Revision of the genus *Psoricoptera* Stainton, 1854 (Lepidoptera, Gelechiidae), with the description of two new Asian species

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Park, K-T. & Karsholt, O. 1999: Revision of the genus *Psoricoptera* Stainton, 1854 (Lepidoptera, Gelechiidae), with the description of two new Asian species. — Entomol. Fennica 10: 35–49.

The Palaearctic gelechiid genus *Psoricoptera* Stainton, 1854 is revised. Two previously described species, *gibbosella* (Zeller) and *speciosella* Teich are recognized based on differences in genitalia; both have a trans-Palaearctic distribution. Their distinction is supported by differences in the morphology and biology of the early stages. *Chelaria triorthias* (Meyrick) and *Lita lepigreella* Lucas are placed in synonymy with *gibbosella* (syn. n.). Two new species *P. latignathosa* sp. n. *P. kawabei* sp. n. are described from E. Asia. Infraspecific variation in the genitalia of *Psoricoptera* is discussed.

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Received 12 July 1997, accepted 11 February 1998

Introduction

The genus *Psoricoptera* was erected by Stainton (1854) for a single aberrant gelechiid moth, *Gelechia gibbosella* Zeller, 1839, which he placed between the genera *Depressaria* and *Gelechia*. *Psoricoptera* exibits in most taxonomically important characters a remarkable variability, which is quite unusual in gelechiids. Up till now it was unsetteled if the hitherto described taxa of *Psoricoptera* represented one or more species.

Meyrick (1925) synonymized *Psoricoptera* with *Chelaria* Haworth, 1828, an objective junior synonym of *Hypatima* Hübner, 1825 (Chelariini), but most authors continued to use *Psoricoptera* for *gibbosella*, and it was listed as a valid genus by Sattler (1973). *Psoricoptera* shares with *Hypatima* the rough scales beneath second segment of labial palpus, but we do agree with Pitkin´s (1984: 6) placement of it in the Gelechiini. Karsholt & Riedl (1996) placed *Psoricoptera* between *Gelechia* Hübner, 1825 and *Mirificarma* Gozmány, 1955.

Up to date three species: *gibbosella* (Zeller), *speciosella* Teich and *triorthias* (Meyrick), all Palaearctic, have been assigned to *Psoricoptera*. *Lita lepigreela* Lucas, described from Algeria, is here considered a synonym of *gibbosella*.

For about 20 years, Scandinavian microlepidopterists had recognized that another species of *Psoricoptera* may occur in North Europe besides *gibbosella*, and that the name *P. speciosella* Teich, 1893 was available for the former. This was first pointed out by Harry Krogerus (pers. comm.) and later published by Svensson (1982). The picture became less clear when material from other geographical areas was studied (Karsholt 1995). Svensson (1982) found a difference in the number of

microspines on the aedeagus between Swedish specimens attributed to *speciosella* and *gibbosella* (10-15 and 21-43 spines, respectively). We examined this character in specimens from different parts of Europe and counted 7-13 spines in specimens with a *speciosella* type of uncus and 21-43 spines in specimens with a *gibbosella* type of uncus. However, these spines are not easily discernable due to their small size, and their number may be counted differently according to the position of the preparation. No helpful studies on the female genitalia of *Psoricoptera* have been published.

Recently, the assumption of the existence of two species of *Psoricoptera* in Europe was strongly supported by evident differences in biology and in colour of larvae (Kaitila 1996). Within the Gelechiidae it is unusual to find noticeable infraspecific variation in the shape of genitalia. In *Psoricoptera*, morphological variation in the male genitalia, especially with regard to the shape of the uncus, has been briefly discussed by several authors (Liu & Pai 1979; Karsholt 1995; Huemer, pers. comm.). Liu & Pai (1979), placing *gibbosella* in *Chelaria*, illustrated two different types (pl. V, Figs 12, 13) of male genitalia, which show differences in the gnathos and uncus. As concluded below, we consider them to represent two different species.

In order to clarify this complex the authors dissected and examined the genitalia of more than 60 *Psoricoptera* specimens, originating from several European countries and from Russian Far East, Japan and Korea. We could confirm that differences in the shape of the uncus (particulary) and in the number of spines on the aedeagus support the recognition of two widespread Palaearctic species, *gibbosella* and *speciosella*. The material from Asia studied by us moreover included two additional new species, which are described below.

In the descriptions of the genitalia below only characters of diagnostic significance are mentioned. In chapters on 'Other material examined' locality and dates are followed by a bracket containing information (when available) on collector, genitalia slides, and collection, separated by semicolons.

Abbreviations:

BMNH: The Natural History Museum, London, England.

CIS: The Center for Insect Systematics, Kangweon National University, Korea.

IBPV: Institute of Biology and Pedology, Vladivostok, Russia.

MGAB: Muzeul de Istorie Naturala "Grigore Antipa", Bucharest, Rumania.

OPU: Entomological Laboratory, Osaka Prefecture University, Sakai Japan.

RNHL: National Museum of Natural History, Leiden, The Netherlands.

TLMF: Tiroler Landesmuseum Ferdinandeum, Innsbruck, Austria.

TMB: Természettudományi Múzeum Állattára, Budapest, Hungary.

ZIAP: Zoological Institut, Academy of Sciences, St. Petersburg, Russia.

ZMHB: Zoologisches Museum, Humboldt Universität, Berlin, Germany.

ZMUC: Zoological Museum, University of Copenhagen, Denmark.

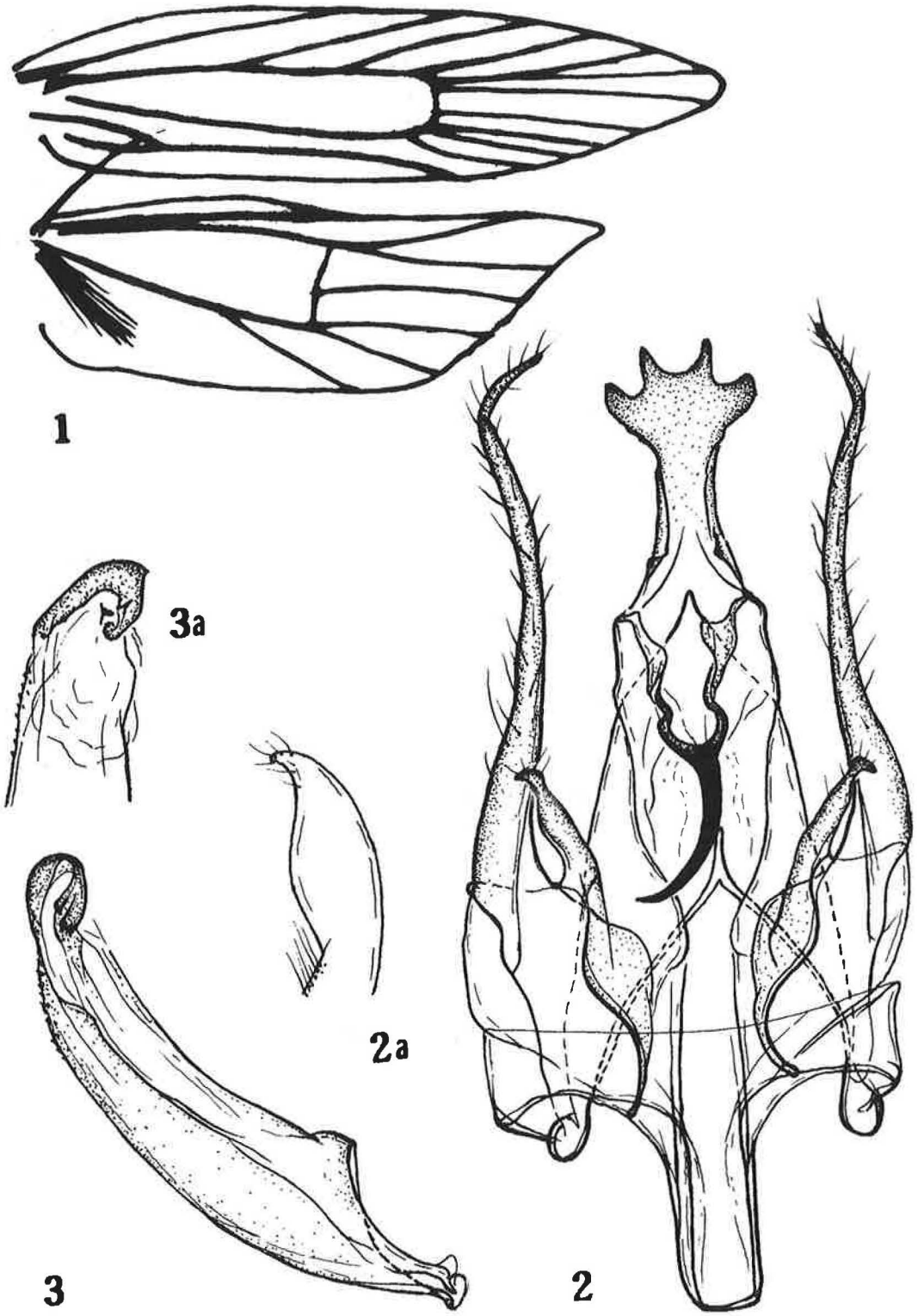
ZMUH: Zoological Museum, University of Helsinki, Finland.

