ANTS OF JAPAN

Japanese Ant Database Group

Gakken
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By

Japanese Ant Database Group:

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Foreword

Ants are insects we often find around us. Since they lead high-level interactive social lives assisting each other to survive, in Japanese, they are called *ari*, which written in *kanji* (癌), literally signifies "insects of loyalty" with respect. So far, there are 273 species of ants known in Japan today. However, until some ten years ago, in spite of the efforts made by the great pioneers in ant taxonomy in Japan such as M. Yano and C. Teranishi, the scientific names of ants commonly found were not clear. This was because the majority (over 200 species) of the type specimens were stored in the natural history museums of the West, and also because there was no literature on ants available in Japan. It was a private ant researcher who resolved this unfortunate situation: his name was M. Kubota and he had spent his entire personal fortune on collecting literature on ants as well as ant specimens. Upon Kubota’s initiative, a society for people interested in ants (“The Myrmecological Society of Japan”) was formed in 1965, and ardent members of this society (M. Kubota, M. Kondoh, H. T. Imai, K. Onoyama, K. Ogata, M. Terayama, etc.) carried out a classification of Japanese ants in a comprehensive manner. The results of these studies were published by the Myrmecological Society of Japan into “A list of the ants of Japan with common Japanese names” (1988), “A guide for the identification of Japanese ants - Volume I” (1989), followed by Volume II (1991) and Volume III (1992), “A list of references on Japanese ants” (Onoyama & Terayama, 1994) as well as “Distribution maps of Japanese ants” (Terayama & Kihara, 1994).

Later, we attempted to publish an encyclopedia of Japanese ants based on the results of the above taxonomical studies together with color photographs of ants taken by H.T. Imai and M. Kubota, but this plan was difficult to achieve because of the high cost of color printing. It was around this time that the Internet started to come into widespread use, and fortunately, we were able to obtain the cooperation of scholars of bioinformatics (Y. Tsuki, Y. Ugawa, A. Kihara), who were well versed in the use of personal computers and consequently, in January 1995, we were the first in the world to open a “Japanese Ant Color Image Database” on the Web. Although this was at first a strongly academic database focusing on the classification and identification of ants, we made improvements by placing the focus on high-grade color images and by including Gakken’s Photo Encyclopedia “Ants” (Kondoh, 1979), with Gakken’s permission, for the benefit of beginners, and this improved version of the database has been well received on the grounds that it serves both scientific and educational purposes. Encouraged by this success, we invited R.W. Taylor, an Australian ant taxonomist, to join us as an overseas member, and in 1998, we launched an English version of this database, which has gained high recognition and evaluation worldwide, having recorded a total of 39,740,000 accesses by March 2003. (In the past three years, the monthly average of accesses amounted to a million, and August 2002 marked the highest record of 1,950,000 accesses in a single month.)

Despite such success, the contents of the database were becoming somewhat outdated with progress recently taking place in the taxonomy of ants. Accordingly, it was decided that JADG would conduct an overall review of the database with the help of two new members: M. Yoshimura, a young ant taxonomist, and S. Kuriyayashi, a professional insect photographer. As a result of this review, a revised edition in 2003 of the “Ant Image Database (Japan)” (http://ant.edb.miyakyo-u.ac.jp) has appeared on the Web. In this revised version, we have reviewed the scientific contents, improved the retrieval system, and included color photographs covering all 273 existing species, and moreover, we have newly added “The Ant Kingdom” (Kondoh, 1986) in the menu for beginners. At the same time, based on our desire for this database to serve as the groundwork for databases on ants worldwide in both scientific and educational fields, we not only deal with Japanese ants, but have also included the “Australian Ant Image Database” (R.W. Taylor) as well as the “Image Database of Japanese Ant Typespecimens housed at MCZ, Harvard University” (G. D. Alpert and E. O. Wilson).

While preparations were being made for this revised 2003 edition, many of the members of this group requested that we publish the essence of this database in an illustrated encyclopedia consisting mainly of images. After considerable efforts, we managed to receive a subsidy for publication (2002) from the Graduate University for Advanced Studies (SOKENDAI), and GAKKEN CO., LTD. kindly agreed to take on the publication. For this reason, we were able to achieve our long-cherished dream of producing an illustrated book on Japanese ants entitled “Ants of Japan”. Readers accustomed to analogue information can familiarize themselves more with the information medium of printed books, which are highly realistic. However, it is also true that printed books are restricted in many ways such as the number of pages and retrieval system. To overcome these drawbacks, we included an ant image database CD-ROM as a supplement in order to provide more detailed information that could not be included in the printed book.

Having finished editing this book, we feel relieved that an overall framework for the taxonomy of Japanese ants has been organized with JADG’s efforts over a period of more than 10 years. At the same time, we are acutely aware of the fact that this book still contains quite a number of specimens that are expected to have their scientific names changed in the future, and there is considerable scope for further improvements in the classification details. We intend to make the correction of these imperfections a goal of the future. In the meanwhile, however, we would be more than happy if readers can trace the ants corresponding to the existing names of specimens and enjoy imagining what these ants look like by referring to the color images of this encyclopedia.

March 2003
Hirotami T. Imai
(Representative Japanese Ant Database Group)

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In this book, we used live ants as far as possible in our photography in order to reproduce as faithfully as possible the colors of ants found in the natural world. We would like to take this opportunity to express our profound gratitude to all those who kindly cooperated in the collection of the ants: Rikio Sonobe, Haruhiko Sakai, Katsusuke Yamachii, Kyouchi Kinomura, Fuminori Ito, Hirofumi Watanabe, Seiki Yamane, Katsuyuki Eguchi and Hitetsune Takamine. Furthermore, we would like to mention that the holotype of the rare species *Rhopalomasix* were lent to us by the Museum of Nature and Human Activities, Hyogo. At the same time, we would like to deeply thankful to Toshikazu Ito who kindly agreed to undertake the printing and publication of this book and willingly devoted himself to the task of editing, to Ryosuke Tanimizu who made a contribution to the image layout and book design, to Masaki Matsubara who provided us with invaluable technical support in the photography of ants by using Stereo Microscope (Olympus, SZX12), to Hideo Mitani of Nature Production who kindly gave us permission to reproduce the booklets of Gakken’s Photo Encyclopedia “Ants” and “The Ant Kingdom” in a CD-ROM as a supplement to this book, and to Tokuko Imai who dedicated herself in all areas ranging from the photography of ants, data organization, to the cover design.

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Distribution details regarding Japanese ant species:

Prefectures where a particular species has been recorded are represented in red on its distribution map. In the text the major mainland Japanese Islands - Hokkaido, Honshu, Shikoku and Kyushu - are often cited. Because the ant faunas of the Ogasawara, Amami, Okinawa and Sakishima islands differ from those of mainland Japan, records from these areas are given separately. The citation Nansei Is. is also used. It covers Amami, Okinawa and Sakishima islands. Note that these islands are placed in areas to the south those shown in the main maps.
### Representation of worker size in mm.

The size of worker specimens is enlarged greatly in the photographs reproduced here. Japanese ants in nature are in fact very small, ranging from 1 mm to 13 mm in length, as cited with each set of illustrations. In many species the workers are polymorphic, sometimes ranging more-or-less continuously in size and relative proportions. Other species have two distinct castes differing greatly in average size, without intermediates. In order to properly image caste differences, illustrated species are classified in three categories - monomorphic, dimorphic or polymorphic, and the figures of the castes in each polymorphic or dimorphic species are reproduced at the same magnification.
Terms used in the keys and descriptions

**Head**
- occiput
- cranium
- ocellus (ocelli)
- eye
- scape
- frontal groove
- antennal socket
- epistomal suture
- clypeus
- mandible
- frontal area
- occipital collar
- antennal groove
- frontal carina
- maxilla
- labrum
- labium
- labial palp
- maxillary palp

**Caste**
- female (queen)
- male
- soldier
- worker
**Mesosoma**

- promesonotal suture
- mesonotum
- metanotal groove
- propodeum
- mesopleuron (ventral aspect)
- mesopleuron (lateral aspect)
- coxa
- metapleuron
- mesonotum
- spiracle
- metapleural gland

**Leg**

- femur
- tibia
- trochanter
- coxa
- tibial spur
- claw

**Antenna**

- scape
- funiculus
- club

**Abdominal pedicel**

- abdominal pedicel
- propodeal spine
- petiole
- postpetiole
- 1st gastric segment
- subpetiolar process
- 1st gastric segment
Key to the SUBFAMILIES

Start from here

Body with single reduced or isolated segment (the petiole) between mesosoma and gaster

Apex of gaster lacking a sting; first gastric segment entirely confluent with the second

Body with 2 reduced or isolated segments (the petiole and postpetiole) between mesosoma and gaster

Apex of gaster with a sting; first gastric segment separated from second segment by an extensive, deep, girdling constriction

