



RESEARCH ARTICLE - ANTS

Taxonomic Studies on the Ant Genus *Strumigenys* Smith, 1860 (Hymenoptera, Formicidae) with Report of Two New Species and Five New Records Including a Tramp Species from India

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Abstract

The Indian species of the ant genus *Strumigenys* Smith, 1860 are keyed. 24 species are recognized two of which are described as new and five represent new records to India. The 24 Indian species are: *S. aduncomala* de Andrade, 2007; *S. assamensis* de Andrade, 1994; *S. emmae* (Emery, 1890); *S. exilirhina* Bolton, 2000; *S. fixata* Bolton, 2000; *S. godeffroyi* Mayr, 1866; *S. habropilosa* Bolton, 2000; *S. hemisobek* (Bolton, 2000); *S. hostilis* Bolton, 2000; *S. hypoturba* Bolton, 2000; *S. lyroessa* (Roger, 1859); *S. membranifera* Emery, 1869; *S. mitis* (Brown, 2000); *S. mukkaliensis* sp. n.; *S. mutica* (Brown, 1949); *S. nannosobek* (Bolton, 2000); *S. nanzanensis* Lin & Wu, 1996; *S. nepalensis* de Andrade, 1994; *S. peraucta* Bolton, 2000; *S. podarge* (Bolton, 2000); *S. rogeri* Emery, 1890; *S. smythiesii* Forel, 1902; *S. thanikkudyensis* sp. n. and *S. virgila* Bolton, 2000. 5 species *S. hemisobek*; *S. mitis*; *S. mutica*; *S. nannosobek* and *S. rogeri* represent first records from India. Among these *S. rogeri* is a tramp species which extends its limit to India as well. A revised key to the Indian ants of this genus is also provided herewith.

Introduction

Members of the genus *Strumigenys* mostly include small sized ants with predominantly cryptic habitat. These generally feed on springtails and other tiny soil arthropods (Bolton, 2000). Mostly, they nest and forage into the leaf litter, topsoil or rotten wood where they form small colonies (Bolton, 1999). These ants are of common occurrence but infrequently seen because of their small size, slow movements and cryptic habits.

The genus *Strumigenys* belongs to the tribe Dacetini. The internal classification of the tribe has been unstable ever since its inception. This instability has impelled many generic shuffling and reshufflings within the tribe. These numerous ambiguous and contrasting changes are worth emphasizing as they are not yet universally understood. Brown's revisionary work (1948, 1949a, b, c, 1950a, b, 1952a, b, 1953a, b, 1954a, b, 1958, 1959a, b, 1960, 1962 and 1964) resulted in subtribal divisions and establishment of 18 generic complexes. This classification was recognized and adopted by Bolton (1994). Baroni Urbani & de Andrade (1994) differed

and established synonymy of all these genera under the name *Strumigenys*. Bolton (1995) promptly contrasted this result and revived many genera within the tribe. However, later on Bolton (1999) synonymized all his generic revivals of (1995) but retained *Pyramica* as a valid genus. *Pyramica* was previously synonymized under *Strumigenys* by Roger (1863). Bolton (2000) carried out a global revision of the tribe Dacetini. All previous work was compiled along with new additions. Baroni Urbani & de Andrade (2007) redefined the limits, constituent genera of the tribe and insisted on the synonymy between *Pyramica* and *Strumigenys*. Recently, Bolton (2013) has also accepted and established the synonymy between *Pyramica* and *Strumigenys*.

The genus *Strumigenys* is currently represented by 834 extant and 4 fossil species (Bolton, 2013). From India 17 species (Bharti, 2011) are recorded so far. The present study reports 2 new species (*S. thanikkudyensis* sp. n. and *S. mukkaliensis* sp.n.) and 5 new records (*S. nannosobek*, *S. mutica*, *S. mitis*, *S. hemisobek* and *S. rogeri*) from India. With the addition of 2 new species and 5 new records the genus *Strumigenys* is now represented by 24 species from India, for



which a revised key is provided here.

Among the 873 dacetine species, only three species have achieved almost global distributional ranges: *S. rogeri*, *S. emmae* and *S. membranifera*. Though widespread these dacetines are most inconspicuous. *S. emmae* and *S. membranifera* were previously reported from India, while the tramp species *S. rogeri* is reported here for the first time from India. Although *S. rogeri* is tiny, its impact on other tiny soil arthropods could be substantial (Wetterer, 2012).

Materials and methods

The specimens were collected by hand picking and Winkler methods. The taxonomic analysis was conducted using a Nikon SMZ 1500 stereo zoom microscope. For digital images, MP evolution digital camera was used on the same microscope with Auto-Montage (Synscopy, Division of Synoptics, Ltd.) software. Later, images were cleaned with Adobe Photoshop CS6. Holotypes of new species have been deposited in PUAC (Punjabi University Patiala, Ant Collection at Department of Zoology and Environmental Sciences, Punjabi University, Patiala, Punjab, India). Description pattern, morphological terminology for measurements (accurate to 0.01 mm) and indices followed after Bolton (2000) include: TL = Total length, HW = Head width, HL = Head length, ML = Mandible length, SL = Scape length, WL = Weber length, PW = Pronotum width, PTH = Petiole height, PTL = Petiole length, PPTH = Postpetiole height, PPTL = Postpetiole length, EL = Eye length, GL = Gaster length, GW = Gaster width, CI = Cephalic index: $HW \times 100 / HL$, MI = Mandibular Index: $ML \times 100 / HL$, SI = Scape index: $SL \times 100 / HW$.