2. Species

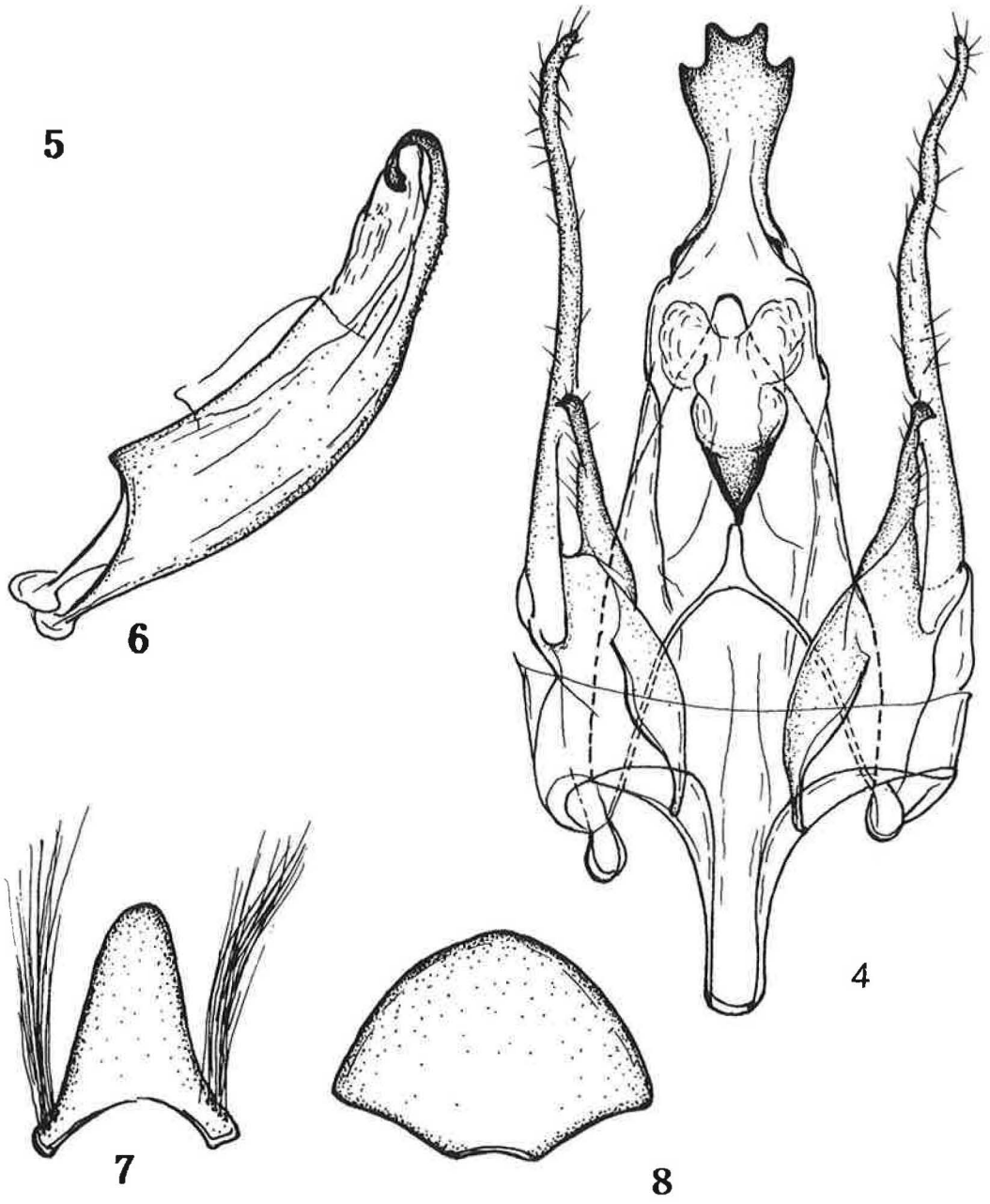
Psoricoptera Stainton
Psoricoptera Stainton, 1854: 100.
Phoricoptera Stainton, 1854: 76 (incorrect original spelling) (Sattler 1973).

Type species: Gelechia (Chelaria) gibbosella Zeller, 1839.

Diagnosis. Segment 2 of labial palpus with expanded ridge of loose scale-tufts beneath, slightly furrowed on ventral surface; segment 3 laterally flattened, thickened with loose scales dorsally. Forewing with well developed erect scale-tufts on upper surface; all veins present (Fig. 1), R3 arising from near upper corner of cell, R4 and R5 stalked near or beyond middle, R5 to costa, M1 separate from R4+5, M2 almost parallel with M1, M3 and CuA1 separated; CuA2 arising from near corner of cell; cell closed; hindwing with costa expanded anteriorly before middle ; Rs and M1



Figs. 1-3. Psoricoptera gibbosella (Zeller): 1. Venation; 2. Male genitalia; 2a. Lateral aspect of valvella; 3. Aedeagus; 3a. Lateral aspect of distal part of aedeagus.



Figs. 4-8. *Psoricoptera latignathosa* sp. nov.: 4. Male genitalia; 5. Uncus; 6. Aedeagus; 7. Eighth tergite; 8. Eighth sternite.

separated from upper corner of cell, M3 and CuA1 connate. Segment VIII in male with sclerotized plates (figs 7-8): membranous plate surrounding basal part of genitalia, with numerous semiovate scales laterally; Tergite VIII conical with a pair of long hair-pencils at lateral base; sternite VIII broad, fan-shaped, distal margin round, anterior margin slightly incurved.

***Psoricoptera gibbosella* (Zeller)** (Figs. 1-3, 9-11, 16-23, 24-29, 34-38, 45-48)

Gelechia (*Chelaria*) *gibbosella* Zeller, 1839: 202 [examined].
Psoricoptera gibbosella: Stainton, 1854: 101.
Chelaria triorthias Meyrick, 1935: 589 [examined], syn. nov.
Psoricoptera triorthias (Meyrick, 1935): Ueda et al. 1995: 148.
Lita lepigreella Lucas, 1946: 98, syn. nov.