Frontal lobes partially to completely concealing antennal sockets; if antennal sockets are significantly exposed, then propodeal spines are present

Frontal lobes either present or absent; in either case the antennal sockets are completely exposed; propodeal spines lacking

FORMICINAE
Ventral apex of gaster developed to form a conical structure with a circular opening, often with a fringe of setae, through which venom is ejected

DOLICHODERINAE
Venom aperture in the form of transverse slit; petiole usually overhung by first gastric segment and not visible in dorsal view

PONERINAE
Tergite at gastric apex (pygidium) unarmored; anterolateral clypeal margin without a projection

CERAPACHYINAE
Tergite of gastric apex (pygidium) bordered or partly faced with short peg-like teeth; anterolateral clypeal margin with a small projection

MYRMICINAE
Pretarsal claws simple; eyes small, maximum length less than 1/4 the length of head capsule (excluding mandibles)

PSEUDOMYRMECINAE
Pretarsal claws with a supplemenary median tooth; eyes large, each about 1/3 the length of the head capsule

AENICTINAE
Frontal lobes present

LEPTANILLINAE
Frontal lobes absent or very reduced
Key to the genera: FORMICINAE

**Start from here**

Mesosoma and petiole with conspicuous spines or other processes

**Polyrhachis**

P 17, 33 ➞

Mesosoma and petiole without spines or processes

**Acropyga**

P 68, 82 ➞

Eyes smaller, each with only 1 or a few facets

Antennae less than 12 segments

**Plagiolepis**

P 67, 82 ➞

Eyes larger, each with 10 or more facets

Antennae 12-segmented

Propodeal spiracles on the lateral face of the sclerite

**Camponotus**

P 19, 34 ➞

Mesothoracic spiracle situated on the dorsal face of the sclerite

Propodeal spiracles subcircular

**Formica**

P 32, 40 ➞

Eyes situated at the mid-length of the sides of the head in lateral view

Mandibles falcate, with rudimentary teeth

**Polyergus**

P 32, 39 ➞

Mesothoracic spiracle situated on the dorsal face of the sclerite

Eyes situated behind the mid-length of the sides of the head in lateral view

Mandibles more or less triangular, with distinct teeth

Paratrechilla

P 53, 63 ➞

In full-face view the posterior margin of the head straight or only slightly concave; mandibles each with 7 or more teeth

Pronotum long; petiole long (or thick) in profile

**Anoplolepis**

P 67, 82 ➞

Pronotum short; petiole short (or thin) in profile

**Lasius**

P 45, 59 ➞

In full-face view the posterior margin of head rounded (at least in Japanese species); mandibles each with 6 teeth

**Prenolepis**

P 66, 81 ➞
Key to the genera: MYRMICINAE (1)

**Start from here**

- **Antennae with 9 or more segments; petiole and postpetiole without spongiform material**
  - Postpetiole articulated on anterior part of first gastral tergite; gaster not capable of strong dorsal reflexion; propodeal spiracles situated laterally on the face of the propodeum
  - **Crematogaster** P 96, 108

- **Antennae with 6 or fewer segments; petiole and postpetiole with outgrowths of spongiform material**
  - Postpetiole articulated on dorsal face of first gastral tergite; gaster capable of reflexion upwards; propodeal spiracles situated on the margins of posterior face of propodeum
  - **Crematogaster** P 96, 108

- **Mandibles more or less triangular**
  - **Pyramica** (in part) P 80, 88

- **Mandibular insertions widely separated; labrum produced apically**
  - **Pyramica** (in part) P 80, 88

- **Mandibles elongate and straight or weakly curved**
  - **Strumigenys** (in part) P 74, 85

- **Frontal lobes closely approximate**
  - **Rhopalomastix** P 103, 112

- **Frontal lobes widely separated**
  - **Rhopalomastix** P 103, 112

- **Antennal club either with 3 or more segments or indistinct**

- **Antennal club composed of 2 segments**
- Petiole without a raised node, more or less cylindrical in shape; dorsal face of propodeum with a pair of small process additional to the propodeal spines
  \textit{Myrmecina} \textbf{P 100, 111} \\

- Petiole with a distinct node, which is clearly set-off from its anterior peduncle; propodeum without small supplementary processes

- Clypeus with several denticles on its anterior margin
  \textit{Pristomyrmex} \textbf{P 100, 110} \\

- Clypeus without denticles on its anterior margin

- Mandibles more or less triangular and bearing teeth

- Clypeus medially with a single setae at the midpoint of its anterior margin

- Mandibles falcate and edentate
  \textit{Strongylognathus} \textbf{P 124, 134} \\

- Worker caste monomorphic, or polymorphic; with a graded series of intermediates between minors and majors; clypeus with a single setae at the midpoint of its anterior margin
  \textit{Solenopsis} \textbf{P 118, 132} \\

- Worker caste dimorphic, without intergrades between majors and minors; the majors often with a pair of denticulate processes on the posterior part of head; clypeus medially with paired setae in both minors and majors
  \textit{Oligomyrmex} \textbf{P 115, 130}
Key to the genera: MYRMICINAE (2)

From P 11

Antennal club composed of 3 segments

- Median part of clypeus produced anteriorly to partly cover the mandibles; antennal scrobes distinct, extending to the posterolateral corners of the head
  - Lordomyrma P 102, 112

- Clypeus shorter, not overhanging the mandibles; antennal scrobes usually absent, or, if present, not extending to the posterolateral corners of the head

- Antennal club either indistinct or with 4 segments

- Lateral portions of clypeus raised to form a distinct transverse ridge on each side, in front of the antennal insertion
  - Tetramorium P 125, 134

- Lateral portions of clypeus not raised to produce such ridges

- Head and mesosoma dorsally without hairs; occipital carina absent
  - Cardiocondyla P 137, 153

- Propodeal dorsum posteriorly rounded or slightly angulate - never produced to form a pair of processes; clypeus anteriorly with a single median seta at its midpoint
  - Monomorium P 120, 132

- Propodeal dorsum posteriorly with a pair of spines or denticles; clypeus anteriorly with paired median setae

- Head and mesosoma with at least some hairs; occipital carina present
Petiole with a distinct subpetiolar process

Subpetiolar process absent

Propodeal spines present

*Myrmica*  P 169, 181

Propodeal spines absent

*Manica*  P 169, 180

Head often ventrally with hairs, but never with thick setae; propodeal spines present

*Stenamma*  P 168, 180

Antennal scapes shorter, at most slightly exceeding posterior margin of head in full-face view; petiolar node lower and less-strongly raised

Head ventrally with long, thick setae; propodeal spines absent

*Messor*  P 152, 160

Antennal scapes long, extending well beyond posterior margin of head in full-face view; petiolar node strongly raised

Promesonotum distinctly raised; worker caste with clear dimorphism producing strongly differentiated major and minor castes; head ventrally with several pairs of processes on the anterior margin

*Pheidole*  P 147, 158

Promesonotum at most only weakly raised; worker caste monomorphic; head ventrally without processes on the anterior margin

*Vollenhovia*  P 104, 112

In profile petiole depressed posteriorly, with its posterior edge produced

*Leptothorax*  P 140, 154

In profile posterior portion of petiole nearly straight; its posterior edge not produced
Key to the genera: PONERINAE

Start from here

Second gastral tergite swollen, only slightly larger than its sternite; the gaster thus not strongly down-curved

Connection between petiole and gaster narrowly constricted; anterior margin of clypeus not denticulate

Mandibles linear, inserted at the median portion of the anterior margin of head (right); head more or less constricted behind eyes (left)

Petiolar dorsum spiniform; Carina separating dorsal from posterior surfaces of head, converging in a V shape at the midline; posterior surface with a pair of prominent, dark lines; larger species, body length exceeding 8 mm

Odontomachus P 192, 212

Second gastral tergite swollen dorsally, much larger than its sternite, so that the gaster is strongly down-curved, with its apex turned ventrally or anterioventrally

Connection between petiole and gaster broad (left); anterior margin of clypeus with several denticles (right)

Amblyopone P 207, 219

Antennae 12-segmented (left), apical segment shorter than the remaining funiculus; anterior margin of clypeus straight or projecting in the middle, but not overhanging the mandibles (right)

Proceratium P 204, 217

Antennae 8- or 9-segmented (left), apical segment as long as or longer than the remaining funiculus; anterior margin of clypeus projecting in the middle and overhanging the mandibular bases (right)

D Discothyrea P 203, 217

Petiolar dorsum with a pair of distinct projections

Diacamma P 202, 217

Frontal carina more or less covering the antennal insertions; anterior clypeal margin not produced forwards to cover the mandibles

Probolomyrmex P 206, 218

Frontal carinae not covering antennal insertions (left), but forming a vertical lamella; anterior clypeal margin prominently produced, so that it almost completely covers the mandibles (right)
Mesepisternum without an oblique furrow

