

REVISION OF THE ANT TRIBE DACETINI.

I. Fauna of Japan, China and Taiwan

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The dacetine ants presently known from eastern Asia undoubtedly represent only a fraction of the species which actually exist there. The island of Taiwan properly belongs with the more tropical part of the Indomalayan faunal region; the few dacetines known from there are either endemic or have strong tropical affinities. Careful collecting on Taiwan should reveal a rich and varied fauna embracing many genera now unknown there and including many new forms. *Pentastruma* Forel, with the single species *sauteri* Forel, is known only from the Formosan type collection.

The temperate and subtropical parts of China and Japan have so far failed to yield very many dacetine species, though *Strumigenys lewisi* is widespread and rather common in the milder parts of both countries and in the Ryukyus. A new genus and species, *Kyidris mutica*, and new species in *Strumigenys* and *Smithistruma* Brown are described below. It is doubted that many more species of *Strumigenys* remain to be discovered in the temperate areas, but canvassing of specialists in other groups who habitually use the Berlese funnel will probably lead to the addition of new forms of *Smithistruma* to the lists of both temperate and tropical areas. North American workers have been quite successful with both the sieve and funnel.

The Wessons (1936, 1939) have shown that several species of *Smithistruma* feed exclusively or nearly exclusively on *Collembola*, and I believe that most if not all of the higher Dacetini will eventually be found to have a similar food preference. Most of the species nest in small cavities in the soil or in rotten logs; the nests are difficult to locate, and the ants move very slowly, feigning death when disturbed.

For a more complete treatment of the dacetine genera of the world, the interested

worker should refer to my preliminary generic revision of the tribe (1948).

In this section as well as other sections dealing with various dacetine genera or special faunas now in press or being prepared, I have referred to certain measurements which are best reduced to initialsymbols. The letter "L" always refers to length; "I" means "index":

- TL —Total length of insect, including mandibles but excluding exerted sting. Maximum error of measurement less than ± 0.04 mm.
- HL —*Maximum measurable* head length, viewed dorsally or *ey face*, measuring from a line connecting the posteriormost visible point or points of the posterior occipital border to the anteriormost point or points on the anterior clypeal border.
- ML —*Exposed* length of closed mandibles, measuring from the most advanced point or points on the anterior clypeal border to the apicalmost point on the most advanced mandible. In measuring the mandibles, a standard is reached only by measuring while the head is in the same viewing plane in which HL was measured. The value obtained will not necessarily be the maximum obtainable exposed mandibular length in cases where tilting of the mandibles away from the major cephalic axis is extreme, but this method is more conveniently followed and is the best approximation to a standard two-dimensional drawing. Since the mandibles are to a certain degree retractible, a series of specimens will show slightly more variation in this measurement than in that of HL. Maximum error of measurement for HL and ML is well under ± 0.01 mm.
- CI —Maximum measurable head width at widest point expressed as a percentage of HL ($HW/HL \times 100$); the *cephalic index*. Maximum error ± 1 .
- MI —Mandibular index. $ML/HL \times 100$. Maximum error ± 1 .
- WL —Weber's length of "thorax", as it is usually known to myrmecologists. It would seem more accurate and logical to call the combined thorax and propodeum the "alitrunk" as it is known in related hymenopterous families. The propodeum is equivalent to the formerly used term (in my publications 1943-1949) "epinotum". WL is the maximum measurable straightline distance, seen from lateral view, from anterodorsal pronotal margin to metasternal angle (so-called) of the posteroventral alitrunk. Maximum error ± 0.02 mm.
- HD —Minimum measurable depth of head, lateral view, measured through point of greatest depth. Maximum error less than ± 0.01 mm.
- ICD —Index of cephalic depression. $HD/HL \times 100$. Maximum error ± 1.5 .

Acknowledgements

In the preparation of this paper, I owe a great debt to Dr. Keizô Yasumatsu of Kyushu University for his great kindness in sending me specimens of three new species and one new genus described herein. Dr. Yasumatsu recognized correctly that the three forms mentioned were undescribed, but he forwarded them to me

in order that they might receive the benefit of description in comparison with a larger collection of dacetines than was at his disposal. This act is in the true spirit of scientific cooperation.

I am also indebted to Dr. M. R. Smith, Dr. Charles Ferriere, Dr. J. C. Bequaert, Mr. Cheng Fung Ying, and Mr. F. G. Werner for their aid with material and in connection with making available other facilities contributing to this work.

Kyidris New Genus

Worker—Size small. Head shaped much like that of *Serrastruma*, broad wedge-shaped, but the occipital lobes not expanded laterally past the ventrolateral borders; the latter nearly straight and convergent anteriorly, visible from dorsal view nearly their entire lengths. Posterior border weakly excised. Clypeus broadly diamond-shaped, the free border broadly rounded, slightly sloping, so that the anterior portion is rather weakly depressed. Eyes small, visible from above. Mandibles shorter than the clypeus, shaped like those of *Smithistruma* except that the extreme bases are slightly bent, so that at full closure, the shafts near the insertions show a slight lateral convexity or rounded angle. The dentition consists of a rounded lamellate basal tooth and an apical series of small teeth separated from the basal tooth by a distinct diastema.

Antennae six-segmented, the apical joint long; funicular segments II and III short. Alitrunk divided into promesonotal and propodeal humps dorsally, the division effected by a well-marked and depressed sutural groove. Propodeum rounded in profile, without definite lamellae or teeth, but with a very low, inconspicuous carina on each side which probably represents a lamellar vestige.

Petiole anteriorly pedunculate, its spongiform appendages vestigial and not immediately apparent; postpetiole transverse, its spongiform appendages moderately developed.

Ground pilosity consisting of fairly abundant but inconspicuous short appressed to subreclinate hairs distributed over most of dorsal body surfaces, including gaster; also a few bilaterally paired long clavate hairs in definite positions on the dorsal surfaces.

Head, alitrunk and nodes densely reticulate-punctulate and opaque; gaster shining except for anterior costulation.

Color yellowish ferrugineous.

Genotype—*Kyidris mutica* new species, described below.

The generic name is made up of the initials of Dr. Keizō Yasumatsu's name plus the root “-idris” meaning “knowing or provident one”—a root used rather commonly in forming generic names for ants.

Kyidris mutica new species (Figure 1, A, B, C)

Holotype worker—TL 2.05 mm., HL 0.51 mm., WL 0.52 mm., CI 79, MI 22.

Head as described above under genus; convex dorsally in both directions across the occipital region, anterior to this straight dorsally in lateral profile view but

weakly convex from side to side as seen from above. Just about the whole of the nearly straight convergent ventrolateral cephalic borders are visible when viewed from a position directly dorsal to the head. Eyes small, consisting of about 15 facets each; oval, moderately convex, situated astride the ill-defined lower borders of the scrobes and clearly visible from above. Scrobe broad and rather deep, occupying nearly the entire side of the head, partially divided anteriorly by a short longitudinal carina. Clypeus about as broad as long, with a rounded posterior angle separating it from the poorly-defined and slightly depressed frontal area. Free clypeal border evenly rounded, with a slight tendency toward an indistinct blunt pointing of the middle anteriorly. The clypeal disc is weakly convex from side to side and noticeably sloping anteriorly, so that the anterior portion of the free border is on a level slightly ventral to that of the middle dorsum of the closed mandibles.

When opened, the mandible is seen to be bent near its base and to possess a diagonal basal border which terminates distally in a prominent rounded lamella of thin, translucent chitin which is approximately as broad as the diastema following it distally. Rounded diastema followed in turn by a series of rather even (basalmost slightly larger), small acute teeth which are fused one to the next except for the extreme tips to form a sort of cross-striate lamella, denticulate along the inner edge. There are eleven of these little teeth or denticles, followed by an apical tooth on the downcurved apices of each mandible, the latter larger and broader, slightly set off from the rest and not fused with the next to last

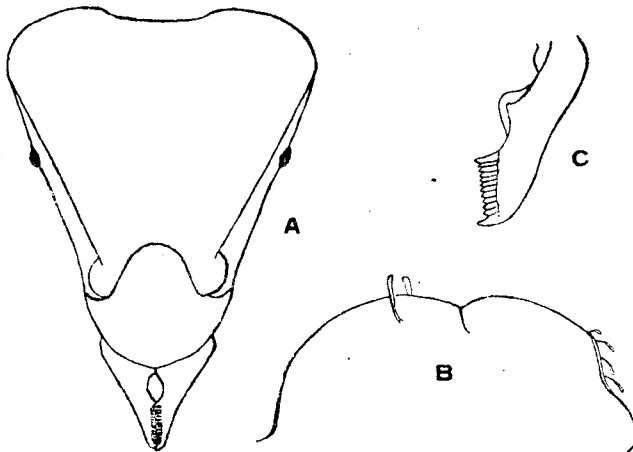


Fig. 1. *Kyidris mutica* new genus and species.

