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A Revision of the Ant Genus *Smithistruma* Brown of Japan, with Descriptions of Four New Species (Hymenoptera: Formicidae)

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Abstract. The ant genus *Smithistruma* Brown of Japan is revised. Eleven species are recognized including four new species: *S. benten* Terayama, Lin et Wu, *S. circothrix* sp. n., *S. hiroshimensis* sp. n., *S. incerta* Brown, *S. japonica* (Ito), *S. kichijo* Terayama, Lin et Wu, *S. leptothrix* (Wheeler), *S. masukoi* sp. n., *S. mazu* Terayama, Lin et Wu, *S. morisitai* sp. n., *S. rostrataeformis* Brown. A key to the species of Japanese *Smithistruma* is presented.

Key words: *Smithistruma*, Japan, new species, taxonomy, Formicidae.

Introduction

The ant genus *Smithistruma* is one of the largest genera of the tribe Dacetonini, including more than 100 species (Bolton, 1995). The genus is characteristic in having short and subtriangular mandibles which are armed with basal lamella followed by a row of denticles. So far the genus is distinguished from other closely related Japanese dacetonines such as *Pentastruma* and *Trichoscapa*, by the combination of the presence of hairs on head and the lack of a definite basal margin of mandible. All the Japanese species have 6-segmented antennae.

In his revision, Brown (1949) described two species of the genus from Japan: *S. incerta* and *S. rostrataeformis*. Later the concept of the genus was extended (Brown, 1973), and the former genus *Weberistruma* was synonymized. Thus the species listed as *Weberistruma japonica* (Ito) in Onoyama (1980) was placed under *Smithistruma*. A check list published by the Myrmecologists Society (Japan) (MSJ: presently Myrmecological Society of Japan) in 1988 nominated 8 species with standard Japanese names. Among them, 5 species remained unidentified (*S.* sp. 4 to sp. 8). Ogata (1991) identified *S.* sp. 5 as *S. leptothrix*. Ogata & Onoyama (1992) gave a key and short comments for these ants, following the MSJ naming system.

In their table of distribution, Terayama *et al.* (1994) added another species as *S.* sp. 9 [Japanese name: Hiroshima-uroko-ari]. In a revision of Taiwanese *Smithistruma* species, Terayama *et al.* (1996) described four new species, 3 of which are also found in Japan. Although they did not refer to Ogata & Onoyama (1992), two of their species, *S. benten* and *S. mazu* apparently correspond to *S.* sp. 4 and *S.* sp. 6, respectively, while *S. kichijo* was a new entry of Japanese *Smithistruma* species.

In the course of the present study, we have concluded that the species placed under separate unidentified genus in Ogata & Onoyama (1992) should be included in *Smithistruma*. Thus a total of 11 species occur in Japan. The purpose of the the present paper is to revise these Japanese species, describing 4 new species, showing distributions of all the Japanese species and give a key to them. The species treated in this paper are summarized in Table 1. Barry Bolton of the Natural History Museum, UK, is now preparing a revision of dacetonine ants and the species-group classification will be treated there.

The followings are abbreviations of depositories:

KU	Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka, Japan
EU	Ehime University, Japan
MNHA	Museum of Nature and Human Activities, Hyogo, Japan

Measurements, indices and their abbreviations used in the present paper are listed below. The definitions of them follow those by Bolton (1983).

Total length (TL)
Head length (HL)
Head width (HW)
Cephalic index (CI: HW×100/HL)
Mandible length (ML) Mandibular index (MI:

Table 1. A list of Japanese *Smithistruma* species.

Present Paper	Ogata & Onoyama (1992)	Japanese Name
S. benten Terayama, Lin et Wu	*S.* sp. 4	Iga-uroko-ari
S. circothrix sp. n.	*S.* sp. 8	Maruge-uroko-ari
S. hiroshimensis sp. n.	[*S.* sp. 9*]	Hiroshima-uroko-ari*
S. incerta Brown	*S. incerta* Brown	Nokoba-uroko-ari
S. japonica (Ito)	*S. japonica* (Ito)	Yamato-uroko-ari
S. kichijo Terayama, Lin et Wu	[not nominated]	Kichijou-uroko-ari**
S. leptothrix (Wheeler)	*S.* sp. 5	Kebuka-uroko-ari
S. masukoi sp. n.	*S.* sp. 7	Manazuru-uroko-ari
S. mazu Terayama, Lin et Wu	*S.* sp. 6	Tsuya-uroko-ari
S. morisitai sp. n.	Genus? A sp.	Kibaore-uroko-ari
S. rostrataeformis Brown	*S. rostrataeformis* Brown	Hoso-nokoba-uroko-ari

* Terayama *et al.* (1994).
** Newly named.

ML×100/HL)
Scape length (SL)
Scape index (SI: SL×100/HW)
Pronotal width (PW)
Weber's length of mesosoma (WL) (=alitrunk length)

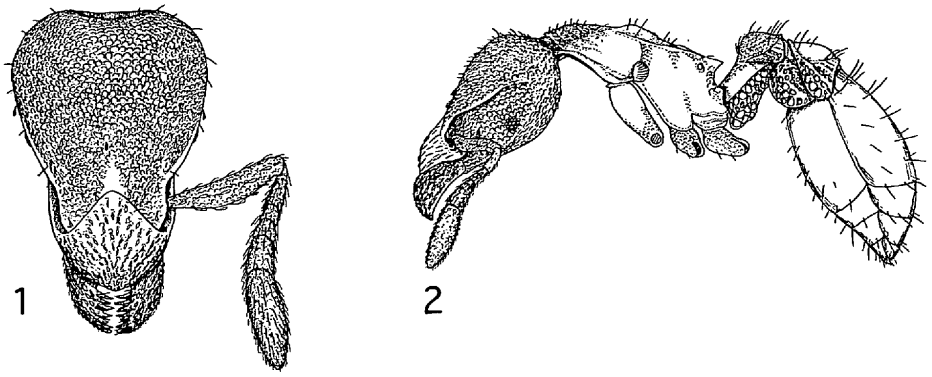
Key to species of Japanese *Smithistruma*

