, Mt. Hieizan, Kyoto Pref., 8-V-1954, T. Yaginuma leg. (TYO); 1♀, s.l., 22-V-1955, T. Yaginuma leg. (TYO); 1♀, s. data, Z.Ohshimo leg. (TYO); 12♀♀, Misen, 800-1,200m alt., Amakawa-mura, Yoshino-gun, Nara Pref., 4-V-1969, Y. Nishikawa leg. (YNO); 19♀♀3♂♂ 1 juv., s.l., 1,400-1,600mm alt., Y. Nishikawa leg. (YNO); 2♀♀, s.l., 1,000-1,700m alt., Y. Nishikawa leg. (YNO); 3 juv., Tonomine-kôgen, 550-700m alt., Ôkochi-cho, Kanzaki-gun, Hyogo Pref., 10-X-1976, Y. Nishikawa leg. (NSMT-Ar 1577); 1♀, Masumizuhara, Mt. Daisen, Tottori Pref., 14-IX-1984, M. Tomokuni leg. (NSMT-Ar 672); 1 juv., Ninosawa,

Mt. Daisen, Tottori Pref., 14-IX-1984, M. Tomokuni leg. (NSMT-Ar 673); 2♀♀, Omogo, Kamiukena-gun, Ehime Pref., 21~23-V-1959, C. Okuma leg. (NSMT-Ar 1578); 1♂, Mt. Hikosan, Fukuoka Pref., 5 9-VI-1958, C. Okuma leg. (NSMT-Ar 674); 1♂, s.l., 13~17-V-1963, Takahashi & Maeda leg. (SMF 30078); 2♂♂, s.l., 27~31-V-1959, C. Okuma leg. (NSMT-Ar 1579); 1♀1♂, s.l., 3-V-19653, Y. Miyatake leg. (NSMT-Ar 1580); 1♀, s.l., 1-VIII-1968, K. Kanmiya leg. (NSMT-Ar 1581).

Description. Measurement. Body length ♀ 2.48-4.30mm, ♂ 2.67-3.19mm; prosoma length ♀ 1.19-1.60mm, ♂ 1.33-1.56mm, width ♀ 1.11-1.36mm, ♂ 1.19-1.36mm; opisthosoma length ♀ 1.28-2.81mm, ♂ 1.56-2.00mm, width ♀ 1.08-2.67mm, ♂ 1.11-1.36mm; lengths of legs of 1♀1♂ from Tanzawa, Kanagawa Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.63/0.78	1.00/1.33	1.18/1.53	0.55/0.60	1.30/1.60	4.66/5.84
II	0.63/0.75	1.03/1.38	1.28/1.60	0.60/0.59	1.55/1.75	5.09/6.07
III	0.40/0.45	0.55/0.70	0.80/0.90	0.46/0.43	1.05/1.18	3.26/3.66
IV	0.38/0.48	0.68/0.75	0.88/0.98	0.43/0.45	1.15/1.25	3.52/3.91

Prosoma longer than wide (length/width ♀ 1.07-1.18, ♂ 1.08-1.16), with long setae. Lateral eyes much developed, ALE/AME ♀ 1.50-1.67, ♂ 1.58-1.80, PLE/PME ♀♂ 1.71-2.00, AME-AME/AME-ALE ♀ 1.00-1.14, ♂ 1.00-1.09, PME-PME/PME-PLE ♀ 1.00-1.06, ♂ 1.00-1.10, MOA-WA/WP ♀ 0.80-0.90, ♂ 0.84-0.89, MOA-L/W ♀ 0.80-0.94, ♂ 0.82-0.93, clypeus/AME-AME ♀ 1.12-1.47, ♂ 1.25-1.39. Labium longer than wide (length/width ♀ 1.33-1.63, ♂ 1.38-1.58),

sternum longer than wide (length/width ♀ 1.12-1.32, ♂ 1.08-1.21). Leg formula II-I-IV-III; tarsal claws of legs I-II with 5 teeth, III-IV with 4 teeth.

Spiniformation of legs of 1♀1♂ from Tanzawa, Kanagawa Pref. ♀: Femur: I dorsal 1 (right 1-1), prolateral 0-1-1-1, II dorsal 1-1-0, III dorsal 1-1-0-1, IV dorsal 0-1-0-0 (right 1-1-0-0); patella I, III and IV dorsal 1-1, II dorsal 1-1-1, I-II prolateral 1, III-IV prolateral 0, I-IV retrolateral 1; tibia: I-IV dorsal 1-1, I-II prolateral 1-1-0-1, retrolateral 1-1-1, ventral 2-2, III prolateral 1-0-1-0, retrolateral 0-0-1-0, IV prolateral 0-1-1, retrolateral 0-0-1, III-IV ventral 1; metatarsi I-II pro- and retrolateral each 0-1-0-1, ventral 2-2, III-IV prolateral 1-1-0, retrolateral 0-1-0, ventral 1.

♂: Femur: I-IV dorsal 1-1-1-1, I prolateral 0-1-1-1; patella I-IV dorsal 1-1, retrolateral 1, I-II prolateral 1, III-IV prolateral 0; tibia: I-IV dorsal 1-1, I-II pro- and retrolateral each 1-1-0-1, ventral 2-2, III pro- and retrolateral each 1-1, ventral 2 (right 1), IV prolateral 0-1, retrolateral 1-0-1, ventral 1; metatarsus I-II prolateral 0-1-0-1, ventral 2-2, I retrolateral 0-1-0-1, II retrolateral 1-1-0-1 (right 0-1-0-1), III-IV pro- and retrolateral each 1-1-0, III ventral 2 (right 1), IV ventral 1.

Male palp (Ono, 1980a, figs. 5-6). Tibia with VTA and RTA; VTA distally widened, RTA much developed, cultrate. Bulbus simple, embolus spiniform, curved.

Opisthosoma longer than wide (length/width ♀ 1.05-1.21, ♂ 1.30-1.47), pyriform in female, ovate in male.

Female genitalia (Ono, 1980a, figs. 2-3; 1985a, figs. 14-15).

Epigynal fold wide, twice as wide as the diameter of spermatheca. Intromittent canal rather long and curved, spermathecae globular.

Coloration and markings. ♀: Prosoma brownish yellow with a pair of blackish brown longitudinal stripes, chelicerae, maxillae, labium brownish yellow, sternum brownish yellow with dark-brown anterior part, legs yellowish brown. Opisthosoma yellowish white with white spots in the anterior part and three pair of brown patches in the posterior part, the underside yellowish white with indistinct U-shaped brown marking.

♂: Prosoma light brown with U- or O-shaped blackish brown marking, chelicerae, labium dark-brown, maxillae light brown, sternum brown, marginated with dark brown, femora I-II pro- and retrolateral dark brown, III-IV retrolateral dark-brown, patellae and tibiae I-IV with dark-brown ring in the proximal and distal parts, tarsi I-IV with dark-brown ring in the proximal part, the other parts of legs I-IV brownish yellow. Opisthosoma light brown mottled with blackish brown, the underside brownish yellow with dark-brown U-shaped marking.

Range. Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea, USSR (South Siberia).

Biology. Adult in May to September.

Remarks. Lysiteles coronatus is the commonest species of the genus in Japan. It can be readily distinguished from the other Japanese species by its markings on the pro- and opisthosoma. Lysiteles saltus Ono, 1979, described from the Nepal Himalayas is closely related to the Japanese species, but the epigynal fold of the former is labiate and narrower than that of the latter.

Lysiteles maius Ono, 1979

[Japanese name: Takane-ebisugumo]

Lysiteles maius Ono, 1979, Senckenbergiana biol., 60, p. 103. Male holotype from Dhorpatan, 3,000m alt., Dhaulagiri-massif, Nepal, 16-V-1973, J. Martens leg., in SMF, examined; 1980, Senckenbergiana biol., 60, p. 207. --- Yaginuma, 1986, Spiders Japan Col., (n.ed.), Osaka, p. 213.

Lysiteles maior: Brignoli, 1983, Cat. Aran., p. 609. An unjustified emendation (International Code of Zoological Nomenclature, Article 33(ii)). (New synonymy.)

Notes and etymology. Brignoli (1983) corrected the original spelling "maius" to "maior" probably because he regarded the name means "larger," the comparative degree of "magnus". My original description for this species was certainly insufficient in the etymology. The specific name is derived from the Latin "Maius" meaning the month of May; the holotype specimen of this spider was collected on 16 May in Nepal. Besides, this species is smaller than the other Lysiteles species. L. maior has a status in nomenclature with own date and author and is regarded as a junior objective synonym of L. maius.

Specimens examined. Type specimen: Holotype: ♂, Dhorpatan, 3,000m alt., Dhaulagiri-massif, Nepal, 16-V-1973, J. Martens leg. (SMF 30006).

Japan: 1♀, Tôbai, Nemuro-shi, Hokkaido, 5-VII-1976, S. Takano leg. (ASEA); 1♀, Lake Onnetô-ko, Hokkaido, 15-VII-1977, K. Kumada leg. (NSMT-Ar

1586); 1 juv., Mt. Kurodake, 2,000m alt., Daisetsu-sankei, Hokkaido, 21-VII-1962, Y. Miyatake leg. (ASEA); 1♂, Mt. Mirayama, Daisetsu-sankei, Hokkaido, 8-VIII-1980, N. Yasuda leg. (NSMT-Ar 1587), 2♀♀, basin of the River Ishikari, 900m alt., Kamikawa-cho, Hokkaido, VI-1979, N. Yasuda leg. (NSMT-Ar 1588); 4 juv., Tokachi-mitsumata, Katô-gun, Hokkaido, 22-VII-1984, M. Tomokuni leg. (NSMT-Ar 1589); 1♂, Rebun Island, Hokkaido, 20-X-1978 (subadult), Y. Chikuni leg. (NSMT-Ar 1590); 1♀, Mt. Iwate, Iwate Pref., 15-VII-1974, H. Ono leg. (ASEA); 1♀, Lake Kirikomi-karikomi, Nikko, Tochigi Pref., 28~29-V-1977, H. Saito leg. (ASEA); 1 juv. ♂, Kôtoku, Nikko, Tochigi Pref., 11-VIII-1971, H. Ono leg. (ASEA); 3 juv., Mt. Fuji, Yamanashi Pref., 8-VIII-1975, H. Ono leg. (NSMT-Ar 1591); 1♀, Kurozawa, Misato-mura, Minamiazumi-gun, Nagano Pref., 14-VII-1977, Y. Chikuni leg. (SMF 30079); 1♂, s. data (ASEA); 1♀, Sanmata, Horigane-mura, Minamiazumi-gun, Nagano Pref., 6-V-1977, Y. Chikuni leg. (ASEA); 1♀, Nakabusa-onsen, Ariake-ku, Hotaka-cho, Minamiazumi-gun, Nagano Pref., 22-X-1970, Y. Chikuni leg. (ASEA).

Description. Measurement. Body length ♀ 3.04-4.37mm, ♂ 2.40-3.42mm; prosoma length ♀ 1.30-1.56mm, ♂ 1.28-1.68mm, width ♀ 1.22-1.43mm, ♂ 1.16-1.48mm; opisthosoma length ♀ 1.63-2.89mm, ♂ 1.62-2.40mm, width ♀ 1.41-2.74mm, ♂ 1.20-1.80mm; lengths of legs from 1♀1♂ from Kurozawa, Misato-mura, Nagano Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.51/0.70	0.80/1.10	1.04/1.50	0.60/0.71	1.38/2.03	4.33/6.04
II	0.53/0.68	0.88/1.10	1.10/1.53	0.63/0.75	1.45/2.05	4.59/6.11
III	0.38/0.48	0.50/0.63	0.75/0.95	0.48/0.58	1.05/1.40	3.16/4.04
IV	0.38/0.50	0.58/0.78	0.83/1.03	0.48/0.50	1.08/1.50	3.35/4.31

Prosoma longer than wide (length/width ♀ 1.04-1.14, ♂ 1.10-1.14), with long setae. Lateral eyes much developed, ALE/AME ♀ 1.50-2.00, ♂ 1.66-1.75, PLE/PME ♀ 1.45-1.67, ♂ 1.50-1.75, AME-AME/AME-ALE ♀ 0.96-1.15, ♂ 1.00-1.08, PME-PME/PME-PLE ♀ 0.96-1.05, ♂ 0.84-0.92, MOA-WA/WP ♀ 0.76-0.82, ♂ 0.77-0.89, MOA-L/W ♀ 0.82-0.94, ♂ 0.83-0.89, clypeus/AME-AME ♀ 0.87-1.18, ♂ 1.16-1.28. Chelicerae of male normal, labium longer than wide (length/width ♀ 1.22-1.58, ♂ 1.28-1.50), sternum longer than wide (length/width ♀ 1.11-1.20, ♂ 1.10-1.26).

Spiniformation of legs. 1♀ from Kurozawa, Nagano Pref.: Femur: I dorsal 0-1-1 (right 1-1-1), prolateral 0-1-2-1, II dorsal 0-1-1-1-0 (right 0-1-1-0-1), III dorsal 1-1-0-1 (right 1-1-0-0), IV dorsal 0-1-1; patella: I-IV dorsal 1-1, III-IV retrolateral 1; tibia: I-IV dorsal 1-1, I-II pro- and retrolateral 1-1, III-IV pro- and retrolateral 0-1, I-II ventral 2-2, III ventral 2, IV ventral 1; metatarsus: I-II pro- and retrolateral 0-1-0-1, III-IV pro- and retrolateral 1, I-II ventral 2-2, III-IV ventral 2.

♂-holotype: Femur: I dorsal 1-1-0-1, prolateral 0-1-2-1, II-III dorsal 1-1-1-1, IV dorsal 1-1-1-0; patella: I-IV dorsal 1-1; tibia: I-II dorsal 1-1, pro- and retrolateral 1-1-1, ventral 2-2, III-IV dorsal 1-1, III pro- and retrolateral 1-0-1-0, ventral 2, IV pro- and retrolateral 1-1-0, ventral 1; metatarsus: I-II prolateral 1-1-1 ap, retrolateral 0-1-1 ap, ventral 2-2, III-IV pro- and retrolateral 1-1-0, III ventral 2, IV ventral 1.

1♂ from Kurozawa, Nagano Pref.: Femur: I dorsal 1-1-0-1, prolateral 0-1-1-1-1-1, III-IV dorsal 1-1-1-1; patella: I-IV dorsal 1-1, II prolateral 1, I-II and IV retrolateral 1; tibia: I-IV dorsal 1-1, I prolateral 1-1-0-2-1, II prolateral 1-1-0-1-1, I-II retrolateral 1-1-0-1, I

ventral 1-2-1-2-2-2, II ventral 2-2-2-2-2, III-IV prolateral 1-0-1, III retrolateral 1-1-1, IV retrolateral 1-0-1, III ventral 2-2-0, IV ventral 1-1-1-0-1; metatarsus: I prolateral 1-1-0-1-1-1, II prolateral 1-1-1-0-1, III-IV prolateral 1-0-1, I-II retrolateral 0-1-0-1, III-IV retrolateral 1-0-1, I ventral 2-2-2-2-2, II ventral 2-2-1-2-2, III-IV ventral 2.

Male palp (Ono, 1979, figs. 9-12). Tibia with VTA and RTA; RTA horn-shaped. Embolus short, conical.

Opisthosoma longer than wide (length/width ♀ 1.02-1.22, ♂ 1.30-1.36), ovate in both the sexes.

Female genitalia (Ono, 1979, figs. 13-15). Epigynal fold small. Intromittent canal short and thick, spermathecae large, globular, not divided.

Coloration and markings. ♀: Prosoma blackish brown, lighter at the middle, chelicerae brown, laterally darker, maxillae and labium dark-brown, sternum dark-brown, lighter at the middle, legs I-II yellowish brown, femora pro- and retrolaterally blackish brown, metatarsi proximally and distally with dark-coloured ring, tarsi yellow, legs III-IV yellow. Opisthosoma white without any marking, or with three to four pair of blackish brown patches on the posterior part, or brown with blackish brown markings, underside light yellowish brown with a pair of longitudinal blackish brown stripes.

♂: Prosoma chestnut, lighter at the middle, chelicerae, maxillae and labium dark- to blackish brown, sternum yellow to dark-brown, darker marginate, legs I-II light yellowish brown, femora I pro- and retrolaterally dark-brown or wholly dark-brown, tibiae proximally and distally with or

without dark-coloured ring, tarsi of the holotype distally chestnut, only tarsus II distally black in 1o from Rebun Island, Hokkaido, tarsi I-II yellowish brown in the other oo, legs III-IV yellow. Opisthosoma of holotype brown with five (two of them small) pair of blackish brown patches in the posterior part, underside white, blackish brown at the middle; of oo from Japan brown with indistinct blackish brown markings, the underside light yellowish brown with a pair of longitudinal blackish brown stripes.

Range. Japan (Hokkaido, Honshu), Nepal.

Biology. Collected from shrubs.

Remarks. This species is closely related to L. annapurnus Ono, 1979, from the Nepal Himalayas (♀ unknown). The structure of male palp is very similar between the two species. They are distinguished from each other by the shape of RTA and the embolus.

A small difference in the shape of embolus is recognized between the Himalayan and Japanese individuals. It is, however, considered to be a geographical variation.

Lysiteles okumae Ono, 1980

[Japanese name: Okuma-ebisugumo]

(Fig. 137-139)

Synaema sp.: Kobayashi, 1974, Atypus, Osaka, (62), p. 46.

Lysiteles okumai Ono, 1980, Senckenbergiana biol., 60, p. 209. Female

holotype and 11 female paratypes from Omogo, Kamiukena-gun, Ehime Pref., Japan, 21~23-V-1967, C. Okuma leg., holotype and 5♀♀ paratypes in SMF, 6♀♀ paratypes in ASEA, examined. --- Yaginuma, 1986, Spiders Japan Col., Osaka, (n. ed.), p. 213.

Lysiteles okumae: Brignoli, 1983, Cat. Aran., Manchester, p. 609.

Emendation of incorrect original spelling.

Notes. I misspelt the specific name of this species as "okumai" instead of "okumae," though the collector of the type specimens is Ms. Chiyoko Okuma. The derivation of the name was given in the original description, but the error of the spelling was found neither by me nor the revisor nor the editor. Finally, Brignoli (1983) corrected the spelling to "okumae" in his catalogue of the Araneae. This emendation can be regarded as a justified one according to the International Code of Zoological Nomenclature valid at that time.

Etymology. Named after Ms. Chiyoko Okuma, Fukuoka.

Specimens examined. Types: Holotype: ♀, Omogo, Kamiukena-gun, Ehime Pref., 21~23-V-1967, C. Okuma leg. (SMF 30080); paratypes: 11♀♀, same data as holotype, 5♀♀ (SMF 30081), 6♀♀ (ASEA).

2♀♀ 2 juv., Amagi-tôge, Izu Province, Shizuoka Pref., 3-V-1984, K. Kumada leg. (NSMT-Ar 1605) ; 1♂, s.l., 11-V-1984, K. Kumada leg. (NSMT-Ar 1606); 1♀, Dandô-uradani Valley, 940m alt., Shitara-cho, Shitara-gun, Aichi Pref., 6-VI-1986, K. Ogata leg. (NSMT-Ar 1607).

Description. Measurement. Body length ♀ 2.81-3.76mm, ♂ 3.30mm; prosoma length ♀ 1.15-1.46mm, ♂ 1.60mm, width ♀ 0.96-1.31mm, ♂ 1.36mm;

opisthosoma length ♀ 1.56-2.32mm, ♂ 2.00mm, width ♀ 1.48-2.15mm, ♂ 1.48mm. Lengths of legs of the holotype ♀ and 1♂ from Amagi-tôge, Shizuoka Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.60/0.74	0.76/1.16	0.96/1.36	0.50/0.58	1.20/1.63	4.02/5.47
II	0.60/0.75	0.80/1.21	0.96/1.39	0.48/0.60	1.24/1.65	4.08/5.60
III	0.40/0.48	0.48/0.66	0.64/0.76	0.40/0.51	0.84/1.11	2.76/3.52
IV	0.40/0.48	0.52/0.75	0.72/0.93	0.40/0.53	0.94/1.25	2.98/3.94

Prosoma longer than wide (length/width ♀ 1.13-1.20, ♂ 1.18), with long setae. Lateral eyes on tubercles separated from each other, ALE> PLE > AME > PME, ALE/AME ♀ 1.67-2.00, ♂ 1.67, PLE/PME ♀ 2.00-2.58, ♂ 2.00, AME-AME/AME-ALE ♀ 0.83-1.00, ♂ 0.93, PME-PME/PME-PLE ♀ 0.85-1.00, ♂ 0.80, MOA-WA/WP ♀ 0.80-0.88, ♂ 0.91, L/W ♀ 0.92-1.00, ♂ 1.02, clypeus/AME-AME ♀ 1.38-1.64, ♂ 1.57. Chelicerae normal, with a vestigial tooth; labium length/width ♀ 1.25-1.43, ♂ 1.33; sternum shield-shaped, longer than wide (length/width ♀ 1.13-1.19, ♂ 1.16).

Spiniformation of legs of the holotype ♀ and 1♂ from Amagi-toge, Shizuoka Pref. ♀: Femur: I dorsal 0-1-1-0-0, prolateral 0-1-1-1, II-IV dorsal 1-1-0-0; patella: I-IV dorsal 1-1, I and IV retrolateral 1; tibia: I-IV dorsal 1-1, I-II pro- and retrolateral 1-1-0-1-0, ventral 2-2, III pro- and retrolateral 0-1, IV pro- and retrolateral 1-1; metatarsus: I pro- and retrolateral 0-1-0-1, II prolateral 0-1-0-1, retrolateral 0-1-0-2, I-II ventral 2-2, III prolateral 1-1-0, ventral 2, IV prolateral 1-1-1, ventral

1-0, III-IV retrolateral 1.

♂: Femur: I dorsal 0-1-1-1-1, prolateral 0-0-1-1-1 (in the right leg 0-1-1-1-1), II dorsal 0-1-1-1-1 (in the right leg 0-1-1-0-1), III dorsal 0-1-1-1-1, IV dorsal 0-1-1-0-1 (in the right leg 1-1-1-1-1); patella: I-IV dorsal 1-0-1, I-II pro- and retrolateral, IV retrolateral respectively 1; tibia: I-IV dorsal 1-1, I-II pro- and retrolateral 1-1-0-1, ventral 2-2, III prolateral 1-1-1, retrolateral 1-1, ventral 2, IV prolateral 1-1-1 (in the right leg 1-0-1), retrolateral 1-1-1 (in the right leg 1-0-1), ventral 2; metatarsus: I-II pro- and retrolateral 1-1-0-1 ap, ventral 2-2, III pro- and retrolateral, IV retrolateral respectively 1-1, III-IV ventral 2, IV prolateral 1-1-1 ap (in the right leg 1-1).

Male palp (Figs. 138-139). Tibia with VTA and RTA; RTA large, much developed and apically bifid. Embolus thin, spiniform and twisted.

Opisthosoma nearly as long as wide in female, longer than wide in male (length/width ♀ 0.96-1.08, ♂ 1.35).

Female genitalia (Ono, 1980a, figs. 20-21). Epigynum with a sclerotized fold labiated. Intromittent canal very short; spermatheca divided into two parts, both globular.

Coloration and markings. ♀: Prosoma reddish brown, lighter at the middle, or blakish brown, reddish at the middle; chelicerae reddish brown; labium, maxillae and sternum light brown or brown; legs yellow, femora I-II prolaterally striped with brown. Opisthosoma light yellowish brown with dark-brown markings; venter yellowish white.

♂: Prosoma and chelicerae black without any marking; maxillae, labium and sternum dark grey; legs yellow, femora I-II prolaterally with

reddish brown stripe. Opisthosoma white with blackish brown marking, both sides blackish brown, venter dirty white with a dark vertical stripe at the middle.

Range. Japan (Honshu, Shikoku).

Biology. Unknown. Collected by the beating method.

Remarks. This species resembles L. niger Ono, 1979, known from Nepal, but the spermatheca of the former is divided into two parts and the femora I-II are striped with brown.

Lysiteles miniatus Ono, 1980

[Japanese name: Daidai-ebisugumo]

(Figs. 140-142)

Lysiteles miniatus Ono, 1980, Senckenbergiana biol., 60, p. 210.

Female holotype from Amami-oshima Island, Kagoshima Pref., Japan, Mt. Kowandake, 25-VI-1971, M. Chujo leg., in SMF, examined. --- Yaginuma, 1986, Spiders Japan Col., Osaka, (n.ed.), p. 213.

Etymology. Specific name from Latin meaning vermilian-coloured; derived from the coloration of prosoma.

Specimen examined. 1♀ (holotype), Mt. Kowandake, Amami-ôshima Island, Amami Islands, Kagoshima Pref., 25-VI-1971, M. Chujo leg. (SMF 30082); 1♂, upper basin of the Kuira River, Iriomotejima Island, Yaeyama Islands, Okinawa Pref., 27-III-1973, M. Shimojana leg. (NSMT-Ar 1624).

Notes. Since I described this rare species based on a single female collected in Amami-ôshima Island, no further specimen has been brought forth. Recently, however, I was able to obtain a male probably referable to this species. The coloration and markings of the pro- and opisthosoma of the male exactly coincide with those of the female holotype. Though the conspecificity of the two is not absolutely settled, it does not seem useless to describe the unknown male at this place.

Description. Measurement. Body length ♀ 3.44mm, ♂ 3.33mm; prosoma length ♀ 1.52mm, ♂ 1.67mm, width ♀ 1.36mm, ♂ 1.41mm; opisthosoma length ♀ 2.24mm, ♂ 1.93mm, width ♀ 1.92mm, ♂ 1.33mm; lengths of legs (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.60/0.69	0.98/1.30	1.20/1.57	0.63/0.70	1.50/1.80	4.91/6.06
II	0.60/0.70	1.03/1.36	1.28/1.62	0.63/0.70	1.55/1.83	5.09/6.21
III	0.38/0.38	0.53/0.63	0.78/0.90	0.38/0.45	0.95/1.10	3.02/3.46
IV	0.40/0.39	0.63/0.70	0.88/0.97	0.45/0.43	1.13/1.19	3.49/3.68

Prosoma longer than wide (length/width ♀ 1.12, ♂ 1.18), with long setae. Lateral eyes on tubercles separated from each other, ALE > PLE > AME > PME, ALE/AME ♀ 1.57, ♂ 1.60, PLE/PME ♀ 2.00, ♂ 1.50, AME-AME/AME-ALE ♀ 1.07, ♂ 1.00, PME-PME/PME-PLE ♀ 0.96, ♂ 0.89, MOA-WA/WP ♀ 0.88, ♂ 0.81, MOA-L/W ♀♂ 0.94, clypeus/AME-AME ♀♂ 1.47. Chelicerae of ♂ slightly curved and distant from each other at the middle. Labium longer than wide (length/width ♀ 1.53, ♂ 1.66), sternum longer than wide (length/width ♀ 1.19, ♂ 1.28). Tarsal claws of legs I-II with 4 teeth, III-IV with 3 teeth.

Spiniformation of legs. ♀: Femur: I dorsal 1, prolateral 0-0-1-1-1-0, II dorsal 1-1-0-0-0, prolateral 0-0-1, III-IV dorsal 1-1-0-1; patella: I-IV dorsal 1-1, I-II pro- and retrolateral, III-IV retrolateral each 1; tibia: I-IV dorsal 1-1, I-II prolateral 1-1-0-1, III prolateral 1-0-1, IV prolateral and I-II retrolateral each 1-1-1, III retrolateral 0-1, IV retrolateral 0-1-1, I-II ventral 2-2, III-IV ventral 1; metatarsus: I-II pro- and retrolateral 1-1-0-1, ventral 2-2, III-IV pro- and retrolateral 1-1, ventral 1.

♂: Femur: I-IV dorsal 1-1-1-1, I prolateral 0-0-1-2-1-1 (in the right leg 1-1-1-1-1-1-1-2), II prolateral 0-0-2-1-1 (in the right leg 0-0-0-1-1), I-II retrolateral 0-0-0-1-1, III-IV prolateral and III retrolateral each 0-0-0-1; patella: I-IV dorsal 1-0-1, I-II pro- and retrolateral, III-IV retrolateral each 1; tibia: I-II dorsal 1-0-1-0, pro- and retrolateral 1-1-1, ventral 2-2, III-IV dorsal, pro- and retrolateral each 1-1, ventral 1; metatarsus: I-II pro- and retrolateral 1-1-1 ap, ventral 2-2, III-IV pro- and retrolateral 1-1, ventral 1.

Male palp (Figs. 141-142). Tibia with VTA and RTA; VTA curved prolaterally, RTA sclerotized, in retrolateral view dentiform.

Opisthosoma longer than wide (length/width ♀ 1.17, ♂ 1.45), with long hairs in the anterior part.

Female genitalia (Ono, 1980a, figs. 23-24). Epigynum with a sclerotized fold thin and arched, intromittent orifices situated under the fold. Intromittent canal thick and short, spermathecae small, ovate, as large as the intromittent canal.

Coloration and markings. ♀: Prosoma cinnaber-reddish brown, a

little lighter at the margin, chelicerae reddish brown, maxillae and labium light reddish brown, sternum yellowish brown. Legs I-II yellowish brown, III-IV light yellowish brown. Opisthosoma yellowish brown with a pair of black markings and a black patch in the posterior part, underside light yellowish brown without any markings. ♂: Almost same as ♀, but lighter.

Range. Japan (Nansei Islands).

Biology. Unknown.

Remarks. This species is easily distinguished from all the known species of the genus by its external characteristics.

Genus Synaema Simon, 1864

[Japanese name: Funojigumo-zoku]

Synema Simon, 1864, Hist. nat. Araign. (Aranéides), P. 433 (incorrect transliteration from Greek συν-αίμα); 1875, Arachn. France, 2, p. 261. —- Keyserling, 1880, Spinnen Amerikas, Laterigradae, 1, p. 4, 56. --- Becker, 1882, Ann. Mus. roy. Hist. nat. Belg., 10, p. 188. --- F.O. Pickard-Cambridge, 1900, Biol. Centr.-Amer., Arachnida Araneidea, 2, p. 149. --- Comstock, 1913, Spider Book, p. 524. --- Franganillo-Balboa, 1917, Aranas, p. 204. --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 885; 1961, Mém. Inst. franç. Afr. noire, (62), p. 75. --- Caporiacco, 1955, Acta biol. venezuel., 1, p. 414. --- Kraus, 1955, Abh. senckenb. naturf. Ges., 493, p. 56. --- Schmidt, 1956, Zool. Anz., 157, p. 26. --- Levi & Levi, 1968, Spiders and their Kin, p. 95.

Synaema: Thorell, 1869, Nova Acta reg. Soc. Sci. Upsal., (3), 7, p. 36 (rectification of Synema). --- Chyzer & Kulczyński, 1891, Aran. hung., 1, p. 81, 86. --- Simon, 1895, Hist. nat. Araign. éd. 2, 1, p. 1031; 1900, Fn. Hawaii., 2, p. 492; 1903, Hist. nat. Araign., éd. 2, 2, p. 1014; 1932, Arachn. France, 6, p. 792, 811. --- Bösenberg 1902, Zoollgica, Stuttgart, 14, p. 368. --- Planet, 1905, Araignées, p. 180. --- Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p. 377, 378, 388. --- Lessert, 1910, Cat. Invertébr. Suisse, 3, Araignées, p. 379. --- Petrunkevitch, 1928, Trans. Conn. Acad. Arts Sci., 29, p. 170. --- Roewer, 1928, Tierw. Mitteleur., 3(2), p. VI-19. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p. 127. --- S. Saito, 1934, J. Fac. Agr. Hokkaido imp. Univ., 33, p. 272; 1936, Rept. Sci. Exped. Manchoukuo, (5), 1(3), p. 9, 74; 1939, Saito Hoon-kai Mus. Res. Bull., 3, p. 83; 1959, Spider Book Illustr. Col., p. 129. --- Gertsch, 1939, Bull. Amer. Mus. nat. Hist., 76, p. 364. --- Kaston, 1953, How to Know the Spiders, p. 99. --- Yaginuma 1956, Atypus, Osaka, (10), p. 28; 1960, Spiders Japan Col., Osaka, p. 98; ibid., (rev. ed.), p. 98; 1986, ibid., (n. ed.), p. 205. --- Bonnet, 1958, Bibliogr. aran., 2, p. 4202. --- Tikader, 1960, J. Bombay nat. Hist. Soc., 57, p. 174; 1971, Mem. zool. Surv. India, 15(3), p. 53; 1980, Fn. India, Araneae, 1, p. 134. --- Utochkin, 1960, Zool. Zhun., 39, p. 375; 1960, ibid., 39, p. 1018. --- Zhu & Wang, 1963, Jilin Yike Daxue, Xue Bao, 5, p. 480. --- Jézéquel, 1966, Bull. Mus. Hist. nat. Paris, (2), 37, p. 619. --- Suman, 1970, Pacif. Ins., 12, p. 839. --- Tyshchenko,

1971, Opredel. pauk. evrop. casti SSSR, p. 107. --- Miller, 1971, Klic Zwireny CSSR, 4, p. 124. --- Levy, 1975, Israel J. Zool., 24, p. 156. --- Hubert, 1979, Araignées, p. 177. --- Sung et al., 1979, Zool. Mag., Beijing, 1979, p. 16. --- Song, 1980, Farm Spiders, p. 196. --- Hu, 1984, Chinese Spiders Fields Forests, p. 335.

Notes. Simon (1864) named this genus "Synema" latinized from Greek συν-αἷμα. Four years later, Thorell (1869) corrected Simon's transliteration to "Synaema". Many araneologists, including Simon after 1895, have supported Thorell's emendation, but some have preferred to use Simon's original spelling (Roewer, Kraus, Levi, etc.). In the present paper, I am inclined to adopt "Synaema" according to the traditional usage in Japan.

Type species. Aranea rotundata Walckenaer, 1802, Fn. paris., Ins., 2, p. 231 (= Aranea globosa Fabricius, 1775, Syst. ent., p. 432).

Etymology. From Greek σύν + αἷμα meaning coloured like blood; neuter.

Diagnosis. Medium-sized thomisids; male thinner than female. Prosoma nearly as long as wide, with long setae. Eyes small; lateral eyes on separate tubercles; ALE > PLE > AME > PME; MOA wider than long, wider behind than in front; clypeus narrower than AME-AME. Chelicera without tooth; labium longer than wide; sternum longer than wide. Legs with developed spines; claw tufts poorly developed; leg formula II-I-IV-III. Female palp with a dentate claw. Male palp with VTA and RTA, occasionally with ITA; RTA poorly developed, simple in shape; bulb simple, without apophisis; embolus

long, filiform. Opisthosoma globular in female, oval in male, with long hairs in both the sexes. Epigynum with a sclerotized plate at the middle; median hood present beneath the plate; intromittent canal soft; spermatheca small, kidney-shaped.

Range. Cosmopolitan, but mainly in the temperate and tropical zones.

Species included. About 130 species are known in the world.

Biology. Living on grasses and shrubs.

Key to the Japanese Species

1(2) Prosoma reddish brown without marking; opisthosoma dark-coloured, with distinct marking; intromittent canal of female genitalia shorter; tibia of male palp without ITA
..... Synaema globosum (Fabricius, 1775).

2(1) Prosoma yellowish brown, darker at the sides; opisthosoma light brown, with indistinct marking; intromittent canal of female genitalia longer; tibia of male palp with ITA
..... Synaema chikunii Ono, 1983.

Synaema globosum (Fabricius, 1775), sensu lato

[Japanese name: Funojigumo]

(Figs. 143-154)

Aranea globosa Fabricius, 1775, Syst. ent., p. 432.

--- Latreille, 1804, Hist. nat. gen. part. Crust. Ins., 7, p. 236.

Aranea platigera Rossi, 1790, Fn. etrusc., 2, p. 134.

Aranea rotundata Walckenaer, 1802, Fn. paris., Ins., 2, p. 231. --- Latreille, 1804, Hist. nat. gén. part. Crust. Ins., 7, p. 284.

Thomisus rotundatus: Walckenaer, 1805, Tabl. Aran., p. 30; 1806, Hist. nat. Aran., pl. 2, f.7; 1826, Fn. fr., Aranéides, p. 71; 1837, Hist. nat. Ins. Aptères, 1, p. 500. --- Latreille, 1818, Encycl. méth., Hist. nat. Ins., (24), p. 11; 1819, Dic. (N.) Hist. nat., n. éd., 34, p. 37. --- Audouin, 1826, Descr. Egypte, Hist. nat., 1(4), p. 166; 1827, ibid., ed. 2, 22, p. 399. --- Lucas, 1840, Hist. nat. Anim. articul., Annélid., Crust., Arachn., Myriapod. Ins., p. 382; 1846, Expl. sci. Algerie, 1, p. 187. --- O. Pickard-Cambridge, 1872, Proc. zool. Soc. London, 1872, p. 306.

Thomisus globosus: Latreille, 1830, Dic. clas. Hist. nat., Paris, p. 232. --- Hahn, 1831, Arachniden, 1, p. 34; 1834, Monogr. Spinn., (7), pl. --- C.L. Koch, 1837, Übersicht Arachn.-syst., (1), p. 24; 1851, ibid., (5), p. 39. --- Lebert, 1877, N. Denkschr. schw. naturf. Ges., 23, p. 262.

Synema rotundata: Simon, 1864, Hist. nat. Araign. (Aranéides), p. 433, 527.

Xysticus globosus: Mocsáry, 1872, Math. Termés. Közlem., Budapest, 10, p.198.

Diaea globosa: Thorell, 1873, Remarks Syn. Eur. Spid., p. 542; 1875, Horae Soc. ent. Ross., 11, p. 94. --- Pavesi, 1873, Ann. Mus. civ. Stor. nat. Genova, 4, p. 151. --- Kroneberg, 1875, in Fedtschenko, Reise in Turkestan, Zool. Theil, 1, p. 33.

Synema globosa: Simon, 1875, Arachn. France, 2, p. 202. --- Becker, 1882, Mus. roy. Hist. nat. Belg., 10, p. 188.

Synaema globosum: Simon, 1875, Ann. Soc. ent. France, (5), 5, Bull., p. CXCVII; 1895, Hist. nat. Araign., éd. 2, 1, p. 1031; 1932, Arachn. France, 4, p. 811. --- Chyzer & Kulczyński, 1891, Aran. hung., 1, p. 81. --- Planet, 1905, Araign., Hist. nat. France, 14, p. 180. --- Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p. 378. --- Lessert, 1910, Cat. Invertébr. Suisse, Araign., p. 379. --- Bonnet, 1958, Bibliogr. aran., 2, p. 4207. --- Utochkin, 1960, Zool. Zhur., 39, p. 1019. --- Tyshchenko, 1971, Opredel. pauk, evrop. casti SSSR, p. 118. --- Levy, 1975, Israel J. Zool., 24, p. 157. --- Matsumoto et at., 1976, Spiders, p. 158. --- Hubert, 1979, Araignées, p. 177. --- Sauer & Wunderlich, 1982, Schönste Spinnen Europas, p. 44. --- Jones, 1983, Spiders, p. 114. --- Shinkai & Takano, 1984, Field Guide Spid. Japan, p. 138. --- Yaginuma, 1986, Spiders Japan Col., Osaka, (n. ed.), p. 205.

Synema globosum: Pavesi, 1875, Atti. Soc. ital. Sci. nat., 18, p. 277. --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 885. --- Levi & Levi, 1968, Guide to Spiders and their Kin, p. 95.

Diaea nitida L. Koch, 1878, Verh. zool.-bot. Ges. Wien, 27, p. 769. Male holotype from Japan, A. v. Roretz leg., probably in BMNH, not examined; preoccupied by Diaea nitida (Thorell, 1877). (New synonymy.)

Synema japonica Karsch, 1879, Verh. naturf. Ver. preuss. Rheinl. Westfalens, 36, p. 75. 1♀1♂ 1 juv. ♀ syntypes from Japan, W. Dönitz & F.M. Hilgendorf leg., in ZMB, examined. (New synonymy.)

Diaea kochi Thorell, 1881, Ann. Mus. civ. Stor. nat. Genova, 17, p. 340. Nom. nov. pro Diaea nitida L. Koch, 1878. (New synonymy.)

Synaema globosa: Fuente, 1898, An. Soc. esp. Hist. nat., 27, Actas, p. 99. --- Bosenberg, 1902, Zoologica, Stuttgart, 14, p. 368. --- S. Saito, 1936, Rept. sci. Exped. Manchoukuo, (5), 1(3), pp. 9, 74; 1937, Annot. zool. japon., 16, p. 150. --- Zhu & Wang, 1963, Jilin Yike Daxue, Xue Bao, 5, p. 480. --- Hu, 1984, Chinese Spiders Fields Forests, p. 335.

Synaema globosum var.? nigriventris Kulczyński, 1901, in Horvath, Zool. Ergeb. asiat. Forsch.-reise Eugen Zichy, 1, p. 317.

Synaema japonica: Bösenberg & Strand, 1906, Abh. senckenb. naturf. Ges., 30, p. 265. --- S. Saito, 1960, in Okada et al., (eds.), Encycl. Zool. Illustr. Col., Tokyo, 4, p. 18.

Synaema (Synaema) globosum: Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p. 378.

Synaema globosum japonicum: Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p.378. --- Yaginuma, 1968, Spiders Japan Col., Osaka, (rev. ed.), p. 98. --- Shinkai, 1969, Spiders of Tokyo, p. 41. --- M.-S. Zhu, 1983, Spiders Paddy Fields Shanxi, 1, p. 184.

Synaema globosum canariense: Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p. 378.

Synema globosa var. clara Franganillo-Balboa, 1913, Broteria, Lisboa, 11, p. 132; 1917, Aranas, p. 246.

Synema globosa var. flava Franganillo-Balboa, 1913, Broteria, Lisboa, 11, p. 132; 1917, Aranas, p. 246.

Synema globosa var. pulchella Franganillo-Balboa, 1925, Bol. Soc. ent. Esp., 8, p. 38.

Synaema globosa japonica: Kishida, 1928, Fuji no kenkyu, 6, p. 480. --- Yuhara, 1931, Study of Spiders, p. 185. --- S. Saito, 1934, J. Fac. Agr. Hokkaido imp. Univ., Sapporo, 33, p. 277; 1959, Spider Book Illustr. Col., p. 129. --- Yaginuma, 1956, Atypus, Osaka, (10), p. 28; 1960, Spiders Japan Col., Osaka, p. 98; 1961, Rev. Fam. Gen. Spp. Japan Spid., p. 37.

Diaea nitidula Mello-Leitão, 1929, Arch. Mus. nac. Rio-de-Janeiro, 31, p. 294. Nom. nov. pro Diaea nitida L. Koch, 1878. (New synonymy.)

Synaema globosum daghestanicum Utochkin, 1960, Zool. Zhur., 39, pp. 1019, 1022. (New synonymy.)

Synaema japonicum: Utochkin, 1960, Zool. Zhur., 39, p. 1019. --- Song, et al., 1979, Zool. Mag., Beijing, for 1979, p. 16. --- Song, 1980, Farm Spiders, p. 196. --- Song, et al., 1981, Acta Sci. nat. Univ. Intramongol., 12, p. 86.

(For further literature, see Bonnet, 1939, 1958.)

Notes. Synaema globosum (Fabricius, 1775), sensu lato, is distributed widely and zonally in Eurasia from southern Europe and the Mediterranean region through Siberia to Japan. Some specialists tried to establish varieties and subspecies within the species: Dahl (1907), Franganillo-Balboa (1913, 1925), and Utochkin (1960). However, their works do not seem successful, because they laid emphasis chiefly on the coloration and markings. Dahl (1907) splitted the species into three subspecies, S. globosum globosum (Europe, Mediterranean), S. g. japonicum Karsch, 1879 (southern Russia, Japan) and S. g. canariense Dahl, 1907 (Canary Islands).

Utochkin (1960) regarded the complex as a species-group with four species and two subspecies, S. globosum (Europe, Mediterranean), S. g. daghestanicum Utochkin, 1960 (Daghestan), S. caucasicum Utochkin, (Caucasus), S. richteri Utochkin, 1960 (Armenia), S. japonicum Karsch, 1879 (Far East) and S. japonicum nigriventris Kulczyński, 1901 (Siberia). Judging from his descriptions and illustrations, S. caucasicum and S. richteri seem to be good species, but the other species and subspecies may only be variations of S. globosum.

In Japan, the Synaema spider has been recognized, according to Dahl (1907), as a subspecies of S. globosum (Kishida, 1928; S. Saito, 1934a, 1959; Yaginuma, 1956, 1960, 1968; Shinkai, 1969). Having examined some specimens collected in Turkey, Iran, Siberia, Mongolia and Japan, I found little difference in the shape of the terminal parts of genital organs of both the sexes, e.g., RTA of male palp and the chitinous plate of epigynum between Turkish and Japanese individuals (cf. Figs. 147-154). However, the difference cannot simply be regarded as a decisive point to split the spiders at species level. Besides, the material is not sufficient for determining the subspecific division of the species. Therefore I prefer to put all the described subspecies and varieties in the complex of S. globosum in the broadest sense.

Judging from the original description and illustration, Diaea nitida L. Koch, 1878, is doubtlessly the same species as S. globosum sensu lato. Thorell (1881) proposed a new name, Diaea kochi, for this species, in view of honomymy with Diaea nitida (Thorell, 1877). On the other hand, Mello-Leitão (1929) also proposed another new name, Diaea nitidula, for

Koch's D. nitida. These names, D. nitida L. Koch, 1878, D. kochi Thorell, 1881, and D. nitidula Mello-Leitão, 1929, are considered synonymous with S. globosum.

Etymology. Specific name from Latin meaning spherical.

Specimens examined. Japan: 1 juv., Ikutawara-machi, Monbetsu-gun, Hokkaiko, 24-VII-1984, T. Tomokuni leg. (NSMT-Ar 1643); 1♀, Mt. Torimiyama, Fukushima Pref., 4-VII-1943, T. Yaginuma leg. (TYO); 1 juv., Okada, 40m alt., Suzu-shi, Noto Pen., Ishikawa Pref., 29-X-1984, S. Uéno leg. (NSMT-Ar 1644); 3♀♀1♂, Tsuetsuki-toge, Kamiina-gun, Nagano Pref., 5-VII-1957, K. Okada leg. (TYO); 1♀1♂ 2 juv., Mt. Nyûgasayama, Nagano Pref., 2~4-VIII-1975, H. Ono leg. (NSMT-Ar 1645); 1♀, Mukaizumi, 600m alt., Takasu-mura, Gujô-gun, Gifu Pref., 12-VIII-1975, Y. Nishikawa leg. (YNO); 1 juv. ♀, Niyukawa-mura, Ohno-gun, Gifu Pref., 18-V-1970, Y. Nishikawa leg. (YNO); 1♀, Mt. Iwawakiyama, Osaka, 10-VI-1956, T. Yaginuma leg. (NSMT-Ar 371); 1♀, Mt. Yoshinoyama, Nara Pref., 3-VIII-1973, T. Yaginuma leg. (TYO); 1♀, Omogo-mura, Kamiukena-gun, Ehime Pref., 15-VII-1974, S. Matsumoto leg. (NSMT-Ar 1646); 1 juv., Mt. Hikosan, Fukuoka Pref., 12~15-VII-1958, K. Morimoto leg. (NSMT-Ar 1647); 3 juv., Kamenohara-ike, Tsuma-mura, Dôgo, Oki Islands, Shimane Pref., 10-IX-1984, M. Tomokuni leg. (NSMT-Ar 1648); 1♀1♂, Japan, W. Dönitz & F. M. Hilgendorf leg. (syntypes of Synema japonica Karsch, 1879, ZMB 2750); 1 juv. ♀, same data (ZMB 2912).

Mongolia: 1♀, Selenga ajmak, Shamor, 29-VII-1982, K. Mikhajlov leg. (ZMM); 1♂, same locality, 6-VIII-1982, K. Mikhajlov leg. (ZMM).

USSR: 1♀, Priamurje, Jewish ASSR, Dichun, Soviet Far East, 7-VIII-1978, V.V. Belov leg. (ZMM); 1♀, Priamurje, near Zeja, 3~4-VI-1978, V. V. Belov leg. (ZMM).

Iran: 1♂, 490-560m alt., 25 km sudl. Amol, westl. Seitental des Heraz, Elburs-Geb., Masandaran, 29-VI-1978, J. Martens leg. (SMF).

Turkey: 1♀1♂, Bururek-Pozani, Taurus, Datum u. Sammler? (SMF RII-11182).

Description. Measurement. Body length ♀ 4.85-8.20mm, ♂ 3.48-5.30mm; prosoma length ♀ 2.07-3.00mm, ♂ 1.63-2.36mm, width ♀ 2.00-2.80mm, ♂ 1.56-1.85mm; opisthosoma length ♀ 3.19-5.20mm, ♂ 2.15-3.00mm, width ♀ 2.33-5.00mm, ♂ 1.56-2.00mm; lengths of legs of 1♀1♂ from Turkey (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.08/0.96	1.88/1.76	1.84/1.80	1.40/1.12	2.76/2.52	8.96/8.16
II	1.08/1.00	1.96/1.80	1.96/1.88	1.40/1.12	2.92/2.60	9.32/8.40
III	0.76/0.66	1.16/0.96	1.28/1.12	0.96/0.72	2.00/1.68	6.16/5.14
IV	0.80/0.60	1.36/1.08	1.40/1.12	0.92/0.68	2.04/1.68	6.52/5.16

Prosoma as long as or slightly longer than wide (length/width ♀ 1.03-1.08, ♂ 1.00-1.09), with long setae. Eyes small, lateral eyes on tubercles, ALE > PLE > AME > PME, ALE/AME ♀ 1.25-1.50, ♂ 1.33-1.67, PLE/PME ♀ 1.30-1.50, ♂ 1.20-1.40, AME-AME/AME-ALE ♀ 1.05-1.24, ♂ 1.11-1.18, PME-PME/PME-PLE ♀ 1.10-1.16, ♂ 1.07-1.23, MOA-WA/WP ♀ 0.75-0.86, ♂ 0.77-0.85, MOA-L/W ♀ 0.68-0.81, ♂ 0.75-0.80, clypeus/AME-AME ♀ 0.44-0.77, ♂ 0.69-0.85, clypeus with 7 setae. Chelicerae without tooth, labium longer than wide (length/width ♀ 1.20-1.34, ♂ 1.12-1.43), sternum longer than wide (length/width ♀ 1.13-1.26, ♂ 1.14-1.35). Leg formula II-I-IV-III; tarsal

claws of legs I-II ♀ with 6-10 teeth, ♂ with 4-6 teeth, III-IV ♀ with 5-6 teeth, ♂ 2-5 teeth; tarsal claws of female palp with 4 teeth.

Spiniformation of legs. ♀ (Turkey): Femur: I-IV dorsal 1-1-1-1-1, I prolateral 3-2-2-1-1 (in the right leg 2-2-2-2-1); patella: I-IV dorsal 1-1, III-IV retrolateral 1; tibia: I-IV dorsal 1-1, I prolateral 0-1-1, II prolateral and I-II retrolateral 1-1-1, I ventral 1-1-2-2-2-2-0-3-2, II ventral 2-2-2-1-2-0-2, III-IV pro- and retrolateral 1-1, ventral 1-2-2; metatarsus: I-II pro-and retrolateral 1-1-2 ap, ventral 2-2-2-2-2, III-IV prolateral and III retrolateral 1-1-2 ap, IV retrolateral 1-1-1 ap, III-IV ventral 2. ♀ (Mt. Nyugasayama, Nagano Pref., Japan): Femur: I dorsal 1-1-1-1, prolateral 1-1-1-2-1-1, II-III dorsal 1-1-1-1-1, IV dorsal 1-1-1-1; patella: I-IV dorsal 1-1; tibia: I-IV dorsal 1-1, I-II pro- and retrolateral 1-1-1, ventral 2-2-2, III-IV pro- and retrolateral 1-1, ventral 1-2-2; metatarsus: I-II prolateral 1-1-2 ap, retrolateral 1-1-1 ap, I ventral 1-2-1-2, II ventral 0-2-2, III-IV pro- and retrolateral 1-1-1 ap, III ventral 2; IV ventral 0-1.

♂ (Turkey): Femur: I-IV dorsal 1-1-1-1-1, I prolateral 1-3-2-1-1, II-III prolateral 0-0-0-1; patella: I-II dorsal 0-1, III-IV dorsal 1-1, I-IV pro- and retrolateral 1; tibia: I-II dorsal, pro- and retrolateral 1-1-1, I ventral 2-1-2-2-2-2-0-0-2, II ventral 2-1-2-2-2, III-IV dorsal, pro- and retrolateral 1-1, III ventral 1-2-2, IV ventral 0-2-2; metatarsus: I prolateral, I-II retrolateral 1-1-2 ap, I retrolateral 1-1-0, I ventral 2-2, II ventral 1-2-2, III-IV pro- and retrolateral 1-1-1 ap, ventral 2. ♂ (Mt. Nyûgasayama, Nagano Pref., Japan): Femur: II-IV dorsal 1-1-1-1-1; patella II-IV dorsal 1-1, pro- and retrolateral 1; tibia: II-IV dorsal 1-1,

II pro- and retrolateral 1-1-1, ventral 2-2-2, III-IV pro- and retrolateral 1-1, ventral 1-2-2; metatarsus: II-III prolateral 1-1-2 ap, IV prolateral and II-IV retrolateral 1-1-1 ap, II ventral 1-2-0-2, III ventral 2, IV ventral 1 (both the leg I absent).

Male palp (Figs. 151-154). Tibia with VTA and RTA; VTA digitiform, RTA sclerotized, spiniform. Bulb simple, without apophysis, embolic division winding once around tegulum, embolus long, filiform.

Opisthosoma of female globular, slightly longer than wide (length/width 1.04-1.38), that of male oval, longer than wide (length/width 1.26-1.50), with short hairs.

Female genitalia (Figs. 147-150). Epigynum with a large chitinous plate; central hood situated beneath the plate. Intromittent canal soft, winding, spermathecae kidney-shaped.

Coloration and markings. ♀: prosoma reddish brown on dark red, head lighter; chelicerae, maxillae, labium and sternum blackish brown, legs I-II blackish brown, III-IV yellowish brown. Opisthosoma dirty white, yellow or orange, marginated with blackish brown, at the middle with distinct marking (Fig. 145); underside blackish brown or black, with two pair of white spots at the sides of spinnerets.

♂: prosoma reddish brown, head lighter; chelicerae, maxillae, labium, yellowish brown to blackish brown, sternum blackish brown, legs I-II brown to blackish brown, III-IV yellowish brown, femora, patellae and tibiae darker. Opisthosoma blackish brown or black with white markings (Fig. 146); underside blackish brown with a white spot near egigastric furrow and two pair of white spots at both sides of spinnerets.

Range. Middle part of Eurasia from Spain to Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Biology. Usually on shrubs or herbs. Adult in June, July and August.

Remarks. Several species occurring in Eurasia and northern Africa seem to be related to this species: S. plorator (O. Pickard-Cambridge, 1872) (Mediterranean, southern Europe, Central Asia), S. diana (Audouin, 1826) (Palestine, northern Africa), S. caucasicum Utochkin, 1960 (Caucasus). These species are similar in habitus to one another; the structure of male palp can be used as the best character to distinguish them from one another.

Synaema chikunii Ono, 1983

[Japanese name: Chikuni-ebisugumo]

Synaema chikunii Ono, 1983, Acta arachnol., 31, p. 59. Female holotype, 2♀♀1♂ paratypes from Susado, Horigane-mura, Minamiazumi-gun, Nagano Pref., Japan, 19-VII-1973, Y. Chikuni leg., 3♀♀ paratypes from the same locality as holotype, 28-VI-1976, Y. Chikuni leg., 1♀ paratype from Akan, Hokkaido, 14-VII-1977, K. Kumada leg., in ASEA, examined. --- Shinkai & Takano, 1984, Field Guide Spider Japan, p. 138. --- Yaginuma, 1986, Spiders Japan Col., Osaka, (n. ed.), p. 205.

Etymology. Named after Mr. Yasunosuke Chikuni, Nagano.

Specimens examined. Type series: Holotype: ♀, Susado, Horigane-mura, Minamiazumi-gun, Nagano Pref., Japan, 19-VII-1973, Y. Chikuni leg. (ASEA); paratypes: 2♀♀1♂, same data as holotype (ASEA); 3♀♀, same locality as holotype, 28-VI-1976, Y. Chikuni leg. (ASEA); 1♀, Akan-cho, Akan-gun, Hokkaido, 14-VII-1977, K. Kumada leg. (ASEA).

1♂ 1 juv., Shirakaba, Horokanai-cho, Uryu-gun, Hokkaido, 25-VII-1984, M. Tomokuni leg. (NSMT-Ar 1662); 1 juv., Meguro, Erimo-cho, Horoizumi-gun, Hokkaido, 28-VII-1984, M. Tomokuni leg. (NSMT-Ar 1663); 1 juv., Mt. Apoidake, Samani-gun, Hokkaido, 30-VII-1984, M. Tomokuni leg. (NSMT-Ar 1664); 1♀, Tohoku, Y. Matsuura leg. (NSMT-Ar 1665); 1♀, Lake Aoki, Kitaazumi-gun, Nagano Pref., 24-VII-1979, M. Mizusawa leg. (NSMT-Ar 1666); 1♀, Furuiwaya, Kuma-machi, Kamiukena-gun, Ehime Pref., Shikoku, 16-VII-1974, S. Matsumoto, E. Shinkai and K. Yamakawa leg. (NSMT-Ar 1667).

Description. Measurement. Body length ♀ 4.22-6.30mm, ♂ 3.19-3.60mm; prosoma length ♀ 1.67-2.22mm, ♂ 1.48-1.60mm, width ♀ 1.59-2.07mm, ♂ 1.41-1.50mm; opisthosoma length ♀ 2.37-4.15mm, ♂ 2.07-2.20mm, width ♀ 2.22-3.70mm, ♂ 1.26-1.60mm; lengths of legs of holotype ♀ and paratype ♂ (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.76/0.84	1.36/1.48	1.60/1.64	0.88/0.80	1.96/2.04	6.56/6.80
II	0.76/0.84	1.36/1.48	1.64/1.72	0.88/0.84	1.96/2.08	6.60/6.96
III	0.52/0.52	0.68/0.68	0.92/0.92	0.52/0.48	1.24/1.20	3.88/3.80
IV	0.52/0.52	0.68/0.72	0.96/0.92	0.56/0.56	1.40/1.32	4.12/4.04

Prosoma as long as or slightly longer than wide (length/width ♀ 1.00-1.08, ♂ 1.04-1.06), with setae. Lateral eyes on tubercles, ALE > PLE > AME ≧ PME, ALE/AME ♀ 1.43-2.00, ♂ 1.67, PLE/PME ♀ 1.29-1.50, ♂ 1.33-1.60, AME-AME/AME-ALE ♀ 1.05-1.24, ♂ 1.12-1.25, PME-PME/PME-PLE ♀ 0.97-1.02, ♂ 0.96-1.00, MOA-WA/WP ♀ 0.79-0.84, ♂ 0.80-0.83, MOA-L/W ♀ 0.75-0.83, ♂ 0.83-0.86, clypeus/AME-AME ♀ 0.88-1.09, ♂ 1.00. Labium longer than wide (length/width ♀ 1.25-1.46, ♂ 1.28-1.72), sternum longer than wide (length/width ♀ 1.06-1.25, ♂ 1.10-1.16), chelicerae without tooth. Tarsal claws of legs I-IV with 4-6 teeth.

Spiniformation of legs. ♀ (holotype): Femur: I-II, IV dorsal 1, I prolateral 0-2-1-1, III dorsal 1-1 (in the right leg 1); patella: I-IV dorsal 1-1; tibia: I-IV dorsal 1-1, I-II prolateral 1-1, retrolateral 0-1-1, ventral 2-2-2, III-IV prolateral 1, retrolateral 1, ventral 1; metatarsus: I-II prolateral 1-1-1, retrolateral 0-1-1, ventral 2-2, III prolateral 1-1, retrolateral 1, ventral 2, IV pro- and retrolateral, ventral each 1.

♂ (paratype): Femur: I dorsal 1, prolateral 0-2-1-1, II dorsal 1-1-1 (in the right leg 1-0-1), III dorsal 1-1 (in the right leg 1), IV dorsal 0-1-1-1; patella: I-IV dorsal 1-1, I pro- and retrolateral, II retrolateral each 1; tibia: I-IV dorsal 1-1, I pro- and retrolateral 1-1-1, ventral 2-2-2, II prolateral 0-1-1, retrolateral 1-1-1, ventral 2-2-1, III-IV pro- and retrolateral 1-1, ventral 2; metatarsus: I-II pro- and retrolateral 1-1-1, ventral 2-2, III-IV pro- and retrolateral 1-1, ventral 2.

Male palp (Ono, 1983, figs. 4-5). Tibia with VTA, RTA and ITA; VTA large, ITA developed, sclerotized, RTA with a dorsal tooth. Bulb simple,

embolic division winding twice around tegulum, embolus long, filiform, apically somewhat curved.

Opisthosoma as long as or longer than wide (length/width ♀ 1.00-1.12, ♂ 1.29-1.65), with long hairs.

Female genitalia (Ono, 1983, figs. 6-7). Epigynum with a large chitinous plate at the middle, guide picket situated under the plate, intromittent orifices at both sides of guide pocket. Intromittent canal long and soft, spermathecae kidney-shaped, small.

Coloration and markings. ♀: prosoma yellowish brown, darker at the sides, head white; chelicerae, maxillae, labium yellowish brown, sternum yellowish brown, darker at the sides; legs I-II yellowish brown, the middle part of tarsus, proximal parts of tibia and patella light-coloured, legs III-IV yellow, the distal parts of tibia and metatarsus dark-coloured. Opisthosoma light brown, distally with a pair of dark-brown longitudinal stripes and a V-shaped white marking; underside milk-white, dark brown at the middle. ♂: almost same as ♀ but darker.

Range. Japan (Hokkaido, Honshu, Shikoku).

Biology. Unknown.

Remarks. This species can be readily separated from S. globosum by its external appearance and also by the genital organs of both the sexes.

Genus Takachihoa Ono, 1985

[Japanese name: Kokihadakanigumo-zoku]

Takachihoa Ono, 1985, Bull. natn. Sci. Mus., Tokyo, (A), 11, p. 28 (type species by monotypy Oxyptila truciformis Bösenberg et Strand, 1906). --- Yaginuma, 1986, Spiders Japan Col., Osaka, (n. ed.), p. 204.

Type species. Oxyptila truciformis Bösenberg et Strand, 1906, Abh. senckenb. naturf. Ges., 30, p. 259.

Etymology. Derived from the type locality of the type species of the genus, "Nishitake, Hiuga," Nishitake-machi, the foot of Mt. Takachiho, Miyakonojô-shi, Miyazaki Pref., Japan.

Diagnosis. Small-sized thomisids; male a littel smaller than female. Prosoma slightly longer than wide, with clavate setae in females. Lateral eye tubercles discrete, ALE > PLE > AME ≧ PME, AME-AME > AME-ALE, PME-PME < PME-PLE, MOA wider than or as wide as long, WA > WP, clypeus narrower than AME-AME, with 7 setae. Labium slightly longer than or as long as wide, sternum longer than wide, chelicerae without tooth. Leg formula I-II-IV-III, femora I-IV with dorsal spines, femur I with prolateral spines, tibiae I-II ventrally with four pair of spines, metatarsi I-II with three pair of ventral spines. Male palp with VTA and RTA; VTA very large, securiform, RTA not much developed, distally sclerotized and bifurcated. Bulb without apophysis, embolus long, filiform, winding twice around tegulum. Opisthosoma of the Xysticus type. Epigynum not much sclerotized,

with a hood at the middle, without chitin-plate. Intromittent canal soft, long, spermathecae small, globular.

Range. Southeast Asia (Japan, Taiwan, Indonesia).

Biology. The species of this genus are collected from shrubs by sweeping and beating.

Species included. Two species are known; T. truciformis (Bösenberg et Strand, 1906), Japan and Taiwan, T. krakatauensis (Bristowe, 1931), comb. nov., Indonesia.

Remarks. This genus is related to Synaema Simon, 1864, but the epigynum of Takachihoa is not much sclerotized and bears no chitin-plate, and the VTA of male palp is very large and securiform.

Only one Japanese species.

Takachihoa truciformis (Bösenberg et Strand, 1906)

[Japanese name: Kokihadakanigumo]

Oxyptila truciformis Bösenberg et Strand, 1906, Abh. senckenb. naturf. Ges., 30, p. 259. 2♀♀ syntypes from "Nishitake, Hiuga," VII-1898, collector unknown, in ZMH, examined.

Ozyptila truciformis: Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 880.

Oxyptila (?) truciformis: Ono, 1978, Atypus, Osaka, (72), p. 3.

Takachihoa truciformis: Ono, 1985, Bull. natn. Sci. Mus., Tokyo, (A), 11, p. 29. --- Yaginuma, 1986, Spiders Japan Col., Osaka, (n. ed.), p. 204.

Notes. This species was originally described by Bösenberg and Strand (1906) under the genus Oxyptila. Since then, however, it has never been rediscovered for 70 years. Recently, I had an opportunity to examine the type specimens, and became aware of the occurrence of the species in the Ryukyus and Taiwan (Ono, 1978b). In the paper, I suggested that this species is widely different from typical Oxyptila in having many setae on the femora and four pair of ventral spines on the tibiae I-II, MOA wider than long, and the different structure of male palp and female genitalia, and that it might not belong to the genus Oxyptila. After that, I came to the conclusion that a new genus had better be erected for this species (Ono, 1985a).

Etymology. Specific name from Latin trux (wild) + formis (like); probably derived from the fact that the species is similar to Oxyptila trux (Blackwall, 1846).

Specimens examined. Type series: syntypes; 2♀♀, "Nishitake, Hiuga," Nishitake-machi, Miyakonojô-shi, Miyazaki Pref., VII-1898, collector unknown, but probably T. Lenz (cf. Bösenberg & Strand (1906), p. 252) (ZMH 266).

Japan: 1♀, Kikaigashima Island, Amami Islands, Kagoshima Pref., 21-V-1973, H. Makihara leg. (NSMT-Ar 1681); 2♀♀1♂ 1 juv., Nishinakama, Amamiôshima Island, Amami Islands, Kagoshima Pref., 24~26-V-1978, H. Makihara leg. (NSMT-Ar 1681); 1♀, Benoki, Kunigami-gun, Okinawa Island, Okinawa Pref., 10-VII-1977, H. Makihara leg. (NSMT-Ar 1683); 1♀1♂, Iheyajima Island, Okinawa Islands, Okinawa Pref., 22-V-1977, M. Shimojana leg. (MSO); 2♀♀1♂ 1 juv., Mt. Katsuudake, Okinawa Island, Okinawa Pref., 6-VI-1977, Y.

Chikuni leg. (NSMT-Ar 1684); 2♀♀, Oku, Kunigami-son, Kunigami-gun, Okinawa Island, Okinawa Pref., 16-V-1978, H. Makihara leg. (NSMT-Ar 1685); 3♀♀, Karimata, Hirara-shi, Miyakojima Island, Yaeyama Islands, 22-VII-1971, M. Shimojana leg. (MSO); 1♀, Mt. Omotodake, Ishigakijima Island, Yaeyama Islands, Okinawa Pref., 20-VI-1974, H. Makihara leg. (NSMT-Ar 1686); 1 juv., Sumiyoshi, Iriomotejima Island, Yaeyama Islands, Okinawa Pref., 27-III-1975, K. Arima & H. Ono leg. (NSMT-Ar 1687); 3 juv., Ushiiku-mori, Iriomotejima Island, Yaeyama Islands, Okinawa Pref., 9-XI-1984, M. Tomokuni leg. (NSMT-Ar 1688); 1♀, Shirahama, Iriomotejima Island, Yaeyama Islands, Okinawa Pref., 2-VIII-1973, M. Shimojana leg. (MSO); 1 juv. ♂, middle reaches of the Kuira River, Iriomotejima Island, Yaeyama Islands, Okinawa Pref., 25-III-1975, M. Shimojana leg. (MSO); 2 juv., upper reaches of the Kuira River, Iriomotejima Island, Yaeyama Islands, Okinawa Pref., 27-III-1973, M. Shimojana leg. (MSO).

Taiwan: 1♀, Sung-kang, Taipei, 9-V-1971, Yau-I-Chu leg. (NSMT-Ar 1689); 1♀, Mt. Yang-ming Shan, Taipei, 28-VII-1977, H. Yoshida leg. (NSMT-Ar 1690); 1♀, Wu-lai, Taipei, 1-VI-1976, H. Makihara leg. (NSMT-Ar 1691); 1♀, same locality, 7-VII-1977, H. Yoshida leg. (NSMT-Ar 1692); 1♂, Ku-kuan, 10-VI-1976, H. Makihara leg. (NSMT-Ar 1693); 1♀, Lu-shan, 5 7-VI-1976, H. Makihara leg. (NSMT-Ar 1694); 1♀, Nan-shan Ch'i, Nan-t'ou Hsien, 23-VII-1977, H. Yoshida leg. (NSMT-Ar 1695); 2♀♀, Hung-yeh Wen-ch'uan, 13-VI-1976, H. Makihara leg. (NSMT-Ar 1696).

Description. Measurement. Body length ♀ 2.74-4.20mm, ♂ 2.20-2.89mm; prosoma length ♀ 1.19-1.70mm, ♂ 1.19-1.33mm, width ♀ 1.19-1.63mm, ♂ 1.19-1.30mm; opisthosoma length ♀ 1.63-2.68mm, ♂ 1.40-1.63mm, width ♀ 1.56-2.72mm, ♂ 1.04-1.30mm; lengths of legs of 1♀1♂ from Mt.

Katsuudake, Okinawa Island (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.48/0.56	0.86/1.04	1.08/1.20	0.68/0.56	1.40/1.36	4.50/4.72
II	0.48/0.56	0.86/0.96	1.00/1.16	0.72/0.56	1.44/1.40	4.50/4.64
III	0.34/0.32	0.44/0.44	0.68/0.66	0.48/0.40	0.92/0.92	2.86/2.74
IV	0.32/0.32	0.52/0.48	0.68/0.72	0.48/0.36	1.00/0.88	3.00/2.76

Prosoma nearly as long as wide (length/width ♀ 0.97-1.14, ♂ 1.00-1.04), with clavate setae in females, with normal setae in males, ALE > PLE > AME ≧ PME, ALE/AME ♀ 2.00-2.58, ♂ 2.00, PLE/PME ♀♂ 1.75-2.00, AME-AME/AME-ALE ♀ 1.15-1.37, ♂ 1.25-1.50, PME-PME/PME-PLE ♀ 0.54-0.63, ♂ 0.50-0.60, MOA-WA/WP ♀ 1.02-1.15, ♂ 1.03-1.06, MOA-L/W ♀ 0.83-0.94, ♂ 0.94-1.00, clypeus/AME-AME ♀ 0.62-0.80, ♂ 0.60-0.67. Chelicerae four times as long as clypeus, labium usually longer than wide (length/width ♀ 1.06-1.18, ♂ 1.00-1.19), sternum longer than wide (length/width ♀ 1.11-1.32, ♂ 1.12-1.20).