A: Outline of head of worker from dorsal view. B: Dorsal profile of worker alitrunk seen from lateral view, showing pattern of major pilosity. C: Enlargement of worker mandible, dorsal view.

tooth basally. After the basal convexity, the external mandibular border is very weakly concave most of its length. Seen from the side, the mandibles are fairly convex dorsally. As in *Smithistruma*, the shafts are considerably hollowed ventrally, and medially so that they form longish convex-concave shells, seen when a mandible is mounted in balsam, but not easily determined when in place on the insect.

Antennal scape (L 0.30 mm.) very feebly S-shaped, depressed and gradually and slightly incrassate, widest near the middle. Funiculus (L 0.48 mm.) with segment V slightly longer than I-IV taken together; I and IV nearly equal in length and each slightly longer than II and III taken together; III broader than long and distinctly shorter than II.

Promesonotum subglobose seen from above, promesonotal suture obliterated or nearly so; anterior pronotal margin and humeral angles not developed, rather evenly rounded. Propodeum shorter than promesonotum and seen from above a little less than half as wide and longitudinally oblong. From the side, the two major regions of the alitrunk are separately convex and meeting at a well-defined postmesonotal sutural depression (much like that of *Serrastruma* spp.) which also forms a definite constriction when viewed from above. Propodeum with a broadly rounded angle in profile, without teeth or lamellae developed, but instead with the merest trace of a low vertical carina (on each side of the declivity) which bears a row of small, narrowly spatulate curved hairs. The declivity itself is weakly concave from side to side.

Petiole with a peduncle as long as or slightly longer than the node, the latter in side view with a steeply sloping anterior face and the summit rather narrowly rounded. Seen from above, the petiolar node is semicircular, with a narrow lamellate or spongiform band bordering the posterodorsal margin, other petiolar spongiform appendages obsolete. Petiolar node about .6 the width of the postpetiolar node, the latter small, transversely elliptical, with a convex dorsum, about half the greatest width of the gaster. Postpetiole with only moderately well-developed spongiform appendages, and these restricted more or less to the posterior and ventral surfaces.

Gaster of the usual dacetine sort; basal dorsal costulae rather few but distinct and long, blending with a poorly-defined superficially reticulate-striate area between and behind them, the whole roughened area extending over the anterior half or so of the first tergite; remainder of gastric dorsum smooth and shining.

Head, alitrunk, nodes and appendages densely reticulate-punctulate and opaque, except for the bottoms of the punctulae, many of which are smooth, causing the surface to appear very weakly shining in certain lights.

Head, including clypeus, with fairly abundant small appressed and subreclinate linear-spatulate hairs, the same on the scapes, directed apically, and more sparsely on the dorsum of the alitrunk, directed toward the midline. Slightly longer subappressed and appressed spatulate and subclavate hairs directed posteriorly on the nodes and posteriorly directed short appressed pointed hairs on the gastric dorsum. Legs with abundant, very small appressed and subappressed clavate and spatulate hairs. In addition to the ground pilosity, there exist larger paired erect clavate hairs, one pair on the occiput, another on the posterior promesonotal dorsum, one

pair on each of the nodes, and about five pairs on the gastric dorsum. Apex of gaster and ventral surface with some shorter, more slender hairs.

Color light ferruginous yellow.

Holotype worker and five *paratype workers* described below taken on Shikoku at "Hirooka (Tosa)" by H. Okamoto. These specimens were sent me by Dr. Yasumatsu; the holotype and paratypes will be returned to him at Kyushu University, Fukuoka, Kyushu, Japan. One each paratypes will be deposited in the Museum of Comparative Zoology and the U. S. National Museum. Female and male unknown to me.

Paratype workers—TL 2.00–2.15 mm., HL 0.50–0.54 mm., WL 0.53–0.56 mm., CI 76–80, MI 21–24.

This new genus proves the most interesting of the fine set of dacetines Dr. Yasumatsu has sent. In the shape of the head proper and of the alitrunk, and in pilosity character, *Kyidris* is most closely related to *Serrastruma* Brown. I originally described *Serrastruma* and *Weberistruma* (see below) as subgenera of *Smithistruma* Brown (1948), but I now consider these as two separate genera after reviewing more material than I had seen at the time of that publication. As it happens, *Kyidris* is also related to *Weberistruma* on the basis of clypeal structure; the clypeus also approaches that of certain *Smithistruma*. The mandibles most resemble those of certain species of *Smithistruma*, but are distinctive in their own right, while the lack of epinotal teeth or lamellae is quite unique among genera related to *Smithistruma*. *Kyidris* may possibly be considered a relict genus combining characters of several *Smithistruma* group genera and adding specializations of its own. More species should be looked for in warm temperate Eastern Asia and possibly in Northwestern North America.

***Pentastruma sauteri* Forel**

Pentastruma sauteri Forel, 1912, Ent. Mitt., 1: 51–52, worker.

This species, the genotype and only known species of the genus, is described by Forel as having five-segmented antennae, the three basal joints of the funiculus subequal in length. The habitus is supposed to be somewhat like that of *Trichoscapa membranifera* Emery or a small *Smithistruma*; the clypeus is produced somewhat on each side as a lamella, and the mandibles are short and serially dentate. The type was taken by Sauter at Pilam, Taiwan; Dr. Charles Ferriere of the Geneva Museum writes me that it is probably now in a collection in Berlin. I have seen no specimens which could be placed in *Pentastruma*. Japanese, Chinese and Formosan ant collections containing specimens from Pilam (I do not know the present name of the locality) should be combed for *Pentastruma*; it would be strange if Sauter's were the only existing specimen.

***Trichoscapa membranifera* Emery**

Strumigenys (Trichoscapa) membranifera, Emery, 1869, Ann. Accad. Aspir. Nat. Napoli, (2) 2: 24–25, Pl. 1, fig. 11, worker.

- S. membranifera* race *simillima* Emery, 1890, Bull. Soc. Ent. Ital., **22**: 69, Pl. 8, fig. 5, worker.
- S. membranifera* var. *santschii* Forel, 1904, Rev. Suisse Zool., **12**: 6, worker.
- S. (Cephaloxys) vitiensis* Mann, 1921, Bull. Mus. Comp. Zool., **64**: 461-462, fig. 22c, worker.
- S. (Cephaloxys) silvestriana* Wheeler, 1928, Boll. Lab. Zool. Sc. Agr. Portici, **22**: 27-28, worker.
- S. (C.) foochowensis* Wheeler, 1928, Idem., pp. 28-29, worker.
- S. (C.) membranifera* var. *marioni* Wheeler, 1933, Proc. Hawaiian Ent. Soc., **8**: 275-277, worker.
- S. (C.) membranifera* var. *williamsi* Wheeler, 1933, Idem., pp. 275-277, worker ♀.
- Trichoscapa membranifera* Brown, 1948, Trans. Amer. Ent. Soc., **74**: 112-114.

I have shown (Brown, 1948, op. cit.) that the various forms listed under the synonymy above are probably only insignificant minor variants of a single, widely spread tramp species, *T. membranifera*. Since that writing, I have seen additional material which strengthens my conviction that these variants are taxonomically inseparable. I have seen specimens taken from two colonies in a yard at Maracaibo, Venezuela (R. G. Wesson) which agree both with *marioni* and *silvestriana* types; one or two of the Maracaibo specimens agrees well with the *vitiensis* types - in fact, the Maracaibo series seem to include workers which agree with types or topotypes of any of the forms listed above except *santschii*, which I have not seen, but which can easily be abandoned on the basis of the original description and subsequent descriptions. Dr. M. R. Smith reports that Savannah, Georgia - a busy seaport on the Atlantic - may be added to the list of the U. S. localities.

In eastern Asia, this form has been reported from Foochow and Macao (F. Silvestri) as synonymic forms (Wheeler, 1928, op. cit.); I have taken a female near Chengtu, Szechuan Province, China. The species undoubtedly has been introduced near or at seaports in the warmer parts of Japan and probably also on Formosa; it is known to occur on several Pacific islands.