Results

Descriptions of new species

Strumigenys mukkaliensis sp.n.
(Figures 1, 2, 3)

Type material

Holotype (worker): India. Kerala, Silent Valley National Park, 11°5'N, 76°26'E, 897m.a.s.l., 25.ix.2011, Winkler method (coll. Shahid A. Akbar). Holotype in PUAC.

Description

Measurements: HL 0.38; HW 0.37; ML 0.04; EL 0.01; SL 0.17; PW 0.22; WL 0.37; PTH 0.15; PTL 0.11; PPTH 0.15; PPTL 0.11; GL 0.44; GW 0.31; TL 1.45; CI 97; MI 10; SI 44.

Head as long as broad (CI 97), posterior head margin shallowly concave; when fully closed the masticatory margins only engage in the apical halves of their length. Proximal

to this with an elongate tooth-lined triangular space between the mandibles. Mandibular dentitions not clear, probably with 12-14 teeth. In profile mandibles almost straight, distal half angled downward with respect to proximal half; outer margin of mandible in full-face view shallowly convex from base to apex. Dorsal surface of each mandible near base with a very distinct sharp transverse rim that extends across its width, parallel to the clypeal margin. Anterior clypeal margin transverse. Antennal scrobes broad shallow. Eyes rudimentary, represented by a single ommatidium which appears as a minute dot near posterior half of antennal scrobes. Antennae 6-segmented, with 3rd and 4th segment reduced, appearing as a single segment; apical segment large, elongate and cylinder shaped.

Mesosoma. Pronotum slightly marginate dorsolaterally, the dorsum depressed between the marginations. When viewed in profile mesonotum appears convex, the dorsum raised slightly. Propodeum convex; propodeal spines absent, the declivity on each side with broad lamellae.

Metasoma. Node of petiole high; broader than long; lateral spongiform lobe in profile well developed; ventral surface with well developed spongiform tissue; postpetiolar spongiform tissue prominent throughout the node.

Sculpture. Body uniformly reticulate-punctate. Head densely and mesosomal dorsum finely reticulate-punctate; petiole and postpetiole finely reticulate-punctate with disc of both petiole and postpetiole smooth and shining. Basigastral costulae well developed.

Vestiture. Leading edge of the scape with a row of conspicuous projecting spatulate curved hairs, of which one or more, distal to the sub-basal bend, distinctly curves towards the base of the scape; basal stem of each hair erect with respect to the long axis of the scape. Cephalic dorsum with appressed, ground-pilosity without any erect hairs, even lacking the usual row near the occipital margin. Dorsal surface of mesosoma without standing pilosity of any form; without pronotal humeral hair. Dorsal surfaces of petiole, postpetiole and first gastral tergite also, without any standing hairs. Last gastral segment with few erect hairs.

Colour. Light yellowish brown.

Etymology

The species is named after its type locality Mukkali, part of Silent Valley National Park.

Differential diagnosis

The new species shares most affinities with members of the rare *extemena* group which is characterized by remarkable mandibular structure which when fully closed has the masticatory margins engaging only in the apical halves or less of their length; proximal to this with an elongate tooth-

lined triangular space between the mandibles. Moreover the dorsal surface of each mandible near the base has a very distinct, sharp, transverse rim that extends across its width. The group currently is represented by 10 species (*acheron*, *aello*, *atopogenys*, *carinognatha*, *deinognatha*, *extemena*, *ocypete*, *podarge*, *tarbosyne* and *yangi*). *S. mukkaliensis* is aberrant with the leading edge of the scape has a row of conspicuous projecting spatulate curved hairs, of which one or more, distal to the sub-basal bend, distinctly curves towards the base of the scape; body lacking any erect pilosity (except a pair on last gastral segment) and eyes rudimentary, represented by small black spot.

Ecology

A single specimen was collected from leaf litter with approximately 2 cm in depth. The collecting area is situated at an altitude of 897 meters. It is a shady place with minimum of sunlight penetration. Mean annual temperature is 20.2°C. Average annual rainfall is 6,000 mm with 95% relative humidity. It is a primary undisturbed tropical moist evergreen forest.

Strumigenys thanikkudyensis sp.n.
(Figures 4, 5, 6)

Type material

Holotype (worker): India: Kerala, Periyar Tiger Reserve, Thanikkudy, 9°30'N, 77°16'E, 1003 m a.s.l., 15.x.2011, hand picking method (coll. Shahid A. Akbar). Holotype in PUAC.

Description

Measurements: HL 0.69; HW 0.52; ML 0.31; EL 0.06; SL 0.41; PW 0.25; WL 0.66; PTH 0.18; PTL 0.16; PPTH 0.18; PPTL 0.13; GL 0.60; GW 0.46; TL 2.25; CI 75; MI 44; SI 59.

Head. Longer than broad (CI 75), posterior head margin shallowly concave; mandibles elongate, linear, produced into narrow projecting blades, longer than broad (MI 44), preapical tooth elongate-pointed, greater than the width of mandible at point where tooth arises; outer margin of mandible in full-face view shallowly convex from base to apex; inner margin between same points shallowly concave; Labral trigger hairs prominent, paired; anterior clypeal margin transverse; antennal scrobes absent behind eyes, lateral; preocular notch absent; maximum diameter of eye slightly greater than the maximum width of the scape: eyes lateral, situated in front of midlength of head, with 5-7 ommatidia across the greatest diameter; antennae 6-segmented, first funicular segment separated from the larger apical and preapical segments by two small segments.

Mesosoma. Pronotum slightly convex to flat; mesonotum

narrow, propodeum flat to shallowly convex; propodeal spines thin, long; propodeal declivity with propodeal lamella very narrow, engaging only extreme base of spine.