Promesonotum nearly flat in lateral view

Mesepisternum with an oblique furrow

Promesonotum strongly raised in lateral view

Outer surfaces of middle tibiae with short, spine-like setae

Cryptopone

Basal portions of mandibles each with a small pit dorsally (left); middle and hind tibiae each with two spurs, one simple, the other pectinate (right)

Pachycondyla (in part)

Subpetiolar process with a translucent "window" in lateral view

Ponera

Subpetiolar process without a translucent "window" in lateral view

Hypoponera

Anterior margin of clypeus straight (left); pretarsal claws simple (right)

Leptogenys

Anterior margin of clypeus projecting prominently (left); pretarsal claws pectinate (right)

Hypopolera
**Key to the genera: DOLICHODERINAE**

Start from here

Petiole scale-like or nodiform not overhung by first gastral segment

Integument thick and hard, the surface sculptured; posterodorsal margin of propodeum projecting prominently backwards, declivitous face concave

*Dolichoderus* P 73, 85

Petiole reduced, in profile lacking a scale or node and overhung by first gastral segment

Integument thin and flexible, the surface smooth and shining; posterodorsal margin of propodeum not projecting backwards, the declivitous face flat

**Key to the genera: LEPTANILLINAE**

Start from here

Antennal scapes short, only slightly exceeding mid-length of head; clypeus very short, its posterior border obscure

*Leptanilla* P 174, 184

Antennal scapes long, reaching the posterior margin of head; clypeus trapezoidal, its borders distinct

Mandibles slender and long in lateral view

*Protanilla* P 173, 183

Mandibles downwardly curved in lateral view, prominently extended dorsally

*Anomalomyrma* P 174, 183

In dorsal view only 4 gastrites visible, the fifth concealed by the fourth; gastral tip opening posteriorly; metanotal groove shallow; propodeum not strongly raised

*Tapinoma* P 72, 84

In dorsal view 5 gastrites visible, the fifth small but not concealed beneath the fourth; gastral tip opening ventrally; metanotal groove more or less deep, propodeum distinctly raised

*Technomyrmex* P 71, 84

Petiolar scale high, the dorsal apex situated over the level of propodeal spiracle

*Linepithema* P 70, 83

Petiolar scale low, the dorsal apex situated under the level of propodeal spiracle

*Ochetellus* P 73, 85
FORMICINAE

*Polyrhachis lamellidens* F. Smith


FORMICINAE

*Polyrhachis moesta* Emery

FORMICINAE

_Polyrhachis dives_ F. Smith


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FORMICINAE

_Polyrhachis latona_ Wheeler

FORMICINAE

Camponotus shohki Terayama

Minor workers 2.5-3 mm, majors 5 mm. Head and mesosoma yellowish brown to reddish brown (sometimes blackish brown); gaster black. Distinguished from C. nipponicus by the longer heads of major workers (head length 1.10 mm, versus 1.00-1.05 mm), and shape of anterior margin of head, which has a pair of blunt projections visible in full face view. Arboreal.

FORMICINAE

Camponotus nipponicus Wheeler

Minor workers 2.5-3 mm, majors 5 mm. Head, mesosoma blackish brown to black; gaster black. Anterior margin of head in major workers straight, without projections in full face view. Arboreal. Nuptial flights: June and July.
FORMICINAE

Camponotus daitoensis Terayama

Majors 5.5-6 mm. Head, mesosoma, legs reddish brown; 1st gastric tergite yellowish brown anteriorly, darker posteriorly; remaining gaster blackish brown; pronotal and mesosomal dorsa, propodeum with short erect hairs. Minors 4 mm. Head, mesosoma, legs light yellowish brown; gaster color as in majors; pronotal dorsum hairless; mesonotal dorsum: a pair of erect hairs; propodeum: about 12 erect hairs.

Arboreal nests in dead twigs on trees.

FORMICINAE

Camponotus hemichlaena Yasumatsu & Brown

Workers 7-12 mm. Mesosoma (excluding pronotum), petiole, base of 1st gastric segment red; remainder black. Hairs on 2nd gastric tergite not exceeding posterior cephalic margin.

Distinguished from C. obscuripes by black pronotum (vs. red in obscuripes).
FORMICINAE

Camponotus friedae Forel

Minor workers 5 mm, majors 7-9 mm. Head black; mesosoma, antennae, legs brown; gaster blackish brown. In majors: mandibles: 5- or 6-toothed. Clypeus produced anteriorly, no anteromedian notch. Propodeal declivity sloping. Vertex, mesosomal dorsum, petiolar dorsum, gaster with long hairs. In minors: mandibles: 5-toothed; propodeal declivity sloping; mesosoma: abundant long hairs. Nests in soil, in forest, forest margins, grasslands. Relatively rare.

FORMICINAE

Camponotus ogasawarensis Terayama & Satoh

Workers 4-5.5 mm. Head, mesosoma, petiole yellowish-brown; gaster black, with 2 or 3 pairs of yellow spots (sometimes transversely merged). Propodeal dorsum concave in minors. majors have straight dorsal mesonotal, propodeal profiles, and anterior end of propodeum bluntly angulate. Petiolar profile an inverted U-shape. Arboreal, nests in dead twigs on trees.
FORMICINAE

Camponotus bishamon Terayama

Workers 4-4.5 mm. Black. Resembles *C. vitiosus*, but has straight or weakly concave dorsal propodeal margin and asymmetrical petiolar scale profile (anterior margin shorter than posterior margin). Arboreal.

FORMICINAE

Camponotus vitiosus F. Smith

Workers 5-6 mm. Black; legs blackish brown; pronotum often brownish. Propodeal dorsum concave in lateral view. Petiole thick, with inverted U-shaped profile. Arboreal, nests in dead twigs on trees.
**FORMICINAE**

*Camponotus nipponensis* Santschi

Workers 4-5 mm. Black to blackish brown. Anterior clypeal margin notched medially. Mesosomal dorsum with over 20 long, flagellate hairs; similar hairs on petiolar dorsum. Separated from other Japanese members of subgenus (*Myrmelionia*) by abundant long hairs on mesosome and petiole. Relatively rare.

**FORMICINAE**

*Camponotus yamaokai* Terayama & Satoh

Workers 3.5-4.5 mm. Black; pronotum reddish brown; legs brown; a pair of whitish gastric spots. Resembles *C. nawai*, distinguished by more prominent eyes, smaller relative head size in minors and majors; petiolar scale in minors is thinner than in *nawai*; thinner and wider in dorsal view in majors. Polygynous. Nests in woods near seashores; nuptial flights in May after overwintering. Arboreal, nests in dead twigs on trees.
FORMICINAE
Camponotus nawai Ito

Workers 4-4.5 mm. Ground color black; pronotum reddish to blackish brown; legs brown; gaster usually with 2 pairs of whitish spots. Propodeal dorsum straight in lateral view; petiole thin. Monogynous. Found in woods near the sea. Nuptial flights in August.

FORMICINAE
Camponotus itoi Forel

Workers 3.5-4.5 mm. Black. Mesonotal dorsum flat in lateral view; propodeal declivity the most abruptly declivitous in subgenus (Myrmamblys), of which this is the smallest Japanese species. Arboreal. Nests in dead twigs on standing trees.
**Camponotus quadrinotatus** Forel

Workers 5-6 mm. Black; pronotum often brownish. Gaster with two pairs of yellowish spots. Metanotal groove not incised dorsally; petiole with hairs. Arboreal. Nests in bark or crevices on tree trunks.

**Camponotus keihitoi** Forel

FORMICINAE

*Camponotus amamianus* Terayama

Workers 7-13 mm. Black, legs black to reddish brown. Anterior clypeal margin straight in minors, concave medially in majors. Mesosomal dorsum moderately convex from pronotum to propodeum; posterodorsal propodeal corners not angular in profile. Mesonotal dorsum: fewer than 6 hairs; propodeal dorsum: a single pair of erect hairs.

Nests in dead portions of tree trunks and soil in forest.

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FORMICINAE

*Camponotus kiusiuensis* Santschi

Workers 8-11 mm. Black, sometimes brownish; legs brown. Anterior clypeal margin medially concave. Posterodorsal propodeal corner bluntly angulate in profile.

Polydomous nests, each with less than 300 workers, in dead bamboo stems or trees. Rare on Hokkaido.
FORMICINAE

Camponotus kaguya Terayama

Workers 7-12 mm. Head blackish brown; mesosoma, petiole, legs, 1st and 2nd gastral terga reddish brown; 3rd to 5th black. Anterior clypeal margin weakly produced; convex medially. Mandibles 6-toothed. Scapes of minors long: 1.3-1.4 times head width. Mesosomal dorsum strongly convex, sloping from anterior pronotum to posterior propodeum. Posterodorsal propodeal corner rounded, not angulate.

Nests in soil in grasslands.

