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IN JAPAN AND KOREA

1928c



SPOLETO
ARTI GRAFICHE PANETTO & PETRELLI

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ANTS COLLECTED BY PROFESSOR F. SILVESTRI IN JAPAN AND KOREA. ⁽¹⁾

BY

WILLIAM MORTON WHEELER

No revision of the ants of Japan has been made since the one I published in 1906 (Bull. Amer. Mus. Nat. Hist. 22, pp. 301-328). In that paper I recorded 51 forms, of which one has since been recognized as an invalid variety. In the meantime 17 forms have been added by Forel, Emery, Ito, Yano and Teranishi. The significance of the material collected by Professor Silvestri in many localities may be estimated from the fact that I have been able to recognize in it no less than 19 forms not hitherto known from Japan. Among these 13 are new (six species, four subspecies and three varieties). Professor Silvestri has also brought to light the males and females of several forms known hitherto only from worker specimens. The species which he collected in Korea are also important, because only a few ants had been previously recorded from that country. As an aid to the future student, it seemed advisable to append to the present paper a list of the known Japanese ants, with a revision of the nomenclature and indication of the known castes.

As our knowledge increases, it becomes more and more evident that the Japanese ant-fauna contains fewer indigenous elements than we had supposed. Many species formerly regarded as peculiar to the islands, have recently turned up in China, and several originally known only from the latter country are now being found in Japan, as will appear from the following pages. In all

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probability, careful collecting in Korea and Mongolia will still further reduce the number of peculiarly Japanese forms. Not improbably, also, the increasing traffic and transportation between all parts of the Orient may be greatly extending the distribution of many of the more adaptable ants between the islands and mainland.

Family Formicidae.

Subfamily Ponerinae.

1. *Stigmatomma silvestrii* sp. nov.

Worker. Length about 3.2 mm.

Head nearly one-fourth longer than broad, very distinctly broader in front than behind, with acutely dentate anterior corners, rather straight sides and scarcely concave posterior border. Eyes small, situated about three-fifths the length of the head from the anterior to the posterior corners. Mandibles three-fifths as long as the head, widest in the middle, where their external borders are nearly straight, curved at their tips; inner borders with six or seven rather acute, bicuspid and recurved teeth, which are longest in the middle and gradually diminish in size both apically and basally; the terminal tooth long and pointed. Clypeus short, flattened, continued back between the frontal carinae, its feebly rounded anterior border with six rather large denticles. Antennal scapes reaching back nearly to the eyes; funiculi distinctly thickened towards the tip; the first joint slightly longer than broad; all the remaining joints, except the last, distinctly broader than long. Thorax rather short, bluntly submarginate on the sides above and contracted in the middle at the mesonotum; in profile very feebly and evenly arched above and somewhat flattened; mesoepinotal suture distinct; pronotum slightly longer than broad; base of epinotum subtrapezoidal, one and one-third times as long as broad, longer than the declivity, which is distinctly sloping and forms an obtuse angle with the base; the sides of the declivity submarginate, the median surface concave. Abdomen slender; petiolar node from above as long as broad, semicircularly rounded in front, with straight, subparallel sides, its anterior slope distinctly concave, its dorsal surface straight in profile and forming a sharp angle with the anterior slope; the ventral surface of the short peduncle with a small, acute, downwardly directed tooth. Postpetiole somewhat broader than the petiole, about one and one-half times as broad as long, feebly convex laterally and dorsally, as long as the first gastric segment. Femora and tibiae slightly compressed.

Somewhat shining; mandibles rather densely striatopunctate; head, thorax and abdomen punctate, the head more densely and coarsely, so that it is subopaque; base of epinotum with a smooth, median, longitudinal streak, Appendages very finely and superficially punctate.

Hairs and pubescence golden yellow; the former short; longer on the gaster than elsewhere; very short, uneven and rather abundant on the head, petiole and postpetiole and merging into the pubescence, which is rather dense and appressed on the gaster where it largely conceals the surface; very fine but conspicuous on the head, indistinct on the thorax.

Reddish ferruginous; posterior border of head and disk of pronotum somewhat infuscated, as are the mandibular teeth; antennæ and legs brownish yellow.

Described from two specimens taken at Nara (Hondo). This species is closely related to *S. bruni* Forel of Formosa, but is smaller (*bruni* measures 4.5 mm.), the head and body are more slender and the proportions of the petiole and postpetiole are different.

2. *Sysphincta watasei* Wheeler — A single dealated female from Otsu (Kiushiu).

3. *Ectomomyrmex japonicus* Emery — Two workers from Okitsu (Hondo) and one from Keyio, Korea.

4. *Euponera* (*Brachyponera*) *solitaria* F. Smith — Numerous workers from Kirishima (Kiushiu) and Kumamotu (Kiushiu), Kagoshima (Kiushiu), Tokio (Hondo), Unzen (Kiushiu), Michino-o (Nagasaki), and Kyoto (Hondo).

5. *Euponera* (*Trachymesopus*) *sauteri* Wheeler — Two workers from Kirishima (Kiushiu), two from Unzen (Kiushiu) and three from Nara (Hondo).

6. *Euponera* (*Trachymesopus*) *sharpi* Forel. subsp. *pilosior* subsp. nov.

Worker. Length 4-5 mm.

Smaller than the typical form and with the antennal scapes distinctly surpassing the occipital border of the head. Pilosity distinctly more abundant on the body and appendages, the suberect hairs on the scapes and tibiæ numerous. The color is also different, the clypeus, frontal carinæ, neck, sutures and sides of the thorax, the epinotal declivity, posterior surface of the petiole, the postpetiole and the sutures of the gastric segments being red, as well as the legs and antennæ.

Six specimens from Moghi (Nagasaki).

The specimens of *sharpi* taken by Dr. Silvestri at Macao and Foochow, China have the coloration of this Japanese form but in the length of the scapes and pilosity are like the types. They do not exceed 5 mm. in length and might be regarded as a distinct variety connecting *pilosior* with the dark typical form of the species from Singapore.

7. *Ponera excœcata* Wheeler — Two workers from Otsu (Kiushiu) agree closely with the type specimen taken by Dr. Silvestri at Taipó, China.

8. *Ponera japonica* Wheeler — A single worker from Nikko (Hondo).

9. *Ponera scabra* sp. nov.

Worker. Length 3.2-3.6 mm.

Head suboblong, about one-sixth longer than broad, as broad in front as behind, with very feebly convex sides and nearly straight posterior border. Eyes minute, but distinct, at the anterior fifth of the head. Mandibles with slightly sinuous external borders, with an acute apical tooth and several very indistinct basal denticles. Clypeus short, convex but not carinate in the middle, the anterior border bluntly rounded and slightly projecting in the middle. Frontal carinæ small, closely approximated; frontal groove distinct, continued back to the middle of the head. Antennal scapes reaching to the posterior border of the head; funiculi distinctly thickened towards the tip; joints 2-7 very short and transverse, fully twice as broad as long; joints 8-10 about one and one-third times as broad as long and forming a club with the terminal joint. Thorax with distinct promesonotal and indistinct mesoëpinotal sutures, in profile with nearly straight, horizontal dorsum, not impressed at the sutures. Pronotum, without the neck, somewhat broader than long; mesonotum twice as broad as long; epinotum narrower, less than one and one-half times as long as broad, as broad in front as behind; the base in profile somewhat longer than the declivity and forming a blunt obtuse angle with it; the latter moderately steep, submarginate on the sides. Petiolar node broader than the epinotum, subsemicircular from above; in profile thick and as high as the epinotum, with perpendicularly truncated anterior and posterior and nearly straight superior surfaces; the ventral surface of the peduncle with a small, acute, backwardly directed tooth. Postpetiole broader than long, not strongly constricted behind.

Mandibles smooth and shining, with small, sparse punctures; head and thorax subopaque, densely and rather coarsely punctate, the dorsum of the latter somewhat more finely and sparsely; the epi-

notal declivity shining and superficially punctate as are also the anterior and posterior surfaces of the petiolar node. Its dorsal and lateral surfaces and the postpetiole scabrous, or coarsely punctate in such a manner as to appear scaly. The sculpture of the first gastric segment is similar but more superficial and the surface therefore more shining; remaining gastric segments smooth and shining, with sparse piligerous punctures. Antennal scapes and legs opaque, very densely and finely punctate.

Hairs and pubescence pale yellow, short, erect or suberect and moderately abundant on the body; more abundant, fine and appressed on the scapes and legs; pubescence rather dense on the head and gaster, very short on the former, long and appressed on the latter.

Black; legs and tip of gaster brownish yellow; mandibles, clypeus, frontal carinae, antennae, neck, promesonotal suture, ventral portion of thorax and petiole and posterior borders of the postpetiole and gastric segments red.