Metasoma. Node of petiole globular; almost as long as broad; lateral spongiform lobe in profile restricted to the extreme posterior margin of the node; ventral surface with reduced longitudinal spongiform or laminate crest; postpetiolar spongiform tissue reduced, confined to periphery of sclerite. Sculpture. Body uniformly reticulate-punctate. Head and mesosomal dorsum finely reticulate-punctate; petiole and postpetiole finely micro-reticulate; pleurae and side of propodeum finely reticulate-punctate; disc of postpetiole smooth; basigastral costulae shorter than disc of postpetiole.

Vestiture. Cephalic dorsum with appressed, very narrow simple ground-pilosity but without erect hairs, even lacking the usual row near the occipital margin. Dorsal mesosoma with sparse appressed ground pilosity, without standing hairs anywhere, without a pronotal humeral hair. Dorsal surfaces of petiole and postpetiole without standing hairs. Few erect hairs present on dorsal surface of gastral segments.

Colour. Light yellowish brown with gaster darker in colouration than rest of the body.

Etymology

The species is named after its type locality Thanikkudy, part of Periyar Tiger Reserve.

Differential diagnosis

The new species belongs to *godeffroyi*-group and is characterized by apical fork of mandible having 2 spiniform teeth with 2 intercalary denticles; a single preapical tooth, anterior clypeal margin shallowly concave and apical antennomere unconstricted basally. With dorsal surface of hind basitarsus lacking any erect filiform or flagellate hairs, the new species is placed in *signeae*-complex of *godeffroyi*-group. While using Bolton's (2000) key, *S. thanikkudyensis* keys with *S. ortholex*. The two species however are easily separated. *S. ortholex* has dorsolateral margin of head in full-face view with a row of small, closely applied spatulate ground-pilosity, disc of postpetiole with one pair and first gastral tergite with two pairs of flagellate hairs, second gastral tergite also with flagellate hairs, disc of postpetiole finely longitudinally costulate and spongiform tissue of postpetiole well developed; whilst *S. thanikkudyensis* has dorsolateral margin of head in full-face view without any row of small, closely applied spatulate ground-pilosity, disc of postpetiole and first gastral tergite without any flagellate hairs, second gastral tergite has some erect hairs but not long flagellate hairs, disc of postpetiole is reticulate-punctate and spongiform tissue of postpetiole is reduced. The new species is aberrant in many characters with antennal scrobes absent behind eyes, propodeal declivity with narrow carina (no lamella), without pronotal humeral hairs; dorsal surfaces

of head, mesosoma and frequently also first gastral tergite lacking standing hairs and dorsal surface of hind basitarsus lacking erect filiform or flagellate hairs.

Ecology

This species seems to be infrequent from Western Ghats. One specimen was collected by handpicking method from Thanikkudy region of Periyar Tiger Reserve. It is a primary undisturbed tropical moist evergreen forest. The area is situated at an elevation of 1003 meters, a shady place with minimum of sunlight penetration.

New records from India

For descriptions and morphometric data sets one is here referred to Bolton (2000).

S. hemisobek (Bolton, 2000)
(Figures 7, 8, 9)

Pyramica hemisobek Bolton, 2000: 452, figs. 265, 289 (w.) NEPAL. Combination in *Strumigenys*: Baroni Urbani & de Andrade, 2007: 121.

Global distribution: Nepal, India.

Material examined: 2 workers: India. Kerala, Silent Valley National Park, 11°5'N, 76°26'E, 897m.a.s.l., 25.ix.2011, Winkler method (coll. Shahid A. Akbar).

Remarks: The species *hemisobek* belongs to the *murphyi* group which consists of 5 species (*dyschima*, *formosa*, *hemisobek*, *murphyi* and *nannosobek*). Members of the group constituted part of the former genus *Epitritus*, now abandoned (Baroni Urbani & de Andrade, 1994 & 2007; Bolton, 1999). The group is mostly distributed in the Oriental and Malesian regions. The most westerly member of the group yet discovered, *hemisobek* is easily distinguished from other members of the group by its lack of orbicular hairs on cephalic dorsum and lack of eyes (Bolton, 2000).

Interestingly the specimens collected in India have small, rudimentary eyes represented by small, black spots placed in the middle of the antennal scrobes posteriorly. These spots however are very much diffused. The dorsal surface of gaster bears reduced, erect hairs. The ventral spongiform tissue is also reduced in specimens from India.

S. mitis (Brown) in Bolton, 2000
(Figures 10, 11, 12)

Pyramica mitis Brown, in Bolton, 2000: 442, figs. 267, 290 (w.q.) PHILIPPINES. Combination in *Strumigenys*: Baroni Urbani & de Andrade, 2007: 124.

Global distribution: China, Thailand, Singapore, India, Malaysia (West Malaysia, Sarawak, Sabah), Brunei, Indonesia (Kalimantan, Sumatra, Java, Bali, Sulawesi), Philippines (Luzon), Papua New Guinea)

Material examined: 1 worker: India. Kerala, Silent Valley National Park, 11°5'N, 76°26'E, 897m.a.s.l., 25.ix.2011, Winkler method (coll. Shahid A. Akbar).

Remarks: This small slender species is very widely distributed in the Oriental and Malesian regions. The species is easily recognized by its dorsal surfaces of middle and hind tibiae without laterally projecting long hairs anterior clypeal margin convex. Pronotal humeral hair absent. First gastral tergite without standing hairs. Base of first gastral sternite without spongiform tissue. Lateral clypeal margins without projecting hairs. With head in full-face view dorsolateral margin of occipital lobe without projecting hairs. It is one of the most commonly encountered members of the genus in Winkler bag samples made in these areas. A very complex species group with great variations, gyne polymorphism and even suspected social parasitism (Bolton, 2000).