Spiniformation of legs of 1♀1♂ used in the measurements. ♀: Femur: I-IV dorsal 1-1, I prolateral 1-1-1; patella: I-IV dorsal 1-1; tibia: I-II ventral 2-2-2-2, I-IV dorsal 1-1; metatarsus: I-II ventral 2-2-2.

♂: Femur: I-II dorsal 1-1-1-1-1, I prolateral 1-1-1, III-IV dorsal 2-1-1-1; patella: I-IV dorsal 1-1; tibia: I-IV dorsal 1-1, I-II ventral 2-2-2-2, prolateral 1-1-1, III-IV prolateral 1-1, IV retrolateral 0-1; metatarsus: I-II ventral 2-2-2, III prolateral 1-1, IV prolateral 1-0.

Male palp (Ono, 1978b, figs. 6-7). Tibia with VTA and RTA; VTA large, securiform, RTA distally sclerotized and bifurcated, cymbium without attached element. Bulb without apophysis, embolic division winding twice around tegulum, embolus filiform.

Opisthosoma wider than or as long as wide in females (length/width 0.90-1.05), longer than wide in males (length/width 1.25-1.35), with many strong hairs.

Female genitalia (Ono, 1978b, figs. 2-5). Epigynum poorly sclerotized, with a hood at the middle. Intromittent canal long and soft, spermathecae small, globular.

Coloration and markings. ♀: Prosoma yellowish brown to dark brown, with dark-coloured markings at the sides; chelicerae, maxillae, labium blackish brown, sternum yellow or light yellowish white, coxa I distally yellow, proximally blackish brown, coxa II yellow, femora I-II dorsally light brown, tibiae I-II dorsally light brown, dorsum of femora, patellae and tibiae I-II each distally blackish brown with white spots, the other parts of legs I-II dark brown, femora III-IV distal 1/3, patellae and tibiae III-IV distal half, metatarsi III-IV proximal half blackish brown, the other parts of legs III-IV yellow. Opisthosomal dorsum dirty yellow or yellowish brown, with indistinct dark-coloured markings, laterally darker, venter light yellowish brown.

♂: Chelicerae dark brown, maxillae, labium yellowish brown, sternum yellow, legs I-II brown, each distal half of the femora and tibiae darker, legs III-IV yellow, femora and tibiae distally darker; other parts of prosoma and opisthosoma nearly the same as in females.

Range. Japan (Kyushu, Nansei Islands), Taiwan.

Biology. Frequently collected from shrubs by sweeping method.

Remarks. This species is closely related to the second species of the genus, T. krakatauensis, but is distinguished from the latter by the shape of RTA of male palp and epigynum.

Genus Misumenops F.O.Pickard-Cambridge, 1900, sensu lato

[Japanese name: Hanagumo-zoku]

Misumenops F.O.Pickard-Cambridge, 1900, Biol. Centr.-Amer., Zool, Arachn., Araneida, 2, p.134. --- Simon, 1903, Hist. nat. Araign., éd. 2, 2, p. 1011; 1932, Arachn. France, 6, p.787, 791. --- Petrunkevitch, 1928, Trans. Conn. Acad. Arts Sci., 29, p.168. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p.224. --- Gertsch, 1939, Bull. Amer. Mus. nat. Hist., 76, p.318. --- Kaston, 1948, Spid. Conn., p.414; 1953, How to Know Spid., p.97. --- Schick, 1965, Bull. Amer. Mus. nat. Hist., 129, p.108. --- Yaginuma, 1965, Atypus, Osaka (36), p.48; 1968, Spid. Japan Col., Osaka (rev. ed.), p.95. --- Suman, 1970, Pacif. Ins., 12, p.800. --- Tyshchenko, 1971, Opredel. pauk. evrop. casti SSSR, p.118. --- Miller, 1971, Klic zvireny CSSR, 4, p.125. --- Dondale & Redner, 1978, Ins. Arachn. Canada, 5, p.140. --- Hubert, 1978, Araign., p.170. --- Rinaldi, 1983, Rev. bras. Ent., 27, p.147. --- Dippenaar-Schoeman,

1983, Ent. Mem. Dept. Agr. S. Afr., (55), p.48. --- Hu, 1984, Chinese Spiders Fields Forests, p.318.

Misumessus Banks, 1904, J.N.Y. ent. Soc., 12, p.112.

Metadiaea Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p.237.

Misumenops (Misumessus): Schick, 1965, Bull. Amer. Mus. nat. Hist., 129, p.110.

Misumenops (Misumenops): Schick, 1965, Bull. Amer. Mus. nat. Hist., 129, p.111.

Since F.O.Pickard-Cambridge (1900) established the genus for a dozen species occuring in Central and South Americas, many species of this genus have been described from the temperate and tropical zones of the world. Comprising about 100 species at present, the genus has become very large and heterogeneous. Though the species known from the Old World should be revised in future, the genus is presented here in the widest sense.

Type species. Misumena maculis-parsa Keyserling, 1891, Spinnen Amerikas, 3, Brasilianische Spinnen, p.245.

Etymology. From Greek μισουμενα (Misumena) with suffix -ops; an animal having eyes of Misumena.

Diagnosis. Small to medium sized thomisids; male smaller than female. Prosoma nearly as long as wide, with setae (setae in the cephalic part rarely undeveloped), somewhat flattened. Tubercles of lateral eyes connate; lateral eyes much larger than medinas, ALE > PLE ≧ AME ≧ PME, AME-AME ≧ AME-ALE, PME-PME > PME-PLE, MOA wider than long, wider behind than in front, clypeus nearly as wide as AME-AME. Chelicera without tooth or with a minute

tooth, labium longer than wide, sternum longer than wide. Leg formula I-II-IV-III or II-I-IV-III; claws of legs with 2 ~ 5 teeth. Spines of legs developed; tibia I-II frequently without lateral spines. Male palp with VTA, ITA and RTA; VTA digitiform, RTA apically sclerotized, frequently with a dorsal tooth; tegulum without apophyses, embolus usually short, filiform or spiniform, frequently curved apically. Opisthosoma pyriform, nearly as long as wide in female, oval, longer than wide in male, with long hairs. Epigynum with central hood; intromittent orifices situated at both sides of hood; intromittent canal winding; spermatheca small, tube-shaped.

Range. Temperate and tropical zones of the world.

Biology. Found on shrubs and grasses. Life history of Misumenops tricuspidatus in Japan was studied by Hukushima and Miyafuji (1970).

Species included. Of ca. 100 known species, about 70% are from the New World.

Remarks. This genus was originally established for some species occuring in Central and South Americas. In the typical species of the New World, the embolic division of male palp is arising on the prolateral or distal margin of tegulum and clearly separated from it by a ridge. The Old World species of the genus have the embolic division not clearly separated from tegulum but winding around it. They are rich in variety and can be divided into some species-groups or subgenera. However, I was unable to revise the Old World constituents of the genus to those levels for shortage of material.

The three Japanese species of the genus are also from peculiar origins, respectively. Misumenops tricuspidatus is distributed widely in

the Eurasian Continent; M. japonicus seems to be derived from a Southeast Asian ancestor; relatives of M. kumadai occur on the Hawaiian Islands.

Key to the Japanese Species

1(2) Thoracic setae of prosoma long; central hood situated at the anterior part of epigynum; male palp with ITA, embolus apically curved ..... M. japonicus (Bösenberg et Strand, 1906).

2(1) Thoracic setae of prosoma short; central hood situated at the middle of epigynum, male palp without ITA, embolus apically not curved.

3(4) Intromittent canal of female genitalia soft and long; embolus of male palp filiform and long ..... M. tricuspidatus (Fabricius, 1775).

4(3) Intromittent canal hard and short; embolus spiniform and short ..... M. kumadai Ono, 1985.

Misumenops japonicus (Bösenberg et Strand, 1906)

[Japanese name: Ko-hanagumo]

(Figs. 155-160)

Misumena japonica Bösenberg et Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.256. Female holotype from "Saga, Kompira," Japan, in SMF, missing. --- S.Saito, 1933, Trans. Sapporo nat. Hist. Soc.,

13, p.37. --- S.Komatsu, 1936, Iconogr. col. viv. aran. japon., 1, p.124. --- Chikuni, 1941, Spid. Jpn. Alps. p.145. --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p.839. --- Yaginuma, 1956, Atypus, Osaka, (10), p.27; 1960, Spiders Japan Col., Osaka, p.96. --- Bonnet, 1957, Bibliogr. aran., 2, p.2938.

Misumena yunohamensis Bösenberg et Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.257. Female holotype from "Yunohamabergen bei Saga," W.Dönitz leg., in SMF, missing. --- S.Komatsu, 1936, Iconogr. col. viv. aran. japon., 1, p.91. --- Roewer, 1954, Kat. aran., Bruxelles, 2(a), p.837. --- Yaginuma, 1956, Atypus, Osaka, (10), p.27; 1960, Spiders Japan Col., Osaka, p.96. --- Bonnet, 1957, Bibliogr. aran., 2, p.2947. --- Uyemura, 1965, J. Jonan High School, 2, p.45.

Misumenops japonicus: Yaginuma, 1965, Atypus, Osaka, (36), p.48; 1968, Spiders Japan Col., Osaka, (rev. ed.), p.96; 1969, Nature & Ins., Tokyo, 4(3), p.12; 1986, Spiders Japan Col., Osaka, (n. ed.), p.206. --- Matsumoto et al., 1976, Spiders, p.156. --- Shinkai, 1978, Collect. & Breed., Tokyo, 40, p.481. --- Shinkai & Takano, 1984, Field Guide to Spid. Japan, p.133. --- M.-S. Zhu, Spiders Paddy Fields Shanxi, 1, p.172.

Misumenops yunohamensis: Yaginuma, 1965, Atypus, Osaka, (36), p.48; 1968, Spiders Japan Col., Osaka, (rev. ed.), p.96.

Misumenops japonica [sic]: Hu, 1984, Chinese Spinders Fields Forests, p. 318.

Etymology. Specific name from a country of Japan.

Specimens examined. Japan: 1 juv., Ikutahara-machi, Monbetsu-gun, Hokkaido, 24-VII-1984, M.Tomokuni leg. (NSMT-Ar 1700); 2 juv., Nopporo, Ebetsu-shi, Hokkaido, 2-VIII-1984, M.Tomokuni leg. (NSMT-Ar 1701); 1 juv., Kenmin-no-mori, Rifu-cho, Miyagi-gun, Miyagi Pref., 30-V-1981, K.Sasaki leg. (NSMT-Ar 1702); 1♂, s.l., 12-VI-1982, K.Sasaki leg. (NSMT-Ar 533); 1♂, s.l., 4-VIII-1982, K.Sasaki leg. (NSMT-Ar 535); 1♀, Yamamoto-cho, Watarai-gun, Miyagi-Pref., 9-VIII-1982, K.Sasaki leg. (NSMT-Ar 534); 1♀, Takashimizu-machi, Kurihara-gun, Miyagi Pref., 19-VII-1981, K.Sasaki leg. (NSMT-Ar 1703); 1♂, Mt. Izumigatake, Izumi-shi, Miyagi Pref., 26-VII-1981, K.Sasaki leg. (NSMT-Ar 1705); 1♀, Kôzu-bokujô, Kanra-gun, Gunma Pref., 25-VI-1972, A.Matsumoto leg. (NSMT-Ar 1704); 1♂, Fujioka-shi, Gunma Pref., 30-V-1984, T.Hayashi leg. (NSMT-Ar 1706); 1♂, Miyakejima Island, Tokyo, 8-VIII-1979, K.Suzuki leg. (NSMT-Ar 1707); 1♀5♂♂ 28 juv., Mitsune, Hachijojima Island, Tokyo, 13-XI-1977, K.Sasaki leg. (NSMT-Ar 1708); 1♀, Ôgagô, Hachijôjima Island, Tokyo, 26-V-1949, T.Aoki leg. (TYO); 1♀, Miyashita, Hachijôji-shi, Tokyo 15-VII-1971, S.Matsumoto leg. (NSMT-Ar 1709); 1♀, Fuezuka, Hakone-machi, Ashigarashimo-gun, Kanagawa Pref., 29-VII-1972, H.Ono leg. (NSMT-Ar 1710); 2 juv., Isehara-shi, Kanagawa Pref., 18-V-1975, H.Ono leg. (NSMT-Ar 1711); 1♀, Tateshina-kogen, Nagano Pref., 2~4-VIII-1975, S.Takano, E.Shinkai & H.Ono leg. (NSMT-Ar 1712); 1♀ 85 juv., Kiyosato, Takane-machi, Kitakoma-gun, Yamanashi Pref., 29-VII-1975, H.Ono leg. (NSMT-Ar 1713); 1♀, Mt. Yoshinoyama, Nara Pref., 16-VIII-1962, T.Yaginuma leg. (NSMT-Ar 287); 3♀♀, s.l., 27-VII-1966, T.Yaginuma leg. (TYO); 1♀, s.l., 13-VIII-1963, T.Yaginuma leg. (TYO); 1♀1♂, s.l.,

19-VII-1968, T.Yaginuma leg. (TYO); 1♀, Nara-shi, Nara Pref., 1-VI-1939, T.Yaginuma leg. (TYO); 1♀, Zenki, 420-800m alt., Shimokitayama-mura, Yoshino-gun, Nara Pref., 3-VIII-1972, K.Harusawa leg. (YNO); 3 juv., Misen, 1,400-1,600m alt., Tenkawa-mura, Yoshino-gun, Nara Pref., 4-V-1969, Y.Nishikawa leg. (YNO); 4♀♀2♂♂, Ônuma, Kitayama-mura, Higashimuro-gun, Wakayama Pref., 1-VI-1951, T.Yaginuma leg. (TYO); 1 juv. ♂, Mt. Hirasan, Shiga Pref., date? M.Maikawa leg. (YNO); 1♀, Mt. Iwawakiyama, Osaka, 9-III-1955, T.Yaginuma leg. (TYO); 1♀3♂♂, Zenihara, 440m alt., Ibaraki-shi, Osaka, 1-VII-1978, Y.Nishikawa leg. (YNO); 1 juv., Ôsugidani-rindô, 500-700m alt., Shiramine-mura, Ishikawa-gun, Ishikawa Pref., 3-V-1972, K.Harusawa leg. (YNO); 4♀♀3♂♂, Mt. Daisen, Tottori Pref., 25-V-1976, Y.Yoneda leg. (NSMT-Ar 1714); 1 juv., Masumizuhara, Mt. Daisen, Tottori Pref., 13-IX-1984, M.Tomokuni leg. (NSMT-Ar 1715); 1 juv., s.l., 14-IX-1984, M.Tomokuni leg. (NSMT-Ar 1716); 1 juv., Yokotemichi, Mt. Daisen, Tottori Pref., 14-IX-1984, M.Tokokuni leg. (NSMT-Ar 1717); 1 juv., Inugu, Saigô-cho, Dôgo, Oki Islands, Shimane Pref., 11-IX-1984, M.Tomokuni leg. (NSMT-Ar 1718); 3 juv., Kamenohara-ike, Tsuma-mura, Dôgo, Oki Islands, Shimane Pref., 10-IX-1984, M.Tomokuni leg. (NSMT-Ar 1719); 3♀♀1♂, Mt. Daimanji, Dôgo, Oki Islands, Shimane Pref., 10-VII-1964, M.Ohno leg. (TYO); 1♀1♂, Omogo-mura, Kamiukena-gun, Ehime Pref., 15-VII-1974, E.Shinkai & S.Matsumoto leg. (NSMT-Ar 1720); 1♀, Kuma-machi, Kamiukena-gun, Ehime Pref., 16-VII-1974, E.Shinkai & S.Matsumoto leg. (NSMT-Ar 1721); 1♂, Mt. Hikosan, Fukuoka Pref., 1-VIII-1968, K.Kanmiya leg. (NSMT-Ar 1722); 2♀♀2♂♂, ibid., 12~15-VII-1958, K.Morimoto leg. (NSMT-Ar 1723); 1♀, Ebino-kogen, Miyazaki Pref., 2-VIII-1967, R.Hamada leg. (TYO); 3♀♀ 1 juv., Kuchinoerabujima

Island, Kagoshima Pref., 17-VIII-1977, M.Shimojana leg. (MSO); 1♀1♂ 1 juv., Suwanosejima Island, Tokara Islands, Kagoshima Pref., 11-VIII-1976, M.Shimojana leg. (MSO); 1♀, Nishinakama, Amami-ôshima Island, Kagoshima Pref., 5-VII-1976, H.Makihara leg. (NSMT-Ar 1724); 3♂♂, s.l., 11-IV-1976, H.Makihara leg. (NSMT-Ar 1725); 1♀ 1 juv., Kinasakubaru, Amami-ôshima Island, Kagoshima Pref., 2~3-XI-1984, M.Tomokuni leg. (NSMT-Ar 1726); 3♀♀, Nakanoshima Island, Toraka Islands, Kagoshima Pref., 25-VI-1973, H.Makihara leg. (NSMT-Ar 1727); 1 juv. ♀, s.l., 6-VIII-1976, M.Shimojana leg. (MSO); 1♀, Yona, Kunigami-son, Kunigami-gun, Okinawa Island, Okinawa Pref., 28-VI-1984, M.Tomokuni leg. (NSMT-Ar 1728); 2♀♀1♂ 1 juv., Benoki, Kunigami-son, Kunigami-gun, Okinawa Island, Okinawa Pref., 10-VII-1977, H.Makihara leg. (NSMT-Ar 1729); 1♀1♂ 6 juv., Mt. Yonahadake, Okinawa Island, Okinawa Pref., 29-VI-1984, M.Tomokuni leg. (NSMT-Ar 1730); 1♀1♂ 1 juv. ♀, Nago-shi, Okinawa Island, Okinawa Pref., 30-VI-1984, M.Tomokuni leg. (NSMT-Ar 1731); 1♀, southern part of Okinawa Island, Okinawa Pref., X-1960, K.Yasumatsu leg. (NSMT-Ar 1732); 1♂, Gesashi, Higashi-son, Kunigami-gun, Okinawa Island, Okinawa Pref., 24-IV-1984, M.Shimojana leg. (MSO); 1♂, Zamamijima Island, Okinawa Islands, Okinawa Pref., 18-VIII-1980, M.Shimojana leg. (MSO); 1♀, Mt. Omotodake, Ishigakijima Island, Yaeyama Islands, Okinawa Pref., 13-XI-1984, M.Tomokuni leg. (NSMT-Ar 1733); 2♂♂ 1 juv. ♀, s.l., 29-III-1973, M.Shimojana leg. (MSO); 1♂ 1 juv., Shirahama, Iriomote Island, Yaeyama Islands, 2-VIII-1973, M.Shimojana leg. (MSO); 2♀♀, Takana, Iriomote Island, Yaeyama Islands, Okinawa Pref., 12-XI-1984, M.Tomokuni leg. (NSMT-Ar 1734); 1 juv. ♀, Komi, Iriomote Island, Yaeyama Islands, Okinawa Pref., 10-XI-1984, M.Tomokuni leg. (NSMT-Ar 1735); 1♀1♂ 1 juv. ♀, Kobisho, Senkaku

Islands, Okinawa Pref., 7-IV-1971, M.Shimojana leg. (MSO).

Taiwan: 2♀♀1♂ 1 juv. ♀, Yang-ming-shan, 28-VII-1977, H.Yoshida leg. (NSMT-Ar 1736); 1♀1♂ 1 juv., A-li Shan, 10-VII-1977, H.Yoshida leg. (NSMT-Ar 1737); 1♂, Meichi, 26-X-1969, Yau I Chu leg. (NSMT-Ar 1738); 1♀, Wu-lai, 27-VI-1976, H.Makihara leg. (NSMT-Ar 1739); 2♀♀, Lu-shan, 5~7-VI-1976, H.Makihara leg. (NSMT-Ar 1740); 1♀, Taiwan, 31-V-1971, K.Kamiya leg. (NSMT-Ar 1741).

Description. Measurement. Body length ♀ 3.70-7.93mm, ♂ 3.26-4.07mm; prosoma length ♀ 1.85-2.67mm, ♂ 1.63-2.07mm, width ♀ 1.78-2.44mm, ♂ 1.59-1.93mm; opisthosoma length ♀ 2.07-5.16mm, ♂ 1.85-2.37mm, width ♀ 1.70-4.67mm, ♂ 1.30-1.70mm; lengths of legs of 1♀1♂ from Hachijojima Island (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.78/0.96	1.70/1.96	2.05/2.15	1.19/0.93	2.52/2.44	8.24/8.44
II	0.78/0.93	1.70/2.00	2.03/2.09	1.19/0.89	2.56/2.37	8.26/8.28
III	0.48/0.56	0.89/0.89	1.11/1.06	0.70/0.63	1.70/1.48	4.88/4.62
IV	0.52/0.56	0.89/0.93	1.11/1.19	0.63/0.56	1.85/1.56	5.00/4.80

Prosoma longer than wide (length/width ♀ 1.01-1.10, ♂ 1.02-1.09), with long setae. Tubercles of lateral eyes connate, lateral eyes much larger than medians, ALE > PLE > AME ≧ PME, ALE/AME ♀ 1.31-1.43, ♂ 1.38-1.59, PLE/PME ♀ 1.06-1.17, ♂ 1.07-1.25, AME-AME/AME-ALE ♀ 1.25-1.38, ♂ 1.11-1.50, PME-PME/PME-PLE ♀ 1.07-1.21, ♂ 1.10-1.20, MOA-WA/WP ♀ 0.74-0.83, ♂ 0.76-0.84, MOA-L/W ♀ 0.84-0.89, ♂ 0.88-0.95, clypeus/AME-AME ♀ 1.16-1.31, ♂

1.10-1.47. Labium length/width ♀ 1.25-1.54, ♂ 1.44-1.86, sternum length/width ♀ 1.08-1.18, ♂ 1.05-1.19, chelicera with two very small teeth. Tarsal claws of legs I-II with 5 teeth, III-IV with 3-4 teeth; claw tuft developed.

Spiniformation of legs of 1♀1♂ used in the measurements of legs. ♀: Femur: I-II dorsal 1, I prolateral 1-1-1, III-IV dorsal 1-0; patella: I-IV dorsal 1-0-1; tibia: I-II dorsal 1-1-0, pro- and retrolateral 1-1-1, ventral 2-2, III-IV dorsal, pro- and retrolateral each 1-1, III ventral 2, IV ventral 1; metatarsus: I-II prolateral 1-1-2 ap, retrolateral 1-1-1 ap, ventral 2-2-2-2, III-IV pro- and retrolateral 1-1, III ventral 2, IV ventral 1.

♂: Femur: I-IV dorsal 1-1-1-1-1, I prolateral 0-1-1-1, retrolateral 0-0-0-1, II pro- and retrolateral and III-IV retrolateral each 0-0-0-1; patella: I-IV dorsal 1-0-1, I-II prolateral and I-IV retrolateral each 1; tibia: I-II dorsal 1-1-0, pro- and retrolateral 1-1-1, I ventral 2-2-2-1 ap, II ventral 2-2-0-2-0, III-IV dorsal 1-1, pro- and retrolateral 1-1, ventral 2-2; metatarsus: I-II prolateral 1-1-0-2 ap, retrolateral 1-1-0-1 ap, ventral 2-2-2-2, III-IV pro- and retrolateral 1-1, ventral 2.

Male palp (Figs. 159-160). Tibia with VTA, RTA and ITA; VTA finger-shaped, distally wider, ITA dentiform, RTA developed and complicated, with a distal tooth, ventral margin with a row of short hairs. Bulb without any apophysis, embolic devision winding 1.5 times around the tegulum, embolus long, filiform, the apical part curved dorsally.

Opisthosoma oval, longer than wide (length/width ♀ 1.07-1.22, ♂ 1.25-1.48), with long hairs.

Female genitalia (Figs. 156-157). Epigynum with a round sclerotized plate, small central hood on the plate, intromittent orifices situated at the sides of the plate. Intromittent canal thin at the beginning, thick and soft at the end, spermathecae tubular, distally constricted, spermathecal cock small.

Coloration and markings. ♀: Prosoma and legs yellow, chelicerae, maxillae, labium and sternum lighter. Opisthosoma variable in colour and pattern; yellow, yellowish brown, beige or light brown mottled with white, occasionally two or three pairs of black spots present, frequently with a large dark-coloured irregular marking.

♂: Prosoma and all its accessories yellow or light yellowish brown, femur of leg I rarely blackish brown. Opisthosomal dorsum yellow or yellowish white, with a pair of light reddish brown markings indistinct and longitudinal; the markings occasionally broken, appearing two pair of black spots as a whole.

Range. Japan (Hokkaido, Honshu, Shikoku, Kyushu, Ryukyus), Korea, China, Taiwan.

Biology. Found on foliage and flowers of lower plants.

Remarks. This species is somewhat different from typical Misumenops species occurring in North America in much developed eyes and very long embolus of male palp. It has a closer affinity with some species described from India, e.g. Misumena horai Tikader, 1962 and M. mridulai Tikader, 1962. Probably, M. japonicus is of South Asian origin.

Misumenops tricuspidatus (Fabricius, 1775)

[Japanese name: Hanagumo]

(Figs. 161-166)

Aranea tricuspidata Fabricius, 1775, Syst. ent., p.433, type area: Germany; type specimen unavailable; 1781, Spec. ins., p.539. --- Gmelin, 1789, in Linné, Syst. nat., 1, p.2953.

Aranea viatica Fourcroy, 1785, Ent. paris., p.531.

Aranea inaurata Olivier, 1789, Encycl. méth., Hist. nat., Ins. Paris, 4, p.225.

Aranea diana Walckenaer, 1802, Fn. paris., 2, p.232. --- Latreille, 1804, Hist. nat. gén. part. Crustacés Insectes, 7, p.287.

Aranea delicatula Walckenaer, 1802, Fn. paris., 2, p.232. --- Laterille, 1804, Hist. nat. gen. part. Crust. Ins., 7, p.287.

Thomisus diana: Walckenaer, 1805, Tabl. Aranéid., p.30. --- Latreille, 1819, N. Dic. Hist. nat., N. éd., 34, p.38. --- Hahn, 1820, Monogr. Spinn., (1), p.7.

Thomisus Diana: Hahn, 1821, Monogr. Spinn., (2), pl; 1831, Arachniden, 1, p.31. --- Walckenaer, 1826, Fn. fr., Aranéid., p.72; 1837, Hist. nat. Ins., Aptères, 1, p.531.

Thomisus delicatulus: Walckenaer, 1805, Tabl. Aran., p.32.

Thomisus tricuspidatus: Walckenaer, 1805, Tabl. Aran., p.32.

Thomisus capparinus: C.L.Koch, 1845, Arachn., 12, p.58; 1851, Übersicht Arachn.-Syst., (5), p.38. (Partim.)

Thomisa (Diana) delicata: Simon, 1864, Hist. nat. Araign. (Aranéid.), p.433.

Thomisa (Diana) caparina (sic): Simon, 1864, Hist. nat. Araign. (Aranéid.), p.433.

Thomise Diane: Simon, 1864, Hist. nat. Araign. (Araneid.), p.435.

Diaea tricuspidata: Thorell, 1873, Remarks Syn. Eur. Spid., 4, p.539; 1875, Horae Soc. ent. Ross., 11, p.44. --- Menge, 1877, Schr. naturf. Ges. Danzig, (N.F.), 3, p.456.

Misumena tricuspidata: Simon, 1875, Arachn. France, 2, p.244; 1895, Hist. nat. Araign., éd. 2, 1, p.1020. --- Becker, 1882, Ann. Mus. roy. Hist. nat. Belg., 10, p.211. --- Chyzer & Kulczyński, 1891, Aran. hung., 1, p.83. --- Bösenberg, 1903, Zoologica, Stuttgart, 14, p.365. --- Planet, 1905, Araign., p.172. --- Bösenberg & Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.254. --- Strand, 1907, Abh. naturf. Ges. Görlitz, 25, p.206; 1916, Arch. Naturg., 81A(9), p.34. --- Lessert, 1910, Cat. Invertébr. Suisse, Araign., p.354. --- Kishida, 1914, Kagaku Sekai, Tokyo, 7(13), p.38; 1933, Idiobiol. Aran., p.74. --- Roewer, 1928, Tierw. Mitteleur., 3(2), p.VI-20; 1932, in Brohmer, Fn. Dtschl., p.415. --- Yuhara, 1931, Study Spid., p.178. --- S.Saito, 1934, J. Fac. Agr. Hokkaido imp. Univ., Sapporo, 33, p.275; 1936, Rept. Sci. Exped. Manchoukuo, (5)1(3), p.7, 34; 1937, Annot. zool. japon, 16, p.150; 1939, Saito Ho-on Kai Mus. Res. Bull., 3, p.82; 1960, Encycl. zool. illstr. Col., 4, p.18. --- S.Komatsu, 1936, Iconogr. Col. vivid. aran. japon., 1, p.105, 143. --- Chikuni, 1941, Spid. Jpn. Alps, P.144. --- Yaginuma, 1956, Atypus, Osaka, (10), p.26; 1960, Spid. Japan

Col., Osaka, p.96; 1961, Rev. Fam. Gen. Sp. Jpn. Spid., p.37. --- Zhu & Wang, 1963, Jilin Yike Daxue, Xue Bao, 5, p.472. --- Uyemura, 1965, J. Jonan High School, 2, p.45.

Misumena decolor Kulczyński, 1901, Rozpr. spraw. wydz. mat. przyrod. Akad. umiej., 41, p.38.

Misumena scuspidata: Nakajima, 1929, Proc. nat. Hist. Soc. Fukien Univ., 2, p.18.

Misumenops tricuspidata: Simon, 1932, Arachn. France, 6, p.791, 869. --- Schenkel, 1936, Ark. Zool., 29A(1), p.135. --- Charitonow, 1936, Sci. Mem. Univ. Perm, 2, p.209. --- Jones, 1983, Spid. Brit. Nth. Europe, p.112.

Misumena tricuspidata var. concolor Caporiacco, 1935, Mem. Soc. ent. ital., 13, p.183.

Misumenops tricuspidatus: Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p.844. --- Bonnet, 1957, Bibliogr. Aran., 2, p.2960. --- Yaginima, 1965, Atypus, Osaka, (36), p.48; 1968, Spid. Japan Col., Osaka (rev. ed.), p.96; 1986, ibid., (n. ed.), p.205. --- Tyshchenko, 1971, Opredel. pauk. evrop. casti SSSR, p.118. --- Miller, 1971, Klic zvireny CSSR, 4, p.126. --- Hubert, 1979, Araign., p.170. --- Song et al., 1979, Zool. Mag., Beijing, 1979, p.16. --- Zhu et al., 1980, Farm Spid., p.189. --- Sauer & Wunderlich, 1982, Schönste Spinn. Eur., p.45. --- M.-S. Zhu, Spiders Paddy Fields Shanxi, 1, p.174. --- Shinkai & Takano, 1984, Field Guide Spider Japan, p.132. --- Hu, 1984, Chinese Spiders Fields Forests, p.319.

Etymology. Specific name from Latin tricuspi (three-pronged) + datus (giving).

Specimens examined. Japan: 1♀, Shôtoshibetsu, Rikubetsu-cho, Ashoro-gun, Hokkaido, 24-VII-1984, M.Tomokuni leg. (NSMT-Ar 1146); 3 juv., Nakasatsunai, Makubetsu-cho, Nakagawa-gun, Hokkaido, 21-VII-1984, M.Tomokuni leg. (NSMT-Ar 1147); 1♀1♂, Ikutahara-machi, Monbetsu-gun, Hokkaido, 24-VII-1984, M.Tomokuni leg. (NSMT-Ar 1148); 1 juv., Tokachimitsumata, Kamishihoro-cho, Katou-gun, Hokkaido, 22-VII-1984, M.Tomokuni leg. (NSMT-Ar 1149); 2♀♀ 1 juv., Mt. Apoidake, Samani-gun, Hokkaido, 30-VII-1984, M.Tomokuni leg. (NSMT-Ar 1150); 1♂, Meguro, Erimo-cho, Horoizumi-gun, Hokkaido, 28-VII-1984, M.Tomokuni leg. (NSMT-Ar 1151); 1♀, Jôzankei, Minami-ku, Sapporo-shi, Hokkaido, 3-VIII-1984, M.Tomokuni leg. (NSMT-Ar 1152); 2♀♀1♂ 5 juv., Hiroo-cho, Hiroo-gun, Hokkaido, 27-VII-1984, M.Tomokuni leg. (NSMT-Ar 1153); 1♀ 1 juv., Kitamoshiri, Horokanai-cho, Uryu-gun, Hokkaido, 25-VII-1984, M.Tomokuni leg. (NSMT-Ar 1154); 1♂, Mt. Monbetsusan, Monbetsu-shi, Hokkaido, 24-VI-1985, N.Tsurusaki leg. (NSMT-Ar 1155); 1♂, Koshiji Pass, Kamikawa-cho, Kamikawa-gun, Hokkaido, 14-VI-1980, N.Yasuda leg. (NSMT-Ar 1156); 1♀, Sôunkyo, Kamikawa-cho, Kamikawa-gun, Hokkaido, 18-VII-1979, N.Yasuda leg. (NSMT-Ar 1157); 1♀, Yaotome, Izumi-shi, Miyagi Pref., 19-VII-1982, K.Sasaki leg. (NSMT-Ar 1158); 1♀1♂, s.l., 23-V-1982, K.Sasaki leg. (NSMT-Ar 1159); 1♀, Kenminnomori, Rifu-cho, Miyagi-gun, Miyagi Pref., 23-VII-1981, K.Sasaki leg. (NSMT-Ar 1160); 1♂, Dainohara-Shinrinkôen, Sendai-shi, Miyagi Pref., 4-X-1981, K.Sasaki leg. (NSMT-Ar 1161); 1♂, Izumi-shi, Miyagi Pref., 17-X-1982, K.Sasaki leg. (NSMT-Ar 536); 1♀, Yonezawa-shi, Yamagata Pref., 4-X-1977, Y.Nishikawa leg. (YNO); 1♀,

Bandai-kôgen, Fukushima Pref., 16~19-VII-1965, S.Matsumoto leg. (NSMT-Ar 1162); 1♀, Sawada-machi, Ikari, Sawane, Sado Island, Niigata Pref., 8-VIII-1984, S.-I. Uéno leg. (NSMT-Ar 1163); 1♀, Miyashita, Hachiôji-shi, Tokyo, 15-VII-1971, S.Matsumoto leg. (NSMT-Ar 1164); 3♀♀8♂♂ 1 ♀ juv., Mitsune, Hachijôjima Island, Izu Islands, Tokyo, 13-XI-1974, K.Sasaki leg. (NSMT-Ar 1165); 2♂♂, Miyakejima Island, Isu Islands, Tokyo, 7-VIII-1978, K.Suzuki leg. (NSMT-Ar 1166); 1♀, Abiko-shi, Chiba Pref., 12-VIII-1969, S.Matsumoto leg. (NSMT-Ar 1167); 1♀, Mt. Nokogiriyama, Chiba Pref., 3-V-1968, S.Matsumoto leg. (NSMT-Ar 1168); 1♂, Kosugi-cho, Nakahara-ku, Kawasaki-shi, Kanagawa Pref., 15-V-1974, F.Matsuzawa leg. (NSMT-Ar 1169); 1♀, s.l., 19-VI-1974, H.Ono leg. (NSMT-Ar 1170); 1♀, Yomiuriland, Tama-ku, Kawasaki-shi, Kanagawa Pref., IX-1984, M.Takada leg. (NSMT-Ar 1171); 2♀♀1♂ 1 juv., Iiyama-kannon, Atsugi-shi, Kanagawa Pref., 10-X-1973, H.Ono leg. (NSMT-Ar 1172); 1♀, Isehara-shi, Kanagawa Pref., 29-IV-1972, K.Takabayashi leg. (NSMT-Ar 1173); 2♂♂ 1♀ juv., s.l. 18-V-1975, H.Ono leg. (NSMT-Ar 1174); 1♀1 juv., Hakone-machi, Ashigarashimo-gun, Kanagawa Pref., 29-VII-1972, H.Ono leg. (NSMT-Ar 1175); 1♀, Mt. Izugatake, Okuchichibu, Saitama Pref., X-1974, N.Takeuchi leg. (NSMT-Ar 1176); 1♀, Toda-shi, Saitama Pref., 7-VI-1971, F.Fuwa & H.Ono leg. (NSMT-Ar 1177); 1♂, Kôzu-bokujô, Shimonita-cho, Kanra-gun, Gunma Pref., 25-VI-1972, A.Matsumoto leg. (NSMT-Ar 1178); 1♀, Misuzuko Lake near Matsumoto-shi, Nagano Pref., 13-VIII-1974, S.Matsumoto leg. (NSMT-Ar 1179); 1♂, Tateshina-kogen, Chino-shi, Nagano Pref., 1-VIII-1975, H.Ono leg. (NSMT-Ar 1180); 1♀2♂♂ 2 juv., s.l., 24-VIII-1975, H.Ono leg. (NSMT-Ar 1181); 1♂, Horyûji Temple, Nara-shi, Nara Pref., 20-III-1979, R.Nishikawa leg. (YNO); 2 juv., Nagano, 80-90m alt.,

Kumihama-machi, Kumano-gun, Kyoto, 1-VIII-1978, Y.Nishikawa leg. (YNO); 1 juv., Mt. Iwawakiyama, Kawachinagano-shi, Osaka, 24-VIII-1970, H.Ono leg. (NSMT-Ar 1182); 2♀♀2♂♂, s.l., 14-V-1967, T.Yaginuma leg. (NSMT-Ar 288); 1♂, Ueshio-machi, Minami-ku, Osaka, 10-V-1976, Y.Nishikawa leg. (YNO);, 1 juv., Bessho, Sennan-shi, Osaka, 12-XI-1972 (YNO); 1♂, Ai, Ibaraki-shi, Osaka, 16-VII-1977, Y.Nishikawa leg. (YNO); 5♀♀1♂, 2 juv., Zenihara, Ibaraki-shi, Osaka, 6-VI-1978, Y.Nishikawa leg. (YNO); 1♂, Hozumidai, Ibaraki-shi, Osaka, 28-IV-1981, Y.Nishikawa leg. (YNO); 1♂, Sakurai, Shimamoto-machi, Mishima-gun, Osaka, 18-X-1980, A.Nagai leg. (YNO); 2♀♀, Numazu-shi, Shizuoka Pref., 14-VII-1969, H.Ono leg. (NSMT-Ar 1183); 3 juv., Kamenoharaike, Tsuma-mura, Okinoshima Islands, Shimane Pref., 10-IX-1984, M.Tomokuni leg. (NSMT-Ar 1184); 2♀♀2♂♂ 1 juv. ♀, Utsu to Honmura, Mishima Island, Hagi-shi, Yamaguchi Pref., 6-V-1978, K.Tani leg. (YNO); 1 juv. ♀, s.l., Y.Nishikawa leg. (YNO); 1♀, s.l., T.Yoshimura leg. (YNO); 1♂, s.l., C.Doi leg. (YNO); 4♀♀2♂♂ 3 juv. ♀, s.l., Y.Kano leg. (YNO); 1♀1♂, Kajigamori, Kochi Pref., 17-VII-1975, H.Ono leg. (NSMT-Ar 1184); 1♀1♂ 1 juv. ♂, Mt. Sefuri, Fukuoka Pref., 10-VI-1956, H.Kamiya leg. (NSMT-Ar 1185); 3♂♂, Harugami, Shingu-cho, Kasuya-gun, Fukuoka Pref., 28-IV-1968, K.Yamaguchi leg. (NSMT-Ar 1186); 4♂♂, Mt. Inunaki, Kurate-gun, Fukuoka Pref., 4-V-1952, C.Okuma leg (NSMT-Ar 1188); 1♀, Shiiba-mura, Higashiusuki-gun, Miyazaki Pref., 6~7-VIII-1961, C.Okuma leg. (NSMT-Ar 1189); 1♂, Chijiwa-mura, Minamitakagi-gun, Nagasaki Pref., 29~30-VII-1965, C.Okuma leg. (NSMT-Ar 1190); 1♂, Fukiage-machi, Hioki-gun, Kagoshima Pref., 31-VII-1973, S.Matsumoto leg. (NSMT-Ar 1191); 1♂, Tarumizu-shi, Kagoshima Pref., 29-VII-1973, S.Matsumoto leg. (NSMT-Ar 1192); 4♀♀2♂♂, 4 juv., Kumano, Nakatane-machi, Tanegashima Island, Ohsumi

Islands, Kagoshima Pref., 11~16-VIII-1974, H.Ono leg. (NSMT-Ar 1193); 2 juv., Miyanoura, Yaku-cho, Yakushima Island, Ohsumi Islands, 21-VIII-1977, M.Shimojana leg. (MSO); 1♂, Hatsuno, Amami-ohshima Island, Amami Islands, Kagoshima Pref., 11-XI-1962, C.Okuma leg. (NSMT-Ar 1194); 1♀, Sosu, Kunigami-son, Kunigami-gun, Okinawa Island, Okinawa Islands, Okinawa Pref., 25-IV-1984, M.Shimojana leg. (MSO); 1 juv., Maju, Kumejima Island, Okinawa Islands, Okinawa Pref., 24-VII-1970, M.Shimojana leg. (MSO); 1 juv., Izenajima Island, Okinawa Islands, Okinawa Pref., 24-V-1977, M.Shimojana leg. (MSO); 1 juv., Karimata, Hirara-shi, Miyakojima Island, Miyako Islands, Okinawa Pref., 22-VII-1971, M.Shimojana leg. (MSO); 3♂♂, Ikemajima Island, Miyako Islands, Okinawa Pref., 4-VII-1977, H.Makihara leg. (NSMT-Ar 1195); 1♀ 1 juv., s.l. 13-VIII-1974, M.Shimojana leg. (MSO); 1♀ 1 juv. ♀ 4 juv., Ôhara, Iriomotejima Island, Yaeyama Islands, Okinawa Pref., 18-III-1975, N.Takeuchi leg. (NSMT-Ar 1196); 1 juv., Sonai, Iriomote Island, Yaeyama Islands, Okinawa Pref., 26-III-1975, H.Ono leg. (NSMT-Ar 1197); 2 juv., Shirahama, Iriomotejima Island, Yaeyama Islands, Okinawa Pref., 2-VIII-1973, M.Shimojana leg. (MSO); 2 juv., Kuira River, Iriomotejima Island, Yaeyama Islands, Okinawa Pref., 27-III-1973, M.Shimojana leg. (MSO); 1♀1♂, Sonai, Yonagunijima Island, Yaeyama Islands, Okinawa Pref., 25-VII-1979, M.Shimojana leg. (MSO).

Germany: 1♀1♂, Neusiedler See, westl. Wallau, F.R.Germany, 27-V-1977, W.Schawaller leg. (NSMT-Ar 1198).

Mongolia: 1♀, Selenga ajmak, Shamor, 31-VII-1982, K.Mikhailov leg. (ZMM).

Description. Measurement. Body length ♀ 4.74-7.26mm, ♂

2.52-4.96mm; prosoma length ♀ 2.15-2.57mm, ♂ 1.26-2.22mm, width ♀ 2.07-2.59mm, ♂ 1.33-2.22mm; opisthosoma length ♀ 2.78-4.37mm, ♂ 1.37-3.11mm, width ♀ 2.52-4.74mm, ♂ 1.22-2.59mm. Lengths of legs of 1♀1♂ from Atsugi-shi, Kanagawa Pref. (NSMT-Ar 1172) (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.08/1.01	2.50/2.16	2.63/2.22	1.48/1.19	3.36/2.89	11.05/9.47
II	1.03/0.99	2.41/2.00	2.55/2.22	1.48/1.13	3.30/2.89	10.77/9.23
III	0.66/0.55	0.95/0.78	1.16/0.95	0.74/0.59	1.56/1.33	5.07/4.20
IV	0.68/0.52	1.11/0.85	1.31/0.93	0.77/0.63	1.86/1.37	5.73/4.30

Prosoma nearly as long as wide (length/width ♀ 0.99-1.04, ♂ 0.97-1.00), somewhat flattened, without thoracic setae; head with setae. Tubercles of lateral eyes connate; ALE > PLE ≧ AME > PME, ALE/AME ♀ 1.14-1.39, ♂ 1.33-1.46, PLE/PME ♀ 1.09-1.28, ♂ 1.12-1.20, AME-AME/AME-ALE ♀ 1.14-1.28, ♂ 1.12-1.23, PME-PME/PME-PLE ♀ 1.13-1.29, ♂ 1.13-1.30, MOA wider than long (length/width ♀ 0.71-0.96, ♂ 0.70-0.78), wider behind than in front (WA/WP ♀ 0.75-0.79, ♂ 0.75-0.78), clypeus/AME-AME ♀ 1.13-1.37, ♂ 0.92-1.18. Chelicera without teeth; labium length/width ♀ 1.12-1.43, ♂ 1.22-1.38; sternum cordate, length/width ♀ 1.07-1.27, ♂ 1.03-1.12. Leg formula I-II-IV-III; claw tuft poorly developed; tarsal claws of legs with 2-5 teeth.

Spiniformation of legs of 1♀1♂ used in the measurements of legs. ♀: Femur: I-III dorsal 1-0, I prolateral 1-1-1 (at the right leg 1-2-1); patella: I-IV dorsal 1-0-1(weak); tibia: I-IV dorsal 1-1-0, I pro- and retrolateral each 0-1-1, ventral 2-1-2-2-2-2 (at the right leg six pair), II

prolateral 1-1-1, retrolateral 0-1-1, ventral 2-0-2-2-2-2, III-IV prolateral 0-1, ventral 1; metatarsus: I-II pro- and retrolateral each 1-1-2 ap, ventral 2-2-2-2-2-2, III-IV prolateral 1-1, III ventral 1.

♂: Femur: I-II dorsal 1-1-1-0-1-0-1, I prolateral 1-1-1-0-1-0, retrolateral 0-1-1, II prolateral 0-1-1, retrolateral 0-0-1, III-IV dorsal 1-1-1-1-1, III prolateral 0-0-1; patella: I-IV dorsal 1-0-1(weak), I-II prolateral and I-IV retrolateral each 1; tibia: I-IV dorsal 1-1-0, I-II pro- and retrolateral each 1-1-1, ventral 2-2-2, III-IV prolateral 1-1, retrolateral 0-1, ventral 2; metatarsus: I-II pro- and retrolateral each 1-1-2 ap, I ventral 2-2-2-2-2-2, II ventral 2-2-2-2-2, III-IV pro- and retrolateral each 1-1, III ventral 2, IV ventral 1.

Male palp (Figs. 165-166). Tibia with VTA and RTA; ITA absent; VTA finger-shaped, RTA simple, long, with a distal tooth near the tip. Bulb simple, without apophyses, embolus winding 1.5 times around the tegulum, filiform, pointed.

Opisthosoma pyriform in female, oval in male, length/width ♀ 0.92-1.11, ♂ 0.93-1.43, with short hairs, dorsum polished.

Female genitalia (Figs. 162-163). Epigynum with a soft median protuberance which is scarcely visible; central hood present in the protuberance; intromittent orifices slit, covered with many long white hairs, situated at both sides of the protuberance. Intromittent canal soft, long and winding; spermatheca kidney-shaped.

Coloration and markings. ♀: Prosoma light yellowish brown, without markings, head white; chelicerae, labium and sternum light yellow. Legs and palps yellow to yellowish brown, tarsi and distal half of metatarsi darker.

Opisthosomal dorsum yellow, white, silver or light green with black markings very variable, rarely without any marking.

♂: Prosoma pale yellow to yellowish brown with a pair of vertical stripe in brown (rarely without stripes); head white; chelicerae, labium and maxillae yellowish brown, sternum yellow. Legs yellowish brown; tarsi metatarsi, patellae and tibiae of legs I-II with black ring in the distal part; femora of legs I ventrally darker. Opisthosomal dorsum silver-white with dark-coloured markings (frequently without any marking), venter yellowish white or silver.

Colour more greenish when alive.

Range. Japan (Hokkaido, Honshu, Shikoku, Kyushu, Ryukyus); distributed very widely from Japan to Spain.

Biology. Found on foliage and flowers of lower plants. Life histories and habits of this species were studied by Hukushima and Miyafuji (1970) as well as by Zhao et al. (1980).

Remarks. This species can be distinguished from M. japonicus by lacking thoracic setae and from M. kumadai by its coloration and markings. The structure of genital organ of this species differs from that of typical Misumenops species occurring in North America in the presence of protuberance on epigynum and long and winding embolus of male palp. Since the thomisid fauna of Asia has not been satisfactorily known, I was unable to find any species directly related to this common one.

Misumenops kumadai Ono, 1985

[Japanese name: Kumada-hanagumo]

Misumenops kumadai Ono, 1985, Proc. Jpn. Soc. syst. Zool., Tokyo, (31), p.15.

Female holotype from Tsukui-cho, Tsukui-gun, Kanagawa Pref., 13-V-1979, K.Kumada leg., 1♀ paratype from Wadatôge, Mt. Jimbasan, Tokyo, 22-V-1984, M.Tomokuni leg., 1♂ paratype from Takiyamajoshi, Hachiôji-shi, Tokyo, H.Ono leg., 1♂ paratype from Mt. Tachibanayama, Fukuoka Pref., 7-V-1976, Y.Kanamaru leg., all types in NSMT, examined.

Etymology. Specific name after Kenichi Kumada, Tokyo.

Specimens examined. Type series: Holotype: ♀, Tsukui-cho, Tsukui-gun, Kanagawa Pref., 13-V-1979, K.Kumada leg. (NSMT-Ar 609); paratypes: 1♀, Wadatôge, Mt. Jimbasan, Tokyo, 22-V-1984, M.Tomokuni leg. (NSMT-Ar 610), 1♂, Takiyamajoshi, Hachiôji-shi, Tokyo, 10-X-1975 (subadult), 15-I-1976 (adult after breeding), H.Ono leg. (NSMT-Ar 611), 1♂, Mt. Tachibanayama, Fukuoka Pref., 7-V-1976, Y.Kanamaru leg. (NSMT-Ar 616).

1 juv., Mt. Hodosan, Chichibu, Saitama Pref., 5-VIII-1979, K.Suzuki leg. (NSMT-Ar 612); 1♂, Mt. Takaosan, Tokyo, 10-III-1985, Y.Sato leg. (NSMT-Ar 1136); 1♂, Hachiôjijôshi, Hachiôji-shi, Tokyo 7-IV-1985, Y.Sato leg. (NSMT-Ar 1137); 1♂, Oshika-mura, Shimoina-gun, Nagano Pref., 10-V-1975, Y.Chikuni leg. (NSMT-Ar 613); 1♀, Zenihara, Ibaraki-shi, Osaka, from Fraxinus japonica (Oleaceae), 13-V-1978, Y.Nishikawa leg. (NSMT-Ar 614); 1

juv. ♂, Oé-machi, Kasa-gun, Kyoto, 17-IX-1984, M.Tomokuni leg. (NSMT-Ar 615); 2 juv., Nakanoshima Island, Takara Islands, Kagoshima Pref., 6-VIII-1976, M.Shimojana leg. (MSO); 1 juv. ♀, Mt. Yuwandake, Amamiôshima Island, Amami Islands, Kagoshima Pref., 5-XI-1984, M.Tomokuni leg. (NSMT-Ar 1138); 1 juv. ♂, Kamiya, Amamiôshima Island, Amami Islands, Kagoshima Pref., 4-XI-1984, M.Tomokuni leg. (NSMT-Ar 1139); 1 juv., Yona, Kunigami-son, Kunigami-gun, Okinawa Island, Okinawa Pref., 28-VI-1984, M.Tomokuni leg. (NSMT-Ar 617); 1♂, Japan, locality date and collector unknown (NSMT-Ar 618).

Description. Measurement. Body length ♀ 3.78-4.07mm, ♂ 2.37-3.04mm; prosoma length ♀ 1.70-1.85mm, ♂ 1.26-1.70mm, width ♀ 1.70-1.85mm, ♂ 1.19-1.70mm; opisthosoma length ♀ 2.15-2.59mm, ♂ 1.48-1.93mm, width ♀ 2.07-2.96mm, ♂ 1.19-1.93mm. Lengths of legs of holotype ♀ and 1♂ paratype from Fukuoka Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.76/0.84	1.32/1.76	1.44/1.80	0.96/0.84	2.04/2.24	6.52/7.48
II	0.76/0.88	1.32/1.64	1.40/1.80	0.96/0.84	2.00/2.20	6.44/7.36
III	0.44/0.44	0.56/0.64	0.68/0.68	0.52/0.52	1.00/1.00	3.20/3.28
IV	0.48/0.44	0.60/0.68	0.68/0.68	0.48/0.48	1.08/1.08	3.32/3.36

Prosoma nearly as long as wide (length/width ♀ 0.96-1.00, ♂ 1.00-1.06), somewhat flattened, without thoracic setae; head with setae. Tubercles of lateral eyes connate in female, touching in male; ALE > PLE ≧ AME ≧ PME, ALE/AME ♀ 1.40-1.50, ♂ 1.16-1.40, PLE/PME ♀♂ 1.20-1.50, AME-AME/AME-ALE ♀ 1.00-1.13, ♂ 1.00-1.08, PME-PME/PME-PLE ♀ 1.17-1.27, ♂

1.11-1.28, MOA wider than long (length/width ♀ 0.67-0.76, ♂ 0.67-0.80), wider behind than in front (WA/WP ♀ 0.73-0.78, ♂ 0.67-0.74), clypeus/AME-AME ♀ 0.89-1.00, ♂ 1.00. Chelicera with a minute tooth on retromargin; labium length/width ♀♂ 1.14-1.50, sternum cordate, slightly longer than wide (length/width ♀♂ 1.06-1.17). Leg formula I-II-IV-III; claw tuft poorly developed, tarsal claws with 2~4 teeth.

Spiniformation of legs. ♀(holotype): Femur: I-III dorsal 1-0, I prolateral 1-1-1-0-1-0; patella: I-IV dorsal 1-1(weak), III-IV retrolateral each 1(weak); tibia: I-IV dorsal 1-1, I ventral 0-2-1-2, II ventral 0-2-2; metatarsus: I-II pro- and retrolateral each 1-1-1 ap, ventral 2-2-2-2-2 ap, III-IV prolateral 0-1.

♂ (paratype from Fukuoka Pref.): Femur: I dorsal 0-1-1, prolateral 1-1-1-0-1-0, II dorsal 1-1-1-0-0-1, III dorsal 0-1-1-1, IV dorsal 0-1-1-0 (in the right leg 0-1-1-1); patella: I-IV dorsal 1-1, IV retrolateral 1; tibia: I-IV dorsal 1-1, I-II pro- and retrolateral each 1-1-1, I ventral 0-2-2, II ventral 0-1-2, III-IV pro- and retrolateral each 0-1, ventral 2; metatarsus: I-II pro and retrolateral each 1-1-1 ap, I ventral 2-2-2-2-2 ap, II ventral 2-2-2-2 ap, III-IV prolateral 1-1, retrolateral 0-1, ventral 1.

Male palp (Ono, 1985c, figs. 6-7). Tibia with VTA and RTA; ITA absent; VTA finger-shaped, RTA developed, with a dorsal tooth long and pointed. Bulb simple, embolic division winding once around tegulum, embolus very short, spiniform.

Opisthosoma of female pyriform or globular, nearly as long as wide (length/width 0.88-1.04), of male long oval, longer than wide (length/width

1.13-1.36); opisthosoma covered with short hairs.

Female genitalia (Ono, 1985c, figs. 2-4). Epigynum sclerotized, with a central hood; intromittent orifices uncovered and situated at both sides of hood; epigynum rarely covered with soft membranous organ. intromittent canal short and hard; spermatheca kidney-shaped.

Coloration and markings. ♀: Prosoma yellow, mottled with yellowish brown, with a pair of brown vertical stripes; head white. Chelicera, maxillae, and labium yellowish brown; sternum yellow, marginated with brown. Legs yellowish brown; patellae distally, tibiae proximally and distally, metatarsi distally banded with brown. Opisthosomal dorsum yellowish white with brown markings on the posterior part, venter grey, darker at the middle.

♂: Prosoma yellow to yellowish brown mottled with dark brown to black, with a pair of dark brown vertical stripes; MOA white. Chelicerae, maxillae and labium dark brown, sternum yellowish brown, darker marginated. Legs I-II dark brown, III-IV yellowish brown. Opisthosomal dorsum reddish brown with white markings, venter dark brown.

Range. Japan (Honshu, Kyushu, Ryukyus).

Biology. Obtained from trees by beating method. Adult only in May.

Remarks. This species is closely related to some species described from the Hawaiian Islands, especially to M. velatus (Simon, 1900). They have many characteristics in common, inclusive of the basic structure of genital organ. From other Japanese species of the genus, this species can be easily distinguished by the short embolus of male palp and short intromittent canal of female genitalia.

Genus Diaea Thorell, 1869

[Japanese name: Gyôjagumo-zoku]

Diana Simon, 1864, Hist. nat. Araign. (Aranéides), p.432. (Preoccupied by Diana Risso, 1826; Pisc.)

Diaea Thorell, 1869, Nova Acta reg. Soc. Sci. Upsal., (3), 7, p.37. (Nom. nov. pro Diana Simon, 1864.); 1870, ibid., p.184. --- L. Koch, 1874, Arachn. Austral., p.564, --- Simon, 1875, Arachn. France, 2, p.247; 1895, Hist. nat. Araign. éd. 2, 1, p.1035; 1932, Arachn. France, 6, p.792. --- Keyserling, 1880, Spinnen Amerikas, 1, p.112. --- Becker, 1882, Ann. Mus. roy. Hist. nat. Belg., 10, p.212. --- Chyzer & Kulczyński, 1891, Aran. hung., 1, p.81. --- F.O. Pickard-Cambridge, 1900, Biol. Centr.-Amer., Zool, Arachn. Araneida, 2, p.134. --- Bösenberg, 1901, Zoologica, Stuttgart, 14, p.17. --- Planet, 1905, Araign., Hist. nat. France, 14, p.175. --- Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p.377. --- Lessert, 1910, Cat. Invertébr. Suisse, Araign, p.356, --- Roewer, 1928, Tierw. Mitteleur., 3(2), p.VI-19, --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p.285, 294. --- Gertsch, 1939, Bull. Amer. Mus. nat. Hist., 76, p.296. --- Locket & Millidge, 1951, British Spiders, 1, p.172. --- Yaginuma, 1956, Atypus, Osaka, (10), p.27; 1960, Spid. Japan Col., Osaka, p.98; 1968, ibid., (rev. ed.), p.98; 1986, ibid., (n. ed.), p.214. --- Schick, 1965, Bull. Amer. Mus. nat. Hist., 129, p.103. --- Tikader, 1971, Mem. zool. Surv. India,

15(3), p.43; 1980, Fn. India, Aran., 1, p.105. --- Tyshchenko, 1971, Opredel. pauk. evrop. casti SSSR, p.115. --- Miller, 1971, Klic Zwireny CSSR, 4, p.114. --- Vilbaste, 1969, Eesti Ämblikud, 1, p.36. --- Hubert, 1979, Araignées, p.177. --- Roberts, 1985, Spid. Great Brit. Ireland, 1, p.98.

Type species. Diaea dorsata (Fabricius, 1777), Gen. ins., p.249 (Thorell, 1870a, p.184). Original designation of the type species of Diana by Simon (1864) was Thomisa (species-group Diana) dorsalis Simon, 1864, (unjustified emendation of Aranea dorsata Fabricius, 1777).

Etymology. Derived from Greek proper name .

Diagnosis. Medium-sized thomisids; male thinner than female. Prosoma slightly longer than wide, with long setae. Tubercles of lateral eyes developed and confluent, eyes developed, ALE > PLE > AME > PME, AME-AME > AME-ALE, PME-PME < PME-PLE, MOA longer than wide, wider behind than in front, clypeus as wide as or slightly wider than AME-AME. Chelicerae toothless, labium and sternum respectively longer than wide. Leg formula I-II-IV-III; spines of legs much developed. Male palp with VTA, ITA and RTA; RTA with a distal tooth; bulb without apophysis, embolic division long. Opisthosoma oval, longer than wide, with strong hairs. Epigynum with a soft mediun protuberance furnished with a guide pocket; intromittent canal long and winding; spermathecae small, globular or oval.

Range. Recorded from all parts of the world.

Biology. Found on trees, shrubs and grasses.

Species included. About 80 species were described, about a half of

them from Asutralia and the Pacific islands.

Remarks. This genus is characterized by having soft protuberance on epigynum.

Diaea gyoja Ono, 1985

[Japanese name: Gyójagumo]

Diaea dorsata: Tikuni (=Chikuni), 1955, Acta arachol., 14, p.34. --- Yaginuma, 1956, Atypus, Osaka, (10), p.25; 1960, Spiders Japan Col., Osaka p.98; ibid., (rev. ed.), p.98. --- Yaginuma & Nishikawa, 1969, Lit. Dept. Rev. Otemon-Gakuin Univ., (3), p.142. --- H.Saito, 1975, Insect, 26(1), p.30. --- Shinkai & Takano, 1984, Field Guide Spider Japan, p.134. (Nec Diaea dorsata (Fabricius, 1777).)

Diaea gyoja Ono, 1985, Bull. natn. Sci. Mus., Tokyo, (A), 11, p.25. Male holotype from Oku-Nikko, Tochigi Pref., 22-IX-1974, H.Saito leg., 1♀ paratype from Mt. Ontake, Gifu Pref., 21-VIII-1968, Y.Nishikawa leg., in NSMT, examined. --- Yaginuma, 1986, Spiders Japan Col., Osaka, (n. ed.), p.214.

Notes. Chikuni (1955) recorded 1♀ of the European species, Diaea dorsata (Fabricius, 1777), from the alpine region of the main island of Japan and described it with a coloured illustration (1♀, Nakabusa-onsen, 1,700m alt., Ariake-mura, Minamiazumi-gun, Nagano Pref., 5-IX-1953, Y.Chikuni leg.,

specimen lost.). Since then, the rare Japanese species was identified with D. dorsata. I was able to collect 1♀1♂ of D. dorsata in France and Germany and carefully compared them with the Japanese individuals, especially by the structure of male palp and female genitalia. It was revealed that the so-called dorsata from Japan was specifically different from the European species (Ono, 1985a).

Etymology. Specific name from Japanese meaning ascetic.

Specimens examined. Type series: Holotype: ♂, Lake Kirikomi-Karikomi, Oku-Nikko, Tochigi Pref., 22-IX-1974, H.Saito leg. (NSMT-Ar 619); 1♀ (paratype), Mt. Ontake, 1,600-1,700m alt., Gifu Pref., 21-VIII-1968, Y.Nishikawa leg. (NSMT-Ar 620).

1 juv., Horoka-Otofuke-Rindo, Tokoro-gun, Hokkaido, 21-VII-1984, M.Tomokuni leg. (NSMAT-Ar 621).

Specimens used for comparison: Diaea dorsata (Fabricius, 1777): 1♂, Strassbourg, France, 17-IV-1977, H.Ono leg. (NSMT-Ar 684); 1♀, Wisper-Tal, Taunus, Hessen, F.R.Germany, V-1978, H.Ono leg. (NSMT-Ar 685).

Description. Measurement. Body length ♀ 5.63mm, ♂ 4.85mm; prosoma length ♀ 2.52mm, ♂ 2.22mm, width ♀ 2.44mm ♂ 2.00m; opisthosoma length ♀ 3.04mm, ♂ 2.70mm, width ♀ 2.59mm, ♂ 1.56mm; lengths of legs of 1♀(paratype)1♂(holotype)(in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.22/1.44	2.40/3.15	2.74/3.44	1.30/1.04	3.33/3.85	10.99/12.92
II	1.15/1.41	2.33/3.00	2.63/3.41	1.30/1.07	3.33/3.78	10.74/12.67
III	0.81/0.74	1.15/1.37	1.48/1.78	0.94/0.89	2.00/2.30	6.38/7.08
IV	0.74/0.73	1.30/1.44	1.74/1.93	1.00/0.89	2.19/2.37	6.97/7.36

Prosoma longer than wide (length/width ♀ 1.03, ♂1.11), with setae. Lateral eyes on tubercles, ALE > PLE > AME > PME, ALE/AME ♀♂ 1.43, PLE/PME ♀♂ 1.33, AME-AME/AME-ALE ♀ 1.58, ♂ 1.40, PME-PME/PME-PLE ♀ 0.75, ♂0.76, MOA-WA/WP ♀ 0.88, ♂0.93, MOA-L/W ♀ 1.06, ♂ 1.14, clypeus/AME-AME ♀ 1.05, ♂ 1.36. Labium longer than wide (length/width ♀ 1.12, ♂ 1.35), sternum longer than wide (length/width ♀ 1.11, ♂ 1.18). Tarsal claws of legs I-II with 7 teeth, III-IV with 4 teeth ; tarsal claw of female palp with 3 teeth.

Spiniformation of legs. ♀(paratype): Femur: I-III dorsal 1, I prolateral 1-1-1-0-1 (in the right leg 1-1-1-2-0-1-0) ; patella: I-IV dorsal 1-0-1, IV retrolateral 1 ; tibia: I-IV dorsal 1-1-0, I prolateral 1-1-0-1 (in the right leg 0-1-1), retrolateral 1-1 (in the right leg 0), ventral 2-2-2-2-2, II prolateral 1-1-0-1, retrolateral 0-0-1 (in the right leg 0-1-1), ventral 0-2-0-2-2-1 (in the right leg 0-2-0-1-2-1), III-IV prolateral 0-0-1, III ventral 1 ; metatarsus: I-II prolateral 1-1-1 ap, retrolateral 1-1-0, ventral 2-2-2-2-2-2 ap, III-IV prolateral 1-1, ventral 1.

♂(holotype): Femur: I dorsal 1-1-1-1-1-1 (in the right leg 1-1-1-1-1), prolateral 1-1-1-0-1 (in the right leg 1-1-1-1-1), II-IV dorsal 1-1-1-1-0-1, II prolateral 0-0-0-0-1 ; patella: I-IV dorsal 1-0-1 (weak) I-II prolateral 1, I-IV retrolateral 1 ; tibia: I-II dorsal 1-1-0, I prolateral 1-1-0-1 (in the right leg 1-1-1-0-1), retrolateral 1-1-1, ventral 2-2 (in the right leg 2-2-0-2-0-1 ap), II prolateral 1-1-0-1, retrolateral 1-1-1, ventral 2-2, III-IV dorsal 1-1, prolateral 1-0-1, III retrolateral 1-1, ventral 2-0, IV retrolateral 1-1-1, ventral 2-0 (in the right leg 1-0); metatarsus: I prolateral 1-1-1 ap (in the right leg 1-1-2 ap), retrolateral 1-1-1 ap, ventral 2-2 (in the right leg 2-2-0-2), II prolateral 1-1-2 ap (in the right

leg 1-1-1 ap), retrolateral 1-1-1 ap (in the right leg 1-0-1 ap), ventral 2-2, III-IV prolateral 1-0-1, retrolateral 1-1, III ventral 2, IV ventral 1 (in the right leg 2).

Male palp (Ono, 1985a, figs. 17-18). Tibia with VTA, ITA and RTA; VTA large, ITA developed, RTA with a distal tooth. Bulb simple, embolic division winding once around tegulum, embolus spiniform, slightly curved.

Opisthosoma much longer than wide (length/width ♀ 1.17, ♂ 1.73), with strong hairs.

Female genitalia (Ono, 1985a, figs. 19-20). Epigynum with a large median protuberance furnished with a guide pocket, intromittent orifices situated at both sides of the protuberance. Internal apparatus wider than long in dorsal view, intromittent canal long and winding, spermathecae small, globular.

Coloration and markings. ♀♂: Prosoma, chelicerae, maxillae, labium, sternum and legs III-IV light yellowish brown, legs I-II darker. Opisthosoma brown with yellow markings at the middle; underside yellow. Basic coloration of living spiders light green.

Range. Japan (Hokkaido, Honshu).

Biology. Collected from broadleaved trees and herbeceous layer (Yaginuma, 1969). This species is adult in August and September, while European D. dorsata adult in May and June.

Remarks. This species is closely related to D. dorsata (Fabricius, 1777) distributed in Europe and westernmost Asia, but is distinguished from the latter by the shape of embolus (cf. Ono, 1985a, figs. 17 and 22) and the structure of female genitalia (cf. Ono, 1985a, figs. 20 and 25).

Genus Heriaeus Simon, 1875

[Japanese name: Ashinagakanigumo-zoku]

Pachyptile Simon, 1864, Hist. Nat. Araign. (Aranéides), p.433 (as Pachyptila in p.526; subgenus within the genus Thomisa (=Thomisus) ; prooccupied by Pachyptila Illiger, 1811, Aves. Simon (1895a) indirectly suggested that Thomisus villosus Walckenaer, 1837, is the type species of the genus.

Heriaeus Simon, 1875, Arachn. France, 2, p.203; 1895, Hist. nat. Araign. éd. 2, 1, 1034 ; 1918, Bull. Soc. ent. France, 87, p.51 ; 1932, Arachn. France, 6, p.870. --- Becker, 1882, Ann. Mus. roy. Hist, nat. Belg., 10, p.191. --- Chyzer & Kulczyński, 1891, Aran. hung., 1, p.85. --- Lawrence, 1942, Ann. Natal Mus., 10, p.159. --- Yaginuma, 1956, Atypus, Osaka, (10), p.27 ; 1960, Spiders Japan Col., Osaka, p.99 ; 1968, ibid., (rev. ed.), p.99; 1986, ibid., (n. ed.), p.208. --- Vilbaste, 1969, Eesti Ämblikud, 1, p.41. --- Tyshchenko, 1971, Opredel. pauk. evrop. casti SSSR, p.114. --- Miller, 1971, Klic zvireny CCCR, 4, p.114. --- Levy, 1973, Israel J. Zool., 22, p.135. --- Hubert, 1979, Araignées, p.176. --- Loerbroks, 1983, Verh. naturw. Ver. Hamburg, N.F., 26, p.95. --- Hu, 1984, Chinese Spiders Fields Forests, p.316.