Female (deälated). Length 4 mm.

Very similar to the worker. Head with even less convex sides and the petiole not so thick and with more concave posterior surface.

Described from ten workers and two females from Mt. Maya (type-locality) and a single worker from Kamakura (Hondo).

This is an unusually striking species, especially in sculpture. I am unable to assign it to any of the Oriental species of *Ponera* of which I have seen specimens or descriptions.

Subfamily Myrmicinae.

10. *Myrmica ruginodis* Nyl. var. *kotokui* Forel - To this form, which was described by Forel as a subspecies of *M. rubra* L. I refer a single worker taken by F. Muir at Nikko (Hondo) (2000-3000 ft.). It agrees with Forel's description in size, coloration and the sculpture of the head and thorax, but the head is rather broad. He does not describe the petiole and postpetiole. In my specimen these are finely punctate and on the sides coarsely rugose, but the upper surface is smoother and on the postpetiole with a few short sulci. Forel recognized the affinities of this form to the common palearctic *ruginodis*.

11. *Myrmica ruginodis* var. *silvestrii* var. nov.

Worker. Length 4.5-5.5 mm.

Of the same size as *ruginodis* but differing in the following characters: Head larger and broader; antennal scapes a little more slender at the base, epinotal spines straight and distinctly shorter, petiolar pe-

duncle shorter and the node more sharply truncated above. Sculpture coarser, the rugæ on the pronotum being thicker, more rounded and very irregular and vermiculate, the declivity of the epinotum smooth and shining. Petiole and postpetiole much more strongly longitudinally rugose, the latter subopaque. Color much darker; deep piceous brown; posterior portion of head, petiole, postpetiole and most of gaster nearly black; epinotal spines and legs brownish yellow; mandibles, antennæ, ventral portion of petiole and tip of gaster somewhat darker and more reddish.

Fifteen workers from Chuzenji Lake, near Nikko (Hondo) (type-locality) and one somewhat smaller specimen from Nikko.

This variety is quite distinct from *kotokui* in its larger size, darker color, relatively shorter epinotal spines and more coarsely sculptured petiole and postpetiole.

12. *Aphaenogaster (Attomyrma) smythiesi* Forel subsp. *japonica* Forel. - Two workers and a female from Unzen (Kiushiu), two workers from Arashiyama (Hondo) and two from Kejio, Korea.

This form was described by Forel as a subspecies of his *A. schmitzi* from Jerusalem, and more recently Emery has cited it as a subspecies of his *syriaca*. To me it seems more appropriate to attach it to *A. smythiesi*, on account of the peculiar angular prominence of the anterior portion of the mesonotum in the worker. I have compared it with cotypes of *smythiesi* taken at 8000 feet in the Himalayas, received from Forel, and find that the mesonotum is only somewhat less projecting and less sharply angular in profile, the rugosity of the head less pronounced and the epinotal spines somewhat smaller and less erect. It is very similar to my subsp. *sinensis*, described from specimens taken by Dr. Silvestri at Peking, but is somewhat larger, with decidedly longer antennal scapes, much smoother and more shining pronotum and more yellowish legs. It differs from the subsp. *kurdica* Ruzsky in the sculpture of the head and thorax. In the var. *prudens* Forel from the Himalayas the epinotal spines are very short and almost dentiform and the head is longer and narrower than in the other forms of the species.

Karawaiew has described an *A. schmidtii* from Korea and is of the opinion that it is most closely related to *A. gibbosa* Latr. It should therefore have the mesonotum rounded and not angularly projecting (See Emery, Deutsch. Ent. Zeitschr. 1908 p. 333 fig. 21), but he describes the « scutellum » as « vorn mit einem stark

hervorspringenden eckigen Wulste ». Since there is no scutellum in the worker, he must be referring to the prominent mesonotum and therefore probably had before him a form closely related to *japonica*. But he describes the color of his specimen as « dunkel gelblich-rotbraun, » which is different from that of any of the described forms of *smythiesi*. I nevertheless believe that his *schmidtii* should be regarded as a subspecies or variety of the Himalayan species.

The dealated female (undescribed) of *japonica* measures nearly 7 mm. Thorax broad and stout, mesonotum very convex, nearly as broad as long; scutellum thick and projecting; epinotum long and sloping, the base longer than the declivity, the spines long and stout. Petiolar node in profile more acutely pointed than in the worker and seen from behind somewhat rounded and narrowed above. Postpetiolar node broader than long, slightly compressed antero-posteriorly.

Rugosity of head coarser than in the worker. Pronotum opaque, sharply transversely rugose. Mesonotum shining, finely and concentrically rugulose; pleuræ longitudinally, base of epinotum transversely rugose; declivity of latter smooth and shining; posterior surfaces of petiolar and postpetiolar nodes subopaque and transversely rugulose. Gaster shining, longitudinally rugulose at the articulation of the postpetiole.

Pilosity on the body yellow, sparse, erect as in the worker; also the shorter appressed pilosity on the scapes and legs is very similar.

Color of thorax and pedicel darker than in the worker, deep blackish brown, like the head and gaster; scapes dark brown.

13. *Aphaenogaster (Attomyrma) famelica* F. Smith — Several workers from Nagasaki (Kiushiu), Kumamotu (Kiushiu), Otsu (Kiushiu), Michino-o (Nagasaki), Nara (Hondo) and Mt. Mayo; a dealated female from Otsu, three males and six winged females from Nara.

Female (undescribed). Length 7.5-8 mm.

Head of the same general shape as in the worker but proportionally somewhat broader. Thorax robust; mesonotum very convex, especially in front; scutellum very thick and protuberant. Epinotum small, its base sloping and much longer than the perpendicular declivity; the spines stout, rather acute, twice as long as broad at their bases, parallel and directed backward. Petiolar node similar to that of the worker but more compressed anteroposteriorly and with the superior border more nearly straight and transverse. Postpetiolar node similar but broader,

transversely elliptical. Gaster and legs of the usual shape. Wings very long (9.5 mm.).

Head more coarsely reticulate-rugose than in the worker, but the occiput smooth and shining. Pronotum and epinotum transversely rugose, the former more reticulately, the latter more sharply and evenly. Mesonotum very smooth and shining, the posterior half finely rugulose on the sides, the rugules converging posteriorly to the median line. Mesosterna in great part smooth. Scutellum somewhat concentrically rugose. Petiolar and postpetiolar nodes subopaque, their surfaces uneven, obscurely punctate-rugulose. Gaster smooth and shining, with scattered piligerous punctures, the extreme base of the first segment longitudinally striate.

Pilosity and color similar to those of the worker, but the erect hairs on the head and thorax are more numerous. Wings whitish hyaline, with dark brown stigma and pale, brownish yellow veins.

Male (undescribed). Length 5 mm.

Head small, with flattened dorsal and gular surfaces, as broad as long, including the large and prominent eyes; cheeks short, subparallel; anterior corners rectangular; postocular region semicircular, the occipital collar well-developed, as in the worker and female. Ocelli rather small, not very prominent. Mandibles with well-developed, five- or six-toothed blades. Clypeus convex and tuberculate posteriorly, its anterior border projecting and feebly emarginate in the middle. Frontal groove deeply impressed at the anterior ocellus. Antennæ slender; scapes cylindrical, about four times as long as broad; funicular joints all more than twice as long as broad; the club distinctly 5-jointed. Thorax long, broad through the mesonotum, narrowed posteriorly; the mesonotum very large and convex, over-arching the pronotum; seen from above subhexagonal, as broad as long; epinotum long and narrow; the base nearly straight, very slightly and transversely impressed behind the middle, gradually sloping backward, twice as long as the perpendicular and slightly concave declivity with which it forms nearly a right angle on each side, representing the spines of the worker and female. The sides of the declivity are distinctly marginate. Petiole slender, the peduncle somewhat curved, the node low and rounded; postpetiole longer than broad, with low, rounded and not compressed node. Gaster shaped somewhat as in the worker but longer. Legs very slender, the hind femora almost angularly bent in the middle.

Mandibles subopaque, with a few scattered punctures. Clypeus somewhat shining. Head very finely and densely punctate, subopaque. Thorax, pedicel and gaster smooth and shining, sides and declivity of the epinotum more opaque, with uneven indistinctly rugulose surface.

Pilosity pale; sparser and more oblique than in the worker and female; very short and subappressed on the appendages.

Deep piceous brown; head and mesonotum black; mandibles, mouthparts, antennæ and legs yellow; clypeus reddish brown; tips of tarsal joints slightly infuscated. Wings as in the female, but the stigma and veins paler.

Among the specimens of *famelica* collected by Dr. Silvestri I am able to recognize the two following subspecies:

14. *Aphaenogaster* (*Attomyrma*) *famelica* subsp. *frontosa* subsp. nov.