S. mutica (Brown, 1949)
(Figures 13, 14, 15)

Kyidris mutica Brown, 1949d: 3, fig. 1 (w.) JAPAN. Wilson & Brown, 1956: 442 (q.m.); Imai, Kubota, *et al.* 1985: 47 (k.). Combination in *Pyramica*: Bolton, 1999: 1672; in *Strumigenys*: Baroni Urbani & De Andrade, 2007: 124. Senior synonym of *itoi*: Brown & Yasumatsu, 1951: 94; of *nuda*: Brown, 1952c: 124. See also: Bolton, 2000: 455.

Global distribution: India, Indonesia, Japan, Malaysia, Singapore, Korea.

Material examined: 7 workers, 4 gynes and 2 males: India. Kerala, Silent Valley National Park, 11°5'N, 76°26'E, 897m.a.s.l., 25.ix.2011, hand picking (coll. Shahid A. Akbar).

Remarks: Member of the widely distributed *mutica* group which previously constituted the genus *Kyidris* now abandoned (Baroni Urbani & de Andrade, 1994; Bolton, 1999). The distinctive form of the mandibles (only apical half of each mandible with teeth while basal halves are edentate, forming a large gap between the mandibles) coupled with the compact biconvex mesosoma, propodeum usually unarmed and spongiform appendages of waist segments reduced. *S. mutica* with one or two pairs of specialized hairs on head close to occipital margin, one pair on mesonotum, one pair on petiole, one or two pairs on postpetiole and at least one pair on basal half of first gastral tergite differentiates it from closely related species *S. yaleogyna* and *S. media* which are lacking such distribution of hairs on head and body (Bolton, 2000).

S. nannosobek (Bolton, 2000)
(Figures 16, 17, 18)

Pyramica nannosobek Bolton, 2000: 453 (w.) BHUTAN.
Combination in *Strumigenys*: Baroni Urbani & de Andrade,
2007: 124.

Global distribution: Bhutan, India.

Material examined: 2 workers: India: Kerala, Periyar Tiger Reserve, Thanikkudy, 9o.30`N, 77o.16`E, 1003m a.s.l., 15.x.2011, Winkler method (coll. Shahid A. Akbar).

Remarks: This is the only species of the group (*murphyi* group) to have long erect hairs on the middle and hind tibiae and basitarsi, and is the only species to have hairs on the leading edge of the scape that are universally curved toward the apex of the scape. It also has the longest mandibles yet recorded in the group (Bolton, 2000).

Strumigenys rogeri Emery, 1890
(Figures 19, 20, 21)

Strumigenys rogeri Emery, 1890b: 68, pl. 7, fig. 6 (w.) ANTILLES. Forel, 1893g: 378 (q.). Senior synonym of *incisa*: Donisthorpe, 1915d: 341; of *sulfurea*: Brown, 1954k: 20. See also: Bolton, 1983: 387; Bolton, 2000: 604.

Global distribution: Neotropical; Nearctic, Malagasy: Great Britain, United States (Florida, Hawaii), Mexico, Haiti, Dominican Republic, Lesser Antilles, Cuba, Puerto Rico, Costa Rica, Ghana, Cameroun, Gabon, Mauritius, Seychelles Islands, Madagascar, Malaysia, Indonesia, India, Solomon Islands, Tonga, Samoa, New Caledonia, Society Islands, Greater Antilles.

Material examined: 9 workers and 4 gynes: India. Kerala, Silent Valley National Park, 11°5`N, 76°26`E, 897m, 25.ix.2011, hand picking (coll. Shahid A. Akbar).

Remarks: The species is easily recognized in the Indian fauna as it is the only one to have the ventrolateral margin of the head deeply indented immediately in front of the eye, so deeply that the anterior portion of the eye is detached from the side of the head. Ventral surface of head with a transverse preocular impression that is posterior to and separate from the postbuccal groove. Preapical dentition of each mandible of two articles; with a preapical tooth and a denticle (Bolton, 2000).

Key to the species of *Strumigenys* from India based on the worker caste (modified after Bolton, 2000)

- 1 Antennae with 4 segments; first funicular segment not separated from the 2-segmented apical club.....2
 - Antennae with 6 segments; first funicular segment separated from the 2-segmented apical club by one or two small segments.....3
- 2 Cephalic dorsum with small orbicular hairs. Mandibles with 2 teeth at apex (apical fork) and a preapical tooth; not serially dentate and engage only at apical third (Pantropical tramp species).....*emmae*
 - Cephalic dorsum with spatulate hairs. Mandibles with 5-7 triangular teeth; serially dentate and engage through all of their visible length (India, Nepal, Thailand, Malaysia (West Malaysia), Singapore).....*nepalensis*
- 3 In full face view mandibles elongate and narrowed, sub-linear to linear and when fully closed the mandibles engage only in the apical third or less of their length.....4
 - In full face view mandibles triangular to elongate-triangular, and when fully closed the mandibles engage through the apical half or more of their length, with a basal gap at most.....19
- 4 Apex of each mandibular blade with a single, long tooth at the dorsal apex subtended by a series of minute denticles; always lacking true apical fork. Labral lobes long and conical, visible between the mandibles in full-face view even when the mandibles are closed; Eyes reduced or absent.....5
 - Apex of each mandibular blade armed with an apical fork of 2 -3 spiniform teeth set in a vertical series, with or without intercalary denticles between the spiniform fork teeth. Labral lobes not long and conical, not visible between the mandibles when the latter are closed; Eyes more or less well developed..... 6
- 5 With head in full-face view the leading edge of the scape with a row of conspicuous projecting curved hairs, of which one or more, distal to the sub-basal bend, distinctly curves toward the base of the scape. Dorsum of head without orbicular hairs, without any standing pilosity. Eyes absent (India, Nepal).....*hemisobek*
 - With head in full-face view the leading edge of the scape lacking projecting hairs that curve toward the base of the scape. Clypeal dorsum with orbicular hairs. Eyes present (Bhutan, India)*nannosobek*
- 6 Apex of mandible with three short-spiniform teeth arranged in an oblique series (series extremely oblique so that lowermost tooth has migrated onto ventral surface and appears as a ventrally-arising preapical tooth in full-face view); with 2 intercalary denticles or small teeth, arising between apicomedian and apicoventral teeth.....7