1. Mandibles in peculiar shape, dorsal surface forming an obtuse but distinctly angular corner in lateral view ..... *S. morisitai* sp. n.
– Mandibles in usual shape, dorsal surface not forming an angular corner in lateral view 2
2. Pronotum wholly unsculptured, smooth and shining; dorsal outline of mesosoma roundly convex in lateral view .... *S. mazu* Terayama, Lin et Wu
– Pronotum more or less sculptured; dorsal outline of mesosoma depressed in lateral view 3
3. Anterior margin of clypeus straight or slightly concave; outer margin of antennal scape broadened at basal 1/4, forming an angulate elbow .. 4
– Anterior margin of clypeus produced in the middle; outer margin of antennal scape simply broadened at basal 1/4, not forming an angulate elbow 7
4. Dorsum of head with orbicular hairs 5
– Dorsum of head with simple, clavate, scale-like or flagellate hairs, but never bearing orbicular ones 6
5. Petiole with two pairs of spatulate hairs ..... *S. circothrix* sp. n.
– Petiole without spatulate hairs ..... *S. hiroshimensis* sp. n.
6. Anterior margin of clypeus shallowly concave in the middle; pronotal humeri with a pair of long flagellate hairs ..... *S. incerta* Brown
– Anterior margin of clypeus not concave but straight; pronotal humeri without long flagellate hairs ..... *S. rostrataeformis* Brown
7. Head and pronotum with long flagellate hairs .. 8
– Head and pronotum without flagellate hairs 9
8. Lamellate appendages on propodeum poorly developed, its outer margin shallowly concave ..... *S. masukoi* sp. n.
– Lamellate appendages on propodeum much developed, its outer margin convex at the lower half ..... *S. kichijo* Terayama, Lin et Wu
9. Dorsum of head densely covered with appressed scale-like hairs; hairs on central area of clypeus dense, their interspaces as long as the hair thickness ..... *S. japonica* (Ito)
– Dorsum of head covered with simple standing hairs or short stout hairs, but never with appressed scale-like hairs densely; hairs on central area of clypeus sparse, their interspaces twice as long as the hair thickness 10
10. Anterior border of antennal scapes with 3 or more suberect or subdecumbent hairs; eyes small, the diameter shorter than suberect hairs on pronotum ..... *S. leptothrix* (Wheeler)
– Anterior border of antennal scapes without or rarely with 1 suberect or subdecumbent hairs; eyes medium, the diameter as long as suberect hairs on pronotum, if the hairs present ..... *S. benten* Terayama, Lin et Wu

Smithistruma benten Terayama, Lin et Wu
(Figs. 1, 2)

Smithistruma benten Terayama, Lin et Wu, 1996: 329. Worker, female. [2 paratype workers examined (MNHA).]

Specimens examined. [Honshu] 3 workers, Komi-



Figs. 1–2. *Smithistruma benten* Terayama, Lin et Wu —— 1, Worker, head, full face view; 2, same, lateral view.

nato, Chiba Pref., 25. xii. 1979, K. Masuko leg.; 1 dealate female, Hinoharu, Yamanashi, Yamanashi Pref., 23. ix. 1977, M. Tanaka leg.; 1 dealate female, 10 workers, Temple Garden of Philosophy, Nakano, Tokyo, 5. x. 1982, K. Ogata leg.; 1 alate female, 2 workers, Unuma, Kakamigahara, Gifu Pref., 5. x. 1980, K. Kinomura leg.; 5 workers, Koiki-cho, Kakamigahara, Gifu Pref., 5. x. 1980, K. Kinomura leg.; 2 workers, Botanical Garden, Kyoto University, Sakyo-ku, Kyoto, Kyoto Pref., 70 m alt., 15. vi. 1973, K. Onoyama leg.; 3 workers, Iwakura, Sakyo-ku, Kyoto, Kyoto Pref., 31. iii. 1971, R. Sonobe leg.; 1 dealate female, 153 workers, 97 larvae (43 large, 51 medium, and 3 small), 8 eggs, Soujiji Temple, Takatsuki, Osaka Pref., 10 m alt., 7. v. 1975, K. Onoyama leg.; 1 dealate female, Takarazuka, Hyogo Pref., 8. vi. 1974, M. Tanaka leg.; 2 workers, Takarazuka, Hyogo Pref., 29. vi. 1974, M. Tanaka leg.; 4 workers, Takarazuka, Hyogo Pref., 6. vii. 1974, M. Tanaka leg.; 1 dealate female, 2 workers, Takarazuka, Hyogo Pref., 30. viii. 1974, M. Tanaka leg.; 1 worker, Takarazuka, Hyogo Pref., 5. x. 1974, M. Tanaka leg.; 5 workers, Takarazuka, Hyogo Pref., 15. x. 1974, M. Tanaka leg.; 10 workers , Gakuenzi Temple, Hirata City, Shimane Pref., 13. ix. 1985, K. Ogata leg. [Shikoku] 1 worker, Sugitate, Ehime Pref., 11. ix. 1954, F. Takechi leg. (EU); 1 worker, Sugitate, Ehime Pref., 19. ix. 1954, K. Morikawa leg. (EU). [Kyushu] Mt. Shiratake, Tsushima I., Nagasaki Pref., Kyushu, 14.vii.1981, K. Ogata leg.; 10 workers, Oshima I., Fukuoka Pref., 14. ix. 1982. S. Eto leg.; 1 worker, Chikuzen-Okinoshima I., Fukuoka Pref., 25–28. vii. 1958, Y. Hirashima, Y. Murakami and Y. Miyatake leg.; 1 dealate female, 2 workers, Kashii-guu, Fukuoka, Fukuoka Pref., 8. ix. 1983, H. Harada leg.; 2 workers, Kashii-guu, Fukuoka, Fukuoka Pref., 15. ix. 1983, S. Nomura leg.; 2 workers, Ueki-cho, Kumamoto Pref., 29. v. 1983, S. Naomi leg.; 1 worker, Mt. Seira, Imari City, Saga Pref., 28. v. 1984, S. Nomura leg.; 1 worker, Miyanoura, Yaku I., Kagoshima Pref., 24. xi. 1974, M. Tanaka leg. [Ryukyus] 1 dealate female, 35 workers, Mt. Banna, Ishigaki I., 23. iii. 1984, K. Ogata leg.; 7 workers, Shirahama, Iriomote I., 10. iii. 1975, M. Tanaka leg.; 5 workers, Ootomi, Iriomote I., 6. viii. 1985, K. Yamauchi and K. Kinomura leg.