Worker. Differing from the typical *famelica* in the shape of the head, the much feebler sculpture and more shining head and pronotum. The head is proportionally narrower, distinctly less convex both dorsally and laterally behind the eyes. The epinotal spines are somewhat smaller and more dentiform. The reticulate rugosity of the head is poorly developed and does not extend back beyond the front or envelope the eyes as in the type, and the pronotum, instead of being coriaceous, is smooth and shining throughout though the neck is transversely rugulose. Pilosity and color as in the typical *famelica*.

Seven specimens from Arashiyama (Hondo) (type locality), one from Unzen (Kiushiu) and one from Kamakura (Hondo)

15. *Aphaenogaster* (*Attomyrma*) *famelica* subsp. *ruida* subsp. nov.

Female, (deälated). Differing from the female of the typical *famelica* in having the whole dorsal surface of the head up to the occipital border subopaque and coarsely reticulate-rugose, the epinotal spines much stouter, somewhat longer and rather blunt, and the peduncle of the petiole considerably thicker dorsoventrally owing to the development of a blunt projection on its ventral side. The color is also different, the body, mandibles and antennæ being deep brownish red, the top of the head and the gaster castaneous; the legs dull orange yellow.

A single specimen from Michino-o (Nagasaki).

Three workers from Saitama in my collection probably belong to this subspecies. The sculpture of the head is coarser than in workers of the typical *famelica* and extends further back so that the shining occipital portion is much shorter. The epinotal spines are somewhat longer and stouter, but the peduncle of the petiole is not thickened. Only the middle of the pronotum is smooth and shining. The color is much like that of the above described female; the gaster is castaneous in the middle and brownish red at the base and apex.

16. *Aphænogaster (Attomyrma) verecunda* sp. nov.

Worker. Length 2.6-3 mm.

Very much smaller than *famelica* but with the head of a similar shape; subelliptical and excluding the mandibles about one and one-third times as long as broad, semicircular behind the eyes and with a distinct occipital collar. Eyes rather convex, near the middle of the sides of the head. Mandibles large and rather flat, their external borders slightly sinuous in the middle, their apical borders with three large terminal teeth and several minute, subequal basal denticles. Clypeus flattened anteriorly, the border distinctly and narrowly notched in the middle. Frontal area distinct, impressed. Antennæ slender; scapes reaching about one-fourth their length beyond the posterior border of the head; funiculi with distinct 4-jointed club; joints 2-7 about one and one-half times as long as broad. Thorax slender, shaped much as in *famelica*, but the mesonotum somewhat concave in the middle, with its anterior end slightly projecting though not rising above the promesonotal suture. Epinotum in profile with the base horizontal and slightly convex, less than twice as long as the perpendicular declivity; the spines small, rather slender, directed backward and somewhat upward. Petiole slender, its rather conical node as long as the peduncle and rising rather abruptly from it; postpetiole pyriform, fully one and one-half times as long as broad, somewhat longer than high through the node, which is similar to that of the petiole but more rounded. Gaster small, broadly elliptical. Legs rather stout, femora somewhat thickened in the middle.

Shining; mandibles subopaque, longitudinally striate; clypeus smooth and shining, upper surface of head less so, finely and densely punctate, with traces of fine longitudinal rugules which are most distinct on either side of the front. Thorax punctate-rugulose; upper surface of pronotum smooth and shining; the rugules on the base of the epinotum not very distinctly transverse. Petiole and postpetiole coriaceous or shagreened; gaster smooth and shining, with sparse piligerous punctures. Antennal scapes indistinctly striate; legs sparsely punctate.

Hairs yellow, erect, bristle-like, rather blunt, very sparse on the head and body; finer, oblique or subapressed on the legs; conspicuously abundant on the tips of the scapes.

Piceous brown; head and median portion of gaster darker and more blackish; mandibles and antennæ light brown; legs yellow, with the knees and tips of the separate tarsal joints infuscated.

Described from three specimens taken at Unzen (Kiushiu).

17. *Aphænogaster (Attomyrma) vapida* sp. nov.

Worker. Length 3.2-3.5.

More slender than *famelica*, with longer head; its postocular portion

being even more gradually narrowed to the collared occipital border than in the subspecies *frontosa*, so that the sides are nearly straight and the vertex is more flattened. The head is fully one and two-thirds times as long as broad. Eyes moderately convex, distinctly in front of the middle of the sides. Mandibles with their external borders slightly sinuate in the middle; apical borders with three large terminal teeth and several minute basal denticles. Clypeus flattened, its anterior border rather narrowly notched in the middle. Antennal scapes much longer than in *verecunda*, extending about one-third their length beyond the occipital articulation; funiculi with distinct 4-jointed club; joints 2-7 twice as long as broad. Thorax long and slender; pronotum without the neck longer than broad, scarcely convex; mesonotum long and sloping, slightly concave in the middle, its anterior end not raised. Mesoëpinotal constriction pronounced; epinotum about one and one-third times as long as broad, broadened posteriorly, in profile with convex base fully one and one-half times as long as the subperpendicular declivity; spines small and slender, acute, twice as long as broad at the base, nearly erect. Petiole and postpetiole much as in *verecunda*. Legs very long; femora, especially the hind pair, noticeably thickened in the middle.

Shining; mandibles subopaque, rather coarsely striatopunctate; clypeus smooth; dorsal surface of head finely and densely but superficially punctate, or reticulate, with a few longitudinal rugules along the frontal carinæ and lateral to the antennal foveæ. Pronotum smooth and shining; neck, mesonotum, epinotum and pleuræ densely and rather strongly punctate; epinotal declivity, petiole, postpetiole, gaster and legs smooth and shining; antennal scapes opaque, very finely and indistinctly punctate.

Pilosity yellowish, erect, sparse and rather blunt, distributed much as in *verecunda*. Scapes and legs, especially the tibiæ, clothed with delicate, oblique hairs.

Piceous brown; head dark brown; mandibles, clypeus, antennæ and neck paler brown; legs brownish yellow, the incrassated median portion of the hind femora, the tips of the tibiæ and separate tarsal joints infuscated.

Described from four specimens taken at Michino-o (Nagasaki).

This species is easily recognized by its small size, posteriorly elongated and almost constricted head and long legs. On superficial examination it might readily be mistaken for the worker of some Pheidole, but the funiculi have 4-jointed clubs.

18. *Messor aciculatus* F. Smith — Three workers from Hejio, Korea.

I have already discussed this species in my account of Pro-

fessor Silvestri's Chinese ants. Examination of numerous specimens from various localities in Japan and China, as far south as Shanghai shows great constancy in structural and other characters. Forel's *brunneicornis* is, in my opinion, not worthy of ranking as a variety and may be regarded as a mere synonym of *aciculatus* and of Emery's *Messor lobulifer* from Mongolia and Shanghai. In all the worker specimens I have examined the third funicular joint is very slightly longer than broad.

19. *Pheidole nodus* F. Smith. — Soldiers, workers and females from Kumamotu (Kiushiu) and a number of workers from Ichinomya (Kiushiu).

20. *Pheidole fervida* F. Smith. — Numerous soldiers and workers from Mt. Maya, Unzen (Kiushiu), Kirishima Mt. (Kiushiu), Kyoto (Hondo) and Nikko (Hondo); two females from Kyoto and a soldiers and seven workers from Suigen, Korea. I am unable to distinguish the Korean from Japanese specimens. The female has not been described.

Female (deälated). Length 6 mm.

Head subrectangular, distinctly broader than long, as broad in front as behind, with rather straight sides and nearly straight posterior border; the antennal scapes reaching to its posterior corners. Mandibles convex, with two stout apical and several indistinct basal teeth. Clypeus with entire anterior border, straight and transverse in the middle. Thorax of the usual shape, epinotal spines stout and blunt, somewhat longer than broad at their bases and turned very slightly upward. Petiolar peduncle ventrally with a thick projection terminating anteriorly in a sharp tooth, the node compressed anteroposteriorly, concave in front, truncated behind and above. Postpetiolar node convex, one and one-half times as broad as the petiole, transversely elliptical, twice as broad as long. Gaster oblong-elliptical, the first segment distinctly concave at the postpetiolar articulation.

Mandibles subopaque, strongly striatopunctate; head subopaque, its whole upper surface rather sharply and densely longitudinally rugose, the interrugal spaces somewhat shining and with occasional, shallow, elongate punctures. Pronotum transversely, pleuræ and epinotum longitudinally rugose; mesonotum sparsely and coarsely punctate, smooth and shining anteriorly, finely striate posteriorly and on the sides. Petiole and postpetiole finely and densely punctate, the nodes slightly rugulose. Gaster very smooth and shining, with sparse piligerous punctures; extreme base of first segment foveolate.