Adult (Figs 9, 47-48). Wingspan 14-20 mm. Labial palp covered with fuscous-brown, light-based scales, segment 2 creamish at inner and upper surfaces, segment 3 laterally flattened with long, loose light-brownish scales. Head creme to light brown, laterally darker, with lighter face; thorax brownish; tegula with light brown to creme scales. Forewing brownish, mixed with whitish, blackish and occasionally orange scales; three erect scale-tufts at 1/4, 2/4 and 3/4; an indistinct, angulated, whitish, subapical, transverse band; fringes dark at basal half, lighter towards tip. Hindwing greyish, darker towards apex, with light grey fringes.

Variation. In some specimens the whitish scales in forewing are particular prominent and can form an irrigular white, subcostal line. In other specimens there are nearly no white scales, and such specimens have a blackish-brown appearence. Occasionally such specimens have black, longitudinal lines (Fig. 9). Specimens which are nearly entirely whitish or blackish are rare. In most West Palaearctic specimens a considerable amount of red-brownish scales are present, whereas East Palaearctic specimens are more blackish.

Male genitalia (Fig. 2). Uncus variable (Figs 16-23, 45), but incisions of distal margin normally not strongly pronounced, and the median incision is not normally deeper than well below the two lateral incisions; aedeagus (Figs 3, 46) with more than 20 small spines on ventral surface beyond two-thirds.

Female genitalia (Fig. 24). Ostium plate (Figs. 24-29) subtriangular, shorter than wide, not tending backwards beyond base of apophyses anteriores; signum (34-38) hexagonal in outline, with diagonal groove, length about equal to width.

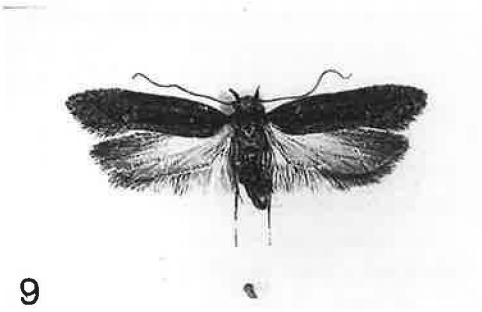
Remarks. A male from Austria inf., Ernstbrunn has a deeply emarginated median incision in uncus (Fig. 23) and 22 microspines on aedeagus, but the male genitalia are distinctly smaller than in most *speciosella*, and the forewings are with many reddish brown scales. It is here tentatively placed under *gibbosella*. Also in some specimens from Germany the median emargination of uncus is deeper than is usual for *gibbosella* (Fig. 45-46), but in other characters they agree with that species, and we consider them to represent individual variation.

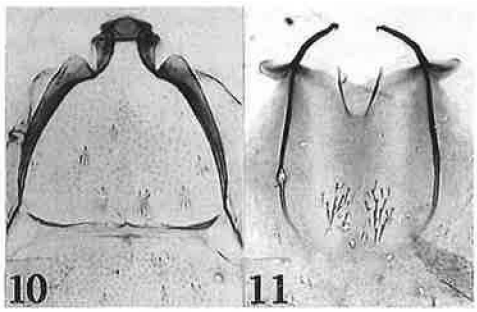
A large (20 mm) male from Far East Russia, Askold Island has nearly uniform light brownish forewings (which may have been exposed to light). Its genitalia fit *gibbosella* well, apart from being of the size of *speciosella*. It is here assigned to *gibbosella*.

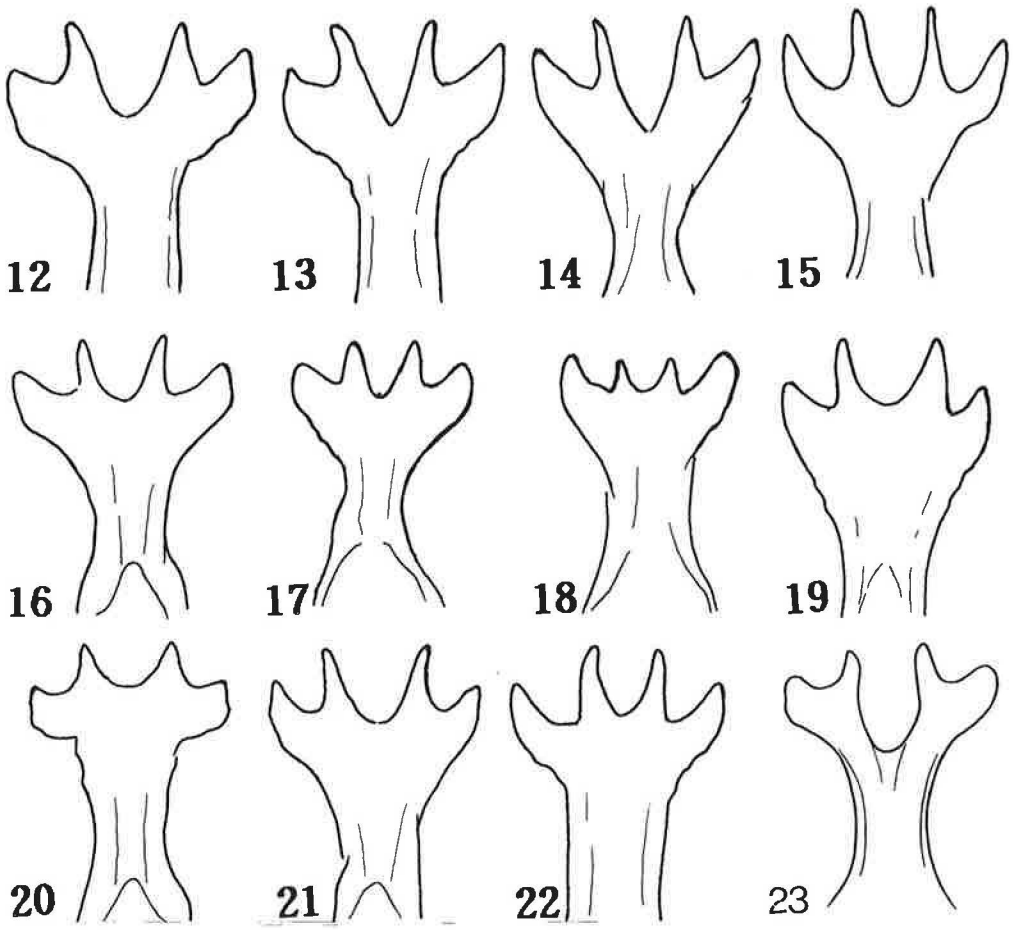
Gelechia (*Chelaria*) *gibbosella* Zeller was described from one male and four females caught around spruce in Berlin (Germany) in July. In the BMNH a female is already labelled as a lectotype by K. Sattler. It is published here for the first time (for data, see below).

Chelaria triorthias Meyrick was described from one male collected in July at Tokyo (Japan) by S. Issiki. We have examined the holotype in the BMNH. It is in a good condition, but the head is missing. The moth and its genitalia are figured by Clarke (1969: pl. 216). Specimens from Japan are generally more blackish and contrasting compared with European ones and may deserve subspecific status. However, having examined very little material from Japan, we refrain from deciding on this until sufficient material from other parts of Asia is available for comparison.