It may be recognized by the short, chunky head; triangular mandibles with strong, horizontal basal borders which are not covered by the clypeus at full closure; strongly laterally margined pronotum with well-marked humeral angles; and by the pilosity: the only hairs at all prominent on the head proper are two short, erect clavate ones on the occiput.

Weberistruma Brown

Strumigenys (Cephaloxys) sensu Wheeler, 1929, Boll. Lab. Zool. Sc. Agr. Portici, **24**: 55-57, fig. 7, part. (*Cephaloxys* preoccupied).

Smithistruma (Weberistruma) Brown, 1948, Trans. Amer. Ent. Soc., **74**: 106-107.

S. (Smithistruma) Brown, 1948, Idem., p. 105, part.

Weberistruma and the Ethiopian-Malagasy genus *Serrastruma* were provisionally described as subgenera of *Smithistruma* in my 1948 paper, but since that time I have seen nearly all the forms which could be considered critical in deciding their status; my conclusion is that these two groups are distinct genera unconnected by known intergradient forms to *Smithistruma*. Since 1948, I have been able to

examine also Menozzi's *Strumigenys* (*Cephaloxys*) *jacobsoni*, which I had placed in *Smithistruma* s. str.; this species is a clearcut *Weberistruma* and the second form to be recognized as belonging to the genus. Although *jacobsoni* is known only from Sumatra, I have included a few measurements and descriptive notes here so as to treat *Weberistruma* as a unit.

***Weberistruma leptothrix* (Wheeler)**

Strumigenys (*Cephaloxys*) *leptothrix* Wheeler, 1929, Boll. Lab. Zool. Soc. Agr. Portici, **24**: 55-57, fig. 7, worker.

Smithistruma (*Weberistruma*) *leptothrix* Brown, 1948, Trans. Amer. Ent. Soc., **74**: 107.

Holotype worker—Head from above superficially like that of *Smithistruma* of the *clypeata* group in general outline, narrow subcuneiform, with not greatly expanded lateral occipital lobes. Dorsum of head above distinctly but loosely longitudinally rugose. Clypeus moderately convex, the anterior border rounded, with a feeble suggestion of blunt pointing in the center. Due to the slope of the clypeus and the dorsally convexly bulging upper mandibular surfaces, the anterior border seems sunken by comparison. The short but robust mandibles are set with a series of sharp teeth along the apical (masticatory) border, and this border slightly depressed; since this and the following specimen are so valuable, I have not dared to try opening the mandibles, so that the important details of both apical and basal armature are undetermined. Viewed at the correct angle, the head with mandibles of both species of *Weberistruma* resemble caricatures of the classical vulture head, since the apices of the mandibles are sharply deflected ventrally and the dorsal surfaces so convex.

The alitrunk is weakly submarginate, flattened and shining in the middle above, with an indistinct median longitudinal carina and some indistinct longitudinal costulae. Propodeal teeth lamelliform, acute, subtended by an infradental lamella of somewhat spongiform consistency.

Petiole forming a weakly arched club because of the low, convex node, which is not or very indistinctly set off from its peduncle. Both nodes with rather abundant spongiform appendages, especially ventrally.

Pilosity of dorsum of body and parts of legs long, weak but erect, rather abundant and quite conspicuous hairs on upper dorsum of head weakly apically enlarged; clypeus and mandibles with very small, appressed, inconspicuous broadly spatulate hairs, which permit the not entirely smooth but rather highly shining *yellowish* clypeus to be easily seen. Color, except for clypeus, light ferruginous.

The single specimen, which is the holotype, collected by Silvestri at Funkiko, Taiwan, is the only specimen known to me. I have placed the measurements and proportions last, so that they may be more easily compared with those of *jacobsoni* below: TL 3.11 mm., HL 0.79 mm., WL 0.80 mm., CI 63, MI 10-11.

***Weberistruma jacobsoni* (Menozzi)**

Strumigenys (*Cephaloxys*) *jacobsoni* Menozzi, 1939, Tijdschr. Ent., **82**: 180-181, fig. 4, worker.

Smithistruma (Smithistruma) jacobsoni Brown, 1948, Trans. Amer. Ent. Soc., 74: 105.

Worker—TL 2.90–2.97 mm., HL 0.73–0.74 mm., WL 0.72 mm., CI 69 (both) and MI 12 (both), from two cotypes taken by Jacobson at Fort de Kock, Sumatra, kindly sent me by Sr. Mario Consani of Firenze, Italy.

Female, gynetype, undescribed—TL 3.49 mm., CI 71, MI 15. Alitrunk mostly longitudinally rugulose above. The *gynetype* is from the type series, with the same data as the workers above; since Menozzi undoubtedly saw the specimen, I do not understand why he never described the sexual caste.

Both female and worker of *jacobsoni* may be distinguished from the worker of *leptothrix* by head shape and several other characters. The head is clearly shorter and broader, and the occipital lobes are narrowed into somewhat pointed angles behind. Neither mandibles nor clypeus quite so convex, and the mandibles both relatively and absolutely are a little longer and less strongly down-curved. The pronotum is very strikingly flattened dorsally, with very sharp and jutting, slightly upturned anterior and lateral margins, causing the dorsal disc of the pronotum to be slightly concave and saucer-like. There is a low suggestion of a median longitudinal carina or tumulus, and the whole surface is rather strongly shining. In other features, such as the arched-clavate petiole and the long dorsal pilosity, *jacobsoni* differs only in details, the general pattern being the same. The pilosity of the head, for instance, has less tendency toward clavation of the tips.

I have thus tried to generalize the generic features of *Weberistruma*, which would certainly seem to ally the genus with the neotropical *Codiomyrmex* Wheeler. Those desiring more specific descriptions of the two *Weberistruma* species should consult the original descriptions and figures.

The gynetype of *jacobsoni* has been returned to the collection of Sr. Mario Consani, Firenze, Italy, along with one cotype worker; a cotype worker is also retained for the collection of the Museum of Comparative Zoology.

Smithistruma (Smithistruma) Brown

Smithistruma Brown, 1948, Trans. Amer. Ent. Soc., 74: 104–106; see that article for full synonymy, discussion, etc.

This genus is apparently partial to temperate regions as well as tropical. It has not yet been taken on Formosa, but species undoubtedly occur there.

The members of the genus have six-segmented antennae patterned like those of *Strumigenys*, but usually shorter; the mandibles are less than 1/3 the head length, usually much shorter, narrowly triangular in shape and serially dentate along the apical border; basal mandibular tooth or lamella varying greatly with the species and present in some form in all forms examined so far. The propodeal declivity is guarded on each side by a lamella which is more or less dentiform above.

The *rostrata* group, to which belong the two new species described below, is characterized by having distinctly bulging lateral borders to the occipital lobes, by the parallel or nearly parallel and usually convex ventrolateral cephalic borders as seen from dorsal view. The cephalic pilosity mostly of spatulate and clavate hairs, that of the clypeal disc of a relatively few small or very small spatulate,

appressed or reclinate hairs; of the free clypeal margin, larger, conspicuous spatulate hairs curved anteriorly and more or less toward the midline, forming a fringe, those in the center anteriorly much shorter. The clypeus is usually if not always broader than long, and the transverse anterior border in the middle is either straight or slightly emarginate. The mandibles are serially dentate along the apical (masticatory) margins, the basal tooth large, acute and not separated from the apical series by a diastema.

Smithistruma (Smithistruma) japonica (Ito)

Strumigenys japonica Ito, 1914, Ann. Soc. Ent. Belg., 58: 40-41, worker.

Smithistruma (S.) *japonica* Brown, 1948, Trans. Amer. Ent. Soc., 74: 105.

The original description of this species contains little of value for purposes of distinction from other *Smithistruma*; indeed, it would not be too surprising if *japonica* proved to belong to another genus. Ito gave the length as $2\frac{1}{2}$ mm.; since this measurement, if very accurate, is more than the corresponding figures for the two species described below, we may perhaps take the larger size as the distinguishing character until someone takes the pains to redescribe the types. Ito says that the mandibles are less than $\frac{1}{2}$ the length of the head, but does not say by how much they are shorter. Neither does he mention any emargination of the anterior clypeal border, nor whether spongiform appendages exist on the petiole, but his statement is clear that the appendages do occur on the postpetiole.