Pilosity yellow, rather coarse and uneven, erect or suberect, mode-

rately abundant on the body ; more abundant and oblique on the pependages.

Brownish black ; mandibles, clypeus, antennæ, legs, articulations of the thorax, bases of the petiole and postpetiole and margins of the gastric segments red ; tarsi paler, middle portions of the femora and tibiæ darker.

21. *Pheidole pieli* Santschi. — Three soldiers and two workers from Michino-o (Nagasaki). They agree very closely with Santschi's description of this species from Zi-ka-wei, China.

22. *Crematogaster (Acrocoelia) laboriosa* F. Smith — Numerous workers and males from Oguri and several workers from Nagasaki (Kiushiu).

The typical form of this species seems not to have been seen since it was described by Smith in 1874 from Hiogo. Ito has described as *C. auberti* var. *nawai* from Obata (Kiushiu), a form which I regard as belonging to the same species. Since Smith's description is so very meagre that it is impossible to say whether Dr. Silvestri's or Ito's specimens approach the types most closely, I retain Ito's varietal name and describe the specimens from Oguri as representing the typical form.

Worker. Length 3-3.5 mm.

Head as broad as long, or in large specimens a little broader than long, as broad in front as behind ; subrectangular, with rounded posterior corners, nearly straight sides and straight or slightly convex posterior border. Eyes moderately large and convex, distinctly behind the middle of the sides of the head. Mandibles narrow, with oblique, 4-toothed apical borders. Clypeus distinctly convex in the middle behind, the anterior border straight and transverse. Antennal scapes reaching to or a little beyond the posterior corners of the head ; funiculi with 3-jointed clubs ; joints 2-7 subequal, a little broader than long ; the two basal joints of the club subequal, but the second thicker than the first and the terminal joints still thicker and nearly as long as the two basal together. Frontal carinæ very short, not prominent ; frontal area very indistinct ; frontal groove absent. Pronotum broad and rather convex, with prominent, submarginate humeri ; promesonotal suture distinct ; mesonotum convex in the middle, shaped much as in *C. auberti* Emery, trapezoidal, narrowed behind, with straight, submarginate sides, as long as broad, the anterior portion somewhat roof-shaped, with a distinct median carina. Mesoëpinal constriction pronounced ; base of epinotum short, convex anteriorly, a little more than half as long as the sloping declivity ; the spines shorter than the base and a little longer

than half the distance between their insertions, moderately stout and acute, directed backward and outward and slightly upward. Petiole and postpetiole shaped very much as in *auberti* but the former, though broader than long and with straight sides, has its posterior angles thickened and tuberculate. Gaster large and acuminate, its ventral surface very convex, its dorsal surface somewhat flattened. Legs moderately long.

Mandibles subopaque, densely striate. Clypeus finely longitudinally rugulose on the sides, smooth in the middle. Head very smooth and shining, sparsely and finely punctate; cheeks with some delicate longitudinal rugules. Pro- and mesonotum very smooth and shining, not distinctly punctate; base of epinotum indistinctly striate, the declivity smooth. Petiole somewhat coriaceous and slightly opaque; postpetiole and gaster smooth and shining, the latter with sparse, piligerous punctures.

Hairs and pubescence white; the former erect, rather delicate, sparse, present on the clypeus and upper surface of the body, including the vertex of the head; rather blunt on the thorax. Pubescence appressed, long and dilute but conspicuous on the head, first gastric segment and posterior borders of the following segments, the legs and the antennæ.

Rather uniformly dark brown, head and median portion of gaster somewhat darker; mandibles, anterior clypeal border and tarsi yellowish brown.

Male (undescribed). Length 2.8 mm.

Head shaped somewhat as in the worker but narrowed anteriorly, with short, straight cheeks, large, long and not very convex eyes. Antennæ short; scapes small, cylindrical, scarcely twice as long as broad; funiculi thicker, with none of the joints longer than broad, except the last. Thorax robust anteriorly, with very convex mesonotum and long, low, sloping and unarmed epinotum. Petiole with indistinct, rounded node at the posterior end and the postpetiole with the node indistinctly divided. Gaster shaped much as in the worker but less acuminate. Legs slender; hind femora angularly bent in the middle, the hind tibiæ with the slender cylindrical basal fourth sharply marked off from the thicker apical three-fourths.

Shining; head and thorax with rather uneven surface; the anterior portion of the mesonotum with coarse, elongate punctures.

Pilosity white, short, sparse and indistinct, except on the pedicel and gaster. Pubescence more dilute and indistinct than in the worker.

Pale piceous brown; head blackish, mesonotum dark brown; mandibles, clypeus and appendages yellowish brown. Wings whitish hyaline, with very pale yellow veins and stigma.

Ito's var. *nawai* must be very close to this form but he describes the thorax and first gastric segment of the worker as having coarse, scattered, piligerous punctures and he does not mention the rugosity of the clypeus or the carina on the anterior portion of the mesonotum. His variety seems also to be paler. *C. laboriosa* is certainly very closely related to the Mediterranean *auberti* and should forms of that species be discovered in Northern or Central Asia, the Japanese ant might have to be regarded as nothing more than a race, or subspecies of Emery's species.

23. *Crematogaster (Acrocælia) matsumurai* Forel.

This ant, which Forel described as a variety of *C. laboriosa* is clearly to be regarded as a distinct species or perhaps as a subspecies of *C. brunnea* F. Smith, which is represented by a number of forms scattered over India, Indo-Malaya, Indonesia, China, and Formosa. Among Dr. Silvestri's material I find the following form which differs sufficiently to be regarded as a subspecies of *matsumurai*:

24. *Crematogaster (Acrocælia) matsumurai* subsp. *vagula* subsp. nov.

Worker. Length 2.3-3 mm.

Somewhat smaller than the typical *matsumurai* which measures 3-3.5 mm., of a darker color, with the thorax more coarsely sculptured and with distinct, though short spines on the epinotum. Pronotum and base of epinotum sharply longitudinally rugose, the former more coarsely. Mesonotum also longitudinally rugose, but usually with the median portion largely smooth. Epinotal spines straight, rather slender, acute, as long as the base though scarcely half as long as the distance between their insertions, directed backward and somewhat outward and upward. Black or very dark brown; sometimes with head and gaster black and thorax and pedicel castaneous; mandibles, cheeks, femora and tibiae brown; funiculi, tarsi and trochanters brownish yellow.

Female. Length 6 mm.

Head resembling that of the worker but its posterior border more distinctly concave. Thorax elongate - elliptical, the mesonotum convex and indistinctly carinate in the middle anteriorly; epinotum abrupt, unarmed. Postpetiolar node with the median longitudinal groove less distinct than in the worker. Gaster of the usual shape.

Smooth and shining; mandibles subopaque, striate-punctate; head and thorax sparsely but rather sharply punctate, the head somewhat more densely. Epinotum, petiole and postpetiole subopaque, finely rugulose-punctate. Gaster punctate like the thorax.

Erect pilosity pale, short, more abundant than in the worker.

Color similar to that of the worker, but the legs and antennæ paler and more yellowish. Gastric segments narrowly bordered with yellowish. Wings clear, hyaline; veins and stigma pale brownish yellow.

Described from eight workers from Kobe (Hondo); three from Moghi (Hondo) and a single worker and female from Okitsu (Hondo). I have also three workers which were taken by Mr. E. M. Ehrhorn in Honolulu, in Paulownia logs imported from Japan.

25. *Crematogaster (Orthocrema) sordidula* Nyl. subsp. *osakensis* Forel.

Numerous workers from Unzen (Kiushiu), Okusa (Kiushiu), Kiroshima Mt. (Kiushiu), Otsu (Kiushiu), Kyoto (Hondo), Nara (Hondo), Kamakura (Hondo), Michino-o (Nagasaki), Ichinomya, (Kiushiu), and Mt. Maya (Kobe) and from Fusan, Korea; four females from Okusa and Michino-o and a number of males from the locality last mentioned.

All of this material belongs to the subspecies *osakensis* since none of the workers measures over 2.25 mm. Forel's var *japonica*, which I have not seen, is described as larger (2.6-3 mm) and as having more flattened eyes. The eyes in Professor Silvestri's series certainly vary in convexity and the color is also variable and in some cases seems to be that of *japonica*, i. e., with the whole gaster brown. The female and male are undescribed.

Female (dealtated). Length 4.8-5.5 mm.

Head at least one fourth broader than long, with straight, subparallel cheeks and the portion behind the eyes with convex occipital border and rather broadly rounded posterior corners. Eyes small, rather convex, at the middle of the sides of the head. Antennal scapes reaching beyond the posterior corners. Thorax elliptical, high in profile, the mesonotum subhexagonal, distinctly longer than broad, convex anteriorly and somewhat overarching the pronotum. Epinotum with very short base, the declivity long, abruptly sloping, flattened in the middle, without spines or teeth. Petiole and postpetiole similar to those of the worker but the latter broader than the former. Gaster voluminous.