- Apex of mandible with two spiniform teeth arranged in a vertical or near-vertical series; with 0 - 3 intercalary denticles or small teeth, which when present arise between the apicodorsal and apicoventral teeth or from dorsal surface of apicoventral tooth near its base.....8
- 7 With mesosoma in dorsal view, pronotal humeral hair absent. First gastral tergite not entirely sculptured (Sri Lanka, Bhutan, India).....*lyroessa*
- With mesosoma in dorsal view, pronotal humeral hair present, projecting laterally; hair clavate, short and stout. First gastral tergite entirely sculptured (India).....*hostilis*
- 8 Preapical dentition of each mandible of two articles; with one tooth and a denticle (Cosmopolitan tramp species).....*rogeri*
- Preapical dentition of each mandible with a single article; a single prominent tooth.....9
- 9 Dorsal (outer) surface of hind basitarsus with one or more freely projecting filiform or flagellate hairs that are very long and suberect to erect; this specialised pilosity may also be present on the middle basitarsus and the middle and hind tibiae.....10
- Dorsal (outer) surface of hind basitarsus without freely projecting long filiform or flagellate hairs; any pilosity present is simple to spatulate and usually decumbent to appressed; projecting long fine simple hairs absent from middle basitarsus and from middle and hind tibiae.....17
- 10 With mesosoma in profile, the propodeal declivity equipped with a simple carina or at most a narrow cuticular flange; carina or narrow flange does not subtend the ventral margin of the tooth for most or all of its length; posterior (free) margin of carina or narrow flange concave, close to and parallel with the edge of the declivity.....11
- With mesosoma in profile, the propodeal declivity equipped with a broad and conspicuous lamella; the propodeal tooth may be replaced by the lamella or completely buried in the lamella, or the lamella may subtend the ventral margin of the tooth for most or all of its length; posterior (free) margin of lamella may be convex, straight or irregular but is not narrowly concave, nor is it close to and parallel with the edge of the declivity.....12
- 11 Anterior clypeal margin with a deep narrow median notch or impression that is narrowly U-shaped or V-shaped. Scape relatively long, SI > 80. Apical segment of funiculus long and narrow, spindle-shaped, basally tapering to a very narrow neck at its articulation with the preapical segment (India, Nepal, Bhutan, Thailand, China, Japan, Wallis Is) *exilirhina*
- Anterior clypeal margin transverse or broadly evenly shallowly concave across its entire width, without a deep median notch. Scape relatively short, SI < 80. Apical segment of funiculus not long and narrow, not spindle-shaped, not or only moderately tapering basally to its articulation with the preapical segment (India)..... *aduncomala*
- 12 With mesosoma in profile, dorsum of pronotum without standing hairs apart from the humeral hair.....13
- With mesosoma in profile, dorsum of pronotum with usually one other pair of standing hairs as well as the humeral hair; rarely with more than one pair.....14
- 13 Dorsal mesosoma entirely smooth and shining, devoid of reticulate-punctate sculpture. The body pilosity predominated by long flagellate hairs (India).....*smythiesii*
- Dorsal mesosoma partially to entirely reticulate-punctate. The body pilosity mixed consists of spatulate, flagellate, stiff as well as simple hairs. (Sri Lanka, India, Malaysia (Sarawak, Sabah), Singapore, Indonesia (Sumatra, Krakatau, Java, Lombok, Seram, Flores, Sulawesi, Kai Besar, Aru, Tanimbar, Timor), Philippines (Mindanao, Luzon, Palawan), Papua New Guinea, Solomon Is, Vanuatu, Fiji Is, Samoa, Tonga, Marshall Is, Society Is, Caroline Is, Marquesas Is, Hawaii; also in Austral region).....*godeffroyi*
- 14 Head in full-face view with a freely laterally projecting long flagellate hair present on dorsolateral margin at or very close to the occipital corner. Apicoscrobial hair also present, also long and flagellate, of the same form and length as the hair at the occipital corner15
- Head in full-face view with dorsolateral margin at occipital corner without a freely laterally projecting long flagellate hair (short simple or curved hairs may occur). Apicoscrobial hair present or absent, when present may be simple or flagellate but is always different in form and length from the hair at the occipital corner.....16
- 15 Cephalic ground-pilosity and pilosity that fringes upper scrobe margins simple and extremely fine. Hairs on leading edge of scape fine and simple. Head narrower and mandibles shorter, CI 77, MI 34. (India)*habropilosa*
- Cephalic ground-pilosity and pilosity that fringes upper scrobe margins broadly spatulate. Hairs on leading edge of scape spatulate. Head broader and mandibles longer, CI 86, MI 39. (India) *hypoturba*
- 16 Head in profile, the pair of standing hairs that straddle the midline near the occipital margin disproportionately long, either flagellate or erect basally and with their apical sections abruptly angled or hooked anteriorly, or even looped (India, Bhutan, Thailand, China, Taiwan, Malaysia, Indonesia) *nanzanensis*
- Head in profile, the pair of standing hairs that straddle the midline near the occipital margin short and stiff, straight to feebly curved and usually slightly inclined anteriorly; apical sections not abruptly angled or hooked anteriorly (India)*peraucta*