Lita lepigreella Lucas was described from an unspecified number of specimens from "Alger" (Algeria), collected by M. Lepigre on April 16, 1937. We have examined, in the BMNH, a colour







Figs. 9-11: *Psoricoptera gibbosella* (Zeller): 9. Adult of an unusual dark specimen from Germany; 10. Tergite I-II; 11. Sternite II; Figs. 12-23. Uncus of male genitalia of Psoricoptera: Figs. 12-15. *P. speciosella* Teich; Fig. 12. Finland (4144/Park); 13. Finland (4148/Park); 14. Finland (4146/Park); 15. Japan (1957/Park); Figs 16-23. *P. gibbosella* (Zeller): 16. Finland, (4154/Park); 17. Finland (4143/Park); 18. Finland (4145/Park); 19. Japan, Holotype of triorthias Meyrick (BM-8517); 20. Korea (1878/Park); 21. Korea (1785/Park); 22. European Russia (BM-26377); 23. Austria (OK 4651).

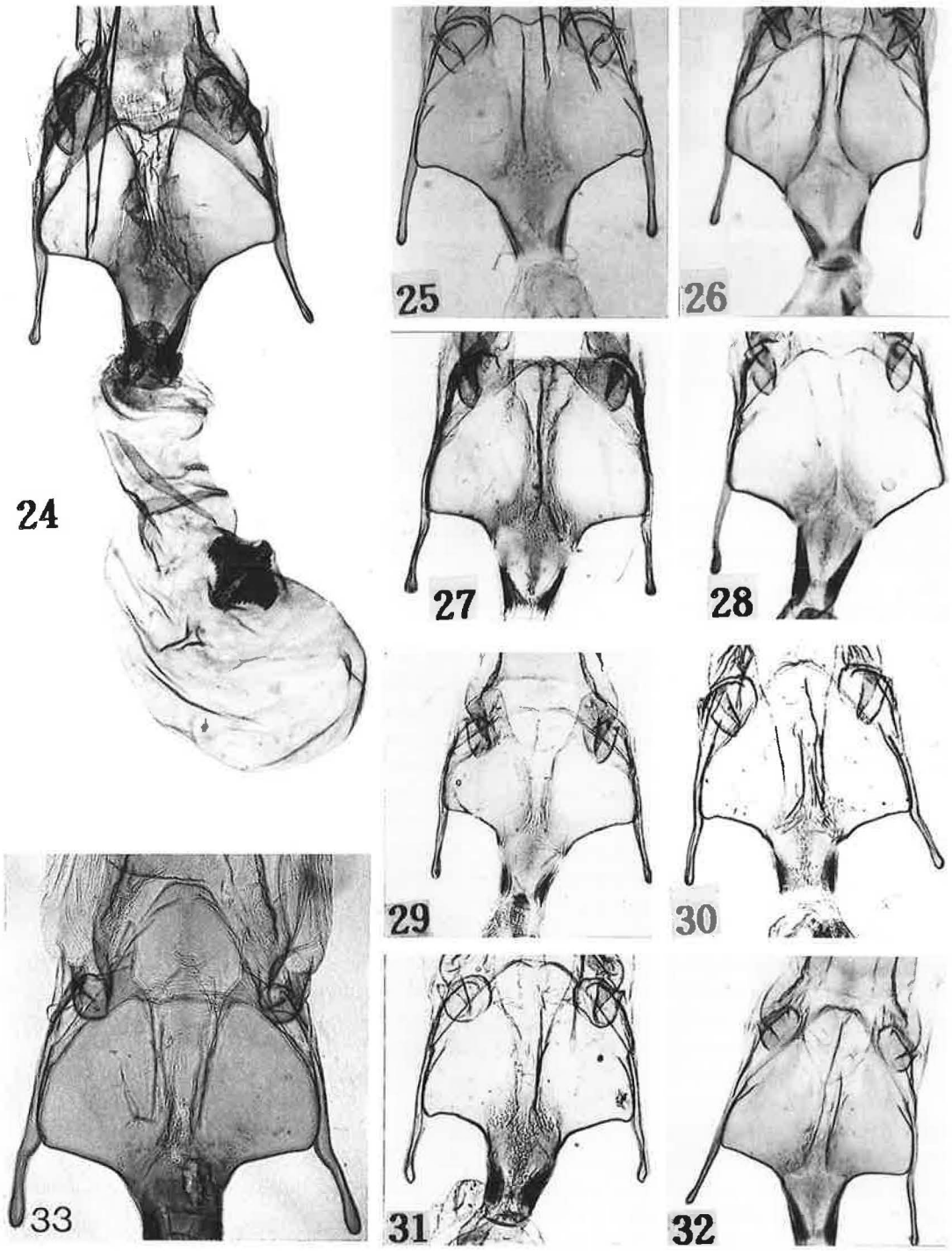
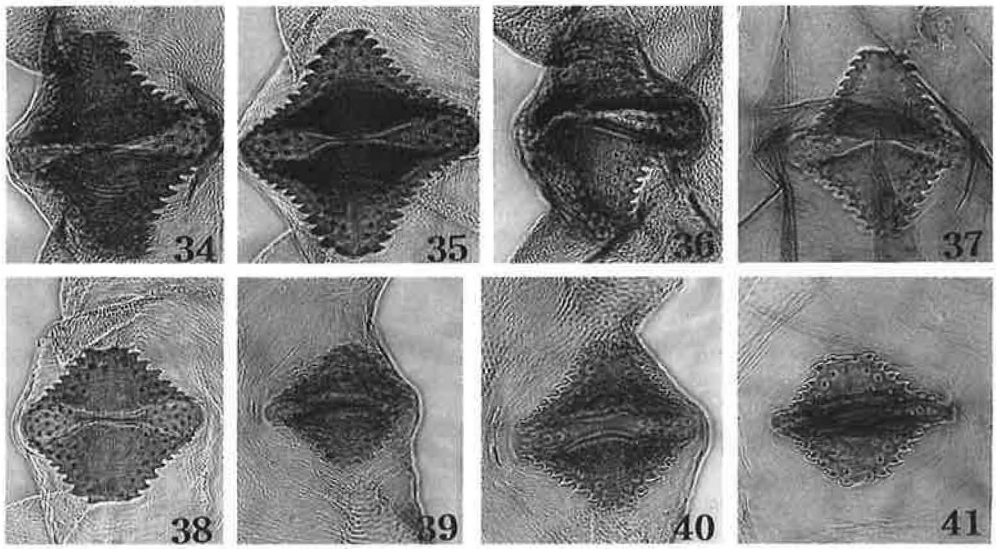


Fig. 24. Female genitalia of *Psoricoptera gibbosella* (Zeller), Korea (1837/Park): Figs. 25-33. Ostium plate of *Psoricoptera*; Figs. 25-29. *P. gibbosella* (Zeller): Fig. 25. Japan (1955/Park); 26. Japan (1880/Park); 27. Far East Russian (4153/Park); 28. Far East Russia (4152/Park); 29. Finland (4149/Park); Figs 30-32. *P. speciosella* (Teich): 30. Finland (4148/Park); 31. Finland (4150/Park); 32. Japan (1834/Park); Fig. 33. *P. kawabei* sp. n., (1839/Park).



Figs. 34-41. Signa of *Psoricoptera*. Figs. 34-38. *P. gibbosella* (Zeller): 34. Korea (1837/Park); 35. Far East Russia (4147/Park); 36. Japan (1880/Park); 37. Finland (4149/Park); 38. Japan (1955/Park); Figs 39-41. *P. speciosella* Teich: 39. Finland (4148/Park); 40. Finland (4150/Park); 41. Finland (4151/Park).

slide of a female, labeled as type and belonging to the Museum National d`Histoire naturelle in Paris, and we are convinced that *lepigreella* is a synonym of *gibbosella*. Arahou et al. (1991) showed that *gibbosella* hibernates as an adult in North Africa.