Shining; mandibles subopaque, coarsely striatopunctate; clypeus finely longitudinally striate. Head, pronotum, mesonotum and scutellum sparsely and coarsely punctate; epinotum and petiole finely rugulose or coriaceous; mesopleuræ smooth and shining; postpetiole with the dorsal surface of the node more shining and with a few elongate pits; gaster smooth and shining, with sparse piligerous punctures, most distinct at the posterior borders of the segments.

Hairs yellow, abundant and erect, especially on the whole surface of the head, and forming a conspicuously long tuft on the posterior border of the scutellum ; more oblique on the gaster ; appendages with abundant but somewhat shorter, oblique hairs.

Brownish yellow ; legs and sides of thorax somewhat paler ; median portion of gastric segments brown ; wing-insertions, sutures between the mesonotum and scutellum and the mandibular teeth blackish.

Male, Length 2-2.5 mm.

Integument thin and collapsible. Head, including the eyes, broader than long ; cheeks very small and short ; postocular portion rounded, with prominent ocelli. Mandibles small but overlapping, obscurely denticulate. Antennæ short ; scapes only about one and one half times as long as broad ; first funicular joint broader than long, button-shaped ; the two terminal joints long and slender ; remaining joints thicker and shorter but distinctly longer than broad. Mesonotum large and convex, broader than long, considerably overarchng the pronotum ; epinotum small, in profile with the base half as long as the declivity, the latter sloping. Petiolar and postpetiolar nodes rounded, subequal, somewhat broader than long. Gaster with prominent, exerted genitalia. Legs slender, the hind femora bent in the middle.

Smooth and shining, the piligerous punctures on the head, thorax and gaster very indistinct.

Hairs whitish, less abundant and more oblique than in the female, shorter and more appressed on the legs.

Sordid brownish yellow ; legs and antennæ whitish yellow ; posterior portion of head and in some specimens also the mesonotum dark brown ; the latter covered with whitish spots which are really the insertions of the vibratory muscles seen through the thin, transparent integument. Wings grayish white, rather opaque ; veins and stigma pale, dull yellow.

26. *Vollenhovia emeryi* Wheeler — Numerous workers, females and males from Kumamotu (Kiushiu), two workers from Kagoshima (Kiushiu) and two from Mt. Maya.

In the original description I failed to mention that there is in the worker and female a distinct median tooth at the posterior end of the petiole on the dorsal side. In Dr. Silvestri's specimens the epinotal teeth are more slender and therefore even more distinct than in the type specimens taken by Sauter at Negishi, near Yokohama and those taken by him at Yamanaka and Kanagawa.

Male. (undescribed). Length about 2.5 mm.

Head longer than broad, somewhat narrowed behind, with the

sides and posterior border slightly convex; eyes large but not very convex; ocelli small, not prominent. Mandibles small, with somewhat spatulate, rounded, edentate tips. Clypeus small, convex in the middle, its anterior border straight and entire. Frontal area elongate, impressed, shining. Antennal scapes short, reaching only to the middle of the head; first funicular joint longer than broad, somewhat swollen; joints 2-6 somewhat broader than long; remaining joints longer. Thorax shaped much as in the female but without teeth on the epinotum. Petiole with lower and more rounded node and legs much more slender than in the worker and female.

Head opaque, densely punctate-rugulose; sides of thorax and legs subopaque, the former indistinctly punctate-rugulose; mandibles, thoracic dorsum, pedicel and gaster shining, very finely and indistinctly punctate.

Pilosity and pubescence much as in the worker and female; lower surface of postpetiole with a distinct tuft of hairs.

Head black; thorax, pedicel and gaster dark brown; dorsal surface of thorax and pedicel blackish; mandibles, mouthparts, antennae and legs brownish yellow. Wings colored as in the female.

27. *Vollenhovia emeryi* subsp. *chosenica* subsp. nov.

Worker. Slightly smaller than the typical form. Head distinctly shorter, less oblong, distinctly narrowed anteriorly and with somewhat more deeply concave posterior border. Antennal scapes reaching somewhat nearer to the posterior corners of the head.

Sculpture less pronounced than in the typical form and the surface of the body therefore slightly more shining. This is especially true of the postpetiole which is quite smooth above. The petiole is nearly smooth and the shining median longitudinal streak on the head is somewhat broader and more distinct than in the type.

Color distinctly paler and more reddish. Front without the large brown spot.

Seven workers from Suijen, Korea (Chosen).

28. *Monomorium nipponense* Wheeler — A number of workers from Ichinomyia (Kiushiu) and Atami (Hondo).

29. *Monomorium minutum* Mayr var. *chinense* Santschi — A single worker from Ichinomyia agrees with Chinese specimens from Foochow in my collection, except that it is paler and of a more castaneous brown. This may be due to immaturity.

30. *Solenopsis fugax* Latr. var. *japonica* var. nov.

Worker. Differing from the typical *fugax* of Europe in having the sides of the head more nearly straight and subparallel even

in the largest workers and in the darker color of the latter, which are decidedly brown, with the head and median portion of the gaster almost blackish.

Numerous specimens from Unzen (Kiushiu), which may be regarded as the type, locality and several from Nara (Hondo) and Ichinomyia.

This form is close to *S. jacoti* Wheeler of China, but the latter is somewhat larger and has considerably larger eyes. Probably the variety here described is the form cited by Ito as « *S. fugax* » from Tokio. According to his statement, it lives in cleptobiosis with *Pheidole fervida* F. Smith, just as does the European type of the species with various common ants.

31. *Pristomyrmex pungens* Mayr. — Many workers from Kumamoto (Kiushiu), Kagoshima (Kiushiu), Nara (Hondo), Kyoto (Hondo), Kobe (Hondo), Michino-o (Nagasaki) and Mt. Maya and a single male from Nara.

As Viehmeyer has shown, this species was redescribed by Forel under the name *P. japonicus*.

Male (undescribed). Length nearly 3 mm.

Head, including the eyes, distinctly broader than long; cheeks very short, the postocular portion semicircular, with large, prominent ocelli. Eyes large and convex. Mandibles small, rounded and edentate, far from meeting. Antennæ 12-jointed; scapes cylindrical, a little more than twice as long as broad; first funicular joint nearly as long as broad, remaining joints less than twice as long as broad, except the last which is twice as long as the penultimate joint and pointed. Thorax short, the promesonotum and scutellum forming a mass as broad as long; mesonotum with very pronounced Mayrian furrows; epinotum with teeth, somewhat longer than broad at their bases, in place of the long spines of the worker. Petiole from above parallelsided, one and one-half times as long as broad, the node rather low and pointed in profile; postpetiole transversely rectangular, a little broader than the petiole. Genitalia small, exerted, their outer pair of appendages subelliptical. Legs rather slender.

Shining; head loosely rugulose; clypeus opaque, very finely and densely punctate; scutellum and epinotum longitudinally and reticulately rugose; mesopleuræ, pedicel and gaster smooth and shining.

Pilosity shorter and less abundant than in the worker; hairs on the legs long but more appressed.

Color like that of the worker, piceous brown, with yellowish brown mandibles, antennæ, legs and genitalia. Wings somewhat smoky, with pale brown veins.

32. *Tetramorium caespitum* L. subsp. *jacoti* Wheeler.

Many workers from Nagasaki (Kiushiu), Kumamoto (Kiushiu), Chofu (Hondo), Kyoto (Hondo), Nara (Hondo) and Mt. Maya, (Kobe), and from Hejio and Fusan, Korea. Also several workers taken by F. Muir in some unrecorded locality in Japan.

All the specimens agree closely with the types of *jacoti* from Peking, China. This form was described in 1923. In 1925 Emery described a subsp. *tsushimae* from the Island of Tsushima between Japan and Korea. It differs from *jacoti* merely in its somewhat paler coloration, so that I regard it as no more than a variety of that subspecies.

33. *Tetramorium caespitum* subsp. *jacoti* var. *tsushimæ* Emery — Numerous workers from Okusa (Kiushiu), Kobe (Hondo) and Ichinomyia (Kiushiu) and two dealated females from Okusa.

These specimens agree closely with Emery's description and figures. The workers approach the Chinese variety which I have described as *geei*.

34. *Tetramorium guineense* Fabr. subsp. *nipponense* subsp. nov.

Worker. Differing from the typical *guineense* in a number of characters. The antennal scapes are longer and reach more nearly to the posterior corners of the head; the transverse crest, or ridge on the pronotum is very sharp and interrupts the sculpture. The epinotal spines are much longer, stouter, more flattened at the base and more strongly recurved at their tips; the episternal teeth are also somewhat longer and more slender and both the petiolar and postpetiolar nodes are more elongate. The color also is different, being paler and more yellowish ferruginous, with the gaster, legs and mandibles yellow. There is no infuscation in the middle of the gaster.