Notes. In the original description, Simon (1875a) included three species in the genus but did not designate type species. Later in 1895, he

fixed Thomisus hirsutus Walckenaer, 1826, as the type species. However, the species identified and described by Simon (1875a) was not true T. hirsutus, and therefore Simon(1918) gave a new name, Heriaeus oblongus Simon, 1918, for the type species originally described. He also pointed out that Thomisus hirsutus Walckenaer, 1826, was in fact a synonym of T. hirtus Latreille, 1819. Loerbroks(1983) revised the genus and raised a question which is appropriate for the type of the genus; Thomisus hirsutus (= hirtus), or Heriaeus oblongus, the really described taxon. Loerbroks suggested that this matter should be applied to the International Commission on Zoological Nomenclature for determining Thomisus hirtus as the type species. But I cannot simply agree with his opinion, because previous use of the name hirtus for the type of the genus has not been so universal as Loerbroks(1983) noted. Heriaeus oblongus should be regarded as valid for the type species.

Type species. Heriaeus oblongus Simon, 1918 (= Thomisus hirsutus: Simon, 1875 ; nec T. hirsutus Walckenaer, 1826).

Etymology. Probably from Greek Ερίον+αίους meaning "made by wool" ; masculine. The name was possibly derived from densely haired habitus of the spiders.

Diagnosis. Medium-sized thomisids, male remarkably smaller than female (♀ 5-12mm, ♂ 3-6mm), though the legs are longer in male than in female. Ground colour generally light green. Body surface and legs covered with extremely long hairs and setae. Carapace as long as or slightly longer than wide. Eyes small, lateral eyes not much larger than median eyes and on separate tubercles. Chelicerae toothless, labium hexagonal, longer than wide, sternum longer than wide. Legs very long, especially in male, with long hairs

and setae, claw tufts and scopula poorly developed. Tarsi of male palp with VTA, ITA and RTA; VTA large, developed, RTA with a distal tooth. Bulb simple, without any apophysis, embolic division winding once around tegulum, embolus long, heavily sclerotized, distally thickened. Opisthosoma oval to pyriform. Epigynum with a median protuberance furrowed and tenderly sclerotized, a central hood present in the protuberance, intromittent orifices situated beside the protuberance. Intromittent canal long, winding, spermathecae small, reniform.

Range. Eurasia and Africa.

Biology. The spiders of this genus inhabit shrubs and grasses. The pilosed body gives the spider an appearance of certain seeds and serves for protection when it remains still (Levy, 1973).

Species included. 23 species are known: H. algericus Loerbroks, 1983 (Algeria), H. buffoni (Audouin, 1826) (North Africa, Palestine), H. buffonopsis Loerbroks, 1983 (USSR (Turkmenistan, Kazakhstan)), H. crassispinus Lawrence, 1942 (South Africa), H. difficilis Strand, 1906 (Tunisia), H. fedotovi Charitonov, 1946 (USSR), H. fimbriatus Lawrence, 1942 (South Africa), H. graminicola (Doleschal, 1852) (Central Europe), H. hirtus (Latreille, 1819) (South Europe), H. horridus Tyshchenko, 1965 (USSR(Kazakhstan)), H. latifrons Lessert, 1919 (Tanzania), H. maurusius Loerbroks, 1983 (Morocco), H. melanotrichus Simon, 1903 (Guinea-Bissau), H. mellottei Simon, 1886 (Japan), H. numidicus Loerbroks, 1983 (Morocco, Algeria), H. oblongus Simon, 1918 (North Eurasia from Spain to China), H. orientalis Simon, 1918 (Greece, Turkey), H. pilosus Nosek, 1905 (Turkey), H. sareptanus Loerbroks, 1983 (USSR), H. setiger (O. Pickard-Cambridge, 1872) (Palestine), H. simoni

(Kulczybski, 1903) (Yugoslavia to Turkey), H. spinipalpis Loerbroks, 1983 (West Asia), H. transvaalicus Simon, 1895 (South Africa).

Loerbroks (1983) divided the genus into three species-groups: hirtus group (Palearctic), buffoni group (North Africa and South Eurasia) and trnsvaalicus group (South Africa). The only known Japanese species, H. mellottei, belongs to the first.

Remarks. Based on the structure of copuratory organs, this genus is regarded as a close relative of the genus Diaea Thorell, 1870, but is easily distinguishable from the latter by the long-haired habitus.

Heriaeus mellottei Simon, 1886

[Japanese name: Ashinagakanigumo]

(Figs. 167-171)

Heriaeus Mellottei Simon, 1886, Act. Soc. linn. Bordeaux, 40, p.177. Female holotype from Yokohama, Japan, Mellottée leg., in MNHN, examined.

Heriaeus Mellotteei: Simon, 1895, Hist. Nat. Araign., éd. 2, 1, p.1032.

Heriaeus Mellotteei: Bösenberg & Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.257. --- S.Saito, 1939, Saito Hoon-kai Mus. Res. Bull., 3, p.84.

Heriaeus melloteei: Yuhara, 1931, Study of Spiders, p.181. --- Bonnet, 1957, Bibliogr. aran., 2, p.2163.

Heriaeus mellottei: S. Komatsu, 1936, Iconogr. col. viv. aran. japon., 1, p.74. --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p.865.

Heriaeus mellotteei: Chikuni, 1941, Spiders Jpn. Alps, p.141. --- Yaginuma, 1956, Atypus, Osaka, (10), p.27; 1960, Spiders Japan Col., Osaka, p.99; 1968, ibid., (rev. ed.), p.99; 1986, ibid., (n. ed.), p.208 --- Hu, 1984, Chinese Spiders Fields Forests, p.316.

Heriaeus mellottei: Loerbroks, 1983, Verh. naturw. Ver. Hamburg, (N.F.), 26, p.114 (partim).

Notes. Various spellings have been used for the name of this spider, but according to the International Code of Zoological Nomenclature, H. mellottei as given in the original description should be valid in this case.

Loerbroks (1983) synonymised European H. oblongus Simon, 1918, with the Japanese H. mellottei Simon, 1886, based on the material from Europe, Mongolia, China and also Japan. He considered H. mellottei to be a Palaearctic species, distributed from Japan to Spain. The only Japanese specimen he examined was a topotypical female (probably the holotype). However, determining a species only with female is rather difficult in this genus. Thus, based on the examination of a series of specimens from Japan, especially of the male, I have come to the conclusion that H. oblongus and H. mellottei are clearly different. H. mellottei is very closely related to H. oblongus, but the apical part of the embolus of the male palp is not curved ventrally and the opisthosoma of female if not oval but dilated. I obtained some material from Mongolia which showed exactly the same characteristics as H. oblongus: 1♀, Shamor, Selenga ajmak, Mongolia, VII-VIII-1982, K. Mikhajlov

leg.; 1♂, Toumantzogto, Sukhe-Bator ajmak, East Mongolia, VII-1983, K. Ulykpan leg. It is true that the range of H. oblongus is very wide in the Palaearctic Region from Spain to Mongolia and probably to China, but the Japanese population is completely isolated. Paik (1967) reported H. mellottei from Korea. It should be interesting to re-examine the Korean specimens of the genus.

Etymology. Specific name for the collector of the type specimen.

Specimens examined. 1♀, Mt. Muroneyama, Higashiiwai-gun, Iwate Pref., 19-VI-1964, M.Ohno leg. (TYO); 1♀1♂, Iwate Pref., 15-VII-1969, M.Ohno leg. (TYO); 1♂, Takanami-no-ike, Nishikubiki-gun, Niigata Pref., 26-VII-1972, M. Ohno leg. (TYO); 2♀♀, Mt. Kiyosumiyama, Chiba Pref., 5-VIII-1971, H.Ono leg. (NSMT-Ar 1757); 1♀, Isehara-shi, Kanagawa Pref., 18-V-1975, (adult on 24-IX-1975), H.Ono leg. (NSMT-Ar 1758); 2 juv., Fujiyoshida-shi, Yamanashi Pref., 5-VIII-1974, S.Matsumoto leg. (NSMT-Ar 1759); 2♀♀ 1 juv. ♀, Lake Misuzuko, near Matsumoto-shi, Nagano Pref., 13-VIII-1974, S. Matsumoto leg. (NSMT-Ar 1760); 1 juv., Nara Pref., 31-VII-1937, T.Yaginuma leg. (TYO); 2 juv., Mt. Yoshinoyama, Nara Pref., 25-VIII-1950, T.Yaginuma leg. (TYO); 1♂, s.l., 19-VII-1968, T.Yaginuma leg. (TYO); 1♀, s.l., 17-VII-1982, T.Yaginuma leg. (TYO); 1♀, Mt. Daimanji, Dôgo, Oki Islands, Oki-gun, Shimane Pref., 10-VII-1964, M.Ohno leg. (TYO); 1♂, Hiwa-cho, Hiba-gun, Hiroshima Pref., 30-VI-1958, Y.Fujisawa leg. (TYO); 1♀, Nagato-shi, Yamaguchi Pref., 16-VII-1966, H.Ikeda leg. (TYO); 1♀, Kajigamori, Nagaoka-gun, Kochi Pref., 22-VIII-1965, K.Nakahira leg. (TYO); 1♂, ibid., 17-VII-1975, K.Nakahira leg. (NSMT-Ar 1761); 1♀, Mt. Tachibanayama, Fukuoka-shi, Fukuoka Pref.,

19-VII-1968, N.Yoshida leg. (NSMT-Ar 1762); 1♂, Mt. Hikosan, Fukuoka Pref., 17-VI-1968, K.Kanmiya leg. (NSMT-Ar 1763); 1♂, s.l., 21-VI-1968, K.Kanmiya leg. (NSMT-Ar 1764).

Description. Measurement. Body length ♀ 6.07-7.56mm, ♂ 4.59-4.89mm; prosoma length ♀ 2.63-3.13mm, ♂ 2.07-2.74mm, width ♀ 2.52-3.11mm, ♂ 2.00-2.44mm ; opisthosoma length ♀ 3.48-4.67mm, ♂ 2.59-2.81mm, width ♀ 3.26-4.15mm, ♂ 1.85-2.07mm ; lengths of legs of 1♀ from Isehara-shi, Kanagawa Pref., and 1♂ from Kajigamori, Kochi Pref. (in mm ; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.11/1.41	3.30/5.57	3.32/5.24	1.60/1.70	3.54/5.26	12.87/19.18
II	1.04/1.19	2.60/4.22	2.30/3.83	1.35/1.33	2.75/4.22	10.04/14.79
III	0.67/0.74	1.15/1.63	1.15/1.48	0.93/0.89	1.70/2.11	5.60/6.85
IV	0.69/0.74	1.35/1.85	1.30/1.85	0.83/0.93	2.19/2.81	6.36/8.18

Prosoma nearly as long as wide (length/width ♀ 1.00-1.15, ♂ 0.98-1.13), somewhat flat, with numerous long hairs and setae. Eyes small, lateral eyes on separate tubercles, ALE/AME ♀ 1.20-1.45, ♂ 1.20-1.50, PLE/PME ♀ 1.00-1.23, ♂ 1.00-1.13, AME-AME/AME-ALE ♀ 1.37-1.83, ♂ 1.56-1.79, PME-PME/PME-PLE ♀ 0.80-0.93, ♂ 0.77-0.87, MOA-WA/WP ♀ 1.17-1.20, ♂ 1.08-1.18, MOA-L/W ♀ 1.03-1.10, ♂ 1.11-1.16, clypeus/AME-AME ♀ 0.93-1.09, ♂ 1.04-1.34. Chelicerae without any tooth, maxillae distally convergent, labium hexagonal, longer than wide (length/width ♀ 1.25-1.67, ♂ 1.20-1.24, more than half the length of maxilla, sternum longer than wider (length/width ♀ 1.10-1.24, ♂ 1.09-1.38). Female palpal claw with two teeth. Legs extremely long

(especially in male), covered with numerous long and strong hairs, only tibiae and metatarsi of legs I-II setaceous; leg formula I-II-IV-III; claws of legs with three or four teeth.

Spiniformation of legs. 1♀ from Isehara-shi, Kanagawa Pref.: Tibia I ventral 2-2-2-2-2-2-2, II ventral 2-2-2-2-2; metatarsus I prolateral 1-1-1 ap, retrolateral 1-1-0, ventral 2-2-2-2-2-2-2-2 ap, II prolateral 1-1-1 ap, ventral 2-2-2-2-2-2-2 ap. It is difficult to distinguish the setae from hairs in the male specimens.

Male palp (Figs. 170-171). Tibia with VTA, ITA and RTA; RTA strongly sclerotized with a distal tooth. Bulb simple, cymbium without any attached element, embolic division winding once around tegulum, embolus long, distally thickened, with apical sclerite wide.

Opisthosoma longer than wide (length/width ♀ 1.03-1.15, ♂ 1.25-1.52), not oval but dilated, wider behind than in front, long-haired.

Female genitalia (Figs. 167-168). Epigynum furrowed, with a median protuberance furnished with a central hood, intromittent orifices situated beside the protuberance. Intromittent canal long, spermathecae small, reniform.

Coloration and markings. ♀♂: Prosoma dark yellow to light yellowish brown, head white, chelicerae, maxillae, labium, sternum dark yellow, legs dark yellow, mottled with white. Opisthosoma white with light yellow markings. Living spiders wholly light green or yellow with a white longitudinal stripe on prosoma and indistinct white markings on opisthosoma.

Range. Japan (Honshu, Shikoku, Kyushu).

Biology. Frequently collected from shrubs by sweeping method. Adult

in summer, from June to September.

Remarks. This species is closely related to H. simoni (Kulczyński, 1903) from Yugoslavia, Albania and Greece, H. setiger (O. Pickard-Cambridge, 1872) from Israel and Libanon. For determining these species, it is necessary to examine certain details of the sexual organs: the shape of embolus and the distal tooth of RTA in the male palp, the shape of protuberance of epigynum and intromittent canal of female genitalia. The opisthosoma is oval in H. setiger and H. oblongus, dilated in H. simoni and H. mellottei.

Genus Misumena Latreille, 1804

[Japanese name: Himehanagumo-zoku]

Misumena Latreille, 1804, Dict. (Nouveau) Hist. nat., 24, p.135. --- Thorell, 1870, Nova Acta reg. Soc. sci. Upsal., (3), 7, p.183. --- Simon, 1875, Arachn. France, 2, p.241; 1895, Hist. Nat. Araign., éd. 2, 1, p.1025; 1932, Arachn. France, 6, p.789. --- Menge, 1876, Schr. naturf. Ges. Danzig, (N.F.), 3, p.451. --- Keyserling, 1880, Spinnen Americas, Laterigradae, 1, p.78. --- Becker, 1882, Ann. Mus. roy. Hist. nat. Belg., 10, p.207. --- Chyzer & Kulczyński, 1891, Aran. hung., 1, p.81. --- Bösenberg, 1901, Zoologica, Stuttgart, 14, p.17. --- Planet, 1905, Araignées, Hist. nat. France, 14, p.171. --- Lessert, 1910, Cat. Invertébr. Suisse. Araign., p.353. --- Comstock, 1913, Spider Book, p.524. --- Petrunkevitch, 1928, Trans. Conn. Acad.

Arts Sci., 29, p.168. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p.220. --- Roewer, 1928, Tierw. Mitteleur., 3(2), p.VI-19. --- Gertsch, 1939, Bull. Amer. Mus. nat. Hist., 76, p.296. --- Tullgren, 1944, Svensk Spindelfauna, 3, p.68. --- Kaston, 1948, Spiders Conn., p.411; 1953, How to Know Spiders, p.98. --- Locket & Millidge, 1951, British Spiders, 1, p.174. --- Yaginuma, 1956, Atypus, Osaka, (10), p.26. --- Zhu & Wang, 1963, Jilin Yike Daxue, Xue Bao, 5, p.472. --- Schick, 1965, Bull. Amer. Mus. nat. Hist., 129, p.107. --- Tikader, 1971, Mem. zool. Surv. India, 15(3), p.37; 1980, Fn India, Araneae, 1, p.90. --- Tyshchenko, 1971, Oprede. pauk. evrop. casti SSSR, p.107. --- Miller, 1971, Klic Zvireny CSSR, 4, p.113. --- Vilbaste, 1969, Eesti Ämblikud, 1, p.38. --- Hubert, 1978, Araignées, p.169. --- Dondale & Redner, 1978, Crab Spiders Canada Alaska, p.131. --- Roberts, 1985, Spiders Great Brit. Ireland, 1, p.98.

Type species. Aranea citrea De Geer, 1778, Mém. serv. Hist. Ins., 7, p.298. (= Araneus vatius Clerck, 1758.)

Etymology. Specific name derived from Greek μισουμενος meaning hated (Thorell, 1870).

Diagnosis. Medium-sized thomisids; male half the size of female. Prosoma nearly as long as wide, with short hairs, head with setae. Tubercles of lateral eyes developed and confluent, eyes poorly developed, ALE > AME ≧ PLE > PME, ALE the largest, other eyes nearly the same in size, PLE smaller than AME, AME-AME > AME-ALE, PME-PME ≦ PME-PLE, MOA wider than long, WA < WP, clypeus

nearly as long as wide. Chelicerae toothless, labium and sternum longer than wide. Leg formula I-II-IV-III. Legs setaceous; male without ventral spine. Male palp with VTA, RTA and ITA; RTA with a distal tooth, embolic division short, embolus apically spiniform and curved. Opisthosoma nearly as long as wide in female, longer than wide in male, oval, globular or pyriform, haired. Epigynum not much developed, without median septum or chitin plate, with a central hood.

Range. Recorded from all parts of the world.

Biology. Found in shrubs and grassland.

Species included. More than 50 species have been registrated in this genus, but most of them are not revised, especially in the morphology of sexual organ.

Remarks. This genus is closely related to Pistius Simon, 1875, but the shape of opisthosoma is different between the two genera, also the structure of male palp and female genitalia.

Misumena vatia (Clerck, 1758)

[Japanese name: Himehanagumo]

(Figs. 172-177)

Araneus vatius Clerck, 1758, Aran. suec., p.128. No type specimen available; type locality: Sweden.

Aranea calycina Linné, 1758, Syst. nat., p.620. No type specimen available.

--- Walckenaer, 1802, Fn. paris., Ins., p.231.

Aranea scorpiformis Fabricius, 1775, Syst. ent., p.436. No type specimen available.

Aranea citrea De Geer, 1778, Mém. serv. Hist. Ins., p.298. No type specimen available. --- Walckenaer, 1802, Fn. paris. Insectes, p.231.

Misumena citrea: Latreille, 1804, Tabl. method. ins. Dict. (Nouv.) Hist. nat., 24, p.135.

Thomisus citreus: Walckenaer, 1805, Tabl. Aranéid., p.31.

Thomisus calycinus: Walckenaer, 1805, Tabl. Aranéid., p.32.

Thomisus pratensis Hahn, 1831, Arachniden, 1, p.43. No type specimen available.

Thomisus devius C.L.Koch, 1845, Arachniden, 12, p.61. No type specimen available.

Thomisus vatius: Thorell, 1856, Nova Acta reg. Soc. sci. Upsal., (3), 2, p.132.

Misumena vatia: Thorell, 1870, Nova Acta reg. Soc. sci. Upsal., (3), 2, p.183. --- Simon, 1875, Arachn. France, 2, p.243; 1895, Hist. nat. Araign., ed. 2, 1, p.1025; 1932, Arachn. France, 6, p.790, 869. --- Menge, 1876, Schr. naturf. Ges. Danzig, (N.F.), 3, p.453. --- Becker, 1882, Ann. Mus. roy. Hist. nat. Belg., 10, p.208. --- Chyzer & Kulczyński, 1891, Aran. hung., 1, p.83. --- Bösenberg, 1903, Zoologica, Stuttgart, 14, p.366. --- Lessert, 1910, Cat. Invertébr. Suisse, Araignées, p.353. --- Comstock, 1913, Spider Book, p.524. --- S.Saito, 1934, Trans. Sapporo nat. Hist. Soc., 13, p.326; 1959, Spider Book illustr. Col., p.128. --- Locket & Millidge, 1951,

British Spiders, 1, p.174. --- Kaston, 1953, How to Know the Spiders, p.98. --- Zhu & Wang, 1963, Jilin Yike Daxue, Xue Bao, 5, p.473. --- Yaginuma, 1969, Nat. & Ins., Tokyo, 4(3), p.12. --- Schick, 1965, Bull. Amer. Mus. nat. Hist., 129, p.107. --- Vilbaste, 1969, Eesti Ämblikud, 1, p.38. --- Matsumoto et al., 1976, Spiders, p.158. --- Shinkai, 1978, Collect. & Breed., Tokyo, 40, p.481. --- Dondale & Redner, 1978, Crab Spiders of Canada and Alaska, p.131. --- Tyshchenko, 1971, Opredel. pauk. evrop. casti SSSR, p.118. --- Miller, 1971, Klic Zvireny CSSR, 4, p.118. --- Hubert, 1979, Araignées, p.169. --- Pfletschinger, 1976, Einheimische Spinnen, p.48. --- Sauer & Wunderlich, 1982, Schönste Spinnen Europas, p.45. --- Jones, 1983, Country Life Guide Spiders Brit. N. Eur., p.112. --- M.-S.Zhu, 1983, Spiders Paddy Fields Shanxi, 1, p.171. --- Shinkai & Takano, 1984, Field Guide Spider Japan, p.133. --- Roberts, 1985, Spiders of Great Britain and Ireland, 1, p.98.

Misumena calycina: Nosek, 1905, Ann. naturh. Hofmus., 20, p.117. --- Bösenberg & Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.255. --- Roewer, 1928, Tierw. Mitteleur., 3(2), p.VI-20. --- Gertsch, 1939, Bull. Amer. Mus. nat. Hist., 76, p.314. --- Tullgren, 1944, Svensk Spindelfauna, 3, p.68. --- Kaston, 1948, Spiders of Connecticut, p.411. --- Yaginuma, 1956, Atypus, Osaka, (10), p.26.

Misumenops vatia (sic): Hu, 1984, Chinese Spiders Fields Forests, p.320.

(For further literature, see Roewer(1954) and Bonnet(1957).)

Etymology. Specific name from Latin meaning bowlegged.

Specimens examined. Japan: 2 juv., Tokachimitsumata, Kamishihoro-cho, Katou-gun, Hokkaido, 22-VII-1984, M.Tomokuni leg. (NSMT-Ar 1101); 1♀, Kiyokawa, Kamikawa-cho, Kamikawa-gun, Hokkaido, 11-VI-1983, N.Yasuda leg. (NSMT-Ar 1102); 1 juv. ♀, Sôunkyô, Kamikawa-cho, Kamikawa-gun, Hokkaido, IX-1981, N.Yasuda leg. (NSMT-Ar 1103); 1♀1♂, Ueda-shi, Nagano Pref., VIII-1975, S.Takano, E.Shinkai & H.Ono leg. (NSMT-Ar 1104); 1♂, ditto (NSMT-Ar 1105).

Germany: 1♀3♂♂, Wisper-Tal, Taunus, Hessen, 2-VI-1978, H.Ono leg. (NSMT-Ar 1106); 1♀, s.l. V-1978, H.Ono leg. (NSMT-Ar 1107); 1♂, Leitha Gebirge, Teufelsgraben, 27-IV-1966, Zool. Exkurs. (SMF 26389).

France: 2♀♀, Moulis, Pyrenees, V-1978, J.Martens leg. (NSMT-Ar 1108).

USSR: 1♀, Siberia, VI-1976, S.Takano leg. (NSMT-Ar 1109); 1 juv., Oichun, Jewish ASSR, Priamorje, Soviet Far East, 7-VIII-1978, V.V.Belov leg. (ZMM).

Iran: 1♀, Aserbeidshan, Makidi, 1,800m alt., VI-1978, J.Martens leg. (SMF).

Description. Measurement. Body length ♀ 5.41-10.89mm, ♂ 3.11-3.78mm; prosoma length ♀ 2.44-3.93mm, ♂ 1.48-1.85mm, width ♀ 2.52-4.07mm, ♂ 1.48-1.76mm; opisthosoma length ♀ 3.56-8.00mm, ♂ 1.93-2.22mm, width ♀ 2.96-8.15mm, ♂ 1.33-1.63mm; lengths of legs of 1♀1♂ from Nagano Pref., Japan (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.26/1.04	2.74/2.52	2.89/2.52	1.67/0.96	3.60/3.26	12.16/10.30
II	1.19/0.96	2.59/2.22	2.67/2.22	1.56/0.96	3.33/3.11	11.34/9.47
III	0.59/0.52	1.26/0.74	1.11/0.81	0.67/0.59	1.85/1.30	5.48/3.96
IV	0.67/0.48	1.48/0.93	1.37/0.96	0.89/0.59	2.11/1.44	6.52/4.40

Prosoma nearly as long as wide (length/width ♀ 0.96-1.03, ♂ 0.95-1.06), disc with strong hairs, head with setae. Eyes not much developed, tubercles of lateral eyes connate, ALE the largest, other eyes subequal in size, AME as large as or larger than PLE, ALE > AME ≧ PLE > PME, ALE/AME ♀ 1.06-1.33, ♂ 1.20-1.23, PLE/PME ♀ 1.06-1.23, ♂ 1.11-1.25, AME-AME/AME-ALE ♀ 1.15-1.50, ♂ 1.16-1.50, PME-PME/PME-PLE ♀ 0.95-1.00, ♂ 0.90-1.05, MOA-WA/WP ♀ 0.84-0.90, ♂ 0.84-0.89, MOA-L/W ♀ 0.85-0.90, ♂ 0.79-0.97, clypeus/AME-AME ♀ 0.85-1.15, ♂ 1.00-1.20. Labium length/width ♀ 1.10-1.27, sternum length/width ♀ 1.17-1.21, ♂ 1.06-1.10. Tarsal claws of legs with three teeth.

Spiniformation of legs of 1♀1♂ from Nagano Pref., Japan. ♀: Femur: II-III dorsal 1-0 (weak); tibia: I-IV dorsal 1-1-0-0(weak), I ventral 1-2-2-2-2-1, II ventral 0-2-1-2-1, III ventral 1; metatarsus: I-II pro- and retrolateral 1 ap, I ventral 1-2-2-2-2-2, II ventral 2-1-2-1-2-2-2, III ventral 1-1 (in the right leg 0-1).

♂: Femur: I dorsal 0-1-0-1-1-0-1-0-0-1-1-0-1, prolateral 1-1-1-0-1-0-0, II dorsal 0-1-1-1-1-0-0-1-1-0-0-1, III dorsal 0-0-1-1-1-1-0-1, IV dorsal 0-0-0-1-1-1-1-0-1 (in the right leg 8 irregularly).

Male palp (Figs. 176-177). Tibia with VTA, RTA and ITA; VTA wider than long, RTA with distal tooth, ITA not much developed. Bulb expanded, without any apophysis, embolic division very short, embolus proximally thick, apical part spiniform, curved retrolaterally.

Opisthosoma longer than wide in male (length/width 1.30-1.53), nearly as long as wide in female (length/width 0.98-1.25), with short and stout hairs.

Female genitalia (Figs. 173-174). Epigynum poorly developed, with a central hood. Intromittent canal short, spermathecae globular.

Coloration and markings. Coloration of females varies from white to yellow; prosoma light yellow, white at the middle, head white; chelicerae white, maxillae, labium and sternum, light yellow to yellowish brown, legs yellowish brown, femora, patellae, tibiae, metatarsi and tarsi I-II prolaterally white. Opisthosoma milk-white, occasionally with some pairs of red spots at the lateral margin. No yellow-coloured individual in the present material.

♂: Prosoma yellow to yellowish brown, darker at the sides or with longitudinal dark-coloured band on each side; chelicerae, maxillae, labium, sternum yellow to light yellowish brown, legs yellowish brown, femora, patellae, tibiae, metatarsi, tarsi I-II distally darker. Opisthosoma white without any markings or frequently with a pair of dark brown or black longitudinal stripes in the posterior part.

Range: Northern Eurasia and North America; in Japan Hokkaido and Honshu (rare).

Biology. Found on flowers and foliage of shrubs and herbs.

Remarks. There is some difference between the male collected in Germany and that from Japan. The European individual has shorter legs (prosoma length 1.52mm, length of leg I 7.07mm, II 6.66mm, III 3.06mm, IV 3.23mm; cf. 1o from Nagano Pref., Japan: prosoma length 1.78mm, leg I 10.30mm, II 9.47mm, III 3.96mm, IV 4.40mm), darker prosoma and femur I, wider bulb of palp and distinct markings on the opisthosoma. However, it should be placed under the range of variation.

Genus Pistius Simon, 1875

[Japanese name: Gazamigumo-zoku]

Thomisus (Phleoides): Simon, 1864, Hist. Nat. Araign. (Aranéides), p.432 (Partim.).

Pistius Simon, 1875, Arachn. France, 2, p.257 (type species by monotypy Aranea truncata Pallas, 1772); 1895, Hist. Nat. Araign., éd. 2, 1, p.1024; 1932, Arachn. France, 6, p.794. --- Becker, 1882, Ann. Mus. roy. Hist. nat. Belg., 10, p.218. --- Chyzer & Kulczyński, 1891, Aran. hung., 1, p.83. --- Bösenberg, 1901, Zoologica, Stuttgart, 14, p.369. --- Lessert, 1910, Cat. Invertébr. Suisse, 3, Araignées, p.352. --- Roewer, 1928, Tierw. Mitteleur., 3(2), p.VI-19. --- Petrunkevitch, 1928, Trans. Conn. Acad. Arts Sci., 29, p.169. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p.303. --- Tullgren, 1944, Svenska Spindelfauna, 3, p.67. --- Locket & Millidge, 1951, British Spiders, 1, p.175. --- Yaginuma, 1956, Atypus, Osaka, (10), p.29; 1960, Spiders Japan Col., Osaka, p.100; 1968, ibid., (rev. ed.), p.100; 1986, ibid., (n. ed.), p.207. --- Zhu & Wang, Jilin Yike Daxue, Xue Bao, 5, p.479. --- Tyshchenko, 1971, Opredel. pauk. evrop. casti SSSR, p.114. --- Miller, 1971, Klic Zvereny CSSR, 4, p.113. --- Hubert, 1978, Araignées, p.167. --- Hu, 1984, Chinese Spiders Fields Forests, p.333. --- Roberts, 1985, Spiders Great Britain & Ireland, 1, p.98.

Type species. Aranea truncata Pallas, 1772, Spicil. zool., (1), 9, p.47.

Etymology. From Greek proper name; masculine. Πίστιος is the Greek name of Juppiter Fedius.

Diagnosis. Medium to large-sized thomisids; male half the size of female. Prosoma nearly as long as wide, with poorly developed setae and short hairs. Tubercles of lateral eyes developed and confluent, eyes poorly developed, ALE > PLE ≧ AME ≧ PME, ALE the largest, the other eyes nearly the same in size, PLE frequently smaller than AME, AME-AME > AME-ALE, PME-PME < PME-PLE, MOA nearly as long as wide, WA≒WP, clypeus wider than AME-AME. Chelicerae toothless, labium and sternum longer than wide. Tarsal claws of legs with 2 4 teeth. Leg formula I-II-IV-III. Leg cetaceous; tibiae and metatarsi I-II without lateral spine. Male palp with VTA, RTA and ITA; RTA with a distal tooth developed, embolic division short and thick, embolus apically spiniform and curved. Opisthosoma wider than long, truncated behind, poorly haired. Epigynum with median septum much developed and soft, furnished with a pair of guide pocket.

Range: Eurasia; Temperate Zone, rare in the north, e.g. England or Sweden.

Biology. Found in lower vegetation; frequently capture bees.

Species included. Three species are known; P. truncatus (Pallas, 1772) (Europe), P. insignitus L.Koch, 1878 (Caucausus), P. undulatus (Karsch, 1879) (central East Asia).

The following species described as Pistius do not belong to the genus without doubt, but their correct position has not been determined: P.

sreepanchamii Tikader, 1962, J. linn. Soc. London, 44, p.571; P. roonwali Basu, 1964, J. Bengal nat. Hist. Soc., 32, p.104, P. kanikae Basu, 1964, ibid., p.107; P. bhadurii Basu, 1965, Proc. zool. Soc. Calcutta, 18, p.71, P. gangulyi Basu, 1965, ibid., p.73, P. barchensis Basu, 1965, ibid., p.74, P. robustus Basu, 1965, ibid., p.75; P. kalimpus Tikader, 1970, Rec. zool. Surv. India, 64, p.53. All these species were described from India; P. geangulyi was also recorded from China by Yaginuma and Wen (1983).

Remarks. This genus is closely related to Misumena Latreille, 1804, but can be distinguished from the latter by the shape of tibia of male palp and epigynum.

Only one Japanese species of the genus is known.

Pistius undulatus Karsch, 1879

[Japanese name: Gazamigumo]

Pistius undulatus Karsch, 1879, Verh. naturh. Ver. preuss. Rheinl. Westfalens, 26, p.77. Female holotype from Japan, F.M.Hilgendorf leg., in ZMB, examined. --- Bösenberg & Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.253. --- Ono, 1985, Bull. natn. Sci. Mus., Tokyo, (A), 11, p.20. --- Yaginuma, 1986, Spiders Japan Col., Osaka, (n. ed.), p.207.

Pistius truncatus: Bösenberg & Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.253. --- S.Saito, 1934, J. Fac. Agr. Hokkaido imp. Univ., Sapporo, 33, p.274; 1939, Saito-Hoonkai Mus. Res. Bull., 3, p.84; 1959, Spider

Book illustr. Col., p.128; 1960, in Osaka et al., Encycl. zool. illustr. Col., 4, p.18. --- S.Komatsu, 1936, Iconogr, col. viv. aran. japon., 1, p.73. --- Chikuni, 1941, Spiders Jpn. Alps, p.140. --- Yaginuma, 1960, Spiders Japan Col., Osaka, p.100; 1968, ibid., (rev. ed.), p.100. --- Zhu & Wang, 1963, Jilin Yike Daxue, Xue Bao, 5, p.479. --- Arita, 1970, Kyôdo to Kagaku, Tottori, 15(2), p.27. --- Matsumoto et al., 1976, Spiders, p.155. --- Shinkai & Takano, 1984, Field Guide Spider Japan, p.138. (Nec Pistius truncatus (Pallas, 1772).)

Thomisus albus: Kishida, 1933, Idiobiol. aran., p.82. --- S.Saito, 1934, J. Fac. Agr. Hokkaido imp. Univ., Sapporo, 33, p.274; 1959, Spider Book illustr. Col., p.130. (Nec Thomisus albus (Gmelin, 1789)(=T. onustus Walckenaer, 1805).)

Notes. Bösenberg and Strand (1906) identified a Japanese Pistius species with P. truncatus known in Europe, though they examined the type specimen of P. undulatus described by Karsch (1879a), a female collected by Hilgendorf in Japan between 1873 and 1876. Their identification was accepted by Japanese araneologists, and the name truncatus has always been used for the Japanese Pistius, while P. undulatus has never been recognized since the original description. I examined the holotype of P. undulatus deposited in the Berlin museum and compared it with the Japanese material of Pistius and the specimens of true truncatus preserved in the Senckenberg museum in Frankfurt am Main. All the Pistius spiders from Japan are clearly different from the specimens of P. truncatus from Germany in the details of the sexual

organ, and should be identified with P. undulatus, though these two species are very closely related and similar in general appearance to each other.

Etymology. Specific name from Latin meaning undulate, derived from the waved folds on the opisthosoma.

Specimens examined. Holotype: ♀, Japan, Hilgendorf leg. (ZMB 2752); Hilgendorf has been in Japan between 1873 and 1876 (M. Uéno, 1973).

1 juv., Iwaobetsu-onsen, Shiretoko Peninsula, Hokkaido, 23-VII-1984, M.Tomokuni leg. (NSMT-Ar 630); 1 juv., Mt. Apoidake, Samani-gun, Hokkaido, 30-VII-1984, M.Tomokuni leg. (NSMT-Ar 632); 1 juv., Nopporo, Ebetsu-shi, Hokkaido, 2-VIII-1984, M.Tomokuni leg. (NSMT-Ar 633); 1 juv., Maruyama-kôen, Sapporo-shi, Hokkaido, 20-VII-1961, T.Yaginuma leg. (TYO); 1♀, Jôzankei, Sapporo-shi, Hokkaido, 19-VII-1956, T.Yaginuma leg. (TYO); 1♀, Tôno-shi, Iwate Pref., 31-VII-1971, H.Yoshida leg. (NSMT-Ar 369); 1 juv., Kenminno-mori, Rifu-cho, Miyagi-gun, Miyagi Pref., 12-VI-1982, K.Sasaki leg. (NSMT-635); 1 juv., Yaotome, Sendai-shi, Miyagi Pref., 17-V-1982, K.Sasaki leg. (NSMT-Ar 634); 1 juv., Kitada, Izumi-shi, Miyagi Pref., 17-V-1982, K.Sasaki leg. (NSMT-Ar 636); 1♀1♂, Bandaikôgen, Fukushima Pref., 16-19-VII-1965, S.Matsumoto leg. (NSMT-Ar 627); 1 juv., Tsurugaoka-joshi, Aizuwakamatsu-shi, Fukushima Pref., 18-X-1960, T.Yaginuma leg. (TYO); 1 juv., Onomigawa, Aikawa-cho, Sado Island, Niigata Pref., 24-IX-1979, O.Tominaga leg. (YNO); 1♂, Byâkodan, 640m alt., Shiramine-mura, Ishikawa-gun, Ishikawa Pref., 4-VI-1985, H.Ono leg. (NSMT-Ar 637); 1 juv., Iiyama-kannon, Atsugi-shi, Kanagawa Pref., 10-X-1973, H.Ono leg. (NSMT-Ar 629); 1♂, Shiroyama, Tsukui-gun, Kanagawa Pref., 13-V-1979, K.Kumada leg. (NSMT-Ar 628); 1♀, Niijima Island, Tokyo, 3-5-V-1955, T.Aoki leg. (TYO); 1 juv., Misen, 1,400-1,600m alt., Amakawa-mura,

Yoshino-gun, Nara Pref., 4-V-1969, Y.Nishikawa leg. (YNO); 1♀, Dorogawa, Nara Pref., 21-VII-1956, Y.Tsutsui leg. (TYO); 1 juv., Yamanakadani, Osaka, 29-VII-1958 (TYO); 1 juv., Osaka (TYO); 1♀1♂, Zenihara, 450m alt., Ibaraki-shi, Osaka, 16-VII-1977, Y.Nishikawa leg. (YNO); 1 juv., Senzan, Awajishima Island, 350-400m alt., Hyogo Pref., 6-XI-1983, O.Tominaga leg. (YNO); 1♂, Kojima, Obe, Tonoshô-machi, Shôdoshima Island, Shôzu-gun, Kagawa Pref., 5-VI-1955, Y.Okada leg. (TYO); 1 juv., Kajigamori, Kochi Pref., 20-VII-1952, T.Yaginuma leg. (TYO); 1 juv., Misasa Shrine, Tottori Pref., IV-1953, N.Fukumoto leg. (TYO); 3 juv., Masumizuhara, Mt. Daisen, Tottori Pref., 13~14-IX-1984, M.Tomokuni leg. (NSMT-Ar 638).

Material used for comparison. Pistius truncatus (Pallas, 1772) (Ono, 1985a, figs. 5-12): 1♀1♂, Dessau, Deutschland (Germany), H.Wiehle det. (SMF 21662/5).

Description. Measurement. Body length ♀ 8.50-12.07mm, ♂ 3.60-5.26mm, prosoma length ♀ 3.40-4.37mm, ♂ 1.80-2.59mm, width ♀ 3.10-4.44mm, ♂ 1.80-2.74mm; opisthosoma length ♀ 5.10-7.41mm, ♂ 2.10-3.04mm, width ♀ 6.50-9.85mm, ♂ 2.30-4.00mm; lengths of legs of 1♀1♂ from Bandai-kôgen, Fukushima Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.44/0.89	3.19/2.07	3.41/2.22	1.56/0.96	4.52/2.81	14.12/8.95
II	1.48/0.89	2.96/1.93	3.26/2.22	1.93/0.96	4.52/2.67	14.15/8.67
III	0.74/0.37	0.96/0.59	1.11/0.67	1.04/0.52	2.00/0.96	5.85/3.11
IV	0.74/0.41	1.33/0.67	1.48/0.70	1.11/0.44	2.37/1.11	7.03/3.33

Prosoma flat, as long as wide or slightly longer or wider (length/width ♀ 0.96-1.10, ♂ 0.94-1.09), discus covered with short hairs, other parts poorly haired, head with poorly developed setae. Eyes small, lateral eyes not remarkably larger than medians, tubercles of lateral eyes connate, low elevation between lateral eyes present, PLEs not visible in frontal view, ALE larger, the others subequal in size, ALE/AME ♀ 1.25-1.42, ♂ 1.28-1.40, PLE/PME ♀ 1.00-1.07, ♂ 1.00-1.10, AME-AME/AME-ALE ♀ 1.18-1.23, ♂ 1.22-1.38, PME-PME/PME-PLE ♀ 0.76-0.95, ♂ 0.75-0.80, MOA-WA/WP ♀ 0.84-1.02, ♂ 0.88-0.97, MOA-L/W ♀ 1.04-1.08, ♂ 0.94-1.12, clypeus/AME-AME ♀ 1.07-1.13, ♂ 0.94-1.14. Chelicerae toothless, labium longer than wide (length/width ♀ 1.10-1.28, ♂ 1.14-1.18), longer than half the length of maxillae, sternum longer than wide (length/width ♀ 1.17-1.19, ♂ 1.04-1.16). Number of teeth on tarsal claws of legs I-IV 4-4-3-3 in female, 3-3-2-2 in male.

Spiniformation of legs of 1♀1♂ used for measuring. ♀: Femur: III dorsal 1-0; tibia: I ventral 0-2-2-2-1-2-2-2 (in the right leg 0-0-2-2-2-2-2-2), II ventral 0-2-2-1-2-2-2-2 (in the right leg 0-0-2-1-2-2-2-2); metatarsus: I ventral 1-2-2-2-1-2-2-2 ap (in the right leg 1-2-2-2-2-2-2-2-2 ap), II ventral 0-2-2-2-2-2-2-2 ap (in the right leg 2-2-2-2-2-2-2-2 ap), III ventral 1.

♂: Femur: I-II dorsal 1-1-1-0-0-0, III-IV dorsal 1-0; metatarsus: I-II pro- and retrolateral 1 ap, ventral 0-2-2.

Male palp (Ono, 1985a, figs. 1-2). Tibia with VTA, RTA and ITA; RTA with distal tooth stout and hooked, not acuminate at the end. Cymbium without attached element; bulb wider than long, without any apophysis; embolic division very short, embolus thick, apically thinned and curved retrolaterally, with the apical end spiniform and sharpened.

Opisthosoma wider than long (length/width ♀ 0.75–0.84, ♂ 0.76–0.92), truncated behind, poorly haired.

Female genitalia (Ono, 1985a, figs. 3–4). Epigynum with a large protuberance, which is soft and furnished with a pair of guide pockets, intromittent orifices situated under the protuberance. Intromittent canal very short, atrium present, spermathecae globular, spermathecal cock large and sclerotized.

Coloration and markings. ♀: Prosoma, chelicerae, maxillae, labium and sternum yellowish brown mottled with brown, legs I–II yellowish brown, tibiae, patellae and femora each distally darker, legs III–IV yellow. Opisthosomal dorsum yellowish brown, beige or greyish brown with many small white spots, without distinct marking.

♂: Darker than in ♀. Prosoma, chelicerae, maxillae, labium and sternum brown or yellowish brown, legs I–II brown or blackish brown, leg III yellow, femora, metatarsus and tarsus of leg IV yellow, the other segments brown. Opisthosoma yellowish brown with many white spots, without distinct marking, venter dirty yellow.

Range. Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea, China.

Biology. A sedentary spider. Waiting among herbs and flowers for passing insects which are frequently larger than the spider's body.

Remarks. This species is very closely related to P. truncatus (Pallas, 1772) widely distributed in Europe, but different from the latter in the details of the male palp: distal tooth of RTA in undulatus blunt, in truncatus sharpened; embolus of undulatus longer than that of truncatus. It is rather difficult to find differences in the external structure of the

female genitalia but the intromittent canal is shorter in undulatus than in truncatus, and the atrium is conspicuous in undulatus, while it is a mere extension of the intromittent canal in truncatus.

Pistius insignitus L.Koch, 1878, described from Caucasus seems also related to P. undulatus and P. truncatus, after the original description by L.Koch. However, the species has never been re-obtained and the details of its genital organ remain unclarified.

Genus Runcinia Simon, 1875

[Japanese name: Shirosujigumo-zoku]

Runcinia Simon, 1875, Arachn. France, 2, p.254; 1895, Hist. nat. Araign., éd. 2, 1, p.1024; 1903, Hist. nat. Araign., éd. 2, 2, p.1012; 1932, Arachn. France, 6, p.787. --- Chyzer & Kulczyński, 1891, Aran. hung., 1, pp.81, 84. --- F.O.Pickard-Cambridge, 1900, Biol. Centr.-Amer., Arachn., Araneidea, 2, p.140. --- Bösenberg, 1901, Zoologica, Stuttgart, 14, p.17. --- Planet, 1905, Araign., Hist. nat. France, 14, p.170. --- Petrunkevitch, 1928, Trans. Conn. Acad. Arts Sci., 29, p.170. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p.286, 305. --- Yaginuma, 1956, Atypus, Osaka, (10), p.30; Spid. Japan Col., Osaka, p.99; 1968, ibid., (rev. ed.), p.99; 1986, ibid, (n. ed.), p.210. --- Jézéquel, 1964, Bull. Inst. fr. Afr. N., 26, p.1122. --- Tikader, 1971, Mem. zool. Surv. India, 15(3), p.26; 1980,

Fn. India, Araneae, 1, p.58. --- Tyshchenko, 1971, Opredel. pauk. evrop. casti SSSR, p.117. --- Miller, 1971, Klic. zvireny CSSR, 4, p.112. --- Levy, 1973, Israel J. Zool., 22, p.131. --- Dippenaar-Schoeman, 1980, J. ent. Soc. S. Afr., 43, p.303; 1983, Ent. Mem. Dept. Agr. S. Afr., (55), p.37. --- Zhu & Wen, 1981, J. Bethune med. Univ., 7(4), p.24. --- Hu, 1984, Chinese Spiders Fields Forests, p.334.

Runciniopsis Simon, 1881, Bull. Soc. zool. France, 6, p.1; 1885, Hist. nat. Araign., éd. 2, 1, p.1023; 1895, Ann, Soc. ent. Belg., 39, p.437; 1901, Ann. Soc. ent. France, 70, p.21.

Machomenus Marx, 1893, Proc. U.S. nat. Mus., 16, p.589.

Runcinia (Runciniopsis): Jézéquel, 1964, Bull. Inst. fr. Afr. N., 26, p.1123.

Notes. Runciniopsis Simon, 1881, (type species: Runciniopsis flavida Simon, 1881) and Machomenus Marx, 1893, (type species: Machomenus albidus Marx, 1893) were synonymized by Simon (1903a) with Runcinia.

Type species. Thomisus lateralis C.L.Koch, 1838, Arachniden, 4, p.43.

Etymology. Probably from Latin proper name, Runcina, a rural goddess presiding over weeding.

Diagnosis. Medium sized thomisids; sexually dimorphic; male without distinct markings on opisthosoma, much thinner than female. Prosoma nearly as long as wide, flattened, with short hairs; head with short setae; tubercle present between ALE and PLE. Eyes small, ALE > PLE > AME > PME, AME-AME < AME-ALE, PME-PME > PME-PLE, MOA wider than long, wider behind than in front, clypeus narrower than AME-AME. Chelicerae toothless; labium longer than wide;

sternum slightly longer than wide. Leg formula I-II-IV-III; leg I more than twice as long as leg IV; spines of legs not developed, tibiae I and II without lateral spines; claws of tarsi with only 2-3 teeth respectively. Male palp: Tibia with VTA and RTA; VTA very small, RTA long, with sclerotized top; bulb without any apophysis, tegulum rounded, embolus filiform or spiniform, not much long. Opisthosoma very long, caudally truncated or extending beyond spinnerets, with short hairs. Epigynum with a small central hood; intromittent canal short; spermathecae oval or globular.

Range. Restricted to Paleotropical, South Palearctic, Oriental and Australian regions.

Biology. Living on shrubs and grasses.

Species included. 27 species are known: Runcinia aethiops (Simon, 1901)(East, West, Central and South Africa), R. affinis (Simon, 1897)(India, North and South Africa), R. albida (Marx, 1893), R. depressa Simon, 1906 (Africa), R. carae Dippenaar-Schoeman, 1983, (Botswana, Kanya), R. albida (Marx, 1893)(Congo, Sudan), R. accuminata (Thorell, 1881) (Australia, Vietnam, Japan), R. albostriata Bösenberg et Strand, 1906 (Southeast Asia), R. annamita Simon, 1903 (Vietnam), R. bifrons (Simon, 1895) (Ceylon, Vietnam), R. chauhani Sen et Basu, 1972 (India), R. disticta Thorell, 1891 (Burma, Nicobar Islands, Sumatra), R. dubia Caporiacco, 1940 (Somaliland), R. erythrina Jézéquel, 1964 (Zimbabwe), R. escheri Reimoser, 1934 (India), R. flavida (Simon, 1881) (Africa), R. ghorpadei Tikader, 1980 (India), R. gramminica (C. L. Koch, 1837) (Greece), R. johnstoni Lessert, 1919 (Africa), R. kinbergi Thorell, 1891 (Burma), R. lateralis (C. L. Koch, 1838) (South Palearctic), R. longipes Strand, 1906 (Africa), R. manicata Thorell, 1895 (Burma), R. multilineata

Roewer, 1961 (Africa), R. oculifrons Strand, 1907 (Madagascar), R. roonwali Tikader, 1965 (India), R. soeensis Schenkel, 1944 (Timor), R. tropica Simon, 1907 (Africa). Of these, two species are distributed in Japan.

Key to the Japanese Species

1(4) Females.

2(3) Prosoma with a median white line; opisthosoma caudally rounded ..... R. albostriata Bösenberg et Strand, 1906.

3(2) Prosoma without median white line; opisthosoma elongated ..... R. acuminata (Thorell, 1881).

4(1) Males.

5(6) RTA of male palp narrow; apical part of embolus not visible from ventral side ..... R. albostriata Bösenberg et Strand, 1906.

6(5) RTA of male palp wider; apical part of embolus visible from ventral side ..... R. acuminata (Thorell, 1881).

Runcinia albostriata Bösenberg et Strand, 1906

[Japanese name: Shirosujigumo]

(Figs. 178-183)

Runcinia albostriata Bösenberg et Strand, 1906, Abh. senckenb. naturf. Ges., 30, p. 252. Female holotype from Saga, Japan, W. Dönitz leg., in SMF, not examined. --- S. Komatsu, 1936, Iconogr. Col. viv. Aran.

Japon., 1, p. 127. --- Yaginuma, 1960, Spiders Japan Col., Osaka, p. 99; 1968, ibid., (rev. ed.), p. 99; 1986, ibid., (n. ed.), p. 210. --- Song et al., 1979, Zool. Mag., Beijing, for 1979, p. 18. --- Song, 1980, Farm Spiders, p. 197. --- Shinkai & Takano, 1984, Field Guide Spider Japan, p. 134.

Notes. Up to the present, R. albostriata was the only species of the genus known from Japan. However, I found two allied, but different, species of Runcinia in my material, that is, R. albostriata and R. acuminata (Thorell, 1881). The latter is widely distributed in South Asia and Australia. In the Ryukyu Islands of Japan, the ranges of the two species overlap each other. Records of R. albostriata from the islands are to be re-examined. The male is described for the first time in this paper.

Etymology. Specific name from Latin albus (white) + striatus (striated).

Specimens examined. Japan: 1♀, Okinoshima Island, Kochi Pref., 30-VII-1957, K. Nakahira leg. (NSMT-Ar 370); 1 juv., Satamisaki, Osumi Peninsula, Kagoshima Pref., 6-V-1964, M. Ohno leg. (TYO); 1♀, Kumano, Tanegashima Island, Kagoshima Pref., 11~16-VIII-1974, H. Ono leg. (NSMT-Ar 1776); 1♀, Miyanoura, Yakushima Island, Kagoshima Pref., 18-VIII-1977, M. Shimojana leg. (NSMT-Ar 1777); 1♀, Kuchinoerabujima Island, Kagoshima Pref., 18-VIII-1977, M. Shimojana leg. (NSMT-Ar 1778); 1 juv., Shimajiri-sogen, Kumejima Island, Okinawa Islands, Okinawa Pref., 26-XII-1974, M. Shimojana leg. (MSO); 1♀, Ikemajima Island, Miyako Islands, Okinawa Pref., 13-VIII-1974, M. Shimojana leg. (NSMT-Ar 1779); 1♀, Mt. Omotodake, Ishigakijima Island,

Yaeyama Islands, Okinawa Pref., 13-IV-1974, H. Makihara leg. (NSMT-Ar 1780); 1♀1♂ 1 juv., Nakano, Iriomotejima Island, Yaeyama Islands, Okinawa Pref., 24-III-1973, M. Shimojana leg. (NSMT-Ar 1781); 1♀, Inaba, Iriomotejima Island, 12-VIII-1965, M. Shimojana leg. (MSO); 1♂, Ôtomi, Iriomotejima Island, 13-VIII-1962, M. Chujo leg. (NSMT-Ar 1782); 2 juv., Ôhara, Iriomotejima Island, 18-III-1975, N. Takeuchi leg. (NSMT-Ar 1783); 4♀♀ 1 juv., Yonagunijima Island, Yaeyama Islands, Okinawa Pref., 26-VII-1979, M. Shimojana leg. (NSMT-Ar 1784); 1♀, Sonai, Yonagunijima Island, 25-VII-1979, M. Shimojana leg. (MSO).

Taiwan : 1♂, Tan-tzu, 27-X-1969, Yau-I-Chu leg. (NSMT-Ar 1786).

Thailand: 1♂, Surin, A Prasart, Ban Si-ko, 31-X-1976, K. Yasumatsu leg. (NSMT-Ar 1787); 1♂ 1 juv., Khorat Plateau, 23-X-1970, C. Okuma leg. (NSMT-Ar 1788); 1♀, same locality, 25-X-1970, C. Okuma leg. (NSMT-Ar 1789), 1♀, Si Kiew, 5-XI-1966, C. Okuma leg. (NSMT-Ar 1790); 1♂, Mangsahan, Phibm, 25-IX-1977, K. Yasumatsu leg. (NSMT-Ar 1791); 2♂♂ 4 juv., Khon Kaen, Ban Kud Khae, 23-VI-1977, K. Yasumatsu leg. (NSMT-Ar 1792); 1♀, Gud-Hin, Ban-Pai, 4-XI-1966, C. Okuma leg. (NSMT-Ar 1793); 1♀1♂, Sri Sa Ket, Ban Kra Sang, 30-X-1976, K. Yasumatsu leg. (NSMT-Ar 1794); 1♀, Saharn Ubol, Piboonmong, 6-VII-1977, K. Yasumatsu leg. (NSMT-Ar 1785).

Description. Measurement. Body length ♀ 4.56-6.00mm, ♂ 2.96-3.48mm; prosoma length ♀ 1.78-2.07mm, ♂ 1.33-1.48mm, width ♀ 1.63-1.85mm, ♂ 1.26-1.44mm; opisthosoma length ♀ 2.74-3.78mm, ♂ 1.81-2.30mm, width ♀ 1.56-2.67mm, ♂ 0.89-1.04mm; lengths of legs of 1♀ from Mt. Omotodake, Ishigaki Island, and 1♂ from Ôtomi, Iriomote Island (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.67/0.86	1.52/2.00	1.66/2.03	0.96/0.88	2.14/2.44	6.95/8.21
II	0.67/0.75	1.30/1.74	1.48/1.82	0.89/0.85	1.93/2.25	6.27/7.41
III	0.35/0.35	0.45/0.45	0.68/0.43	0.55/0.69	1.04/0.97	3.07/2.89
IV	0.40/0.38	0.58/0.53	0.90/0.83	0.54/0.43	1.16/1.11	3.58/3.28

Prosoma flattened, with short hairs, longer than wide in female (length/width 1.09-1.23), nearly as long as wide in male (length/width 0.97-1.09); head and clypeus with short setae. Eyes small, the region between ALE and PLE protuberant, ALE/AME ♀ 1.50-1.78, ♂ 1.40-1.63, PLE/PME ♀ 1.11-1.38, ♂ 1.12-1.38, AME-AME/AME-ALE ♀ 0.75-0.90, ♂ 0.83-0.92, PME-PME/PME-PLE ♀ 1.08-1.29, ♂ 1.10-1.16, MOA-WA/WP ♀ 0.58-0.64, ♂ 0.56-0.,67, MOA-L/W ♀ 0.52-0.60, clypeus/AME-AME 0.62-0.86, ♂ 0.66-0.91. Labium longer than wide (length/width ♀ 1.06-1.13, ♂ 1.09-1.19), sternum longer than wide (length/width ♀ 1.11-1.16, ♂ 1.15-1.34). Leg formula I-II-IV-III; claws of legs with two small teeth.

Spiniformation of legs. 1♀ from Mt. Omotodake, Ishigakijima Island: Femur: I-III dorsal 1 (short), I prolateral 1-1-1 (short); tibia: I-II ventral 0-2-2-2; metatarsus: I-II pro- and retrolateral each 1 ap, ventral 2-2-2-2. 1♀ from Okinoshima Island, Kochi Pref.: Tibia: I ventral 2-2-2-2-2-2-2, II ventral 2-2-2-2-2; metatarsus: I ventral 2-2-2-2-2-2-2-2, II ventral 2-2-2-2-2-2. 1+ from Tanegashima Island: Metatarsus: I ventral 2-2-2-2.

1♂ from Otomi, Iriomotejima Island: Femur: I dorsal 1-1-1-0-1 (short), prolateral 1-1-1-0-1-0 (short), II dorsal 1-1-1-1-1 (short), III-IV dorsal 1-1-1-1 (short); tibia: I ventral 2-2-2, II ventral 2-2, III-IV ventral 2; metatarsus: I-II pro- and retrolateral each 1 ap, I ventral 2-2-2-2, II ventral 2-2-0-2.

Male palp (Figs. 182-183). Tibia with VTA and RTA; VTA very small, RTA cone-shaped, long; ITA absent. Bulb simple, embolus short, filiform, its apical part not visible from ventral, radix of embolic division in the distal half of tegulum.

Opisthosoma longer than wide (length/width ♀ 1.77-2.08, ♂ 1.41-1.81), much wider than in R. acuminata, with short hairs.

Female genitalia (Figs. 179-180). Epigynum small, with a small central hood in the anterior part; intromittent orifices situated at the middle. Intromittent canal winding; spermatheca oval.

Coloration and markings. ♀: Prosoma yellow to light beige with a longitudinal white stripe at middle and brown band on each side, eye region white; chelicerae, maxillae, labium, sternum and legs III-IV yellow, legs I-II light yellowish brown, prolateral part of femur, patella, tibia and metatarsus white. Opisthosoma white to beige with black stripes at the sides along marginal folds, distally with some black spots, underside light yellowish brown.

♂: Prosoma yellow to yellowish brown with longitudinal brown bands on each side, individually without those bands, head white; chelicerae, maxillae, labium, sternum and palps yellow; legs yellow, distal third of tibiae I-II and whole metatarsi I-II light brown. Opisthosoma yellow or white

with some black stripes along marginal folds, a pair of black median spots and some black spots in the posterior region, individually with only a pair of median spots or without any marking.

Range. Japan (Honshu, Shikoku, Kyushu, the Ryukyu Islands), Korea, China, Taiwan, Thailand.

Biology. The spiders live in grassland. Chu and Okuma (1970) collected this species in the paddy fields in Taiwan with sweeping method.

Remarks. This species seems to be very closely related to R. lateralis (C. L. Koch, 1838) widely distributed in South Europe, North Africa, Middle East to China. I was able to examine 3♂♂ of R. lateralis from Iran (25km south of Amol, western side of the Heraz valley, Masandaran, 29-VI-1978, J. Martens leg.). Based on the comparison in the males, the only differences between R. lateralis and R. albostriata are the prosoma as long as wide and covered with stout short hairs and the shape of RTA of male palp.

Runcinia acuminata (Thorell, 1881)

[Japanese name: Togari-shirosujigumo]

(Figs. 184-189)

Misumena elongata L. Koch, 1874, Arachn. Austral., p. 529. Female syntypes from Bowen, Rockhampton and Cape York, Australia, in ZMH, not examined. (Preoccupied by Runcinia elongata (Stoliczka, 1869) (= Thomisus (Xysticus) elongatus Stoliczka, 1869.)

Runcinia elongata: L. Koch, 1876, Arachn. Austral., p.803. --- Simon, 1895, Hist. Nat. Araign., éd. 2, 1, p.1024; 1908, Bull. sci. France Belg., 42, p.141. --- Rainbow, 1911, Rec. Austral. Mus., 9, p.216. --- Bonnet, 1957, Bibliogr. aran., 2, p.3884. --- Mascord, 1970, Austral. Spiders Col., p.48.

Pistius (Runcinia) acuminatus Thorell, 1881, Ann. Mus. civ. Stor. nat. Genova, 17, p. 333. (Nom. nov. pro Pistius (Runcinia) elongatus (L. Koch, 1874).)

Runcinia acuminata: Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 855. --- Chrysanthus, 1964, Nova Guinea, (n. ser.), (28), p. 99. --- Mascord, 1980, Spiders Austral., p. 102.

Runcinia albostriata: Hu, 1984, Chinese Spiders Fields Forests, p. 334. (Misidentification.)

Notes. L. Koch (1874) described Misumena elongata from Australia. Two years later, he transferred it to the genus Runcinia established by Simon (1875a) with the type species, Thomisus lateralis C. L. Koch, 1838. Thorell (1881) arranged elongata L. Koch as Pistius (Runcinia) elongatus and stated that the name had been preoccupied by Pistius (Runcinia) elongatus (Stoliczka, 1869) originally described as Thomisus (Xysticus) elongatus from India. Based on this homonymy, he gave the junior elongata the new name, Pistius (Runcinia) acuminatus. At present, Runcinia is regarded as an independent genus. Though Roewer (1954) supported Thorell's arrangement, Bonnet (1957) used L. Koch's original name because he considered Stoliczka's elongata not to be a Runcinia but a Thomisus. Judging from the original description and illustration by

Stoliczka, it is clear that the species is a member of Runcinia. The illustration shows an elongated opisthosoma and typical eye arrangement of the genus Runcinia.

Chrysanthus (1964) redescribed and illustrated this species after a re-examination of the syntypes of Misumena elongata L. Koch, 1874. Not only in the general appearance, coloration and markings, but also in the structure of female genitalia, the Japanese material accords exactly with the Australian and New Guinean species studied by Chrysanthus.

The male of this species is described here for the first time.

Etymology. Specific name from Latin acuminatus meaning acuminate, pointed; derived from the cone-shaped posterior end of opisthosoma extending beyond spinnerets.

Specimens examined. 2♀♀, Amami-ôshima Island, Amami Islands, Kagoshima Pref., 28-VI-1971, M. Chujo leg. (NSMT-Ar 1795); 1♀ 1 juv. ♂ 6 juv., Yona, Kunigami-gun, Okinawa Island, Okinawa Pref., 28-VI-1984, M. Tomokuni leg. (NSMT-Ar 1796); 1♀1♂, Mt. Yonaha-dake, Kunigami-gun, Okinawa Island, Okinawa Pref., 29-VI-1984, M. Tomokuni leg. (NSMT-Ar 1797); 1 juv. ♀, Ada, Kunigami-son, Kunigami-gun, Okinawa Island, Okinawa Pref., 5-V-1975, M. Shimojana leg. (MSO); 1♀, Namihira, Yomitan-son, Nakagami-gun, Okinawa Island, Okinawa Pref., 24-VIII-1984, M. Shimojana leg. (MSO); 1♀, Izumi, Motobu-cho, Kunigami-gun, Okinawa Island, Okinawa Pref., 3-XI-1969, C. Okuma leg. (NSMT-Ar 1798); 1♀, Chinen-son, Shimajiri-gun, Okinawa Island, Okinawa Pref., 4-VII-1984, M. Tomokuni leg. (NSMT-Ar 1799); 1♀, Zamamijima Island, Okinawa Islands, Shimajiri-gun, Okinawa Pref., 18-VIII-1980, M. Shimojana leg. (MSO).

2♀♀2♂♂, Amphur Muan, Phattabung Province, Thailand, 16-I-1973, K. Yasumatsu leg. (NSMT-Ar 1800).

Description. Measurement. Body length ♀ 6.30-8.44mm, ♂ 3.04-4.15mm; prosoma length ♀ 2.00-2.89mm, ♂ 1.26-1.48mm, width ♀ 1.78-2.59mm, ♂ 1.24-1.48mm; opisthosoma length ♀ 4.22-5.85mm, ♂ 2.00-2.81mm, width ♀ 1.85-2.52mm, ♂ 0.81-1.11; lengths of legs of 1♀1♂ from Mt. Yonaha-dake, Okinawa Island (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.89/1.04	2.37/2.52	2.37/2.48	1.33/1.07	3.11/3.11	10.07/10.22
II	0.93/1.11	2.00/2.22	2.15/2.15	1.26/1.04	2.81/2.81	9.15/ 9.33
III	0.48/0.36	0.59/0.46	0.91/0.80	0.70/0.48	1.20/1.08	3.88/ 3/18
IV	0.53/0.38	0.75/0.50	1.15/0.88	0.66/0.43	1.63/1.18	4.72/ 3.37

Prosoma flattened, with short hairs, longer than wide in female (length/width 1.08-1.13), as long as or longer than wide in male (length/width 1.00-1.02), head and clypeus with short stout setae. Eyes small, the region between ALE and PLE protuberant, ALE/AME ♀ 1.33-1.60, ♂ 1.50, PLE/PME ♀ 1.12-1.50, ♂ 1.14-1.34, AME-AME/AME-ALE ♀ 0.66-0.71, ♂ 0.73-0.77, PME-PME/PME=PLE ♀ 1.18-1.47, ♂ 1.15-1.22, MOA-WA/WP ♀ 0.53-0.58, ♂ 0.56-0.63, MOA-L/W ♀ 0.51-0.57, ♂ 0.58-0.63, clypeus/AME-AME ♀ 0.76-0.97, ♂ 0.80-0.91. Labium longer than wide (length/width ♀ 1.13-1.17, ♂ 1.02-1.15), sternum longer than wide (length/width ♀ 1.17-1.35, ♂ 1.17-1.23). Leg formula I-II-IV-III, claws of legs with two or three small teeth.

Spiniformation of 1♀1♂ from Mt. Yonaha-dake, Okinawa Island. ♀: Femur: I-IV dorsal 1 (short), I prolateral 1-1-0-1-0-0-0-0-0-0; tibia: I ventral 0-1-2-2-1-2-2-2 (right 0-2-1-2-1-2-2-2-2), II ventral 0-2-2-2-2-2

(right 0-1-1-1-2-1-1-2-1), III-IV ventral 1; metatarsus: I-II pro- and retrolateral 1 ap, I ventral 2-2-2-2-2-2-2-2 (right 2-1-2-2-2-2-2-2-2-2), II ventral 2-2-2-1-2-2-2 (right 2-2-2-2-2-2-2-2).

♂: Femur: I-IV dorsal 1-1-1-1-1, I prolateral 1-1-0-1-0-0-0-1-0-0; tibia: I-II dorsal 1, pro- and retrolateral 0-1-1, ventral 2-2, III-IV dorsal 1-1-0-0, III ventral 0-2-2-2 ap, IV ventral 0-2-2-2 ap; metatarsus: I prolateral 0-1-0-1-1 ap, retrolateral 1-0-1-0-1 ap, ventral 2-2-2-2, II prolateral 0-1-0-1-0-1 ap, retrolateral 0-1-0-1-0-1 ap, ventral 2-2-0-2.

Male palp (Figs. 188-189). Tibia with VTA and RTA; VTA small, RTA developed, cone-shaped, ITA absent. Bulb simple, radix of embolic division situated in the proximal half of tegulum, embolus filiform, apical part of embolus visible from ventral.

Opisthosoma much longer than wide (length/width ♀ 2.07-2.33, ♂ 2.46-2.60), with short hairs, its posterior end bluntly cone-shaped, extending beyond spinnerets.

Female gnitalia (Figs. 185-186). Epigynum small, with indistinct hood at middle, intromittent orifices situated just behind the hood. Intromittent canal short, spermathecae ovate.

Coloration and markings. ♀: Prosoma light yellowish brown or beige with brown lontigudinal band at the sides, the middle part whitish though without distinct white stripe, head white; chelicerae, maxillae and labium yellowish brown, sternum paler, legs I-II whitish yellow, venter of femur mottled with black, legs III-IV wholly yellow. Opisthosoma beige with brown stripes along the marginal folds and distinct yellowish green or light greenish brown marking and a pair of black spots at the middle.

♂: Prosoma light yellowish brown with dark-coloured side bands not so clear as in female; head white, chelicerae, maxillae, labium and sternum yellow; legs I-II light yellowish brown, tibia distally with a black ring, legs III-IV and palps wholly yellow.

Range. Japan (Ryukyu Islands south of Amami-oshima Island), Thailand, New Guinea, Australia.

Biology. Mascord (1970) described that the spider is usually found in grass-seeding heads and low herbage and that the egg-sac is built in the seeding heads of grass.

Remarks. This species is similar in appearance to R. escheri Reimoser, 1934, R. roonwali Tikader, 1965, and R. ghorpadei Tikader, 1980, all described from India. Judging from the wide geographical range of R. acuminata, it is possible that these species are identical with R. acuminata. A detailed comparative examination of the species, especially in the male palp, is required.

From the other Japanese species, R. albostriata, this species is easily distinguishable by the elongated opisthosoma and the other morphological features given in the key.