The specimens collected at Kirishima Mountain and identified by Wheeler as *japonica* (see below) are believed to be a new and different species. I have no evidence that Wheeler's identification was on other than a strictly geographical basis, since it is doubtful that he ever saw any of the types or other reliable specimens, and Ito's vague description would fit either the Kirishima specimens or the types of *rostrataeformis* new species described below. The fact that at least two different *Smithistruma* species occur in the Japanese islands destroys any chance of identification purely by locality. Ito's locality citation was "Japan: Prov. Nagato... Island of Hondo (Y. Nawa)." His type series consisted of four workers.

Smithistruma (Smithistruma) incerta new species

Strumigenys (*Cephaloxys*) *japonica* Ito, *sensu* Wheeler, 1928, Boll. Lab. Zool. Portici, 21: 115-116, ♀ and (in part) worker.

I consider that the worker and female now in the Museum of Comparative Zoology, collected by Prof. Silvestri at Kirishima Mountain, Kyushu, and determined by Wheeler as *japonica*, represent a new species of the *rostrata* group probably distinct from the types of *japonica*. I leave it to some worker who has access to the *japonica* types to give final proof of the identity of *japonica*. The same female which Wheeler used as a model for his description of the gynetype of the species *japonica* as that author saw it is here made the holotype of *incerta*, since the single worker available to me (taken with the female at Kirishima Mt.) has the postpetiole and gaster missing.

Ergatotype worker—The estimated probable TL is in the neighborhood of 2.15 to 2.20 mm., HL 0.56 mm., WL 0.52 mm., CI 66, MI 13.

Head in general shape and proportions like that of *S. rostrata* Emery, which has been well figured by Emery (1895, Pl. 8, fig. 23) and M. R. Smith (1931, Pl. 2, fig. 8). (These figures, especially that of Smith, will serve to illustrate the general head shape of the entire *rostrata* group if allowances are made for variation in mandibular length, pilosity and the degree or absence of emargination of the anterior clypeal border.)

Head strongly convex across the vertico-occiput in both directions: frontal area subtriangular, rather small, sharply depressed below the level of the posterior clypeal border, to which it is connected by some short, very indistinct longitudinal striae. Posterior border broadly but rather shallowly excised, excision perhaps a little less deep than in *rostrata*. Clypeus about 1.10 times broader than long, surface of disc weakly convex behind and with a low tumulus just anterior to its center, center of anterior clypeal border slightly depressed and slightly but distinctly emarginate, the emargination in both ergatotype and holotype female more marked than in specimens of *rostrata* showing somewhat similar emargination.

Mandibles like those of *rostrata*, but decidedly shorter (MI in both holotype and ergatotype 13; MI in *rostrata* 19-21). The dentition is apparently similar to that of *rostrata* in that the basal mandibular tooth is not separated from the apical series of teeth by a diastema; though the mandibles were not opened in either specimen, the basal tooth seems, from what can be seen of it, to be acute like that of *rostrata* and an undescribed species from California in my working collection. The blades are rather broad across their bases and moderately depressed.

Antennal scape L 0.28 mm.; slightly bent near base, flattened and slightly incassate, the anterior border obtusely angulate at the bend. Funiculus L 0.41 mm.; apical segment (V) between $1\frac{1}{2}$ and $1\frac{1}{4}$ times the length of segments I through IV of the funiculus taken together. Eyes much as in the worker of *rostrata*.

Alitrunk like that of *rostrata*, but no so strongly depressed anteriorly. In lateral profile, the anterior slope of the pronotum gently convex, forming nearly a 45° angle with the posterior dorsum, but meeting the latter through the rounded promesonotal convexity. The posterior part of the mesonotum and the dorsum of the propodeum forming a nearly straight dorsal outline; the postmesonotal suture scarcely noticeable in lateral view, but visible as a dark transverse line seen from above. Pronotum arcuately rounded and marginate anteriorly; humeri rounded, each with an indistinct piligerous tubercle. Median longitudinal carina extending length of promesonotum, but very weak. Propodeal lamellae as in *rostrata*, each forming a small acute tooth above, narrow and concave beneath this, not widened ventrally, but forming a small angle at its ventral terminus.

Petiole pedunculate, with spongiform tissue forming fair-sized flaps on each side of the dorsally rounded node and a heavy ventral longitudinal band beneath.

Head obscurely tuberculate above posteriorly. Head, alitrunk (except posterior pleurae, which are partly smooth and shining) and petiole densely reticulate-punctulate and opaque. Postpetiolar node and gaster (as shown by the female) smooth and shining, the latter with a few long, weak costulae extending about

the basal quarter of the length of the first gastric tergite. Clypeus, except for the feebly shining tumulus, punctulate-granulate and opaque.

Clypeus with very small separated suberect to subreclinate spatulate hairs on the disc, the lateral borders of the free margin of the clypeus on each side with about 6 longer, medially curved spatulate hairs, which are nearly even in length and not very broad (each hair broader than the corresponding one of *rostrata* and the fringe more even; hairs not so broad as in *creightoni* M. R. Smith (1931, Plate IV, fig. 16). The emarginate portion of the anterior clypeal border with three or four small hairs on each side of the middle, these very indistinct and becoming shorter nearest the midline. Dorsum of head posterior to clypeus with short, erect clavate hairs which become progressively longer posteriorly, those on the extreme occiput longest and scarcely thickened at the tips. Antennal scapes each with about 9 more or less perpendicular straight or nearly straight prominent hairs which are weakly broadened at the tips; the longest, at the angle near the base of the anterior border, is about as long as the greatest width of the scape. Dorsum of alitrunk with a sparse growth of hairs like those on the occiput, erect and weakly or not at all enlarged apically. Hairs on petiole, postpetiole and gaster (in both female and worker) similar to those of occiput and alitrunk, those on the gaster longest, weakest and least or not at all apically enlarged, moderately abundant above, more abundant and shorter below. Humeral tubercles each bearing a long, weak crooked flagellate hair.

Color ferrugineous yellow.

Holotype female—Differing from worker in the usual characters of full sexuality (ocelli, thoracic and gastric regions more strongly developed, compound eyes larger, etc.), the compound eyes relatively larger and more prominent than in the female of *rostrata*. Dorsum of mesonotum not clearly striate or rugulose, but the punctulae forming indistinct longitudinal rows. Ocellar triangle darkened. Postpetiole with abundant spongiform appendages, which are probably much the same in the worker caste. TL 2.36 mm., HL 0.59 mm., WL 0.62 mm., CI 70, MI 13, Clypeus 1.1 times as broad as long.

This form may be distinguished from all other members of the *rostrata* group which I have seen, including an undescribed Californian species and *rostrataeformis* new species (described below) by the combination of very short mandibles with the slightly but distinctly emarginate anterior clypeal border. It is also different in pilosity and other characters.

Smithistruma (Smithistruma) rostrataeformis new species

Holotype worker—TL 2.35 mm., HL 0.61 mm., WL 0.60 mm., CI 67; MI 14-15. Scape L 0.32 mm.; Funiculus L 0.45 mm., funicular segment V (apical) $1\frac{1}{4}$ times as long as the four basal segments taken together.

This form quite definitely belongs to the *rostrata* group; furthermore, it has quite a striking resemblance to *rostrata* itself, hence the name. In many characters, the new species is intermediate between *incerta* and *rostrata*; the com-

parison below is made chiefly against *incerta*, and where comparison is made to *rostrata*, that species is always mentioned by name.

(1) The head is slightly more depressed dorsally than in *incerta*, nearly straight in lateral profile from vertex anteriorly, with the depression of the frontal area and concomitant elevation of the posterior clypeal border less marked (head intermediate to that of *rostrata* in these respects).

(2) Clypeus broader (1.3-1.4 times as broad as long), more nearly plane; tumulus weakly shining and touching the anterior clypeal margin; central portion of transverse anterior clypeal margin straight, not at all emarginate.

(3) Mandibles slightly longer than those of *incerta*, but not nearly so long as those of *rostrata*; dentition appearing similar to that of both species at full closure.