- 17 Pronotal humeral hair absent (India).....*thanikkudyensis* **sp.n.**
- Pronotal humeral hair present; may be simple, clavate, remiform or flagellate.....18
- 18 Mesosoma in profile, the propodeal declivity equipped with a simple cuticular carina or at most a narrow crest; posterior (free) margin of carina or crest narrowly concave, close to and paralleling the concave shape of the edge of the declivity. Mandibular dentition consists of 2 spiniform teeth with 1 intercalary denticle. A single preapical tooth present near the apex, short (India)*fixata*
- Mesosoma in profile, the propodeal declivity equipped with a broad lamella; posterior (free) margin of lamella broadly convex. Mandibular dentition consists of an intercalary tooth with two denticles between it and the apicoventral tooth; usually there is also a denticle between the intercalary tooth and the apicodorsal spiniform fork tooth (India, Bhutan)*virgila*
- 19 Head in full-face view the leading edge of the scape with a row of conspicuous projecting curved hairs, of which one or more, distal to the sub-basal bend, distinctly curves toward the base of the scape. These hairs may be spatulate, remiform, spoon-shaped or broadly clavate apically; basal stem of each hair (which may be short) erect or suberect with respect to the long axis of the scape.....20
- Head in full-face view the leading edge of the scape lacking projecting hairs that curve toward the base of the scape. Scape edge may have elongate simple straight projecting hairs present, or entirely apically directed short hairs that may be simple, narrowly to broadly spatulate, or spoon-shaped; in some species the leading edge may be hairless.....21
- 20 Pilosity of head without any standing hairs at the highest point of the vertex. Dorsum only having minute appressed pubescence which is very sparse. Cephalic dorsum without a pair of erect hairs. Eyes rudimentary represented by a small black pigmented spot situated in middle of antennal scrobe away from ventral scrobe margin posteriorly (India)*mukkaliensis* **sp.n.**
- Pilosity of head represented by a single pair of standing hairs at the highest point of the vertex. Otherwise the dorsum only having minute appressed pubescence which is very sparse and difficult to see. Eyes prominent represented by 2-3 ommatidia situated at the ventral scrobe margin (Cosmopolitan tramp species).....*membranifera*
- 21 Petiole node in profile long and low; either anterior face of node much shorter than the long dorsum, or the anterior face shallowly sloped and grading evenly into the peduncle so that the entire segment is subclavate. Petiole node in dorsal view long and narrow, much longer than broad and equal in length to the disc of the postpetiole. (India).....*assamensis*
- Petiole node in profile short and relatively high; either anterior face of node at least subequal in length to the dorsum, or the anterior face steeply sloped and meeting the peduncle through an obtuse but marked angle, or both. Petiole node in dorsal view short and broad, as long as broad and shorter in length to the disc of the postpetiole.....22
- 22 With the head in full-face view and the mandibles fully closed the dorsal surface of each massively triangular mandible has, near its base, a very distinct sharp transverse rim that extends across the width of the mandible (India, Nepal).....*podarge*
- With the head in full-face view and the mandibles fully closed the dorsal surface of each mandible, near its base, is without a sharp transverse rim that extends across the width of the mandible; if dorsum of mandible slightly depressed basally then mandible is linear, not triangular23
- 23 With head in full-face view the fully closed mandibles narrow or elongate-triangular, with teeth present only on distal half of exposed length of inner margin; proximal half of inner margin edentate and forming a long diastema between basal tooth and basal lamella; a large space present basally between the opposed mandibles through which the apices of the labral lobes are visible (India, Japan, Taiwan, Malaysia (West Malaysia), Singapore, Indonesia (Java, Bali, Lombok))*mutica*
- With head in full-face view the fully closed mandibles triangular, with teeth present along entire length of exposed inner margin; proximal half of inner margin dentate, without a long diastema between basal tooth and basal lamella; without a large space basally through which the apices of the labral lobes are visible (India, China, Thailand, Singapore, Malaysia (West Malaysia, Sarawak, Sabah), Brunei, Indonesia (Kalimantan, Sumatra, Java, Bali, Sulawesi), Philippines (Luzon), Papua New Guinea).....*mitis*

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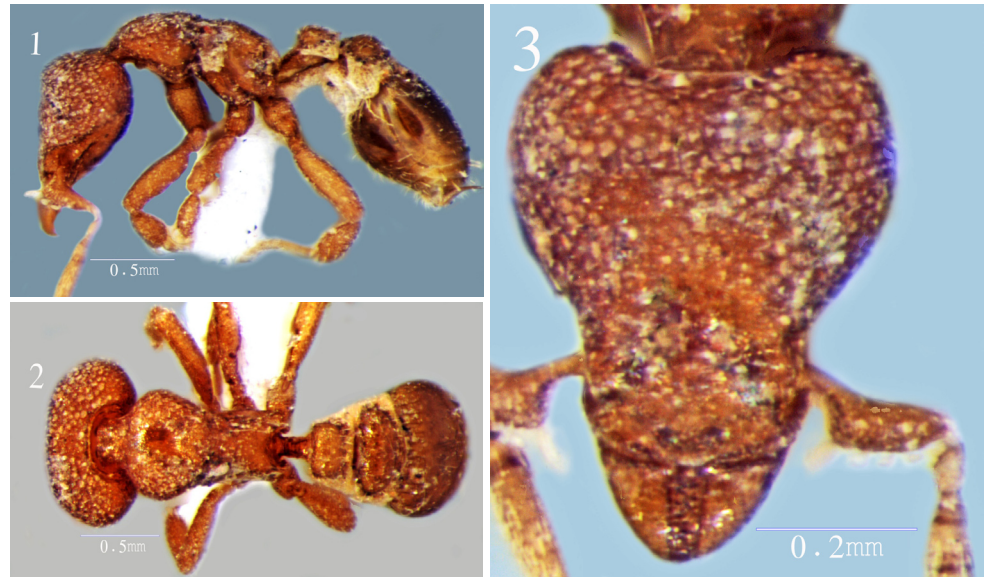