Distribution. Japan (Honshu, Shikoku, Kyushu, Ryukyus), Taiwan.

Remarks. S. benten resembles species formerly placed under *Weberistruma*, in having the rounded anterior margin of clypeus and in lacking fringed hairs of clypeal margin. In particular, among the Japanese *Smithistruma* species, *S. benten* is most similar to *S. leptothrix* sharing the well convex dorsum of head and the slender mesosoma. But it is distinguished by 3 or more standing hairs on the anterior border of scapes and the size of eyes.

Another closely related species to *S. benten* is *S. formosimonticola* from Taiwan. In their key, Terayama *et al.* (1996) mentioned the pilosity to distinguish *S. benten* from *S. formosimonticola.* But the length and numbers of suberect to erect hairs on the dorsa of head and mesosoma vary considerably among colonies and even within a colony. A specimen from Takarazuka, Hyogo Prefecture has numerous standing hairs of medium length in the posterior half of head dorsum, promesonotum, hind tibiae and hind basitarsi, and falls into *S. formosimonticola* according to their key. Several specimens have hair conditions intermediate between typical *S. benten* and *S. formosimonticola.* Another distinguishing character of them may be the length-width ratios of 3rd and 4th antennal segments, but this also varies among specimens. (The drawing of *S. formosimonticola* Terayama *et al.* (1996) indicates 3rd and 4th antennal segments longer than wide, whereas in their text "wider than long".) *S. formosimonticola* may be an extreme of *S. benten.*

This species is distributed in south-western Japan, nesting in the soil or under stones and are found from Berlese funnel samples of forest floors. The record from Takatsuki, Osaka Prefecture gives an example of

the colony size of *S. benten*. The colony nested under a concrete stone among thinly spaced trees on the precincts of a temple, including more than 150 workers.

Smithistruma circothrix sp. n.

(Figs. 3, 4)

Worker. TL: 1.0–1.2 mm; HL: 0.45–0.47 mm; HW: 0.38 mm; CI: 82–85; ML: 0.08–0.12 mm; MI: 19–25; SL: 0.18–0.20 mm; SI: 48–52; PW: 0.20–0.23 mm; WL: 0.43–0.45 mm (3 measured).

Head longer than wide; posterior half of lateral borders of head roundly convex in full face view; posterior border concave with low occipital carina. Mandibles short, shorter than clypeus. Clypeus wider than long, with straight anterior margin and rounded corners, fringed with spatulate hairs. Antennae 6-segmented, scape slightly longer than apical segment of antenna, outer margin of scape angulate at the basal 1/4; apical segment longest, about twice as long as funiculi 3 and 4 together. Eyes small, consisting of 3–5 facets; the diameter shorter than the length of subapical segment of antenna. Pronotum marginate anteriorly, but not laterally; promesonotal area slightly raised in profile; pronotal humeri not distinct; metanotal groove obsolete. Propodeum with more or less distinct lamellae (infradental lamella) at posterior margin; propodeal spines small and narrow. Petiole with spongiform appendages on ventral margin, and in posterior and lateral portions of node; node weakly raised in profile, slightly longer than wide in dorsal view. Disc of postpetiole surrounded with spongiform appendages, but rather thin; its thickness of each side narrower than the dorsal width of hind femur. First gastral tergite with basigastral costulae.

Ground surface of head and mesosoma reticulate-punctate, but smooth and shining on lateral surfaces of pronotum, mesopleuron and propodeum.

Hairs on head and mesosoma suborbicular; those on petiole, postpetiole and gaster spatulate or spoon-shaped. Dorsum of petiolar node with 2 pairs of spoon-shaped hairs, one anterolaterally and another posterolateraly. Body color yellowish to reddish brown.

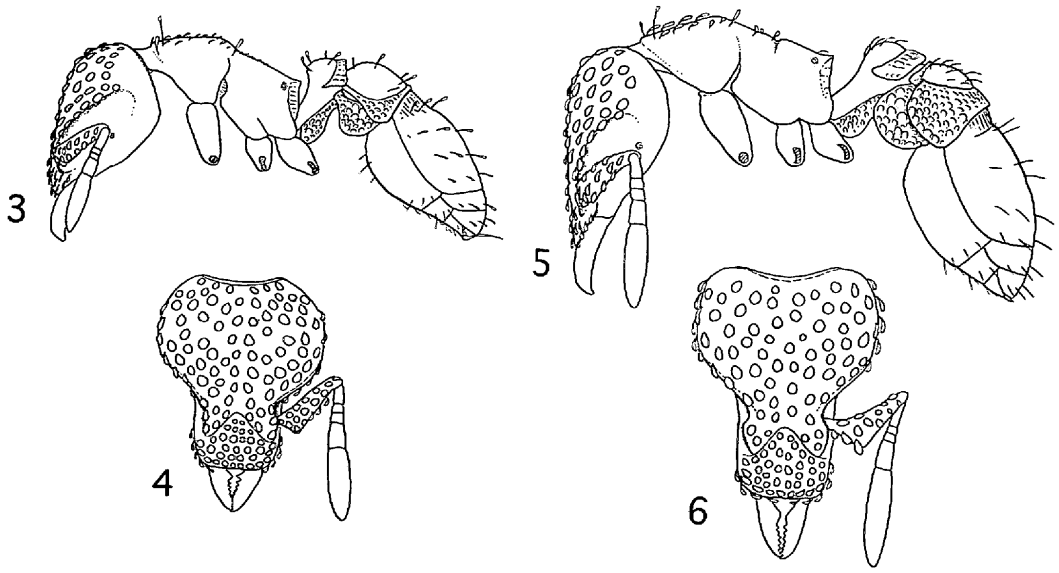
Female. TL: 1.4 mm; HL: 0.53 mm; HW: 0.42 mm; CI: 78; ML: 0.13 mm; MI: 25; SL: 0.25 mm; SI: 60; PW: 0.25 mm; WL: 0.57 mm. (1 measured).