Genus Thomisus Walckenaer, 1805

[Japanese name: Azuchigumo-zoku]

Thomisus Walckenaer, 1805, Tabl. Aranéides, p.28; 1826, Fn. Fr., p.70;

1837, Hist. nat. Ins., Aptères, 1, pp.202, 499, 538. --- Latreille, 1819, N. Dic. Hist. nat., n. éd., 34, p.127. --- Audouin, 1826, Expl. Pl. Arachn. Egypte Syrie, 1(4), p.158. --- Sundevall, 1833, Conspectus Arachnidum, p.27. --- C.L. Koch, 1837, Übersicht Arachn.-syst., 1, p.24; ibid., 5, p.37. --- Nicolet, 1849, Hist. fis. polit. Chile, Zool., 3, p.390. --- Vinson, 1863, Aranéides îl. Réunion, Maurice, Madagascar, p.65. --- Prach, 1866, Verh. zool.-bot. Ges. Wien, 16, p.605.--- Staveley, 1866, Brit. Spid., p.24, 67. --- Simon, 1866, Ann. Soc. ent. France, (4), 6, p.285; 1875, Arachn. France, 2, p.249; 1895, Hist. nat. Araign., éd. 2, 1, p.1023; 1908, Bull. sci. France Belg., 42, p.130; 1932, Arachn. France, 6, p.787. --- Thorell, 1870, Nova Acta reg. Soc. sci. Upsal., (3), 7, pp. 174, 183. --- Keyserling, 1880, Spinnen Americas, Laterigradae, 1, p.3. --- Becker, 1882, Ann. Mus. roy. Hist. nat. Belg., 10, p.215. --- Chyzer & Kulczyński, 1891, Aran. hung., 1, p.81. --- F.O. Pickard-Cambridge, 1900, Biol. Centr.-Amer. Zool, Arachn., Aran., 2, pp. 133, 136. --- Bösenberg, 1901, Zoologica, Stuttgart, 14, p.17; 1902, ibid., p.339. --- Planet, 1905, Araignees, Hist. nat. France, 14, p.169. --- Lessert, 1910, Cat. Invertébr. Suisse, Araign., p.350. --- Merian, 1910, Dedeutg. Aran. Tiergeogr., p.35; 1913, Rev. Mus. La Plata, 20, p.33. --- Petrunkevitch, 1928, Trans. Conn. Acad. Arts Sci., 29, p.170. --- Roewer, 1928, Tierw. Mitteleur., 3(2), p.VI-19. --- Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, pp. 289, 309. --- Millot, 1941, Mem. Acad. Sci. Inst. France, 65, p.43. --- Locket & Millidge, 1951, Brit. Spid., 1, p.170. --- Yaginuma, 1956,

Atypus, Osaka, (10), p.29.; 1960, Spid. Japan Col., p.96; 1968, ibid., (rev. ed.), p.96; 1986, ibid., (n. ed.), p.211. --- Comellini, 1957, Rev. Zool. Bot. afr., 55, p.1. --- Tullgren, 1944, Svensk Spindelfauna, 3, p.65. --- Tikader, 1971, Mem. zool. Surv. India, 15(3), p.13; 1980, Fn. India, Araneae, 1, p.30. --- Tyshchenko, 1971, Opredel. pauk. evrop. casti SSSR, p.114. --- Miller, 1971, Klic zvireny, CSSR, 4, p.113. --- Levy, 1973, Israel J. Zool., 22, p.124. --- Hubert, 1979, Araignées, p.168. --- Dippenaar-Schoeman, 1983, Ent. Mem. Dept. Agr. S. Afr., (55), p.8. --- Hu, 1984, Chinese Spiders Fields Forests, p.338.

Thomisa: Simon, 1864, Hist. nat. Araign. (Aranéides), pp. 431, 525.

Chorizopsis Simon, 1864, Hist. nat. Araign. (Aranéides), p.428. (Subgenus within the genus Xystica.)

Phloeoides Simon, 1864, Hist. nat. Araign. (Aranéides), p.432. (Subgenus within the genus Thomisa.)

Daradius Thorell, 1870, Nova Acta reg. Soc. sci. Upsal., (3), 7, p.170.

Type species. Thomisus onustus Walckenaer, 1805, Tabl. Aranéid., p.32.

Etymology. From Greek θωμίσσω meaning bind (Graveley, 1866; Thorell, 1869). Parker (1980) described "Thomisus Gr. thomis: a sting."

Diagnosis. Medium to large-sized thomisids; sexually dimorphic, male remarkably smaller and darker than female. Prosoma nearly as long as wide, without setae. Head with horn-shaped, large protuberance between ALE and PLE; eyes not developed, subequal in size, ALE the largest, AME-AME <

AME-ALE, PME-PME > PME-PLE, MOA (of Japanese species) wider than long, wider behind than in front, clypeus nearly as wide as AME-AME. Chelicerae toothless, labium longer than wide, sternum as long as or longer than wide. Leg formula I-II-IV-III or II-I-IV-III; claws of legs with a few small teeth. Spines of legs not developed, more remarkably in male, tibiae I-II without lateral spines; tibiae and metatarsi I-II respectively with some pair of ventral spines. Male palp with VTA, ITA and RTA; VTA not developed, RTA long, frequently ITA strongly sclerotized; bulb simple, without apophysis, embolus short, filiform or spiniform. Opisthosoma wider than long, very large in female, much sclerotized in male. Female genitalia usually very simple; epigynum not developed, without hood; intromittent canal short, spematheca globular, with gland.

Range. Mainly in Paleotropical regions.

Biology. Living on shrubs and grasses, especially on flowers. Adult male climbs on opisthosoma of subadult female and clings to it for a while to wait for mating. The life cycle of Thomisus onustus Walckenaer, 1805, was studied by Levy (1970), but those of the other species have been unknown.

Species included. About 80 species have been described; half of them from Africa.

Remarks. The genus is related to Runcinia, Simon, 1875, Plancinus Simon, 1886, and Massuria Thorell, 1887, but differs from them in the presence of large protuberance between ALE and PLE.

Three species of this genus are known from Japan. Records of Thomisus onustus in Japan are regarded as misidentifications.

Key to the Japanese Species

1(6) Females.

2(3) Epigynum with a sclerotized plate at the middle; clypeus/AME-AME more than 1.40 ..... T. okinawensis Strand, 1907.

3(2) Epigynum without a sclerotized plate; clypeus/AME-AME lower than 1.20.

4(5) Intromittent canal of female genitalia extending first in anterior direction, then curved to posterior direction ..... T. labefactus Karsch, 1881.

5(4) Intromittent canal extending in posterior direction and winding ..... T. kitamurai Nakatsudi, 1943.

6(1) Males.

7(8) ITA of male palp large, nearly as long as RTA; clypeus/AME-AME more than 1.30 ..... T. okinawensis Strand, 1907.

8(7) ITA shorter than RTA; clypeus/AME-AME lower than 1.25.

9(10) ITA of male palp thinner (Fig. 197) ..... T. labefactus Karsch, 1881.

10(9) ITA thicker (Fig. 203) ..... T. kitamurai Nakatsudi, 1943.

Thomisus labefactus Karsch, 1881

[Japanese name: Azuchigumo]

(Figs. 190-198)

Thomisus labefactus Karsch, 1881, Berl. ent. Z., 25, p.38. Female holotype

from Tokyo, Japan, W. Dönitz leg., in ZMB, examined. --- Bösenberg & Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.249. --- S. Komatsu, 1936, Iconogr. Col. Viv. Aran. Japon., 1, p.82. --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p. 856. --- Bonnet, 1957, Bibliogr. Aran., 2, p.4582. --- S. Saito, 1959, Spider Book Illustr. Col., p.131. --- Yaginuma, 1960, Spid. Japan Col., Osaka, p.96; 1968, ibid., (rev. ed.), p.96; 1986, ibid., (n. ed.), p.211. --- Namkung, 1964, Atypus, Osaka, (33/34), p.43. --- Matsumoto, 1973, Collect. & Breed., 35(2), p.42. --- Song et al., 1979, Zool. Mag., Beijing, 1979, p.18. --- Shinkai & Takano, 1984, Field Guide Spider Japan, p.139. --- Hu, 1984, Chinese Spiders Fields Forests, p.338.

Thomisus labefactus bimaculatus Bösenberg et Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.250. Female holotype from "Nishitake, Hiuga, Kiushiu" (Nishitake-cho, Miyakonojô-shi, Miyazaki Pref.), Japan, VII-1898, probably T. Lenz leg., in ZMH, examined. --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p.856.

Thomisus onustoides Bösenberg et Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.251. Types from "Kompira," 31-VIII-?, W. Dönitz leg., Yunohama, 29-III-?, W. Dönitz leg., "Nishitake, Hiuga," T. Lenz leg. (cf. Bösenberg et Strand (1906), p.252), probably in SMF, not examined. --- Strand, 1907, Abh. naturf. Ges. Görlitz, 25, p.93; 1918, Zool. Anz., A82(11), p.81. --- Simon, 1908, Bull. sci. France Belg., 42, p.132. --- S. Saito, 1936, Trans. Sapporo nat. Hist. Soc., 14, p.249. --- Fox, 1937, J. Wash. Acad. Sci., 27, p.22. --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p.856. --- Bonnet, 1957, Bibliogr.

Aran., 2, p.4584. --- 1959, Spider Book Illustr. Col., p.168. --- Hu, 1984, Chinese Spiders Fields Forest, p.338. (New synonymy.)

Thomisus albus: Uyemura, 1934, Kishu Doshokubutsu, 1(2), p.17. (Misidentification.)

Notes. Thomisus labefactus was first described by Karsch (1881) from Tokyo without illustration. Bösenberg and Strand (1906) redescribed and illustrated the holotype, then described a variant form, T. labefactus bimaculatus. Though T. labefactus is wholly yellow without any marking, T. l. bimaculatus has distinct markings on the pro- and opisthosomata. Its epigynum illustrated by Bosenberg and Strand seemed also somewhat different from that of T. labefactus. Roewer (1954) recognized T. l. bimaculatus as a valid subspecies; on the contrary, Bonnet (1957) included it within T. labefactus. After a re-examination of their type specimens, I came to the conclusion that T. l. bimaculatus is nothing but a variant of T. labefactus. The difference in the situation of intromittent canals seen through the integument caused variable appearance of epigynum. There is no difference in the internal structure between them.

On the other hand, T. onustoides was described by Bösenberg and Strand in the same work. Yaginuma (1961a) raised a question that T. labefactus and T. onustoides are the same species because male specimens collected from various places in Japan always show the same structure of male palp as the illustration of T. onustoides by Bosenberg and Strand. The male of T. onustoides described by Bosenberg and Strand is without doubt the male of T. labefactus, which was unknown at that time. It is surmised that the

epigynum of T. onustoides shown by Bösenberg and Strand (1906) was drawn from a different angle from those of T. labefactus and T. l. bimaculatus. Therefore, I regarded T. onustoides as a junior synonym of T. labefactus.

Etymology. From Latin meaning shaken, weakened. I was unable to ascertain on what point the name is given. It may be associated with Thomisus onustus (meaning loaded, filled), which Karsch (1881) cited in the original description as an allied species of T. labefactus. If that is the case, the name expresses that the body is more withered than that of T. onustus.

Specimens examined. 1♀ (holotype), "Tokio," W. Dönitz leg. (ZMB 3531); 1 juv. ♀, Kashitate, Hachijôjima Island, Tokyo, 12-XI-1974, K. Sasaki leg. (NSMT-Ar 1814); 1♀2♂♂, Emi-cho, Kamogawa-shi, Chiba Pref., 9-VIII-1968, S. Matsumoto leg. (NSMT-Ar 1815); 1♀1♂ 1 juv. ♀, Isehara-shi, Kanagawa Pref., 23-29-VII-1972, K. Takabayashi leg. (NSMT-Ar 1816); 1 juv., Numazu-shi, Shizuoka Pref., 15-VII-1969, H. Ono leg. (NSMT-Ar 1817); 5♀♀, Mie Pref., 27-VIII-1979, K. Suzuki & E. Shinkai leg. (NSMT-Ar 1818); 1♀, Kitayama-kyô between Mie, Wakayama and Nara Pref., 3-VIII-1951, T. Yaginuma leg. (TYO); 1♂, Mt. Hira, Shiga Pref., 3-VIII-1955, T. Yaginuma leg. (TYO); 1♀, Mt. Iwawakiyama, Osaka, 20-VIII-1954, T. Yaginuma leg. (TYO); 1♀, s.l., 18-VIII-1957, I. Hiura leg. (TYO); 1♀, s.l., 18-VIII-1956, T. Yaginuma leg. (TYO); 1♀, Mt. Nijôsan, Osaka Pref., 7-VIII-1939, Y. Tsuchiga leg. (TYO); 1♀, Mt. Yoshinoyama, Nara Pref., 16-VIII-1957, T. Yaginuma leg. (TYO); 1♀, s.l., 19-VIII-1958, T. Yaginuma leg. (TYO); 1♀, s.l., 28-VIII-1972, T. Yaginuma leg. (TYO); 1 juv., s.l., 29-VIII-1982, T. Yaginuma leg. (TYO); 1♀, Shodôshima Island, Shôzu-gun, Kagawa Pref., 20-VIII-1952, T. Yaginuma leg. (NSMT-Ar 373); 1♀2♂♂, Mt. Bizan, Tokushima Pref., 10-VIII-1957 (TYO); 1♂, Omogo,

Kamiukena-gun, Ehime Pref., 15-VII-1974, S. Matsumoto leg. (NSMT-Ar 1819); 1♀, 2 juv. ♀, Kochi-shi, Kochi Pref., 18-VII-1975, H. Ono leg. (NSMT-Ar 1820); 1♀, ibid., 10-VIII-1954, T. Yaginuma leg. (TYO); 2♂♂, Ômura-shi, Nagasaki Pref., 31-VII-1965, C. Okuma leg. (NSMT-Ar 1821); 1 juv. ♀, Ushibuka-shi, Kumamoto Pref., VIII-1953, M. Yoshikura leg. (TYO); 1♂, Iwato, Takachiho-cho, Nishiusuki-gun, Miyazaki Pref., 24-VII-1960, C. Okuma leg. (NSMT-Ar 1822); 1♀ (holotype of T. labefactus bimaculatus Bösenberg et Strand, 1906), Nishitake-cho, Miyakonojô-shi, Miyazaki Pref., VII-1898, T. Lenz leg. (ZMH 267); 1♀1♂, Ôsumi Penninsula, Kagoshima Pref., 30-VII-1973, S. Matsumoto leg. (NSMT-Ar 1823); 1♀3♂♂, Tarumizu-shi, Kagoshima Pref., 29-VII-1973, S. Matsumoto leg. (NSMT-Ar 1824).

1♀, Wu-lai, Taipei, Taiwan, 29-VII-1977, H. Yoshida leg. (NSMT-Ar 1825); 1♂ 1 juv. ♀, Ken-ting, Ping-tung, Taiwan, 13-VII-1977, H. Yoshida leg. (NSMT-Ar 1826).

Description. Measurement. Body length ♀ 6.00-8.59mm, ♂ 2.22-3.41mm; prosoma length ♀ 2.80-3.63mm, ♂ 1.19-1.70mm, width ♀ 2.60-3.56mm, ♂ 1.15-1.70mm; opisthosoma length ♀ 3.20-5.56mm, ♂ 1.30-1.85mm, width ♀ 3.48-6.52mm, ♂ 1.41-2.00mm; leg lengths of 1♀ (holotype of T. l. bimaculatus) from Miyazaki Pref. and 1♂ from Kanagawa Pref. (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.00/0.49	1.40/0.74	1.90/0.76	1.35/0.54	2.70/1.13	8.35/3.66
II	0.90/0.49	1.50/0.73	1.80/0.80	1.35/0.54	2.80/1.15	8.35/3.71
III	0.50/0.27	0.80/0.38	0.95/0.40	0.75/0.35	1.50/0.65	4.50/2.05
IV	0.50/0.25	1.00/0.40	1.10/0.44	0.80/0.35	1.80/0.72	5.20/2.16

Prosoma nearly as long as wide (length/width ♀ 0.95-1.10, ♂ 0.96-1.04), with numerous small tubercles. Eyes subequal in size, ALE largest, ALE/AME ♀ 1.25-1.50, ♂ 1.08-1.25, PLE/PME ♀ 0.93-1.29, ♂ 1.00, AME-AME/AME-ALE ♀ 0.68-0.82, ♂ 0.77-0.84, PME-PME/PME-PLE ♀ 1.40-1.62, ♂ 1.30-1.46, MOA wider than long (length/width ♀ 0.51-0.64, ♂ 0.56-0.60), WA/WP ♀ 0.54-0.62, ♂ 0.60-0.65, clypeus/AME-AME ♀ 0.75-1.16, ♂ 0.86-1.25. Chelicera of male without any protuberance, but with one or two short setae; labium longer than wide (length/width ♀ 1.10-1.34, ♂ 1.06-1.15), sternum as long as to slightly longer than wide (length/width ♀ 1.25-1.49, ♂ 1.00-1.25). Leg formula I-II-IV-III or II-I-IV-III; claws of legs with 2-4 small teeth.

Spiniformation of legs. Holotype ♀: Tibia: I ventral 0-0-0-0-2-1, II ventral 0-0-0-0-2-0; metatarsus: I ventral 1-2-2-2, II ventral 1-1-2-2-2-2 (both the legs III lost). 1♀ (holotype of T. l. bimaculatus): Femur: I-II dorsal 1 (short), I prolateral 1-1-1-0-0-0 (short); tibia: I ventral 0-1-2-1, II ventral 0-0-2; metatarsus: I-II pro- and retrolateral 1 ap, I ventral 0-2-2-2, II ventral 0-1-2-2-2.

1♂ from Isehara-shi, Kanagawa Pref.: Femur: I-III dorsal 1 (short); tibia: I-II ventral 0-2; metatarsi I-II prolateral 1 ap, ventral 2-2, I retrolateral 1 ap.

Male palp (Figs. 197-198). Tibia with small VTA, much developed RTA; ITA thinner than in T. kitamurai. Bulb almost the same as in T. kitamurai.

Opisthosoma nearly as long as wide in female (length/width 0.95-1.10), slightly wider than long in male (length/width 0.90-0.97).

Female genitalia (Figs. 191-192, 194-195). Epigynum without sclerotized plate, intromittent orifices situated at the sides. Intromittent

canal short, curved, spermathecae ovate.

Coloration and markings. Holotype ♀: Prosoma and legs yellowish brown, head and clypeus white with a pair of dark-coloured patches between the ALE's and a dark-coloured patch on clypeus. Opisthosoma wholly white without any marking. 1♀ (holotype of T. l. bimaculatus): Prosoma and legs yellowish brown with a pair of blackish brown patches at the sides, head and clypeus blackish brown with a pair of white patches on MOA and a white patch on clypeus. Opisthosoma white without any marking. Coloration of females in life: prosoma and legs white, yellow or light green, opisthosoma white or yellow.

♂: Prosoma yellowish brown to brown, head light-coloured, chelicerae, maxillae, labium and sternum yellow to light yellowish brown, legs yellow to light yellowish brown, femora and tibiae darker. Opisthosoma light yellowish brown.

Range. Japan (Honshu, Shikoku, Kyushu), Korea, China, Taiwan.

Biology. Habitat: Grasses and flowers. This spider catches flying insects, which are often as large as or larger than the spider, especially bees and flies. Retreat for breeding is made of living leaves (Nakahira, 1958). Adult in July and August.

Remarks. This species is closely related to T. kitamurai, but is distinguished by the shape of male palpal tibia and the structure of female genitalia. While T. kitamurai is distributed only in the Ryukyu Islands of Japan, T. labefactus ranges very widely in Japan, Korea, China and Taiwan. It is probable that T. kitamurai was derived from T. labefactus.

Simon (1908) reported and described T. onustoides, which is a synonym

of T. labefactus, from Tonkin. Judging from his illustration of the male palp, however, Simon's spider is undoubtedly different from T. labefactus and rather resembles T. onustus.

Thomisus kitamurai Nakatsudi, 1943

[Japanese name: Amami-azuchigumo]

(Figs. 199-204)

Thomisus kitamurai Nakatsudi (= Nakatsuji), 1943, J. agr. Sci. Tokyo Nogyo Daigaku, 2, p.190. Male holotype from Tatsugo-cho, Amami-ôshima Island, Kagoshima Pref., Japan, 22-VII-1941, T. Kitamura leg., burnt by bomb attack in the Zoological Institute of the Tokyo University of Agriculture.

Notes. This species was never rediscovered after the original description. Although the holotype was lost, the description and illustrations of male palp given by Nakatsudi (1943) are sufficient for recognizing what the species indicates. As was expected, a series of specimens of the species in question is included in the material I examined. The female is described for the first time.

Etymology. Named for the collector, Teruhiko Kitamura.

Specimens examined. 1 juv. ♀, Nishinakama, Amami-ôshima Island, Amami Islands, Kagoshima Pref., 5-VII-1976, H. Makihara leg. (NSMT-Ar 1833); 1♂, Oyama, Okinoerabujima Island, Amami Islands, Kagoshima Pref., 3-VII-1974,

H. Makihara leg. (NSMT-Ar 1834); 1♀5♂♂ 2 juv., Yona, Okinawa Island, Okinawa Pref., 28-VI-1984, M. Tomokuni leg. (NSMT-Ar 1835); 3♂♂, Mt. Yonahadake, Okinawa Island, Okinawa Pref., 29-VI-1984, M. Tomokuni leg. (NSMT-Ar 1836); 1♂, Mt. Katsuudake, Okinawa Island, Okinawa Pref., 1-VII-1984, M. Tomokuni leg. (NSMT-Ar 1837); 2♂♂ 2 juv. ♀, Benoki, Kunigami-gun, Okinawa Island, Okinawa Pref., 10-VII-1977, H. Makihara leg. (NSMT-Ar 1838); 1 juv. ♀, Mt. Bannadake, Ishigakijima Island, Yaeyama Islands, Okinawa Pref., 16-XI-1984, M. Tomokuni leg. (NSMT-Ar 1839); 1♀1♂, Shirahama, Iriomotejima Island, Yaeyama Islands, Okinawa Pref., 2-VIII-1973, M. Shimojana leg. (NSMT-Ar 1840).

Description. Measurement. Body length ♀ 10.37-11.93mm, ♂ 2.59-3.04mm; prosoma length ♀ 4.59-4.81mm, ♂ 1.33-1.48mm, width ♀ 4.67-4.85mm, ♂ 1.37-1.59mm; opisthosoma length ♀ 6.15-6.74mm, ♂ 1.41-1.78mm, width ♀ 6.22-9.56mm, ♂ 1.63-2.07mm; lengths of legs of 1♀ from Yona, Okinawa Island, and 1♂ from Mt. Ôyama, Okinoerabu Island (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.56/0.56	2.52/0.72	3.37/0.92	2.37/0.64	4.89/1.28	14.71/4.12
II	1.48/0.56	2.52/0.68	3.41/0.92	2.41/0.60	4.96/1.24	14.78/4.00
III	0.67/0.28	1.33/0.32	1.73/0.40	1.56/0.36	2.52/0.72	7.81/2.08
IV	0.78/0.32	1.63/0.36	1.89/0.44	1.41/0.36	2.96/0.76	8.67/2.24

Prosoma nearly as long as wide (length/width ♀ 0.98-0.99, ♂ 0.93-1.04), with numerous small tubercles. Eyes small, subequal in size, ALE largest, PME and PLE often equal in size, ALE/AME ♀ 1.20-1.40, ♂ 1.08-1.17, PLE/PME ♀ 1.00-1.12, ♂ 1.00-1.25, AME-AME/AME-ALE ♀ 0.79-0.80, ♂ 0.90-0.95,

PME-PME/PME-PLE ♀ 1.44-1.50, ♂ 1.30-1.46, MOA wider than long (length/width ♀ 0.59-0.64, ♂ 0.52-0.63), anteriorly narrower (WA/WP ♀ 0.59-0.62, ♂ 0.63-0.67), clypeus nearly as wide as AME-AME (clypeus/AME-AME ♀ 1.16-1.18, ♂ 0.88-1.12). Chelicera of male without any protuberance, but a seta at middle. Labium as long as to slightly longer than wide (length/width ♀ 1.05-1.20, ♂ 1.00-1.18), sternum as long as wide in male (length/width 0.96-1.04), longer than wide in female (length/width 1.37-1.44). Leg formula I-II-IV-III or II-I-IV-III; claws of legs with 2 4 small teeth.

Spiniformation of legs of 1♀ from Yona, Okinawa Island, and 1♂ from Mt. Ôyama, Okinoerabujima Island. ♀: Femur: I-III dorsal 1 (short); tibia: I-II ventral 0-2, III-IV dorsal 1-1-0 (weak); metatarsus: I-II pro- and retrolateral each 1 ap, ventral 1-2-2-2.

♂: Femur: II dorsal 1; tibia: I-II prolateral 1 (weak); metatarsus: I-II prolateral 1 (weak).

Male palp (Figs. 203-204). Tibia with small VTA, much developed RTA and tooth-shaped ITA; ITA larger than in T. labefactus. Bulb simple, almost the same as in T. labefactus; embolus filiform, winding a half around tegulum.

Opisthosoma wider than long in female (length/width 0.70-0.99), nearly as long as wide in male (length/width 0.85-1.05), male dorsum with granulations at the anterior edge.

Female genitalia (Figs. 200-201). Epigynum without hood, intromittent orifices situated in the anterior part. Intromittent canal rather long, winding, spermathecae shaped like a deflated balloon.

Coloration and markings very different between the two sexes. ♀: Prosoma light yellowish brown; head and clypeus black, a pair or two pairs of

white marking between the ALE's and a triangular white marking at clypeus; chelicerae proximally yellow, distally white, maxillae, labium and sternum yellow; legs and palps yellow, excepting distal half of metatarsi I-II black and tibia I at middle with a prolateral black spot in the female from Yona, Okinawa Island, in the other ♀ and juvenile females legs and palps wholly yellow. Opisthosoma wholly white, without any marking.

♂: Prosoma brown, darker at the sides; chelicerae, maxillae, labium brown, sternum yellowish brown; legs I-II blackish brown; femora III-IV blackish brown, the other parts of legs III-IV yellowish brown. Opisthosomal dorsum orange to brown with many white spots in the anterior part, venter white, black at the sides.

Range. Japan (Ryukyu Islands).

Biology. Almost unknown. Often collected by sweeping method from grasses.

Remarks. This species is closely related to T. labefactus, and is separated from the latter by the shape of ITA of male palp and the structure of female genitalia. The material so far examined shows that the ranges of the two species do not overlap.

Thomisus okinawensis Strand, 1907

[Japanese name: Okinawa-azuchigumo]

(Figs. 205-214)

Thomisus okinawensis Strand, 1907, Abh. naturf. Ges. Görlitz, 25, p.202. Female holotype from Okinawa, Japan, O. Warburg leg., in ZMH, examined.

Thomisus Formosae Strand, 1907, Abh. naturf. Ges. Görlitz, 25, p.204. Female holotype from North Formosa, O. Warburg leg., in ZMH, examined. (New synonymy.)

Thomisus picaceus Simon, 1908, Bull. sci. France Belg., 42, p.135. Male holotype from Luc-Nam, Tonkin, M. Blaise leg., probably in MNHN, not examined. (New synonymy.)

Thomisus formosae: Mello-Leitão, 1929, Arch. Mus. nac. Rio de Janeiro, 31, p.310. —— Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p.861.

Thomisus formosanus: Bonnet, 1957, Bibliogr. Aran., 2, p.4580.

Thomisus okinawaensis: Yaginuma, 1977, Acta arachnol., 27 (spec. no.), p.397.

Notes. Strand (1907) described two new species of the genus Thomisus from Okinawa and Taiwan, T. okinawensis and T. Formosae; both the species have never been correctly recognized since the original descriptions because neither general appearance nor epigynum were illustrated. I examined the type specimens of both and found that they are beyond doubt identical in the structure of female genitalia, though the coloration and markings are remarkably different. Variation in the pattern is sometimes considerable in the Thomisus spiders, e.g., T. labefactus, and that is also the case in T. okinawensis and T. Formosae. Of 10♀♀ new material collected from Japan, Taiwan and Thailand, 5♀♀ have the pattern of the okinawensis type and the others that of Formosae type. The male of this species was found for the

first time in my material, and is described here. The characteristics of the male are exactly identical with the description and illustration of male palp of T. picaceus from the northern part of Vietnam given by Simon (1908). T. picaceus is considered to be a synonym of T. okinawensis.

Etymology. From its type locality, Okinawa, Japan.

Specimens examined. 1♀ (holotype), "Lincon Insel, Okinawa," O. Warburg leg. (ZMH); 1♀, Ikemajima Island, Miyako Islands, Okinawa Pref., 4-VII-1977, H. Makihara leg. (NSMT-Ar 1852); 1♀, Tarama, Miyakojima Island, Miyako Islands, Okinawa Pref., 27-V-1974, H. Makihara leg. (NSMT-Ar 1853); 1♀, Mt. Omoto-dake, Ishigakijima Island, Yaeyama Islands, Okinawa Pref., 20-VI-1974, H. Makihara leg. (NSMT-Ar 1854); 1♀, Arakawa, Ishigakijima Island, Yaeyama Islands, Okinawa Pref., 18-VI-1974, H. Makihara leg. (NSMT-Ar 1855); 1♂, Ôtomi, Iriomotejima Island, Yaeyama Islands, Okinawa Pref., 13-VIII-1962, M. Chujo leg. (NSMT-Ar 1856); 1♂, Nakano, Iriomotejima Island, Yaeyama Islands, Okinawa Pref., 24-III-1973, M. Shimojana leg. (MSO); 1♀2♂♂4 juv., Yonagunijima Island, Yaeyama Islands, Okinawa Pref., 26-VII-1979, M. Shimojana leg. (MSO).

1♀ (holotype of Thomisus formosae Strand, 1907), "Nord Formosa," 24-XI-1890, O. Warburg leg. (ZMH); 1♀, Hung-tou, Lan-hsu, Tai-tung, Taiwan, 4~6-VI-1980, H. Makihara leg. (NSMT-Ar 1857); 1♀, Ken-ting Park, Huang-chun, Ping-tung Hsien, Taiwan, 18-V-1971, K. Kanmiya leg. (NSMT-Ar 1858); 1♀, Khorat Plateau, Tahiland, 23-X-1970, C. Okuma leg. (NSMT-Ar 1859); 1♂, Piboonmong, Saran Ubol, Thailand, 6-VII-1977, K. Yasumatsu leg. (NSMT-Ar 1860); 1♂, Rajburi, Thailand, 1-XI-1966, C. Okuma leg. (NSMT-Ar 1861).

Description. Measurement. Body length ♀ 7.00-11.55mm, ♂

2.44-3.05mm; prosoma length ♀ 3.00-4.22mm, ♂ 1.26-1.70mm, width ♀ 2.90-4.37mm, ♂ 1.37-1.78mm; opisthosoma length ♀ 4.00-7.33mm, ♂ 1.33-2.09mm, width ♀ 3.80-9.85mm, ♂ 1.48-2.01mm; lengths of legs of ♀ holotype and 1♂ from Ôtomi, Iriomotejima Island (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	1.25/0.77	2.50/1.33	2.80/1.41	2.10/0.93	3.80/1.94	12.45/6.38
II	1.30/0.71	2.50/1.26	2.80/1.33	2.00/0.89	3.90/1.91	12.50/6.10
III	0.60/0.39	1.30/0.52	1.40/0.63	1.10/0.52	2.00/1.02	6.40/3.08
IV	0.80/0.37	1.50/0.67	1.60/0.67	1.20/0.53	2.50/1.11	7.60/3.35

Prosoma nearly as long as wide in female (length/width 0.95-1.06), slightly wider than long in male (length/width 0.91-0.96). Eyes subequal in size, ALE rarely smaller than AME, ALE/AME ♀ 1.11-1.25, ♂ 0.91-1.20, PLE/PME ♀ 1.00-1.33, ♂ 1.12-1.25, AME-AME/AME-ALE ♀ 0.68-0.80, ♂ 0.71-0.84, PME-PME/PME-PLE ♀ 1.42-1.54, ♂ 1.38-1.54, MOA much wider than long (length/width ♀ 0.43-0.54, ♂ 0.50-0.57), WA/WP ♀ 0.54-0.62, ♂ 0.57-0.65, clypeus/AME-AME ♀ 1.40-1.85, ♂ 1.30-1.50. Chelicerae of male respectively with a tubercle at the middle; labium longer than wide (length/width ♀ 1.03-1.56, ♂ 1.17-1.33), sternum longer than wide in female (length/width 1.30-1.39), nearly as long as wide in male (length/width 0.98-1.10).

Spiniformation of legs. Holotype ♀: Tibia: I pro- and retrolateral 1 ap (short), ventral 0-1-0-2-2-2-2, II pro- and retrolateral 1 ap (short), ventral 0-1-0-1-1-2-1; metatarsus: I-II pro- and retrolateral 1 ap, I ventral 1-2-2-1-2-2, II ventral 1-2-2-2-2. 1♀ from Mt. Omoto-dake, Ishigakijima

Island: Femur: I-II dorsal 1 (short), I prolateral 1-1-1 (short); tibia: I-II ventral 2-2-2-2; metatarsus: I-II pro- and retrolateral 1 ap, I ventral 2-0-0-1-2-1 (right 2-2-1-2-2-2), II ventral 2-2-2-2. 1+ from Taiwan (holotype of T. formosae): Femur: I-II dorsal 1 (short); tibia: I ventral 0-1-0-1-2-1 (right 0-1-0-1-2-2), II ventral 0-1-2-0; metatarsus: I-II pro- and retrolateral 1 ap, I ventral 1-2-2-2-2, II ventral 0-2-2-2-2.

1♂ from Ôtomi, Iriomotejima Island: Femur: I-III dorsal 1 (short), IV dorsal 0-1-1 (short), I prolateral 1-1-1 (short); tibia: I-II ventral 1-2; metatarsus: I-II pro- and retrolateral 1 ap, ventral 0-2-2.

Male palp (Figs. 212-214). Tibia with wide and low VTA, much developed RTA and ITA; ITA largest in the three known species from Japan. Bulb simple and convex, embolus filiform, shorter than in T. labefactus and T. kitamurai.

Opisthosoma in female wider than long, rarely slightly longer than wide (withered individual) (length/width 0.73-1.06), in male nearly as long as wide (length/width 0.88-1.04).

Female genitalia (Figs. 206, 208-209). Epigynum with a small sclerotized plate at the middle, intromittent orifices situated in the plate. Intromittent canal short, spermathecae large, ovate.

Coloration and markings. Two types are recognizable in female. The okinawensis type: Pro- and opisthosomal dorsum without any marking; prosoma wholly yellow to yellowish brown, legs yellowish brown with white and black spots, opisthosoma white. The formosae type: pro- and opisthosomata with markings; prosoma yellow to yellowish brown with a pair of dark brown patches or two to three pairs of dark brown spots at the sides; opisthosomal dorsum

white to yellowish white with three pairs of yellow to beige patches framed in black at the sides. No geogrphical inclination of these types is observed in the preesent material.

♂: Prosoma yellowish brown without any marking; chelicerae yellowish brown, maxillae, labium and sternum dark yellow; legs I-II yellowish brown, femora proximally and distally, patellae distally, tibiae proximally and distally, metatarsi distally with brown ring respectively; legs III-IV dark yellow, femora, patellae, tibiae and metatarsi each distally dark-coloured. Opisthosoma yellowish white to yellowish brown.

Range. Japan (Ryukyu Islands south of Okinawa Island), Taiwan, Thailand.

Biology. Unknown. Often collected by sweeping method from grasses.

Remarks. Thomisus okinawensis is similar to T. labefactus and T. kitamurai in general appearance, but is easily distinguished from the latter two by the shape of male palpal tibia and the structure of female genitalia. This species is one of the typical Oriental elements.

Subfamily Bominae Simon, 1886

[Japanese name: Tsubukanigumo-aka]

Bomini Simon, 1886, Act. Soc. linn. Bordeaux, 40, p.173. (Section within the family Thomisidae.)

Bomeae: Simon, 1895, Hist. nat. Araign., éd. 2, 1, p.1002. (Genus-group

within the subfamily Misumeninae.) --- Roewer, 1954, Kat. Aran., Bruxelles, 2(a), p.827.

Bomidae: Dahl, 1907, Mitt. zool. Mus. Berlin, 3, p.372; 1913, Vergl. Physiol. Morph. Spinnentiere, p.18.

Bominae: Ono, 1984, Bull. natn. Sci. Mus., Tokyo, (A), 10, p.65.

Notes. The Bomini was first recognized by Simon (1886b) as a section of the family Thomisidae. Later, Simon (1895a) raised it to a genus-group of the subfamily Misumeninae (= Thomisinae). It is now known to comprise nine genera mainly distributed in the Paleotropical and Australian Regions (Roewer, 1954). Dahl (1907) raised it to the familial rank because of the presence of a row of modified hairs on the promargin of chelicera. Later in 1913, he placed Stiphropodinae Simon, 1895 (type genus: Stiphropus Gerstaecker, 1873) in the family. It is true that the Stiphropodinae may be related to bomid spiders, but is, as I already pointed out (Ono, 1980b), definitely different from the latter at the subfamilial level in view of various characteristics including genital features. Although Dahl's classification is too splitting to be accepted at the present state of our knowledge, his family Bomidae cannot be simply united with the subfamily Thomisinae. Therefore, I recognized an independent subfamily for the bomid spiders on the basis of the following diagnosis (Ono, 1984). In the previous report, I regarded the year of publication of the genus as 1895, since Simon established the genus-group Bomeae in that year. However, Simon used the name Bomini for a section of the family Thomisidae in 1886, and the year of its publication is herewith corrected from 1895 to 1886.

Diagnosis. Carapace convex, poorly haired, often covered with granulation or small tubercles. Elevation of ocular area not much developed. Chelicerae devoid of teeth, but with bristle-like hairs in a row (scopula) on their promargins. Labium longer than wide. Legs short and thick, without setae. Patellae long, nearly as long as tibiae, longer than metatarsi. Hairs of legs and palps not branched.

Genera included. Avelis Simon, 1895, Boliscus Thorell, 1891, Boliscodes Simon, 1908, Bomis L. Koch, 1874, Corynethrix L. Koch, 1876, Felsina Simon, 1895, Holopelus Simon, 1886, Parabomis Kulczyński, 1901, Thomisops Karsch, 1879 (not carefully studied except for Boliscus). Only one genus occurs in Japan.

Genus Boliscus Thorell, 1891

[Japanese name: Ibokanigumo-zoku]

Boliscus Thorell, 1891, Kongl. Svensk. Vet.-Akad. Handl., 24, p.98. --- Simon, 1895, Hist. nat. Araign., éd. 2, 1, p.1006. --- Ono, 1984, Bull. natn. Sci. Mus., Tokyo, (A), 10, p.65. --- Yaginuma, 1986, Spiders Japan Col., Osaka, (n. ed.), p.210.

Type species. Boliscus tuberculatus (Simon, 1886) (= B. segnis Thorell, 1891.)

Etymology. Greek βῶλος + ἰσκός, meaning a small lump of earth; masculine.

Diagnosis. Small thomisids; male a half the size of female. Carapace poorly haired, without setae. Tubercles of eyes poorly developed, lateral eyes on separate tubercles. Chelicerae toothless, labium oblong, longer than wide. Legs short, thick, without setae, patellae nearly as long as tibiae, longer than metatarsi. Tarsi of male palp with VTA and RTA, bulb simple in form, without apophyses, embolic division winding twice around tegulum, embolus long, aciculate. Opisthosoma tuberculate. Epigynum without hood, intromittent canal long and winding, atrium present.

Range. Southeast Asia (Japan, Taiwan, Burma, Thailand, Singapore, Java, Ceylon), New Caledonia.

Species included. Other than the type species, only two described species are known: B. decipiens O. Pickard-Cambridge, 1899 (Ceylon) and B. duricorius (Simon, 1880) (New Caledonia). Both have not been rediscovered since the original description.

Remarks. This genus is distinguished from all the known genera of the subfamily Bominae by the presence of various tubercles on the opisthosoma.

Only one Japanese species is known.

Boliscus tuberculatus (Simon, 1886)

[Japanese name: Ibokanigumo]

Corynethrix tuberculatus Simon, 1886, Act. Soc. Linn. Bordeaux, 40, p.146.

Juvenile female holotype from Bangkok, Thailand, in MNHN, examined.

Boliscus segnis Thorell, 1891, Kongl. Svensk. Vet.-Akad. Handl., 24(2), p.98. Juvenile female holotype from Singapore, Workman leg., probably in the National Museum of Ireland, Dublin, not examined; 1895, Descr. Cat. Spid. Burma, p.283. 1 juvenile male and 3 juvenile females from Burma, Thorell det., in BM(NH), examined. --- Simon, 1895, Hist.nat. Araign., ed. 2, 1(4), p.1006. Female specimen from Singapore, in MNHN, examined. --- Workman, 1886, Malays. Spid., p.93.

Boliscus tuberculatus: Simon, 1895, Hist. nat. Araign., éd. 2, 1, p.1006. --- Ono, 1984, Bull. natn. Sci. Mus., Tokyo, (A), 10, p.66. --- Yaginuma, 1986, Spiders Japan Col., Osaka, (n. ed.), p.210.

Thomisidae gen. sp.: Ohno & Yaginuma, 1968, J. Tôyô Univ., Gen. Educ. (Nat. Sci.), (10), p.29.

Notes. In spite of its darker coloration and withered body, the holotype of B. tuberculatus shows the same diagnostic characters as B. segnis. I regarded the latter as a junior synonym of the former (Ono, 1984). Judging from the original description and illustration given by O. Pickard-Cambridge (1899), B. decipiens may be a synonym of B. tuberculatus. A re-examination of the type specimens is required.

Etymology. Specific name from Latin meaning tuberculate.

Specimens examined. 1 juv. ♀ (holotype), Bangkok, Thailand (MNHN 6475); 2♀♀, Java, Simon det. as Boliscus sp. (MNHN 19037); 1♀, Singapore, Simon det. as Boliscus segnis Thorell, 1891 (MNHN 13815); 3 juv. ♀ 1 juv. ♂, Burma, Oates leg., Thorell det. as Boliscus segnis (BM(NH)95-9-21-875-7); 1♂ 2 juv., Yangmingshan, Taipei, Taiwan, 28-VII-1977, H. Yoshida leg. Japan: 1♀,

Mt. Takatsukayama, Chikura-cho, Chiba Pref., 10-X-1967, K. Ishii leg. (TYO); 1♀, Emi-cho, Chiba Pref., 15-VI-1966, S. Matsumoto leg., (NSMT-Ar 424); 1 juv., Niijima Island, Izu-shichito Islands, Tokyo, 2-VI-1967, M. Ohno leg. (TYO); 1 juv., Miyakejima Island, Izu-shichito Islands, Tokyo, 5-VIII-1978, K. Suzuki leg. (NSMT-Ar 425); 1 juv., Mikurajima Island, Inazusa, Shimoda-shi, Shizuoka Pref., 4-VIII-1976, H. Ono leg.; 1 juv., Nanto-cho, Watarai-gun, Mie Pref., 11-VIII-1971, K. Kaihotsu leg. (TYO); 1♀ 2 juv., Kuki-cho, Owase-shi, Mie Pref., 12-VII-1964 (TYO); 1♀, Kizuro, Kitayama-kyô, Wakayama Pref., 30-V-1951, M. Okura leg. (TYO); 2♂♂, Naeno, Ôkubo, Tsushima Islands, Nagasaki Pref., 21-X-1968, J. Aoki leg. (NSMT-Ar 427); 1 juv., Konoura, Nakadorishima Island, Goto Islands, Nagasaki Pref., 21-V-1968, M. Ohno leg. (TYO); 1 juv., Yusubaru, Oita Pref., 3-XII-1965, S. Fujisawa leg. (TYO); 1♂ 1 juv., Nishi-toyoda, Oita-shi, Oita Pref., 26-I-1966, S. Fujisawa leg. (TYO); 1♀, Kamihouri, Higashi-usuki-gun, Miyazaki Pref., 16-VI-1966 (TYO); 1♀ 2♂♂, Minamata-shi, Kumamoto Pref., 25-IX-1967, R. Hamada leg. (TYO); 1♂ 1 juv. ♀, Kuchierabujima Island, Kamiyaku-cho, Kumage-gun, Kagoshima Pref., 18-VIII-1977, M. Shimojana (MSO); 1♂, northern part of Okinawa Island, Okinawa Pref., X-1960, K. Yasumatsu leg. (NSMT-Ar 428); 1♀, Enobi, Gushikawa-shi, Okinawa Island, Okinawa Pref., 30-VI-1977, H. Yoshida leg. (NSMT-Ar 1144); 1♀, Shoshiunten, Nakijin-mura, Kunigami-gun, Okinawa Island, Okinawa Pref., 16-VIII-1957, Shoza leg. (TYO); 1♂, Yona, Kunigami-gun, Okinawa Island, Okinawa Pref., 28-VI-1984, M. Tomokuni leg. (NSMT-Ar 1145); 2 juv., Mt. Banna-dake, Ishigaki Island, Yaeyama Islands, Okinawa Pref., 29-III-1976, N. Takeuchi leg. (NSMT-Ar 429); 2 juv., Miyagi Island, Okinawa Islands, Okinawa Pref., 7-X-1961, M. Shimojana leg. (TYO); 2♀♀3♂♂ 1 juv. ♀, Karimata,

Hirara-shi, Miyakojima Island, Miyako Islands, Okinawa Pref., 22-VII-1971, M. Shimojana leg. (MSO); 1 juv., Inoda, Ishigakijima Island, Yaeyama Islands, Okinawa Pref., 29-III-1973, M. Shimojana leg. (MSO); 1 juv., Mt. Omotodake, Ishigakijima Island, Yaeyama Islands, Okinawa Pref., 29-III-1973, M. Shimojana leg. (MSO); 1 juv., Kabira, Ishigakijima Island, Yaeyama Islands, Okinawa Pref., 1-IV-1975, H. Ono leg. (NSMT-Ar 473); 2♂♂, Iriomote Island, Yaeyama Islands, Okinawa Pref., 17~18-VIII-1963, M. Shimojana leg. (TYO); 1 juv., upper basin of the Kuira River, Iriomote Island, Yaeyama Islands, Okinawa Pref., 27-III-1973, M. Shimojana leg. (MSO); 1♀, Shirahama, Iriomotejima Island, Yaeyama Islands, Okinawa Pref., 2-VIII-1973, M. Shimojana leg. (MSO).

Description. Measurement. Body length ♀ 2.60-4.25mm, ♂ 1.65-1.95mm; prosoma length ♀ 1.36-1.75mm, ♂ 0.90-1.00mm, width ♀ 1.48-1.85mm, ♂ 0.95-1.05mm; opisthosoma length ♀ 1.32-2.85mm, ♂ 1.10-1.20mm, width ♀ 1.92-3.35mm, ♂ 1.25-1.40mm. Lengths of legs of 1♀ from Gushikawa-shi of Okinawa Island and 1♂ from the Tsushima Islands (in mm; ♀/♂):

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.35/0.24	0.48/0.30	0.73/0.45	0.68/0.38	1.10/0.63	3.34/2.00
II	0.35/0.25	0.48/0.30	0.73/0.45	0.70/0.35	1.13/0.63	3.39/1.98
III	0.25/0.18	0.35/0.23	0.45/0.25	0.50/0.25	0.73/0.43	2.28/1.34
IV	0.28/0.18	0.40/0.25	0.55/0.33	0.50/0.25	0.93/0.55	2.66/1.56

Prosoma. Carapace poorly haired, without setae, as long as wide to slightly wider than long, convex, highest in the posterior region, cephalic region sloping gently downwards to clypeus, thoracic region steep to the

posterior margin, some small white granulation on the posterior region. Eyes small, lateral eyes on separate, poorly developed tubercles, ALE> PLE ≧ AME ≧ PME with little difference in size, ALE/AME 1.40-2.00, PLE/PME 1.13-1.50, AME-AME/AME-ALE ♀ 0.85-1.12, ♂ 1.00-1.23, PME-PME/PME-PLE ♀ 1.37-1.70, ♂ 1.28-1.34, MOA-WA/WP ♀ 0.66-0.69, ♂ 0.75-0.80, L/WP ♀ 0.71-0.76, ♂ 0.83-0.90, clypeus/AME-AME ♀ 1.10-1.34, ♂ 1.40-1.60. Chelicerae toothless, maxillae distally convergent, labium oblong, longer than wide (length/width ♀ 1.22-1.40, ♂ 1.16-1.25), more than half the length of maxillae, sternum longer than wide (length/width ♀ 1.20-1.50, ♂ 1.20-1.34), with the edge extending between coxae. Legs haired, without setae, patellae longer than metatarsi, metatarsi and tarsi with scopula.

Male palp (Ono, 1984, figs. 3-4). Tibiae with VTA and RTA, RTA chitinous, without ITA. Cymbium without attached elements, bulb simple in form without apophyses, embolic division winding twice around tegulum, embolus long, needle-shaped.

Opisthosoma with tubercles of various size, ♂ dorsum chitinous.

Female genitalia (Ono, 1984, figs. 5-8). Epigynum without chitinous hood, vestibulum wide, concave, intromittent orifices situated in the posterior part of vestibulum. Intromittent canal long, winding forward, atrium present, spermathecae oval.

Coloration and markings (Figs. 1-2). ♀♂ Carapace yellowish or reddish brown or brown mottled with dark brown, darkest at the sides, tubercles in the posterior region white. Palps, chelicerae, maxillae, labium and sternum yellowish brown to dark brown. Legs yellow, with darker femora. Opisthosoma dorsally yellowish brown to dark reddish brown, with faint black

markings, underside yellowish brown.

Range. Japan (Honshu, Shikoku, Kyushu, Ryukyu Islands), Taiwan, Thailand, Burma, Singapore, Java.

Biology. Unknown. Often collected from shrubs by sweeping method.

Remarks. This spider can be readily identified by its external appearance. It is the only member of the subfamily Bominae known from Japan, and is the smallest thomisid spider of Japan in the male.

Species Incertae Sedis

Xysticus cetrariae Dönitz et Strand, 1906

[Japanese name: Hohobeni-kanigumo]

Xysticus cetrariae Dönitz et Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.385.

Notes. From the original description and figure, it is impossible to recognize this spider from among several Xysticus species occurring at Saga, the type locality of X. cetrariae. The description is too short and does not include any explanation of the genital structure. Though it was described in the explanation of the figure "♀ von oben," the habitus figure shows exactly a male. The type depository of this species has been unknown. Probably X. croceus Fox, 1937, or X. ephippiatus Simon, 1880.

Xysticus mojensis Strand, 1907

[Japanese name: Moji-kanigumo]

Xysticus mojensis Strand, 1907, Abh. naturf. Ges. Görlitz, 25, p.206.

Specimen examined. Holotype: Juv. ♀, "Moji, Japan, Dr. R. Mull, Schiffsarzt, leg. 15-V-1900, ded. 31-VII-1900," (ZMH).

Notes. Strand (1907) gave for a single female collected at Moji in Japan a detailed description including a few lines on the "Genitalfeld." However, the explanation of the genitalia shows that the specimen could be an immature. After a re-examination of the type specimen deposited in the museum at Hamburg, I found that the holotype is totally damaged and of no use for identification. It has already been labelled in the vial of the holotype as "species dubia, rev. Crome, 10.6.1958, unreifes ♀, verdorben." Probably X. insulicola Bösenberg et Strand, 1906.

Misumena lutea Peelle et S. Saito, 1933

[Japanese name: Ki-hanagumo]

Misumena lutea Peelle et S. Saito, 1933, J. Fac. Sci. Hokkaido imp. Univ., (6), 2, p.111; 2♀♀1♂ syntypes from Shakotan on the Island of

Shikotan, Kurile Islands, Japan, 9-VIII-1931, M.L. Peelle leg., lost.

Misumena lutea [sic]: S. Saito, 1959, Spid. Book Illustr. Col., p.127.

Notes. This species cannot be recognized, since no specimens from the Kurile Islands are available for this study.

Misumena saitoi Roewer, 1951

[Japanese name: Nagate-hanagumo]

Misumena oblonga S. Saito, 1939, Saito Ho-on Kai Mus. Res. Bull., 3, p.82; ♀ holotype from Kuriyagawa, Morioka City, 2-IX-1936, S. Oyama leg., lost; 1959, Spid. Book Illustr. Col., p.127. (Preoccupied by Misumena oblonga Kerserling, 1880.)

Misumena saitoi Roewer, 1951, Abh. naturw. Ver. Bremen, 32, p.448. (Nom. nov. pro Misumena oblonga S. Saito, 1939.)

Notes. Though S. Saito described this species with illustrations of the habitus and epigynum, it has never been re-obtained since the original description. The holotype was lost.

Doubtful Records, Misplaced and Misidentified Species.

Xysticus desidiosus Simon, 1875

Xysticus desidiosus: Annen, 1940, Acta arachnol., 5, p.90.

Notes. Since the distributional range of X. desidiosus seems to be limited to southern Europe, the record of this species from Japan is unbelievable.

Xysticus triguttatus Keyserling, 1880

Xysticus triguttatus: Peelle & S. Saito, 1933, J. Fac. Sci. Hokkaido, Imp. Univ., (6), 2, p.113. --- S. Saito, 1959, Spid. Book Illustr. Col., 131.

Notes. It is doubtful whether this North American species is actually distributed in Japan, because it does not occur even in Alaska. The figure of epigynum illustrated by the authors is considerably different from the figures of X. triguttatus given by American authors (Gertsch, 1953; Turnbull et al., 1965; Schick, 1965; Dondale & Redner, 1978).

Misumenoides formosipes (Walckenaer, 1837)

[Japanese name: Amerika-hanagumo]

Misumena aleatoria: Peelle & S. Saito, 1933, J. Fac. Sci. Hokkaido imp. Univ., (6), 2, p.110. --- S. Saito, 1959, Spider Book Illustr. Col., p.122.

Notes. Judging from the illustrations of habitus and male palp given by Peelle and S. Saito (1933) as well as by S. Saito (1959), the spider determined by the authors as Misumena aleatoria is not the New World species, which is synonymized at present with Misumenoides formosipes. I have been unable to decide the true identity of the spider recorded from the Kurile Islands.

Pistius truncatus (Pallas, 1772)

Pistius truncatus: Bösenberg & Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.253. (For further literature see the notes of Pistius undulatus.)

Notes. As I already pointed out, the only Pistius species occurrring in Japan is not P. truncatus as was considered by many authors including Bösenberg and Strand (1906) but P. undulatus Karsch, 1979 (Ono, 1985a). The European spider, P. truncatus, has been unknown in Japan.

Thomisus onustus Walckenaer, 1805

[Japanese name: Shiro-azuchigumo]

Thomisus albus: Chyzer & Kulczyński, 1891, Aran. hung., 1, p.82. --- Bösenberg & Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.249.

Notes. This species has been recorded from various countries in Eurasia, also from Japan by Chyzer & Kulczyński (1891). However, I have never seen any Japanese spider which can be identified with T. onustus. All the other records by Japanese authors (Kishida, 1933; S. Saito, 1939, etc.) may be due to misidentification of Pistius undulatus or Thomisus labefactus.

Philodromus auricomus L. Koch, 1878 (Philodromidae)

[Japanese name: Kiniro-ebigumo]

Philodromus auricomus L. Koch, 1878, Verh. zool.-bot. Ges. Wien, 27, p.763.
Diaea subadulta Bösenberg et Strand, 1906, Abh. senckenb. naturf. Ges., 30, p.258. Subadult male holotype from Saga, Japan, W. Dönitz leg., in SMF, examined. (New synonymy). (Japanese name: Shirotsuba-kanigumo.)

Notes. Diaea subadulta was originally described as a member of the family Thomisidae. After an examination of the holotype, I became aware of the fact that it is a philodromid and is identical with Philodromus auricomus L. Koch, 1878.

Nomina Nuda

Tmarus amoenus Kishida, in Yuhara, 1931, Study of Spiders, Tokyo, p.180.

Monaeses simoni Kishida, 1913, Kagaku Sekai, Tokyo, 7(13), p.37.

Eremita typica Kishida, 1913, Kagaku Sekai, Tokyo, 7(13), p.38.

Oxyptila kishidai Okami, 1909, Hakubutsugaku Zasshi, Tokyo, (109), p.24.

Xysticus iatsme Kishida, in Annen, 1940, Acta arachnol., 5, p.90.

Xysticus onoi Kishida, in Shinji & O. Ono, 1936, Saito Ho-on Kai Mus. Res. Bull., (30), p.13.

Xysticus rotundus Kishida, 1936, Nikko no Shokubutsu to Dôbutsu, Tokyo, p.491.

Xysticus subluctator Kishida, in Hoshino, 1937, Acta arachnol., 2, p.52.

Xysticus trizonatus Kishida, in Annen, 1940, Acta arachnol., 5, p.90.

Phrynarachne honshiensis Kishida, in Uyemura, 1935, Kishu Dôshokubutsu, Shirahama, 2(2), p.27.

Phrynarachne formosensis Uyemura, 1936, Rika Kyôiku, Tokyo, 5(7), p.6.

Yaginuma (1953) recorded the following nomina nuda besides those listed above (Atypus, Osaka, (4), pp.12-15):

Coriarachne nipponica Kishida

Oxytate kochii Kishida

Synaema honsiana Kishida

Xysticus yamaji Uyemura

Xysticus Joshidae Kishida

List of the Taxa Described in this Paper

Family Thomisidae Sundevall, 1833

Subfamily Stephanopinae O. Pickard-Cambridge, 1871

Genus Cupa Strand, 1906

1. Cupa typica Bösenberg et Strand, 1906
2. C. zhengi Ono et Song, 1986

Genus Phrynarachne Thorell, 1869

3. Phrynarachne ceylonica (O. Pickard-Cambridge, 1884)
4. P. katoi Tikuni, 1955

Subfamily Dietinae Simon, 1895

Genus Oxytate L. Koch, 1878

5. Oxytate striatipes L. Koch, 1878
6. O. hoshizuna Ono, 1978

Genus Loxobates Thorell, 1877

7. Loxobates daitoensis sp. nov.

Genus Alcimochthes Simon, 1885

8. Alcimochthes limbatus Simon, 1885

Subfamily Thomisinae Sundevall, 1833

Tribe Tmarini Simon, 1895, stat. nov.

Genus Tmarus Simon, 1875

9. Tmarus piger (Walckenaer, 1802)

10. T. hanrasanensis Paik, 1973

11. T. rimosus Paik, 1973

12. T. yaginumai Ono, 1977

13. T. makiharai sp. nov.

Genus Monaeses Thorell, 1869

14. Monaeses aciculus (Simon, 1903)

Tribe Coriarachnini Simon, 1895

Genus Coriarachne Thorell, 1870

15. Coriarachne fulvipes (Karsch, 1879)

Genus Bassaniana Strand, 1928

16. Bassaniana decorata (Karsch, 1879)

Genus Xysticus C.L. Koch, 1835, sensu lato

Group of X. triangulosus

17. Xysticus jacuticus Utochkin, 1968

Group of X. luctuosus

18. X. rostratus sp. nov.

Group of X. labradorensis

19. X. daisetsuzanus sp. nov.

Group of X. luctans

20. X. croceus Fox, 1937

21. X. ephippiatus Simon, 1880

22. X. atrimaculatus Bösenberg et Strand, 1906

23. X. dichotomus Paik, 1973

24. X. insulicola Bösenberg et Strand, 1906

25. X. transversomaculatus Bösenberg et Strand, 1906

Group of X. locuples

26. X. saganus Bösenberg et Strand, 1906

27. X. trizonates sp. nov.

28. X. kurilensis Strand, 1907

Group of X. cristatus

29. X. audax (Schrank, 1803)

30. X. bifidus Paik, 1973

Genus Oxyptila Simon, 1864

31. Oxyptila nipponica Ono, 1985

32. O. sincera Kulczyński, 1926

33. O. matsumotoi sp. nov.

Tribe Talaini Simon, 1895, stat. nov.

Genus Lysiteles Simon, 1895

34. Lysiteles coronatus (Grube, 1861)

35. L. maius Ono, 1979

36. L. okumae Ono, 1980

37. L. miniatus Ono, 1980

Genus Synaema Simon, 1864

38. Synaema globosum (Fabricius, 1775)

39. S. chikunii Ono, 1983

Genus Takachihoa Ono, 1985

40. Takachihoa truciformis (Bösenberg et Strand, 1906)

Tribe Misumenini Simon, 1895

Genus Misumenops F.O. Pickard-Cambridge, 1900

41. M. japonicus (Bösenberg et Strand, 1906)

42. Misumenops tricuspidatus (Fabricius, 1775)

43. M. kumadai Ono, 1985

Genus Diaea Thorell, 1869

44. Diaea gyoja Ono, 1985

Genus Heriaeus Simon, 1875

45. Heriaeus mellottei Simon, 1886

Genus Misumena Latreille, 1804

46. Misumena vatia (Clerck, 1758)

Genus Pistius Simon, 1875

47. Pistius undulatus Karsch, 1879

Tribe Thomisini Sundevall, 1833

Genus Runcinia Simon, 1875

48. Runcinia albostriata Bösenberg et Strand, 1906

49. R. acuminata (Thorell, 1881)

Genus Thomisus Sundevall, 1833

50. Thomisus labefactus Karsch, 1881

51. T. kitamurai Nakatsudi, 1943

52. T. okinawensis Strand, 1907

Subfamily Bominae Simon, 1886

Genus Boliscus Thorell, 1891

53. Boliscus tuberculatus (Simon, 1886)

Higher Classification and Phylogeny

The history of spiders stretches back to the Devonian Period about 350 million years ago (Hirst, 1923; Bristowe, 1971). From coal measures of the next Carboniferous Period, a fossil spider was found and named Arthrolycosa antiqua Hargar, 1874, which closely resembles recent liphistiid spiders restricted to Southeast Asia. For this exceedingly long time, the carnivorousness of spiders has never changed; they feed only on insects and other small animals. Though the food habit is simple, spiders have varied their external features and occupied every possible terrestrial environment. It can be safely said that the Araneae are the most successful order in the class Arachnida. The diffentiation of spiders in various quarters was possible under adaptation parallel to the evolution of insects. Having evolved their ability and tactics to capture the prey, the spiders have adapted themselves to every space on the earth. Consideration of the feeding habits seems indispensable to the study of the phylogeny of spiders (Levi, 1977, etc.). Though some major works have recently been published on the phylogeny of "web builders" in relation to their webs (Lehtinen, 1967; Levi, 1977, 1980, 1983; Opell, 1979, Nentwig & Heimer, 1982; Uetz, 1986, etc.), little has been discussed on the phylogeny of what is called "hunting spiders" which occupy more than one-third of the known species of spiders.

The spiders of the family Thomisidae, a group of hunting spiders that do not build webs, lie on various plants in wait for passing insects.

Their remarkable appearance is in the condition of legs which extend sideways like those of crabs. These laterigrade legs are also found in the Heteropodidae, Selenopidae, Platoridae and Philodromidae. However, the Thomisidae is different from the others in the remarkable development of the anterior pair to hold the prey (the posterior pair of legs somewhat degenerated and used only to walk and to hold on the ground) and the large lateral eyes as compared with the medians. The Philodromidae was previously included in the family Thomisidae, but I have treated it as an independent family in view of the characteristics of legs and eyes, the condition of the surface of body as well as the structure of the genital organ (see the descriptive chapter of this paper). The Thomisidae is a specialized group in the Dionycha and more highly evolved than the other laterigrade spiders.

As mentioned above, the basic body structure of thomisid spiders is closely related with the development of their feeding habits. The characteristic features derived from such adaptations can be used for determining the systematic position of them in higher categories. Contrary to this, some specialized features in spiders living on threads stretched in space are occasionally formed by accidental reasons. Grasshoff (1974 a,b) pointed out that the male palp of the "web builders" has become much larger and more complicated than that of the mygalomorph and hunting spiders.

The shape of mouth parts, namely chelicera, maxilla and labium, the size and arrangement of eyes, the condition of legs and prosoma, especially hairs, setae and spines on them, and the structure of male and female genital organs are regarded as the characters to serve as defining the systematic status of each taxon. On the other hand, the spinnerets, which cannot be

neglected in analysing phylogenetic relationships of spiders (Lehtinen, 1967; Baum, 1972), are simple and rather homogeneous in the family Thomisidae. The genital organ functioning to preserve species has no direct relationship with physical and biological environment. In spiders, it consists of female genitalia and male palp, both widely used for determining relationships not only at species level but also in higher categories like suborders (Kraus, 1977; Haupt, 1979, 1983). Levi (1980, 1983) successfully explained subfamilial relationships in the family Araneidae by genitalic structure as well as by other important characteristics. However, the structure of female genitalia and male palp is basically simple and rather poorly varies in the family Thomisidae, though it is useful for recognizing interspecific or intergeneric relationships. The male palp of the genus Xysticus which is largest in the family is rich in variety; its most primitive type is closely similar to the male palp of other genera such as Coriarachne and Bassaniana (Ono, 1978c).

The only and interesting exception is the male palp of the Sino-Japanese thomisid, Cupa zhengi (see p. 34). It is distributed in the coastal areas on either side of the East China Sea, which lie exactly on the range of the most primitive spiders (Suborder Mesothelae). The male palp of this spider is of the most primitive type in the Thomisidae; its tarsus is long and not typical for a thomisid, its tegulum is not much developed, and its bulb is simple, longer than wide and with a large conductor. This is the only species in the Thomisidae bearing a conductor on the male palp. Because of the peculiar genitalic structure, an independent subfamily may be established for this spider (the male of the other member of the genus, Cupa

typica, is unknown). However, I included the genus in the subfamily Stephanopinae, since all the external features of Cupa seem to fall within the scope of stephanopines.

Fossil records of thomisid spiders are not abundant, usable material having been obtained chiefly from ambers. Up to the present, several amber thomisids belonging to five genera of two subfamilies, Syphax C.L. Koch et Berendt, 1854, Facundia C.L. Koch et Berendt, 1854, and Fiducia Petrunkevitch, 1950, in the Stephanopinae, and Misumena Latreille, 1804, and Komisumena Ono, 1981, in the Thomisinae, have been described from Baltic and Dominican ambers. Of these, Komisumena, the only known thomisid spider from Dominican amber, was recently described by myself. The genus is at present monotypic, and the type specimen of the type species, Komisumena rosae Ono, 1981, consists of a single male enclosed in the Dominican amber from a layer of the Oligocene Epoch. Its material prepared by the Staatliches Museum fur Naturkunde in Stuttgart was offered to me in excellent condition. After examining this amber spider, I found some interesting facts; either the condition of fossil itself or the grind technique were not good for previous studies on amber thomisids.

The genus Komisumena is a member of the subfamily Thomisinae and stands near by the recent genus Misumenops F.O. Pickard-Cambridge, 1900, which is dominant in North and South Americas. The legs I-II of Komisumena rosae are developed, much longer than the legs III-IV and with many strong spines; the eyes are also developed as in recent Misumenops species and ALE is much larger than AME. However, the prosoma is furnished with long thoracic hairs

which have not transformed into setae. The cephalic setae are also poorly developed excepting the pair (S 1) behind both PLE's.

The amber spider was an adult male, and the details for the genital organ in a fossil species has been newly introduced into science through it. The male palp of Komisumena rosae was observed from all possible angles and its complete shape was reconstructed and illustrated (Ono, 1981a, figs. 7-11). The cymbium is simple and without any attached element, the bulb is also simple, the tegulum is not much developed and sclerotized, without tegular apophysis, the embolic division is long and winding around the tegulum, and embolus is filiform, long and without conductor. In the shape of tarsus, there is no significant difference between this fossil spider and recent thomisid species of various genera. Especially, Synaema globosum (Fabricius, 1775) (Thomisinae) possesses a tarsus closely resembling that of the amber species. The tibia of the amber species is also simply shaped; VTA is present but small and digitiform, and RTA is absent and replaced by a strong spine. A male palp without RTA seems very unusual in recent thomisids. So far as I know, only three species of the genus Stephanopoides Keyserling, 1880 (Stephanopinae) possess it, that is S. brasiliana Keyserling, 1880, S. simoni Keyserling, 1880, and S. mirabilis Soares, 1942, all described from Brasil. Simon (1889b) has described that Geraesta hirta from Madagascar also lacks RTA of male palp, but having examined the holotype (MNHN 9317) of this stephanopine species, I have found that the specimen is a subadult male and cannot be said if it actually lacks RTA. The other member of the genus, Geraesta bilobata Simon, 1897, possesses RTA. The male palps of these Stephanopoides species represent the simplest type in the family Thomisidae.

However, the absence of conductor on the bulb is regarded as a modified state. The absence of tibial apophyses should be a secondary phenomenon judged from the structure of the male palp of the other stephanopine genera.

On the basis of the morphology of fossil and recent forms, an image of the prototype of thomisid spiders can be constructed as follows: the legs are normal (prograde) or slightly laterigrade, the legs I, II and IV are subequal in length, only the leg III is shorter than the others, the tarsi are furnished with developed claw tufts and two claws (Dionycha) denticulated, and the metatarsi, tibiae, patellae and femora bear much developed spines; the integument of prosoma is covered with many normal hairs and devoid of thoracic setae or granulations, occasionally with weak cephalic setae; the eyes are subequal in size, homogeneous and in two rows; the chelicera with strong marginal teeth on the fang furrow, the maxillae and labium normal; opisthosoma oval, haired and without granulations or apophyses; the tegulum of male palp is simple and without tegular apophysis, the embolus is long, filiform and supported by a conductor, the palpal tibia with spines and apophyses. The spider should have had hunting habit in the day time.

Gradually, the legs and eyes have become modified for adapting to the lie-in-wait habit on plants, namely the legs I and II have become grown longer than legs III and IV, the lateral eyes have become larger than the medians and able to see in clear view when the prey is close to the spider. Then, differentiations took place; the extreme case is the Aphantochilinae whose

members mimic ants.

A sister group of the Thomisidae may be found in the "Clubionoidea" which is heterogeneous and insufficiently revised.

The "thomisid" spider was originally recognized by Latreille (1802) as "Laterigrades," a group of spiders with legs extending sideways. This was followed by many authors who made monographic studies of the group of spiders, e.g., C.L. Koch (1837-'51), Simon (1864), Prach (1866), etc. This category included all the "laterigrade" spiders, including Heteropodidae, for instance. Thorell (1870a) divided the "laterigrade" spiders (Thomisoidae) into three subfamilies, the Thomisinae, Philodrominae and Anetinae. The Philodrominae included heteropodid spiders and the Anetinae is at present regarded as a member of the Araneidae. The araneologist who rather strictly defined the family was Simon, who separated the Sparassidae (Heteropodidae) from the thomisid spiders in the work "Les Arachnides de France" (1875a). However, the article was based only on European material. First complete revision of the thomisid spiders was published by the same author in 1895 and 1903. In the second edition of his "Histoire Naturelle des Araignées," a revision of all spiders from the world, he diagnosed the family Thomsidae and established many genus-groups and new genera. Though his family included the Philodromidae, he laid the foundation of the modern systematics of the Thomisidae.

In the twentieth century, however, very little study has been made on the systematics of the family Thomisidae on the world-wide basis, with the exception of Petrunkevitch and Roewer, who made minor changes on Simon's system. The difference of groupings of the "thomisid" taxa between Simon

(1895a, 1903a), Petrunkevitch (1928), Roewer (1954) and myself is shown in the table given below.

Simon (1895a, 1903a)	Petrunkevitch (1928)	Roewer (1954)	Ono (Present paper)
Stiphropodinae	Stiphropodinae	Stiphropodinae	Stiphropodinae
			Bominae
	Misumeninae	Misumeninae	
Misumeninae			Thomisinae
	Dietinae	Dietinae	Dietinae
Strophiinae	Strophiinae	Strophiinae	Strophiinae
Aphantochilinae	Aphantochilidae	Aphantochilidae	Aphantochilinae
Stephanopsinae	Stephanopsinae	Stephanopinae	Stephanopinae
Philodrominae			
	Philodrominae	Philodrominae	Philodromidae
Pselloninae			

The Stephanopinae is the only subfamily having strong teeth on the margins of cheliceral fang furrow and is considered to be most closely related to the prototype of the Thomisidae. It contains 36 genera (see p. 27) of which 13 are monotypic, and about 270 species widely distributed in the tropics (Bonnet, 1939-'61; Roewer, 1954; Brignoli, 1983; Zoological Record up to 1984). However, most of them have been described from South America and Southeast Asia, and the subfamily has only a small share in Africa. Two

genera and four species are known from Japan. Of these, Cupa zhengi (p. 34) possesses a peculiar male palp unusual for the Thomisidae. The presence of a conductor on the bulb seems to be a plesiomorphic character of the family.