(4) Pilosity white and conspicuous, differing in detail from that of *incerta* and *rostrata*. Hairs on disc of clypeus short, erect or suberect and strongly clavate. Five large spatulate hairs fringing each side of the free clypeal margin, those nearest the anterior margin (on the "anterior corners") are largest, but not nearly so long relative to the rest as in *rostrata*; slightly longer than the corresponding ones of *incerta*, curved anteriorly and medially. Straight transverse section (anterior border) of free clypeal margin with about three small, indistinct incurved spatulate hairs on each side of the middle, becoming shorter from the sides toward the middle. Anterior border of scape with about 7 prominent hairs, the largest one (at the blunt angle near the base) as long as the greatest scape width and with its tip broader than the rest of the hairs, which are narrowly spatulate apically. Remainder of cephalic dorsum with short inverted-spoon-shaped hairs, their broadened parts bent anteriorly more or less parallel to the integumental surface; those on the occiput a little longer, narrower and less strongly bent, but never nearly so long, erect and slender as those of *incerta*. Alitrunk with a pair of long, stiff flattened-clavate hairs on the humeral angles (these flagellate in *incerta*) and another pair of the same arising from low tubercles at the posterolateral pronotal angles. In addition, the promesonotum supports a very few small, indistinct appressed to suberect spatulate hairs. Petiole and postpetiole each with a few posteriorly inclined clavate hairs of varying lengths; a row of 5 or 6 long anteriorly inclined weakly clavate hairs across the anterior of gastric tergite I and an erect pair of the same near the posterior border of that tergite; a few fine straight erect hairs about the gastric apex.

(5) Alitrunk a little more strongly depressed than in *incerta*, less so than in *rostrata*, the anterior pronotal surface more gently sloping than in *incerta* and only very gently convex antero-posteriorly. Pronotum sharply and arcuately marginate anteriorly, a feeble carina along the dorsolateral margins on each side causing a weak submarginate appearance. Mesonotum barely perceptibly marked off from the pronotum by an indistinct arcuate sutural line or ridge; posterior mesonotum very weakly depressed. Postmesonotal suture weakly depressed; median longitudinal carina fine but distinct, running from the anterior pronotal margin to the dorsum of the propodeum, where it forks into two fine carinae continuing posteriorly as the dorsal edges of the propodeal teeth.

(6) Postpetiolar disc broad, convex, smooth and shining, with a row of short, fine longitudinal costulae along its anterior border. Spongiform appendages of both petiole and postpetiole voluminous, gleaming white, divided by fine alveolar reticulation. Basal costulae of gaster distinct but fine, separated, 16-18 in number, occupying about the basal fifth of gastric tergite I. Remainder of gastric dorsum smooth and strongly shining.

(7) Color rather even medium ferruginous, decidedly darker than in *incerta* types and lighter than is usual in *rostrata*.

The *holotype* worker and the *paratype* described below were taken together by H. Okamoto at Umaji (Tosa) on the island of Shikoku, and were sent by Dr. Yasumatsu, to whom the holotype will be returned. The paratype is to be retained in the collection of the Museum of Comparative Zoology at Cambridge.

The single *paratype* worker is slightly larger all around than the holotype, though the clypeus is only about 1.2 times as broad as long. TL 2.37 mm., HL 0.64 mm., WL 0.62 mm., CI 66, MI 14-15.

The distribution of the *rostrata* group, to which these two forms belong, is rather remarkable. In addition to the two Japanese forms, there are *rostrata* Emery, a common form in the temperate forest regions of the eastern United States, *conspersa* Emery from Northern Argentina, and an undescribed form from California which Wheeler had previously identified as *rostrata*. I have described this form, and it will appear in a subsequent section of this revision. Since the two females upon which the California species is based were collected in the heavily agricultural district around Claremont, California (C. F. Baker) (which was formerly semiarid territory). I consider that this form may well have been introduced from the Orient. Although no other species of dacetine is known to occur on the Pacific Coast, Dr. M. R. Smith has reported to me (*in litt.*) that Dr. A. C. Cole had collected a single *Smithistruma* worker, apparently of the *clypeata* group, at a point along the Oregon-California border. This specimen has since been lost, but it indicates that dacetines can and do exist in the coastal temperate forest areas. The present distribution of the *rostrata* group is certainly suggestive of the patterns followed by many other animal (*Alligator*) and plant genera restricted to temperate or subtropical parts of both eastern Asia and North America. We may perhaps explain the anomalous occurrence of *conspersa* in Argentina either by supposing the predilection of the *rostrata* group for more temperate areas or by assuming that its *rostrata*-like characters arose through convergence from a tropical group, and that it really does not belong with *rostrata* at all.

I have seen a specimen of *incerta* with a locality label from an eastern Chinese locality, but since the specimen is not presently available to me, I cannot record it any more precisely or certainly.

Strumigenys Fred. Smith (*sensu stricto*)

Strumigenys Fred. Smith, 1860, Journ. Ent., 1: 72.

Orectognathus Fred. Smith, 1876, Trans. Ent. Soc. London, p. 491, part.

- Proscopomyrmex* Patrizi, 1946, Boll. Ist. Ent. Univ. Bologna, **15**: 294-295.
Strumigenys (*Proscopomyrmex*) Arnold, 1941, Occ. Pap. Nat. Mus. S. Rhodesia, No. 14, p. 227.
Eneria Donisthorpe, 1948, Ann. Mag. Nat. Hist., (11) **14**: 598. (Genotype: *Eneria excisa* Donisthorpe, Idem., pp. 598-600, fig. 1, worker ♀, synonym of *Strumigenys loriae* Emery, 1897, Term. Füzetek, **20**: 576, Pl. 14, fig. 3, worker.)

Strumigenys is the largest genus of the *Dacetini*, with species in tropical or warm temperate sections of all continents, but apparently absent in the Mediterranean region, cold Holarctic regions, and Chile. Although there exist many described species, my own working collection contains at least as many more new forms, and probably at least half of the existing species remain uncollected.

The genus is characterized by the long linear mandibles with one to a few spiniform teeth at the apices; the antennae conform to the typical "*Strumigenys* pattern" of six segments, with funicular segments II and III very small and the apical segment long and massive. The species of *Strumigenys* (*s. str.*) all possess some sort of spongiform appendages on at least the postpetiole, and all have "epinotal" teeth, lamellae, or both.

There is no definite information on food habits, but it is supposed that the species feed on Collembola or other small arthropods.

Perhaps a way will be found eventually to split *Strumigenys* into smaller subgenera, but at present the only subgenus I can recognize, and that with some uneasiness, is *Pyramica* Roger of the New World tropics. The descriptions of *Proscopomyrmex* and *Eneria* were based on single species, the latter on a synonym, and it appears certain that the authors in question were unaware at the time of their writings that there might be several species of *Strumigenys* previously described which fit each generic diagnosis. The prime character in both new genera appears to be the conformation of the eyes and periocular area, particularly the "preocular notch" or "groove"—a character upon which one could easily set up a finely graded vanishing series using only described forms. Dr. Arnold recognized the weakness of Patrizi's genus and reduced it to a subgenus on the basis of the intergradient forms he found in a relatively restricted area in southeastern Africa, and when one takes into account species like *S. chyzeri*, *S. szalayi*, *S. rogeri*, *S. nidifex*, *S. formosensis* and many other forms occurring outside Africa, the notion of basing a subgenus on this character becomes highly questionable. In a group like the dacetines, with its tangle of parallelisms and convergences, no one should attempt to base genera or subgenera on species from a limited faunal study. The distribution of the "preocular notch" character is, for example, a very broad one, including so far as is known all the tropical zoogeographical areas of the world. Even after prolonged study of this character, I am not prepared to say whether it is mono- or polyphyletic in origin, though there are certainly indications that the character has arisen more than once within the genus, perhaps correlated with a secondary enlargement of the eyes when the ants assumed an arboreal or subarboreal mode of life like that led by certain South American species.

I have synonymized *E. excisa* after examining series kindly sent me by Dr. E. S.

Ross, the original collector, and comparing these with a worker cotype of *S. loriae* sent by Sr. Mario Consani. I can see no differences worth the name, and both series agree with Mr. Donisthorpe's figure very closely in all respects.

Three of the four Sino-Japanese species treated here definitely belong to the group about *S. godeffroyi* Mayr. This group contains more and commoner species than any other among Old World *Strumigenys*, and several forms range very widely. The fourth species, *S. formosensis* Forel, may be considered a link between the *chyzeri* group and the *godeffroyi* group; it has features of both and could be assigned to either with equal propriety. It will perhaps end by being considered in a separate group containing also a few other Indomalayan species to which it is related more closely.

***Strumigenys* (*Strumigenys*) *lewisi* Cameron**

Strumigenys lewisi Cameron, 1887, Proc. Manchester Lit. Phil. Soc., 25: 229, worker. *S. godeffroyi* var. or subsp. *lewisi* of authors.