Holotype: Worker, Mt. Banna, Ishigaki I., Ryukyus, 20. vi. 1991, K. Morimoto leg. (Type No. 3059, KU).

Paratypes: 1 worker, same data as holotype; 1 worker, Kumejima I., Ryukyus, 19. viii. 1983, H. Takamine leg.; 1 dealate female, Nago, Okinawa I., Ryukyus, 27. vi. 1974, T. Abe leg.

Distribution. Japan (Ryukyus).

Remarks. Rare species, found on the floor of broad-leaf forest or at the forest margins. The orbicular hairs on head and the shape of the clypeus of this species resemble those of *Epitritus*, but the mandibles show *Smithistruma* type. The species corresponds to *Smithistruma* sp. of Onoyama (1976), and was treated as *S.* sp. 8 of MSJ (1988) and Ogata & Onoyama (1992) with a Japanese name, Maruge-uroko-ari.



Figs. 3–6. *Smithistruma* spp. —— 3, *S. circothrix* sp. n., worker, lateral view; 4, same, head, full face view; 5, *S. hiroshimensis* sp. n., worker, lateral view; 6, same, head, full face view. (Surface sculpture omitted).

***Smithistruma hiroshimensis* sp. n.**
(Figs. 5, 6)

Worker. TL: 1.35 mm; HL: 0.53 mm; HW: 0.42 mm; CI: 78; ML: 0.13 mm; MI: 25; SL: 0.25 mm; SI: 60; PW: 0.25 mm; WL: 0.57 mm. (1 measured).

Head longer than wide, with roundly convex sides posteriorly; posterior border emarginate with low occipital carina. Mandibles as long as clypeus in full face view; dentition not observed. Clypeus with straight anterior margin and rounded corners, and fringed with spatulate hairs. Antennae 6-segmented; outer margin of scape with angulate elbow at basal 1/4; apical segment longer than the rest of funiculus. Eyes small, consisting of 4 facets.

Pronotum angulate anteriorly, but not posteriorly. Propodeum with infradental lamella posteriorly. Petiolar node broader than long in dorsal view. Spongiform appendages of postpetiole well developed, the width of each side thicker than the dorsal width of hind femur in dorsal view.

Head and mesosoma covered with suborbicular hairs. Spatulate hairs present on pronotal humeri, mesonotum, but absent on petiole, postpetiole and gaster.

Lateral surface of mesothorax, propodeum, and whole gaster except for basitergum of 1st segment smooth and shining; the rest of body reticulate-punctate. Body color reddish brown.

Holotype: worker, Mt. Futabayama, Hiroshima City, Hiroshima Pref., Honshu, 2. viii. 1996, Y. Touyama leg. (Type No. 3060, KU).

Distribution. Japan (Honshu).

Remarks. The hairs on the petiole, postpetiole and gaster are stout, but not spatulate. *S. hiroshimensis* is similar to *S. circothrix*, distinguishable in having the larger size, longer mandibles and well developed spongiform appendages on postpetiole in addition to the characters used in the key. Rare species. Found on the floor of broadleaf forests and nesting in the soil.

The species had not been treated in MSJ (1988) nor Ogata & Onoyama (1992). But later Terayama *et al.* (1994) nominated the ant from Hiroshima Prefecture in their distribution table as *Smithistruma* sp. 9 and gave a Japanese name as Hiroshima-uroko-ari. The species also corresponds to *Smithistruma* sp. 3 of Ogata *et al.* (1994).

***Smithistruma incerta* Brown**
(Figs. 7, 8)

Smithistruma (*Smithistruma*) *incerta* Brown, 1949: 10. Female, worker.

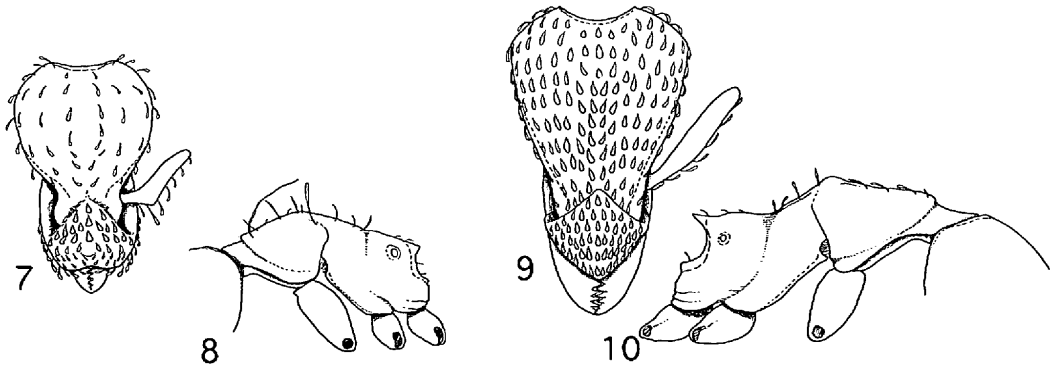
Specimens examined. [Honshu] 2 dealate females, 1 worker, Yamanaka, Mishima, 550 m alt., Shizuoka Pref., 6. i. 1974, K. Onoyama leg.; 1 worker, Manazuru-misaki, Kanagawa Pref., 5. i. 1973, K. Onoyama leg.; 1 dealate female, 2 workers, Kinkazan, Gifu Pref., 16. i. 1983, K. Kinomura leg.; 1 dealate female, 5 workers, Semi, Miyama-cho, Gifu Pref., 3. vi. 1984, K. Yamauchi leg. [Kyushu] 1 worker, Minamata, Kumamoto Pref., 5. i. 1970, M. Kubota leg.