FORMICINAE

Camponotus albosparsus Bingham

Workers 4-7 mm. Head blackish brown; mesosoma, petiole, legs brown; gaster black, with 2 pairs of yellow spots. Anterior clypeal margin straight. Mandibles 6-toothed. Scapes 1.2-1.3 times head width in minors, just exceeding posterior cephalic border in majors. Petiole relatively high, profile an inverted V-shape. Head and mesosoma relatively hairy.
FORMICINAE

*Camponotus yambaru* Terayama

Yellowish brown. Majors 5 mm: mandibles 6-toothed; scapes short, reaching cephalic margin; mesosoma short, pro- and mesonotal dorsa flat; pronotal disc wide; pro- and mesonotal dorsa: 2 to 4 hairs; propodeum: about 10; petiolar scale thin. Minors 3.5 mm: mandibles 5-toothed; scapes exceeding cephalic margin, Pronotum: without hairs; mesonotum: one pair; propodeum: about 10. Arboreal. Nests in dead twigs on trees and bamboo.

FORMICINAE

*Camponotus monju* Terayama

Workers 7-10 mm. Head, gaster blackish brown; mesosoma, petiole, legs brown to blackish brown. Resembles *C. devestitus*, distinguished by more abundant erect hairs on head, dorsa of pronotum and mesonotum, and fore coxae.
**FORMICINAE**

*Camponotus devestivus* Wheeler

Workers 7-10 mm. Head brown; mesosoma, petiole, legs yellowish brown; gaster brown to blackish. Head long. Clypeus apically truncated. Mandibles 6-toothed. Scapes long, 1.8 times head width in minors, exceeding cephalic margin by 1/4 their length in majors. Petiole in profile thick, triangular. Pronotum: no erect hairs; mesonotum: one pair; fewer than 3 hairs on forecoxae. Nests in tree trunks, dead twigs.

**FORMICINAE**

*Camponotus* sp. 6

Workers 7-9 mm. Black. Propodeal dorsum short, so the mesosoma appears compressed in length. Resembles *C. japonicus*, distinguished by (1) 2nd gastral tergite with non-overlapping pubescence (overlapping in *C. japonicus*); (2) individual hair length 1.5-2 times distance separating them; (3) head and mesosomal pubescence sparse and shorter.
**Camponotus yessensis** Yasumatsu & Brown

Workers 7-12 mm. Shining black. Head, scapes, dorsum of mesosoma with numerous long hairs. Easily distinguished from other Japanese ants of subgenus *Camponotus* by its dense, long erect hairs. Nests in dead portions of tree trunks. Widely distributed, but sporadic and rare.

**Camponotus obscuripes** Mayr

Workers 7-12 mm. Mesosoma, petiole, gastric base yellowish to reddish brown, remainder black. Hairs on 2nd gastric tergite short. Resembles *C. hemichlaena*, distinguished by red pronotum (versus black). High mountain populations darker than others. Nuptial flights May to June in lowlands, until August in mountains. Nests in dead portions of standing trees or rotting wood in forests.
**FORMICINAE**

*Camponotus japonicus* Mayr

Workers 7-12 mm. Black; head sub-opaque, not shining. Promesonotal profile gently convex. Posterodorsal propodeal corner more rounded, propodeal declivity more gently declivitous than in *C. herculeanus*. 2nd gastric tergite with hairs in 4-8 overlapping rows; hairs 3-5 times as long as interspaces. Promesonotum with few erect hairs. Nests in soil in open habitats. Nuptial flights May to June.

**FORMICINAE**

*Camponotus sachalinensis* Forel

Workers 7-12 mm. Black, somewhat shining. Promesonotal dorsum not distinctly raised. Posterodorsal propodeal corner more strongly angulate, propodeal declivity more steep than in *C. japonicus*. Promesonotal dorsum with hairs lacking or sparse. Found in mountainous regions of Honshu and Hokkaido.
**Polyergus samurai** Yano


A slave-making species, usual host *Formica japonica*. Nests in soil, seldom abroad except when raiding (usually around late afternoon in summer, when cocoons of slave species are present). Nuptial flights in July.

**Formica hayashi** Terayama & Hashimoto

Workers 5.5-7 mm. Black. Slender. Antennae, femora, tibiae blackish brown. Head posteriorly slightly shining (compare *F. japonica*). In life gastral tergites appear velvety (greyish in *japonica*). Gastral tergite II virtually lacking setae, unlike *japonica* and *F. lemani*.

Abundant at woodland margins, penetrating grassland in south. Nests under stones etc. Nuptial flight 2 to 3 weeks later than *F. japonica*. 
Subfamily FORMICINAE

Polyrhachis lamellidens F. Smith

Original Reference: Smith, F. (1874)
Distribution: Honshu, Shikoku, Kyushu, Yaku I.; Mainland
China, Korea, Hong Kong, Taiwan.

Total length of workers around 7-8 mm. Body bicolored; head, legs
and gaster black; mesosoma and petiole reddish brown. Dorsal sur-
face of mesosoma flattened, dorsolateral edges carinate. Pronotum
with a pair of forwardly-directed spines. Mesonotum with a pair of
backwardly curved spines. Propodeal spines long, their apices
curved. Dorsolateral margins of propodeum carinate. Petiole with a
pair of long, hooked spines.

This species is referable to subgenus Polyrhachis (s. str). It
could be a temporary social parasite, since its queens have been
reported to invade the nests of Camponotus japonicus, C.
obscuripes, and probably C. kiusuiensis by Sakai (1990). Nests are
found in hollow tree trunks. The nuptial flights occur from
September to November.

Polyrhachis moesta Emery

Original Reference: Emery, C. (1887)
Synonym(s): Polyrhachis hippocanes var. moesta Emery (Emery,
1887)
Polyrhachis moesta Emery (Wang & Wu, 1991)
Distribution: Honshu (Kanto District and southwards), Shikoku,
Kyushu, Yaku I., Nansei Is.; Mainland China, Taiwan, Indonesia
(Java, Sumatra).

Total length of workers around 6 mm. Body color jet black, legs
reddish brown. Dorsal surface of mesosoma arched, without dorso-
lateral carination. Metanotal dorsum strongly convex in profile.
Anterolateral corners of pronotum angulate in dorsal view, without
spines. Mesonotum without teeth. Propodeum with well developed
spines. Petiole with a pair of large spines. Viewed anteriorly, dorsal
margin of petiolar scale straight, with a small cornicle posteriorly.

This taxon was cited as P. hippocanes moesta in Myrmecological Society of Japan Editorial Committee (1988). The
subspecies moesta was subsequently raised to species rank by
reported a nest incorporating larval silk. A relatively rare species.

Polyrhachis dives F. Smith

Original Reference: Smith, F. (1857)
Distribution: Nansei Is (Okinawa I. and southwards); Mainland
China, Taiwan, Philippines, SE Asia, New Guinea.

Total length of workers around 5 - 6 mm. Body color black.
Mesosoma covered with coarse punctures. Head and gaster with
white to whitish yellow pubescence. Dorsal surface of mesosoma
arched, dorsolateral margins not carinate. Pronotum with a pair of
well-developed teeth directed laterally. Mesonotum without teeth.
Propodeum with a pair of well-developed teeth. Petiole with a pair
of long lateral spines, which are longer than those of mesosoma,
and a pair of small median cornicles.

This species is referable to subgenus Myrmhopla. Its nests are
found on grasses or trees. They are constructed by the ants using
plant leaves and dead twigs, which are woven together with larval
silk (Takahashi, 1937; Takamine, 1983). This species is polygy-
nous, including around 50 females in a colony (Yamauchi et al.,
1989).
**Polyrhachis latona** Wheeler

*Original Reference:* Wheeler, W. M. (1909)

*Distribution:* Nansei Is (Sakishima group); Taiwan.

Total length of workers around 5 - 6 mm. Body color black with dense whitish pubescence. Dorsal outline of mesosoma roundly convex in profile, the dorsal surface transversely flat with lateral margination. Pronotum with a pair of acute teeth directed forwards. Mesonotum without teeth. Propodeum with small teeth; posterodorsal margin carinate. Petiole with two pairs of spines, the inner pair larger than the others; dorsal margin of petiole with a median blunt angle in frontal view.

This species is referable to subgenus *Myrma*. It is commonly distributed in the Sakishima group of the Nansei Islands. It nests in the soil.

**Camponotus shohki** Terayama


*Distribution:* Nansei Is (Yoron-jima I. and southwards), Daito Is.

Total length around 2.5 - 3 mm in minor workers and around 5 mm in major workers. Head and mesosoma yellowish brown to reddish brown (sometimes blackish brown); gaster black.

This species is distinguished from *C. nipponicus* by the much longer heads of its major workers (head length about 1.10 mm, versus 1.00 - 1.05 mm in *C. nipponicus*), and the shape of the anterior margin of the head, which has a pair of blunt projections visible in full face view. This is an arboreal species.