The Aphantochilinae (originally spelled as Aphantochiloidae) was established by Thorell (1873) as an independent family. Since these spiders are extraordinary in appearance, Thorell's arrangement was supported by some authors (Petrunkevitch, 1928; Roewer, 1954, etc.). On the other hand, Simon (1895a) regarded it as a subfamily of the Thomisidae. The prosomata of these spiders are furnished with several pointed apophyses, and the leg IV is as long as or longer than the anterior legs. The proportion of the legs I to IV is very small and unusual for a "thomisid" spider. However, these characteristics should have been derived from the result of adaptation mimicing ants, and can be regarded as the secondary acquisition. For example, Aphantochilus rogersi O. Pickard-Cambridge, 1870, the type species of the type genus of the subfamily, known from Brasil, accurately mimics some species of black ants, Zacryptocerus pusillus and Z. depressus (Cephalotini). This aphantochiline spiders are found in the vicinities of its models' nests and prey on the ants (Oliveira & Sazima, 1984).

Other than those mimicking characteristics, the spiders possess typical "thomisid" eyes (Homann, 1975), pointed maxilla and long labium (specialized mouth parts), claw tufts on the tarsi, and the male palp typical of the Thomisidae. Having regarded these features as essential ones, I concluded that aphantochilines constitute a subfamily related to the Strophiinae. The Aphantochilinae consists of eight species of three genera, Aphantochilus O. Pickard-Cambridge, 1870, Bucranium O. Pickard-Cambridge, 1881, and Majellula Strand, 1932, all distributed in Central and South

America. The genus Cryptoceroides Toledo Piza, 1937, was synonymized with Aphantochilus by Gerschman and Schiapelli (1964).

The Strophiinae Simon, 1895, is a small subfamily composed of 9 genera and 30 species described from the tropics of the world, mainly from South America. The genera included are: Acracanthostoma Mello-Leitão, 1917 (2 spp.; S. America), Ceraarachne Keyserling, 1880 (3 spp.; S. America), Hexommulocymus Caporiacco, 1955 (monotypic; S. America), Parastrophius Simon, 1903 (2 spp.; Africa and India), Simorcus Simon, 1895 (4 spp.; previously known from Africa; I have seen specimens of an undescribed species from China), Strigoplus Simon, 1885 (2 spp.; S. Asia), Strophius Keyserling, 1880 (11 spp.; S. America; type genus of the subfamily), Synstrophius Mello-Leitão, 1925 (2 spp.; S. America), and Ulocymus Simon, 1886 (3 spp.; S. America).

The subfamily is characterized by the following features: Chelicera without teeth, labium very long, more than twice as long as wide, surpassing the middle line of maxillae which are also long and moderately pointed, both maxilla and labium often covered with strong hairs; prosoma with thoracic setae; lateral eyes much more developed than the medians; legs long and thin, with spines, claw tufts of tarsi not developed. Judging from these external features and the genitalic structure of some strophiine species which I examined, it can be surmised that the subfamily lies on a phylogenetic line branching off from the main stem. Though the Strophiinae has not been known from Japan, it is possible that certain species may be found in the southwestern part, namely on the Ryukyu Islands.

The Dictinae Simon, 1895, is the subfamily restricted in the Old World tropics. It comprises of 32 genera (see p.50), of which 15 are monotypic. There are about 80 described species, all of which possess

developed claw tufts with tenent hairs on the tarsi of their legs. This may agree with running and tightly holding on the smooth foliage of trees. The prosomal surface is heterogeneous. For example, Oxytate and Loxobates lack thoracic setae, whereas Domatha and Tagulinus have developed setae; the prosomata of Apyre and Sylligma are somewhat transformed and have long setae only on the marginal parts; Emplesiogonus possesses extremely specialized prosoma without setae. Taking up the shape of prosoma and the arrangement of eyes, Simon divided the subfamily into seven genus-groups. Excepting the presence of true claw tufts, the Dietinae is not so different from the Thomisinae.

The Thomisinae Sundevall, 1833, is the largest subfamily in the Thomisidae, including more than 1,500 species of 71 genera of which 28 are monotypic (for the diagnosis of the subfamily, see p.80). Simon (1895a, 1903a) divided his Misumeninae (= Thomisinae) into 18 genus-groups. Of these, the Taguleae, Apyreae, Alcimochtheae, Dieteae, Amyciaeeae and Mysterieae were put together into the subfamily Dietinae and the Bomeae was regarded as an independent subfamily (Ono, 1984). At present, the remaining groups are placed in the Thomisinae. In the revision of the Japanese thomisid spiders, I have attempted to reclassify the subfamily by using tribes, though a complete system of thomisine tribes has never been published.

Having examined not only actual specimens but original and revisional descriptions and illustrations, I made a provisional system of the thomisine genera as given below. In order to present all the current generic names of the subfamily, it includes a few genus-groups automatically raised to the tribal level because of the lack of material to solve their systematic

position, and some genera which were poorly recognized due to insufficient or problematical original accounts.

Tmarini Simon, 1895: Acentroscelus Simon, 1886 (10 spp.; S. America), Gnoerichia Dahl, 1907 (monotypic; C. Africa), Haplotmarus Simon, 1908 (monotypic; SE. Asia), Latifrons Kulczyński, 1911 (monotypic; New Guinea), Martus Mello-Leitão, 1943 (monotypic; S. America), Monaeses Thorell, 1869 (22 spp.; S. Europe, Africa, S. Asia), Pherecydes O. Pickard-Cambridge, 1883 (8 spp.; Africa), Philodamia Thorell, 1894 (3 spp.; SE. Asia), Rhynchognatha Thorell, 1887 (2 spp.; S. Asia), Titidiops Mello-Leitão, 1929 (monotypic; S. America), Titidius Simon, 1895 (19 spp.; S. America), Tmarus Simon, 1875 (197 spp.; cosmopolitan).

Coriarachnini Simon, 1895: Bassaniana Strand, 1928 (4 spp.; NE. Asia, N. America), Bassaniodes Pocock, 1903 (monotypic; Socotra Island), Coriarachne Thorell, 1869 (6 spp.; Eurasia, N. America), Narcaeus Thorell, 1890 (monotypic: Java), Ocyllus Thorell, 1887 (2 spp.; Burma), Oxyptila Simon, 1864 (106 spp.; Holarctic), Xysticus C.L. Koch, 1835 (349 spp.; Holarctic).

Talaini Simon, 1895: Dimizonops Pocock, 1903 (monotypic; Socotra Island), Heriaesynaema Caporiacco, 1939 (monotypic; C. Africa), Lysiteles Simon, 1895 (17 spp.; E. Asia), Phireza Simon, 1886 (monotypic; S. America), Pyresthesis Butler, 1879 (3 spp.; Africa, Madagascar), Soelteria Dahl, 1907 (monotypic; Madagascar), Synaema Simon, 1864 (134 spp.; Eurasia, Africa, S. America), Takachihoa Ono, 1985 (2 spp.; E. Asia), Talaus Simon, 1886 (7 spp.; Africa, S. Asia).

Misumenini Simon, 1895: Cyriogonus Simon, 1886 (4 spp.; Madagascar), Demogenes Simon, 1895 (monotypic; New Guinea), Diaea Thorell, 1869 (86 spp.;

cosmopolitan), Firmicus Simon, 1895 (18 spp.; S. Europe, Africa, E. Asia), Herbessus Simon, 1903 (monotypic; Madagascar), Heriaeus Simon, 1875 (17 spp.; Africa, Eurasia), Loxoporetes Kulczyński, 1911 (monotypic; New Guinea), Massuria Thorell, 1887 (2 spp.; SE. Asia), Mecaphesa Simon, 1900 (3 spp.; Hawaiian Islands), Misumena Laterille, 1804 (59 spp.; Africa, Eurasia, N. & S. America), Misumenoides F.O. Pickard-Cambridge, 1900 (42 spp.; N. & S. America), Misumenops F.O. Pickard-Cambridge, 1900 (96 spp.; Eurasia, N. & S. America), Parasynaema F.O. Pickard-Cambridge, 1900 (3 spp.; S. America), Physoplatys Simon, 1895 (monotypic; S. America), Pistius Simon, 1875 (3 spp.; Eurasia), Platypyresthesis Simon, 1903 (monotypic; C. Africa), Saccodomus Rainbow, 1900 (monotypic; Australia), Synaemops Mello-Leitão, 1929 (4 spp.; S. America), Tharpyna L. Koch, 1874 (12 spp.; S. Asia, Australia), Wechselia Dahl, 1907 (monotypic; S. America), Whittickius Mello-Leitão, 1940 (monotypic; S. America).

Thomisini Sundevall, 1833: Bonapruncinia Benoit, 1977 (monotypic; Saint Helena Islands), Odontoruncinia Caporiacco, 1954 (monotypic; S. America), Plancinus Simon, 1886 (4 spp.; SE. Asia, S. America), Runcinia Simon, 1875 (34 spp.; Africa, S. Europe, S. Asia, Australia, S. America), Runcinioides Mello-Leitão, 1929 (5 spp.; S. America), Thomisus Walckenaer, 1805 (141 spp.; cosmopolitan), Zygometis Simon, 1901 (monotypic; SE. Asia).

Pagidini Simon, 1895: Pactates Simon, 1895 (3 spp.; Africa), Pagida Simon, 1895 (2 spp.; SE. Asia).

Porrhopini Simon, 1886: Porropis L. Koch, 1876 (6 spp.; Africa, Australia).

Cymbachini Simon, 1895: Cymbacha L. Koch, 1874 (8 spp.; SE. Asia, Australia), Cymbachina Bryant, 1933 (monotypic; New Zealand).

Camaricini Simon, 1895: Camaricus Thorell, 1887 (8 spp.; Africa, SE. Asia, New Caledonian Islands), Cynathea Simon, 1895 (5 spp.; Africa, Madagascar).

Platythomisini Simon, 1895: Platythomisus Doleschall, 1859 (13 spp.; Africa, SE. Asia), Poecilothomisus Simon, 1895 (monotypic; Australia).

Uraarachnini Simon, 1895: Uraarachne Keyserling, 1880 (monotypic; S. America).

Platyarachnini Simon, 1895: Deltoclita Simon, 1877 (3 spp.; S. America), Philogaeus Simon, 1895 (2 spp.; S. America), Platyarachne Keyserling, 1880 (4 spp.; S. America).

Smodicini trib. nov.: Smodicinus Simon, 1895, type genus (2 spp.; Africa), Parasmodix Jézéquel, 1966 (monotypic; Africa). This tribe is closely related to the Tmarini, but is distinguished from the latter by its prosoma furnished with many strongly developed, conical apophyses.

The tribes from the Pagidini to the Smodicini seem to have been aberrantly evolved and specialized from the main stem of the Thomisinae.

The Bominae was originally established by Simon (1886b) as a section within the family Thomisidae. Later, Simon (1895a) treated it as a genus-group of the subfamily Misumeninae (= Thomisinae). Having split the family Thomisidae, Dahl (1907, 1913) raised Simon's Bomeae to the fimilial rank and combined it with the stiphropine spiders. His splitting classification has never been accepted by other araneologists, and the synonymy between the Bominae and Stiphropinae is not correct. The latter should be regarded as an independent subfamily because of its unique body and the highly evolved legs with specialized hairs (Ono, 1980b, figs. 12-21). After a revisional study of

the Japanese genus Boliscus and its relatives, I have come to the conclusion that the subfamilial status should be recognized on bomid spiders (Ono, 1984). This has been supported by Dippenaar-Schoeman (1986a, b) in the study of African thomisids.

The Bominae comprises small and granulous spiders having convex prosoma, small eyes and short and thick legs with relatively long patellae. Several species of nine genera (see p.353) have been known. They are of the Paleotropical origin. This subfamily should have been derived from a common ancestor with the Thomisinae and Stiphropodinae by sclerotizing the body, transforming the legs and reducing the spines.

The stiphropodine spiders are unusual and most specialized thomisids with strongly sclerotized body, thickened legs and strongly branched hairs (Ono, 1980b, figs. 20-21). Since the first species, Stiphropus lugubris Gerstaecker, 1873 (type species of the genus), was found in East Africa, 20 species have been known only from the Old World. The subfamily includes three known genera: Stiphropus Gerstaecker, 1873 (18 spp. from Africa, 6 spp. from Asia), Stiphropella Lawrence, 1952 (monotypic; Africa) and Heterogriffus Platnick, 1976 (monotypic; Africa). Specimens of these spiders are obtained from under tree barks and under stones lying on the ground. Judging from these habitat, the flattened and strongly sclerotized body of the spiders seems to be an adaptation to the living in narrow spaces, and the thickened legs without spines but densely covered with short and branched hairs may be useful not for catching prey but for exercising the power in burrowing.

The distributional range of the subfamily and known localities of the Asian species of Stiphropus were shown in Ono (1981b), figs. 1-2.

As mentioned at the beginning of this chapter, only little paleontological evidence has been known in crab-spiders, excepting some useful amber fossil material. Therefore, the phylogenetic diagnosis in this paper is mainly based upon morphological, ecological and zoogeographical observations of recent species. Though investigations on the thomisids from tropical regions have not been sufficiently made, I propose herewith an analysis of the system of the family Thomisidae on the basis of the knowledge which I was able to obtain.

If a spider species has had its history in a constant environment without any competition, it may not undergo major transformation of the body and organ. Actually, however, all physical and biotic circumstances have been changing, and there are not only interspecific competitions but also ecological connection with various organisms. If it did not have latent ability of actual adaptation to the changing environment, it could have become extinct.

The diversification of Thomisid spiders into about 2,000 recent species is without doubt the result of evolutionary history of the family. In the modern araneology, the genitalic structure has been regarded as the most important and useful character to indicate phylogenetic relationships. Though it is useful for analysing either the interfamilial or interspecific relationships (Dondale & Redner, 1978; Turnbull et al., 1965; Schick, 1965; Ono, 1978c, etc.), the taxonomic importance of male palp and female genitalia has been too much stressed in determining the relationships of subfamilies or genera. Through a systematic study of Xysticus, the largest genus of the family, and a series of revisional works on a number of small and monotypic

thomisid genera, I have recognized an interesting fact in the differentiation of species, that is, interspecific variation of external features does not always correlate with that of genitalic ones.

The genus Xysticus is a very large genus composed of heterogeneous species occurring mainly in the Northern Hemisphere. The spiders dwell on forest floors and on low vegetations, and are sometimes abundant in such favourable places as unspilt meadows and forest floors. The body is crab-like, somewhat flattened, hairly, and the claw tufts of legs are not developed. Though all the known species of the genus have similar facies probably due to similar habitats and the same prey catching behaviour, their genitalic structure is variable and changes from the simplest type to very complicated form with some tegular apophyses. The simplest form resembles at the same time those of such close relatives as Coriarachne, Bassaniana and Oxyptila, and those of some phylogenetically distant genera. The groups having simple genitalic structure are not numerous in Xysticus, as they are either distributed in extremely cold regions or restricted in alpine areas (Ono, 1978c).

On the other hand, there are many small and monotypic genera in the family Thomisidae. Their diversification may have been caused by historical changing of the environment and the evolutionary potential of characters connected with important behaviour, mainly the prey capture. However, the genitalic structure is less variable than the external features in these genera; the palpal tibia bears a ventral and a retrolateral apophyses, the bulb is simple with a filiform or spiniform embolus; female genitalia have a pair of short or long intromittent canal, the spermatheca is globular, ovoid

or similarly shaped. The primitive genitalic structure was only one more step advanced than that of the most primitive thomisid, Cupa, in the recent genera of the family, and seems to have been constantly preserved for a long time. This basic structure in both the male and female sexual organs can be seen in many species of all the subfamilies of the Thomisidae.

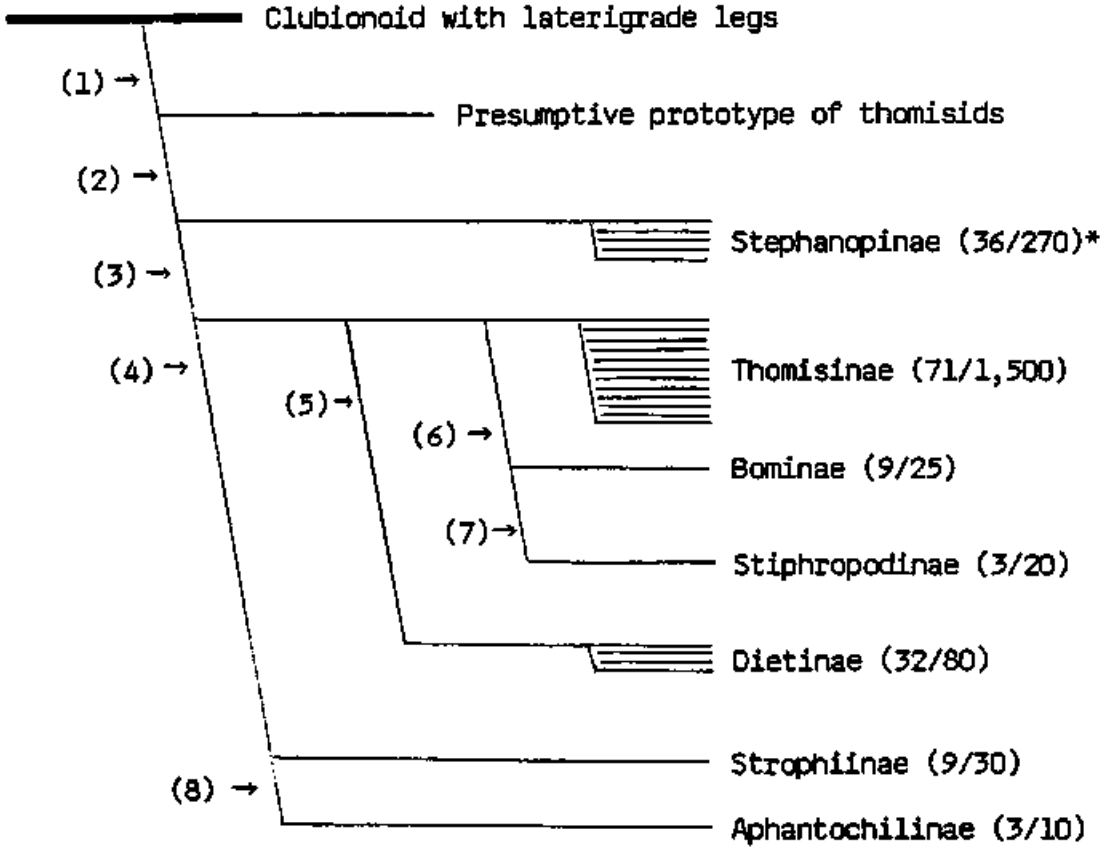
This gives an assumption that competition between related species was not heavy in the evolutionary history of the Thomisidae, and if the competition existed, it did not last long. Between genitalic and external features, there seems to have been a difference in the process of formation. The former features have been completed through interspecific competition only, which could have occurred in various environment. The genital organ has a potential to vary in the competitive condition, but not under other circumstances. The most prominent example of this condition in recent thomisid spiders is the genus Xysticus. The remarkable diversification of such organs as the male palp and female genitalia in this genus can be ascribed to the result of competitive evolution. Contrary to this, the latter features may have become completed under the influence of physical and biological environment in which the spiders under consideration have continuously lived.

The environmental pressure is continuous but affects the spiders in a limited way. Thus, certain special features, most of which are related to various modes of life, develop to such an extent as can be regarded as the characteristics of generic importance. On the other hand, genitalic differentiation seems to have taken place at an indefinite period of their evolutionary history, irrespective of the changes of environmental factors.

In many cases, genitalic features may indicate the phylogeny of the spiders concerned, but in the Thomisidae, the basic structure of sexual organs is rather homogeneous and the diversification seems to have occurred in portions of secondary importance as the result of rapid speciation. Therefore, it does not seem appropriate to analyse their phylogeny simply on the basis of genitalic structure. Though about 160 genera have hitherto been known in the family Thomisidae, most of them are small specialized groups, which seem to have become differentiated as the result of behavioural adaptation.

As the conclusion of this chapter, a diagram showing possible phylogenetic relationships among the recent thomisid subfamilies will be given below.

*(Number of genera/approximate number of species now known.)



(1) Ambush prey capture, development of legs I and II which become much stronger than III and IV.

(2) Diurnal hunting, development of ALE.

(3) Degeneration of cheliceral teeth, development of venom glands.

(4) Elongation of maxillae and labium.

(5) Development of claw tufts which facilitate walking on smooth surface of leaves.

(6) Total reduction of spines of legs, which become thickened, with patella as long as tibia.

(7) Heavily sclerotization of clavate legs densely covered with branched hairs.

(8) Ant-mimicing specialization of body.

Zoogeographical Notes

As was already enumerated in a foregoing chapter, 4 subfamilies, 22 genera and 53 species of thomisid spiders have been known in Japan. Comparing these numbers with those of other countries, for example, the British Islands, where only 1 subfamily, 6 genera and 25 species are known (Roberts, 1985), I can safely conclude that the Japanese thomisid fauna is much richer in variety than the others. More than 120 species of the family Thomisidae occur in the North American Continent, but they belong to only 9 genera of a single subfamily (Dondale & Redner, 1978). The richness of the Japanese fauna has resulted to a considerable extent from the geographical situation of the

island chain. It lies along the eastern edge of the Eurasian Continent, stretching from the subtropical zone to the cold-temperate one. Besides, the land is much undulated and is covered with various vegetation partially due to high precipitation. The spider fauna of Japan has become very rich and complicated not only because of these existing conditions but also because of the intricate paleogeography of the islands. Southern Kyushu and the Ryukyu Archipelago belong to the most significant area in arachnology, since they are the northern part of the distributional range of the recent Mesothelae.

The Stephanopinae, the most primitive subfamily in the Thomisidae, has only two genera and four Japanese species. However, one of them, Cupa zhengi, has been regarded as the most remarkable thomisid in Japan. It shows the unique morphological characteristics (p.34), which suggest the origin of the Thomisidae. Unfortunately, the type species of the same genus, Cupa typica, has never been rediscovered since it was originally described by Strand (1906) from Kyushu, but the distributional range of the genus, namely Kyushu, the Ryukyu Archipelago and the eastern coast if Southeast China, nearly overlaps that of the genus Heptathela, the Mesothelae spiders.

Phrynarachne, the birds dung spider with considerable sexual dimorphism in the size, is the most specialized genus in the subfamily Stephanopinae. The spiders of this genus mimic birds excrement laid on leaves in their colour, patterns and external features as well as in the posture of repose. Of the 28 described species distributed in the tropical regions of Africa, Asia and Australia, two occur in Japan. While Phrynarachne katoi is widely distributed, though very rare, in South Japan and Korea, P. ceylonica originally described from Ceylon has been known in Japan only from the Yaeyama

Islands of the Ryukyus.

The subfamily Dietinae, which centres its distribution in the Old World tropics, includes only four species of three genera in the Japanese fauna. Loxobates and Alcimochthes are small and little-known genera, each of which contains a single species known from Japan. These spiders were found on the southern islands of the Ryukyus, that is, Iriomotejima Island (Alcimochthes limbatus) and the Daitojima Islands (Loxobates daitoensis). Of the green-coloured thomisids of the genus Oxytate, two species have been described from Japan; O. striatipes is widely distributed in Japan north of Yakushima Island, while O. hoshizuna is known only from the Ryukyus. In a previous paper of mine (Ono, 1978a), I gave the opinion that O. striatipes became differentiated from O. hoshizuna and extended its distribution northwards into Japan. At present, however, both the species are known from China, and therefore, they can be safely regarded as two of many species that originated in Southeast Asia, where the genus Oxytate demonstrates considerable diversification in genitalic features. Incidentally, O. striatipes is one of the dominant thomisids in Japan.

It is remarkable that a member of the Bominae occurs in Japan. The subfamily consists of some specialized thomisids of Paleotropical origin. The occurrence of Boliscus tuberculatus was recently reported from Japan (Ono, 1984). As shown in Ono, 1984, fig. 9, the collecting records of the species is widely scattered, though it is not so common. That the distributional range stretches from Taiwan through the Ryukyus to the Pacific side of the mainland is typical to species of Southeast Asian origin. Its preying behaviour is still unknown but may be interesting in connection with the

morphological characters of the spider, especially the small and heavily sclerotized body with many tubercles and the thickened legs without spines which usually play an important role for catching insects.

The largest subfamily Thomisinae is also one of the most dominant groups in Japan, with 17 genera and 44 species. Of these, the genus Xysticus including 14 species shows prosperity in this country. Most popular species of the Japanese Thomisinae are as follows: Tmarus piger, T. rimosus, Bassaniana decorata, Xysticus croceus, X. ephippiatus, X. saganus, X. kurilensis, Oxyptila nipponica, Lysiteles coronatus, Synaema globosum, Misumenops tricuspidatus, M. japonicus, and Thomisus labefactus.

The thomisid fauna of Japan will be classified into six elements by the range of distribution at the generic level, as shown in the following table.

Element	Number of genus	
Holarctic	3	(Misumena, Oxyptila, Xysticus)
North Pacific	1	(Bassaniana)
Central Eurasian	2	(Pistius, Coriarachne)
World tropical	3	(Tmarus, Diaea, Misumenops)
Southeast Asian	6	(Cupa, Loxobates, Alcimochthes, Lysiteles, Takachihoa, Boliscus)
Old World tropical	7	(Phrynarachne, Oxytate, Monaeses, Synaema, Thomisus, Runcinia, Heriaeus)

It appears evident that the genera originating in the Old World

tropics including Southeast Asia are predominant in Japan. This is true to the species level for the Ryukyuan fauna, but is not so for the mainland forms. Detailed analysis at the species level clearly shows that as a whole, the northern elements are superior in the number of both species and individuals. It seems natural that the mother stocks in the Eurasian Continent exert definite influence on the Japanese fauna, as can be understood from the fact that most part of Japan belongs to the Palearctic Region, which borders on the Oriental Region at the south of Yakushima Island and north of Amamioshima Island (through the Tokara Islands). Anyway, the thomisid fauna of Japan is much more complicated than it was previously considered and consists of some elements of different derivation.

Element	Number of species	
Arctic	3	(Xysticus diasetsuzanus, X. jacuticus, X. rostratus)
Holarctic	3	(Misumena vatia, Diaea gyoja, Oxyptila sincera)
North Pacific	2	(Bassaniana decorata, Xysticus saganus)
Eurasian	33	
North Eurasian	6	(Tmarus piger, T. hanrasanensis, Coriarachne fulvipes, Oxyptila nipponica, Xysticus trizonatus, X. audax)
Central Eurasian	8	(Tmarus rimosus, T. yaginumai, T. makiharai, Synaema globosum, Xysticus bifidus, Misumenops tricuspidatus, Pistius undulatus, Heriaeus mellottei)

Chinese	19	(Cupa typica, C. zhengi, Phrynarachne katoi, Oxyptila matsumotoi, Xysticus croceus, X. ephippiatus, X. atrimaculatus, X. insulicola, X. dichotomus, X. transversomaculatus, X. kurilensis, Synaema chikunii, Lysiteles coronatus, L. maius, L. okumae, L. miniatus, Misumenops japonicus, Thomisus labefactus, T. kitamurai)
Southeast Asian	12	(Phrynarachne ceylonica, Oxytate striatipes, O. hoshizuna, Loxobates daitoensis, Alcimochthes limbatus, Monaeses aciculus, Takachihoa truciformis, Misumenops kumadai, Thomisus okinawensis, Runcinia albostriata, R. acuminata, Boliscus tuberculatus)

Probable origins of the respective Japanese species of the Thomisidae are as shown in the table on the previous page. It shows a close relationship in the thomisid fauna between Japan and the Eurasian Continent, especially China. This accords well with the results obtained in many other Japanese animals.

Generally speaking, the distribution of the spiders with high ability of migration is regulated by the climatic condition, especially temperature. The spider fauna of Japan has therefore been discussed in regard with isothermal lines (Yaginuma, 1969; Matsumoto et al., 1976, etc.). However, the

distributional ranges of various species actually show delicate differences caused from their microhabitats. The environment itself is also changing by degrees. Therefore the actual distribution of a spider cannot be exactly explained by isotherms. In the present paper, I have attempted to analyse the thomisid fauna of Japan on the basis of various distributional patterns shown by different species. Then, the Japanese Islands can be discriminated into seven regions (Fig. 215) as explained in the following lines.

MH: Mountain region of Hokkaido under the extremely cold climate. It is restricted to the Daisetsu and Hidaka Mountains.

LH: Lower altitudinal region of Hokkaido, bordered on Honshu by Blakiston's line. (This has no great difference from MM in the thomisid fauna.)

AM: Alpine region of the main island of Honshu higher than approximately 1,700m in altitude.

MM: Mountain region of the main islands of Honshu, Shikoku, Kyushu including Yakushima Island.

LM: Lowlands of Honshu, Shikoku and Kyushu including accessory islands.

NR: Northern Ryukyu Islands including the Amami and Okinawa Groups, bordering LM on the north and SR on the south.

SR: Southern Ryukyu Islands including the Yaeyama Islands and Daitô Groups.

As shown in the table below, the Japanese species of the Thomisidae will be classified into 11 groups based on the distributional patterns. In order to show the relation between the patterns and the origin of each

species, the presumptive elements will be given with the following abbreviations (see p.393 table): (at), Arctic; (ha), Holarctic; (np), North Pacific; (ne), North Eurasian; (ce), Central Eurasian; (ch), Chinese; (sa), Southeast Asian.

Distributional range	Species
MH type	Xysticus daisetsuzanus (ac), X. jacuticus (ac), X. rostratus (ac)
LH-AM type	Misumena vatia (ha), Diaea gyoja (ha), Oxyptila sincera (ha), Xysticus audax (ne), Lysiteles maius (ch)
LH-MM type	Pistius undulatus (ce), Lysiteles coronatus (ch), Synaema chikunii (ch)
LH-MM-LM type	Bassaniana decorata (np), Xysticus saganus (np), X. croceus (ch), X. insulicola (ch), X. kurilensis (ch), X. bifidus (ce), Oxyptila nipponica (ne), Synaema globosum (ce), Tmarus piger (ne), Oxytate striatipes (sa)
LH-SR type	Misumenops tricuspidatus (ce), M. japonicus (ch), Xysticus ephippiatus (ch)
MM-LM type	Cupa typica (ch), Tmarus hanrasanensis (ne), T. yaginumai (ce), Xysticus atrimaculatus (ch), X. dichotomus (ch), X. trizonatus (ne), X. transversomaculatus (ch), Coriarachne fulvipes (ne), Oxyptila matsumotoi (ch), Lysiteles okumae (ch), Thomisus labefactus (ch), Heriaeus mellottei (ce)
MM-LM-NR type	Phrynarachne katoi (ch), Misumenops kumadai (sa)
NR type	Cupa zhengi (ch), Thomisus kitamurai (ch), Tmarus makiharai (ce)

LM-NR-SR type	Takachihoa truciformis (sa), Runcinia albostriata (sa), Boliscus tuberculatus (sa)
NR-SR type	Monaesis aciculus (sa), Lysiteles miniatus (ch), Runcinia acuminata (sa), Oxytate hoshizuna (sa)
SR type	Phrynarachne ceylonica (sa), Loxobates daitoensis (sa), Alcimochthes limbatus (sa), Thomisus okinawensis (sa)

As is readily understood from this table, the thomisid fauna of Japan is basically Eurasian, with some heterogeneous elements derived from both the north and south. There are some species endemic to Japan, but most of them have their close relatives in the Eurasian Continent. For instance, the group of Tmarus stellio has two endemics in Japan, but the group itself is widely distributed in Central Eurasia and yields endemics only on the eastern edge of the continent.

The northern elements can be regarded as the relicts of the Glacial Age. Xysticus daisetsuzanus is an example of this. It is found only in the alpine zone of Mt. Daisetsu-zan in central Hokkaido, and is very closely related to circumpolar species of the genus. Less restricted but probably similar to X. daisetsuzanus in their origin are Bassaniana decorata and Xysticus saganus, which are distributed in Japan, Korea and China but have their close relatives only in North America. This type of distribution is known in a few arachnids, for example Antrodiaetus (Coyle, 1971), some opilions (Suzuki, 1972), and also in plants (Li, 1952).

As can be expected, the southern elements are predominant in the

Ryukyu Islands. They gradually extended their distribution northwards and in some cases, even reached Hokkaido. This may mean that the Japanese climate has become warmer after the Last Glacial Age and has permitted the northward dispersal of thomisid spiders of the southern origin.

References

Annen, K., 1940. A list of spiders of Toyama Prefecture (preliminary report). Acta arachnol., 5: 86-91. (In Japanese.)

----- 1941. Collecting records of three spider species. Ibid., 6: 108-112. (In Japanese.)

Arita, T., 1970. Spiders from Mt. Daisen, Tottori Prefecture. Kyodo to Kagaku, Tottori, 15: 25-29. (In Japanese.)

Audouin, J.V., 1826. Arachnides. Explication Sommaire des Planches d'Arachnides de l'Egypte et de la Syrie. In Savigny, M.J.C.L. de, G. Saint-Hilaire & J.V. Audouin, Description de l'Egypte, Histoire Naturelle, 1(4), pp.99-186, pls. I-IX. Paris.

Ausserer, A., 1867. Die Arachniden Tirols nach ihrer horizontalen und verticalen Verbreitung, I. Verh. zool.-bot. Ges. Wien, 17: 137-170. (Non vidi.)

Banks, N., 1893. Notes on spiders. J. N.Y. ent. Soc., 1: 123-134.

----- 1896. New North American spiders and mites. Trans. Amer. ent. Soc., 23: 57-77.

Basu, E.D., 1964. Diagnosis of two new species of Pistius (Thomisidae: Araneae: Arachnida). J. Bengal nat. Hist. Soc., 32: 104-109.

----- 1965. Four new species of the spider genus Pistius Simon (Arachnida: Araneae: Thomisidae) from India. Proc. zool. Soc. Calcutta, 18: 71-77.

Baum, S., 1984. Zum "Cribellaten-Problem": die Genitalstrukturen der

Oecobiinae und Urocteinae (Arach.: Aran.: Oecobiidae). Abh. Verh. naturw. Ver. Hamburg, (N.F.), 16: 101-153.

Becker, L., 1878. Catalogue des Arachnides de Belgique. Première partie. Ann. Soc. ent. Belg., 21: 45-61. (Non vidi.)

----- 1882. Les Arachnides de Belgique. 1re partie. Ann. Mus. roy. Hist. nat. Belg., 10: 1-246.

Benoit, P.L.G., 1977. Fam. Thomisidae. In La faune terrestre de l'ile de Saint Helene IV. Ann. Mus. roy. Afr. Centr., Zool., (8), 220: 82-87.

Blackwall, J., 1834. Spiders. In Researches in Zoology, pp.229-270, 289, 298, 302-303, 356. London. (Non vidi.)

----- 1836. Characters of some undescribed species of Araneidae. Phil. Mag. J. Sci., London, Edinburgh, Dublin, (3), 8: 481-491. (Non vidi.)

----- 1854. Supplement to a catalogue of British spiders including remarks on their structure, function, oeconomy and systematic arrangement (continued). Ann. Mag. nat. Hist., (2), 14: 28-33. (Non vidi.)

----- 1861-'64. A History of the Spiders of Great Britain and Ireland, 1 (pp. 1-174, pls. I-XII) (1861), 2 (pp.175-384, pls. XIII-XXIX) (1864). London. (Non Vidi.)

----- 1870. A list of spiders captured by Professor E. Perceval Wright, M.D., in the Province of Lucca, in Tuscany, in the summer of 1863, with caracters of such species as appear to be new or little known to arachnologists. J. Linn. Soc. London, 10: 405-434.

Bösenberg, W., 1899. Die Spinnen der Rheinprovinz. Verh. naturh. Ver. preuss. Rheinl. Westfalens, 56: 69-131.

----- 1901. Die Spinnen Deutschlands, I. Zoologica, Stuttgart, 14: 1-96.

----- & E. Strand. Japanische Spinnen. Abh. senckenb. naturf. Ges., 30: 93-422.

Bonnet, P., 1939-'61. Bibliographia Araneorum, Analyse Méthodique de Toute la Littérature Aranéologique jusqu'en 1939. 1 (pp.I-XVII, 1-832, pls. I-XXVIII) (1939), 2(1) (pp.1-918) (1955), 2(2) (pp.919-1926) (1956), 2(3) (pp.1927-3026) (1957), 2(4) (pp.3027-4230) (1958), 2(5) (pp.4231-5058) (1959), 3 (pp.1-591) (1961). 1, private publication, Toulouse. 2-3, Douladoure, Toulouse.

----- 1969. A plea against the re-establishment of incorrectly spelt names: on article 32a (ii) of the International Code of Zoological Nomenclature. Z. N. (S.) 1880. Bull. zool. Nom., 26: 160-163.

Bowling, T.A., & R.J. Sauer, 1975. A taxonomic revision of the crab spider genus Coriarachne (Araneida, Thomisidae) for North America north of Mexico. J. Arachnol., 2: 183-193.

Braun, R., 1965. Beitrag zu einer Revision der paläarktischen Arten der Philodromus aureolus- Gruppe (Arach., Araneae). I.

Morphologisch-systematischer Teil. Senckenbergiana biol., 46: 369-428.

----- & W. Rabeler, 1969. Zur Autokologie und Phänologie der Spinnenfauna des nordwestdeutschen Altmoränen-Gebiets. Abh. senckenb. naturf. Ges., 522: 1-89.

Brignoli, P.M., 1983. Catalogue of the Araneae Described between 1940 and 1981. 755 pp. University Press, Manchester.

Bristowe, W.S., 1926. The mating habits of Britisch thomisid and sparassid spiders. Ann. Mag. nat. Hist., (9), 18: 114-131.

----- 1931. The mating habits of spiders: a second supplement, with the description of a new thomisid from Krakatau. Proc. zool. Soc. London, for 1931: 1401-1412.

----- 1939. The Comity of Spiders. Vol. 1. 228 pp., 19 pls. Ray Society, London.

----- 1971. The World of Spiders, (rev. ed.). xvi + 304 pp. Collins, London.

Bryant, E.B., 1930. A revision of the American species of the genus Ozyptila. Psyche, Cambridge, 37: 375-391.

----- 1933. Notes on types of Urquhart's spiders. Rec. Canterbury Mus., 4: 1-27.

Buchar, J., & K. Thaler, 1984. Eine zweite Diaea-Art in Mitteleuropa: Diaea pictilis (Araneida, Thomisidae). Věst. čs. Společ. zool., 48: 1-8.

Buckle, D.J., & J.H. Redner, 1964. The Nearctic species of the Xysticus labradorensis subgroup (Araneae: Thomisidae). Canad. Ent., 96: 1138-1142.

Butler, A.G., 1879. On Arachnida from the Mascarene Islands and Madagascar. Proc. zool. Soc. London, for 1879: 729-734.

Canestrini, G., & P. Pavesi, 1868. Aracnidi italiani. Atti. Soc. ital. Sci. nat., 11: 738-872. (Non vidi.)

----- & ----- 1870. Catalogo istematico degli Arneidi italiani. Arch. zool. anat. fisiol., (2), 2: 20-64. (Non vidi.)

Caporiacco, L. di, 1936. Saggio sulla fauna arachnologica del Casentino, Val d'Arno Superiore e Alta Val Tiberina. In Festschrift zum 60. Geburtstage von Professor Dr. Embrik Strand, 1, pp.326-369. Riga.

----- 1939. Arachnida. In Missione Biol. Paese dei Borana, 3(2), pp.303-385. Roma. (Non vidi.)

----- 1940a. Due ragni nuovi dello Scioa. Redia, Firenze, 27: 19-23.

----- 1940b. Alcuni Aracnidi di Somalia. Boll. Lab. zool. gen. agr. Fac. Agr. Port., 31: 295-305.

----- 1941. Arachnida. In Missione biologica Sagan-Omo, 12. Zool. Centr. stud. Afr. orient. Ital., 6, pp.1-179.

----- 1947. Arachnida Africae orientalis a dominibus Kittenberger, Kovaco et Bornemisza lecta, in Museo Nationali Hungarico servata. Ann. Mus. natn. Hung., 40: 97-257.

----- 1954. Araignées de la Guyane francaise du Muséum d'Histoire Naturelle de Paris. Comment. pontif. Acad. Sci., 16: 45-193. (Non vidi.)

----- 1955. Etudios nobre los Arachnidos de Venezuela. 2ª Parte. Araneae. Acta biol. venezuel., 1: 265-448.

Charitonow, D.E., 1923. K faounié paoukow Wostotschnogo skiona Ourala. Izw. biol. Inst. Perm, 2: 25-36.

----- 1926a. Materially k faounié paoukow Permskoy goubernii. Iejiegod. zool. Muz. Akad. Nauk SSSR, 26: 103-136.

----- 1926b. Materially k faounié paoukow Werchotourskogo Ourala. Izw. biol. Inst. Perm, 5: 49-60.

----- 1932. Katalog der russischen Spinnen. Iejiegod. zool. Muz. Akad. Nauk SSSR, 32: 1-206.

Chickerling, A.M., 1940. The Thomisidae (crab spiders) of Michigan. Pap. Mich. Acad. Sci., 25: 189-237.

----- 1950. The spider genus Tmarus (Thomisidae) in Panama. Bull. Mus. comp. Zool., 103: 213-255.

----- 1965. Five new species of the genus Tmarus (Araneae, Thomisidae) from the West Indies. Psyche, Cambridge, 72: 229-240.

Chikuni, Y., 1941. Spiders of the Japanese Alps. 163 pp. Shinano Kyôikukai, Minamiazumi-bukai, Matsumoto. (In Japanese.)

----- 1955. See Tikuni, Y., 1955.

Chrysanthus, F., 1964. Spiders from South New Guinea VI. Nova Guinea, Zool., Leiden, (28): 87-104.

Chu, Y.-I., & C. Okuma, 1970. Preliminary survey on the spider-fauna of the paddy fields in Taiwan. Mushi, Fukuoka, 44: 65-88.

Chyzer, C., & W. Kulczyński, 1891-1897. Araneae Hungariae. 1 (Salticoidae, Oxyopoidae, Lycosoidae, Heteropodoidae, Misumenoidae, Euetroidae, Tetragnathoidae, Uloboroidae, Pholcoidae, Scytodoidae, Urocteoidae, Eresoidae, Dictynoidae.) (pp.1-170, pls. I-VI) (1891), 2 (pars prior) (Theridioidae.) (pp.1-151, pls. I-V) (1894), 2 (pars posterior) (Zodarioidae, Agelenoidae, Drassoidae, Zoropseoidae, Dysderoidae, Filistatoidae, Calommatatoidae, Theraphosoidae.) (pp.147-366, pls. VI-X) (1897). Budapest.

Clerck, C., 1758 [1757]. Aranei Suecici, descriptionibus et figuris oeneis illustrati, ad genera subalterna redacti speciebus ultra LX determinati. 154 pp, 6 pls. Stockholm.

Collett, R., 1877. Oversigt af Norges Araneider. II. Laterigradae, Orbitelariae. Forh. Vid. Selsk. Christiania, Oslo, 1877: 1-27. (Non vidi.)

Comellini, A., 1955. Notes sur les Thomisidae d'Afrique. Rev. Zool. Bot. afr., Bruxelles, 51: 117-129.

----- 1957. Notes sur les Thomisidae d'Afrique. Ibid., 55: 1-32.

Comstock, J.H., 1913 & 1940. The Spider Book. 721 pp. Doubleday, Doran & Co., New York. (Non vidi.) (Reissued in 1940.)

----- 1948. The Spider Book, rev. ed. 729 pp. Cornell Univ. Press, Ithaca.

Coyle, F.A., 1971. Systematics and natural history of the mygalomorph spider genus Antrodiaetus and related genera (Araneae: Antrodiaetidae). Bull. Mus. comp. Zool., 141: 269-402.

Crome, W., 1962a. Studien an Krabbenspinnen (Araneae: Thomisidae). I. Thomisinae (Sundevall, 1833) Simon, 1875 statt Misumeninae Simon, 1895. Dtsch. ent. Z., N.F., 9: 261-263.

----- 1962b. Studien an Krabbenspinnen (Araneae: Thomisidae). 2. Die Stellung der Gattung Pherecydes O. Pickard-Cambridge, 1883, im System der Thomisidae. Mitt. zool. Mus. Berlin, 38: 153-162.

----- 1962c. Studien an Krabbenspinnen (Araneae: Thomisidae). 3. Über Monaeses Thorell, 1869, und Rhynchognatha Thorell, 1887. Ibid., 38: 163-169.

----- 1962d. Studien an Krabbenspinnen (Araneae: Thomisidae). 4. Bemerkungen zur praktischen Unterscheidung der beiden Genera Xysticus C.L. Koch, 1835, und Oxyptila Simon, 1864. Mitt. dtsch. ent. Ges., 21: 37-39.

Dahl, F., 1907. Synaema marlothi, eine neue Laterigraden-Art und ihre Stellung im Systhem. Mitt. zool. Mus. Berlin, 3: 369-395.

----- 1913. Vergleichende Physiologie und Morphologie der Spinnentiere unter besonderer Berucksichtigung der Lebensweise. Erster Teil. Die Beziehungen des Korperbaues und der Farben zur Umgebung. 113 pp. Gustav Fischer, Jena.

Dalmas, R. de, 1922. Catalogue des araignées récoltées par le Margius G. Doria dans l'île Giglio (Archipel toscan). Ann. Mus. civ. Stor. nat. Genova, 50: 79-96. (Non vidi.)

Denis, J., 1933. Chasses arachnologiques dans les Pyrénées-Orientales (région de Banyuls-sur-Mer et Vallespir). Bull. Soc. Hist. nat. Toulouse, 65: 529-591.

----- 1938. A contribution to the knowledge of the spider fauna of the Andorra Valleys. Proc. zool. Soc. London, (B), 107: 565-595.

Dippenaar-Schoeman, A.S., 1980a. The crab-spiders of southern Africa (Araneae: Thomisidae). 1. The genus Runcinia Simon, 1875. J. ent. Soc. S. Afr., 43: 303-326.

----- 1980b. The crab-spiders of southern Africa (Araneae: Thomisidae). 2. The genera Pherecydes Pickard-Cambridge, 1883, and Smodicinus Simon, 1895. Ibid., 43: 327-340.

----- 1983. The spider genera Misumena, Misumenops, Runcinia and Thomisus (Araneae: Thomisidae) of southern Africa. Ent. Mem. Dept. Agr. S. Afr., Pretoria, (55): 1-66.

----- 1984. The crab-spiders of southern Africa (Araneae: Thomisidae). 4. The genus Monaeses Thorell, 1869. Phytophylactica, Pretoria, 16: 101-116.

----- 1985. The crab-spiders of southern Africa (Araneae: Thomisidae). 5. The genus Tmarus Simon, 1875. Ibid., 17: 115-128.

----- 1986a. The crab-spiders of southern Africa (Araneae: Thomisidae). 6. The genus Avelis Simon, 1895. Ibid., 18: 131-132.

----- 1986b. The crab-spiders of southern Africa (Araneae: Thomisidae). 7. The genus Holopelus Simon, 1886. Ibid., 18: 187-190.

Dönitz, W., & E. Strand, 1906. Anhang. In Bösenberg W., & E. Strand, Japanische Spinnen. Abh. senckenb. naturf. Ges., 30: 374-399.

Doleschall, C.L., 1852. Systematisches Verzeichnis der im Kaiserthum Österreich vorkommenden Spinnen. Sitz.-ber. Akad. Wiss. Wien, 9: 622-651.

----- 1859. Tweede Bijdrage tol de Kennis des Arachniden van den Indischen Archipel. Acta Soc. sci. Ind.-Neerl., 5: 1-60.

Dondale, C.D., & J.H. Redner, 1975. The genus Ozyptila in North America (Arachnida: Thomisidae). J. Arachnol., 2: 129-181.

----- & ----- 1978. The Crab Spiders of Canada and Alaska, Araneae: Philodromidae and Thomisidae. The Insects and Arachnids of Canada. Part 5. 255 pp. Supply and Services Canada, Hull.

Dyal, S., 1935. Fauna of Lahore. 4. Spiders of Lahore. Bull. Dept. Zool. Panjab Univ., 1: 119-252.

Emerton, J.H., 1894. Canadian spiders. Trans. Conn. Acad. Arts Sci., 9: 400-429. (Non vidi.)

----- 1902. The Common Spiders of the United States. 225 pp. Ginn & Co., Boston.

----- 1919. New spiders from Canada and the ajoining States, No. 2. Can. Ent., 51: 105-108. (Non vidi.)

Fabricius, J.C., 1775. Systema entomologiae, sistens Insectorum classes, ordines, genera, species, adiectis, synonymis, locis descriptionibus observationibus. 832 pp. Flensburgi et Lipsiae. (Non vidi.)

----- 1777. Genera Insectorum eorumque characteres naturales, secundum numerum, figuram, situm et proportionem omnium partium oris; adjecta mantissa specierum nuper detectarum. 310 pp. Chilonii. (Non vidi.)

Fitzinger, L.J.F.J., 1843. Systema reptilium, 1st sec., Amblyglossae.

106 pp. Wien. (Non vidi.)

Foelix, R.F., 1979. Biologie der Spinnen. 258 pp. Thieme, Stuttgart.

----- 1982. Biology of Spiders. vi + 306 pp. Harvard Univ. Press, Cambridge.

Forbes, H.O., 1883. On the habits of Thomisus decipiens, a spider from Sumatra. Proc. zool. Soc. London, for 1883: 586-588.

Forster, R.R. & L.M., 1973. New Zealand Spiders, an Introduction. 254 pp. Collins, Auckland.

Fox, I., 1937. Notes on Chinese spiders of the families Salticidae and Thomisidae. J. Wash. Acad. Sci., 27: 12-22.

Franganillo-Balboa, P., 1913. Arácnidos de Asturiasy Galicia. Broteria, Lisboa, 11: 119-133. (Non vidi.)

----- 1917. Las Aranas. Manual de Araneologia. 254 pp. Gijón. (Non vidi.)

----- 1925. Contribution al estudio de la geographia aracnológia de la Peninsula Ibérica. Bol. Soc. int. Esp., 8: 31-40.

Fuente, J.M. de la, 1898. Datos para la fauna de la provincia de Ciudad Real. IX. Arácnidos de Pozuelo de Calatrava, determinados en su mayor parye por M. E. Simon. An. Soc. esp. Hist. nat., 27, Actas: 98-99. (Non vidi.)

Gering, R.L., 1953. Structure and function of the genitalia in some American agelenid spiders. Smith. Misc. Coll., 121(4): 1-84.

Gerschman de Pikelin, B.S., & R.D. Schiapelli, 1964. Observaciones sobre el género Cryptoceroides Toledo-Piza, 1937 (Araneae -- Aphantochilidae). Physis, Buenos Aires, 24: 418.

Gerstaecker, A., 1873. Arachnoidea. In Decken, C. von der, Reisen in Ostafrica, 3(2), pp.463-503. Leipzig.

Gertsch, W.J., 1932. A new generic name for Coriarachne versicolor Keyserling, with new species. Amer. Mus. Novit., (563): 1-7.

----- 1934. Notes on American crab spiders (Thomisidae). Ibid., (707): 1-25.

----- 1939. A revision of the typical crab-spiders (Misumeninae) of America north of Mexico. Bull. Amer. Mus. nat. Hist., 76: 277-442.

----- 1953. The spider genera Xysticus, Coriarachne, and Oxyptila (Thomisidae, Misumeninae) in North America. Ibid., 102: 413-482.

Giltay, L., 1932. Arachnides recueillis par M. d'Orchymont au cours de ses voyages aux Balkans et en Asia Mineure en 1929, 1930 et 1931. Bull. Mus. roy. Hist. nat. Belg., 8(22): 1-40.

Gmelin, J.F., 1789. In Linné C. de, Systema Naturae par regna tria naturae, secundum classes, ordines, genera, species; cum characteribus, differentiis, synonymis, locis. Editio decima tertia aucta, reformata; cura Jo. Frid. Gmelin, 1(5), pp.2946-2961. Lipsiae. (Non vidi.)

Grasshoff, M., 1974a. Zur Evolution der Kopulationsorgane der Spinnen. Natur u. Mus., Frankfurt am Main, 104: 55-60.

----- 1974b. Transformierungsreihen in der Stammesgeschichte -- mechanischer Wandel an Kopulationsorganen von Radnetzspinnen. Ibid., 104: 321-330.

Grese, N.S., 1909. Die Spinnen der Halbinsel Jamal (Kola). Ann. Mus. zool. Akad. Sci. URSS, 14: 325-331.

Grube, A.E., 1861. Beschreibung neuer, von den Herren L. v. Schrenck, Maack, C. v. Ditmar u.a. im Amurlande und in Ostsibirien gesammelter Arachniden. Bull. Acad. imp. Sci. S.-Pétersb., 4: 161-180.

Hahn, C.W., 1820-'36. Monographie der Spinnen. (1) (pp.1-16, 4 pls.) (1820), (2) (pp.1-2, 4 pls.) (1821), (3) (pp.1-2, 4 pls.) (1822), (4) (pp.1-2, 4 pls.) (1826), (5) (pp.1-2, 4 pls.) (1827), (6) (pp.1-2, 4 pls.) (1831), (7) (pp.1-2, 4 pls.) (1834), (8) (pp.1-2, 4 pls.) (1836). Nurnberg.

——— 1831-'34. See Hahn, C.W., & C.L. Koch, 1831-'48.

——— & C.L. Koch, 1831-'48. Die Arachniden. (In 16 volumes: 1-2 by C.W. Hahn, 3-16 by C.L. Koch) 1 (pp.1-129, pls I-XXXVI) (1831), 2 (pp.1-75, pls. XXXVII-LXXII) (1834), 3 (pp.1-120, pls. LXXIII-CVIII) (1836), 4 (pp.1-144, pls. CIX-CXLIV) (1838), 5 (pp.1-158, pls. CXLV-CLXXX) (1839a), 6 (pp.1-156, pls. CLXXXI-CCXVI) (1839b), 7 (pp.1-130, pls. CCXVII-CCLII) (1839c), 8 (pp.1-131, pls. CCLIII-CCLXXXVIII) (1841), 9 (pp.1-108, pls. CCLXXXIX-CCCXXIV) (1842), 10 (pp.1-142, pls. CCCXXV-CCCIX) (1843), 11 (pp.1-174, pls. CCCLXI-CCCXCVI) (1845a), 12 (pp.1-166, pls. CCCXCVII-CCCCXXXII) (1845b), 13 (pp.1-234, pls. CCCCXXXIII-CCCCLXVIII) (1846), 14 (pp.1-210, pls. CCCCLXIS-DIV) (1848a), 15 (pp.1-136, pls. DV-DXL) (1848b), 16 (pp.1-80, pls. DXLI-DLXIII) (1848c). Nurnberg.

Harger, O., 1874. Notice of a new fossil spider from the coal measures of Illinois. Amer. J. Sci., (3), 7: 219-223.

Hasselt, A.W.M. van, 1887. Excursie naar Winterswijk Spinnen. Tijdsch. Ent., 30: 31-32.

Haupt, J., 1979. Lebensweise und Sexualverhalten der mesothelen Spinne Heptathela nishihirai n. sp. (Araneae, Liphistiidae). Zool. Anz., 202: 348-374.

----- 1983. Vergleichende Morphologie der Genitalorgane und Phylogenie der liphistiomorphen Webspinnen (Araneae: Mesothelae). I. Revision der bisher bekannten Arten. Z. zool. Syst. Evolut.-forsch., 21: 275-293.

Hentz, N.M., 1837. Descriptions and figures of the Araneides of the United States. Boston J. nat. Hist., 5: 443-478.

Hirst, A.S., 1923. On some arachnid remains from the Old Red Sandstone (Rhynie Chert Bed, Aberdeenshire). Ann. Mag. nat. Hist., (9), 12: 455-474. (Non vidi.)

Hogg, H.R., 1914. Spiders from Montebello Islands. Proc. zool. Soc. London, 1914: 69-92.

Holm, Å., 1940. Studien über die Entwicklung und Entwicklungsbiologie der Spinnen. Zool. Bidr. Uppsala, 19: 1-214.

----- 1973. On the spiders collected during the Swedish expeditions to Novaya Zemlya and Yenisey in 1875 and 1876. Zool. Script., 2: 71-110.

Homann, H., 1975. Die Stellung der Thomisidae und der Philodromidae im System der Araneae (Chelicerata, Arachnida). Z. Morph. Tiere, 80: 181-202.

Hoshino, T., 1937. A provisional list of spiders from Niigata Prefecture. Report I. Acta arachnol., 2: 46-54. (In Japanese.)

Hu, J.L., 1984. Thomisidae. In Hu, J.L., (ed.), The Chinese Spiders Collected from the Fields and the Forests, pp. 313-352. Tianjin Press Sci. Tech., Tienjin. (In Chinese.)

Hubert, M., 1979. Les Araignées. Généralités -- Araignées de France et des pays limitrophes. 277 pp. Boubee, Paris.

Hukushima (= Fukushima), S. & M. Miyafuji, 1970. Life histories and habits of

Misumenops tricuspidatus Fabricius (Araneae: Thomisidae). Ann. Rept. Soc. Plant Protect. N. Japan, Akita, (21): 5-12. (In Japanese.)

Iermolaiew (= Ermolajev), W.N., 1937. Beitrage zur Spinnentier-Fauna der Stadt Tobolsk (West-Sibirien). In Festschrift zum 60. Geburtstage von Professor Dr. Embrik Strand, 2, pp. 519-524. Riga.

International Commission on Zoological Nomenclature, 1961. International Code of Zoological Nomenclature adopted by the XV International Congress of Zoology. xvii + 176 pp. International Trust for Zoological Nomenclature, London.

——— 1985. International Code of Zoological Nomenclature, third edition adopted by the XX General Assembly of the International Union of Biological Sciences. xx + 338 pp. International Trust for Zoological Nomenclature, London.

Jézéquel, J.F., 1964. Araignées de la savagne de Singrobo (Côte d'Ivoire). III. Thomisidae. Bull. Inst. franç. Afr. N., 26(A): 1103-1143.

——— 1966. Araignées de la savagne de Singrobo (Côte d'Ivoire). V. Not complémentaire sur les Thomisidae. Bull. Mus. natn. Hist. nat. Paris, (2), 37: 613-630.

Jones, D., 1983. The Country Life Guide to Spiders of Britain and Northern Europe. 320 pp. Hamlyn Publishing Group, Feltham.

Kaestner, A., 1968. Invertebrate Zoology. Vol. 2, Arthropod relatives, Chelicerata, Myriapoda (translated and adopted by Levi, H.W., & L.R.) ix + 472 pp. John Wiley & Sons, New York.

——— 1969. Ordnung Araneae, Spinnen. In Lehrbuch der speziellen Zoologie,

dritte, erweiterte Auflage, 1, Wirbellose, (1), pp. 676-714. Gustav Fischer, Stuttgart.

Karsch, F., 1879a. Baustoffe zu einer Spinnenfauna von Japan. Verh. naturf. Ver. preuss. Rheinl. Westfalens, 36: 57-105.

----- 1879b. Über ein neues laterigraden-Geschlecht von Zanzibar. Z. gesamt. Naturw., Leipzig, 52: 374-376.

----- 1881. Diagnoses Arachnoidarum japoniae. Berl. ent. Z., 25: 35-40.

Kaston, B.J., 1948. Spiders of Connecticut (State of Connecticut Public Document No. 47). State geol. nat. Hist. Surv. Bull., Hartford, No. 70. 874 pp. State Library, Hartford.

----- 1953. How to Know the Spiders. Pictured-Keys for Determining the more Common Spiders, with Suggestions for Collecting and Studying them. 220 pp. W.M.C. Brown, Dubuque.

----- 1981. Spiders of Connecticut, revised edition. State geol. nat. Hist. Surv. Bull., Hartford, No. 70. vi + 1020 pp. Dept. Environmental Protection, Hartford.

Keyserling, E., 1880, Die Spinnen Amerikas. Laterigradae. Bd. 1. 283 pp., 8 pls. Bauer & Raspe, Nürnberg.

----- 1884. Neue Spinnen aus Amerika. V. Verh. zool.-bot. Ges. Wien, 33: 649-684.

----- 1887. Neue Spinnen aus Amerika. VII. Verh. zool.-bot. Ges. Wien, 37: 421-490.

Kishida, K., 1914. Spiders of Japan (8). Kagaku-Sekai, Tokyo, 7(13): 35-38. (In Japanese.)

----- 1924. Spiders from northern Saghalien, collected by Mr. T. Uchida, with

description of a new species of the genus Dolomedes from Okinawa Prefecture. Zool. Mag., Tokyo, 36: 510-520. (In Japanese.)

----- 1927. Thomisidae. In Hirase, S. et al., (eds.), Figuraro de Japanej Bestoj, p. 969. Hokuryûkan, Tokyo. (In Japanese.)

----- 1928. Araneae. In Sengenjinja, (ed.), Fuji-no-Dobutsu, Fuji-no-Shokubutsu. Fuji-no-Kenkyû, 6, pp. 459-491. Kokin-shoin, Tokyo. (In Japanese.)

----- 1933. Idiobiologia Aranearum. 82 pp. Ars Publ., Tokyo. (In Japanese.)

----- 1936. Araneida and Opilionida. In Nikko-tôshôgû, (ed.), Nikko-no Shokubutsu to Dôbutsu, pp. 489-494. Yôkendô, Tokyo. (In Japanese.)

----- 1938. On 68 families of the order Araneida. 23 pp. Private Publ., Tokyo. (In Japanese.)

Kobayashi, H., 1974. On the spiders of Umegashima-onsen (Shizuoka Prefecture). Atypus, Osaka, (62): 41-49. (In Japanese.)

Koch, C.L., 1833-'37. Spinnen. Arachniden. In Panzer, G.W.F., & G.W. Herrich-Schäfer (fortges.), Faunae Insectorum Germaniae initia, (119)(Fol. 1-4), (120) (fol. 1-3, 8-11, 17-24), (121) (fol. 13-24) (1833); (122) (fol. 9-24), (123) (fol. 1-24), (124) (fol. 16-24), (125) (fol. 11-24), (127) (fol. 16-24) (1834); (128) (fol. 8-16, 23-24), (129) (fol. 12-24), (130) (fol. 13-24), (131) (fol. 1-24) (1835); (134) (fol. 1-24), (137) (fol. 3-6), (138) (fol. 3-6), (139) (fol. 3-6) (1836), (141) (Fol. 3-6) (1837). Regensburg.

----- 1836-'48. See Hahn, C.W., & C.L. Koch, 1831-'48.

----- 1837-1851. Spinnen. In Übersicht des Arachnidensystems, 1 (pp. 1-39, pls. 1-6) (1837), 5 (pp. 1-104) (1851). Nürnberg.

----- 1840. Crustacea, Myriapoda et Arachnides. In Fürnrohr, A.E., Naturhistorische Topographie von Regensburg, 3. Die Fauna von Regensburg, pp. 387-458. (Non vidi.)

----- 1847. System der Myriapoden mit Verzeichnissen und Berichtungen zu Deutschlands Crustaceen, Myriapoden und Arachniden. 270 pp. Regensburg. (Non vidi.)

----- & G.C. Berendt, 1854. Die im Bernstein befindlichen Crustaceen, Myriapoden, Arachniden und Apteren der Vorwelt. In Berendt, G.C., Die im Bernstein befindlichen Organischen Reste der Vorwelt, 1(2), pp. 1-124. Berlin. (Non vidi.)

Koch, L., 1871-1881. See Koch, L., & E. Keyserling, 1871-1883.

----- 1876a. Verzeichnis der in Tirol bis jetzt beobachteten Arachniden nebst Beschreibungen einiger neuen oder weniger bekannten Arten. Z. Ferdinand. Tirol Voralb., Innsbruck, (3), 19: 221-354. (Non vidi.)

----- 1878a. Verzeichnis der bei Nürnberg bis jetzt beobachteten Arachniden (mit Ausschlu der Ixodiden und Acariden) und Beschreibungen von neuen, hier vorkommenden Arten. Abh. naturh. Ges. Nürnberg, 6: 1-86. (Non vidi.)

----- 1878b. Kaukasische Arachnoideen. In Schneider, O., Naturwissenschaftliche Beiträge zur Kenntnis der Kaukasusländer, pp. 36-71, pls. I-II. Dresden.

----- 1878c. Japanische Arachniden und Myriapoden. Verh. zool.-bot. Ges. Wien, 27: 735-793.

----- & E. Keyserling, 1871-1883. Arachniden Australiens, nach der Natur beschrieben und abgebildet. 1489 pp. (pp. 1-1271 by Koch, pp.

1272-1489 by Keyserling); (pp. 1-104) (1871), (pp. 105-368) (1872), (pp. 369-472) (1873), (pp. 473-576) (1874), (pp. 577-740) (1875), (pp. 741-888) (1876b), (pp. 889-968) (1877), (pp. 969-1044) (1878d), (pp. 1045-1156) (1879), (pp. 1157-1212) (1880), (pp. 1213-1324) (1881), (pp. 1325-1420) (1882), (pp. 1421-1489) (1883). Bauer & Raspe, Nurnberg.

Kolosváry, G., 1934. Beiträge zur Spinnenfauna Siebenbürgens. Folia zool. hydrobiol., Riga, 7: 38-43.

----- 1936. Ein Versuch zur Einleitung der Karpathischen Länder mit Berücksichtigung der spinnenfaunistischen Angaben und ein Beitrag zum Rassenkreisproblem bei Spinnen. Ibid., 9: 92-114.

----- 1937. Neue Daten zur Spinnenfauna Siebenbürgens. In Festschrift zum 60. Geburtstage von Professor Dr. Embrik Strand, 3, pp. 402-406.

Komatsu, S., 1936. Iconographia Colorata Vivida Aranearum Japonicarum. Vol. 1. 192 pp. Ranzankai, Tokyo. (In Japanese.)

Kraus, O., 1955. Spinnen aus El Salvador (Arachnoides, Araneae). Ergebnisse der Forschungsreise A. Zilch 1951 nach El Salvador, 22. Abh. senckenb. naturf. Ges., 493: 1-111.

----- 1978. Liphistius and the evolution of spider genitalia. In Merret, P., (ed.), Arachnology, Seventh International Congress. Sym. zool. Soc. London, (42): 235-254.

Kroneberg (= Croneberg, Kronenberg), A.I., 1875. Araneae. In Fedtschenko, A.P., Reise in Turkestan. Zoologischer Theil, 2, pp. 1-58, pls. I-V. Moskau.

Kulczyński, W., 1881. Wykaz Pajaków z Tatr, Babiéj gory i Karpat szlazkich

z uwglednieniem pionowego rozsiedlina Pajaków zyjacych w Galicyi zachodniéj. Spraw. kom. fizyogr. Kraków, 15: 248-322.

----- 1901. Arachnida. In Horváth, G., Zoologische Ergebnisse der dritten asiatischen Forschungsreise des Grafen Eugen Zichy, 2, pp. 311-369. Budapest, Leipzig.

----- 1911. Spinnen aus Nord-Neu-Guinea. In Nova Guinea, Résultats de l'expedition scientifique néerlandaise à la Nouvell Guinée en 1903 sous les auspices d'Arthur Wichmann, 3(4), pp. 423-518, pls. XIX-XX. Leiden.

----- 1926. Arachnoidea Camtschadalica. Ann. Mus. zool. Acad. Sci. URSS, 27: 29-72.

Kuribayashi, S., 1973. Insects of Okinawa. 184 pp. Gakushû-Kenkyû-sha, Tokyo. (In Japanese.)

Latreille, P.A., 1802. Mémoire sur une nouvelle distribution méthodique des Araignées; lu à la Société philomatique. In Histoire Naturelle des Fourmis et recueil de mémoires et d'observations sur les Abeilles, les Araignées, les Faucheurs et d'autres Insects, an X, pp. 332-353. Paris (Non vidi.)

----- 1804a. Tableau méthodique des Insects. In Dictionaire (Nouveau) d'Histoire Naturelle, 24, pp. 129-200. Paris.

----- 1804b. Arachnides. In Histoire Naturelle Générale et Pariculière des Crustacés et des Insectes, 7, pp. 144-305, pls. LXII-LXIV. Paris. (Non vidi.)

----- 1818. Explication des Planches d'Histoire Naturelle faisant suite à celles des Crustacés, des Arachnides et des Insectes (nos. 1-268).

Encyclopedie methodique. Histoire Naturelle. Insectes. In Tableau encyclopédique et méthodique des trois Règnes de la Natur, 24, pp. 1-38, 269-397. Paris. (Non vidi.)

----- 1819. Thomise. In Dictionaire (Nouveau) d'Histoire Naturelle, appliquée aux Arts, à l'Agriculture, à l'Economie rurale et domestique, à la Médecine, etc. par une Société de Naturalistes et d'Agriculteurs. Nouvelle édition presque entièrement refondue et considérablement augmentée, 34, pp. 26-42. Paris.

----- 1825. Arachnides. In Familles naturelles du Règne Animal, pp. 306-322. Paris. (Non vidi.)

----- 1830. Thomise. In Dictionaire Classique d'Histoire Naturelle; ouvrage dirigé par Bory de Saint-Vincent, 16, pp. 231-232. Paris.

Lawrence, R.F., 1928. Contribution to a knowledge of the fauna of South-West Africa. V. Arachnida. Ann. S. Afr. Mus., 25: 1-75.

----- 1952. New spiders from the eastern half of South Africa. Ann. Natal Mus., 12: 183-226.

Lebert, H., 1877. Die Spinnen der Schweiz, ihr Bau, ihr Leben, ihre systematische Übersicht. N. Denkschr. schw. naturf. Ges., 23: 1-321.

Lehtinen, P.T., 1967. Classification of the cribellate spiders and some allied families, with notes on the evolution of the suborder Araneomorpha. Ann. zool. Fenn., 4: 199-468.

Lessert, R. de, 1910. Catalogue des Invertébrés de la Suisse. Fasc. 3. Araignées. 635 pp. Mus. Hist. nat., Genève.

----- 1919. Araignées du Kilimandjaro et du Mérou (suite). III. Thomisidae. Rev. Suisse Zool., 27: 99-234.

----- 1928. Araignées du Congo recuillies au cours de l'expédition organisée par l'American Museum (1909-1915). Deuxième partie. Ibid., 35: 303-352.