Distribution. Japan (Honshu, Shikoku, Kyushu).

Remarks. *S. incerta* is similar to *S. rostrataeformis*, but distinguished by the shape of anterior margin of clypeus as in the key. This species is often found in the rotten wood in broadleaved forests. According to Brown (1949), the record of *Strumigenys* (*Cephaloxys*) *japonica* Ito by Wheeler (1928) is a misidentification, and *S. incerta* was described based on the material.

***Smithistruma japonica* (Ito)**
(Figs. 9, 10)

Strumigenys japonica Ito, 1914: 40. Worker.



Figs. 7–10. *Smithistruma* spp. —— 7, *S. incerta* Brown, worker, head, full face view; 8, same, mesosoma, lateral view; 9, *S. japonica* (Ito), worker, head, full face view; 10, same, mesosoma, lateral view. (Surface sculpture omitted).

Strumigenys japonicus: Yano, 1932: 335.
Smithistruma (Smithistruma) japonica: Brown, 1948: 105.
Weberistruma japonica: Brown, 1953: 27.
Smithistruma japonica: Terayama, Lin & Wu, 1996: 334.

Specimens examined. [Honshu] 3 dealate females, 1 alate female, 52 males, 36 workers, Campus of the Faculty of Science, Kyoto University, Sakyo-ku, Kyoto, 60 m alt., 26. vi. 1990, A. Taki leg.; 1 dealate female, 3 workers, Miyajima, Hiroshima Pref., 18. v. 1958, F. Takechi leg. [Ryukyus] 1 worker, Shirahama, Iriomote I., 12. iii. 1975, M. Tanaka leg.; 5 workers, Ootomi, Iriomote I., 6. viii. 1985, K. Yamauchi and K. Kinomura leg.

Distribution. Japan (Honshu, Kyushu, Ryukyus).

Remarks. This species is rare. The former records of this species (e.g. Sonobe, 1972) are doubtful for their identification, most of which may be misidentifications of *S. benten.*

The Kyoto specimens have 3 (rarely 4) pairs of erect hairs on mesonotal dorsum, whereas the Iriomote specimens from both localities have no erect hairs on it; we regard this is a variation within the species.

Smithistruma kichijo Terayama, Lin et Wu

Smithistruma kichijo Terayama, Lin et Wu, 1996: 335. Worker. [2 paratypes examined (MNHA).]

Distribution. Japan (Ryukyus), Taiwan.

Remarks. S. kichijo is similar to *S. masukoi* in having abundant flagellate hairs on head and pronotum, but distinguished by the poorly developed lamellate appendages on propodeum from the latter. Rare ant.

The species was newly described by Terayama *et al.* (1996) from Taiwan and Okinawa Island. The ant had not been treated in MSJ (1988) nor Ogata & Onoyama (1992).

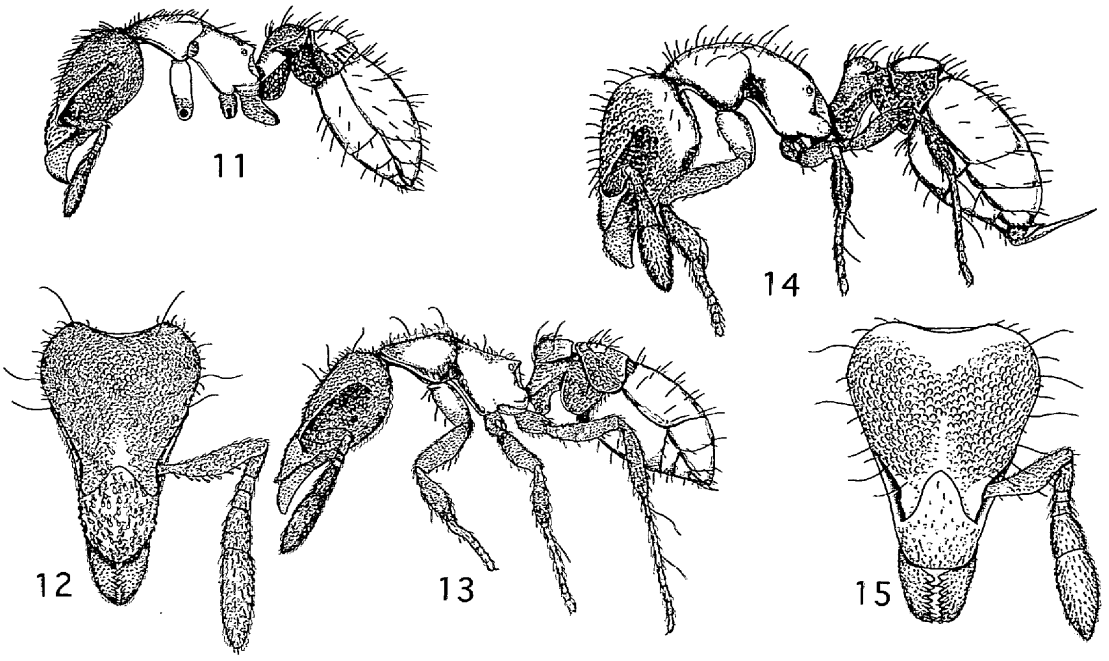
Smithistruma leptothrix (Wheeler)
(Fig. 11)

Strumigenys (Cephaloxys) leptothrix Wheeler, 1929: 55. Worker.
Smithistruma (Weberistruma) leptothrix: Brown, 1948: 74.
Weberistruma leptothrix: Brown, 1949: 8.
Weberistruma leptothrix: Brown, 1953: 24.
Smithistruma leptothrix: Terayama, Lin & Wu, 1996: 336.