Measurements and proportions from 15 workers taken in Szechuan, Shantung, Kiangsu and Fukien Provinces, China; Kyushu and Honshu, Japan: TL 2.40-2.65 mm., HL 0.60-0.66 mm., WL 0.60-0.68 mm., CI 71-74, MI 45-48, ICD 45-47.

Three females from Szechuan and Kyushu ranged as follows: HL 0.64-0.65 mm., CI 75-77, MI 43-44, ICD 49-51.

This species is no doubt familiar to myrmecologists who have dealt with the East Asian fauna. I believe that Cameron was originally correct in separating this form completely from *S. godeffroyi*. In addition to the more strongly arcuate mandibles, which is the only character usually stressed in separating the two forms, *S. lewisi* has only very sparse pilosity on the dorsum of the alitrunk, consisting of 4-8 fine *erect* hairs and a very few tiny, inconspicuous reclinate or subreclinate hairs. In addition, the propodeal lamellae are differently shaped, and that of *lewisi* bears very little or no spongiform tissue.

The type of *lewisi* came from Japan, and the species is apparently common in the warm temperate parts of Japan, China and adjacent islands, including the Ryukyus. It has been reported also from Hawaii and Upper Burma, and Dr. M. R. Smith has sent me specimens taken at U. S. Plant Quarantine Stations in ginger root; it is also known to have reached other points on the shores of Pacific in shipments of timber and in the earth about living plants. Mr. F. G. Werner has turned over to me specimens taken by Dr. C. T. Parsons at Kanna, Okinawa, and I have taken several nests numbering 200 to 250 workers each on the densely populated irrigated plains around Chengtu, Szechuan Province. One of these nests (Chengtu) was intermingled in a colony of a small yellow *Tetramorium* under a small board; the other (Hsuangliu) accompanying a different species was with a common blackish *Aphaenogaster* nesting in the soil of a farm compound among extensive rice paddies. Up to six queens were found in colonies of *lewisi* examined.

This species is an inhabitant of warm temperate and subtropical regions, while it is doubtful that *godeffroyi* can exist in any but the hottest of regions. It is not known whether the ranges of the two forms meet or overlap in southeastern

Asia; no evidence in the form of intergrades exists in collections to prove that the two forms act as geographical races of the same species.

Strumigenys (Strumigenys) godeffroyi Mayr

S. godeffroyi Mayr, 1866, Sitz. Akad. wiss. Wien, **53**: 516, worker.

S. godeffroyi var. *indica* Forel, 1902, Rev. Suisse Zool., **10**: 243, ♀.

S. godeffroyi var. *butteli* Forel, 1913, Zool. Jahrb. Syst., **36**: 83, worker ♀.

This very common and widespread species of the Pacific and Indomalayan areas has just about the same measurements and proportions found in small or medium-sized specimens of *lewisi*, according to scattered measurements I have made among my series. The female averages slightly smaller than the female of *lewisi*, but this difference could easily disappear when more specimens are measured. A female cotype of *butteli* and three workers of *indica*, also cotypes, were examined through the courtesy of Dr. Charles Ferriere of the Geneva Museum. In measurements and proportions the two varieties agree perfectly with *godeffroyi* series from Guam, New Hebrides, Philippine Islands, Sumatra, Solomon Islands and Borneo. No other characters could be found to separate these cotypes from the other series after an intensive, point-by-point comparison, so I conclude that the two varieties must have been described on a geographical basis rather than a morphological one. Although *indica* has been repeatedly cited as a form from "Western India", the label on the *indica* types states, in Forel's own hand, "Ceylan—Escherich". Since *butteli* is also from Ceylon, and in the absence of differentiating characters in the cotypes, I must consider Forel's two varieties as synonyms of *godeffroyi* proper.

This species has more nearly straight mandibles than *lewisi*, and the pilosity of the alitrunk consists of abundant long fine subclinate hairs which form a woolly covering, and several pairs of long weak flagellate hairs. The propodeal lamellae have the upper parts more acute and toothlike, the edges below are weakly excised. (Upper angle blunt, not toothlike; border below straight or slightly convex in *lewisi*.) Also, *godeffroyi* has rather well-developed small patches of spongiform tissue partly covering the lamellae.

This species ranges very widely, being found on many insignificant islands and coral atolls in the Pacific. It will probably be found on any really tropical shore in the central and western part of the Pacific. Since specimens have been taken in the U. S. Plant Quarantine and in other circumstances which leave no doubt that *godeffroyi* can and does spread through commerce as a tramp, the extent to which the species had colonized the present range through natural means, such as by floating logs and debris, may never be known. The presence of closely related species on New Zealand, Australia, and elsewhere in the Pacific indicates that the group in general is one which has been able to travel over long stretches of open sea and establish successful populations without help from man. I have included it here because it very probably occurs on Taiwan and Hainan and along the extreme southern coast of China. The type locality is Samoa.

Strumigenys (Strumigenys) solifontis new species

Holotype worker—Differs from the closely related *lewisi* as follows:

- (1) TL 3.15 mm. (*Paratypes*, 2.93–3.33 mm.)
- (2) Head both relatively (CI 69) and absolutely (HL 0.74 mm.) longer than in *lewisi*, also slightly less convex above and generally more dorsoventrally depressed (ICD 44). Eyes less convex. The *paratypes* are as follows for the same measurements and proportions: HL 0.71–0.80 mm., CI 66–69, ICD 41–43.
- (3) Mandibles both absolutely and relatively (ML 0.39 mm.; MI 53) longer than in *lewisi*, and relatively slightly more robust. The preapical tooth is long and acute, set its length or slightly more away from the dorsal apical tooth (slightly less in *lewisi*). Apical fork much like that of *lewisi* (dorsal tooth long and acute, ventral shorter and more blunt at apex; between, on the dorsal margin of ventral tooth near its base, two short denticles). *Paratypes*: ML 0.37–0.41 mm., MI 51–52.
- (4) Thorax very slender, with dorsal profile from lateral view broadly and rather strongly concave from the summit of the convexly raised promesonotum to the propodeal teeth, much more strongly concave than in *lewisi*.
- (5) Pilosity similar to that of *lewisi*, but the dorsal hairs a little longer and slightly stiffer. The long erect hairs on the alitrunk slightly more numerous, numbering 5–6 pairs, varying in length, the long pair gracing the humeri stiff and not attenuated as are the corresponding hairs of *lewisi*.
- (6) Postpetiole relatively slightly broader than in *lewisi*, about half again as broad as long.
- (7) Spongiform appendages less voluminous on both nodes; the lateral lobes on the petiolar node reaching only halfway or a little more up the sides of the node (reaching to or nearly to the anterior nodal face in *lewisi*).
- (8) A broad area just behind the costulae on the first gastric tergite feebly and superficially reticulate and subopaque, remainder of the segment shining (in *lewisi* gastric tergite I, is smooth and shining except for the basal costulae).
- (9) Descending border of propodeal lamellae slightly excised below upper acute toothlike portion, convex ventrally (upper corner bluntly rectangular in *lewisi*, not toothlike; descending border straight or nearly straight above, weakly rounded below).
- (10) Antennae much longer and more slender throughout; Scape L 0.50 mm., funiculus L 0.64 mm.
- (11) Color medium ferruginous, perhaps slightly darker than is usual in *lewisi*.

Gynotype female—TL 3.56 mm., HL 0.78 mm., WL 0.94 mm., CI 71, MI 52, ICD 45.

The *holotype worker*, *gynotype female* and the smaller *paratype worker* were taken, according to Dr. Yasumatsu, in a cave near Saruta, Shikoku (J. Ishikawa). An additional worker (the larger of the two paratypes) was taken in U. S. Plant Quarantine at Seattle, Washington in cargo originating from an unknown locality in Japan. This latter specimen reached me through the courtesy of Dr. M. R. Smith, and it will be returned to the collection of the U. S. National Museum. The *holotype* and *gynotype* will be returned to Dr. Yasumatsu at the University of Kyushu,

and the remaining paratype will be deposited in the collection of the Museum of Comparative Zoology, Cambridge, Massachusetts, U. S. A.

The name *solifontis* refers to the characters 日 and 本 of Sino-Japanese writing; it is used here as a divergence from the monotony of the more commonly used terms for species first found in Japan.