----- 1943. Araignées du Congo Belge (Troisième partie). Ibid., 50: 305-338.

Levi, H.W., 1978. Orb-webs and phylogeny of orb-weavers. In Merret, P., (ed.), Arachnology, Seventh International Congress. Symp. zool. Soc. London, (42): 1-15.

----- 1980. The orb-weaver genus Mecynogea, the subfamily Metinae and the genera Pachygnatha, Glenognatha and Azilia of the subfamily Tetragnathinae north of Mexico (Araneae: Araneidae). Bull. Mus. comp. Zool., 149: 1-75.

----- 1983. The orb-weaver genera Argiope, Gea, and Neogea from the Western Pacific region (Araneae: Araneidae, Argiopinae). Bull. Mus. comp. Zool., 150: 247-338.

----- & L.R. Levi, 1968. A Guide to Spiders and their Kin. 160 pp. Western Publ., Racine.

Levy, G., 1970. The life cycle of Thomisus onustus (Thomisidae: Araneae) and outlines for the classification of the life histories of spiders. J. Zool., London, 160: 523-536.

----- 1973. Crab-spiders of six genera from Israel (Araneae: Thomisidae). Israel J. Zool., 22: 107-141.

----- 1975. The spider genera Synaema and Oxyptila in Israel (Araneae: Thomisdae). Ibid., 24: 155-175.

----- 1976. The spider genus Xysticus (Araneae: Thomisidae) in Israel. Ibid., 25: 1-37.

Li, H.L., 1952. Floristic relationships between eastern Asia and eastern North America. Trans. Amer. phil. Soc., 42: 371-427.

Li, Y.-C., F.-Y. Chen & D.-X. Song, 1985. A new species of the genus Phrynarachne (Araneae: Thomisidae). J. Anhui norm. Univ., (1): 72-74. (In Chinese with English summary.)

Linné, C. de, 1758. Aranea. In Systema Naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus defferentiis, synonymis, locis. Editio decima, reformata, 1, pp. 619-624. Holmiae.

Locket, G.H., & A.F. Millidge, 1951. British Spiders, Vol. 1. 310 pp. Ray Society, London.

Loerbroks, A., 1983. Revision der Krabbenspinnen-Gattung Heriaeus Simon (Arachnida: Araneae: Thomisidae). Verh. naturw. Ver. Hamburg, (N.F.), 26: 85-139.

Lucas, H., 1840. Histoire Naturelle des Animaux Articulés, Annélides, Crustacés, Arachnides, Myriapodes et Insectes. 601 pp., 46 pls. Paris. (Non vidi.)

----- 1946. Aranéides. In Histoire naturelle des Animaux articulés. Exploration scientifique de l'Algérie pendant les années 1840, 1841, 1842, publiée par ordre du Gouvernment et avec le concours d'une commission académique. Sciences, physiques, Zoologie, 1, pp. 89-271; 4, pls. I-XVII. Paris. (Non vidi.)

Marx, G., 1893. On a new genus and some new species of Araneae from the west coast of Africa collected by the U.S. Steamer Enterprise. In Riley, C.V., Scientific results of the U.S. Eclipse Expedition to West

Africa 1889-90. Report on the Insecta, Arachnida and Myriapoda. Proc. U.S. natn. Mus., 16: 587-590.

Mascord, R., 1970. Australian Spiders in Colour. 112 pp. Charles E. Tuttle, Rutland, Vermont & Tokyo.

----- 1980. Spiders of Australia, a Field Guide. 128 pp. A.H. & A.W. Reed, Sydney, London, Auckland & Christchurch.

Matsuda, M., 1985. A list of spiders of the central mountain district (Taisetsuzan National Park), Hokkaido. Bull. Higashi Taisetsu Mus. nat. Hist., (7): 1-33. (In Japanese with English summary.)

Matsumoto, S., 1973. The spiders from the island of Kôzu-jima. Collect. & Breed., Tokyo, 35(2): 41-47. (In Japanese.)

-----, E. Shinkai & H. Ono, 1976. Spiders. 194 pp. GakushÛ-KenkyÛsha, Tokyo. (In Japanese.)

Mello-Leitão, C.F. de, 1917. Aranhas novas ou pouco conhecidae de Thomisidas e Salticidas brasileiras. Arch. Esc. sup. agr. med. veter., 1: 117-153. (Non vidi.)

----- 1925. Pequenas notas arachnologicas. Bol. Mus. nac. Rio-de-Janeiro, 1: 455-463.

----- 1929. Aphantochilidas e Thomisidas do Brasil. Arch. Mus. nac. Rio-de-Janeiro, 31: 9-359.

----- 1940. Aranhas do espirito santo coligidas por Mario Rosa, em 1936 e 1937. Rev. Mus. Paulista, 25: 199-214.

----- 1943. Alguns Pisauridae e Thomisidae do Brasil. Rev. Chil. Hist. nat., 45: 164-172. (Non vidi.)

----- 1948. Contribuicão ao conhecimento da fauna araneológica da Guianas. Ann. Acad. Bras. Ciencias, 10: 151-196.

Menge, A., 1876. Preussische Spinnen. VIII. Fortsetzung. Schr. naturf. Ges. Danzig, (N.F.), 3: 423-454. (Non vidi.)

Merian, P., 1910. Die Bedeutung der Araneen für die Tiergeographie. 72 pp. Zürich.

Miller, F., 1971. Rad Pavouci, Araneida. In Klic Zvireny CSSR, 4, pp. 51-306. Praha.

Millot, M.J., 1941. Les Araignées de l'Afrique occidentale française. Mém. Acad. Sci. Inst. France, 65: 1-82.

Mocsáry, S., 1872. Adatok Biharmegye faunájához. Math. Termés. Közlem., Budapest, 10: 163-200. (Non vidi.)

Nakahira, K., 1958. Spiders making use of living leaves on their webs and dwellings. Acta arachnol., 15: 17-20. (In Japanese.)

Nakatsudi (= Nakatsuji), K., 1943. Some Arachnida from Is. Okinawa and Is. Amami-Osima. J. Agr. Sci. Tokyo Nodai, 2: 181-194. (In Japanese.)

Namkung, J., 1964. Spiders from Chungjoo, Korea. Atypus, Osaka, (33/34): 31-50. (In Japanese.)

Nentwig, W.,& S. Heimer, 1983. Orb webs and single-line webs: an economic consequence of space web reduction in spiders. Z. zool. Syst. Evolut.-forsch., 21: 26-37

Nicolet, H., 1849. Zoologia III. In Gay, P.C., Historia fisica y politica de Chile, pp. 319-543. Paris.

Nielsen, E., 1932. The Biology of Spiders. 1 (pp. 1-248, 32 pls.), 2 (pp. 1-725, 5 pls.). Copenhagen.

Nitzsch, C.L., 1840. Monastes. In Nitzsch, C.L., & H. Burgmeister, System der Pterylographie; nach seinen handschriftlich aufbewahrten

Untersuchungen verfasst von Hermann Burgmeister, p. 135. Halle. (Non vidi.)

Ohno, M., & T. Yaginuma, 1968. The spiders from the islands of Niijima, Shikinejima, and Kôzushima, belonging to the Izu islands, Japan. J. Tôyô Univ. gen. Educ., (Nat. Sci.), Tokyo, 10: 17-29. (In Japanese.)

Okami, U., 1909. Spiders from Harima (2). Hakubutsugaku Zasshi, Tokyo, (109): 23-24. (In Japanese.)

Oliveira P.S., & I. Sazima, 1984. The adaptive bases of ant-mimicry in a neotropical aphantochilid spider (Araneae: Aphantochilidae). Biol. J. linn. Soc., London, 22: 145-155.

Ono, H., 1977a. Thomisidae aus Japan I. Das Genus Tmarus Simon (Arachnida: Araneae). Acta arachnol., 27 (spec. no.): 61-84.

----- 1977b. On a collection of the unidentified Japanese spiders in the Museum of Munich. Kishidaia, Hino, (42): 4-12. (In Japanese.)

----- 1978a. Thomisidae aus Japan II. Das Genus Oxytate L. Koch 1878 (Arachnida: Araneae). Senckenbergiana biol., 58: 245-251.

----- 1978b. Redescription of the Japanese crab spider Oxyptila (?) truciformis Bösenberg et Strand (Araneae: Thomisidae). Atypus, Osaka, (72): 3-7. (In Japanese.)

----- 1978c. Thomisidae aus dem Nepal-Himalaya. I. Das Genus Xysticus C.L. Koch 1835 (Arachnida: Araneae). Senckenbergiana biol., 59: 267-288.

----- 1979. Thomisidae aus dem Nepal-Himalaya. II. Das Genus Lysiteles Simon 1895 (Arachnida: Araneae). Ibid., 60: 91-108.

----- 1980a. Thomisidae aus Japan III. Das Genus Lysiteles Simon, 1895 (Arachnida: Araneae). Ibid., 60: 203-217.

----- 1980b. Thomisidae aus dem Nepal-Himalaya. III. Das Genus Stiphropus Gerstaecker 1873, mit Revision der asiatischen Arten (Arachnida: Araneae). Ibid., 61: 57-76.

----- 1981a. Erstnachweis einer Krabbenspinne (Thomisidae) in Dominikanischem Bernstein (Stuttgarter Bernsteinsammlung: Arachnida, Araneae). Stuttgarter Beitr. Naturk., B, (73): 1-13.

----- 1981b. The distribution and phylogeny of the Japanese crab spider Xysticus ephippiatus Simon, 1880 (Araneae: Thomisidae). Kishidaia, Hino, (47): 69-75. (In Japanese.)

----- 1983. Eine neue japanische Synaema-Art (Araneae: Thomisidae). Acta arachnol., 31: 59-63.

----- 1984. The Thomisidae of Japan IV. Boliscus Thorell, 1891 (Arachnida, Araneae), a genus new to the Japanese fauna. Bull. natn. Sci. Mus., Tokyo, (A), 10: 63-71.

----- 1985a. Revision einiger Arten der Familie Thomisidae (Arachnida, Araneae) aus Japan. Ibid., (A), 11: 19-39.

----- 1985b. The Thomisidae of Japan V. Monaeses Thorell, 1869, and its new junior synonym, Mecostrabus Simon, 1903 (Arachnida, Araneae). Ibid., (A), 11: 91-97.

----- 1985c. Eine neue Art der Gattung Misumenops F.O. Pickard-Cambridge, 1900, aus Japan (Araneae: Thomisidae). Proc. Jpn. Soc. syst. Zool., Tokyo, (31): 14-19.

----- 1986. Spiders of the families Clubionidae, Gnaphosidae and Thomisidae from the Noto Peninsula and the southern part of Ishikawa Prefecture, Japan. Mem. natn. Sci. Mus., Tokyo, (19): 167-174.

----- & D.-X. Song, 1986. A new Sino-Japanese species of the genus Cupa (Araneae, Thomisidae) from the coastal areas of the East China Sea. Bull. natn. Sci. Mus., Tokyo, (A), 12: 25-29.

Opell, B.D., 1979. Revision of the genera and tropical American species of the spider family Uloboridae. Bull. Mus. comp. Zool., 148: 443-549.

Paik, K.Y., 1967. The spider fauna of Korea. Educ. J. Teach. Coll. Kyungpook Univ., 7/8: 55-73.

----- 1973a. Korean spiders of genus Tmarus (Araneae, Thomisidae). Theses Coll. Grad. Scho. Educ. Kyungpook Univ., 4: 79-89.

----- 1973b. Three new species of genus Xysticus (Araneae, Thomsidae). Res. Rev. Kyungpook natn. Univ., 17: 105-116.

----- 1974. Korean spiders of the genus Oxyptila (Araneae; Thomisidae). Educ. J. Teach. Coll. Kyungpook Univ., 16: 119-131.

----- 1985. Korean spiders of the genus Oxytate L. Koch, 1878 (Thomisidae: Araneae). Korean Arachnol., Seoul, 1 (2): 29-42.

----- & J.-P. Kim, 1985. A list of Korean spiders (revised in 1985). Ibid., 1 (1): 51-82.

Pallas, P.S., 1772. Aranea. In Specilegia Zoologia. Tomus 1. Continens Quandrupedium, Avium, Amphibiorum, Piscium, Insectorum, Molluscorum, Aliorumque Marinorum Fasciculos decem, 9, pp. 44-50, pls. I, III. Berolini (Non vidi.)

Palmgren, P., 1950. Die Spinnenfauna Finnlands und Ostfennoskandiens, III. Xysticidae und Philodromidae. Acta zool. Fenn., 62: 1-43.

----- 1983. Die Philodromus aureolus-Gruppe und die Xysticus cristatus-Gruppe (Araneae) in Finnland. Ann. zool. Fenn., 20: 203-206.

Parker, J.R., 1980. What's in a name? Part I. Secretary's News Let. Brit. arachnol. Soc., (27): 1-7.

Pavesi, P., 1873a. Enumerazione dei ragne dei dintorni di Pavia. Atti. Soc. ital. Sci. nat., 16: 68-78. (Non vidi.)

——— 1873b. Catalogo sistematico dei ragni del cantone ticino con la loro distribuzione orizzontale e verticale e cenni sulla araneologia elvetica. Ann. Mus. civ. Stor. nat. Genova, 4: 5-215.

----- 1875. Note araneologiche. III. Catalogo generale dei ragni della Svizzera con aggiunte e correzioni a quello del Canton Ticino. Atti. Soc. ital. Sci. nat., 18: 254-283. (Non vidi.)

----- 1879. Saggio di una fauna araneologica del Varesotto. Ibid., 21: 789-817. (Non vidi.)

----- 1895. Esplorazione del Giuba e dei suoi affluenti compiuta dal Cap. Bottego. XVIII. Aracnidi. Ann. Mus. civ. Stor. nat. Genova, 35: 493-537.

----- 1897. Studi sugli aracnidi africani IX. Aracnidi Somali e Galla raccolti da Don Eugenio dei Principi Rispoli. Ibid., 38: 151-188.

Peelle L., & S. Saito, 1933. Spiders from the southern Kurile Islands. II. Araneida from Shikotan. J. Fac. Sci. Hokkaido imp. Univ., (6-Zool.), 2: 109-123.

Petrunkevitch, A., 1928. Systema Aranearum. Trans. Conn. Acad. Arts Sci., 29: 1-270.

----- 1949. A study of Palaeozoic Arachnida. Ibid., 37: 69-315.

----- 1950. Baltic amber spiders in the Museum of Comparative Zoology. Bull. Mus. comp. Zool., 103: 259-337.

Pickard-Cambridge, F.O., 1897-1905. Arachnida. Araneida and Opiliones. Bd.2. Biologia Centrali-Americana, Zoologia, pp. 1-160, pls. I-LIV. (pp. 1-40) (1897), (pp. 41-88) (1899), (pp. 89-192) (1900), (pp. 193-312) (1901), (pp. 313-424) (1902), (pp. 425-464) (1903), (pp. 465-545) (1904), (pp. 546-610) (1905). E. Wilson, Cambridge.

Pickard-Cambridge, O., 1869. Descriptions and sketches of some new species of Araneidea, with characters of a new genus. Ann. Mag. nat. Hist., (4), 3: 52-74.

——— 1870. On some new genera and species of Araneida. Proc. zool. Soc., London, 1870: 728-747.

——— 1871. Arachnida. Zool. Rec., 7: 207-224.

——— 1872. General list of the spiders of Palestine and Syria, with descriptions of numerous new species and characters of two new genera. Proc. zool. Soc. London, for 1872: 212-354.

——— 1881a. On some new genera and species of Araneidea. Ibid., for 1881: 765-775.

——— 1881b. The spiders of Dorset, with an appendix containing short descriptions of those British species not yet found in Dorsetshire II. Proc. Dorset nat. Hist. Field Club, for 1881: 237-625.

——— 1883. On some new genera and species of spiders. Proc. zool. Soc. London, for 1883: 352-365.

——— 1884. On two new genera of spiders. Ibid., for 1884: 196-205.

——— 1885. Arachnida, Araneida. In Scientific Results of the Second Yarkand Mission, pp. 1-115, 2 pls. Calcutta.

——— 1889-1902. Arachnida. Araneida. Bd.1. Biologia Centrali-Americana,

Zoologia, pp. 1-316, pls. I-XXXIX. (pp. 1-56) (1889), (pp. 57-72) (1890), (pp. 73-88) (1891), (pp. 89-104) (1892), (pp. 105-120) (1893), (pp. 121-144) (1894), (pp. 145-160) (1895), (pp. 161-224) (1896), (pp. 225-232) (1897), (pp. 233-288) (1898), (pp. 289-304) (1899a), (pp. 305-316) (1902). E. Wilson, Cambridge.

——— 1899b. On some new species of exotic Araneidea. Proc. zool. Soc. London, for 1899: 518-532.

Piza, jr. S. de Toledo, 1938. Novas especies de Aranhas myrmecomorphas do Brasil e consideraçoes sobre o seu mimetismo. Rev. Mus. paul., São-Paolo, 23: 307-319. (Non vidi.)

Planet, L., 1905. Araignées (Araignées, Chernètes, Scorpions, Opilions). Histoire Naturelle de la France, 14, pp. 1-341, pls. I-XVIII. Paris.

Platnick, N.I., 1976. Notes on the spider genus Doliomalus (Araneae, Gnaphosidae). Rev. Zool. afr., Bruxelles, 90: 975-983.

Pocock, R.I., 1903. Arachnida. In Forbes, H.O., The natural history of Sokotra and Abdel-Kuri. Bull. Liverp. Mus., spec., for 1903: 175-208.

——— & N.C. Rothschild, 1903. On a new "bird's dung" spider from Ceylon. Proc. zool. Soc. London, for 1903: 48-51.

Prach, H., 1860. Život pavoukŭ pravých či prodŏueích (Araneae). Živa, Praze, 8: 80-93. (Non vidi.)

——— 1866. Monographie der Thomisiden (Krabben-Spinnen) der Gegend von Prag, mit einem Anhange, das Verzeichniss der bisher in der Umgebung unserer Hauptstadt aufgefundenen Araneen enthaltend. Verh. zool.-bot. Ges. Wien, 16: 597-638.

Prószyński, J., & W. Starega, 1971. Pajaki. Katalog Fauny Polski, 33. 382 pp. Warszawa.

Rainbow, W.J., 1900. Two new Thomisids. Rec. Austral. Mus., 3: 169-175.

----- 1911. A census of Australian Araneidae. Ibid., 9: 107-319.

Reimoser, E., 1919. Katalog der echten Spinnen (Araneae) des paläarktischen Gebietes. Abh. zool.-bot. Ges. Wien, 10(2): 1-280.

----- 1925. Fauna sumatrensis, Araneina. Suppl. ent., Berlin, 10: 89-94.

----- 1927. Spinnen von Sumatras Ostküste. Misc. zool. Sumatra., Medan, 13: 1-6.

----- 1934. Araneae aus Süd-Indien. Rev. Suisse Zool., 41: 465-511.

Reiskind, J., 1969. The spider subfamily Castianeirinae of North and Central America (Araneae, Clubionidae). Bull. Mus. comp. Zool., 138: 163-325.

Rinaldi, I.M.P., 1983. Contribiucao ao estudo das Misumeninae do Brasil (Araneae, Thomisidae). Rev. bras. Ent., 27: 147-153. (Non vidi.)

Risso, A., 1826. Diana. In Histoire Naturelle des Principales Productions de l'Europe Méridionale, 3, p.267. Paris. (Non vidi.)

Roberts, M.J., 1985. The Spiders of Great Britain and Ireland. Vol. 1. Atypidae — Theridiosomatidae, pp. 1-229. Vol. 3 (colourplates), pp. 1-256. Harley Books, Colchester.

Roewer, C.F., 1928. Ordnung: Araneae. Echte oder Webespinnen. In Brohmer, P. et al., (eds.), Die Tierwelt Mitteleuropas, 3(2), pp. VI-1-VI-144, pls. 1-28. Quelle & Meyer, Leipzig.

----- 1932. Arachnoidea, Spinnentiere. In Brohmer, P., (ed.), Fauna von Deutschland, pp. 404-432. Leipzig.

——— 1942a. Katalog der Araneae von 1758 bis 1940. Bd. 1 (Mesothelae, Orthognatha, Labidognatha: Dysderaeformia, Scytodiformia, Pholciformia, Zodariiformia, Hersiliaeformia, Argyopiformia). 1040 pp. Natura, Bremen.

——— 1942b. Opiliones, Pedipalpi u. Araneae von Ferdinand Poo. Veröff. dtsch. Kolon.- Übersee-Mus., Bremen, 3: 244-258. (Non vidi.)

——— 1951. Neue Namen einiger Araneen-Arten. Abh. naturw. Ver. Bremen, 32: 437-456.

——— 1954. Katalog der Araneae von 1758 bis 1940, bzw. 1954. Bd. 2(a) (Lycosaeformia, Dionycha [excl. Salticiformia]), pp. 1-924. Bd. 2(b) (Salticiformia, Cribellata, Synonyma-Verzeichnis, Gesamtindex), pp. 925-1751. Inst. roy. Sci. nat. Belg., Bruxelles.

——— 1961. Opilioniden und Araneen. In Le parc national du Nikolo-Koba (deuxième fascicule). Mém. Inst. franç. Afr. n., (62): 33-81.

Rossi, P., 1790. Aranea. In Fauna etrusca, sistens Insecta quae in Provinciis Florentina et Pisana praesertim collegit, 2, pp. 126-138, pls. I, III, IX. Liburni. (Non vidi.)

Saito, H., & K. Horiuchi, 1975. A record of Diaea dorsata (Fabricius). Insect, Utsunomiya, 26(1): 30-31. (In Japanese.)

Saito, S., 1932. Description of two new species of Araneida from the northern Kurile Islands. Trans. Sapporo nat. Hist. Soc., 12: 100-104.

——— 1933a. Notes on the spiders from Formosa. Ibid., 13: 32-61.

——— 1933b. Araneida from the northern Kurile Islands, with descriptions of two new species. Bull. biogeogr. Soc. Japan, 4: 122-132.

——— 1934a. Spiders from Hokkaido. J. Fac. Agr. Hokkaido imp. Univ.,

Sapporo, 33: 267-362.

----- 1934b. A supplementary note on spiders from southern Saghalien, with descriptions of two new species. Trans. Sapporo nat. Hist. Soc., 13: 326-340.

----- 1935. Further notes on spiders from southern Saghalien (the third supplement). Ibid., 14: 51-54.

----- 1936a. The spiders collected by the late Mr. Sadae Takahashi, with descriptions of two new species. Ibid., 14: 249-254.

----- 1936b. Order Araneina. In Arachnida of Jehol, Orders Scorpiones, Araneina, Opiliones & Acarina. Report of the First Scientific Expedition to Manchoukuo under the Leadership of Shigeyasu Tokunaga, June-October 1933, (5)1(3), (11), pp. 1-88, pls. I-XXXII. Tokyo.

----- 1937. A supplementary note on spiders from Manchoukuo, with descriptions of two new species. Annot. zool. japon., 16: 148-156.

----- 1938. Arachnida of Manchoukuo, III. Trans. Sapporo nat. Hist. Soc., 15: 191-193.

----- 1939. On the spiders from Tohoku (northernmost part of the main island), Japan. Saito Hoon-kai Mus. Res. Bull., 3: 1-91.

----- 1959. The Spider Book Illustrated in Colours. 194 pp., 28 pls. Hokuryukan, Tokyo. (In Japanese.)

----- 1960. Araneae. In Okada, K., et al., (eds.), Encyclopaedia Zoologica Illustrated in Colours, 4, pp. 10-21. Hokuryukan, Tokyo. (In Japanese.)

Sakaguchi, Y., 1970. Spiders from Yaeyama and Okinawa Islands. In Result of the Expedition to the Yaeyama Islands, pp. 51-65. Faculty of Agriculture, Kinki University, Osaka. (In Japanese.)

Sauer, F., & J. Wunderlich, 1982. Die schönsten Spinnen Europas, nach Farbfotos erkannt. 110 pp., 79 pls. Fauna-Verlag, Karlsfeld.

Schenkel, E., 1930. Die Arachniden der schwedischen Kamtchatka-Expedition 1920-1922. Ark. Zool., Stockholm, 21(A)(15): 1-33.

----- 1936. Kleine Beiträge zur Spinnenkunde. II. Teil. Rev. Suisse Zool., 43: 307-333.

----- 1939. Beitrag zur Spinnenkunde. Ibid., 46: 95-114.

----- 1944. Arachnoides aus Timor und China aus den Sammlungen des Basler Museums. Ibid., 51: 173-206.

----- 1953. Chinesische Arachnoidea aus dem Museum Hoangho-Peiho in Tientsin. Bol. Mus. nac. Rio-de-Janeiro, Zool., 119: 1-108.

----- 1963. Ostasiatische Spinnen aus dem Muséum d'Histoire Naturelle de Paris. Mém. Mus. natn. Hist. nat., Paris, (A), 24: 1-288.

Schick, R.X., 1965. The crab spiders of California (Araneida, Thomisidae). Bull. Amer. Mus. nat. Hist., 129: 1-180.

Schmidt, G., 1956. Genus- und Spezies-Diagnosen neuer, mit Bananen eingeschleppten Spinnen nebst Mitteilung Über das Auffinden der Männchen zweier Spinnenarten. Zool. Anz., 157: 24-31.

Schrank, F. v. P., 1803. Spinnen. In Fauna Boica, durchgedachte Geschichte der in Baiern einheimischen und zahmen Tiere, 3(1), pp. 229-244. Landshut. (Non vidi.)

Sen, J.K., & K.C. Basu, 1972. A new spider of the genus Runcinia Simon, 1875 (Thomisidae: Arachnida) from India. J. zool. Soc. India, 24: 103-104.

Shear, W.A., 1986. The evolution of web-building behavior in spiders: a

third generation of hypotheses. In Shear, W.A., (ed.), Spiders, Webs, Behavior, and Evolution, pp. 364-400. University Press, Stanford.

Shimojana, M., 1967. Spiders from Taiwan. Nat. & Ins., Tokyo, 2(2): 21-23. (In Japanese.)

Shinji, O., & O. Ono, 1936. A distributional list of the spiders from Iwate Prefecture. Saito Hoon-kai Hakubutsukan Jihô, Sendai, (30): 6-16. (In Japanese.)

Shinkai, E., 1969. Spiders of Tokyo. 65 pp., 10 pls. Arachnol. Soc. East Asia, Osaka. (In Japanese.)

----- 1977. Spiders of Tokyo III. Acta arachnol., 27 (spec. no.): 321-336. (In Japanese with English synopsis.)

----- 1978. Spiders of Hachioji City, Tokyo. 1. List and distribution. Mem. Educ. Inst. priv. Scho., Tokyo, (56): 79-109. (In Japanese.)

----- & S. Takano, 1984. A Field Guide to the Spider of Japan. 206 pp. Tokai Univ. Press, Tokyo. (In Japanese.)

Simon, E., 1864. Histoire Naturelle des Araignées (Aranéides). 540 pp. Roret, Paris.

----- 1866. Sur quelques araignées d'Espagne. Ann. Soc. ent. Fr., (4), 6: 281-292.

----- 1874-1937. Les Arachnides de France, 7 tomus en 13 volumes. 1 (pp. 1-272, pls. I-III) (1874), 2 (pp. 1-350, pls.) (1875a), 3 (pp. 1-360, pls. VIII-XI) (1876), 4 (pp. 1-334, pls. XII-XVI) (1878), 5(1) (pp. 1-179, pl. XXV) (1881a), 5(2-3) (pp. 180-808, pls. XXVI-XXVII) (1884a), 6 (Synopsis général et catalogue des espèces françaises de

l'ordre des Araneae) (1) (pp. I-VI + 1-308) (1914), 6(2) (pp. 309-532) (1926), 6(3) (pp. 533-772) (1929), 6(4) (pp. 773-978) (1932), 6(5) (pp. 979-1298) (1937), 7 (pp. 1-332, pls. XVII-XXIV) (1879). Roret, Paris.

----- 1875b. Liste d'Arachnides de Constantinople et description de deux Opilionides. Ann. Soc. ent. Fr., Bull., (5), 5: CXCVI-CXCVIII.

----- 1880a. Etude arachnologique. 11^{e} mémoire XVII. Arachnides recueillis aux environs de Pekin par M. V. Collin de Plancy. Ann. Soc. ent. Fr., (5), 10: 97-128.

----- 1880b. Matériaux pour servir à une faune arachnologique de la Nouvelle Calédonie. Ann. Soc. ent. Belg., 23, C.R.: 164-175.

----- 1881b. Description d'Arachnides nouveaux d'Afrique. Bull. Soc. ent. Fr., 6: 1-15.

----- 1882. Aracnidi raccolti a Lavaiano (Provincia di Pisa) da G. Cavanna. Boll. Soc. ent. ital., 14: 356-365. (Non vidi.)

----- 1884b. Description d'une nouvelle famille de l'ordre des Araneae (Bradystichidae). Ann. Soc. ent. Belg., 28, C.R.: 297-301.

----- 1885. Matériaux pour servir à la faune de l'Asie méridionale. Bull. Soc. zool. Fr., 10: 436-462.

----- 1886a. Arachnides recueillis par M.A. Pavie (sous-chef du service des postes au Cambodge) dans le royaume de Siam, au Cambodge et Cochin-chine. Act. Soc. linn. Bordeaux, 40: 137-166.

----- 1886b. Espèces et genres nouveaux de la famille des Thomisidae. Ibid., 40: 167-187.

----- 1887a. Observations sur divers Arachnides: synonymies et descriptions.

Ann. Soc. ent. Fr., (6), 7, Bull.: CLVIII-CLIX, CLXVII, CLXXV-CLXXVI, CLXXXVI-CLXXXVII, CXCIII-CXCV.

----- 1887b. Espèces et genres nouveaux de la famille des Sparassidae. Bull. Soc. zool. Fr., 12: 466-474.

----- 1889. Etudes arachnologiques. 21^{e} mémoire. XXXI. Descriptions d'espèces et de genres nouveaux de Madagascar et de Mayotte. Ann. Soc. ent. Fr., (6), 8: 223-236.

----- 1892-1903. Histoire Naturelle des Araignees. Deuxième édition, 2 tomes en 8 fascicules. 1(1) (pp. 1-256) (1892), 1(2) (pp. 257-488) (1893), 1(3) (pp. 489-760) (1894), 1(4) (pp. 761-1084) (1895a), 2(1) (pp. 1-192) (1897a), 2(2) (pp. 193-380) (1898a), 2(3) (pp. 381-668) (1901a), 2(4) (pp. 669-1080) (1903a). Roret, Paris.

----- 1895b. Description d'Arachnides nouveaux de la famille des Thomisidae. Ann. Soc. ent. Belg., 39: 432-443.

----- 1897b. Arachnides recueillis par M. M. Maindron à Kurrachee et à Matheran (près Bombay) en 1896. Bull. Mus. Hist. nat., Paris, for 1897: 289-297.

----- 1898b. Etudes arachnologiques 28^{e} mémoire. XLIV. Arachnides recueillis par M. Ch. Alluand à l'île Maurice en 1896. Ann. Soc. ent. Fr., 66: 276-281.

----- 1898c. Sur quelques Arachnides du Portugal appartenant au Musée de zoologie de l'Académie polytechnique de Porto. Ann. Sci. nat., Porto, 5: 92-102. (Non vidi.)

----- 1900. Arachnida. In Fauna Hawaiiensis or the Zoology of the Sandwich Isles, 2, pp. 443-519, pls. XV-XIX. London.

----- 1901b. Etude sur les Arachnides recueillis au cours de la Mission de Bonchamps à travers l'Ethiopie, de Djibouti au Nil blanc (1897-1898). Ann. Soc. ent. Fr., 70: 18-26.

----- 1901c. On the Arachnida collected during the "Skeat Expedition" to the Malay Peninsula, 1899-1900. Proc. zool. Soc. London, for 1901: 45-84.

----- 1903b. Etudes arachnologiques. 33^{e} mémoire. LIII. Arachnides recueillis à Phuc-Son (Annam) par M. H. Fruhstorfer (nov.-dec. 1899). Ann. Soc. ent. Fr., 71: 725-736.

----- 1903c. Descriptions de quelque genres nouveaux de l'ordre des Araneae. Bull. Soc. ent. Fr., for 1903: 123-124.

----- 1903d. Descriptions d'Arachnides nouveaux de Madagascar, faisant partie des collections du Muséum. Bull. Mus. Hist. nat., Paris, 9: 133-140.

----- 1905. Arachnides de Java, recueillis par le Prof. K. Kraepelin en 1904. Mitt. naturh. Mus. Hamburg, 22: 51-73.

----- 1906a. Voyage de M. Maurice Maindron dans l'Inde méridionale. 8^{e} mémoire. Arachnides (2^{e} partie). Ann. Soc. ent. Fr., 75: 279-314.

----- 1906b. Engebnisse der mit Subvention aus der Erbschaft Treitl unternommenen zoologischen Forschungsreise Dr. F. Werner's nach dem ägyptischen Sudan und Nord-Uganda. VII. Arachnida. Sitz.-ber. Akad. Wiss. Wien, 115: 1159-1176. (Non vidi.)

----- 1907. Arachnides recueillis par L. Fea sur la côte occidentale d'Afrique. 1re partie. Ann. Mus. civ. Stor. nat. Genova, (3), 3: 218-323.

----- 1908. Etude sur les Arachnides du Tonkin (1re partie). Bull. sci.

Fr. Belg., 42: 69-147.

----- 1910. Arachnoidea. Araneae (II). In Schultze, L., Zoologische und anthropologische Ergebnisse einer Forschungsreise im westlichen und zentralen Südafrika. Denkschr. med. naturw. Ges. Jena, 16: 175-218.

----- 1918. Notes sur la synonymie de plusieurs espèces de la famille des Thomisides. Bull. Soc. ent. Fr., for 1918: 51-52.

Soares, B.M., 1942. Alguns Thomisidas e um Salticidas novos do Brasil. Pap. Avuls. Dept. Zool. secr. Agr. Sao Paolo, 2: 255-265.

Sörensen, W., 1898. Arachnida Groenlandica (Acarius exceptis). Vid. Medd. naturh. Foren. Kjöbenhavn, for 1898: 176-235. (Non vidi.)

Song, D.-X., 1980. Thomisidae Sundevall 1833. In Zhu, C.D., et al., (eds.), Farm Spiders, pp. 188-199. Science Press, Beijing. (In Chinese.)

Song, D.-X., Z.-Q. Feng & J.-W. Shang, 1982. On the males of two species of crab spiders (Araneida: Thomisidae). Acta zootaxon. sin., 7: 257-259. (In Chinese with English descriptions.)

-----, ----- & S.-X. Zheng, 1979. The common species of Thomisidae in China. Zool. Mag., Beijing, for 1979: 16-19. (In Chinese.)

----- & M. Hubert, 1983. A redescription of the spiders of Beijing described by E. Simon in 1880. J. Huizhou Teach. Coll., Sci., for 1983, (2): 1-23. (In Chinese with English summary.)

----- & G.X. Liu, 1982. New records of Chinese spiders. Acta zootaxon. sin., 7: 449. (In Chinese.)

-----, S.-Y. Yu & J.-W. Shang, 1981. A preliminary note on spiders from Inner Mongolia. Acta Sci. nat. Univ. Intramongol., 12: 81-92. (In Chinese with English summary.)

Staveley, E.F., 1866. Birtish Spiders: an Introduction to the Study of the Araneidae of Great Britain and Ireland. 280 pp., 16 pls. L. Reeve, London.

Stoliczka, F., 1869. Contribution towards the knowledge of Indian Arachnoidea. J. asiat. Soc. Bengal, 38: 201-251.

Strand, E., 1906. Diagnosen nordafrikanischer, hauptsächlich von Carlo Freiherr von Erlanger gesammelter Spinnen. Zool. Anz., 30: 604-637, 655-690.

----- 1907a. Diagnosen neuer Spinnen aus Madagaskar und Sansibar. Ibid., 31: 725-748.

----- 1907b. Süd- und ostasiatische Spinnen. Abh. naturf. Ges. Görlitz, 25: 107-215.

----- 1918. Zur Kenntnis japanischer Spinnen, I. und II. Arch. Naturg., 82A(11): 73-113.

----- 1928. Miscellanea nomenclatorica zoologica et palaeontologica, I-II. Arch. Naturg., 92A(8): 30-75.

----- 1929. Zoological and palaeontological nomenclatorial notes. Acta Univ. Latv., Riga, 20(29): 1-29. (Non vidi.)

----- 1932. Miscellanea nomenclatorica zoologica et palaeontologica, III. Folia zool. hydrobiol., Riga, 4: 133-147.

----- 1934. Miscellanea nomenclatorica zoologica et palaeontologica, VI. Ibid., 6: 271-277.

----- 1942. Miscellanea nomenclatorica zoologica et palaeontologica, X. Ibid., 11: 386-402.

Suganami, Y., 1971. Spiders of Ibaragi Prefecture 1. Spiders from northern

part of Ibaragi Prefecture. Atypus, Osaka, (56): 14-37. (In Japanese.)

Suman, T.W., 1970. Spiders of the family Thomisidae in Hawaii. Pasif. Ins., Honolulu, 12: 773-864.

Sundevall, J.C., 1833. Conspectus Arachnidum. 39 pp. Londini Gothorum. (Non vidi.)

Suzuki, S., 1972. On the discontinuous distribution in some Opiliones. Acta arachnol., 24: 1-7. (In Japanese with English resume.)

Taczanowski, L., 1873. Les Araneides de la Guyane française. Horae Soc. ent. Ross., St. Pétersbourg, 9: 64-150, 261-286.

Takano, S., 1976. Observations of the spiders (5). Kishidaia, Hino, (40): 18-20. (In Japanese.)

Thorell, T., 1856. Recensio critica Aranearum Suecicarum, quas descripserunt Clerckius, Linnaeus, de Geerus. Nova Acta reg. Soc. sci. Upsal., (3), 2: 61-176. (Non vidi.)

----- 1869-'70a. On European spiders, part 1. Review of the European genera of spiders, preceded by some observations on zoological nomenclature. Ibid., (3), 7: 1-242. (pp. 1-108, 1869; pp. 109-242, 1870.)

----- 1870b-'73. Remarks on Synonyms of European Spiders. 645 pp. (pp. 1-96, 1870b; pp. 97-228, 1871; pp. 229-374, 1872; pp. 375-645, 1873.) C.J. Lundström, Upsala.

----- 1875a. Verzeichnis südrussischer Spinnen. Horae Soc. ent. Ross., St. Pétersbourg, 11: 39-122.

----- 1875b. Descriptions of several European and North African spiders.

Kongl. Svensk. Vet.-Akad. Handl., (N.F.), 13(5): 3-203.

——— 1877a. Due ragni escotici descritti dal Dott. T. Thorell. Ann. Mus. civ. Stor. nat., Genova, 9: 301-310.

----- 1877b. Studi sui ragni Malesi e Papuani. I. Ragni di Selebes raccolti nel 1874 dal Dott. O. Beccari. Ibid., 13: 1-317.

----- 1881. Studi sui ragni Malesi e Papuani, III. Ragni dell'Austro-Malesia e del Capo York, conservati nel Museo civico die Storia Naturale die Genova. Ibid., 17: vii-xxvii, 1-720.

----- 1887. Viaggio di L. Fea in Birmania e regioni vicini. II. Primo saggio sui ragni birmani. Ibid., (2), 5: 5-417.

----- 1890. Diagnoses Aranearum aliquot novarum en Indo-Malesia inventarum. Ibid., (2), 10: 132-172.

----- 1891. Spindlar från Nikobarerna och andra delar af Södra Asien, etc. Kongl. Svensk. Vet.- Akad. Handl., 24(2): 1-149.

----- 1892. Studi sui ragni Malesi e Papuani. IV, 2. Ann. Mus. civ. Stor. nat. Genova, 31: 1-490.

----- 1894. Decas Aranearum, in ins. Singapore a Cel. Th. Workman inventarum. Bull. Soc. ent. ital., 26: 321-355.

----- 1895. Descriptive Catalogue of the Spiders of Burma. 406 pp. British Museum, London.

Tikader, B.K., 1960. On some new species of spiders (Arachnida) of the family Thomisidae. J. Bonbay nat. Hist. Soc., 57: 173-183.

----- 1962. Studies on some Indian spiders (Araneae: Arachnida). J. linn. Soc. London, Zool., 44: 561-584.

----- 1963. Studies on interesting South Indian crab-spiders (family: Thomisidae). Proc. Ind. Acad. Sci., Bangalore, 58: 249-262.

----- 1966. Studies on some crab-spiders (family Thomisidae) from Khasi and Jainta Hills, Assam, India. Ibid., 64: 53-61.

----- 1970. Spider fauna of Sikkim. Rec. Ind. Mus., Calcutta, 64: 1-83.

----- 1971. Revision of Indian crab spiders (Araneae: Thomisidae). Mem. Ind. Mus., Calcutta, 15: 1-90.

----- 1980. Thomisidae (crab-spiders). The Fauna of India, 1(1), pp.1-247. Zool. Surv. Ind., Calcutta.

Tikuni (=Chikuni), Y., 1955. Five interesting spiders from Japan Highlands. Acta arachnol., 14: 29-40. (In Japanese.)

Tollitt, M.E. 1986. Dates and authorship of the text volumes of the Histoire Naturelle Section of Savigny's Description de l'Egypte. N.Z.(S.) 2515. Bull. zool. Nom., 43: 107-111.

Tullgren, A., 1944. Krabbspindler. Thomisidae. Svensk Spindelfauna, 3, pp.64-102, pls. VII-XIV. Stockholm.

Turnbull, A.L., C.D. Dondale & J.H. Redner, 1965. The spider genus Xysticus C.L.Koch (Araneae: Thomisidae) in Canada. Can. Ent., 97: 1233-1280.

Tyshchenko, V.P., 1971. Opredelitel' Paukov Evropejskoj Casti SSSR. 281 pp. Lenningrad.

Uéno, M., 1973. Nippon-Hakubutsugaku-Shi. xiii + 680 + 73 pp. Heibonsha, Tokyo. (In Japanese.)

Uéno, S.-I., 1980. The anophthalmic trechine beetles of the group of Trechiama ohshimai. Bull. natn. Sci. Mus., Tokyo, 6: 195-274.

Utochkin, A.S., 1960a. Spiders belonging to the genus Synaema, the group

plorator (O.P. Cambri.) in the USSR. Zool. Zh., 39: 375-380.

----- 1960b. Spiders of the genus Synaema, the group globosum (F.) in the USSR. Ibid., 39: 1018-1024.

----- 1968. Pauki Roda Xysticus Fauni SSSR. Opredelitel, Uchebnoe Posobie. 73 pp. Universitet, Perm.

Uyemura, T., 1934. Kumorui Zusetsu (1). Kishû Dôshokubutsu, Shirahama, 1(2): 16-20. (In Japanese.)

----- 1935. Thomisid and Theridiid spiders from Wakayama-ken, Nippon. Ibid., 2(2): 26-28. (In Japanese.)

----- 1936. Habits of some interesting spiders. Rika-Kyôiku, Tokyo, 5(7): 2-8. (In Japanese.)

----- 1937. Two new spiders from Mt. Amagi, Izu Province. Acta arachnol., 2: 150-156. (In Japanese.)

----- 1965. On spiders from Hachijo Island, the most southern of the Seven Islands of Izu, Japan. J.Jônan High Scho., Tokyo, 2: 19-26. (In Japanese with English summary.)

Vilbaste, A., 1969. Eesti Ämblikud, 1. Krabiämbliklased (Xysticidae), Jooksikämbliklased (Philodromidae) ja Hüpikämbliklased (Salticidae). 224 pp. Kirjastus Valgus, Tallinn.

Vinson, A., 1863. Aranéides des îles de la Réunion, Maurice et Madagascar. cxx + 337 pp, 14 pls. Paris.

Walckenaer, C.A., 1802. Araignées. In Faune Parisienne, Insectes ou Histoire Abrégée des Insectes des Environs de Paris, 2, pp. 187-250. Paris. (Non vidi.)

----- 1805. Tableau des Araneides ou Caractères Essentiels des Tribus,

Genres, Familles et Races que Renferme le Genre Aranea de Linné, avec la Désignation des Espèces Comprises dans Chacune de ces Divisions. xii + 88 pp., 1 tab., 9 pls. Paris.

----- 1826-'30. Aranéides. In Faune Française ou Histoire Naturelle Générale et Particulière des Animaux qui se Trouvent en France, (livre 11-12) (1826), (27, 29) (1830). Paris.

----- 1837-'47. Araignées. In Histoire Naturelle des Insectes. Aptères, 1 (pp. 1-682) (1837), 2 (pp. 1-549) (1842), 4 (pp. 1-623) (1847). Paris.

Walker, F., 1854-'60. Bassania, Apyre. In List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, (2) (p. 490) (1854), (20) (p. 269) (1860). British Museum, London. (Non vidi.)

Wang, F.Z., & C.D. Zhu, 1963. A list of spiders of China. Jilin Yike Daxue, Xue Bao, 5: 381-459. (In Chinese.)

Wiehle, H., 1965. Die Clubiona-Arten Deutschlands, ihre natürliche Gruppierung und die Einheitlichkeit im Bau ihrer Vulva (Arach., Araneae). Senckenbergiana biol., 46: 471-505.

Workman, T., 1892-'99. Malaysian Spiders. (1) (pp. 1-8, pls. I-VIII) (1892), (2-3) (pp. 9-24, pls. IX-XXIV) (1894), (4-10) (pp. 25-80, pls. XXV-LXXX) (1896), (11-13) (pp. 81-104, pls. LXXXI-CIV) (1897), (14-15) (pp. 105-120, pls. CV-CXX) (1899). Priv. Publ., Belfast.

Wunderlich, J., 1986. Spinnenfauna gestern und heute, fossile Spinnen in Bernstein und ihre heute lebenden Verwandten. 283 pp. Erich Bauer, Wiesbaden.

Yaginuma, T., 1953. A list of spiders recorded from Japan (3). Atypus, Osaka, (4): 9-16. (In Japanese.)

----- 1956. Synopsis of Japanese spiders (5). Ibid., (10): 25-32. (In Japanese.)

----- 1957. Spiders from Hokkaido and Rishiri Island. Acta arachnol., 14: 51-61. (In Japanese.)

----- 1960. Spiders of Japan in Colour. 186 pp., 56 pls. Hoikusha, Osaka. (In Japanese.)

----- 1961a. Revision of Families, Genera and Species of Japanese Spiders. 45 pp. Arachnol. Soc. East Asia, Osaka. (In Japanese.)

----- 1961b. A historical review of studies on Japanese spiders. Acta arachnol., 17: 39-48.

----- 1962. The Spider Fauna of Japan. 74 + 18 pp., 2 pls. Arachnol. Soc. East Asia, Osaka.

----- 1966. Spiders of Mishima Island, Yamaguchi Prefecture. Yamaguchi-ken-no Shizen, Yamaguchi, (15): 8-11. (In Japanese.)

----- 1967. Revision and new addition to fauna of Japanese spiders, with descriptions of seven new species. Lit. Dept. Rev. Otemon-Gakuin Univ., Ibaraki, (1): 87-107. (In Japanese with English descriptions.)

----- 1968. Spiders of Japan in Colour, (enl. rev. ed.). 197 pp., 56 pls. Hoikusha, Osaka. (In Japanese.)

----- 1969. The Honshu southern coastal line viewed from the distribution of spiders. Nat. & Ins., Tokyo, 4(11): 2-5. (In Japanese.)

----- 1970. The spider fauna of Japan (revised in 1970). Bull. natn. Sci.

Mus., Tokyo, 13: 639-701. (In Japanese with English summary.)

----- 1977. A list of Japanese spiders (revised in 1977). Acta arachnol., 27 (spec. no.): 367-406. (In Japanese with English synopsis.)

----- 1978. On availability of some scientific names of Japanese spiders. Atypus, Osaka, (73): 3-13. (In Japanese.)

----- 1986. Spiders of Japan in Color, (n. ed.). 305 pp., 64 pls. Hoikusha Osaka. (In Japanese.)

----- & T. Arita, 1966. A gynandromorph of a crab spider, Xysticus insulicola Boes. et Str. from Japan. Acta arachnol., 20: 18-20. (In Japanese with English summary.)

----- & Z.-G. Wen, 1983. Chinese and Japanese spiders II. Fac. Let. Rev. Otemon-Gakuin Univ., Ibaraki, (17): 187-205. (In Japanese.)

-----, T. Yamaguchi & Y. Nishikawa, 1976. Spiders of the Tsushima Islands. In Fauna and Flora of the Tsushima Islands, pp. 823-837. Nagasaki. (In Japanese.)

Yuhara, S., 1931. Study of Spiders. 305 pp. Sôgôkagaku Shuppan Kyôkai, Tokyo. (In Japanese.)

Zhao, J.-Z., F.-X. Liu & W.H. Chen, 1980. Preliminary studies of the life history of Misumenops tricuspidatus and its control of cotton pests. Acta zool. sin., Beijing, 26: 255-261. (In Chinese.)

Zhou, N.L., H. Wang & C.D. Zhu, 1983. Spiders from Xinjiang Uygur Zizhiqu and Heilongjiang Sheng, newly recorded to the Chinese fauna. J. Bethune med. Univ., for 1983, Suppl.: 153-160. (In Chinese.)

Zhu, C.D., 1983. A list of Chinese spiders (revised in 1983.) Ibid., for 1983, Suppl.: 1-130. (In Chinese.)

——— & F.Z. Wang, 1963. The Thomisidae of China (1). Jilin Yike Daxue, Xue Bao, 5: 471-488. (In Chinese.)

——— & Z.G. Wen, 1981. Chinese spiders of genus Tmarus (Araneae: Thomisidae). J. Bethune med. Univ., 7(4): 24-27, 47. (In Chinese.)

Zhu, M.-S., 1983. Thomisidae Sundevall, 1833. In Yang, B.-Q., M.-S. Zhu & J.-G. Shi, (eds.), Spiders of the Paddy Fields in Shanxi, 1, pp. 167-198. Shanxi Univ. Agr., Taiyuan. (In Chinese.)

Explanation of Figures

Figs. 1-5. External and internal features of thomisid spider. 1. Body. 2. Eyes. --- Left, frontal view; right, dorsal view. 3. Male palp. --- Left, ventral view; right, retrolateral view. 4. Female genitalia. 5. Spiniformations of legs.

Figs. 6-10. Cupa typica Bösenberg et Strand, 1906. --- 6. Eyes, frontal view. 7. Eyes, dorsal view. 8. Chelicerae, ventral view. 9. Maxillae and labium, ventral view. 10. Epigynum. (Scale: 0.1mm.)

Figs. 11-17. Phrynarachne ceylonica (O. Pickard-Cambridge, 1884). --- 11. Pro- and opisthosomata of female, dorsal view. 12. Head of female, frontal view. 13. Epigynum. 14. Female genitalia, dorsal view. 15. Pro- and opisthosomata of male, dorsal view. 16. Male palp, ventral view. 17. Same, retrolateral view. (Scale: 0.5mm.)

Figs. 18-26. Phrynarachne katoi Tikuni, 1955. --- 18. Pro- and opisthosomata of female, dorsal view. 19. Head of female, frontal view. 20. Spine of leg I. 21. Tubercle of opisthosoma. 22. Epigynum. 23. Female genitalia, dorsal view. 24. Pro- and opisthosomata of male, dorsal view. 25. Male palp, ventral view. 26. Same, retrolateral view. (Scale: 0.3mm.)

Figs. 27-33. Loxobates daitoensis sp. nov. --- 27. Pro- and opisthosomata of female, dorsal view. 28. Epigynum. 29. Female genitalia, dorsal view. 30. Pro- and opisthosomata of male, dorsal view. 31. Male palp, ventral view. 32. Same, retrolateral view. 33. Tibia of male palp, dorsal view. (Scale: 0.3mm.)

Figs. 34-45. Alcimochthes limbatus Simon, 1885. --- 34, 37, 40, 43. Pro- and opisthosomata, dorsal view. 35. Prosoma lateral view. 36, 38. Epigynum. 39. Female genitalia, dorsal view. 41. Male palp, ventral view. 42. Same, retrolateral view. 44. Tibia of male palp, retrolateral view. 45. Apical part of embolus, retrolateral view. (34-36, female syntype; 37-39, female from Japan; 40-42, male syntype; 43-45, male from Japan.) (Scale: 0.3mm.)

Figs. 46-47. Tmarus hanrasanensis Paik, 1973. --- 46. Pro- and opisthosomata of female, dorsal view. 47. Female genitalia, dorsal view. (Scale: 0.5mm.)

Figs. 48-50. Tmarus yaginumai Ono, 1977. --- 48. Pro- and opisthosomata of female, dorsal view. 49. Epigynum. 50. Female genitalia, dorsal view. (Scale: 0.5mm.)

Figs. 51-53. Tmarus makiharai sp. nov. --- 51. Male palp, ventral view. 52. Tibia of male palp, retrolateral view. 53. DTA of male palp, retrolateral view. (Scale: 0.5mm.)

Figs. 54-60. Coriarachne fulvipes (Karsch, 1879). --- 54. Pro- and opisthosomata of female, dorsal view. 55. Same, lateral view. 56. Epigynum. 57. Female genitalia, dorsal view. 58. Pro- and opisthosomata of male, dorsal view. 59. Male palp, ventral view. 60. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 61-63. Xysticus jacuticus Utochkin, 1968. --- 61. Pro- and opisthosomata of male, dorsal view. 62. Male palp, ventral view. 63. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 64-68. Xysticus rostratus sp. nov. --- 64. Epigynum. 65. Female

genitalia, dorsal view. 66. Pro- and opisthosomata of male, dorsal view. 67. Male palp, ventral view. 68. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 69-72. Xysticus daisetsuzanus sp. nov. --- 69. Epigynum. 70. Female genitalia, dorsal view. 71. Male palp, ventral view. 72. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 73-75. Xysticus albidus Grese, 1909. --- 73, 74. Epigynum. 75. Female genitalia, dorsal view. (Scale: 0.25mm.)

Figs. 76-79. Xysticus croceus Fox, 1937. --- 76. Epigynum. 77. Female genitalia, dorsal view. 78. Male palp, ventral view. 79. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 80-85. Xysticus ephippiatus Simon, 1880. --- 80. Pro- and opisthosomata of female syntype, dorsal view. 81. Epigynum. 82. Female genitalia, dorsal view. 83. Pro- and opisthosomata of male, dorsal view. 84. Male palp, ventral view. 85. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 86-87. Xysticus dichotomus Paik, 1973. --- 86. Male palp, ventral view. 87. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 88-91. Xysticus insulicola Bösenberg et Strand, 1906. --- 88. Epigynum. 89. Female genitalia, dorsal view. 90. Male palp, ventral view. 91. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 92-94. Xysticus transversomaculatus Bösenberg et Strand, 1906. --- 92. Pro- and opisthosomata of female, dorsal view. 93. Epigynum. 94. Female genitalia, dorsal view. (Scale: 0.25mm.)

Figs. 95-100. Xysticus saganus Bösenberg et Strand, 1906. --- 95. Pro- and

opisthosomata of female, dorsal view. 96. Epigynum. 97. Female genitalia, dorsal view. 98. Pro- and opisthosomata of male, dorsal view. 99. Male palp, ventral view. 100. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 101-107. Xysticus trizonatus sp. nov. --- 101. Pro- and opisthosomata of female, dorsal view. 102. Epigynum. 103. Female genitalia, dorsal view. 104. Pro- and opisthosomata of male, dorsal view. 105. Male palp, ventral view. 106. Same, retrolateral view. 107. Tegular apophyses of male palp, ventral view. (Scale: 0.25mm.)

Figs. 108-116. Xysticus kurilensis Strand, 1907. --- 108. Pro- and opisthosomata of female, dorsal view. 109-110. Epigynum. (109, Hokkaicho; 110, Gifu). 111-116. Tegular apophyses of male palp, ventral view (111, 112, Hokkaido; 113, Aomori; 114, Fukushima; 115, Nagano; 116, Chiba). (Scale: 0.25mm.)

Figs. 117-122. Xysticus audax (Schrank, 1803). --- 117. Pro- and opisthosomata of female, dorsal view. 118. Epigynum. 119. Female genitalia, dorsal view. 120. Pro- and opisthosomata of male, dorsal view. 121. Male palp, ventral view. 122. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 123-125. Xysticus bifidus Paik, 1973. --- 123. Pro- and opisthosomata of male, dorsal view. 124. Male palp, ventral view. 125. Same, retrolateral view. (Scale: 0.25mm.)

Fig. 126. Oxyptila nipponica Ono, 1985, pro- and opisthosomata of female (Scale: 0.1mm.)

Figs. 127-130. Oxyptila sincera Kulczyński, 1926. --- 127. Epigynum. 128.

Female genitalia, dorsal view. 129. Male palp, ventral view. 130. Same, retrolateral view. (Scale: 0.1mm.)

Figs. 131-136. Oxyptila matsumotoi sp. nov. --- 131. Pro- and opisthosomata of female, dorsal view. 132. Epigynum. 133. Female genitalia, dorsal view. 134. Pro- and opisthosomata of male, dorsal view. 135. Male palp, ventral view. 136. Same, retrolateral view. (Scale: 0.1mm.)

Figs. 137-139. Lysiteles okumae Ono, 1980. --- 137. Pro- and opisthosomata of male, dorsal view. 138. Male palp, ventral view. 139. Same, retrolateral view. (Scale: 0.1mm.)

Figs. 140-142. Lysiteles miniatus Ono, 1980. --- 140. Pro- and opisthosomata of male, dorsal view. 141. Male palp, ventral view. 142. Same, retrolateral view. (Scale: 0.1mm.)

Figs. 143-154. Synaema globosum (Fabricius, 1775). --- 143. Prosoma of female, dorsal view. 144. Same, frontal view. 145. Opisthosoma of female, dorsal view. 146. Opisthosoma of male, dorsal view. 147, 149. Epigynum. 148, 150. Female genitalia, dorsal view. 151, 153. Male palp, ventral view. 152, 154. Same, retrolateral view. (143-148, 151-152, from Turkey; 149-150, 153-154, from Japan.) (Scale: 0.25mm.)

Figs. 155-160. Misumenops japonicus (Bösenberg et Strand, 1906). --- 155. Pro- and opisthosomata of female, dorsal view. 156. Epigynum. 157. Female genitalia, dorsal view. 158. Pro- and opisthosomata of male, dorsal view. 159. Male palp, ventral view. 160. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 161-166. Misumenops tricuspidatus (Febricius, 1775). --- 161. Pro- and

opisthosomata of female, dorsal view. 162. Epigynum. 163. Female genitalia, dorsal view. 164. Pro- and opisthosomata of male, dorsal view. 165. Male palp, ventral view. 166. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 167-171. Heriaeus mellottei Simon, 1886. --- 167. Epigynum. 168. Female genitalia, dorsal view. 169. Pro- and opisthosomata of male, dorsal view. 170. Male palp, ventral view. 171. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 172-177. Misumena vatia (Clerck, 1758). --- 172. Pro- and opisthosomata of female, dorsal view. 173. Epigynum. 174. Female genitalia, dorsal view. 175. Pro- and opisthosomata of male, dorsal view. 176. Male palp, ventral view. 177. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 178-183. Runcinia albostriata Bösenberg et Strand, 1906. --- 178. Pro- and opisthosomata of female, dorsal view. 179. Epigynum. 180. Female genitalia, dorsal view. 181. Pro- and opisthosomata of male, dorsal view. 182. Male palp, ventral view. 183. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 184-189. Runcinia acuminata (Thorell, 1881). --- 184. Pro- and opisthosomata of female, dorsal view. 185. Epigynum. 186. Female genitalia, dorsal view. 187. Pro- and opisthosomata of male, dorsal view. 188. Male palp, ventral view. 189. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 190-198. Thomisus labefactus Karsch, 1881. --- 190, 193. Pro- and opisthosomata of female, dorsal view. 191, 195. Female genitalia,

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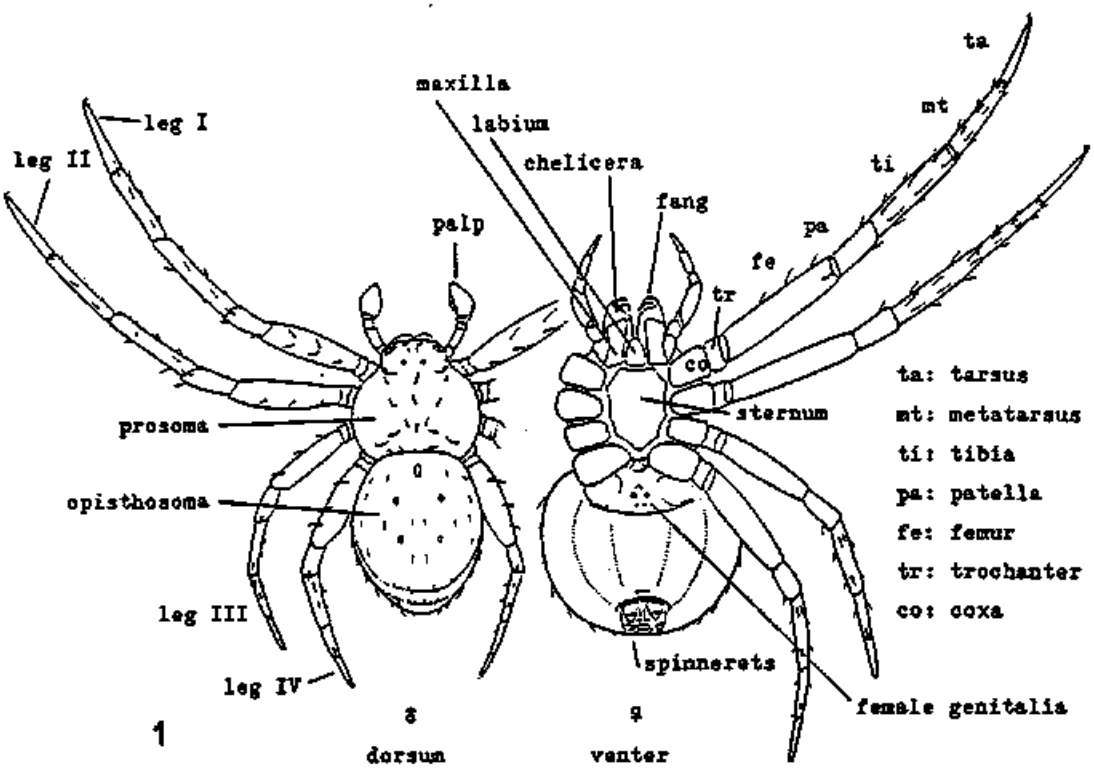
Figs. 199-204. Thomisus kitamurai Nakatsudi, 1943. --- 199. Pro- and opisthosomata of female, dorsal view. 200. Epigynum. 201. Female genitalia, dorsal view. 202. Pro- and opisthosomata of male, dorsal view. 203. Male palp, ventral view. 204. Same, retrolateral view. (Scale: 0.25mm.)

Figs. 205-214. Thomisus okinawensis Strand, 1907. --- 205, 207. Pro- and opisthosomata of female, dorsal view. 206-208. Epigynum. 209. Female genitalia, dorsal view. 210. Pro- and opisthosomata of male, dorsal view. 211. Prosoma of male, frontal view. 212. Male palp, ventral view. 213. Same, retrolateral view. 214. Tibia of male palp, dorsal view. (207-209, holotype: 205-206, from Taiwan.) (Scale: 0.25mm.)

Fig. 215. Division of Japan into seven zoogeographically specified regions on the basis of distribution of thomisid spiders; for explanation of abbreviations, see text.