Specimens examined. [Ryukyus] 1 dealate female, 82 workers, 64 larvae (no egg), Shirahama, Iriomote I., 22. iii. 1975, K. Onoyama leg.

Distribution. Japan (Ryukyus), Taiwan.

Remarks. Weberistruma sp. reported from the Ryukyus by Onoyama (1976) corresponds to this species. The above record shows an example of the colony size of *S. leptothrix.* The colony nested in an oval cavity of 1 and 1.5 cm axis lengths at a depth of between 10 and 15 cm in the soil near the root of a tree in a forest.



Figs. 11–15. *Smithistruma* spp. —— 11, *S. leptothrix* (Wheeler), worker, lateral view; 12, *S. masukoi* sp. n., worker, head, full face view; 13, same, lateral view; 14, *S. mazu* Terayama, Lin et Wu, worker, lateral view; 15, same, head, full face view.

***Smithistruma masukoi* sp. n.**
(Figs. 12, 13)

Worker. TL 1.5–1.9 mm; HL 0.60–0.67 mm; HW 0.40–0.44 mm; CI 65–67; ML 0.10–0.13 mm; MI 15–22; SL 0.27–0.32 mm; SI 65–74; PW 0.27–0.28 mm; WL 0.59–0.63 mm (7 measured).

Head elongate with slightly convex dorsum; posterior margin roundly emarginate with low occipital carina. Mandibles small, convex dorsally; basal lamella on masticatory margin long and low followed by acute 7 teeth and by 6–7 minute apical ones. Labrum not dissected, but at least paired anterior lobes visible. Clypeus longer than wide, occupying about 1/3 of HL in length, slightly convex in the middle; anterior margin narrowly convex, but not forming a median lobe. Frontal lobes slightly raised. Frontal area depressed. Antennae 6-segmented; scapes slender, without subbasal elbows; second segment as long as following two segments together; apical segment as long as preceding four segments together. Eyes small, well convex, consisting of 4 to 7 facets, situated slightly before the posterior 1/3 of head length.

Dorsum of mesosoma without a distinct median longitudinal carina or lateral marginations in dorsal view; pronotum weakly marginate anteriorly, slightly arched dorsally, without distinct humeri; promesonotal suture indistinct dorsally; mesonotal dorsum slightly raised; hair wheel large and distinct; metanotal groove weakly impressed dorsally; propodeum with small dentiform projection posterodorsally, and with lamelliform appendages; propodeal spiracle situated near the base of propodeal spine. Petiole with narrow anterior peduncle and rounded node. Postpetiolar node broad, nearly twice as wide as petiolar node. Spongiform appendages on petiole and postpetiole well developed. Basal portion of first gastral tergite with 14 distinct striae, which are nearly same in length.

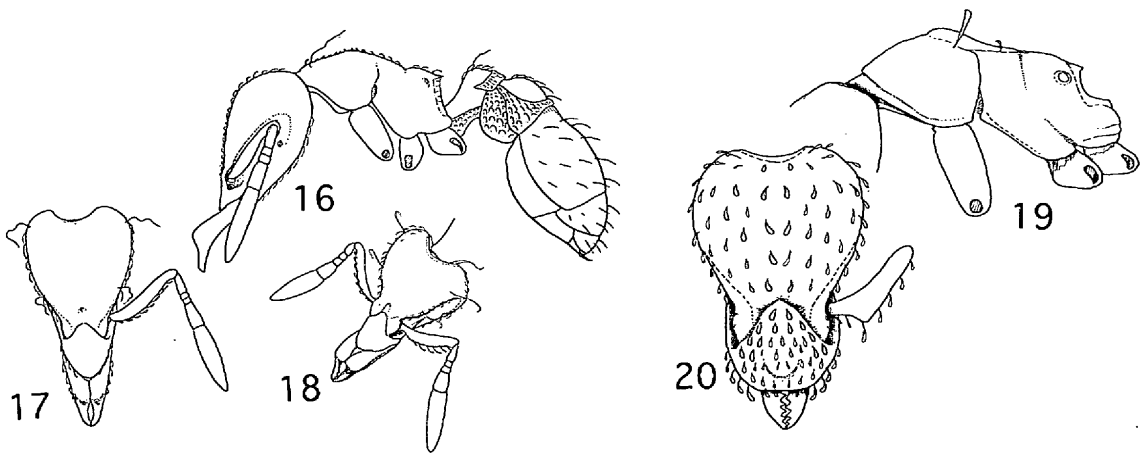
Mandibles and clypeus shallowly punctate, interspaces smooth and shining; the rest of head finely reticulate. Dorsal surfaces of mesonotum and propodeum, legs and petiole reticulate; the remainder of body smooth and shining. Mandibles covered with spatulate hairs, clypeus with broad spatulate hairs, which are longer than intervals; dorsum of head, trunk, petiole and postpetiole with abundant hairs, most of which are short and decumbent, but some are extremely long and flagellate. Gastral dorsum sparsely with simple, long, and erect hairs. Besides abundant appressed hairs, hind tibia with 2 long erect hairs, and tarsus I with 2 long erect hairs (in some cases, apical one may be subdecumbent). Body color reddish brown.

Holotype: worker, Manazuru-misaki, Kanagawa Pref., Honshu, 3. vii. 1983, K. Masuko leg. (Type No. 3061, KU).

Paratypes: 4 workers with same data as holotype; 8 workers, same locality as holotype, 21. vi. 1984; 1 worker, Mt. Kakezuyama, Hiroshima Pref., 18. x, 1992, Y. Touyama leg.

Distribution. Japan (Honshu).

Remarks. S. masukoi resembles *S. kichijo* in having elongate head, rounded anterior margin of clypeus, unelbowed antennal scape and flagellate hairs on head and mesosoma, but distinguished by the poorly developed lamellate appendages on propodeum and long erect hairs on hind tibiae and basitarsi. The species is very rare, known only from two localities. The species corresponds to *S.* sp. 7 of MSJ (1988) and Ogata & Onoyama (1992).