Strumigenys (Strumigenys) formosensis Forel (Figure 2)

S. feae variety *formosensis* Forel, 1912, Ent. Mitt., Berlin, 1: 52, worker.

Although I have seen no specimens of Emery's Burmese species *feae*, I am arbitrarily raising the Taiwan form to species rank. Forel mentions that *formosensis* has small, acute propodeal teeth, and the posterior dorsum of the alitrunk is described as strongly concave, whereas Emery mentions no such concavity in the *feae* description. Whether or not these differences are valid, we cannot in these days of the geographical race accept the varietal rank as such, and since we have no proof at all that the Taiwanese form acts as a geographical race, the best treatment seems to be as a provisional species until someone works out the ranges of the two forms more thoroughly on the basis of a more extensive collection.

I have worked out the description of the worker caste given below on the basis of: one cotype worker sent from the Geneva Museum by Dr. Charles Ferriere, one topotypic worker (type locality is Pilam, Taiwan) collected and determined by T. Shiraki and kindly sent by Mr. Cheng Fung Ying of National Taiwan University, and four workers labelled "Taihoku, S. Issiki" resting in the collection of the Museum of Comparative Zoology. All of these specimens are more or less damaged, but by using the entire series, a quite satisfactory diagnosis is possible.

Worker—TL 3.00–3.30 mm. (Forel's measurements were stated as "2.6–2.7 mm."), HL 0.80–0.87 mm., WL 0.76–0.82 mm., CI 64–67, MI 45–48, ICD 39–42. Head long and somewhat depressed, weakly convex dorsally above, posterior excision deep, occipital lobes moderately laterally expanded, their lower lateral borders visible from above and evenly convex, upper lateral borders (including carinae) more nearly straight, anteriorly convergent. Dorsum of head with a weak median longitudinal sulcus running from the clypeus to the occiput. Eyes small (5–10 pigmented facets total), in themselves only moderately convex, but situated on a small prominence of the ventral border of each scrobe (at the midlength of the head) which is partly formed by an immediate preocular hollowing of the ventrolateral portions of the head in such a way that the main axis of vision of each eye is directed not only laterally but somewhat anteriorly. Clypeus strongly and broadly sulcate in the middle anteriorly, anterior border deeply notched in the middle.

Antennal scape L: (of largest specimen) 0.55 mm.; scape nearly straight and incrassate gently at about the basal fifth of its length. Funiculus (of largest specimen) L 0.72 mm., segment V about $\frac{1}{2}$ again as long as I–IV taken together.

Mandibles straight, depressed and broad, with inner and outer borders nearly or quite parallel, the two shafts lying very close together and parallel at full closure. Shaft barely broader just at the single preapical tooth than elsewhere, the preapical

tooth itself low and blunt and directed more toward the apex than inwards, being practically a direct extension of the lamellate or sublamellate inner mandibular border. Just apical to this tooth, the apex is suddenly narrowed into the base of

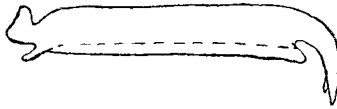


Fig. 2. *Strumigenys* (*s. str.*) *formosensis* Forel, worker mandible, dorsal view.

the apical fork, the dorsal tooth of which is separated from the apex of the preapical tooth by only about the length of the latter. Two principal teeth of fork long, stout and spiniform, only slightly divergent, the ventral tooth only about two thirds the length of the dorsal; a very small acute tooth between them, springing from the dorsal side of the base of the ventral tooth. Inner mandibular border continued basally under the clypeus as a digitiform basal tooth or process directed slightly obliquely inward and feebly curved.

Alitrunk like that of *solifontis*, but more slender even than that of the latter; with a very broad, even concavity of the posterior dorsum of the alitrunk seen in lateral profile. Sutures obliterated or very nearly so. Pronotum anteriorly rather narrowly rounded, this edge marginate, but not marginate along the sides and without humeral angles or distinct tubercles on the humeri. Pronotum itself only gently convex in lateral profile, but together with the fused mesonotum forming a prominent convex hump. Propodeal declivity steep, on each side with a low, even lamella which is extended above as a short, acute tooth which is about half as long as the distance from the center of its base to that of its twin, the two teeth diverging somewhat behind and directed slightly dorsad.

Petiole with a long, slender peduncle, but the node as long or even slightly longer (node nearly twice as long as broad seen from above), with a rather steep anterior face. Median ventral spongiform lobe unusually large, especially under the peduncle; the band extending transversely around the posterior border of the node on the upper half not covering more than half of the dorsal and lateral nodal surfaces and not nearly so extensive as the corresponding structure in the *godeffroyi* group. Disc of postpetiole small, wider than the petiolar node, but not by much, about $\frac{4}{5}$ as long as broad, with convex sides, surface convex, surrounded by well-developed spongiform masses.

Gaster rather narrow ($\frac{3}{4}$ or so as wide as head), gently depressed above, with numerous distinct basal costulae extending $\frac{3}{4}$ or more the length of tergite I. Remainder of gaster in general smooth and shining.

Sculpture of the normal *Strumigenys* pattern, but the pronotum has the sculpture partly effaced in some areas and is feebly to moderately shining in certain lights when clean. Sides of alitrunk for the most part smooth and shining.

Dorsum of head and anterior borders of scapes with small inconspicuous spatulate hairs, those on the free clypeal margins rather broad, those farther back on the dorsum of the head becoming narrower, all on the head bent forward, mostly reclinate or subreclinate; those on scapes slender, bent strongly outward. Sides of head above with two or three pairs of long, weak flagellate hairs, and a pair of the same on the occiput, sometimes rubbed off. Alitrunk with three or four pairs of flagellate hairs and a very sparse scattering of much smaller, very inconspicuous reclinate or subreclinate hairs on the dorsum. Nodes and gaster with a sparse growth of long flagellate hairs, mostly arching back to the integumental surface.

Medium to darkish ferrugineous in color.

Male and female unknown to me.

Quadristruma emmae (Emery)

This is the *Epitritus emmae* of authors, including various synonyms. It is treated in a separate paper now in press, where I have shown that it is a tramp species commonly found in tropical and subtropical littoral areas, especially in the vicinity of commercial centers. Since this species has been taken in the U. S., in the Philippines and in Hawaii, as well as other Pacific islands, it is very probably securely introduced at a number of points in the warmer parts of eastern Asia.

Key to the genera and species of dacetine ants known to occur or probably occurring in Japan, China and Taiwan, based on the worker caste

1. Antennal funiculi with only three segments; mandibles arcuate, with apical spiniform teeth (Probably occurring in warm coastal areas) *Quadristruma emmae* (Emery)
- Antennal funiculi with 4 or 5 segments; if with 5, segments II and III small and often indistinct 2.
2. Funiculus 4-segmented, the three basal segments small, subequal in length: mandibles short, serially dentate (*teste* Forel) (Taiwan) ... *Pentastruma sauteri* Forel
- Funiculus 5-segmented, segments II and III small; mandibles short or long, dentition diverse 3.
3. Mandibles long, linear, with a few spiniform teeth at the apex, two of the longest forming an apical fork..... *Strumigenys* F. Smith (*s. str.*) 4.
- Mandibles short, narrowly subtriangular or triangular, serially dentate or denticulate, without an apical fork of spiniform teeth 7.
4. Mandibles straight, single preapical tooth short and blunt, not spiniform; propodeal teeth free at tips. (Taiwan)..... *Strumigenys formosensis* Forel
- Mandibles more or less weakly arcuate; preapical tooth acutely spiniform; propodeal teeth entirely or nearly entirely submerged in the well-developed propodeal lamellae..... *S. godeffroyi* group 5.
5. Mandibles slightly more than $\frac{1}{2}$ the length of head proper; head longer, more depressed and more slender (HL 0.70-0.80 mm., CI 66-70, ICD 41-44)... (Japan) *Strumigenys solifontis* n. sp.