Fig. 1-3. *Strumigenys mukkaliensis* sp.n.

- 1. body in profile.
- 2. body in dorsal view.
- 3. head in full-face view.

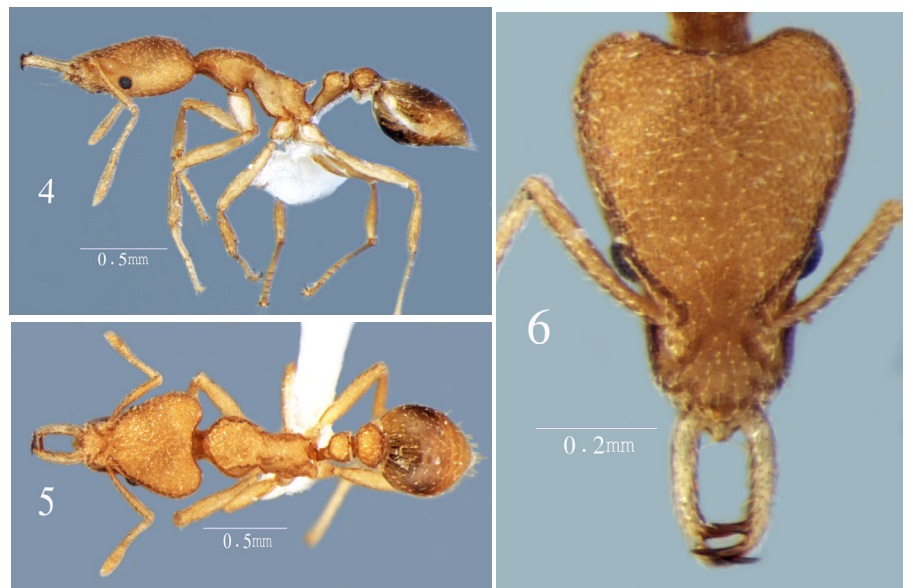


Fig. 4-6. *Strumigenys thanikkudyensis* sp. n.

- 4. body in profile.
- 5. body in dorsal view.
- 6. head in full-face view.

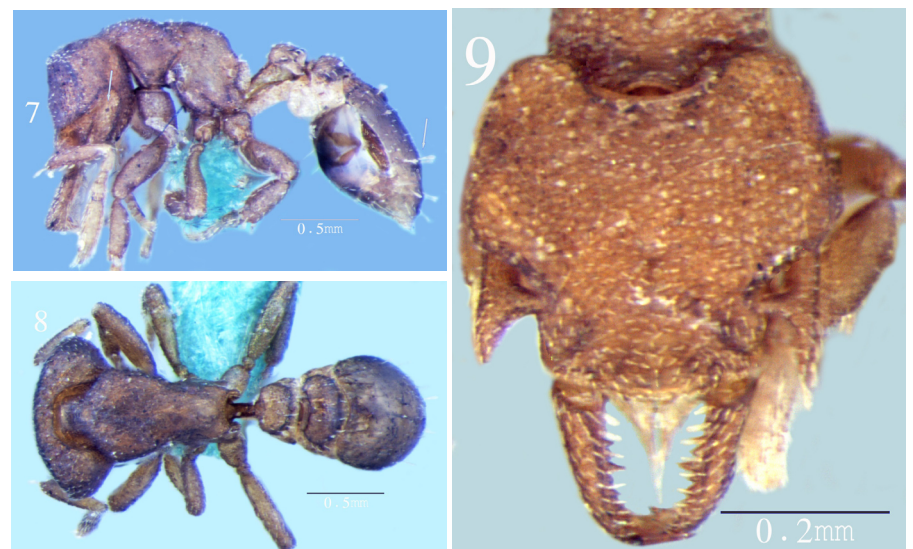


Fig. 7-9. *Strumigenys hemisobek*.

- 7. body in profile.
- 8. body in dorsal view.
- 9. head in full-face view.