Figs. 216-222. Distribution of thomisid spiders in Japan. 216. Xysticus daisetsuzanus sp. nov. and the relatives. 217. Oxyptila species. 218. Lysiteles species. 219. Xysticus ephippiatus. 220. Species of the group of Tmarus stellio. 221. Runcinia species. 222. Thomisus species.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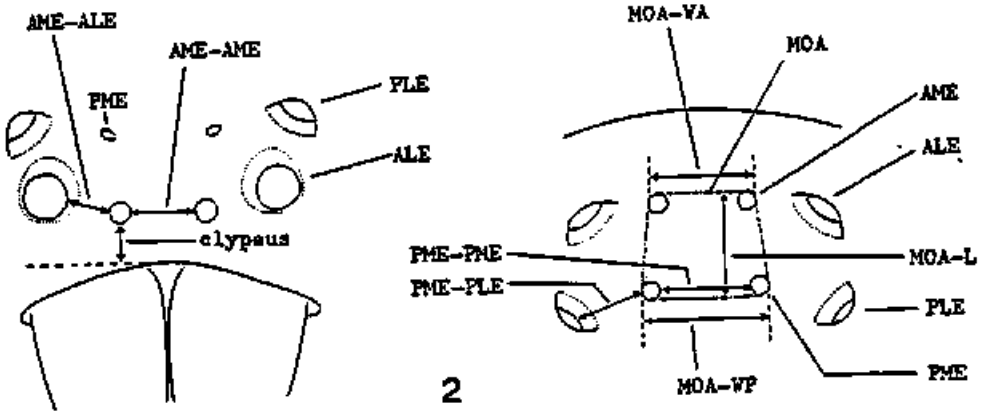
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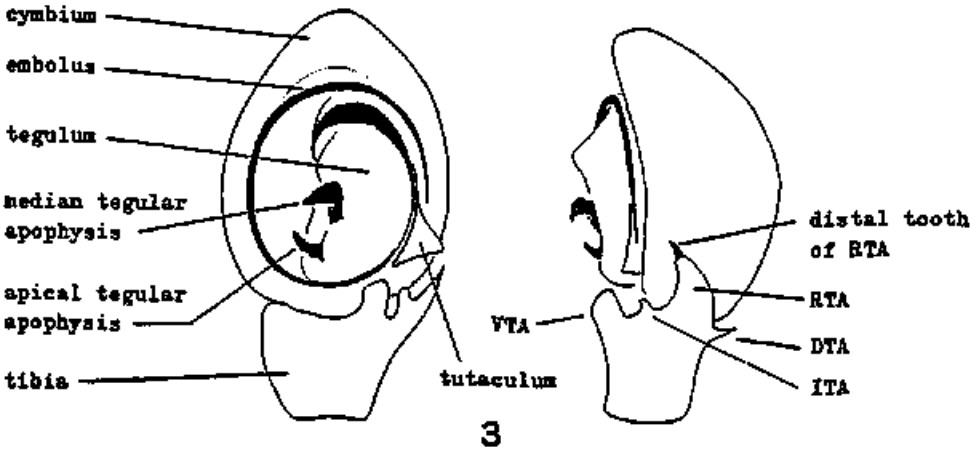
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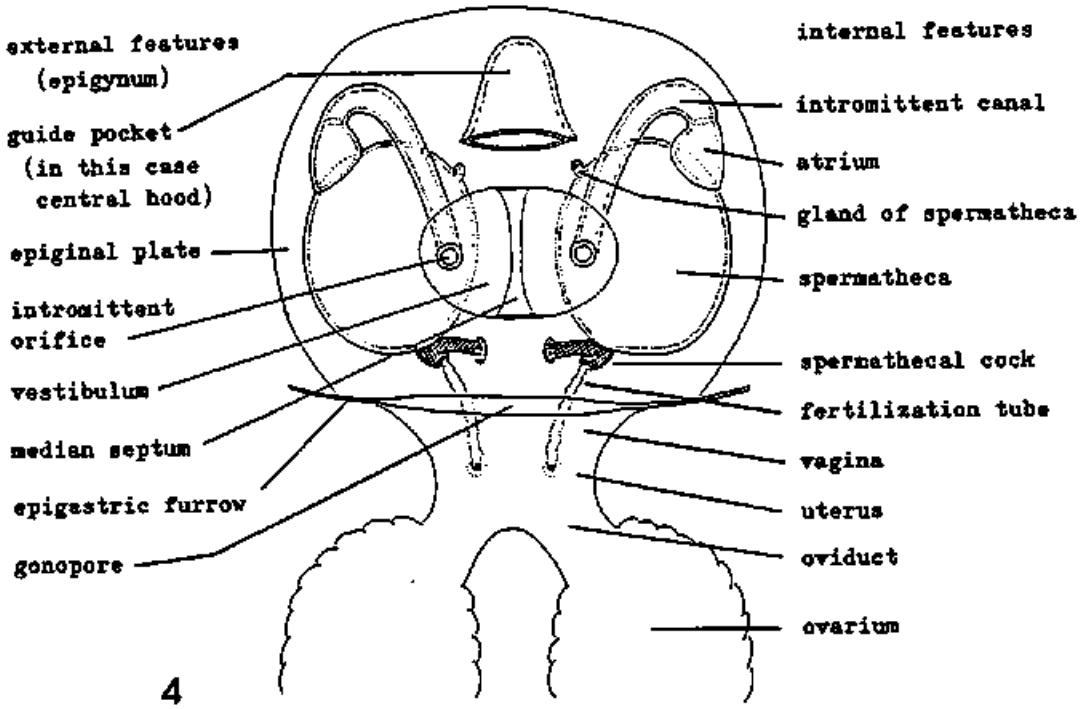
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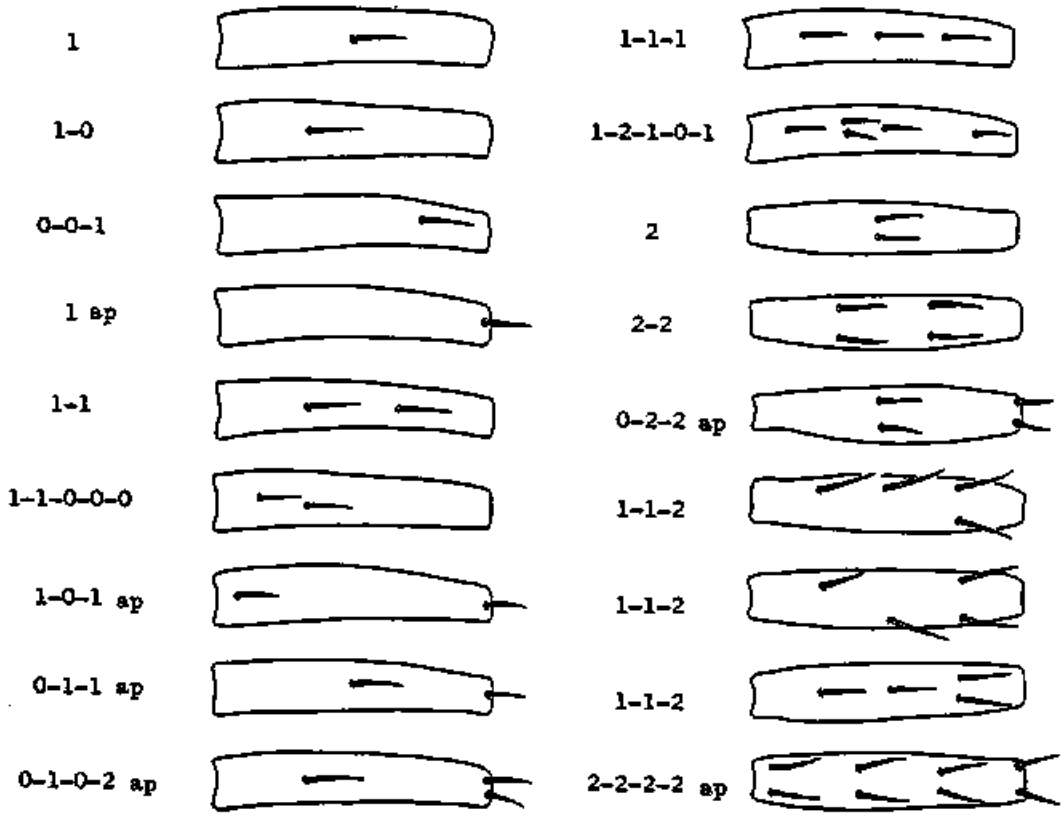
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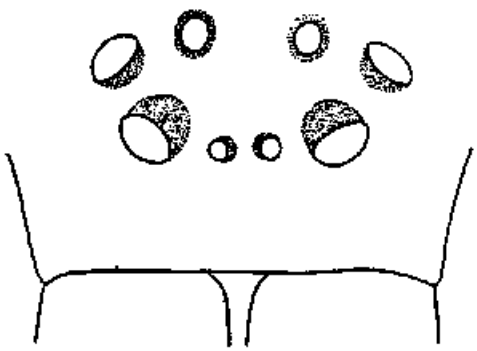

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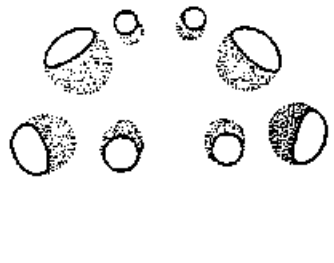

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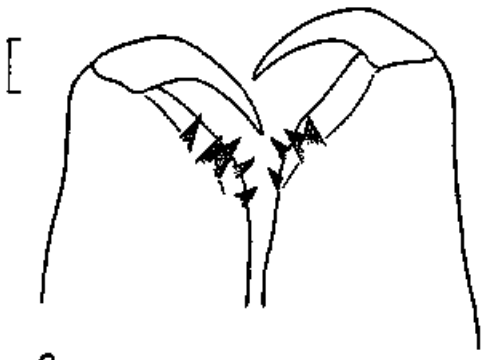

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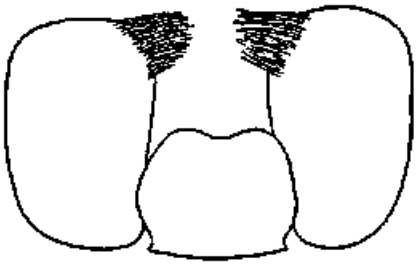

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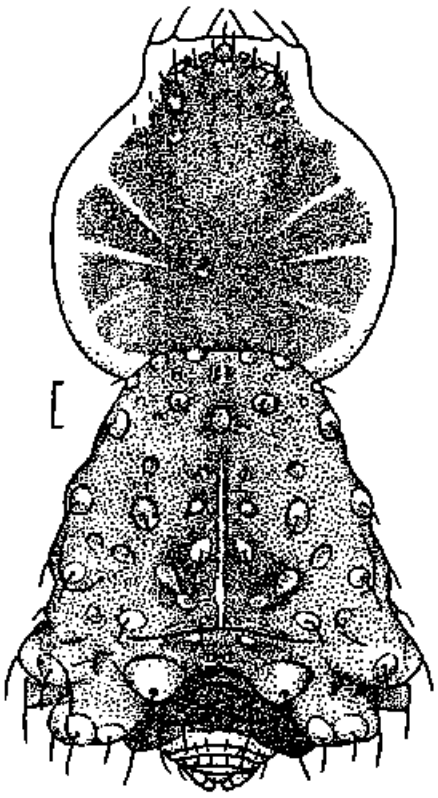

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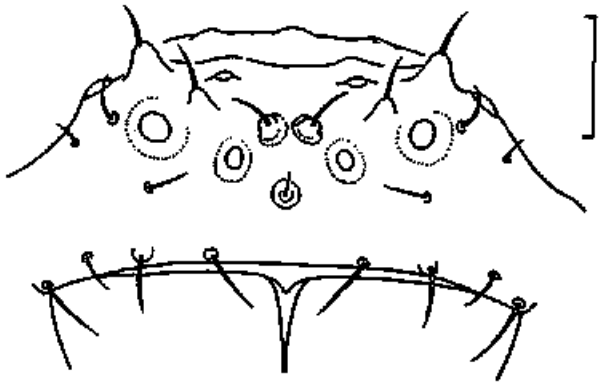

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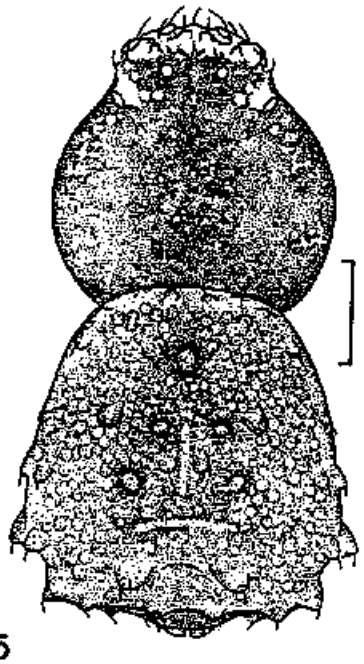

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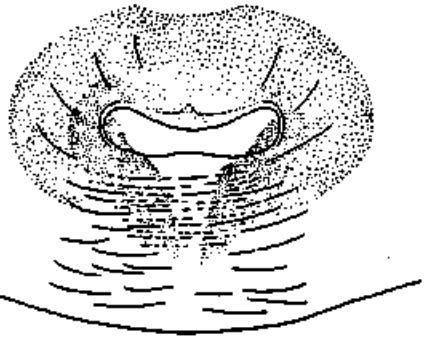

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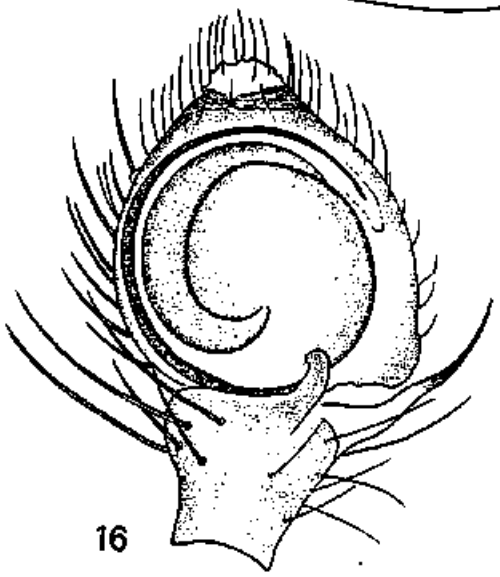

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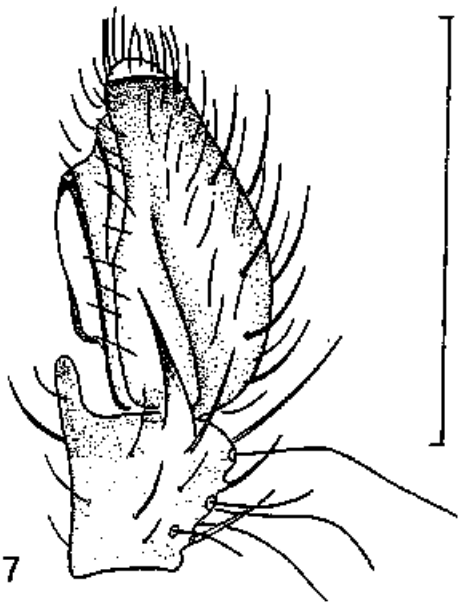

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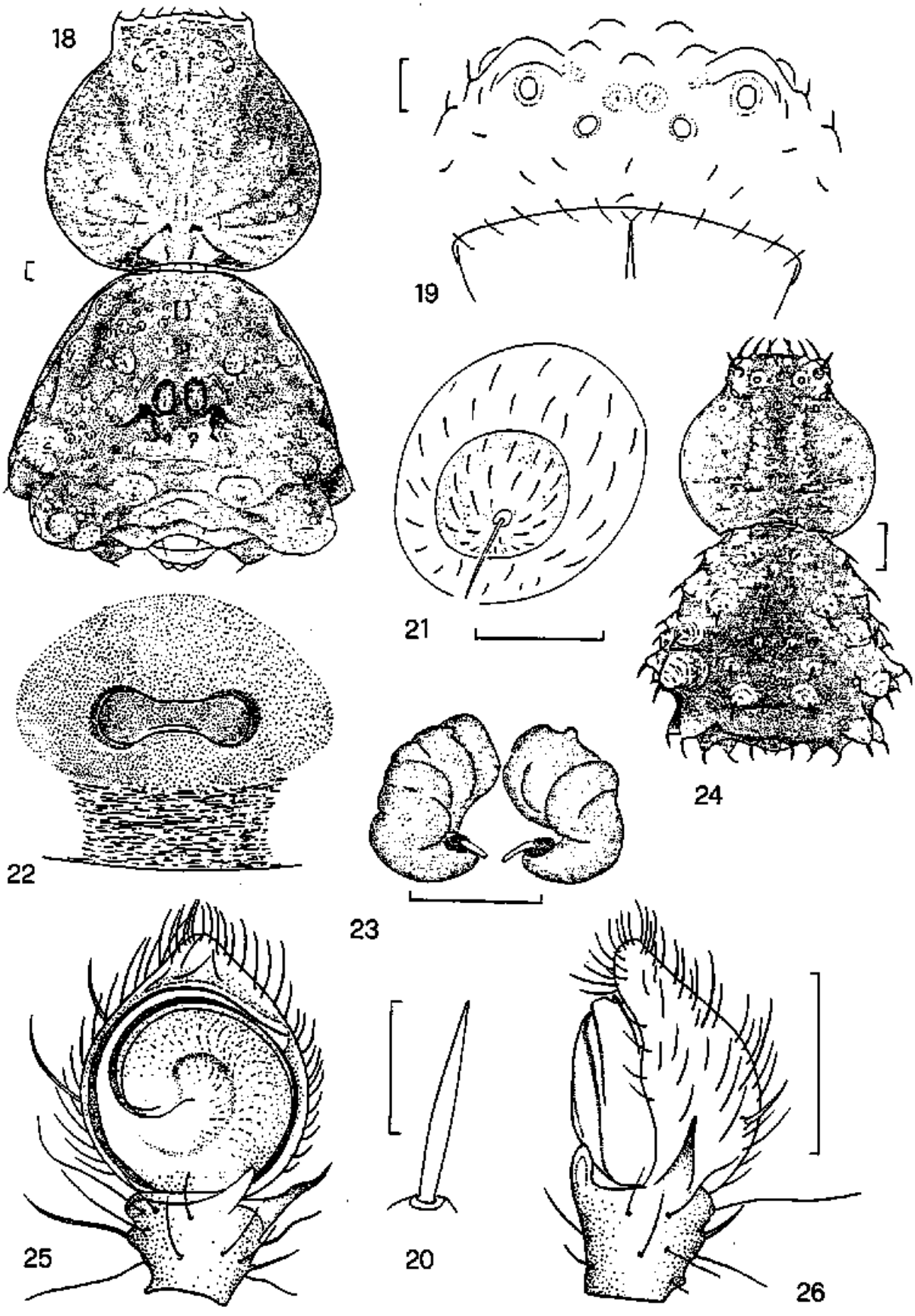
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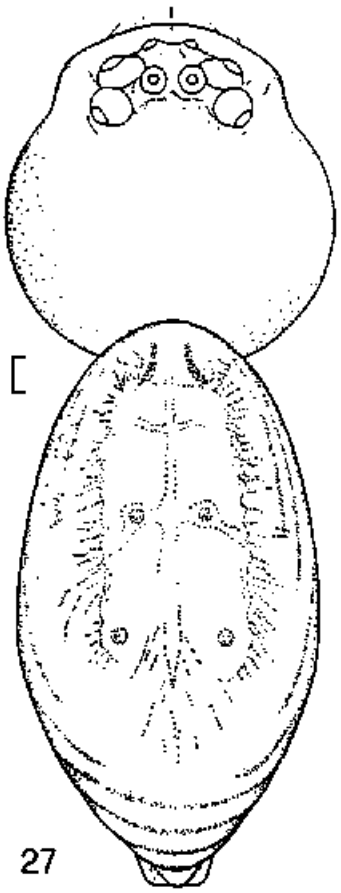

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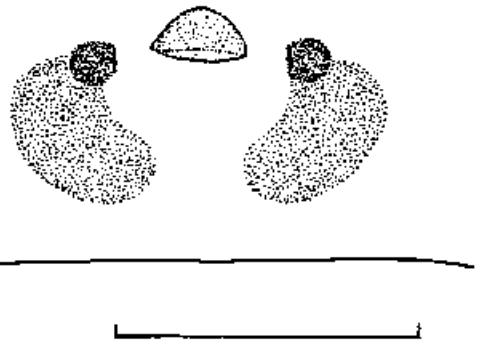

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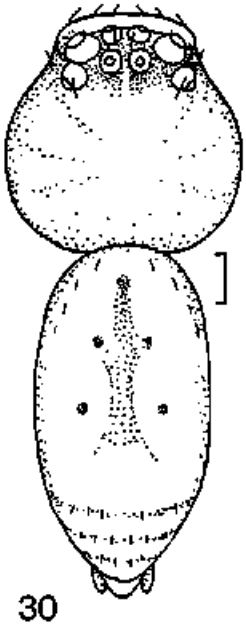

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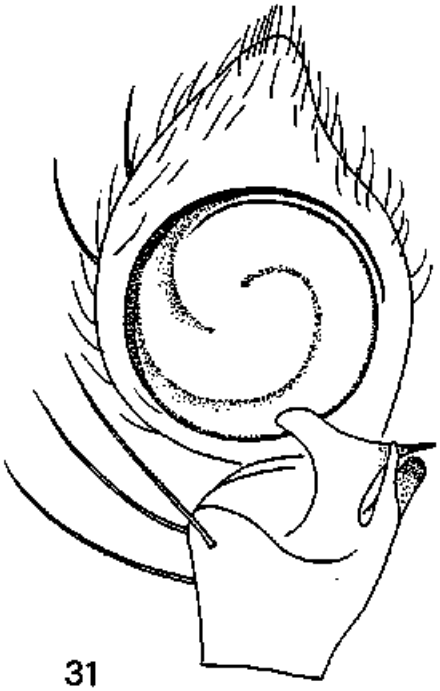

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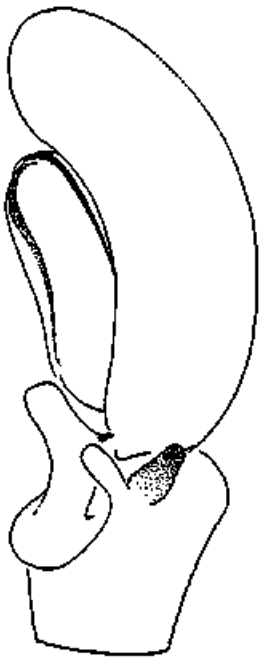

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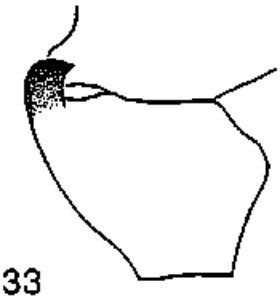

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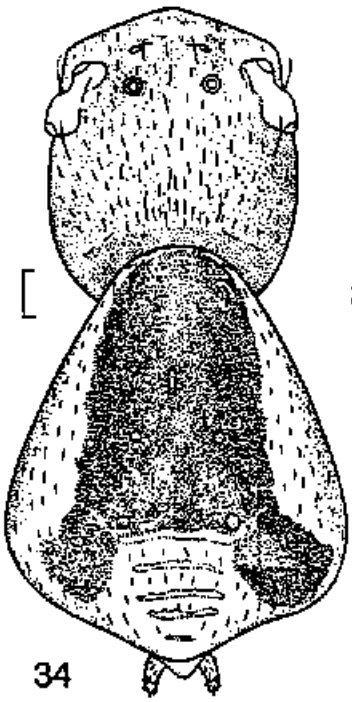

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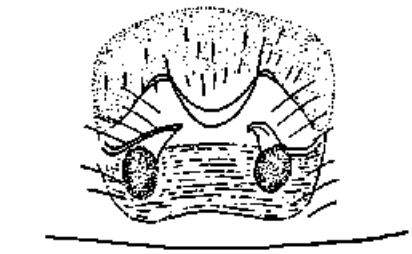

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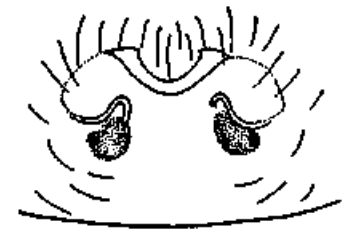

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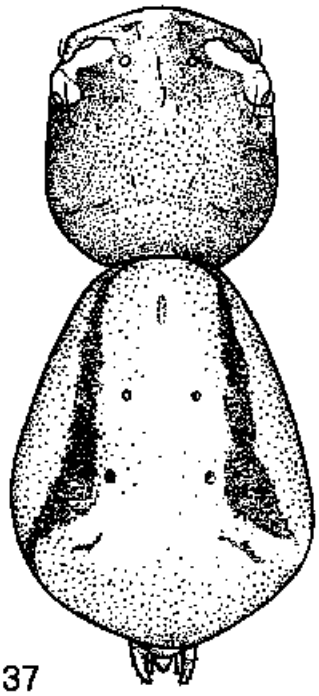

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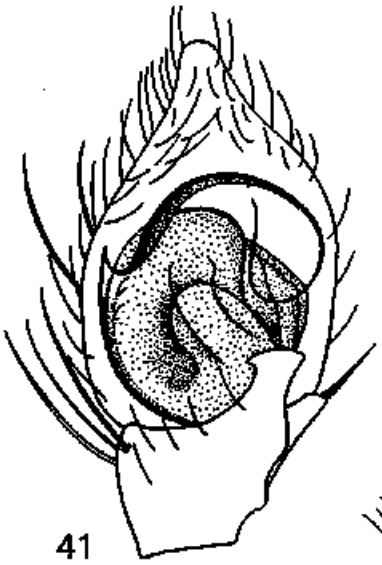

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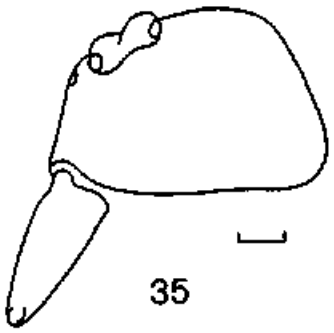

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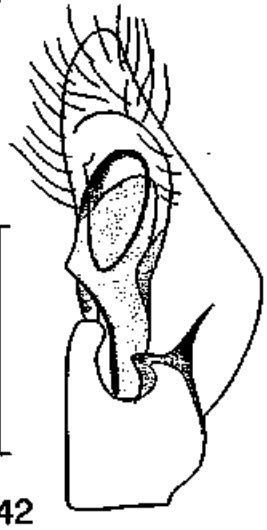

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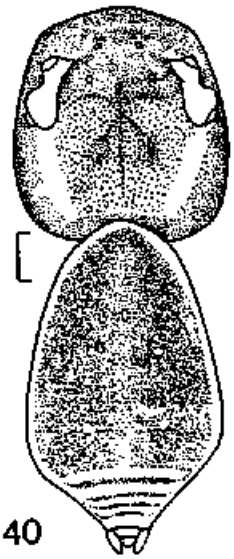

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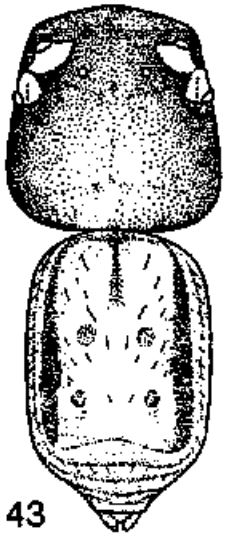

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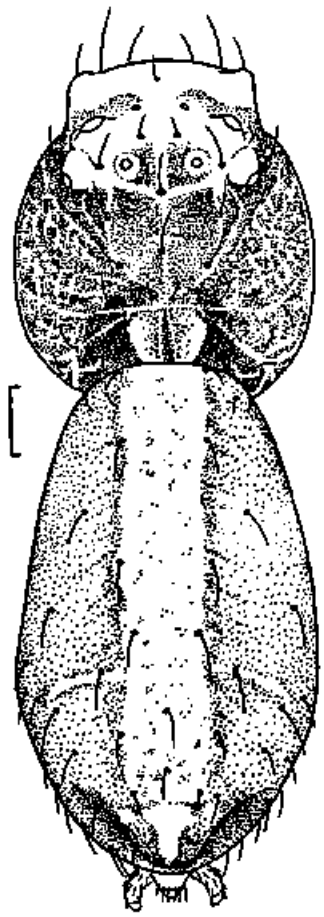

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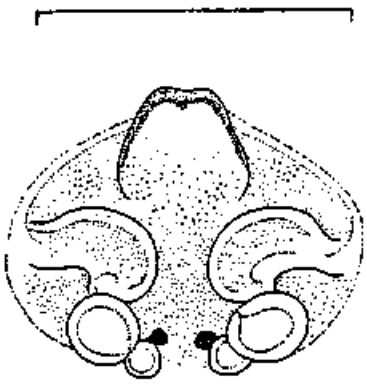

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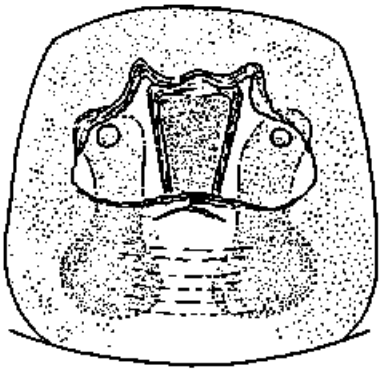

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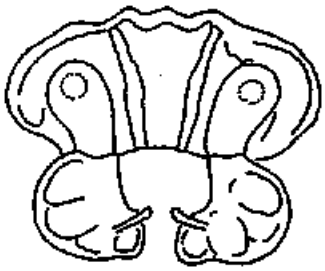

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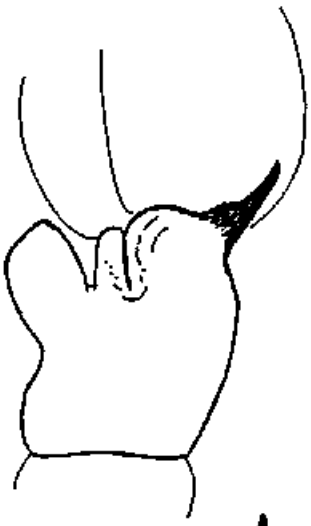

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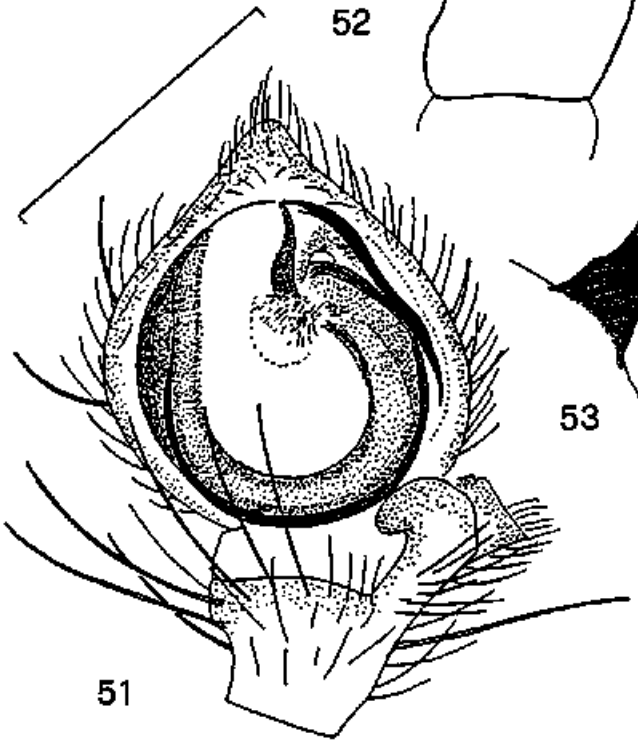

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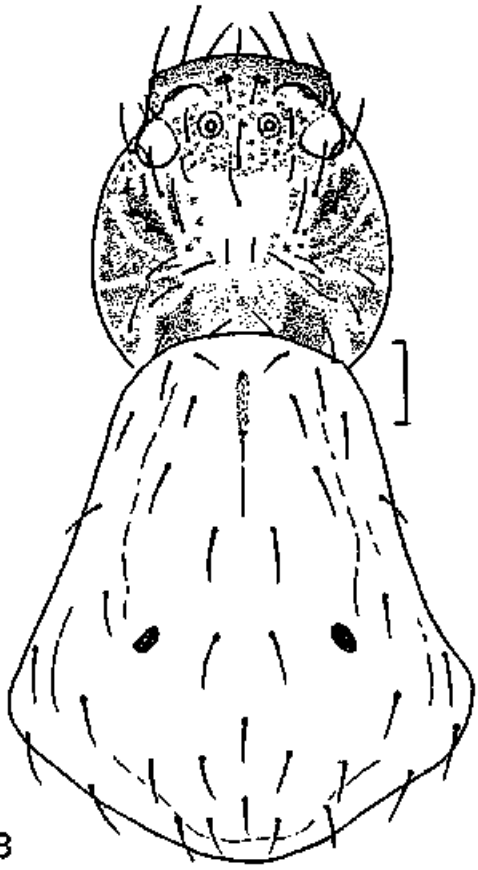

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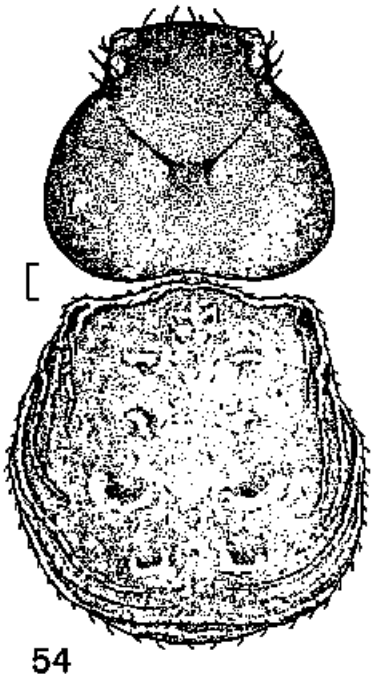

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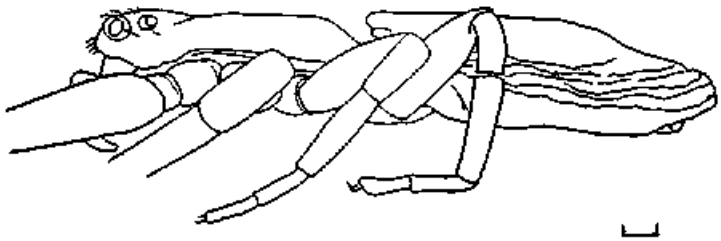

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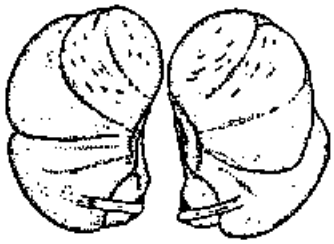

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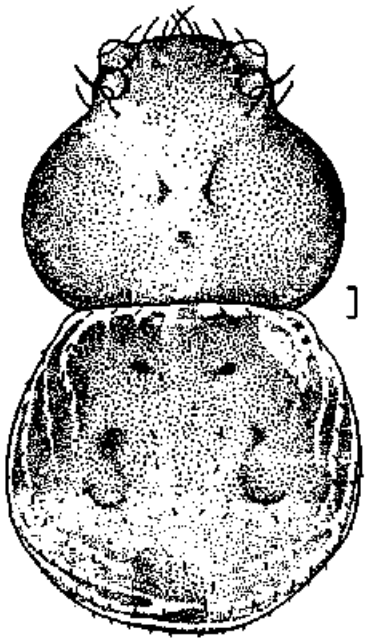

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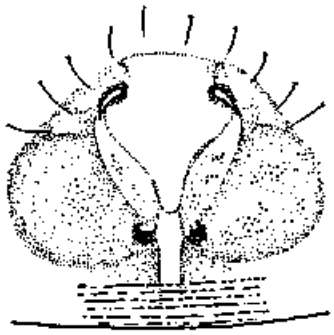

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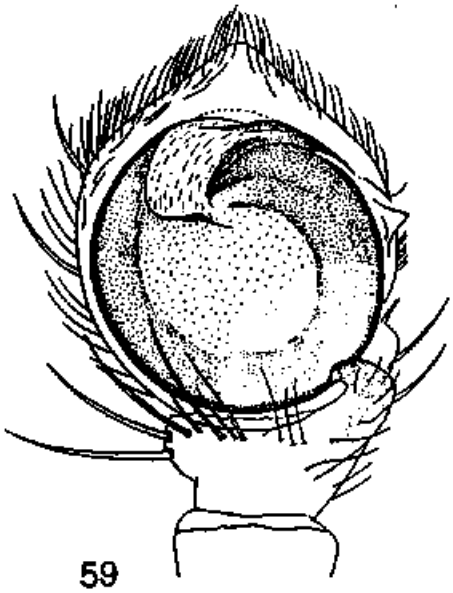

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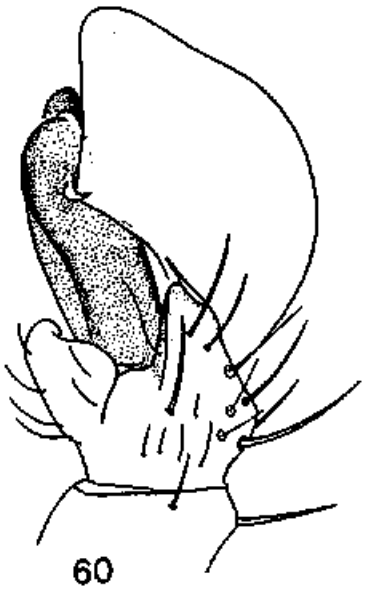

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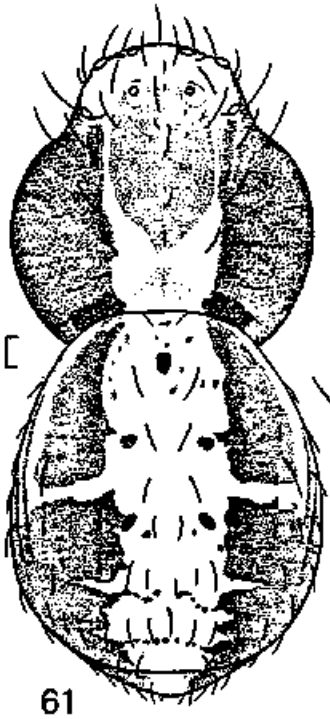

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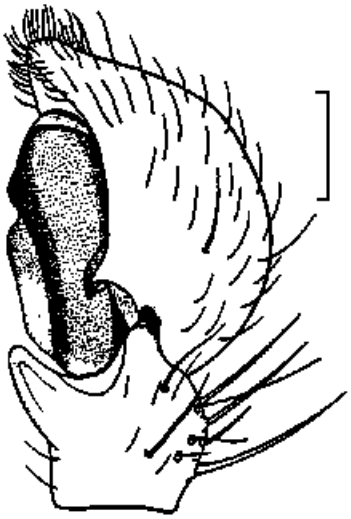

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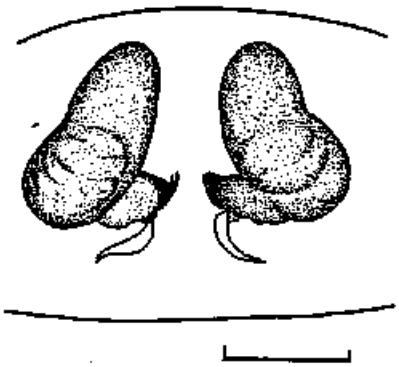

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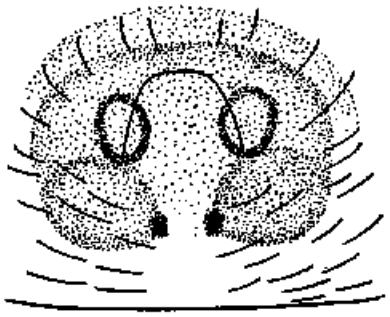

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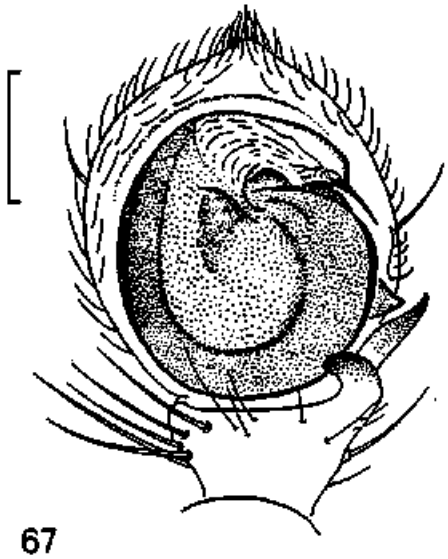

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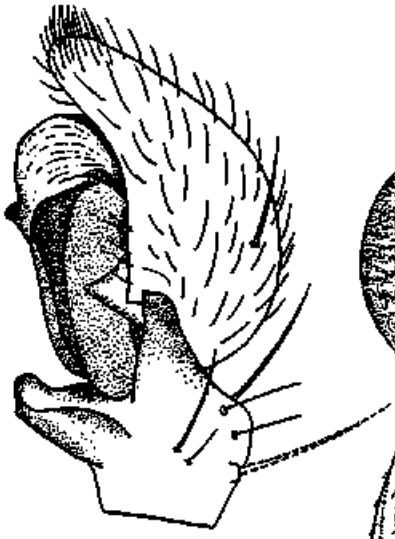

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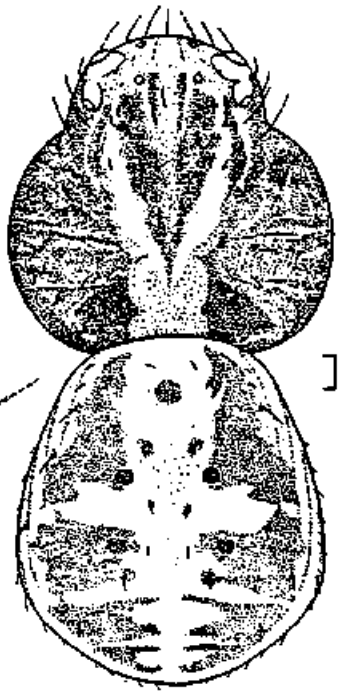

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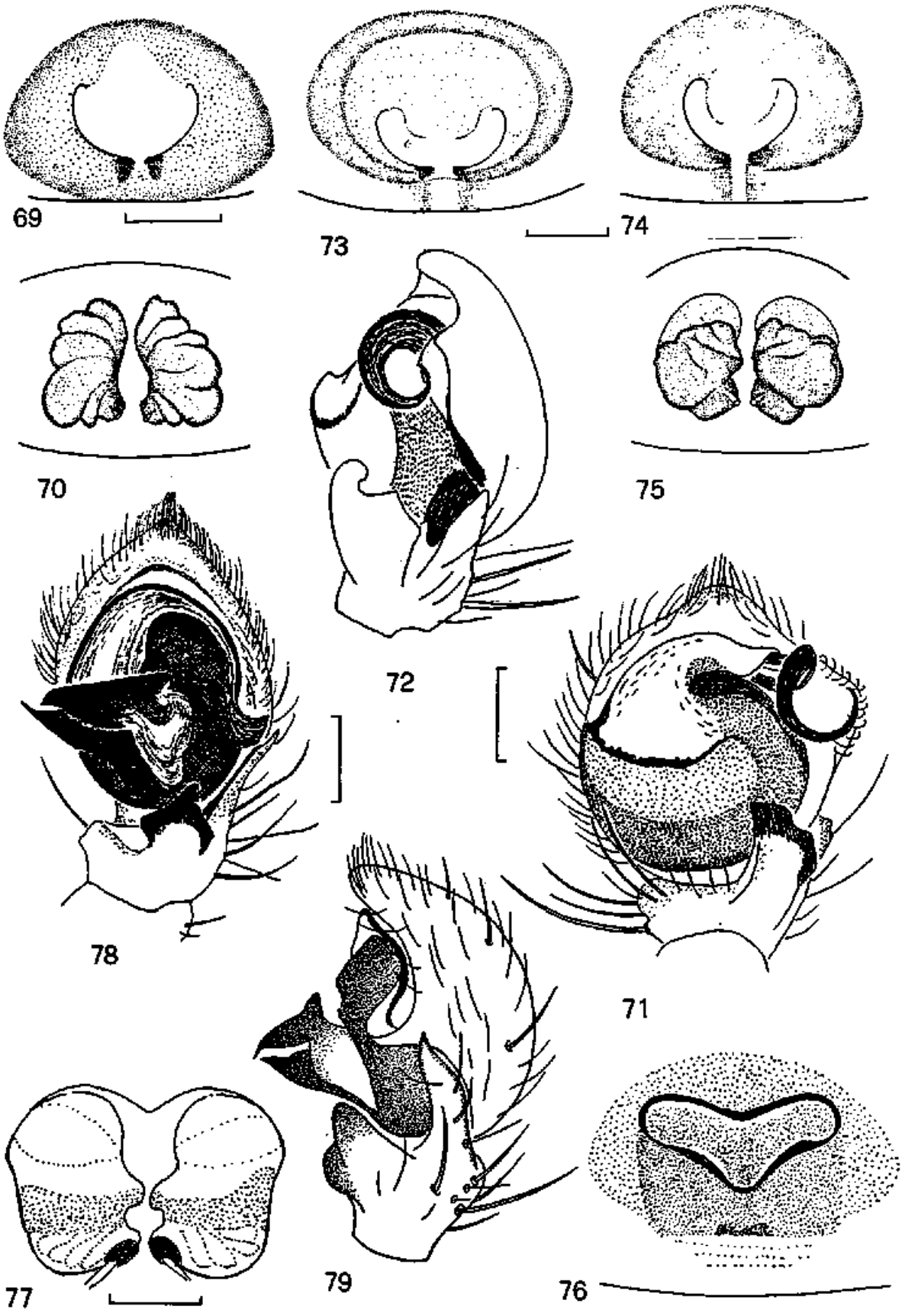
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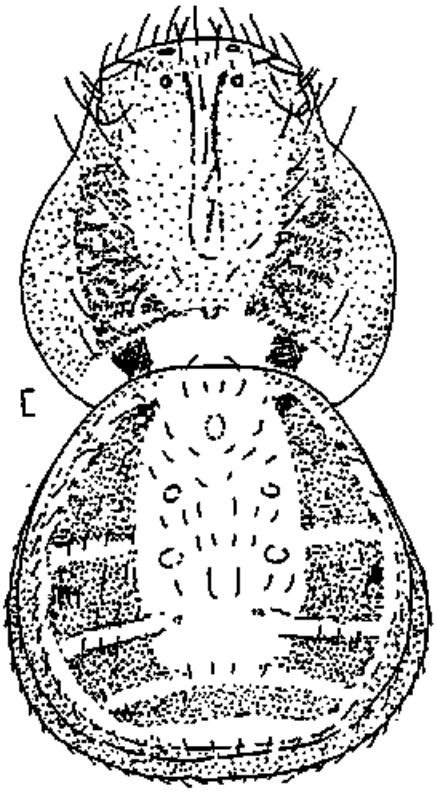

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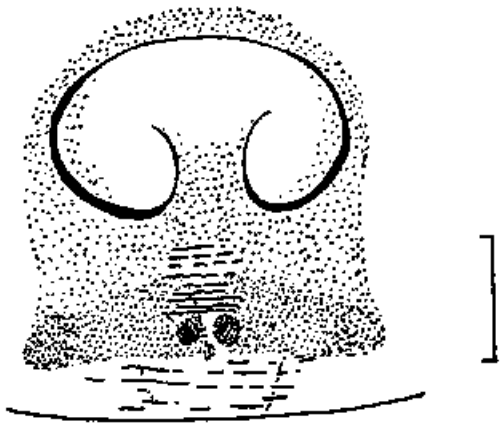

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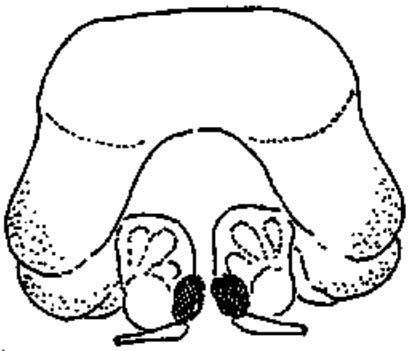

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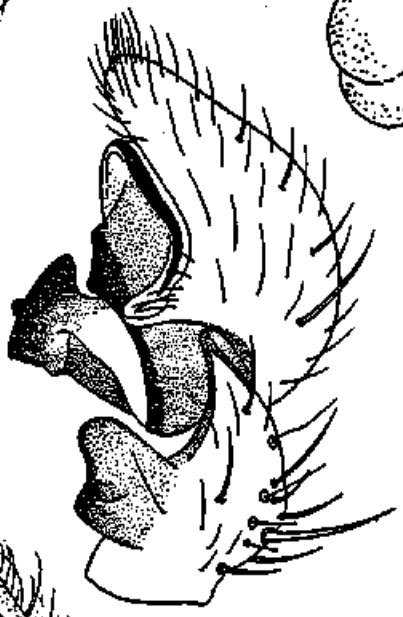

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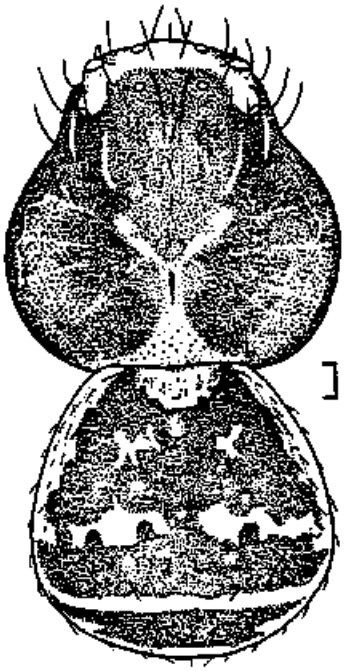

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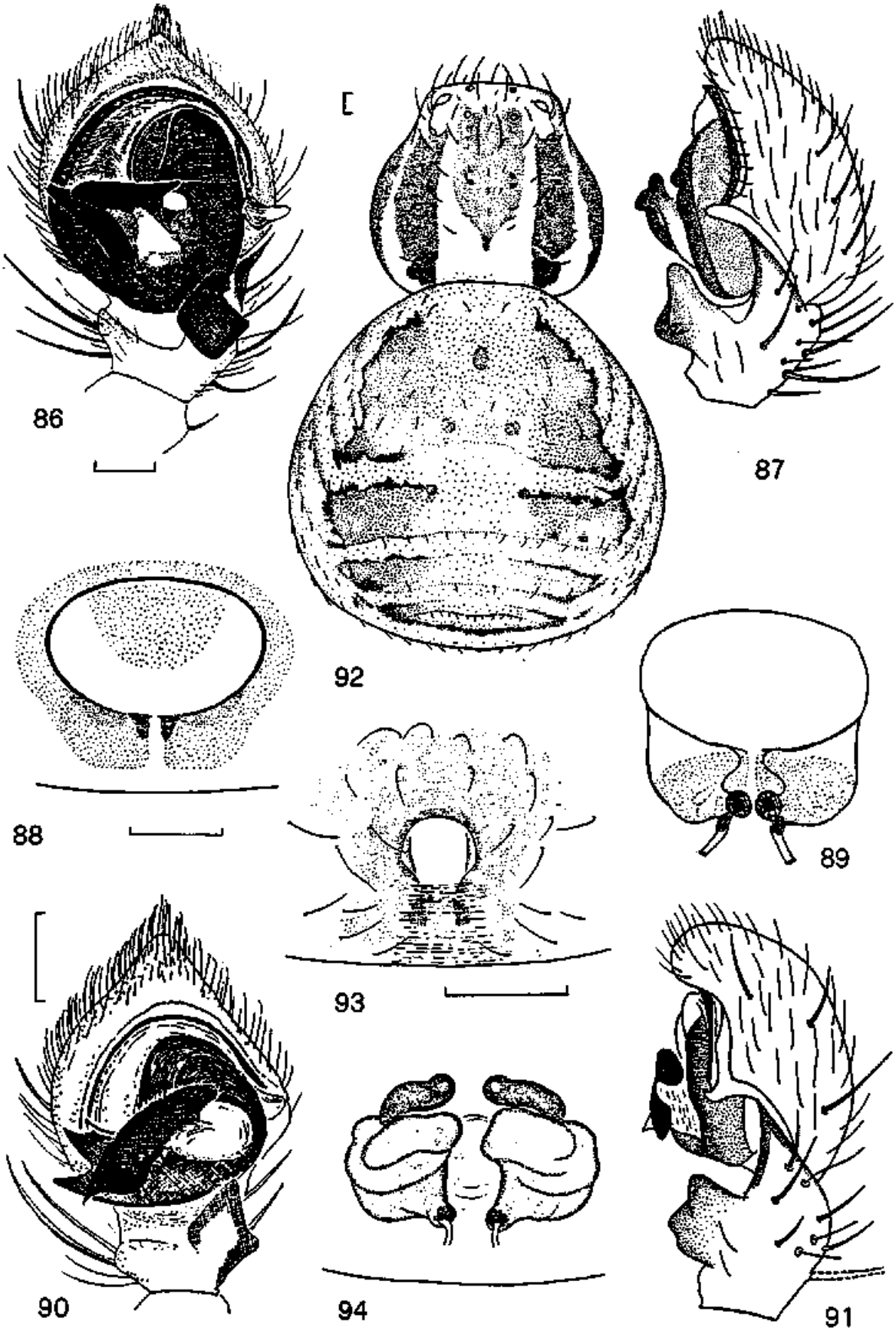
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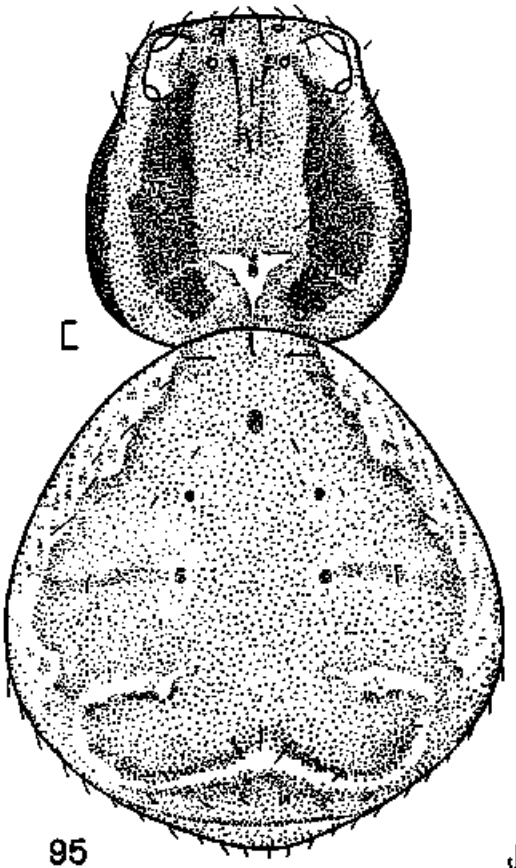

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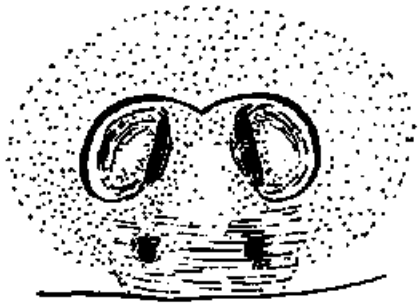

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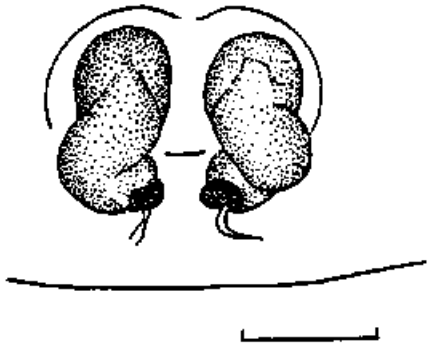

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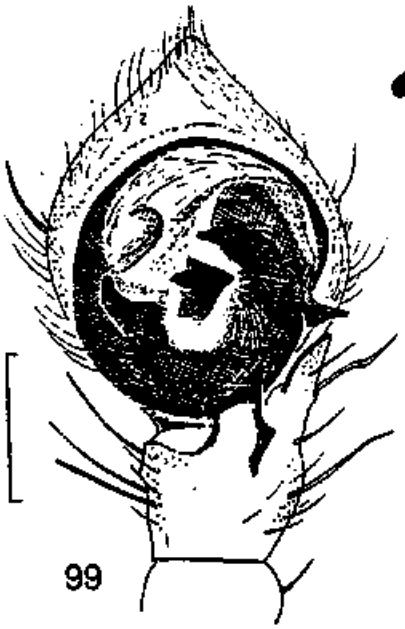

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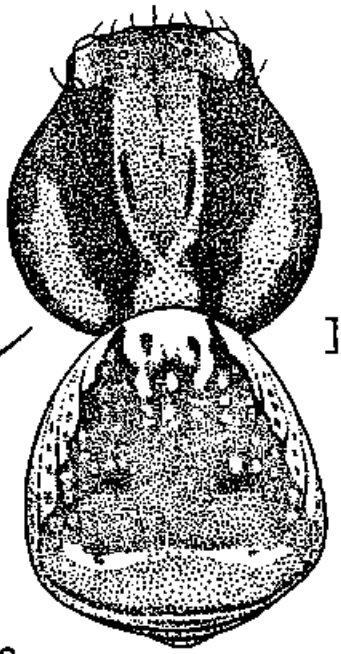

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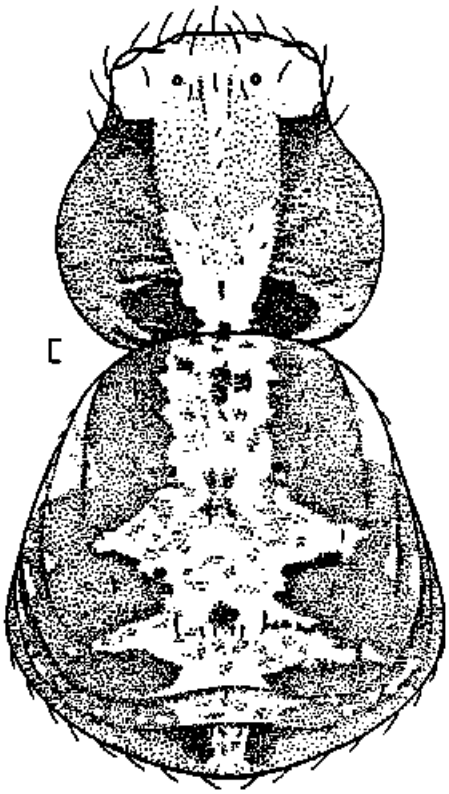

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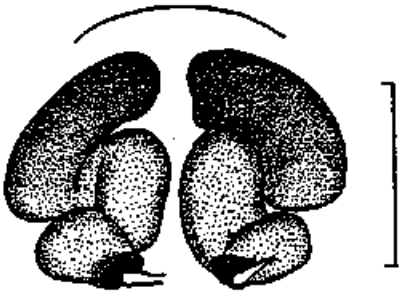

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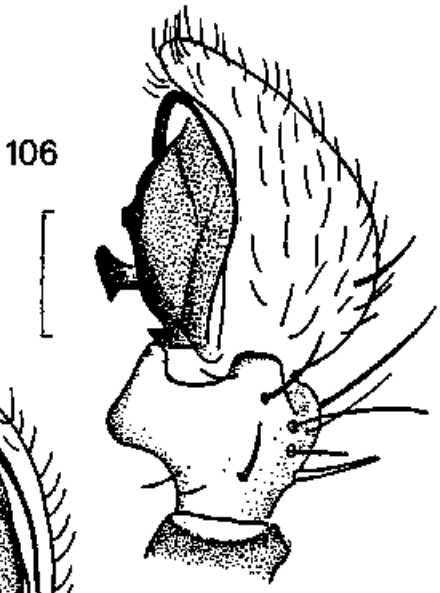

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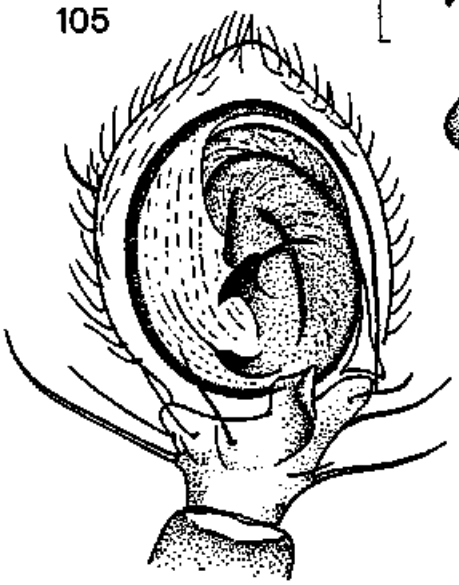

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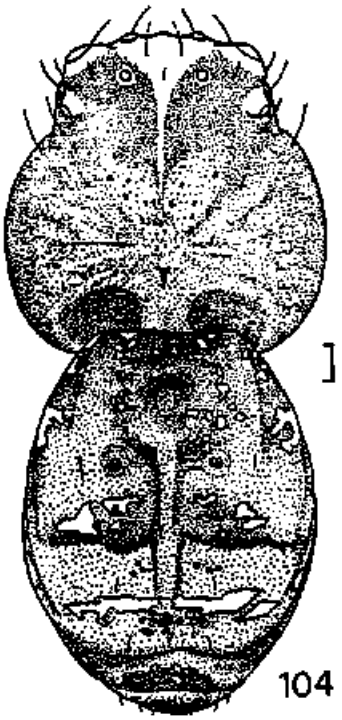

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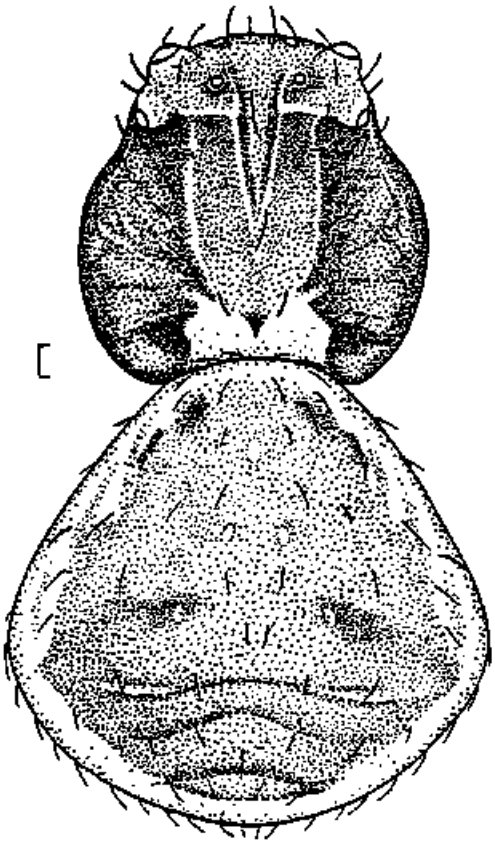

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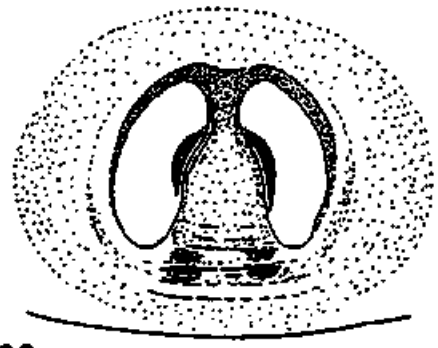

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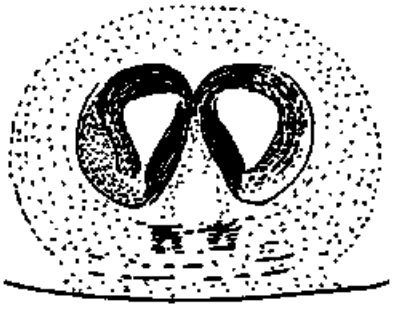

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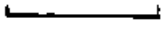

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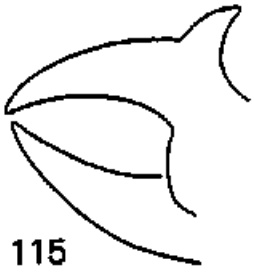

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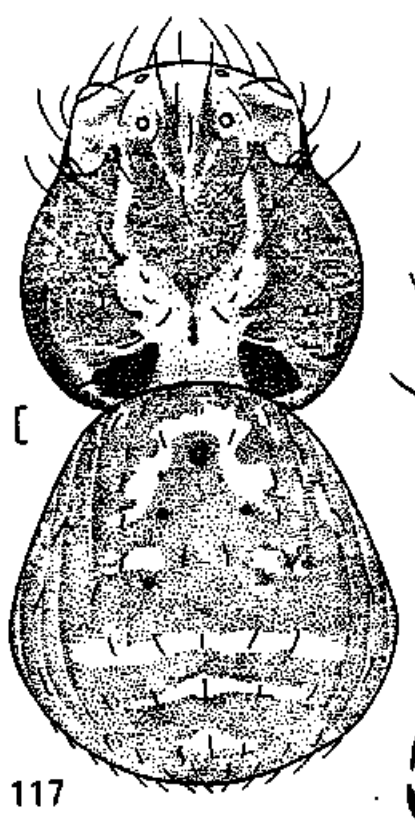

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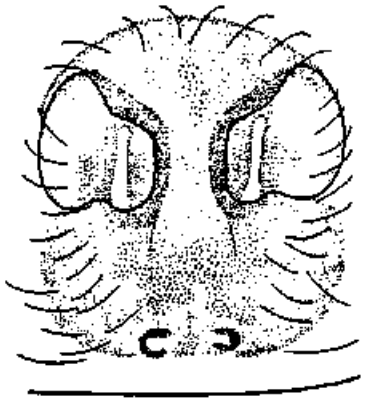

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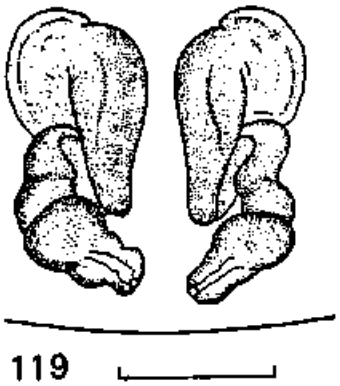

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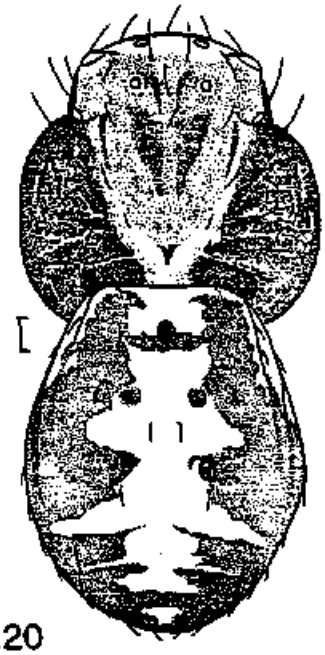

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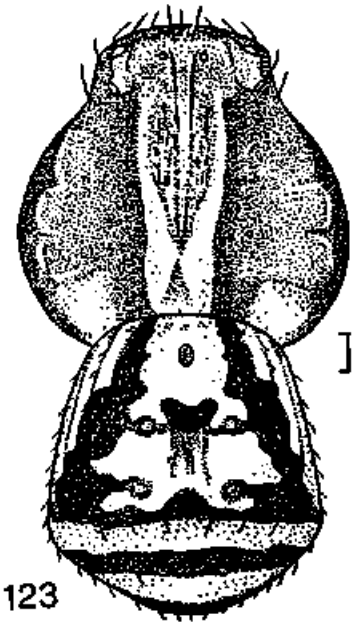

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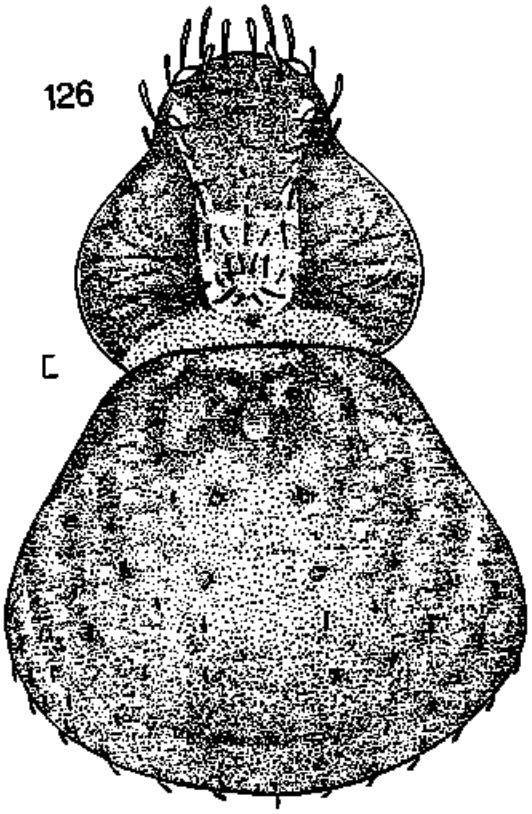

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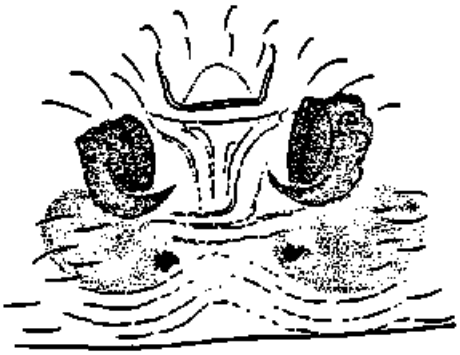

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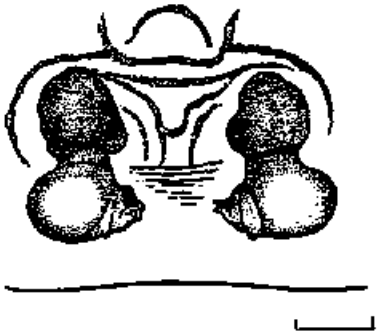

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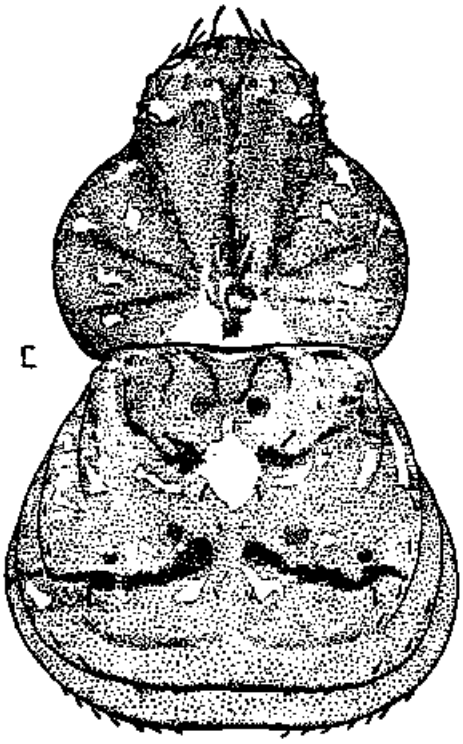

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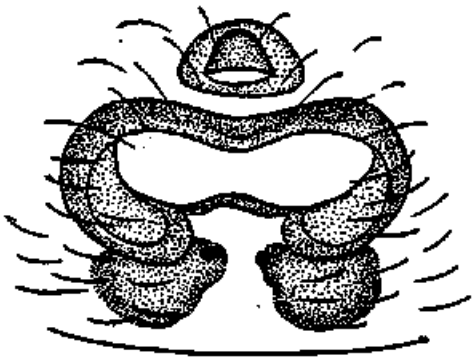

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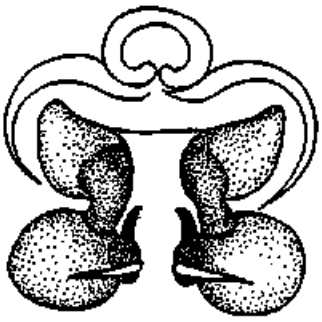

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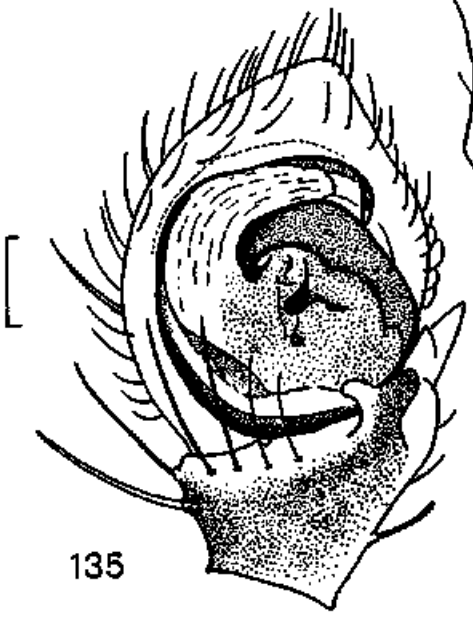

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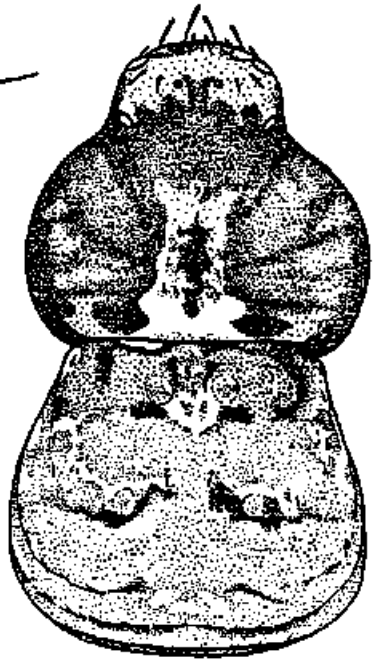

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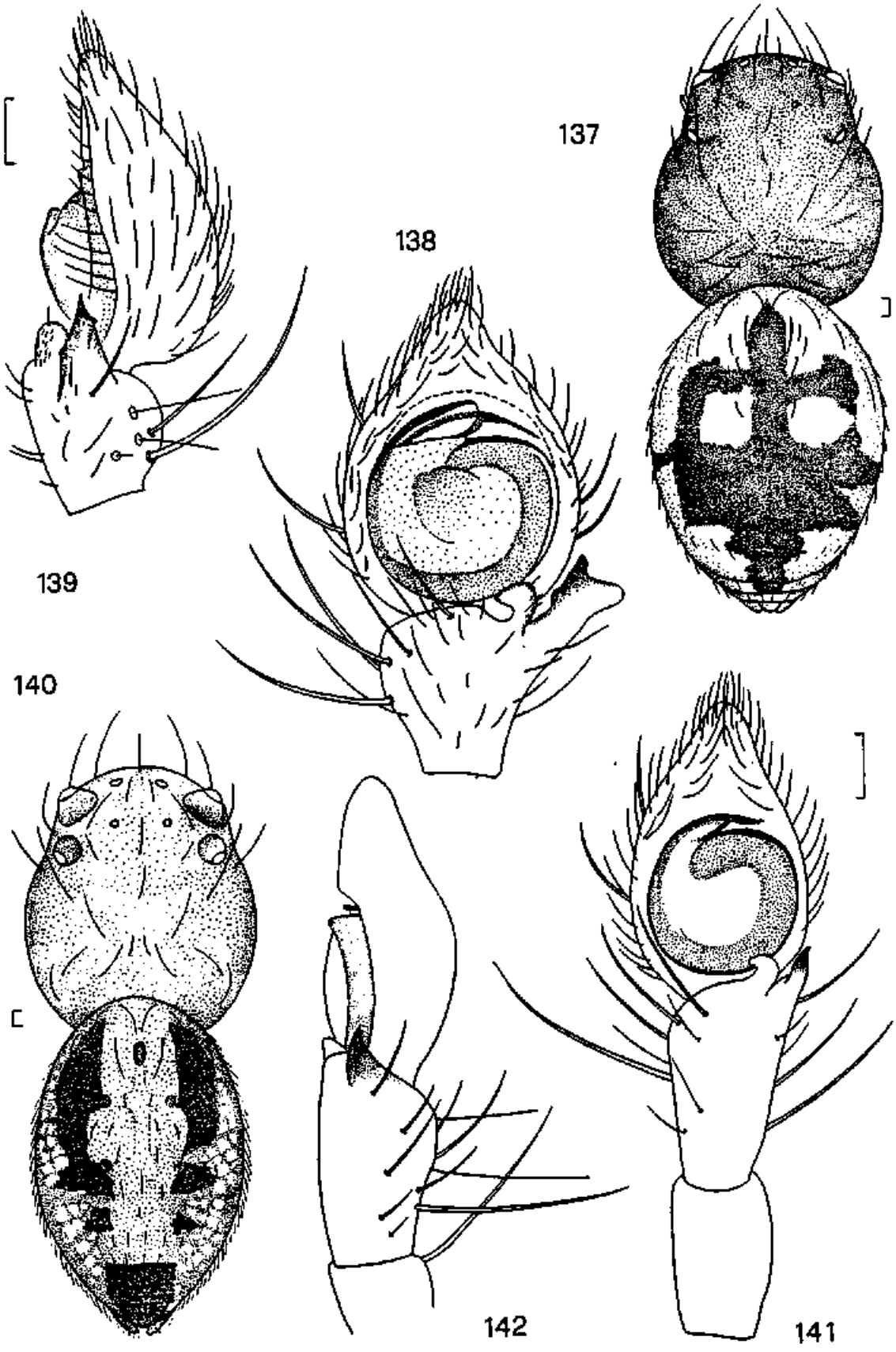
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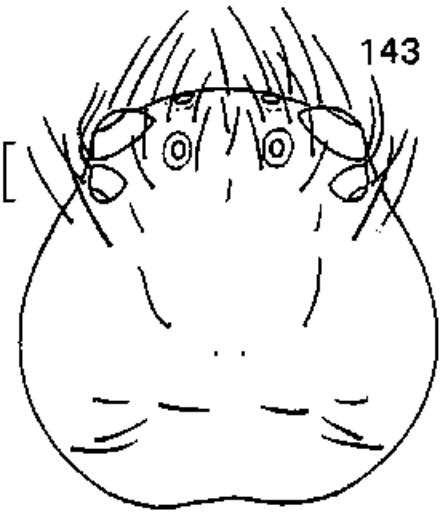