Larva. The larva was first described by Stainton (1867) as: "Grey, with darker subdorsal line and slender, slightly darker dorsal line; head black; the second segment black, with the anterior edge whitish; anal segment with a small black plate; ordinary spots small and black". According to Kaitila (1996) it "is greenish grey with dark grey middorsal line. Abdorsal line absent". Most descriptions of the larva of *gibbosella* (e. g. by Meess 1910) originate from Lienig & Zeller (1846), and refer to the larva of *speciosella* (see below).

Bionomics. The main host plant is *Quercus* sp., but it has occasionally been bred from *Salix* sp. (compare "Material examined" below). Records of larvae from *Crataegus* and *Malus*, as well as in galls of *Eriophyes* mites (Piskunov 1981) need confirmation. In Russian Far East it has been reared from *Quercus mongolica*, and Liu & Pai (1979) gave, in addition to *Quercus*, also *Juglans mandschurica* and *Salix* sp. as host plants in China. However, it is apparent (see Liu & Pai 1979, fig. 12) that these records probably included specimens of the following new species, *P. latignathosa*. Arahou et al. (1991) rapported *gibbosella* to be a pest in Morocco, where the larva lives in buds of *Quercus ilex*. They found that up to 45% of the buds could be destroyed. The adult flies from July and into the autumn. In N. Europe it is rarely seen later than medio September, but further south it is met with in late September and October, and from N. Africa it is reported to hibernate as an adult (Arahou et al. 1991).

Distribution. China, Japan, Korea, Russia (including Siberia and Far East), Europe, Asia Minor, N. Africa. Scarlato & Gorodkov (1984) published a distribution map for *gibbosella* within former Sovjet Union, but their records certainly included *speciosella* as well.

Type material. 'Lectotype / 4/7 34, 33 / Zeller coll., Walsingham Collection, 1910-427 / Lectotype ♀, *Gelechia gibbosella* Z., Select. K. Sattler, 1961 / B. M. ♀ Genitalia slide No. 7143'. Paralectotype: labeled as lectotype, but numbered '32'.

'Type / Tokyo, Japan, 10.7.34 / ♂ genitalia on slide 4.XII.1948, J.F.G.C 8517 / *Chelaria triorthias* Meyr., 1/1, E. Meyrick det. in Meyrick Coll. / *triorthias* Meyr. / Meyrick Coll., B. M. 1938-290'

Other material examined. Armenia: 1♂, Ko-

sikoparan, 1901 (Korb; MGAB). Austria: 1 ♀, N. Tirol, Fritzens, la. 10.VI.1969 (Hernegger; P. Huemer/GEL 208; TLMF); 1 ♀, N. Tirol, Ampass, 8.VIII.1969, (Hernecker; Huemer/GEL 211; TLMF); 1 ♂, inferior, Ernstbrunn, 21.VIII.1971 (M. & W. Glaser; OK 4651; ZMUC); 1 ♀, superior, Linz, Schweiger, 4.IX.1987 (F. Lichten-berger; Huemer/GEL 208; TLMF). Czech Republic: 1 ♀, Bohemia, Praha, Krc, 11.X.1953 (V. Zouhar; ZMUC). Denmark: 1 ♂, EJ, Stenholt, 29.VII.1974, (E.S. Nielsen; ESN 1180; ZMUC); 1 ♂, NEJ, Læsø, Skoven, 27.VII.1980 (O. Karsholt; OK 4659; ZMUC); 1 ♀, LFM, Lolland, Blands Skifter, bred 12.VII.1920, in leaf of Salix caprea, (H.P.S. Sønderup; OK 4585; ZMUC); 1 ♂, SZ, Basnæs, 3.VIII.1942 (P.K. Nielsen; OK 4584; ZMUC); 1 ♀, NEZ, Gadevang, 27.VII.1945 (N.L. Wolff; OK 4043; ZMUC); undissected specimens from Denmark: 33 ♂♂, 17 ♀♀ (ZMUC). Finland: Ab: 1 ♂, Turku, Ruissalo, 7.VIII.1921 (Clayhills; ZMUH); 1 ♀, ideb., 21.VII.1940, (Lankiala; 4154/Park; ZMUH); 3 ♂♂, 1 ♀, ideb., 16-18.VIII.1979 (J. Jalava; 4143/Park, 4145/Park, 4149/Park; ZMUH); 2 ♀♀, Satava, 26.VIII.1936, 25.VIII. 1938, (W. Hackmann; P. Huemer 93/444, 93/445; ZMUH); Al: 2 ♂♂, Föglö, Bänö, 3.-4. VIII.1973 (J. Jalava; ZMUH). Germany: 1 ♂, Krs Bitterfeld, Lingenau, 8. VIII.1982 (R. Sutter; OK 4560; ZMUC); 1 ♀, Württemberg, Markgröningen, Rotenecker, 25. VIII.1976 (L. Süssner; Huemer/GEL 209; TLMF); 1 ♂, Sachsen-Anhalt, Krs Bitterfeld, Pouch, 4. VIII.1996 (R. Sutter; Sutter 5219; Sutter). Greece: 1 ♂, Fthiotis, Ag. Konsta-tinos, Livantae, 2 m, 28.IX.1984 (M. Fibiger; OK 4657; ZMUC); 1 ♂, 20 km NW Xanthi, Kallithea, 6.VII.1985 (B. Skule & P. Skou; ZMUC); 1 ♂, Florina, 6 km W Psarades, 6.-8.IX.1991 (F. Schepler; ZMUC). Hungary: 1 ♂, Budapest, Kamarae, 12.VII.19? (Uhrik; 6679/Gozmany; TMB) 1 ♀, Apaj, 2.VII.1909 (Schmidt; 6678/Gozmany; TMB). Italy: 1 ♀, S. Tirol, Schnalstel, 800 m, primo ix.1973, (F. Zürnbauer; Huemer/GEL 206; TLMF); 1 ♂, Verona, Monte Baldo, San Zeno, 400 m, 1.-2.X.1983 (B. Skule & P. Skou; OK 4647; ZMUC); 1 ♂, 2 ♀♀, Bolzen, Auer, 200 m, 29.VII.1990 (P. Huemer & O. Karsholt; OK 4582, 4586; ZMUC). Japan: 2 ♂♂, 1 ♀, [no further locality] (Pryer; BM 15778; BMNH); 1 ♂, Tama Hill, Tokyo, 14.VII.1958 (A. Kawabe; CIS); 1 ♂, 1 ♀, Nagano Pref., Setagaya, 13.VI.1965 (A. Kawabe; 1838/Park, 1880/Park; CIS); 1 ♀, Kiyosato, 1300m, Yamanashi-ken, 20. VIII.1972 (H. Inoue; CIS); 1 ♀, Mt. Minaka, 23. VIII.1974 (A. Kawabe; CIS). 1 ♀, Nakaizamurai, Tenyushimoina, 16.IX.1987 (M. Hara; CIS); 1 ♂, 2 ♀, Shirahone-guti, Azumi, Nagano, 1460m, 11. VIII.1988 (K. Fujisawa, 1954/Park, 1955/Park; CIS); 1 ♂, Obikawa Anan, 430 m, Shimoina, Nagano, 16.X.1988 (K. Fujisawa; 1955/Park; CIS); 1 ♀, Kyushu, Kagoshima Pref., Amamioshima Is., Nishinakama, la. 6.iv.1996, host unknown (T. Ueda; TU 419; OPU); Korea: Gangweon Prov.: Chuncheon, 1 ♂, 25.VII.1988, 3 ♂, 1 ♀, 7.ix.1988 (K.T. Park; 1785/Park, 1878/Park; CIS); 1 ♀, Mt. Keunbong-San, 5.VII.1985 (K.T. Park; 1384/Park; CIS); 1 ♀, Jeombong-san, 10. VIII.1992 (K.T. Park; CIS). Netherlands: 1 ♂, Breda, 24.VIII. 1884, (Snellen; 1958/Park; RNHL); 1 ♀, Senep, 9. VIII.1877 (Snellen; 1959/Park; RHNL). Poland: 1 ♂, Ohalia [=Olawa] near Lissa, 17.VII.1865 (ZMHB); 1 ♂, Oswitz [=Auschwitz], 21.VII.1861 (ZMHB); 1 ♂, 1 ♀, Stettin [=Sczecin], 6.VII.1894 (ZMHB); 1 ♀, Torunia, Las Piwnicki, 31.VII.1978 (J. Buszko; ZMUC). Rumania: 1 ♂, Dobrogea, Hagieni, 8.-9.VII.1992 (L. Rakozy, ZMUC). Russia: 2 ♂♂, 2 ♀♀, Kasakevitsch, 1908 (Korb; 4152/ Park, 4153/Park; MGAB); 1 ♂, 2 ♀♀, Gornotaezhnoe, 20 km SE Ussurysk, 23.-29.VI.1990, reared from Quercus mongolica; 1 ♀, ideb., 23.VI.1990 (M. Ponomarenko; IBPV), 1 ♂, Sarepta, [=Krasnoarmeysk], 12.VII.1885 (H. Christoph, BM 26377; BMNH); 1 ♂, ideb., without date (MNHU); 1 ♂, Vladivostok, Askold Isl., 1883 (Dör.; K. Sattler 503a; MNHU); 1 ♂, Amur Oblast., between River Perog and River Bol'schaja Ergelia, la. 19.VI.1959, Quercus mongolica (bred 14.VII.1958), (Kuznetsov & Suhareva (ZIAP). Spain: 1 ♀, Andalusia, Camino d. Rhonda, Urb. Madronal, Loma de Colmas, 500 m, 14.X.1988 (E. Traugott-Olsen; ZMUC). Tunisia: 1 ♀, Ain Draham, 21.VII.1886 (Eaton; BMNH); Turkey: 1 ♀, Anatolien, Ak-Chehir, 1900 (Korb; MGAB); 1 ♂, Prov. Mersin, Taurus, Gözeloluk NW Erdemli, 1400 m, 16.VII.1986 (M. Fibiger; OK 4649; ZMUC).