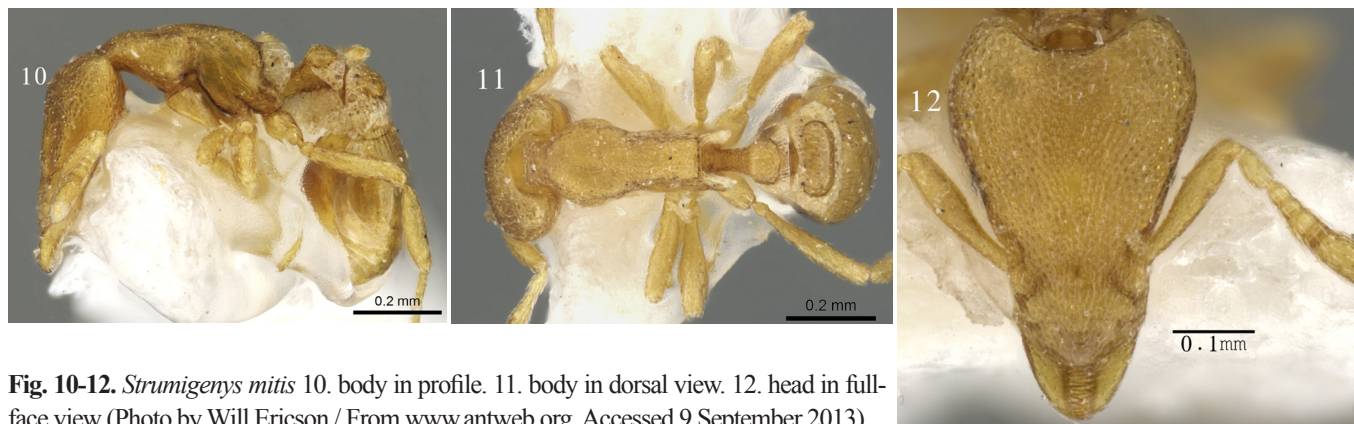


Fig. 10-12. *Strumigenys mitis* 10. body in profile. 11. body in dorsal view. 12. head in full-face view (Photo by Will Ericson / From www.antweb.org. Accessed 9 September 2013).

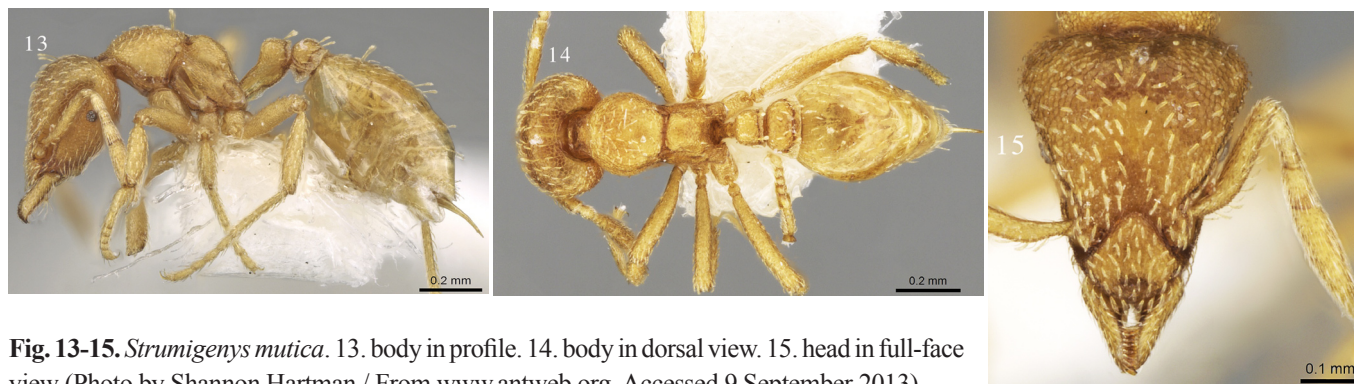


Fig. 13-15. *Strumigenys mutica*. 13. body in profile. 14. body in dorsal view. 15. head in full-face view (Photo by Shannon Hartman / From www.antweb.org. Accessed 9 September 2013).



Fig. 16-18. *Strumigenys nanmosobek*. 16. body in profile. 17. body in dorsal view. 18. head in full-face view (Photo by Will Ericson / From www.antweb.org. Accessed 9 September 2013).

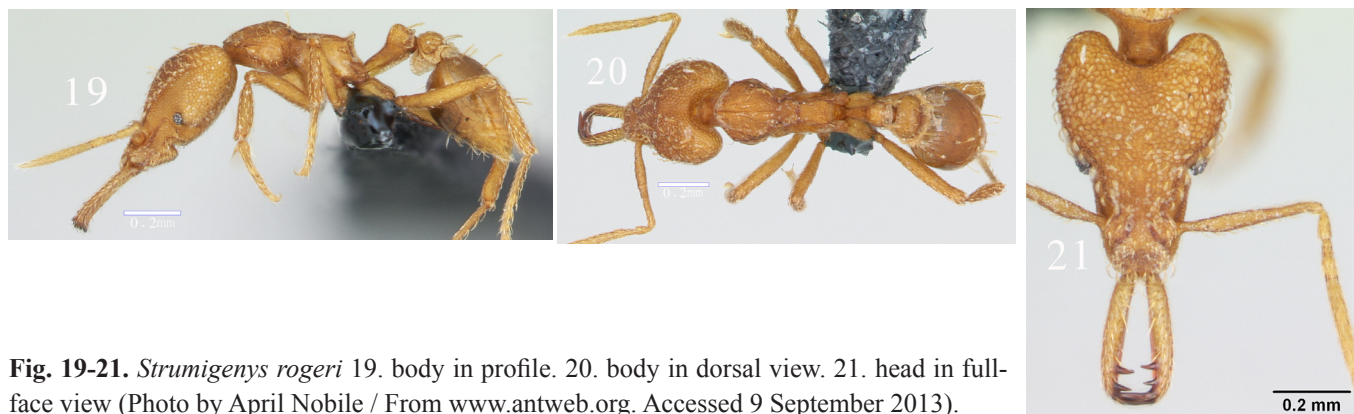


Fig. 19-21. *Strumigenys rogeri* 19. body in profile. 20. body in dorsal view. 21. head in full-face view (Photo by April Nobile / From www.antweb.org. Accessed 9 September 2013).