Numerous workers from Michino-o (Nagasaki).

No form of this common tropicopolitan ant has previously been recorded from Japan.

35. *Strumigenys godeffroyi* Mayr. var. *lewisi* Cameron — Seven workers and two females from Atami (Hondo); one worker from Nagasaki (Kiushiu), two from Kamakura (Hondo) and a series of eleven from Michino-o (Nagasaki).

36. *Strumigenys* (*Cephaloxys*) *japonica* Ito. — A single worker and female from Kirishima Mt. (Kiushiu).

Female (undescribed). Length about 1.8 mm.

Very similar to the worker but the head slightly broader behind and somewhat more coarsely sculptured. Ocellar area blackish. Wings grayish, pubescent, the posterior pair with strongly ciliate posterior borders. Thorax and postpetiole somewhat darker and more brownish than in the worker.

Subfamily Dolichoderinae.

37. *Iridomyrmex iloi* Forel. — Numerous workers from Michino-o (Nagasaki), Chofu (Hondo) and Ichinomyia, and one dealated female from Chofu.

Female. (undescribed) Length 5 mm.

Head longer than broad, abruptly narrowed in front of the eyes, with parallel cheeks only about one third as long as the latter; the postocular portion subrectangular, with nearly straight sides and posterior border. Antennal scapes reaching nearly to the posterior corners of the head. Thorax long, elliptical; mesonotum somewhat longer than broad, narrowed anteriorly; epinotum in profile with the base somewhat transversely impressed in the middle, distinctly longer than the nearly perpendicular declivity with which it forms a rounded angle. Petiolar scale cuneate, higher than long, narrowed above, scarcely inclined forward. Gaster elongate-elliptical.

Shining; very finely and indistinctly punctate; head and especially the mandibles more subopaque.

Hairs pale, erect, most abundant on the thoracic dorsum, longer and sparser on the head and gaster; pubescence pale, longest and most distinct on the head and gaster, finer on the appendages.

Black; mandibles, antennal scapes, legs and first gastric segment dark brown.

38. *Bothriomyrmex wroughtoni* Forel. — A single worker from Hejio, Korea.

39. *Tapinoma geei* Wheeler. — Ten workers from Hegio, Korea.

Subfamily Formicinae.

40. *Camponotus japonicus* Mayr. — Several workers from Kobe (Hondo), Kumamotu (Hondo), Okitsu (Hondo), Tokio (Hondo), Kyoto (Hondo), Nagasaki (Kiushiu) and Ichinomyia, and one worker from Fusan, Korea.

41. *Camponotus herculeanus* L. subsp. *ligniperda* Latr. var. *obscuripes* Mayr. — Three workers and a dealated female from Nikko (Hondo), a dealated female from Chusenji Lake, near Nikko, and one from Otsu (Kiushiu).

42. *Camponotus* (*Tanæmyrmex*) *devestivus* sp. nov.

Worker major. Length 9.5 mm.

Allied to *C. carin* Emery but much less pilose. Head small (2.5×2.2 mm), narrowed in front, with feebly convex sides, prominent posterior corners and rather deeply and broadly excised posterior border. Eyes large and moderately convex. Mandibles stout and convex, with five strong teeth. Clypeus subhexagonal, as long as broad, carinate, its anterior portion produced as a rectangular lobe with rather sharp corners and crenulate, transverse median border. Frontal carinæ closely approximated, their posterior about one and one-fourth times as far apart as their anterior ends. Frontal area small, rather indistinct, transversely lozenge-shaped. Ocelli represented by three shallow pits. Antennæ slender, the scapes terete, reaching about one-fourth their length beyond the posterior corners of the head. Thorax slender, moderately arcuate dorsally, with strongly impressed promesonotal and mesoëpinal sutures, the mesonotum raised somewhat at its anterior end above the pronotum. Metanotum short and distinct, but its sutures not pronounced. Epinotum long, the base in profile twice as long as the sloping declivity and broadly rounding into it so that the two surfaces are not very clearly separated. Petiole small, the node from behind elliptical, narrowed upward to a rounded summit; in profile cuneate, inclined forward, with convex anterior and nearly flat posterior surface, the border rather acute but not acuminate. Gaster of the usual shape. Legs slender; posterior tibiæ slightly compressed, neither channelled nor bearing bristles on their flexor surface, except one or two at the tips.

Moderately shining; mandibles smooth at the base, coarsely and sparsely punctate and somewhat rugose at their tips. Clypeus and head shagreened; the former and the anterior portions of the cheeks with a few coarse, widely scattered punctures. Thorax, petiole and gaster shagreened very much like the head, but more finely than the clypeus. Legs more superficially shagreened and more shining. Antennal scapes minutely and densely punctate.

Hairs pale yellow, erect, short and very sparse; most numerous on the front, clypeus and tip of gaster, absent on the cheeks, vertex, petiole, legs and scapes; very few on the pro- and mesonotum and dorsal surface of the gaster. Pubescence very dilute and appressed, but distinct on all parts of the body and appendages.

Head and thorax dull castaneous, the head somewhat darker,

the cheeks and front nearly black; the anterior portion of the clypeus aler and somewhat yellowish. Scapes dark brown. the funiculi palers dbrown. Gaster black, with a brownish yellow spot at the base of the fit segment and all the segments with rather broad, dull whitish yellow posterior borders. Legs brownish yellow, the knees darker.

Worker media. Length about 8.5 mm.

Head nearly half again as long as broad, a little narrower through the posterior than the anterior corners, but with distinct though rounded posterior corners, the sides evenly and feebly convex. In other respects like the major worker, but the color of the thorax, head, clypeus and appendages paler, probably in part due to immaturity of the specimen.

Worker minima. Length 7 mm.

Head resembling that of the media but gradually narrowed behind the eyes to the occipital border and without any traces of posterior corners, the sides being only very feebly convex. The color of the head and thorax is paler than in the major but darker than in the media.

Single specimens of each of the three castes from Atami (Hondo).

This form is very puzzling. Judging from the shape of the head in the worker minima, it belongs to the group comprising *C. carin* Emery, *dorycus* F. Smith, etc. but is peculiar in its small size and very smooth and almost hairless integument. I am not certain that the specimen described as the worker major really represents the maxima form.

43. *Camponotus* (*Myrmamblys*) *itoi* Forel. — Three workers from Ichinomyia.

44. *Camponotus* (*Myrmamblys*) *itoi* subsp. *tokyoënsis* Ito. — A dealated female and an immature minor worker from Moghi tokyënsis (Nagasaki).

45. *Camponotus* (*Myrmentoma*) *caryæ* Fitch var. *quadrinotatus* Forel. — A single worker minor from Nagasaki (Kiushiu).

46. *Camponotus* (*Myrmentoma*) *caryæ* var. *teranishii* nom. nov.

In 1915, Teranishi (Japan, Ent. Mag. 1, p. 137) described as *C. tokioensis* a minor worker taken at Aoyama, Tokio. Since the specific name is preoccupied by *C. tokyoënsis* Ito I have renamed the form, which seems to be merely a variety of *caryæ*.

47. *Camponotus* (*Colobopsis*) *nipponicus* sp. nov.

Soldier. Length 4 mm.

Resembling *C. truncatus* Spinola of Southern Europe but smaller (*truncatus* measures 4-6 mm.). Head very similar in shape but the man-

dibles are more convex, the sharp border of the anterior truncated portion of the head is somewhat less acute; the eyes are distinctly larger, the antennal scapes shorter and not reaching the posterior corners of the head. The base and declivity of the epinotum are subequal and form more nearly a right angle in profile. Petiole decidedly thinner, with sharper, more rounded and much less excised superior border.

Mandibles much more finely punctate than in *truncatus* and somewhat shining; anterior portion of the head less coarsely rugose and the roughened surface extending not nearly so far posteriorly.

Pilosity on the head much less developed; absent on the cheeks and front.

Color similar to that of *truncatus* but the gaster immaculate and the appendages much paler. Antennæ pale reddish; coxæ and legs pale yellow, the bases of the fore coxæ and the median portions of the femora infuscated. Pronotum, metasterna and base of petiole yellowish.

Female (deälated). Length 5.3 mm.

Very slender and much smaller than the female of *truncatus*, which measures fully 6-8 mm. Sculpture, pilosity and color as in the worker, except that the epinotum is dark brown, with the remainder of the thorax sordid yellowish brown. The petiole is much thinner and more rounded above than in the female *truncatus*.