***Psoricoptera speciosella* Teich** (Figs. 12-15, 30-32, 39-41, 49-50)

Psoricoptera speciosella Teich, 1893: 358.

Adult (Figs. 49-50). Wingspan 17-21 mm. Very similar to *gibbosella*, but with forewing more blackish, or blackish and whitish, only occasionally with brownish areas.

Variation. In some specimens the whitish scales form an irrigular subcostal line, and rarely they cover most of the costal half of the forewing. Occasionally specimens with many red-brownish scales, especially in dorsal half, occur.

Male genitalia. Very similar to those of *gibbosella*, but slightly larger; median incision of distal margin of uncus between inner lobes strongly emarginated, reaching well beyond the incision of the two lateral incisions (Figs. 12-15); aedeagus with less than 16 microspines on ventral surface beyond two-thirds.

Female genitalia. Ostium plate (Figs. 30-32) posteriorly more acute and less distinctly intended medially than in *gibbosella*, its length and width almost equal, extending backwards beyond base of apophyses anteriores; signum (39-41) generally smaller than that of *gibbosella*, variable, but usually shorter than wide, whereas in *gibbosella* the length and width are subequal. Apophyses anteriores usually longer than in *gibbosella*.

Larva. The larva was first described by Lienig & Zeller (1846) (under the name of *gibbosella*) (translated from German): "It is first light dust-grey with fine black warts with a few light hairs. Later it becomes light brown-whitish with a dark grey line on each side of the abdomen; head blackish, prothoracic plate and thoracic legs black; anal plate bone white. At last it changes again into pale apple-green. The warts, which look as black dots, have a light brownish hair; along the back runs a fine grey-green line with small, rounded, rosa-reddish spots in the incisions between the segments. Along the sides of the abdomen is a brownish line, and above the abdominal legs a line composed of rosa reddish spots. Head dark brown; prothoracic plate wax-yellow, posteriorly and laterally blackish edged; thoracic legs black". Recently the larva has been described as "pale brownish grey with reddish brown middorsal line. Abdorsal line reddish" (Kaitila 1996).

Bionomics. The larva is slim and quick and bends an edge of a leaf of the hostplant close around its body (Lienig & Zeller 1846). It feeds on leaves of *Salix* sp. in late June and early July (Kaitila 1996). A larva found on "Wollweide" [*Salix* cf. *caprea*] in the beginning of June pupated at the 25th of June and the adult emerged at the 20th of July (Lienig & Zeller 1846). The adult moth flies from late July to late September. In Finland and Sweden it is a little later on the wing than *gibbosella* (Kaitila 1996, Svensson 1982). Aarvik (1987) reported upon finding of a larvae of *speciosella* already the 26th of May.

Distribution. Finland, Germany, Japan, Norway, Poland, Russia, Sweden. Recently reported from France (Nel & Varenne 1996).

Remarks. According to Kaitila (1996) the genitalia of *speciosella* are larger than those of *gibbosella*. Our measurements show them to be about 10-15% larger (at least in N. European specimens), but *speciosella* is, on average, larger than *gibbosella*, wherefore the relative size of the genitalia may be the same in both species.

In one specimen from Japan the gnathos are shorter and broader, resembling that of *P. latignathosa* n. sp. However, it has the uncus similar to *speciosella*, and it was bred from *Salix* together with a female, which has the genitalia similar to those of *speciosella* (Fig. 32). It is here tentatively listed under that species, but we are aware that it may well represent a further, undescribed species.

Kaitila (1996) stated the larva of *gibbosella* and *speciosella* to differ in colour. However, also in these character there seems to be some variation, when one compare his descriptions with those given by Stainton (1867) and Lienig & Zeller (1846) (see above). Further research is needed to prove if constant morphological characters exist between the larva of *gibbosella* and *speciosella*.

The host plant association of the larva of *gibbosella* with *Quercus* spp. and *speciosella* to *Salix* spp. is apparently an important diagnostic character for these two species in both Europe and Asia. Even though we examined a specimen of *gibbosella* which was, according to its label, bred from *Salix*, cases of host plant shifts between these two species are at most very occasional. There

may, moreover, be some doubt about the correctnes of this information as it is known that the collector, H. P. S. Sønderup, in some cases labeled bred specimens according to the host plant(s) given in the literature, when he could not remember from where he bred the moths (O. Karsholt, unpubl.). At his time most literature records of host plants for *gibbosella* were based upon Lienig & Zeller´s (1846) record from *Salix*, which originated from a misidentified larva of *speciosella*. New, well documented records of larvae of *gibbosella* from *Salix* or *speciosella* from Quercus would therefore be important.

Psoricoptera speciosella Teich was described from a single specimen collected at Dudeln in Latvia. The collection of Teich is considered lost, but the identity of *speciosella* has been generally accepted.