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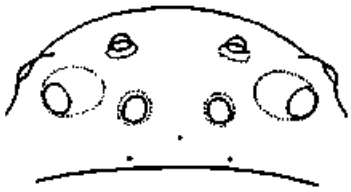

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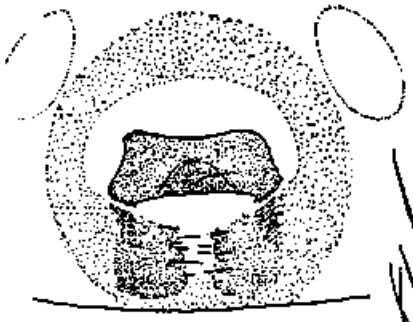

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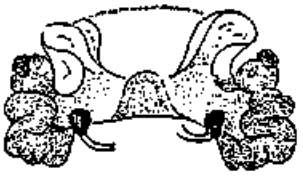

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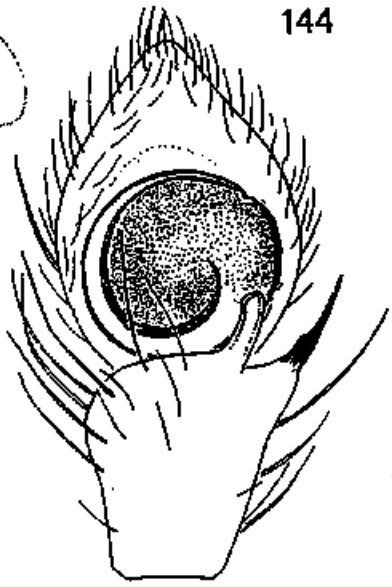

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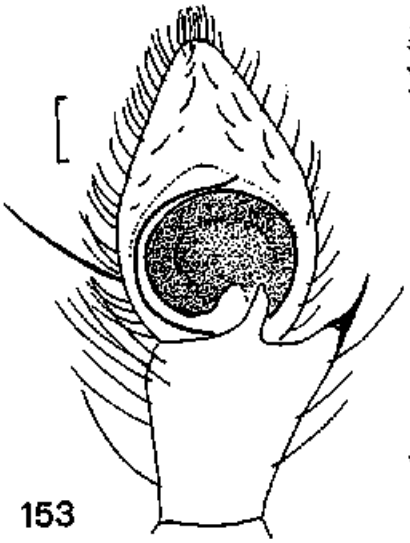

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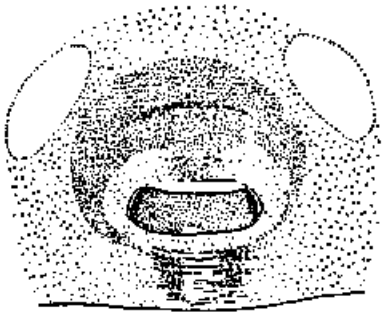

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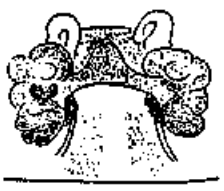

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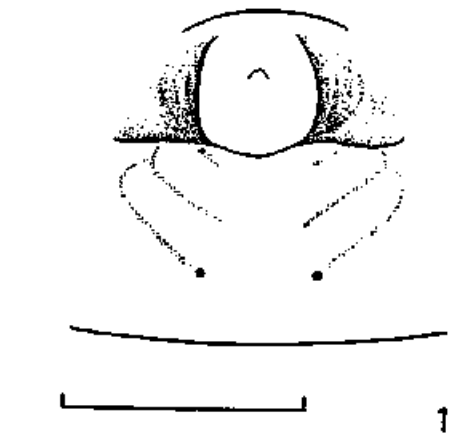

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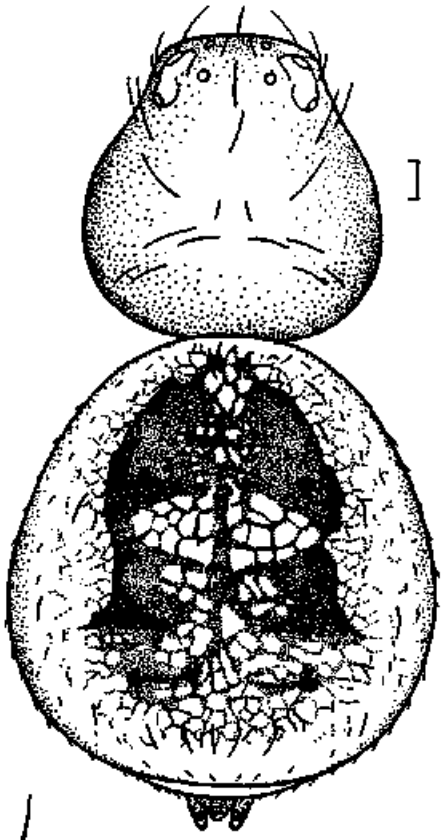

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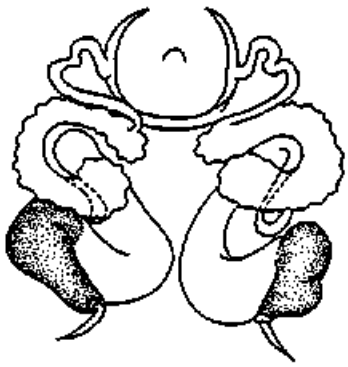

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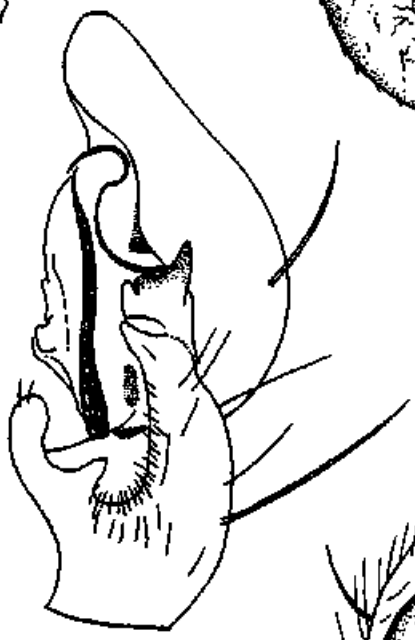

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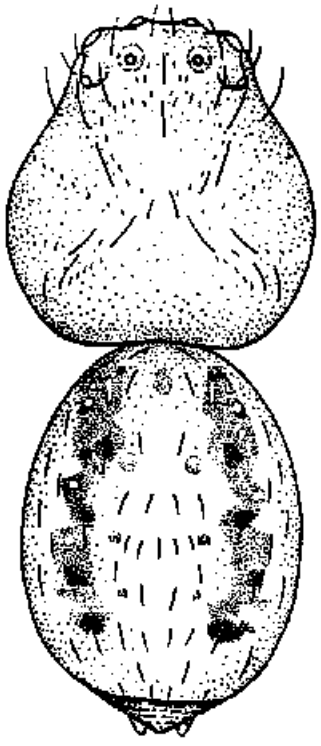

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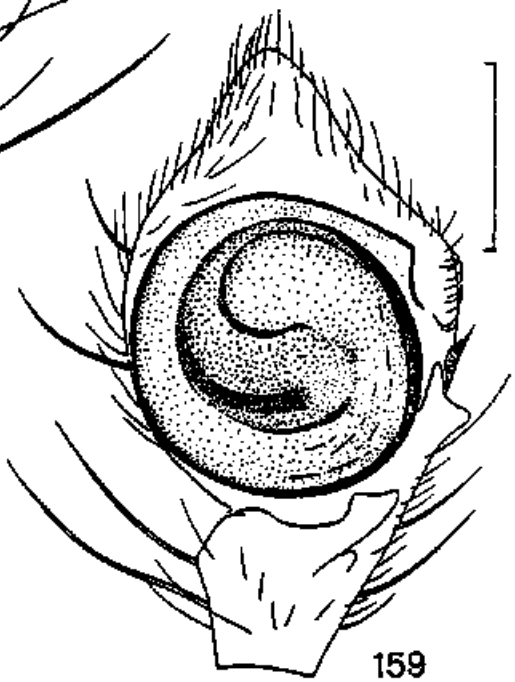

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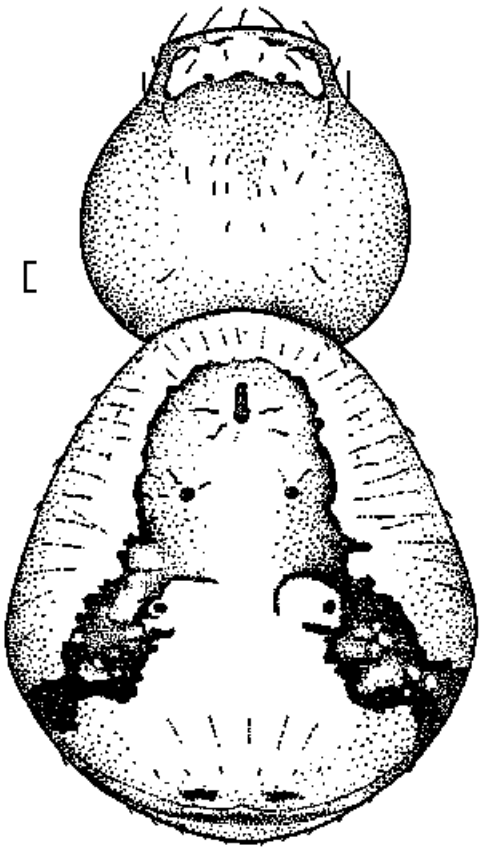

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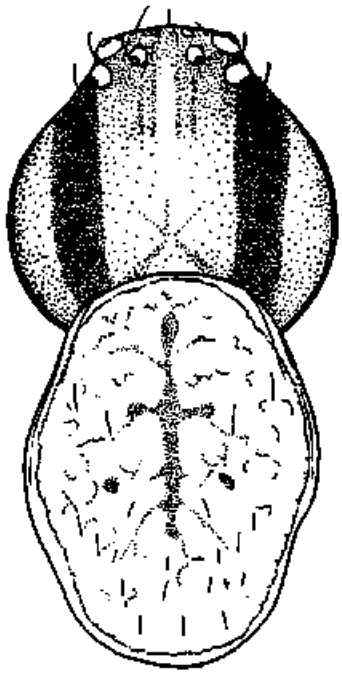

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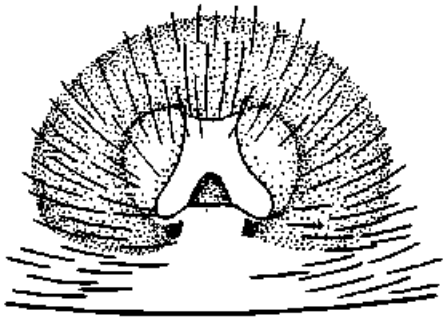

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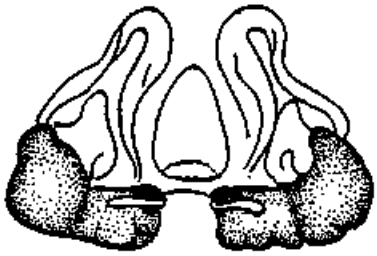

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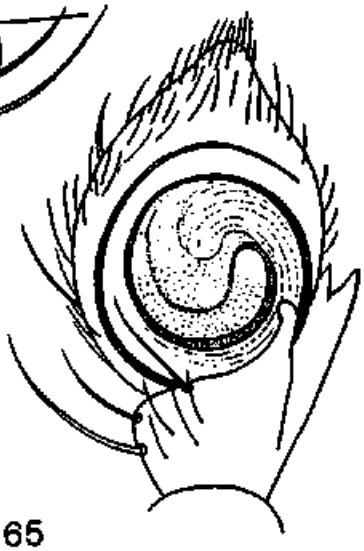

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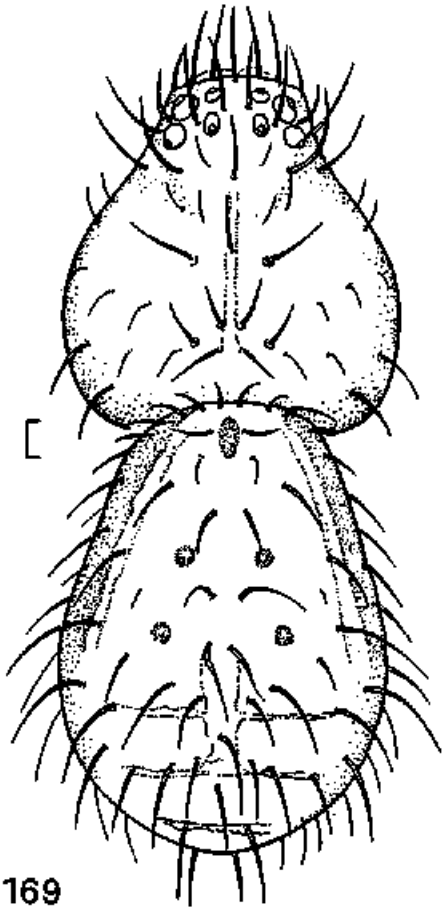

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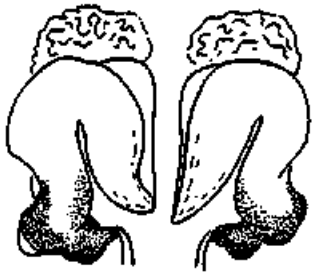

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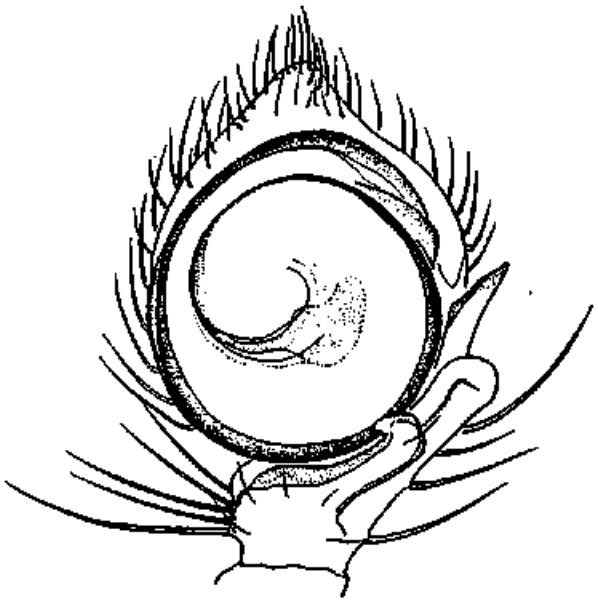

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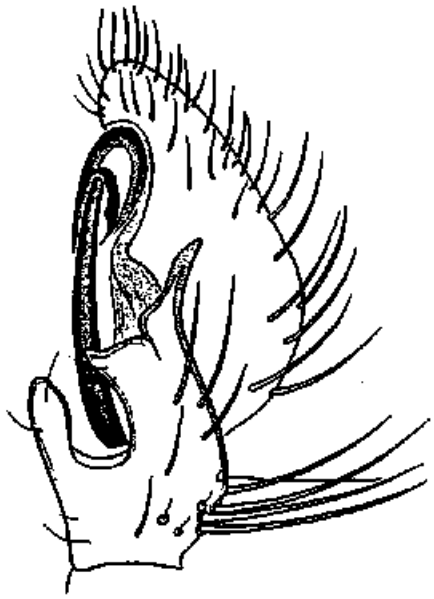

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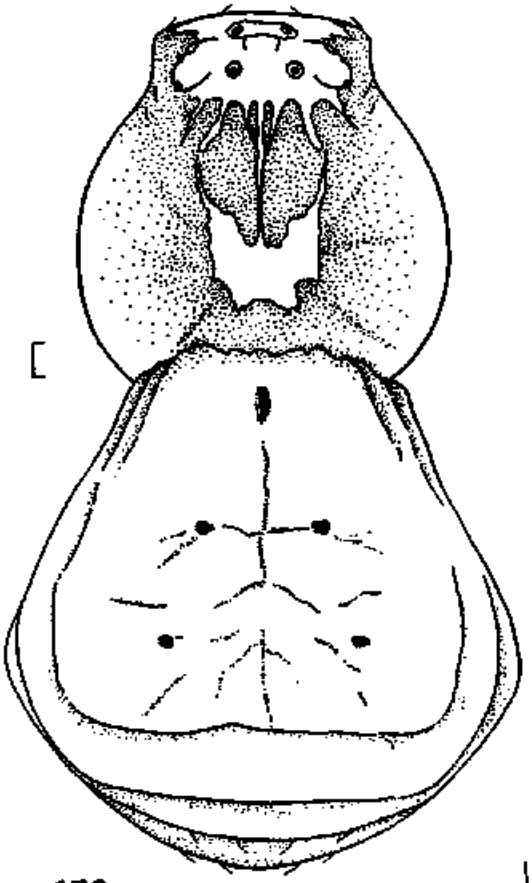

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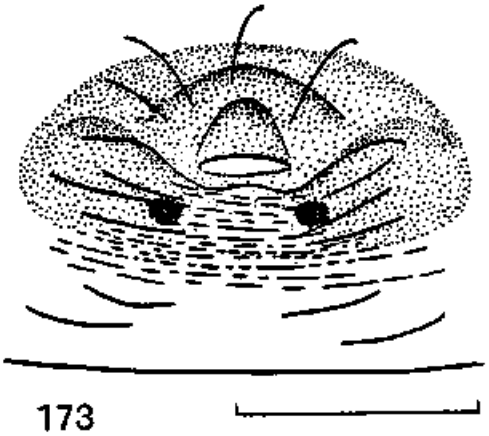

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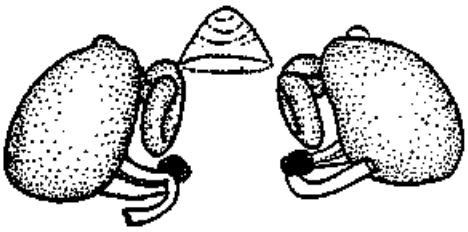

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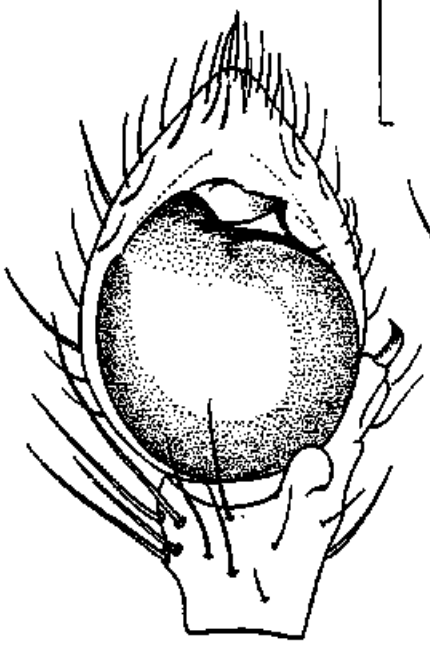

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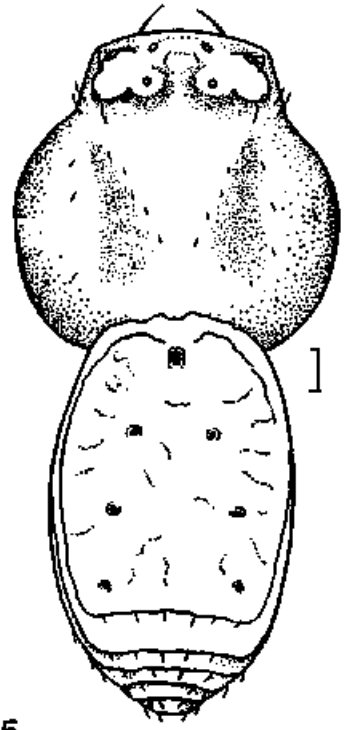

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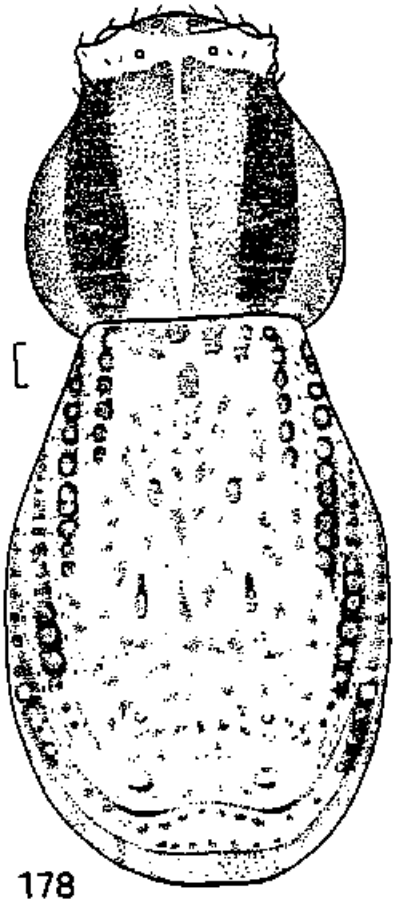

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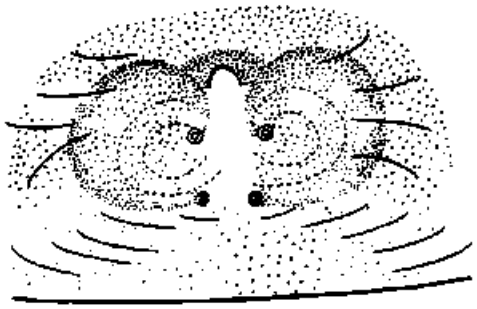

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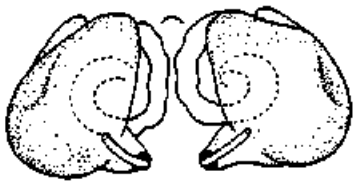

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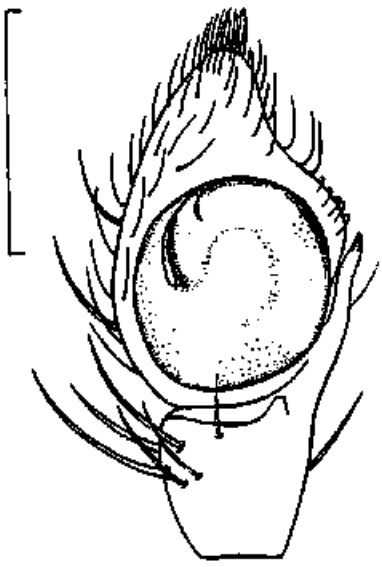

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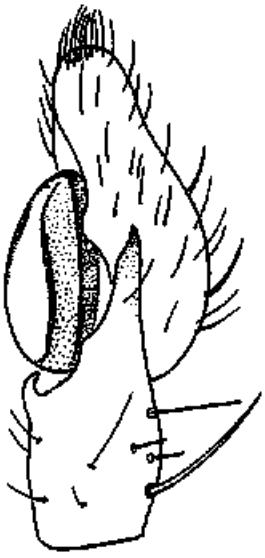

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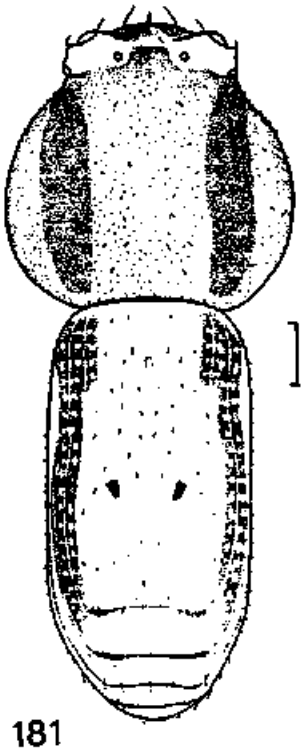

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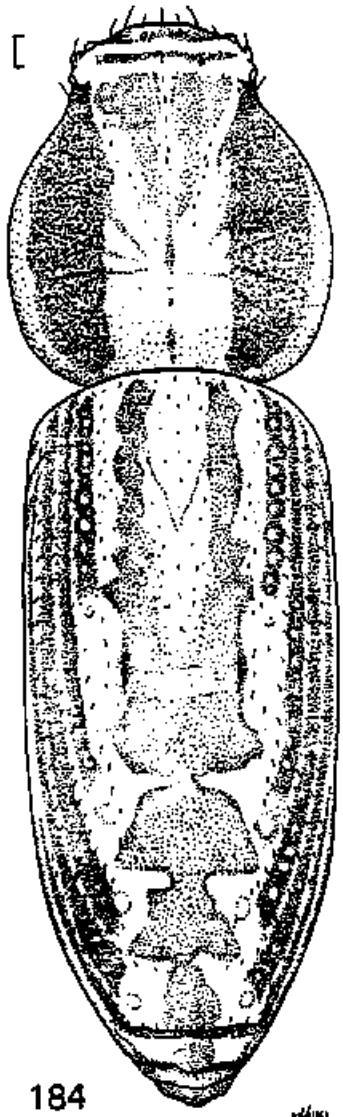

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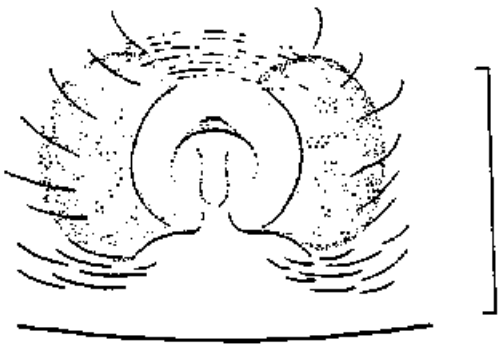

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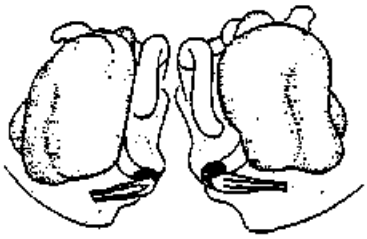

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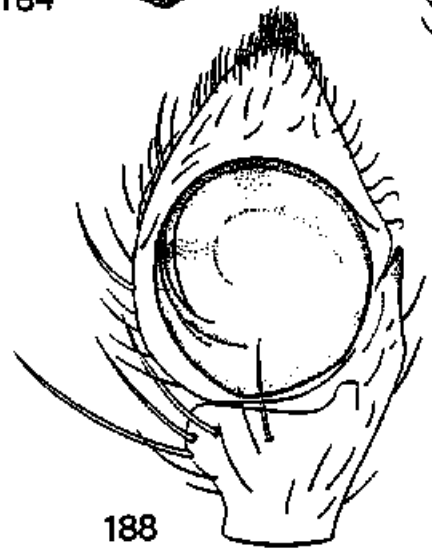

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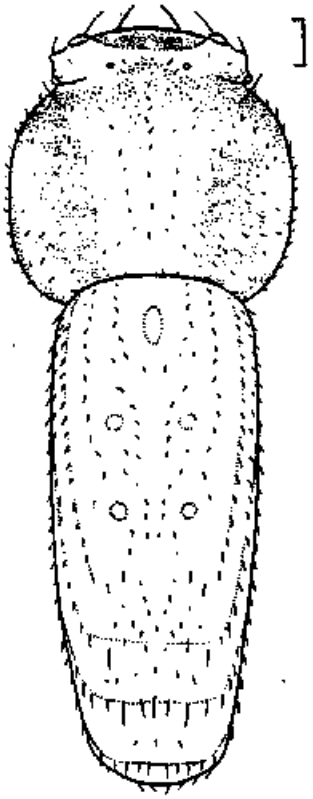

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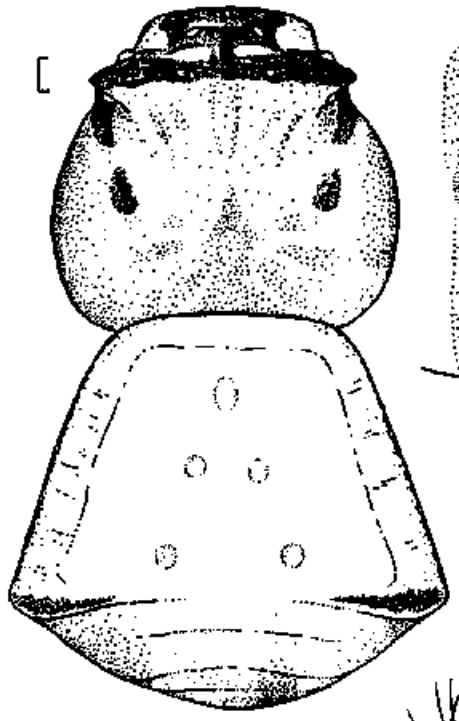

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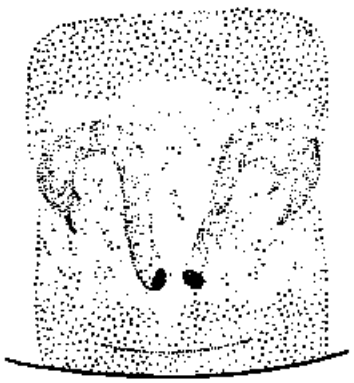

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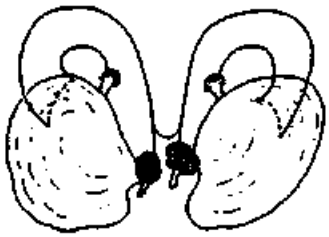

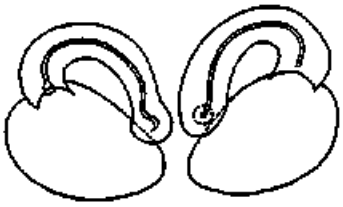

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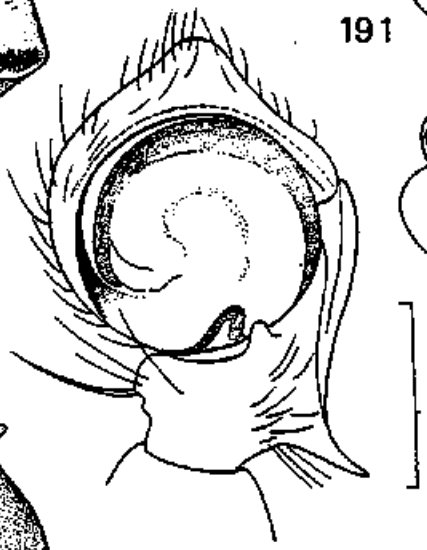

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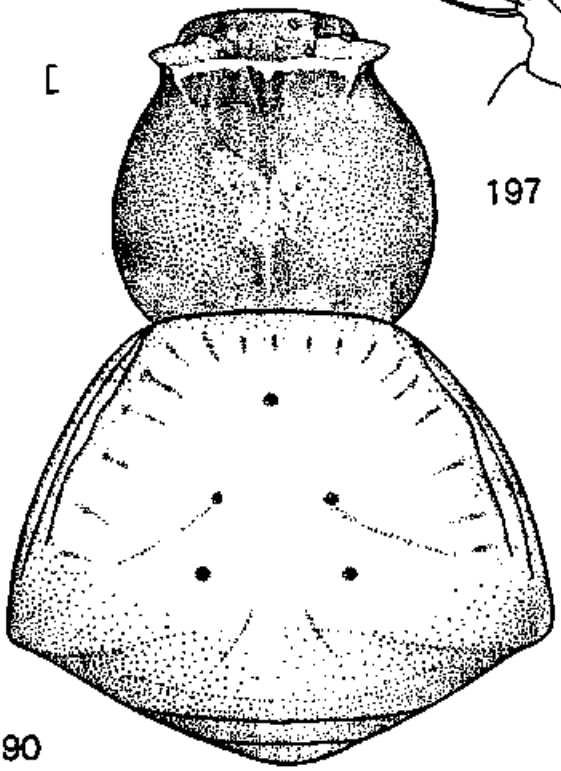

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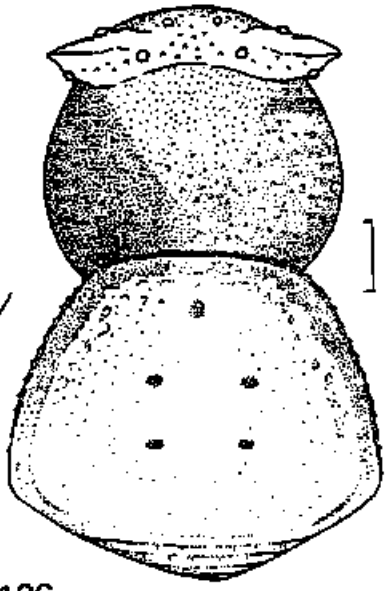

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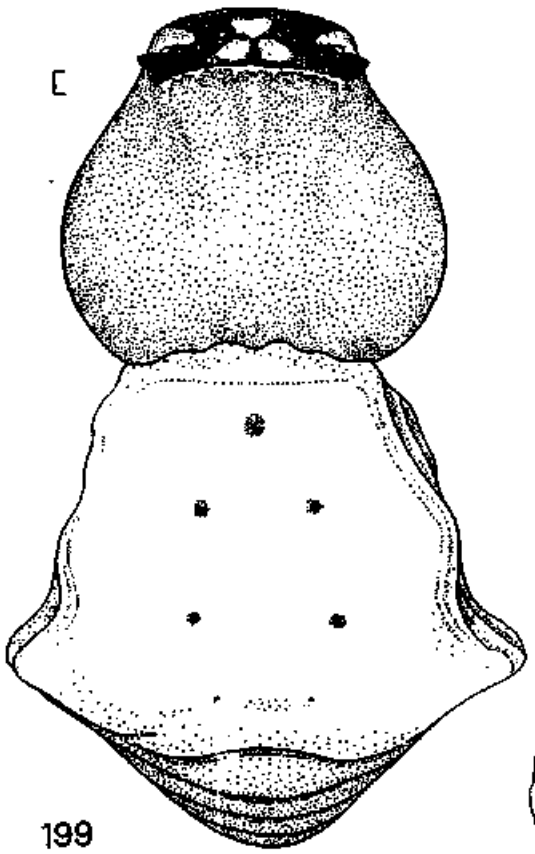

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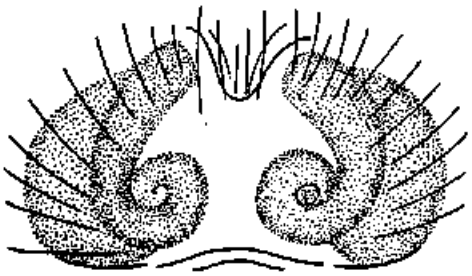

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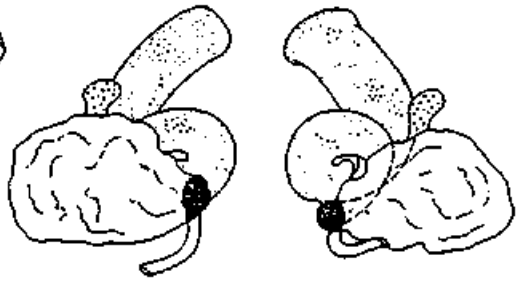

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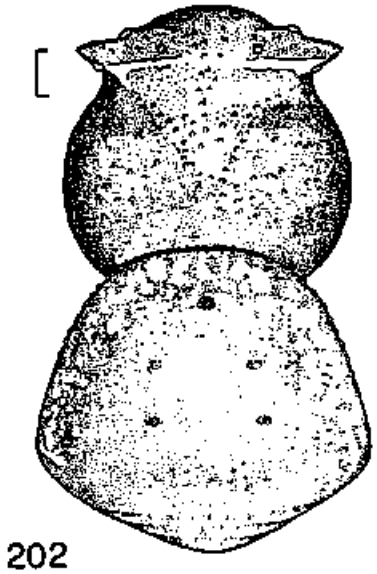

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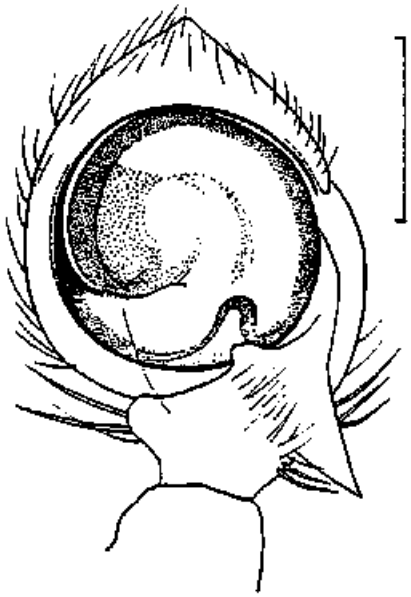

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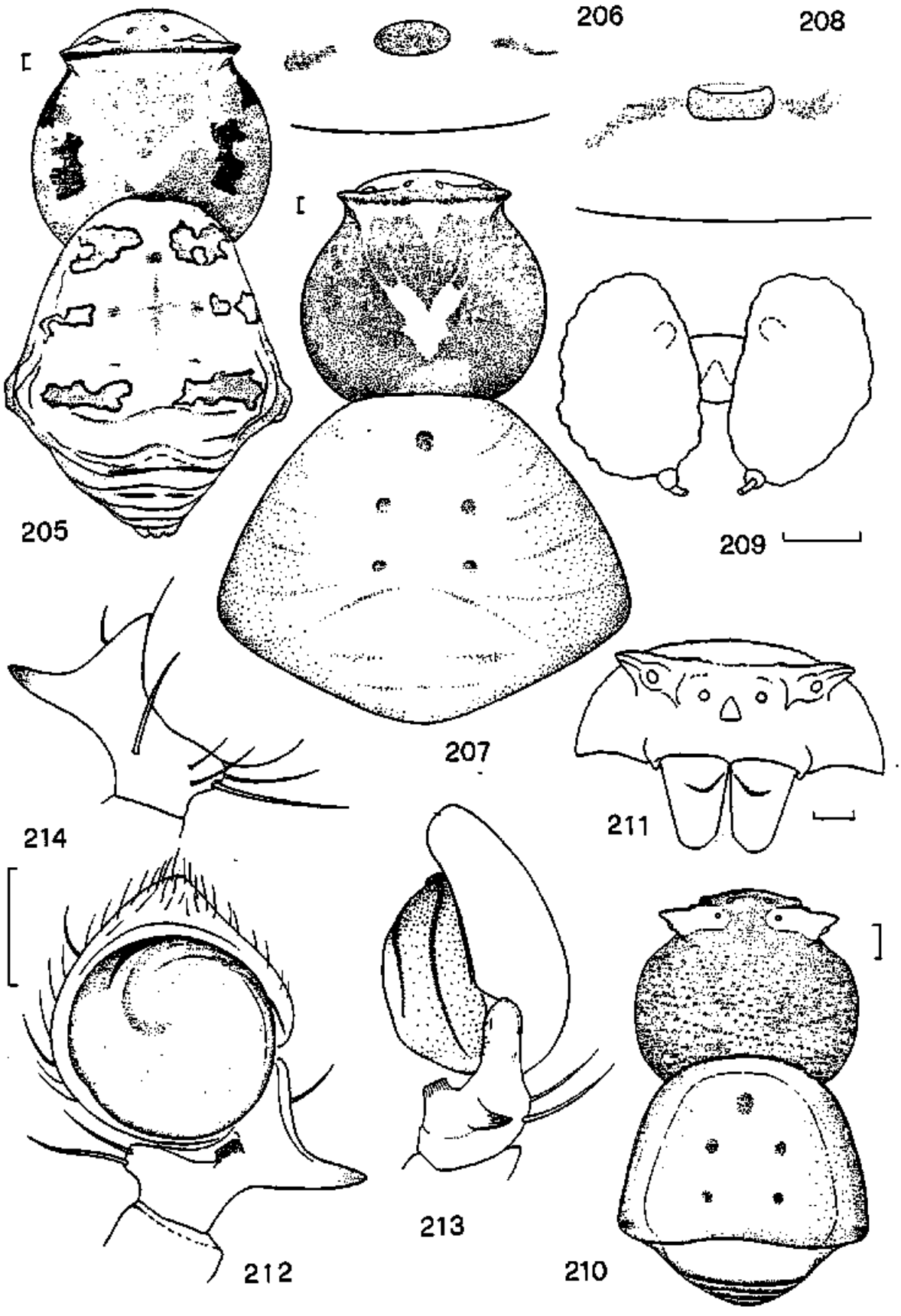
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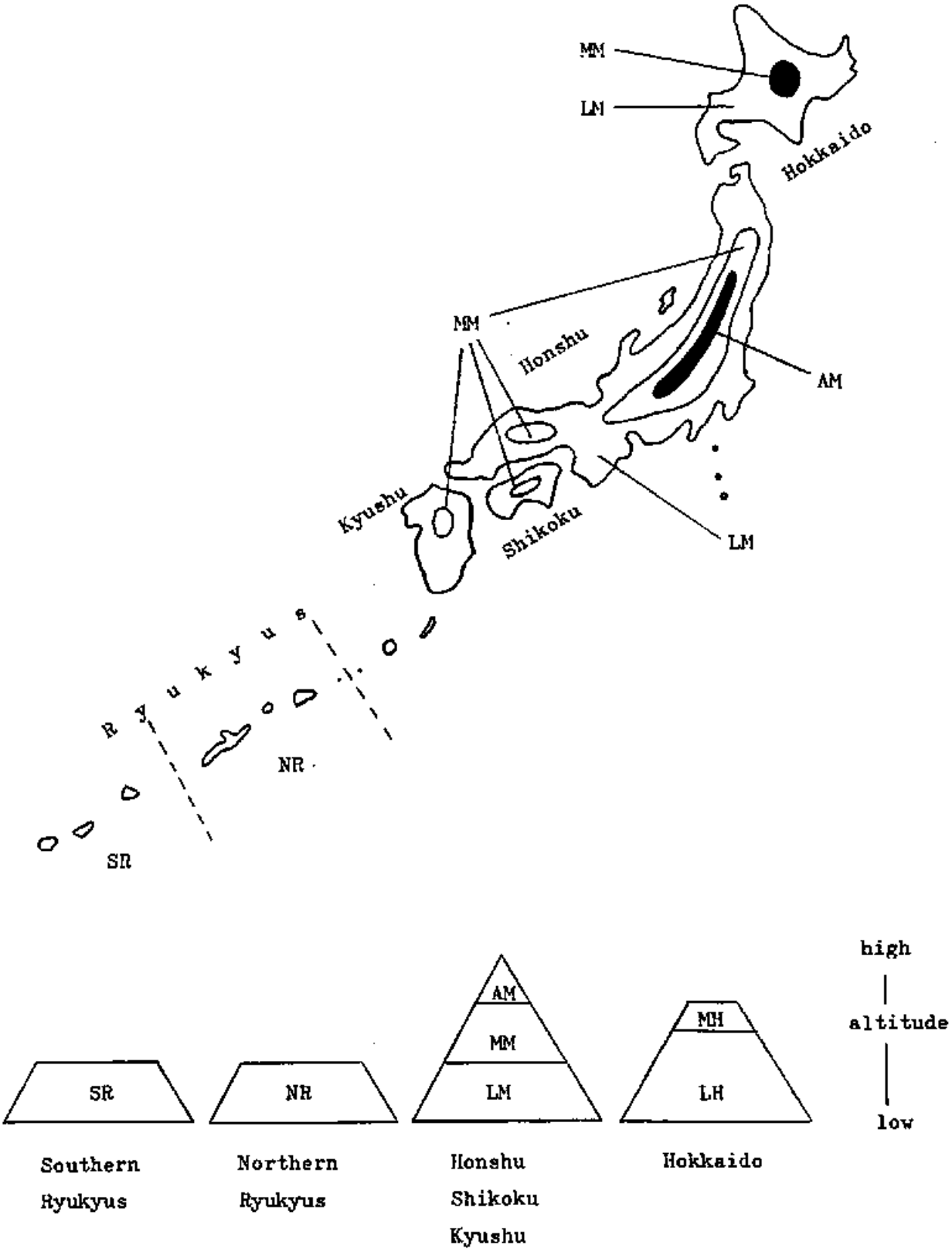
MM
LM
Hokkaido
MM
Honshu
AM
Kyushu
Shikoku
LM
Ryukyus
NR
SR
high
altitude
low
AM
MM
LM
MH
LH
SR
NR
Southern Ryukyus
Northern Ryukyus
Honshu
Shikoku
Kyushu
Hokkaido

Fig. 215

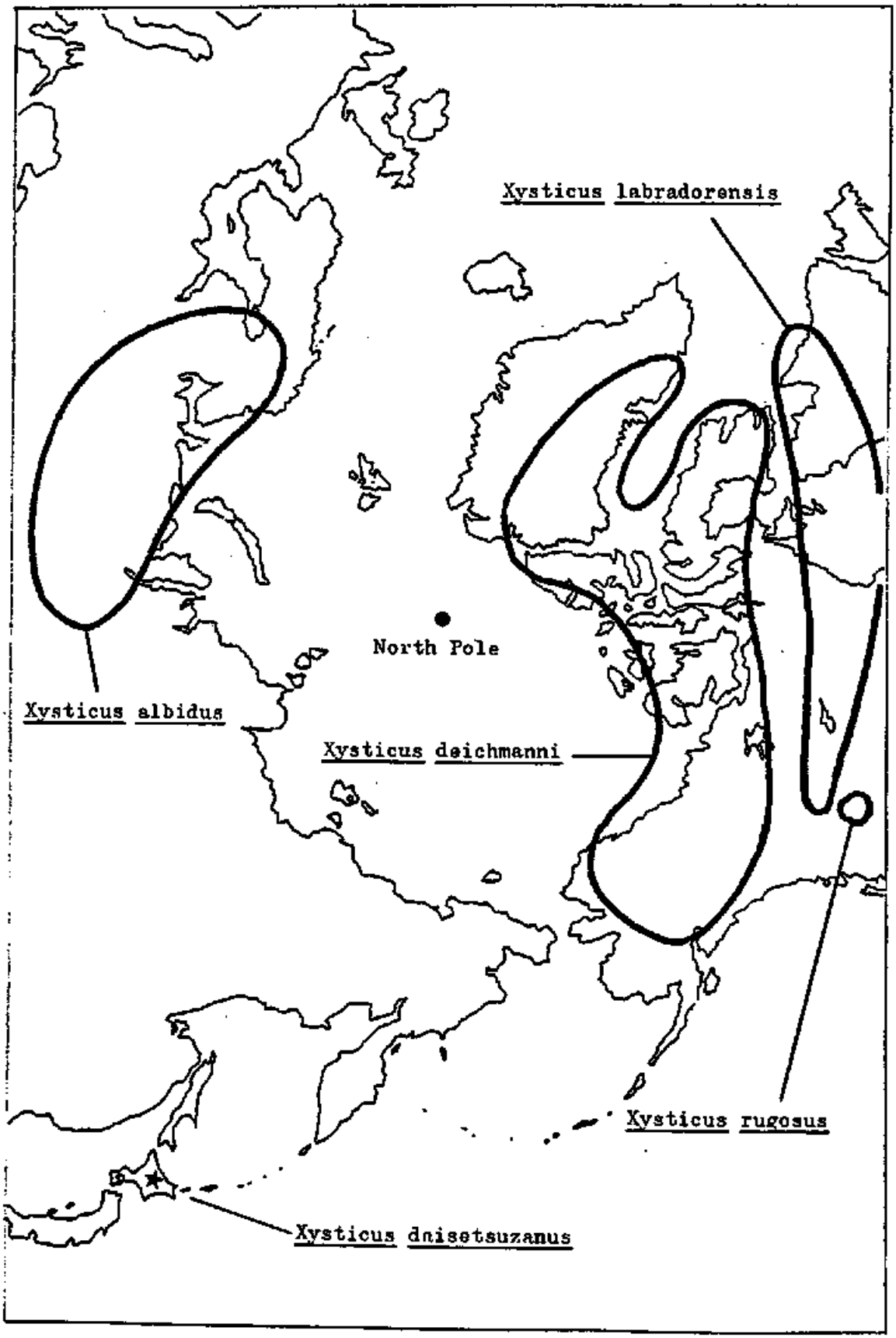
Xysticus labradorensis
North Pole
Xysticus albidus
Xysticus deichmanni
Xysticus rugosus
Xysticus daisetsuzanus

Fig. 216

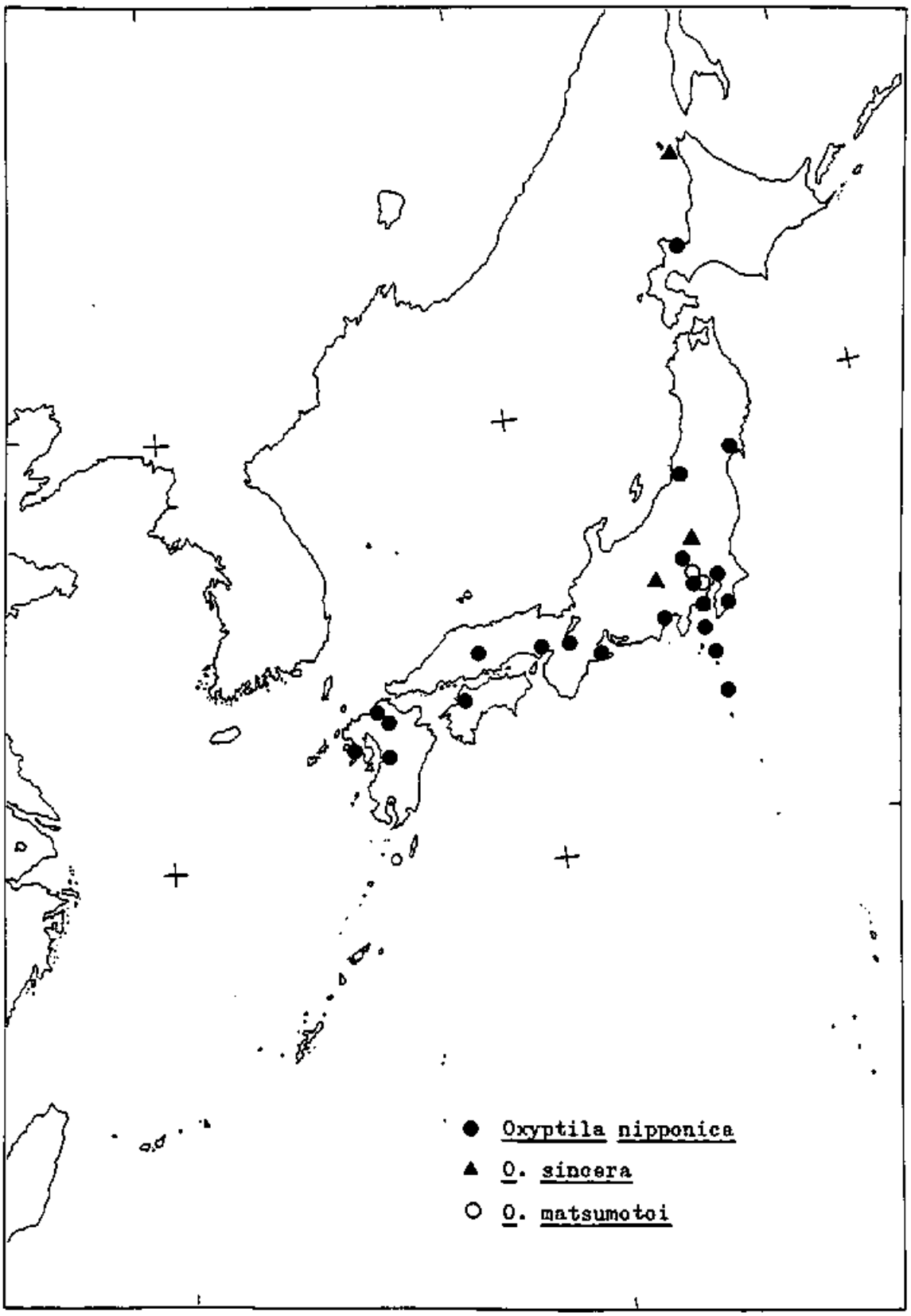

Fig. 217

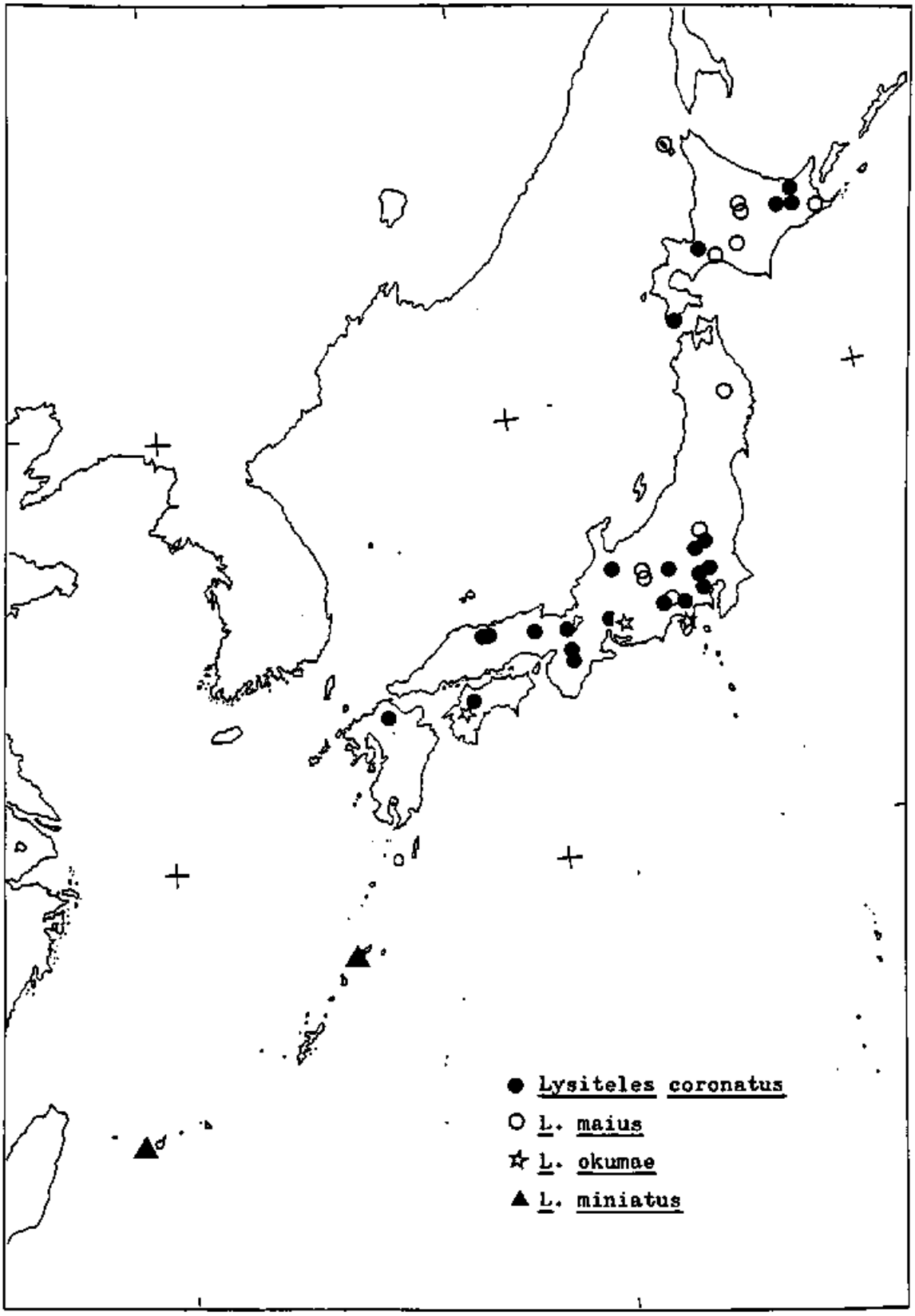

Fig. 218

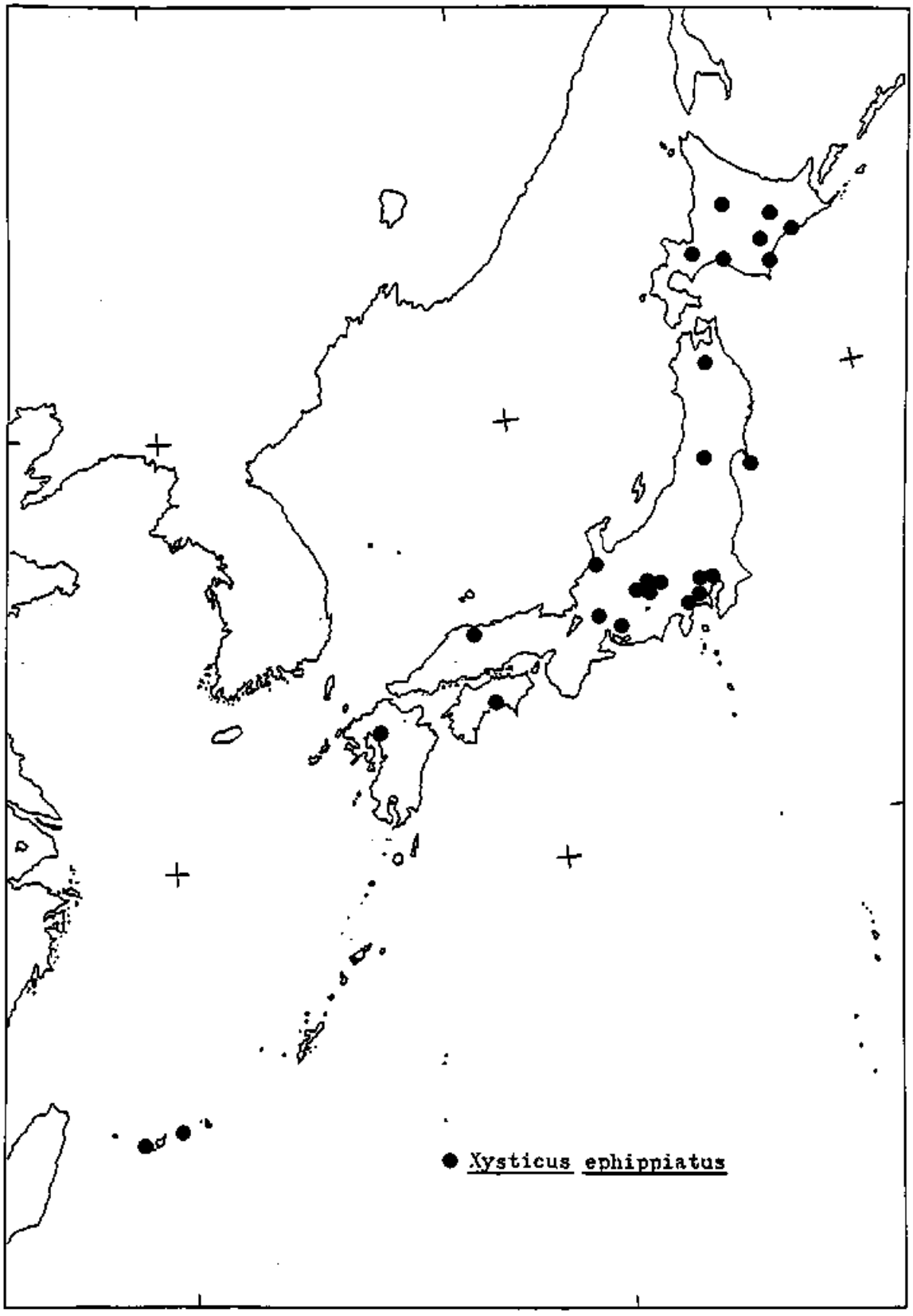

Fig. 219

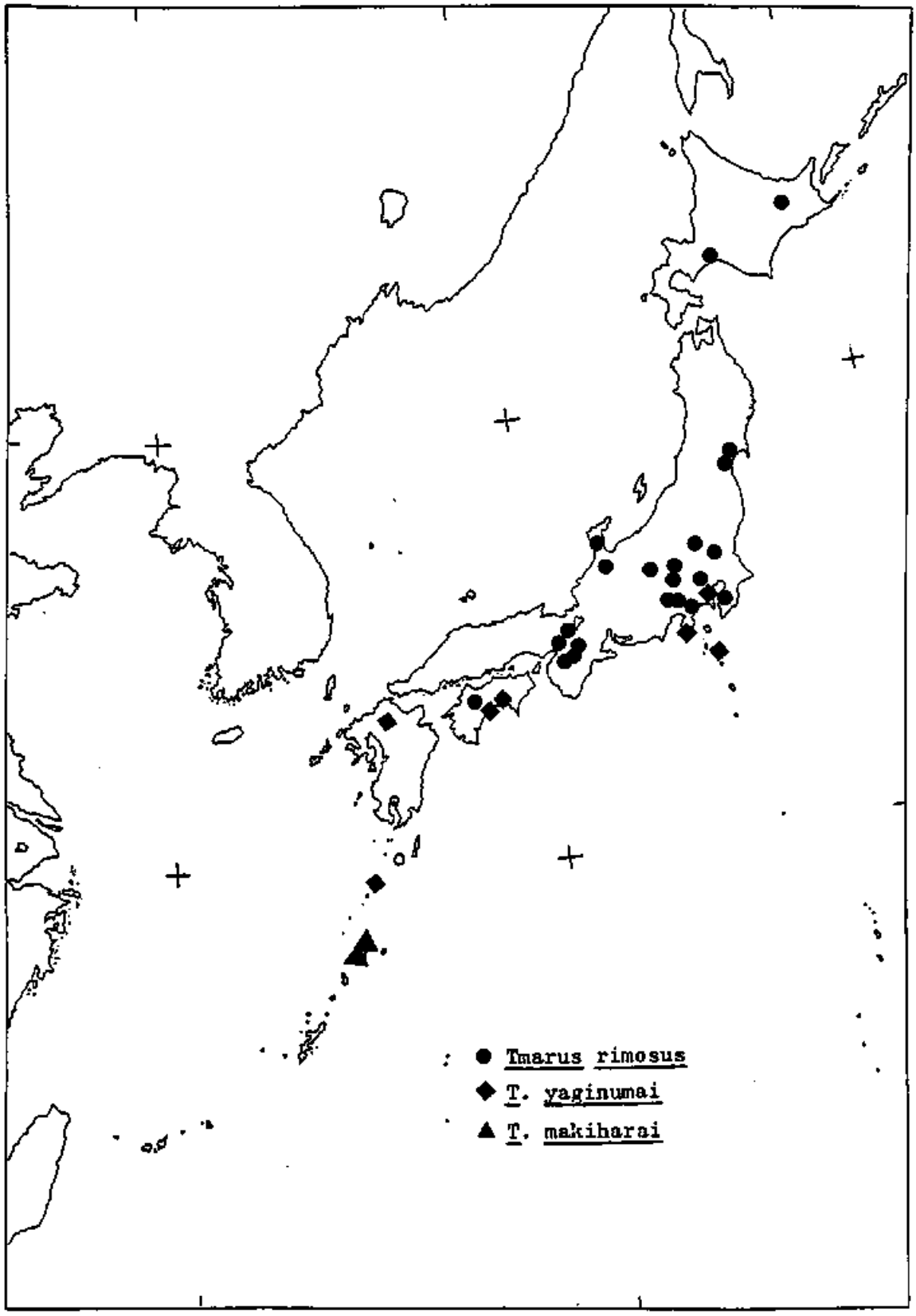

Fig. 220

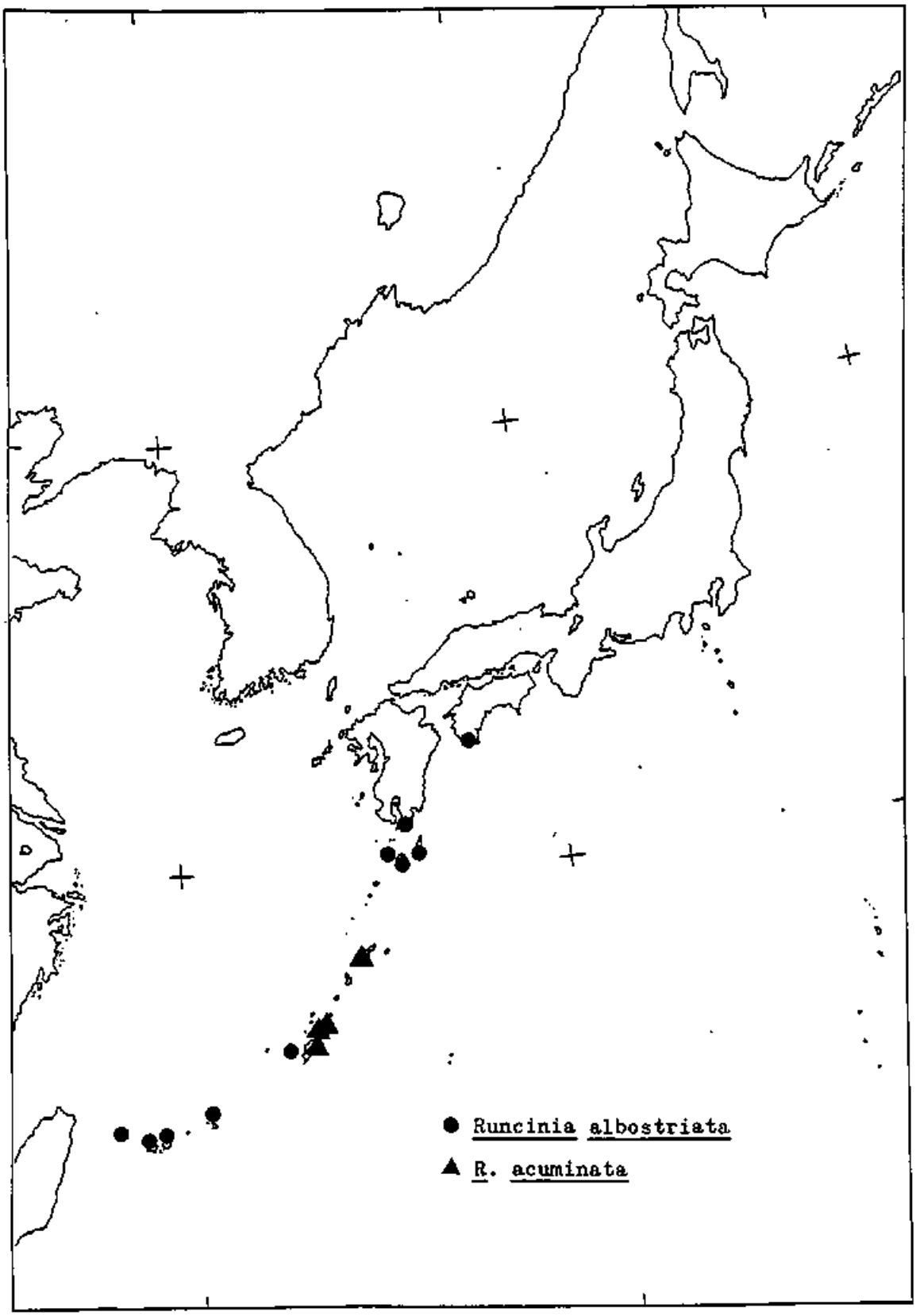

Fig. 221

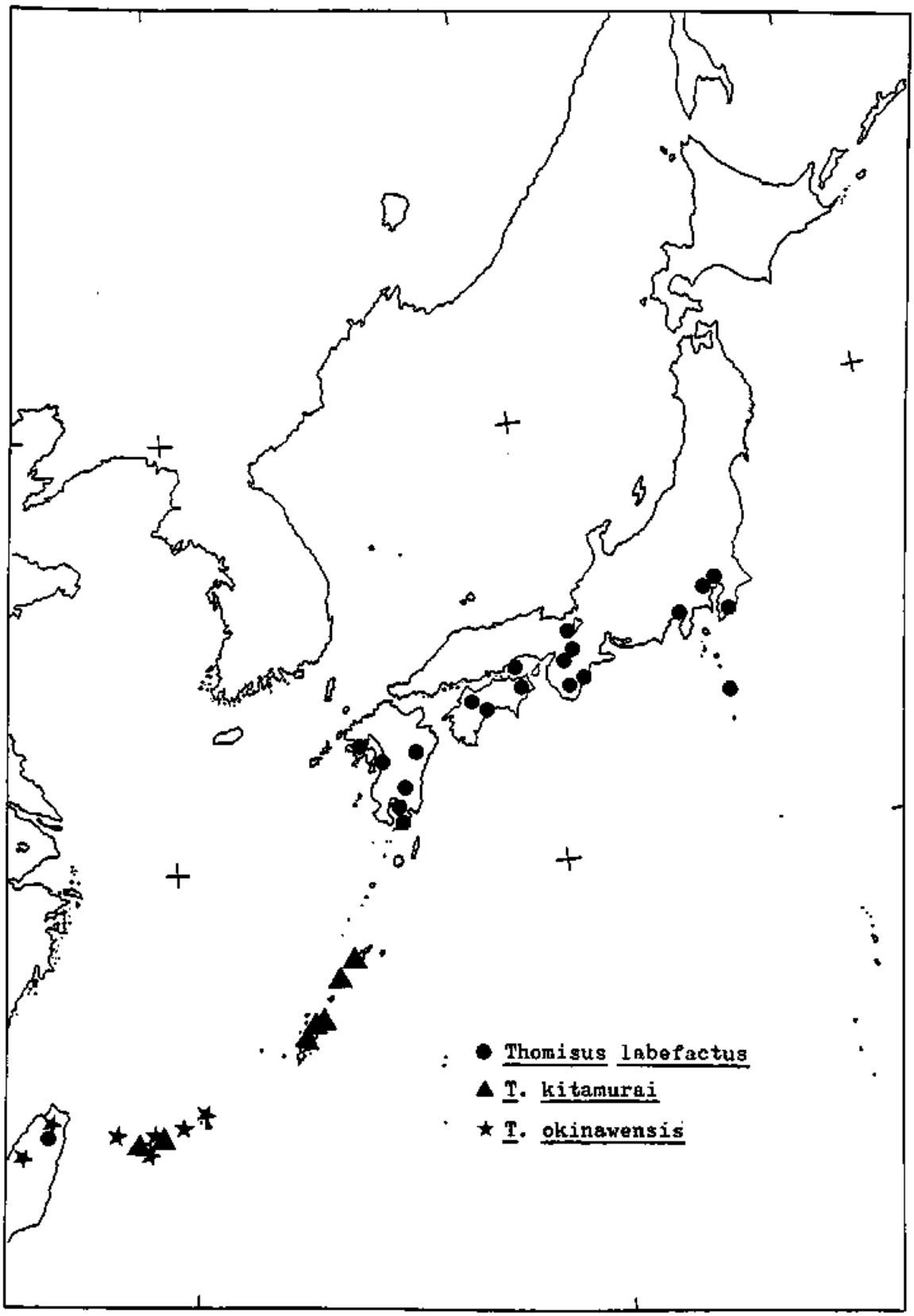

Fig. 222