A single soldier and female taken by H. Sauter at Okayama. These specimens were referred to *C. rothneyi* Forel in my paper of 1906. Recently I have received a number of specimens of the true *rothneyi* from Indie and find that it is really a different species. Ito seems to have refferred the form here discribed to the European *truncatus*, but though the colors of this species are variable, the more convex mandibles, the larger eyes, the absence of pilosity on the cheeks and finer and less extensive sculpture of the head, the much thinner and more roundend petiole and more angular epinotum show that the Japanese form be regarded either as a distinct species or at least as a well-marked subspecies of *truncatus*. Ito gives the length of tho soldier as 4.5-5.5 mm., of the worker or 3.5-4 mm.

48. *Paratrechina* (*Nylanderia*) *flavipes* F. Smith. — Numerous workers, females and males from Kirishima Mt. (Kiushiu), Unzen (Kiushiu), Kumamotu (Kiushiu), Okayama (Hondo), Nara (Hondo), Atami (Hondo), Moghi (Nagasaki), Michino-o (Nagasaki),

Mt. Maya (Kobe) and Ichinomyia (Kiushiu). Also a few workers from Kejio and Fusan, Korea.

There is considerable variation in size and coloration among the workers in this material.

49. *Paratrechina* (*Nylanderia*) *minutula* Forel subsp. *sauteri* Forel. — A single worker from Kirishima Mt. (Kiushiu) is evidently referable to this subspecies, which was originally described from Formosa.

50. *Lasius niger* L. — Numerous workers from Nikko (Hondo) Nara (Hondo), Okayama (Hondo), Okusa (Kiushiu), Nagasaki (Kiushiu), and Moghi (Nagasaki) and a few from Suijen and Hejio, Korea. A number of workers from Kagoshima (Kiushiu), Michino-o (Hondo) and one taken at Chuzenji (4000-5000 ft.) by F. Muir are somewhat larger and more reddish. They seem to be intermediate between the var. *silkaënsis* Pergande of Boreal America and our common North American var. *neoniger* Emery and may, perhaps, represent a distinct variety.

51. *Lasius* (*Chthonolasius*) *flavus* De Geer. — Three workers from Nikko (Hondo) agree very closely with the common European form.

52. *Lasius* (*Chthonolasius*) *flavus* var. *myops* Forel. — Three workers from Ichinomyia.

53. *Lasius* (*Chthonolasius*) *umbratus* Nyl. — Three workers and two males from Kyoto (Hondo), a worker from Kobe (Hondo) and a small worker from Hejio, Korea.

54. *Lasius* (*Chthonolasius*) *umbratus* subsp. *mixtus* Nyl. — A single worker from Ichinomyia.

55. *Lasius* (*Chthonolasius*) *teranishii* nom. nov.

Teranishi has doubtfully referred to *L. umbratus* Nyl. a peculiar dealated female with much flattened scapes, femora, tibiae and metatarsi and therefore modified in much the same manner as the β -females of *L. latipes* Walsh and *L. spathepus* Wheeler. The specimen was taken at Nokkeuchi, Hokkaido. Since neither *umbratus* nor any of its subspecies or varieties in Eurasia and North America have ever been found to have dimorphic females, it seems best to regard Teranishi's specimen as representing a distinct species. I therefore call it *L. teranishii* for the same reason that I regard *L. spathepus* as a distinct species (*vide infra*).

56. *Lasius* (*Chthonolasius*) *silvestrii* sp. nov.

Female (deälated). Length nearly 7 mm.

Head distinctly broader than long, somewhat narrowed anteriorly. with feebly convex sides and broadly concave posterior border. Eyes small, flat, behind the middle of the head, twice their longest diameter from the anterior corners of the head. Clypeus convex and subcarinate posteriorly, the anterior border nearly straight in the middle, feebly sinuate at the sides. Frontal area large, triangular, its sutures not very strong; frontal groove sharply impressed, frontal carinae short, thick, posteriorly diverging. Antennal scapes reaching a little beyond the posterior corners of the head, distinctly thickened but not flattened apically; funicular joints 3-8 but little longer than broad. Thorax broad and robust, though narrower than the head; mesonotum flattened behind. Petiolar scale large, broad and high, compressed anteroposteriorly; subrectangular from behind, as broad as high, its superior border thin, broadly and angularly, but not very deeply excised. Gaster of the usual shape. Femora and tibiae, but not the metatarsi, distinctly flattened, not so broad as in *teranishii* and *spathepus* though decidedly broader than in *umbratus*.

Shining; gaster and appendages subopaque; mandibles rather sharply punctate-striate. Body finely and superficially punctate.

Erect hairs grayish, short, abundant on the head and gaster, less numerous on the thoracic dorsum; on the antennal scapes and legs very short but suberect. Petiolar node with a border of short hairs. Pubescence gray, abundant and rather long, especially on the gaster where it conceals the surface.

Brownish black; gaster and petiole dark brown; mandibles reddish, with more infuscated tips; antennal scapes and femora dark brown; funiculi, tips of scapes, base of petiole, a large spot at the base of the first gastric segment, trochanters, tibiae and tarsi yellowish brown.

A single specimen from Mt. Maya (Kobe) This. is quite distinct from *umbratus* though it obviously represents an allied species.

57. *Lasius* (*Dendrolasius*) *spathepus* Wheeler. — A single deälated female from Kamakura (Hondo) and several workers from Kyoto (Hondo) and Michino-o (Nagasaki). Also two workers from Yokohama (F. Muir).

I described and figured this ant (Biol. Bull. 19, 1910, p. 130) from a single deälated female taken by Professor Kuwana at Tokio, and from its peculiar aberrant characters, especially the greatly flattened femora, tibiae and metatarsi, was led to suspect that it might be the β -female of *L. fuliginosus* Latr. corresponding to the β -female of our North American *L. (Acanthomyops)*

latipes Walsh. Forel (Am. Soc. Ent. Belg. 56, 1912, p. 339) described a second female of the same conformation taken by Ito in the same locality. In this paper Forel described workers and a female of a new variety, *nipponensis*, of *L. fuliginosus*, also from Tokio, and regarded it as distinct from *spathepus*, because the female showed merely varietal differences when compared with the female of the common European *fuliginosus*. The matter has now been at least partially cleared up by Teranishi (Notes on Japanese Ants. I Aberrant Forms. 1927, pp. 90 and 94), who states that numerous workers of *nipponensis* were taken with winged females of *spathepus* by Mr. K. Tokura from the same nest at Omori, Tokyo-Fu (July 1925). This and Forel's account of the female of *nipponensis* seem to prove that I was right in supposing that the Japanese form of *fuliginosus* might have two females, α - and a β -form, like *L. latipes*. Teranishi adopts this view and therefore reduces *spathepus* to varietal rank under *fuliginosus*. After reexamining all the Japanese workers, which I formerly referred merely to *fuliginosus* (Bull. Amer. Mus. Nat. Hist. 22, 1906 p. 322), including also some males taken by H. Sauter at Kanagawa, I am convinced that the Japanese form should be regarded as an independent species. It differs from the European *fuliginosus*, not only in having two female forms but also in several other characters in the worker and male. These two castes and the α -female (Forel's *nipponensis* female) may be distinguished as follows :

Worker. Length 3.7-4 mm.

Smaller than *fuliginosus*, which measures 4-5 mm. Head distinctly narrower in front, with somewhat shorter antennal scapes. Eyes smaller. Petiole very characteristic, its scale being slightly lower and much thinner and broader above, with the superior border distinctly emarginate and not bluntly pointed as in *fuliginosus*. The head, thoracic dorsum and gaster are furnished with longer and much more numerous erect hairs and the superior border of the petiole bears a row of hairs which are lacking in *fuliginosus*. Scapes, funiculi and legs covered with short, dense, oblique hairs, whereas these appendages are merely finely and densely pubescent in *fuliginosus*.

α - *Female* (according to Forel). Length 5.3 mm.

Smaller than the single (α -) female of *fuliginosus*, which measures 6-6.5 mm., and with longer and more conspicuous pubescence on the head.

Male (undescribed). Length 3.8-4. mm.

Also smaller than the male *fuliginosus*, which measures 4-5 mm.

Wings distinctly darker. Head more convex at the vertex, with much smoother and more shining surface. Petiole compressed and rather deeply emarginate above, not thick, entire and rounded as in *fuliginosus*. Pilosity longer on the body and much more distinct on the appendages than in the European species.

Emery, in the « Genera Insectorum », remarks that *fuliginosus* is lacking on the islands in the Mediterranean, in the Caucasus, Siberia and Hindustan. The var. *orientalis* Karawaiew (Rev. Russe d'Ent. 12, 1912 p. 586), based on workers from Korea, is very briefly described. The only distinctions cited refer to its small size and paler coloration. I am therefore unable to decide whether it belongs to *spathepus* or actually represents a distinct variety of *fuliginosus*, as Karawaiew supposes.