Material examined. Finland: *Ka*: 3♂♂, 2♀♀, Virolahti, 2.-18.VIII.1975 (J. Jalava; 4142/Park, 4148/Park, 4150/Park; ZMUH); 1♂, ideb., 16.-28.VIII.1979 (E. Laasonen, ZMUC); *Ab*: 1G Loja, 1.VIII.1975, 1♂ 18.VIII.1978 (H. Krogerus; OK 4652; ZMUC); 1♂, Karisloja, 18.VIII.1978 (H. Krogerus; ZMUC); *N*: 2♀♀, Porvoon mlk., 15.VIII.1970, 2.IX.1972 (E. Suomalainen; OK 4044; ZMUC); 1♀, ideb., 5.-7.VIII.1980 (L. Löfgren; ZMUC); 1♂, Nurmijärvi, 18.VIII.1971 (J. Jalava; ZMUH); 1♂, 1♀, Helsingfors, 23.VIII.1975 (Nybom; 4151/Park; ZMUC, ZMUH); 3♂♂, 2♀♀, Helsinki, Kannelmäki, 31.VII.-2.VIII.1979 (J. Jalava; P. Huemer 93/443, 93/444, 4146/Park; ZMUH); 1♂, Espoo, 11.-14.IX.1982 (L. Löfgren; ZMUC). Germany: 1♂, Leutstetten, 590 m, primo IX.1966, 1♂, ultimo VIII.1968 (F. Zürnbauer; Huemer/GEL207, 210; TLMF); 1♂, Blankenburg, Schwarzatal, 11.VIII. 1988 (H. Steuer; HS 3383; Steuer). Japan: *Nagano Pref.*: 1♂, 1♀, Setagaya, 5.-10.VII.1964, bred from *Salix* sp. (A. Kawabe; 1834/Park, 1835/Park; CIS); 1♂, Kisojihara, Nagawa, 25.VIII.1984 (K. Fujisawa; 1957/Park; CIS); 1♂, 1♀, Hokkaido, Tokachi, Shikaoi, Shikaribetsukyo, 24.VIII.1981 (J. Kanazawa; OK 4650, OK 4654; ZMUC). Poland: 1♂, Puszcza Bialowieska, Park Narod, 25.VIII.1965, 1♀, 26.VIII.1966 (S. Adamczewski; OK 4653, OK 4658; ZMUC). Russia: 3♂, 1♀, Altai, Teletshoe oz., Artybas biol. st., 18.-22.VIII. 1982 (K. Mikkola; ZMUC, ZMUH); 1♂, SU, Bez. Perm, Verdichter station Ordinskaja, 28 km Ösö Barda, 300-400 m, 8.-9.VIII.1987 (T. Karish; BMNH); 8♂, 5♀, Far East, Primorskij Kraj, Shkotovo distr., Anisimarka, 19.VII.-7.VIII.1994 (N. Savenkov, ZMUC).

***Psoricoptera latignathosa* sp. n.** (Figs. 4-8, 51)

Diagnosis. In external characters very similar to *gibbosella* (Zeller) and *speciocella* Teich, apart from that the forewing (of the somewhat worn holotype) has no whitish or brownish scales, the postmedian line of forewing is followed by black scales, and the fringes of hindwing has a dark fringe-line. For differences from *P. kawabei* q. v. In the male genitalia *latignathosa* is unique in having the gnathos extremely broad towards base (not narrowed and sickle-shaped as in the two above mentioned species), and uncus with only slight incisions in distal margin.

Adult (Fig. 51). Wingspan 18 mm. Head and thorax greyish brown. Antenna and labial palp typical for the genus. Forewing greyish with scattered black markings; three prominent, erect, blackish scale-tufts: two larger, longitudinal ones are located posteriorly to cell, one at distal end of cell, and a couple of smaller ones are irregularly scattered over the wing; an indistinct, angulated, light grey, subapical, transverse band is followed by black scales; fringes dark at basal half, distally lighter. Hindwing greyish, darker towards apex; fringes greyish, with darker, basal fringe-line.

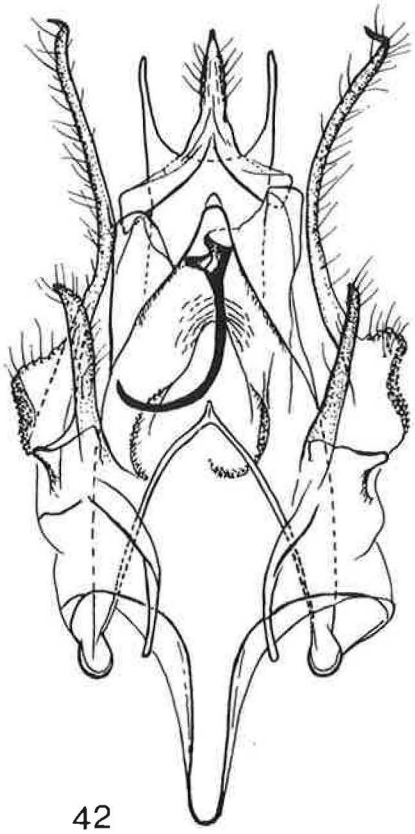
Male genitalia (Fig. 4). Gnathos broad basally, triangular, with pointed apex. Uncus (Fig. 5) only slightly emarginated or incised on distal margin, with lateral lobes very short (this character may prove to be variable); saccus narrower than in related species; aedeagus (Fig. 6) with less than 15 inconspicuous microspines beyond two-thirds.

Female. Unknown.

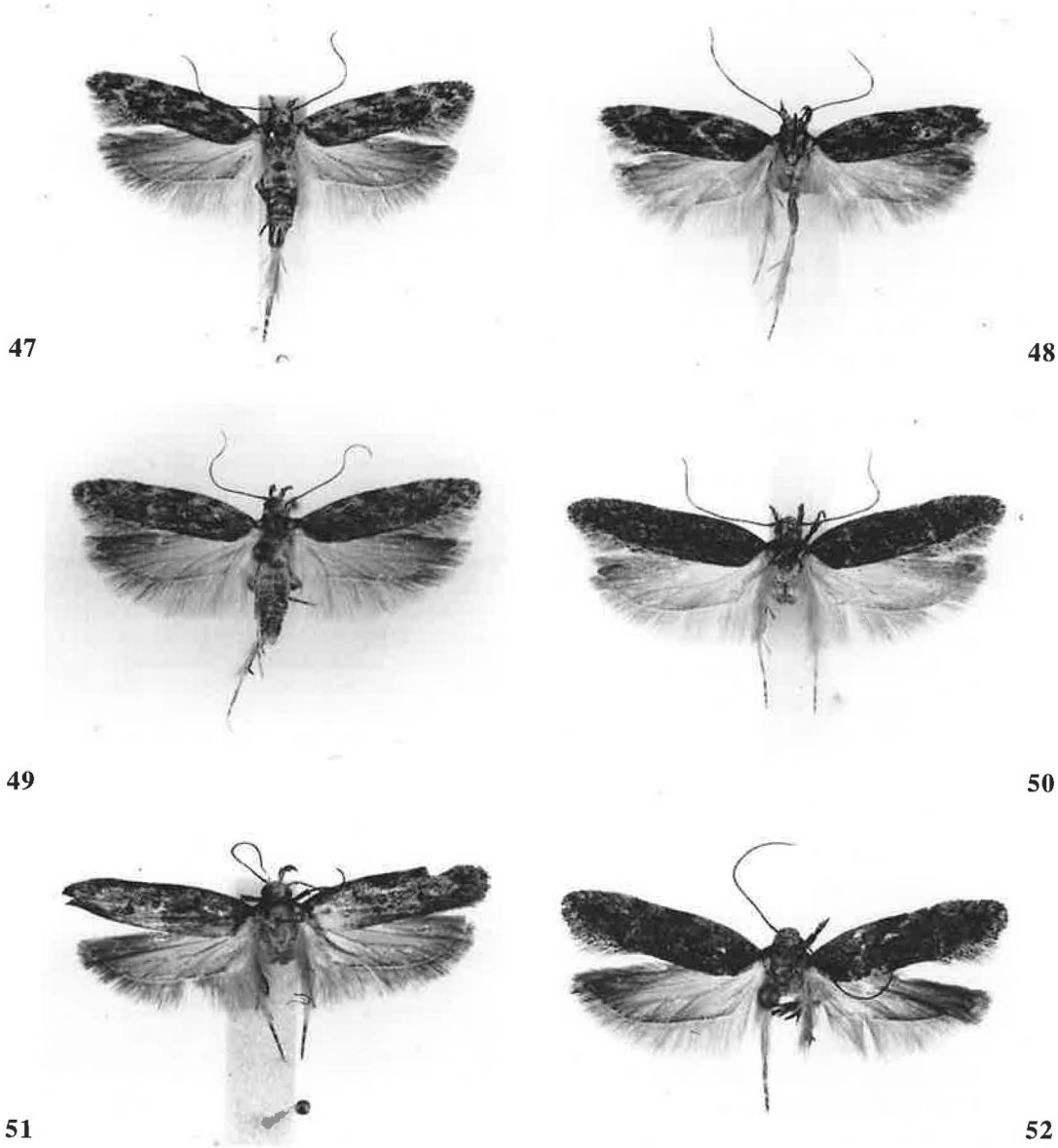
Bionomics. Immatures and host plant unknown (but see "Remarks" below). The holotype was collected in late July.