Figs. 16–20. *Smithistruma* spp. —— 16, *S. morisitai* sp. n., worker, lateral view; 17, same, head, full face view; 18, same, head, dorsolateral view; 19, *S. rostrataeformis* Brown, worker, mesosoma, lateral view; 20, same, head, full face view. (Surface sculpture omitted).

Smithistruma mazu Terayama, Lin et Wu
(Figs. 14, 15)

Smithistruma mazu Terayama, Lin et Wu, 1996: 337. Worker. [Paratype examined (MNHA).]

Specimens examined. [Honshu] 4 workers, Manazuru-misaki, Kanagawa Pref., 28. vii. 1982, K. Masuko leg.; 3 workers, Shirahama Jinja, Wakayama Pref., 7. vi. 1956, K. Morikawa leg. (EU); 2 workers, Shiono-misaki, Wakayama Pref., 20 m alt., 30. x. 1973, K. Onoyama leg. [Kyushu] 3 workers, Kashii-gu, Fukuoka, Fukuoka Pref., 8. ix. 1983, K. Ogata leg.; 1 worker, Ambo, Yaku I., Kagoshima Pref., 22. xi. 1974, M. Tanaka leg. [Ryukyus] 1 worker, Nakijin, Okinawa I., 3. iii. 1960, M. Nishihira leg.; 2 workers, Northwest part of Mt. Tanodake, Hanechi, Nago, Okinawa I., 100m alt., 25. x. 1987, Y. Nishikawa leg.

Distribution. Japan (Honshu, Kyushu, Ryukyus), Taiwan.

Remarks. The species easily distinguished from other Japanese species of *Smithistruma* by the distinctly smaller size and the roundly convex node. This peculiar shape of the mesosoma is unique among the species of the Old World *Smithistruma*. The species reported by Onoyama (1976) under *Codiomyrmex* with question from the Ryukyus corresponds to this species.

***Smithistruma morisitai* sp. n.**
(Figs. 16, 17, 18)

Worker. TL 1.2–1.3 mm, HL 0.44–0.45 mm, HW 0.32–0.33 mm, CI 71–73, ML 0.14–0.15 mm, MI 32–33, SL 0.20–0.22 mm, SI 61–69, PW 0.21–0.22 mm, WL 0.43–0.45 mm (3 measured).

Head distinctly longer than wide, with roundly

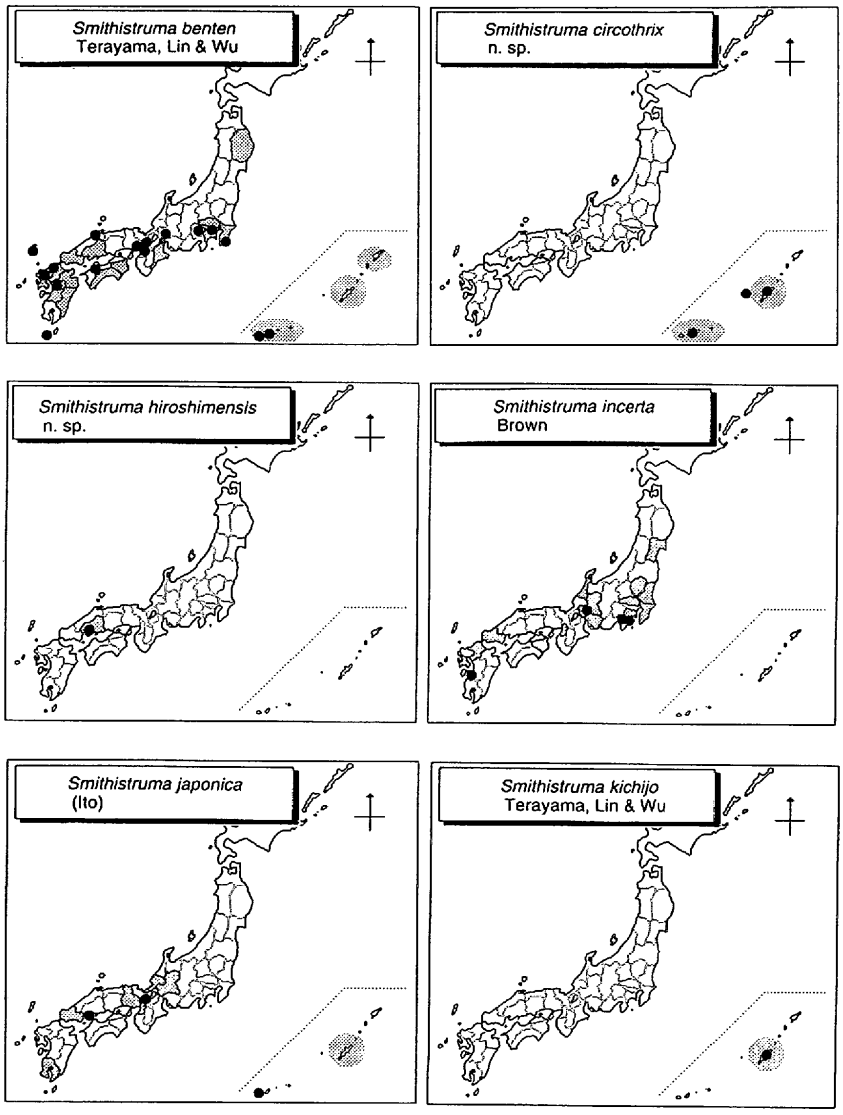


Fig. 21. Distribution map of 6 Japanese *Smithistruma* species. Shadow areas indicate prefectures recorded in Terayama & Kihara (1994), solid circles indicate localities of examined materials in this study.

convex sides posteriorly; posterior border emarginate with low occipital carina. Mandibles elongate, the exposed length about×1.5 as long as clypeus; the shape peculiar; the shaft broadened towards apex and somewhat truncate or strongly bending downwards at anterior 1/3, forming an obtuse but distinct angled corner in lateral view; the subapical portion slightly concave in lateral view, and forming shallow space in full face view, when the mandibles are closed. Clypeus as long as wide or slightly longer than wide; anterior margin narrowly convex. Antennae 6-segmented; scape simply broadened at basal 1/3, not forming an angulate elbow; apical segment long, as long as scape and longer than the rest of funicular segments together; subapical segment as long as 2nd antennal segment. Eyes small but distinct, consisting of 4 facets, situated at posterior 2/5.