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**Camponotus nipponicus** Wheeler

*Original Reference:* Wheeler, W. M. (1928)

*Synonym(s):* Camponotus (Colobopsis) rothneyi Forel (Wheeler, 1906)

*Camponotus (Colobopsis) truncatus* Spinola (Ito, 1914)

*Distribution:* Honshu (Kanto District and southwards), Shikoku, Kyushu, Yaku I., Nansei Is. (Amami-osshima I., Tokunoshima I., Tokashiki-jima I.), Ogasawara Is.

Total length around 2.5 - 3 mm in minor workers and around 5 mm in major workers. Head and mesosoma blackish brown to almost black; gaster black. Anterior margin of the head in major workers straight, without projections in full face view.

This species is arboreal. Nuptial flights occur during June and July.

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**Camponotus daitoensis** Terayama


*Distribution:* Daito Is (Minami-daito I.).

Total length around 4 mm in minor workers; 5.5 - 6 mm in major workers. In major workers: head, mesosoma and legs reddish brown; 1st gastral tergite yellowish brown excepting posterior margin which is blackish brown to black; 2nd to terminal segments blackish brown to black; pronotal dorsum with several relatively short erect hairs; mesonotal dorsum with 4 to 6 such hairs; propodeum with more than 10 erect hairs. In minor workers: head, mesosoma and legs light yellowish brown; coloration of gaster as in the major worker; pronotal dorsum without hairs; mesonotal dorsum with a pair of erect hairs; propodeum with about 12 erect hairs.

This is an arboreal species which nests in dead twigs on trees.

**Camponotus hemichlaena**

*Yasumatsu & Brown*

*Original Reference:* Yasumatsu, K. & Brown, W. L., Jr. (1951)

*Synonym(s):* Camponotus obscuripes hemichlaena Yasumatsu & Brown (Yasumatsu & Brown, 1951)

*Camponotus hemichlaena* Yasumatsu & Brown (Yasumatsu & Brown, 1957)

*Distribution:* Honshu (Chugoku District), Shikoku, Kyushu, Yaku I.

Total length of workers around 7 - 12 mm. Body bicolored: mesosoma (excluding pronotum), petiole and basal portion of 1st gastral segment red; the remainder black. Hairs on posterior section of 2nd gastral tergite not extending beyond its posterior margin.

This species is distinguished from *C. obscuripes* by its black
pronotum (pronotum red in C. obscures). It was originally described as a subspecies of C. obscuripes and later raised to species rank by Yasumatsu & Brown (1957). However, since no other morphological distinctions have been observed between it and C. obscuripes, separation from obscuripes depends exclusively on coloration. Further study on its taxonomic status is needed. Both C. hemidraena and C. obscuripes are present in Shikoku and Kyushu, with obscuripes tending to distribution at higher elevations. On Honshu, C. hemidraena is known only from Hiroshima.

Camponotus friedae Forel
Fig. p 21
Original Reference: Forel, A. (1912)
Distribution: Nansei Is (Amami-oshima I., Miyako I.); Taiwan, Mainland China.

Total length around 5 mm in minor workers and 7 - 9 mm in major workers. Head black; mesosoma, antennae and legs brown; gaster blackish brown. In major workers: mandibles each with 6 teeth (5 in smaller individuals); clypeus produced anteriorly, anterior margin without a median notch; propodeal declivity abruptly sloping; dorsum of mesosoma with more than 20 long, erect hairs; similar hairs also present on vertex of head, petiolar dorsum and gaster. In minor workers: mandibles each with 5 teeth; propodeal declivity abruptly sloping; mesosoma with more than 20 long, erect hairs.

This species nests in the soil and under stones in forest, at forest margins, and in grasslands. Relatively rare in Japan.

Camponotus ogasawarensis
Terayama & Satoh
Fig. p 21
Distribution: Ogasawara Is.

Total length of workers around 4 - 5.5 mm. Head, mesosoma and petiole yellow; ground color of gaster black; 1st to 3rd gastral tergites each with a pair of yellow spots or a yellow transverse band; 4th gastral tergite often with a pair of similar spots (absent in some individuals). Dorsal margin of propodeum concave in minor workers. Viewed from the side, major workers have straight dorsal mesonotal and propodeal profiles, and the anterior end of the propodeum forms a blunt angle. Petiolar scale with an inverted U-shaped profile.

This is an arboreal species which nests in dead twigs of trees.

Camponotus bishamoni
Terayama
Fig. p 22
Distribution: Honshu (southern parts), Shikoku, Kyushu, Yaku I., Nansei Is.

Total length of workers around 4 - 4.5 mm. Body black. This species resembles C. vitiosus, but is distinguished by the straight or very weakly concave dorsal margin of its propodeum and the asymmetrical shape of its petiolar scale (the anterior margin of the petiolar scale is shorter than the posterior margin in profile).

This is an arboreal species which is common in the Nansei Islands. It was referred to as Camponotus (Myrmamblys) sp. by Ono (1976), and Camponotus sp. "Senaga-umematsu-oo-ari" by Terayama & Satoh (1990c).

Camponotus vitiosus F. Smith
Fig. p 22
Original Reference: Smith, F., (1874)
Synonym(s): Camponotus itoi tokioensis Ito (Ito in Forel, 1912) Camponotus (Myrmamblys) itoi tokioensis Ito (Emery, 1925) Camponotus (Myrmamblys) itoi tokioensis Ito (Wheeler, 1928) Camponotus (Myrmamblys) tokioensis v. inconstans Santschi (Santschi, 1937) Camponotus (Myrmamblys) tokioensis v. atrigenatus Santschi (Santschi, 1937) Camponotus (Myrmamblys) tokioensis[!] Ito (Menozzi, 1940) Camponotus (Myrmamblys) tokioensis Ito (Terayama & Satoh, 1990)
Distribution: Honshu, Shikoku, Kyushu; Mainland China, Korean Peninsula.

Total length of workers around 5 - 6 mm. Body black; legs blackish brown; pronotum often brownish. Propodeal dorsum concave in lateral view. Petiole thick, with an inverted U-shaped profile.

C. tokioensis Ito was synonymized with C. vitiosus by Yamanaka and Terayama (1999). This is an arboreal species which nests in dead twigs of trees.

Camponotus nipponensis Santschi
Fig. p 23
Original Reference: Santschi, F. (1937)
Distribution: Honshu; Korean Peninsula.

Total length of workers around 4 - 5 mm. Body black to blackish brown. Anterior margin of clypeus with a median notch. Dorsum of mesosoma with more than 20 long, flagellate hairs; similar hairs also present on petiolar dorsum.
This species is easily separated from the other Japanese members of subgenus (*Myrmomenta*) by the abundant long hairs on its mesosoma and petiole. It is distributed from lowlands to lower mountainous regions and is relatively rare.

Total length of workers around 3.5 - 4.5 mm. Body black; pronotum reddish brown; legs brown. First and 2nd gastric terga each with a pair of whitish spots which vary intraspecifically in size.

This species resembles *C. nawai*, but is distinguished by its much more prominent eyes and smaller relative head size in minor and major workers. Also, in minor workers, the petiolar scale is thinner in lateral view than in *C. nawai*; while in major workers it is thinner and wider in dorsal view than in *C. nawai*. *C. nawai* is monogynous, nests in woods near seashores, nuptial flights occur during August. *C. yamaokai* is polygynous, new queens overwinter in the nests and decamp during May (Satoh, 1989). This species is arboreal and nests in dead twigs on trees.

**Camponotus yamaokai**
*Terayama & Satoh*

![C. nipponensis](image1) ![C. yesensis](image2)

**Fig. p 23**

**Original Reference:** Terayama, M. & Satoh, T. (1990a)

**Distribution:** Honshu, Shikoku, Kyushu, Yaku I.

Total length of workers around 4 - 4.5 mm. Ground color of body black; pronotum reddish brown to blackish brown; legs brown; 1st and 2nd gastric terga each with a pair of whitish spots, which vary from well-developed to almost absent. Propodeal dorsum straight in lateral view; petiole thin.

The Izu Islands and central Honshu populations show slight morphological differences in petiolar scale and coloration from those of the Kii Peninsula and Shikoku. Further studies are needed to determine the range of this species in Japan. *C. nawai* is monogynous. It is distributed in woods near the sea coast (Satoh 1989). Nuptial flights occur during August. *C. yamaokai*, on the other hand, is polygynous, with nuptial flights during May. It is distributed from lowlands to mountainous regions. *C. nawai* is arboreal and nests in dead twigs. In "A List of the Ants of Japan with Common Japanese Names" (Myrmecological Society of Japan Editorial Committee, 1988), the name "nawai" was listed as a variety of *C. itoi*. Terayama & Satoh (1990a) later raised it to full species rank.

![C. nawai](image3) ![C. itoi](image4)

**Fig. p 24**

**Original Reference:** Forel, A. (1912)

**Distribution:** Honshu, Kyushu; Korean Peninsula.

Total length of workers around 3.5 - 4.5 mm. The smallest Japanese species in subgenus (*Myrmamblys*). Body black. Mesonotal dorsum flat in lateral view; propodeal declivity the most abruptly declivitous in subgenus (*Myrmamblys*).