Distribution. China, Korea.

Remarks. The male genitalia figured by Liu & Pai (1979: Fig. 12) under the name of *gibbosella*



Figs. 42-44. *Psoricoptera kawabei* sp. n. Fig. 42. Male genitalia (1956/Park); Fig. 43. Aedeagus (1956/Park); Fig. 44. Corpus bursa with signum (1839/Park); Figs. 45-46. *Psoricoptera gibbosella* (Zeller), Austria (Sutter 5219); Fig. 45. Uncus; Fig. 46. Lateral aspect of distal part of aedeagus.



Figs 47-52. Adults of *Psoricoptera* (x 3). Figs 47-48. *P. gibbosella* (Zeller) Fig. 47. ♂, Denmark. Fig. 48. ♂, Korea; Figs. 49.-50. *P. speciosella* Teich: Fig. 49. ♂, Finland; Fig. 50. ♂, Japan; Fig. 51. *P. latignathosa* sp. n., Holotype ♂, Korea; Fig. 52. *P. kawabei* sp. n., E, Japan.

obviously belong to *latignathosa*. In the description (in Chinese) of the adult, larva, and biology of their *gibbosella*, they listed as host plants *Quercus* sp., *Juglans mandschurica* and *Salix* sp., and it is possible that the host plant of *latignathosa* is one of these trees. We have had no opportunity to examine the material studied by Liu & Pai.

Type material. Holotype: ♂, Korea, Gangweon Prov., 10 km N Chuncheon, Chugog, 30.VII.1986 (K.T. Park; 1786/Park; CIS).

***Psoricoptera kawabei* sp. n.** (Figs. 33, 42-44, 52)

Diagnosis. In external characters similar to the three other *Psoricoptera* species, apart from being slightly larger. From most specimens of *gibbosella* and *speciosella* it can be separated by having no brownish or whitish scales, and from *latignathosa* by its dark hindwings without darker fringe-line. In the male genitalia *kawabei* is characterized by the shape of the uncus, the well developed distal lobes of tegumen, the slender gnathos, and the narrow saccus. In female genitalia the different shape of the ostium plate is characteristic.

Adult (Fig. 52). Wingspan 19-20.5 mm. Labial palp brownish, mixed with blackish-brown scales. Head light brown; thorax dark brown; tegula with light brownish tip. Antenna dark brown, indistinctly lighter ringed. Forewing with three prominent, erect scale-tufts, fuscous-brown with indistinct blackish markings, most prominent at basal part of dorsum, in middle of costa and near apex; fringes dark at basal half, lighter distally. Hindwing light fuscous, darker towards apex; fringes dark grey, without fringe-line.

Male genitalia (Fig. 42). Tegumen with symmetrical, slender distal lobes, arising from near base of uncus; uncus narrow, laterally with setae, apex pointed, turned down ventrally; gnathos sickle-shaped, very slender, with small base; valva slender, exceeding apex of uncus; aedeagus (Fig. 43) relatively slender, without microspines on ventral surface.

Female genitalia. Ostium plate (Fig. 33) larger compared with that of previous species, divided into two parts; apex clearly extending beyond base of apophyses anteriores and only slightly emarginated; signum (Fig. 44) short, about two thirds of width, elongated horizontally.

Host. Rhus chinensis Mill. (Anacardiaceae).

Distribution. Japan.

Remarks. We consider it likely that the male holotype and the female specimens are conspecific, as they are similar in external appearance, have a large wingspan, very characteristic genitalia compared to the other *Psoricoptera* species, and they were collected in the same area. However, as we have no definite proof for this we exclude the females from the type series.

Etymology. This new species is named after the late Mr. A. Kawabe who collected and reared larvae of this species.

Type material. Holotype: G, Japan, Nagano Pref., Shimonia, Tamoto Yasuoka, 23.VIII.1982 (M. Hara; 1956/Park; CIS).

Material excluded from type series. Japan: 1♀, Gunma Pref., Tanigawa, 6.VII.1973, bred from *Rhus chinensis* (A. Kawabe; 1839/Park; CIS). 1♀, Gunma Pref., Minakami, 23.VIII.1974 (A. Kawabe; 1882/Park; CIS).

Acknowledgements. We would like to express our thanks to Dr. P. Huemer, TLMF, Innsbruck, Austria for placing at our disposal specimens and genitalia slides prepared for his own research. We also acknowledge the help received from Dr. L. Gozmány, TMB, Budapest, Hungary; Mr. J. Jalava and Dr. L. Kaila, ZMUH, Helsinki, Finland; Dr. H. Krogerus, Helsinki, Finland; Dr. A.L. Lvovsky, ZIAP, St. Petersburg, Russia; Dr. W. Mey, ZMHB, Berlin, Germany; Dr. E. van Nieukerken, RNHL, Leiden, The Netherlands; Dr. M.G. Ponomarenko, IBPV, Vladivostok, Russia; the late Dr. A. Popescu-Gorj, MGAB, Bucharest, Romania; Dr. K. Sattler, BMNH, London, Great Britain, and Mr. T. Ueda, OPU, Osaka, Japan, who provided information and loaned us material under their care. Mr. A. Fujisawa, and the late Mr. A. Kawabe, both of Tokyo, Japan provided valuable specimens for KTP, and Mr. M. Fibiger, Sorø; Mr. F. Schepler, Vejle; Mr. P. Skou, Stenstrup, Mr. B. Skule, Rødovre, all of Denmark, Dr. N. Savenkov, Latvijas Dabas muzejs, Riga, Latvia, and Mr. E. Traugott-Olsen, Marbella, Spain presented material of *Psoricoptera* to ZMUC. Prof. N. P. Kristensen and Dr. Leif Lyneborg, ZMUC kindly commented upon the manuscript, and Mr. P. Stadel Nielsen, Holte, Denmark gave technical advice.

Most figures were prepared by KTP, but fig. 23 was drawn by Ms. B. Rubæk, ZMUC, and fig. 45-46 was provided by Mr. R. Sutter, Bitterfeld, Germany. The photographs used for fig. 9 and 47-52 were taken by Mr. G. Brovad, ZMUC.

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