58. *Formica fusca* L. var. *japonica* Motschulsky. — Numerous workers from Tokio (Hondo), Kobe (Hondo), Okitsu (Hondo), Nara (Hondo), Kyoto (Hondo), Chusenji (Hondo), Kumamotu (Kiushiu), Okusa (Kiushiu), Unzen (Kiushiu), Nagasaki (Kiushiu), Kirishima (Kiushiu), Michino-o (Nagasaki) and Mt. Maya (Kobe). Also three workers from Fusan and one from Suijen, Korea.

59. *Polyergus samurai* Yano. — Numerous workers from Okitsu (Hondo) and Tokio (Hondo), the latter with their slaves, *F. fusca* var. *japonica* Motsch.

A REVISED LIST OF THE ANTS OF JAPAN.

Fam. Formicidae.

Sulfam. Ponerinae.

1. *Stigmatomma silvestrii* Wheeler. ♂
2. *Sysphincta watasei* Wheeler. ♂ ♀
3. *Ectomomyrmex japonicus* Emery. ♂
4. *Euponera (Trachymesopus) sauteri* Wheeler. ♂ ♀
5. *Euponera (Trachymesopus) sharpi* Forel subsp. *pilosior* Wheeler. ♂
6. *Euponera (Brachyponera) solitaria* F. Smith. ♂ ♀
7. *Ponera japonica* Wheeler. ♂ ♀
8. *Ponera excrucata* Wheeler. ♂
9. *Ponera scabra* Wheeler. ♂ ♀

Subfamily Myrmicinae.

10. *Myrmica lævinodis* Nyl. ♀
11. *Myrmica ruginodis* Nyl var. *kotokui* Forel. ♀ ♀ ♂
12. *Myrmica ruginodis* Nyl var. *silvestrii* Wheeler. ♀
13. *Myrmica lobicornis* Nyl var. *jessensis* Forel. ♀
14. *Myrmica kurokii* Forel. ♀
15. *Aphaenogaster (Attomyrma) smythiesi* Forel. var. *japonica* Forel. ♀ ♀
16. *Aphaenogaster (Attomyrma) famelica* F. Smith. ♀ ♀ ♂
17. *Aphaenogaster (Attomyrma) famelica* subsp. *frontosa* Wheeler. ♀
18. *Aphaenogaster (Attomyrma) famelica* subsp. *ruida* Wheeler. ♀
19. *Aphaenogaster (Attomyrma) verecunda* Wheeler. ♀
20. *Aphaenogaster (Attomyrma) vapida* Wheeler. ♀
21. *Stenamma owstoni* Wheeler. ♀
22. *Messor aciculatus* F. Smith. ♀ ♀ ♂
23. *Pheidole nodus* F. Smith. ♀ ♀
24. *Pheidole fervida* F. Smith. ♀
25. *Pheidole pieli* Santschi. ♀
26. *Crematogaster (Acrocælia) laboriosa* F. Smith. ♀ ♂
27. *Crematogaster (Acrocælia) laboriosa* var. *nawai* Ito. ♀
28. *Crematogaster (Acrocælia) matsumurai* Forel. ♀
29. *Crematogaster (Acrocælia) matsumurai* var. *vagula* Wheeler. ♀ ♀
30. *Crematogaster (Orthocrema) sordidula* Nyl subsp. *osakensis* Forel. ♀ ♀ ♂
31. *Crematogaster (Orthocrema) sordidula* subsp. *osakensis* var. *japonica* Forel. ♀
32. *Vollenhovia emeryi* Wheeler. ♀ ♀ ♂
33. *Monomorium minutum* Mayr var. *chinense* Santschi. ♀
34. *Monomorium nipponense* Wheeler. ♀
35. *Monomorium floricola* Jerdon. ♀ ♀ ♂
36. *Monomorium triviale* Wheeler. ♀
37. *Solenopsis fugax* Latr. var. *japonica* Wheeler. ♀
38. *Myrmecina graminicola* Latr. subsp. *nipponica* Wheeler. ♀
39. *Pristomyrmex pungens* Mayr. ♀ ♂
40. *Leptothorax congruus* F. Smith. ♀ ♀
41. *Leptothorax congruus* var. *spinosior* Forel. ♀ ♀
42. *Tetramorium cæspitum* L. subsp. *jacoti* Wheeler. ♀ ♀
43. *Tetramorium cæspitum* subsp. *jacoti* var. *tsushimæ* Emery. ♀ ♀
44. *Tetramorium guineëns* Fabr. subsp. *nipponense* Wheeler. ♀
45. *Strumigenys (Strumigenys) godeffroyi* Mayr. var. *lewisi* Cameron. ♀ ♀
46. *Strumigenys (Cephaloxys) japonica* Ito. ♀ ♀

Subfamily Dolichoderinae.

47. *Iridomyrmex itoi* Forel. ♀ ♀
48. *Iridomyrmex itoi* subsp. *abboti* Wheeler. ♀
49. *Technomyrmex gibbosus* Wheeler. ♀

Subfamily Formicinae.

50. *Camponotus* (*Camponotus*) *japonicus* Mayr. ♀ ♀ ♂
51. *Camponotus* (*Camponotus*) *herculeanus* L. var. *sachalinensis* Forels. ♀
52. *Camponotus* (*Camponotus*) *herculeanus* subsp. *ligniperda* Latr. var. *obscuripes* Mayr. ♀ ♀ ♂
53. *Camponotus* (*Tanæmyrmex*) *devestivus* Wheeler. ♀
54. *Camponotus* (*Tanæmyrmex*) *habereri* Forel. ♀
55. *Camponotus* (*Myrmamblys*) *itoi* Forel. ♀
56. *Camponotus* (*Myrmamblys*) subsp. *tokyoensis* Ito. ♀ ♀
57. *Camponotus* (*Myrmentoma*) *caryæ* Fitch var. *quadrinotatus* Forel. ♀ ♀ ♂
58. *Camponotus* (*Myrmentoma*) *caryæ* var. *nawai* Ito. ♀
59. *Camponotus* (*Myrmentoma*) *caryæ* var. *teranishii* Wheeler. ♀
60. *Camponotus* (*Myrmentoma*) *caryæ* var. *keihitai* Forel. ♀ ♀
61. *Camponotus* (*Myrmentoma*) *caryæ* subsp. *brunni* Forel. ♀
62. *Camponotus* (*Myrmentoma*) *caryæ* subsp. *vitiosus* F. Smith. ♀
63. *Camponotus* (*Colobopsis*) *nipponicus* Wheeler. ♀ ♀
64. *Polyrhachis* (*Polyrhachis*) *lamellidens* F. Smith. ♀
65. *Paratrechina* (*Nylanderia*) *flavipes* F. Smith. ♀ ♀ ♂
66. *Paratrechina* (*Nylanderia*) *sakuræ* Ito. ♀
67. *Paratrechina* (*Nylanderia*) *minutula* Forel subsp. *sauteri* Forel. ♀
68. *Lasius* (*Lasius*) *niger* L. ♀ ♀ ♂
69. *Lasius* (*Lasius*) *niger* subsp. *alienus* Förster. ♀ ♀ ♂
70. *Lasius* (*Lasius*) *niger* subsp. *alienus* var. *alieno-niger* L. ♀ ♀ ♂
71. *Lasius* (*Lasius*) *niger* subsp. *brunneus* Forel. ♀ ♀ ♂
72. *Lasius* (*Chthonolasius*) *flavus* De Geer. ♀ ♀ ♂
73. *Lasius* (*Chthonolasius*) *flavus* var. *myops* Forel. ♀
74. *Lasius* (*Chthonolasius*) *umbratus* Nyl. ♀ ♀ ♂
75. *Lasius* (*Chthonolasius*) *umbratus* var. *mixtoulumbratus* Forel. ♀ ♀ ♂
76. *Lasius* (*Chthonolasius*) *umbratus* subsp. *mixtus* Nyl. ♀ ♀ ♂
77. *Lasius* (*Chthonolasius*) *teranishii* Wheeler. ♀
78. *Lasius* (*Chthonolasius*) *silvestrii* Wheeler. ♀
79. *Lasius* (*Dendrolasius*) *spathepus* Wheeler. ♀ ♀ ♂
80. *Formica* *rufa* L. subsp. *pratensis* De Geer. ♀ ♀ ♂
81. *Formica* *truncicola* Nyl. ♀ ♀ ♂
82. *Formica* *truncicola* var. *yessensis* Forel. ♀
83. *Formica* *sanguinea* Latr. subsp. *fusciceps* Emery. ♀
84. *Formica* *exsecta* Nyl. var. *fukaii* Wheeler. ♀
85. *Formica* *fusca* L. var. *japonica* Motsch. ♀ ♀
86. *Polyergus* *samurai* Yano. ♀