This is an arboreal species. It nests in dead twigs on standing trees.

**Camponotus quadrinotatus**

![C. yamaokai](image5) ![C. nawai](image6)

**Fig. p 25**

**Original Reference:** Forel, A. (1886)

**Synonym(s):** *Camponotus mariginatus* var. *quadrinotatus* Forel (Forel, 1886)

**Camponotus* (Myrmentoma) caryae* var. *quadrinotatus* Forel (Wheeler, 1928)

**Camponotus quadrinotatus** Forel (Collingwood, 1976)

**Distribution:** Hokkaido, Honshu, Shikoku, Kyushu; Mainland
Camponotus keihitoi Forel

Original Reference: Forel, A. (1913)

Synonym(s): Camponotus fallax var. keihitoi Forel (Forel, 1913) [Replacement name for C. tokyoensis Teranishi (Teranishi, 1915)]
Camponotus tokyoensis Teranishi (Teranishi, 1915)
Camponotus caryae var. keihitoi Forel (Wheeler, 1923)
Camponotus (Myrmotoma) caryae var. teranishii Wheeler (Wheeler, 1928)
Camponotus keihitoi Forel (Terayama & Satoh, 1990)

Distribution: Honshu, Shikoku, Kyushu; Korean Peninsula.

Total length of workers around 4.5 mm. Body black, evenly shining. Dorsa of mesosoma and petiole without hairs. Metanotal groove distinctly incised dorsally.

This is an arboreal species, nesting in dead twigs on standing trees. The name "keihitoi" was listed as a variety of Camponotus caryae in "A List of the Ants of Japan with Common Japanese Names" (Myrmecological Society of Japan Editorial Committee, 1988), but Terayama and Satoh (1990b) later raised it to full species rank.

Camponotus amamianus Terayama


Distribution: Amami-oshima I.

Total length of workers around 7 - 13 mm. Body jet black, legs jet black to reddish brown. Anterior margin of clypeus straight in minor workers, concave medially in medium and major workers. Dorsum of mesosoma moderately convex from pronotum to posterior portion of propodeum; posterodorsal corner of propodeum not forming an angle in profile. Mesonotal dorsum with fewer than 3 pairs of hairs; propodeal dorsum with a single pair of erect hairs.

This species is found in forests. It nests in dead portions of tree trunks and in the soil.

Camponotus kiusiuensis Santschi

Original Reference: Santschi, F. (1937)

Distribution: Hokkaido, Honshu, Shikoku, Kyushu, Yaku I.; Korean Peninsula.

Total length of workers around 8 - 11 mm. Body black, sometimes slightly brownish; legs brown. Anterior margin of clypeus medially concave. Posterodorsal corner of propodeum bluntly angulate in profile.

This species nests in dead bamboo stems or trees. Its colonies occupy several small nests, each with less than 300 workers. For this reason queens are seldom found in nests (Ito et al., 1988). Foraging is largely nocturnal, but above-ground activity occurs during the day in dark forests (Sonobe, 1984). This species is rare on Hokkaido.

Camponotus kaguya Terayama


Distribution: Nansei IIs (Akuseki-to I., Amami-oshima I., Tokunoshima I., Okinawa I.).

Large species: total length of workers around 7 - 12 mm. Head blackish brown; mesosoma, petiole, legs and 1st and 2nd gastral terga reddish brown; 3rd to 5th gastral terga black. Anterior margin of clypeus weakly produced; convex medially. Mandibles each with 6 teeth. Scapes of minor workers long: 1.3 - 1.4 times head width. Mesosomal dorsum strongly convex, sloping from anterior portion of pronotum to posterior portion of propodeum. Posterodorsal corner of propodeum rounded, not forming an angle.
This species is found in grasslands and nests in the soil.

**Camponotus albosparsus** Bingham

*Fig. p 27*

**Original Reference:** Bingham, C. T. (1903)

**Synonym(s):** Camponotus tayloiri var. albosparsus Bingham (Bingham, 1903)

*Camponotus albosparsus* Bingham (Wang et al., 1989)

**Distribution:** Nansei Is (Sakishima Is); Taiwan, China (southern parts), SE Asia.

Total length of workers around 4 - 7 mm. Head blackish brown; mesosoma, petiole and legs brown; gaster black, 1st and 2nd gastric terga each with a pair of yellow spots (often merging on the 1st tergite). Anterior margin of clypeus straight. Mandibles each with 6 teeth. Scapes short: 1.2 - 1.3 times the head width in minor workers, and just exceeding the posterior border of the head in majors. Petiole relatively high, with an inverted V-shaped profile. Head and mesosoma with relatively abundant erect hairs.

This species is widely distributed in Southeast Asia. Nests are found in soil in open country or grassland.

**Camponotus yambaru** Terayama

*Fig. p 28*

**Original Reference:** Terayama, M. (1999)

**Distribution:** Northern part of Okinawa I.

Total length around 3.5 mm in minor workers, 5 mm in majors. Body color yellowish brown. In major workers: head somewhat darker than mesosoma and gaster; mandibles each with 6 teeth; scapes short, just reaching posterior margin of head; mesosoma short, pro- and mesonotal dorsa almost flat in profile; in dorsal view, pronotal disc wide; propodeal declivity abruptly declivitous; dorsum of pro- and mesonotal each with 2 to 4 erect hairs; propodeum with about 10 erect hairs; petiolar scale thin, with hairs dorsally. In minor workers: mandibles each with 5 teeth; scapes each exceeding posterior margin of head by 1/3 its length; pronotal dorsum without erect hairs; mesonotal dorsum with a pair of erect hairs; propodeum with about 10 erect hairs.

This is an arboreal species which nests in dead twigs on trees and bamboo internodes. It is known only from the northern part of Okinawa.

**Camponotus monju** Terayama

*Fig. p 28*

**Original Reference:** Terayama, M. (1999)

**Distribution:** Kyushu (Unzen), Ryukyu Is; Taiwan.

Total length of workers around 7 - 10 mm. Head and gaster blackish brown to black; mesosoma, petiole and legs brown to blackish brown.

This species resembles *C. devestivus*, but is distinguished by the much more abundant erect hairs on the head, the dorsa of the pronotum and mesonotum, and the fore coxae.

**Camponotus devestivus** Wheeler

*Fig. p 29*

**Original Reference:** Wheeler, W. M. (1928)

**Distribution:** Honshu (Kanto District and southwards), Shikoku, Kyushu, Yaku I., Ryukyu Is (Tokunoshima I. and northwards).

Total length of workers around 7 - 10 mm. Head brown to dark brown; mesosoma, petiole and legs yellowish brown; gaster brown to blackish brown. Head long. Clypeus apically truncated. Mandibles each with 6 teeth. Scapes long, more than 1.8 times head width in minor workers, exceeding posterior margin of head by 1/4 their length in major workers. Petiolar scale thick and triangular in profile. Pronotum without erect hairs; mesonotum with only one pair of erect hairs; fewer than 3 hairs on anterior coxae.

This species nests in tree trunks or dead twigs. Three worker subcastes are recognized (Harada 1993-1996).

**Camponotus sp. 6**

*Fig. p 29*

**Distribution:** Senkaku Is (Uotsuri-jima I.).

Total length of workers around 7 - 9 mm (based on 2 individuals only). Color black. Propodeal dorsum short, so that the mesosoma appears compressed in length.

This species resembles *C. japonicus*, but is distinguished from it by the following characteristics: (1) 2nd gastric tergite with sparse pubescence, the hairs not overlapping their neighbours (they overlap in *C. japonicus*); (2) the length of the individual hairs of the pubescence 1.5 to 2 times the distance separating them; (3) pubescence on head and mesosoma more sparse and shorter than in *C. japonicus*. This species is found only on Uotsuri-jima Island. *C. japonicus* has been recorded from Okinawa Island, Ishigaki Island, Iriono Island and Senkaku Is (Ikehara & Shimojana, 1971; Takara & Azuma, 1973). The relevant records could involve...
Camponotus yessensis
Yasumatsu & Brown

Fig. p 30

Original Reference: Yasumatsu, K. & Brown, W. L., Jr. (1951)

Synonym(s): Camponotus (Camponotus) herculeanus vagus var. yessensis Teranishi (Teranishi, 1940)

Camponotus yessensis Yasumatsu & Brown (Yasumatsu & Brown, 1951)

Distribution: Hokkaido, Honshu, Shikoku, Kyushu.

Total length of workers around 7 - 12 mm. Body color shining black. Head, scape and dorsal part of mesosoma with numerous long, erect hairs.

This species is easily distinguished from other Japanese ants of subgenus Camponotus by its dense, long erect hairs. C. yessensis nests in dead portions of tree trunks. It is widely distributed in the Japanese archipelago, but sporadic and rare.