Pronotum weakly marginate anteriorly; anterior margin narrowly rounded in dorsal view; metanotal groove very weakly impressed. General shape of mesosoma similar to that of *Smithistruma incerta*, without angulate pronotal humeri; dorsal outline gently convex; posterior margin of propodeum with thin lamellate appendages and with dorsal spiniform processes. Spongiform appendages on petiole and postpetiole developed. Hairs on body narrow scale-like and appressed, on gaster simple and decumbent. Body color brownish yellow.

Holotype: worker, Higashi, Kunigami-gun, Okinawa I., 14. xi. 1975, T. Abe leg. (Type No. 3062, KU).

Paratypes: 2 workers, same data as holotype.

Distribution. Japan (Ryukyus).

Remarks. The mandibular shape of *S. morisitai* is very unique and distinct from other *Smithistruma* species. It is somewhat similar to that of *Asketogenys*,

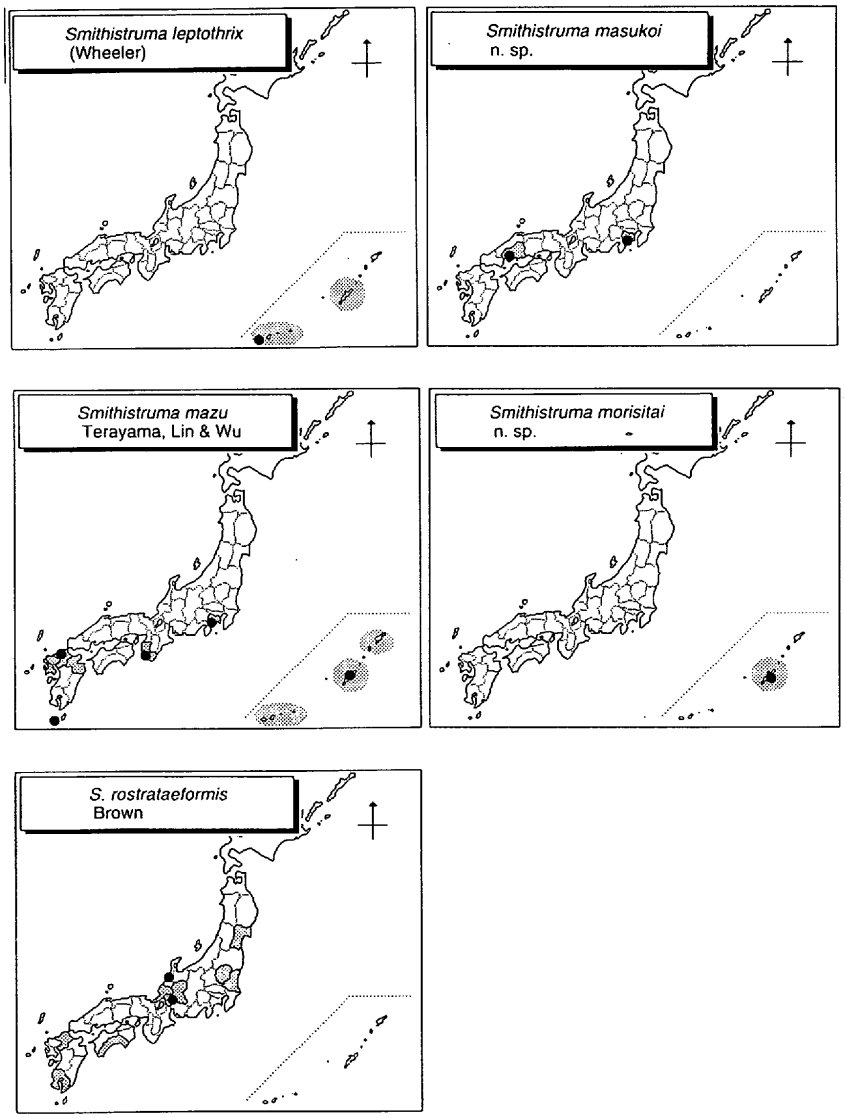


Fig. 22. Distribution maps of 5 Japanese *Smithistruma* species. Shadow areas indicate prefectures recorded in Terayama & Kihara (1994), solid circles indicate localities of examined materials in this study.

a monotypic genus consisting of *A. acubecca*, described by Brown (1972) from Malaysia, in having strong bending outlook. But the dentition, the shapes of the clypeus and mesosoma and pilosity are quite different.

The species was placed under a separate unnamed genus in MSJ (1988) and Ogata & Onoyama (1992) and was treated with the Japanese name, Kibaore-uroko-ari. It also corresponds to "unnamed new genus? sp." of Onoyama (1976).

The species name is for the memory of the late Dr. Masaaki Morisita.

Smithistruma rostrataeformis Brown
(Figs. 19, 20)

Smithistruma (*Smithistruma*) *rostrataeformis* Brown, 1949: 12. Worker. [Holotype examined (KU)]

Specimens examined. [Honshu] 1 worker, Campus of Kanazawa University, Kenrokuen, Kanazawa, Ishikawa Pref., 2. ix. 1990, S. Amano leg.; 1 dealate female, 1 male, 2 workers, Miyajima, Tsukechi-cho, Gifu Pref., 23. ix. 1980, K. Kinomura leg.

Distribution. Japan (Honshu, Shikoku, Kyushu).

Remarks. *S. rostrataeformis* is similar to *S. incerta*, but distinguished by the characters given in the key. Rare.

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