- Mandibles slightly less than $\frac{1}{2}$ the length of head proper; head shorter, wider and thicker (HL 0.60-0.67 mm., CI 69-74, ICD 45-48) 6.
6. Alitrunk with a very few long, erect hairs and extremely sparse, short subreclinate under-pilosity; propodeal lamellae without or with scarcely noticeable development of spongiform tissue on the propodeal lamellae(Warm temperate China, Japan, Ryukyus, etc.)*Strumigenys lewisi* Cameron
- Alitrunk with very abundant long subreclinate or arching fine hairs, giving the dorsum a wooly appearance, also a few long flagellate hairs; propodeal lamellae with small but distinct development of spongiform tissue on lateral surfaces.....(Low, hot coastal and island tropical areas of southeastern Asia and the Pacific: India to the Marquesas; often introduced by commerce to new areas)*Strumigenys godeffroyi* Mayr
7. Propodeal lamellae reduced to fine, indistinct carinae without teeth or angles above; alitrunk not laterally marginate, in profile the dorsum forming two convex humps separated by a well-notched postmesonotal suture(Japan: Shikoku)*Kyidris mulica* new gen. et sp.
- Propodeal lamellae well-developed, usually toothlike or angulate above, pronotum laterally marginate or otherwise different 8.
8. Head short and broad (worker CI 80 plus); mandibles thick, short, triangular, with transverse basal borders visible at full closure; pronotum laterally marginate, with pronounced humeral angles, head proper nearly devoid of prominent hairs, only two short erect clavate ones on the vertex. (Warm temperate China, probably in S. Japan)*Trichoscapa membranifera* Emery
- Head more elongate (worker CI 70 or less); mandibles narrowly subtriangular, their basal borders oblique and hidden beneath clypeus at full closure; head proper with abundant and usually prominent pilosity; pronotum marginate laterally or not 9.
9. Clypeus entirely rather strongly shining, without a surrounding fringe of prominent hairs on the free margin; head above distinctly but loosely longitudinally rugose and with very long, weak erect hairs which are not or very weakly apically enlarged(Taiwan)*Weberistruma leptothrix* (Wheeler)
- Clypeus, occasionally excepting the small, more or less centrally-placed tumulus, granulose-punctulate and opaque, the free clypeal border bearing a fringe of prominent, usually spatulate hairs; dorsum of head above never clearly rugulose or rugose in a longitudinal direction, but sometimes weakly subtuberculate; dorsal cephalic hairs not exceptionally long, many or all enlarged and at least some not erect*Smithistruma* Brown (*s. str*)10.
10. Total length $2\frac{1}{2}$ mm. (according to Ito); see text discussion of this form..... (Japan: Honshu)*Smithistruma japonica* (Ito)
- Total length (of worker) under 2.40 mm. 11.
11. Anterior clypeal border shallowly but distinctly emarginate in the center; humeral tubercles each bearing a long, weak crooked flagellate hair..... (Kyushu, probably also eastern China). *Smithistruma incerta* n. sp.
- Anterior clypeal border transverse and straight, not at all emarginate; humeral

tubercles each bearing a stiff, apically broadened hair.(Japan: Shikoku)
 *Smithistruma rostrataeformis* n. sp.

References

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 Smith, M. R., 1931, Ann. Ent. Soc. Amer., 24: Pl. 2, fig. 8, Pl. 4, fig. 16.
 Wesson, L. G., Jr., 1936, Ent. News, 47: 171-174.
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 Brown, 1948, Trans. Amer. Ent. Soc., 74: 101-129, 2 figs.

Additional Notes

After sending off the body of the manuscript of Part I to be published, I received from Dr. Yasumatsu several specimens of interest and some further biological information on species already treated. This, plus some information pertinent to the subject which I have belatedly gleaned from other sources, is here presented as an appendix.

Kyidris nuda new species

Holotype female—TL 2.21 mm., HL 0.57 mm., ML 0.11 mm., WL 0.61 mm., CI 77, MI 19. Quite similar to the worker of *K. mutica*, but differing in the following respects:

(1) Petiolar node obliquely depressed from in front and above, appearing tilted posteriorly, with the narrowly rounded-subtruncate apex jutting somewhat behind, its anterior slope very gradual forming an angle of about 30° with the dorsum of its peduncle. Petiolar spongiform appendages entirely lacking, those of the post-petiole reduced to practically invisible vestiges under the sides of the node. Sculpture of both nodes, especially that of the postpetiole, dorsally largely effaced, the surfaces more or less strongly shining.

(2) Basal striae or costulae of gastric tergite I largely effaced, replaced for the most part by some very weak and indefinite superficial roughening or reticulation; the greater part of the tergite smooth and shining.

(3) Pilosity consisting in this specimen entirely of extremely fine, short, pointed appressed hairs, much like a sparse pubescence in other groups of ants, distributed rather widely over the body surfaces, with a small erect, bristlelike hair on each side of the gastric apex. There may originally have been a complement of erect hairs on the specimen, but if so, no trace of these can now be seen. The very small appressed hairs can best be seen on the smooth areas of the gaster, where they correspond to similar but much larger and heavier ground hairs in *K. mutica*.

(4) The mandibles very much the same as in *mutica*, but perhaps a wee bit shorter and less convex laterally at their bases; the diastema also appears slightly more prominent. These mandibular differences are very slight, and may represent only the differences normal in the genus between female castes.

The obvious sexual characters include large but only moderately convex oval

eyes and a very high, strongly humped alitrunk. The mesonotum is flattened above, lending a somewhat dorsally truncate appearance to the profile of the alitrunk viewed from the side, but this flattened area passes anteriorly and posteriorly into the adjacent sclerites through easy curves, so that the profile line is rather even. The sutures are present as well-marked but no deeply cut transverse grooves which do little to interfere with the evenness of the profile. The mesonotal surface is densely punctulate-granulose, without longitudinal striae or rugulae. Wings clear, the venation reduced to a few very indistinct traces of the radial sector and the first free abscissa of M.

Color yellowish ferrugineous.

Described from a single female lacking the wings on one side, taken on Mount Niitaka, Taiwan (Shoichi Miyamoto), to be returned to the collection of Dr. Yasumatsu. Niitaka, according to Dr. Yasumatsu, is more than 3000 meters in altitude, but I possess no information as to the altitude of Mr. Miyamoto's collection of this or the following specimen. The discovery of this species extends the range of *Kyidris* well into the Indomalayan region, but we cannot assume that it is represented by true tropical forms until the collecting locality of *nuda* is more precisely known with regard to altitude in the mountains.

Strumigenys (Strumigenys) formosensis Forel

Gynotype female—TL 3.58 mm., HL 0.92 mm., ML 0.42 mm., WL 0.94 mm., CI 65, MI 46. Agrees quite well with the worker of the species, described in the body of the paper, but differing in the usual sexual characters and in possessing broader petiolar and postpetiolar nodes (the former broader than long). Eyes large, but only moderately convex, mesonotum with fine indistinct longitudinal costulae or rugulae superimposed upon the densely punctulate ground sculpture. Postpetiolar node shining. Propodeal teeth much as in the worker, but less strongly dorsally directed, infradental lamella narrow, concave, of even width its length.

Described from a single specimen taken July 17, 1941 on Mount Niitaka (S. Miyamoto); to be returned to the collection of Dr. Yasumatsu.

Collection Notes on Previously Described Forms

(Kindly furnished by Dr. Keizō Yasumatsu)

Kyidris mulica new species

Hirooka, Kamino-mura, Agawa-gun, Tosa Province, Shikoku, 5. xi. 1948, 30 M. in altitude, nest under a stone in the clay soil of a somewhat arid place.

Strumigenys solifontis new species

"..... found in a stalactite grotto in Shikoku where sunlight does not reach all the year round." I strongly suspect that this species, because of the usual restriction of cave insect faunas, is a feeder upon Collembola.

Smithistruma rostrataeformis new species

Umaji-mura, Aki-gun, Tosa Province, Shikoku, 16. x. 1938, 600 M. in altitude, in a decayed stump of an unknown tree.

Weberistruma jacobsoni (Menozzi)

In Tijdschr. v. Ent., 84: Verslag ii-iii (1941), Stärcke has published some observations made by Jacobson on a "*Strumigenys*" taken in Sumatra in a cavity in a polypore fungus. From the remarks quoted from Jacobson's letter, it is obvious that the colony referred to is the same one from which Menozzi later described *S. (Cephaloxys) jacobsoni*. Jacobson mentions the "sterke beharing" of the larvae, which I have not seen.

Dr. Yasumatsu has also sent a female of a species of *Rhopalothrix* from Botel-Tobago Island off the southern tip of Formosa (Taiwan). I have not tried to identify this form, since it is now my firm conviction that *Rhopalothrix* and related genera are not properly placed in the *Dacotini*. I plan to demonstrate this at greater length in a section of the revision to be published soon. The specimen may belong to one of the species of *Rhopalothrix* described from the Philippines, but at any rate, it forms a considerable northward extension of the range of the genus in the Old World. The specimen was collected by Dr. Tadao Kano; it will be returned to Dr. Yasumatsu.