Camponotus obscursipes Mayr

Fig. p 30

Original Reference: Mayr, G. (1879)

Synonym(s): Camponotus ligniperdus var. obscursipes Mayr (Mayr, 1879)

Camponotus obscursipes Mayr (Yasumatsu & Brown, 1957)

Distribution: Hokkaido, Honshu, Shikoku, Kyushu, Tsushima I., Yaku I.; Kurile Is, Sakhalin.

Total length of workers around 7 - 12 mm. Body bicolored: mesosoma, petiole and basal part of gaster red (sometimes yellowish brown to reddish brown); the remainder black. Hairs on 2nd gaster tergite short, those of the most posterior row not extending beyond posterior margin of the tergite.

This species resembles C. hemichlaena, but is distinguished by its reddish pronotum (pronotum black in hemichlaena). Color variation is seen in some populations. For example, the body is almost black except for the petiole and adjacent areas which are reddish in Obihiro, Hokkaido; or completely black at Mt. Kuju, Kyushu. In these cases C. obscursipes is distinguished from other black Japanese Camponotus species, except C. yessensis, by the short pubescence on its 2nd gaster tergite. C. obscursipes is distributed from lowland to mountain areas. The high mountain populations tend to be darker in color than lowland ones. Nuptial flights occur from May to June in lowlands, and until August in the mountains. This species is found in forested areas. It nests in dead portions of standing trees or in rotting wood. The black woodpecker Dryocopus martius feeds preferentially on C. obscursipes in Hokkaido.

Camponotus japonicus Mayr

Fig. p 31

Original Reference: Mayr, G. (1866)

Synonym(s): Camponotus pennsylvanicus var. aterrima Emery

Camponotus herculeanus saxatilis Ruzsky (Ruzsky, 1895)

Camponotus herculeanus japonicus Mayr (Yasumatsu & Brown, 1951)

Distribution: Hokkaido, Honshu, Shikoku, Kyushu, Tsushima I., Yaku I., Tokara Is (Suwanose-jima I. and northwards); Mainland China, Korean Peninsula.

Total length of workers around 7 - 12 mm. Body color black; head subopaque, not shining. Promesonotum gently convex in profile. Posterodorsal corner of propodeum more rounded, and propodeal declivity more gently declivitous than in C. herculeanus. Hairs on 2nd gaster tergite arranged in 4 to 8 rows, each overlapping the next; the hairs 3 - 5 times as long as their interspaces. Promesonotum with a few erect hairs.


Polyergus samurai Yano

Fig. p 32

Original Reference: Yano, M. (1911)

Synonym(s): Polyergus rufigenans subsp. samurai Yano 1911
Polyergus samurai: Emery, 1925

**Distribution:** Hokkaido, Honshu, Shikoku, Kyushu; Mainland China, Korean Peninsula.

Total length of worker about 7 mm. Body color somewhat brownish black. Antennal insertions situated adjacent to posterior margin of clypeus. Posterior border of head narrowed. Promesonotum not especially protrusive; spiracles of mesothorax conspicuously raised. Posterodorsal portion of propodeum slightly angulate and raised.

This species much resembles its slave *Formica japonica* Motschoulsky in size and color, but is distinguishable by its slightly larger size, more blackish body colour and sickle-shaped mandibles (versus subtriangular in *F. japonica*). *Formica japonica* is its main slave, and sometimes *F. hayashi*. A colony comprising three species, with both *F. fukaii* Wheeler and *F. japonica* as slaves, has been observed on Mt. Zao, Miyagi Prefecture (Sonobe, unpublished); this seems to be a rare occurrence. *P. samurai* nests in the soil and is seldom seen on the ground except when slave-raiding. Raids are carried out at around 3 to 4 pm during summer, when cocoons of slave species are to be found. Hasegawa & Yamaguchi (1995) reported the detailed ecology and raiding behavior of this species. Less common in Shikoku and Kyushu than elsewhere. Nuptial flights occur around July. Chromosome number n = 27 (Crozier, 1970).

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*Formica hayashi*

Terayama & Hashimoto

**Original Reference:** Terayama, M. & Hashimoto, Y. (1996)

**Distribution:** Hokkaido (Sapporo and southwards), Honshu, Shikoku, Kyushu, Tsushima I., Yaku I.; southern part of Korean Peninsula.

Total length of workers around 5.5 - 7 mm. Body color black. Antennae, femora and tibiae dark brown to blackish brown, tarsi a little lighter. Posterior margin of head slightly shining, and thus different from *F. japonica*. It is easy to distinguish the two species in the field: the gastral tergites have a velvety sheen in *Formica hayashi*, and those of *F. japonica* are greyish. In museum specimens this species is distinct from *F. japonica* and *F. lemani* because it virtually lacks setae on gastral tergite II. Head and body slender.

*F. hayashi* was described by Terayama & Hashimoto (1996), and corresponds to the former *F. sp. 5* of Myrmecological Society of Japan Editorial Committee (1988). This species is abundant at woodland margins from low elevations to mountainous regions. In southern Kyushu it penetrates grassland areas and is more abundant there than *F. japonica*. It nests under stones or other covering material. The nuptial flight occurs 2 to 3 weeks later than in *F. japonica*.
**FORMICINAE**

*Formica candida* F. Smith

Workers 4-5.5 mm. Shining black, Mesosoma densely pubescent, weakly shining; pronotum, mesonotum, petiole brownish; legs, antennae blackish brown. Distinguished from other *Formica* by sparsity of pubescence on dorsum of first gastral tergite. Long white hairs often on ventral side of head. Nests in soil under stones.

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**FORMICINAE**

*Formica lemari* Bondroit

Workers 3.5-5.5 mm. Shining brownish black; mandibles, funiculi, legs brown; scapes, tibiae yellowish. *F. japonica* has different middle-leg tibial length/head width ratio. Erect setae on 1st, 2nd gastral tergites respectively numbering 10, 20, more than in *japonica*. Pronotal setae usually also more abundant. Nests in soil under stones, near grass roots. Flights from mid August.
FORMICINAE
Formica japonica Motschoulsky

Workers 4.5-6 mm. Greyish or brownish black. Similar to *F. hayashi*, but usually with 10+ erect setae on second gastral tergite, and dorsum of first gastral tergite with a few erect setae (averaging 4). Common in lowlands and mountains. Nests in soil. Flights early June to mid September (geographically variable). Pseudogynes in some colonies.

FORMICINAE
Formica gagatoides Ruzsky

Workers 4-5 mm. Greyish or brownish black. Similar to *F. japonica*: mesosoma more strongly reddish, gaster more polished. Distinguished from *F. candida* by dense pubescence on first gastral tergite, from other species by blackish color, sparsity of pubescence on third gastral tergite. Distributed at 2700 m. above sea level in central Honshu. Nuptial flights probably after late August.
**FORMICINAE**

*Formica yessensis* Wheeler

Workers 4.5-7 mm. Head, mesosoma, petiole, legs yellowish red-brown; gaster black, base reddish. Distinguished from *F. truncorum* by near absence of erect setae on extensor surfaces of hind tibiae and scapes. Upper petiolar border convex to flat.

Nest mounds of dead grass, conifer needles, ca. 1 m diameter. A supercolony of 45,000 nests, at Ishikari Bay, Hokkaido. Females relatively small. Flights in August.

**FORMICINAE**

*Formica truncorum* Fabricicus

Workers 4.5-7 mm. Color as in *F. yessensis*, sometimes more yellowish. Distinguished from other *Formica* by numerous erect setae on extensor surfaces of hind tibiae, and erect setae on scapes (variable). Erect, dense, frequently long, setae over entire body.

Mounds of dead grass, conifer needles ca, 1 m diameter.
**FORMICINAE**

*Formica fukaii* Wheeler

Workers 4.5-6.5 mm. Head, mesosoma, petiole yellowish to reddish brown; crown of head, median pronotum, antennal scapes, tibiae darker. Distinguishable from other *Formica* by concave posterior cephalic border. Dorsal petiolar border concave at center. No erect hairs on cranium, mesosoma, petiole, gastric tergites I, II. Builds small mounds of dead grass.

**FORMICINAE**

*Formica sanguinea* Latreille

Workers 6-7 mm. Head dark red to black; mesosoma, petiole, legs red; gaster black. Distinguished by concave median anterior clypeal border. Few erect setae on body. Males: concave anterior clypeal border; mandibles with 5 or more denticles. Does not build mounds. Frequently assembles mixed nests by raiding *F. japonica*, *F. lemni*, *F. candida*, and *F. hayashi*. Nuptial flights July to August.
FORMICINAE

Lasius teranishii Wheeler

Nuptial flights during July.

Lasius spathepus Wheeler

Nuptial flights June and August.
FORMICINAE

Lasius morisitai Yamauchi

Workers 4.5 mm. Black. Petiole high (+0.6mm), inverted V-shaped profile; lateral margins parallel; dorsal margin with shallow notch. Females: scapes with short decumbent hairs, no erect hairs; mesonotal dorsum with sparse erect hairs; petiole with inverted V-shape profile. Rare. Nuptial flights in July.

FORMICINAE

Lasius nipponensis Forel

**FORMICINAE**

*Lasius capitatus* (Kuznetsov-Ugamsky)

Workers 4-4.5 mm. Black. Petiole with inverted V-shaped profile; scale broadest at midlength, tapering dorsally, acutely convex above, without median notch. Females: scape, mesonotal dorsum with abundant erect hairs; petiole thin, high, acute dorsally in profile. Nuptial flights in September.

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**FORMICINAE**

*Lasius umbratus* (Nylander)

Workers 4-4.5 mm. Yellow. Distinguished from *L. hikosanus* by straight posterior propodeal margin. Females separated from *L. meridionalis* by relatively short scapes, circular in section, lacking erect hairs. Found in forests and at forest margins nesting in tree trunks. Nuptial flights July and August.
FORMICINAE

Lasius meridionalis (Bondroit)

Workers 4-4.5 mm. Yellow. Differs from L. hikosanus in possessing a straight posterior propodeal margin. Difficult to distinguish from L. umbratus, but females have relatively long, flattened scapes, with many long, erect hairs. Found in forests and at forest margins; nests in tree trunks, near the roots. Nuptial flights July to September.

FORMICINAE

Lasius hikosanus Yamauchi

Workers 4.5 mm. Yellow. Easily distinguished from L. umbratus and L. meridionalis by convex posterior margin of propodeum in profile. Rare. Nests at forested sites in trunks of standing trees, usually near the roots.
**Lasius talpa** Wilson

Workers 2-3 mm. Yellow. Scapes, tibiae with many erect hairs. Eyes small, (ca 0.08 mm diameter, 6-17 facets). Often common in southern Japanese forests. Nuptial flights August and September.

**Lasius sonobei** Yamauchi

Workers 2.5-3.5 mm. Yellow. Scape length 0.91-0.98x head width (usually exceeding 0.95 times). Eye diameter 0.07-0.10 mm. Scapes, tibiae lacking erect hairs. Abundant in southern Japan. Nests in soil and under stones. Nuptial flights August and September.
**FORMICINAE**

*Lasius flavus* (Fabricius)

Workers 2-3.5 mm. Yellow to yellowish brown. Scapes short, length 0.85 times head width. Eyes relatively large diameter +0.11 mm. each with more than 20 facets. Scapes, tibiae without erect hairs. Rare in south, common in north (Hokkaido, Tohoku district), especially in mountains, few lowland records. Nests in soil and under stones in grasslands, forest margins. Nuptial flights August and September.

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**FORMICINAE**

*Lasius sakagamii* Yamauchi & Hayashida

Workers 2.5-3.5 mm. Brown. Scapes as long as head width, with more than 30 erect hairs. Anterior tibiae: many erect hairs. Petiole thick, low, anterior margin bluntly angulate in lateral view.

Nests polygynous and polycalic in soil, dry environments, grasslands at riversides, seashores, multiplication by budding; sometimes with several hundred thousand inmates. Nuptial flights June to October.
FORMICINAE

*Lasius productus* Wilson

Workers 3.5-4.5 mm. Head, gaster dark brown, mesosoma brown. Scapes proportionately long, exceeding 1.12 times head width. Scapes, anterior tibiae usually without erect hairs. Petiole in lateral view with acutely angulate dorsum. Nests in rott ing wood, stumps, dead portions of tree trunks in broad-leaved deciduous forests. Nuptial flights August and September.

FORMICINAE

*Lasius japonicus* Santschi

Workers 2.5-3.5 mm. Blackish brown, mesosoma lighter than remainder. Scapes: 5 to 25 erect hairs. Petiole: dorsal margin bluntly angulate in profile; anterior margin bluntly angulate. Separated from *L. alienus* by erect hairs on scapes and anterior tibiae. Nests in soil, rotting wood in grasslands, forests, lowlands to 2000 m. Nuptial flights July and August.
FORMICINAE

Lasius hayashi Yamauchi & Hayashida

Workers 2-4 mm. Head, mesosoma light brown, gaster darker. Scapes slightly shorter than head width, with erect hairs. Petiole high, tip acutely angulate; anterior scale margin not angulate.

Nests in dead portions of tree trunks, near the roots. Nupial flights July and August.

FORMICINAE

Lasius alienus (Foerster)

Workers 2-2.5 mm. Blackish brown. Resembles L. japonicus, distinguished by (1) scapes and anterior tibiae lacking erect hairs or with fewer than 10; (2) dorsal pronotal width less than 0.70 mm.

Females: distinguished from L. japonicus by absence of erect hairs on antennal scapes and anterior tibiae.
FORMICINAE

Paratrechina sp. 11


FORMICINAE

Paratrechina yambaru Terayama

Workers 1.5-2 mm. Head, sides of mesosoma, legs dark brown; mesosomal dorsum, antennae, gaster blackish brown; tarsi whitish. Mandibles 6-toothed. Scapes exceeding cephalic margin by half their length, without hairs. Mesonotal dorsum: a pair of short erect hairs. Propodeum, hind femora, tibiae without erect hairs. Fragile, easily collapsed, cuticle.
FORMICINAE

*Paratrechina ogasawarensis* Terayama

Workers 2 mm. Head, mesosoma yellowish brown; gaster dark brown. Pronotal dorsum: 2 pairs long, erect hairs, 3 pairs short hairs; mesonotal dorsum: 2 pairs long erect hairs; propodeal dorsum lacking hairs. Resembles *P. amia*: the color lighter; mesonotal dorsum with fewer hairs than in *amia*. Nests in soil, leaf litter and rotting wood in grasslands and forests.

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FORMICINAE

*Paratrechina otome* Terayama

Workers 1.5-2 mm. Head, sides of mesosoma, gaster brown; antennae, mesosomal dorsum, petiole, legs brownish white. Mandibles 6-toothed. Scapes exceeding cephalic margin by half length; no erect hairs. Eyes small (<1/4 head length). Ocelli distinct. Propodeum, hind femora, tibiae without erect hairs. Distinguished from *P. longicornis* by shorter scapes, hairs; from *P. yambaru* by coloration.
FORMICINAE

Paratrechina yaeyamensis Terayama


FORMICINAE

Paratrechina nubatama Terayama

FORMICINAE

*Paratrechina ryukyuensis* Terayama

Workers 2 mm. Head, mesosoma, 1st gastal tergite brown; remaining gaster dark brown. Scape: moderate subdecumbent pubescence, erect hairs. Mesosoma darker than *P. flavipes*. Gaster uniformly dark brown except 1st tergite (unlike *P. yaeyamensis*). Erect hairs on scapes longer than *P. flavipes*; pubescence much more abundant than *P. yaeyamensis*.

Nests: leaf litter, rotting wood, soil, in grasslands and forests.

FORMICINAE

*Paratrechina amia* (Forel)

2.5-3 mm. Blackish brown; legs brown femora, tibiae lighter. Mandibles 6 toothed. Scape exceeding posterior cephalic margin by half length, erect hairs. Funicular segments as long as wide pronotal dorsum convex; mesonotal dorsum straight; metanotal groove incised. Head, gaster: abundant hairs. Pronota dorsum: 4 erect, 6 shorter hairs; mesonotal dorsum: 6 erect; none on propodeum. Hind femora, tibiae: erect, suberect hairs.
Formica candida F. Smith

Fig. p 41

Original Reference: Smith, F. (1878)

Synonym(s): Formica picea Nylander, 1846
Formica transcaucasica Nasonov, 1889
Formica fusca var. picea: Emery, 1909
Formica picea: Bondroit, 1912

Formica gagatoides: Kuznetsov-Ugamsky, 1929
Formica galaates var. piceogalatae Karavaiev, 1926
Formica picea var. piceoinplana Emery, 1925
Formica picea var. locomaster Stärcke, 1935

Formica fusca orientalis Ruzsky, 1915

Distribution: Hokkaido, Honshu (the central part and northwards), Kyushu (Mt. Kuju); northern Eurasia.

Total length of workers around 4 - 5.5 mm. Body generally strongly shining, black; Mesosoma covered with dense pubescence, weakly shining; pronotum, mesonotum and petiole slightly brownish; legs and antennae blackish brown.

This species is distinguished from others in Formica by the sparsity of pubescence on the dorsum of its first gastric tergite. Long white hairs are often seen on the ventral side of the head. F. candida nests in the soil under stones and near grass roots. Chromosome number 2n=52 (Imai, 1969) - different from other species of subgenus Serviformica, which have 2n=54. F. candida is the first available name of Tsuya-kuroyama-ari formerly identified as F. picea or F. transcaucasica (Bolton, 1995).

Formica lemani Bondroit

Fig. p 41

Original Reference: Bondroit, J. (1917)

Synonym(s): Formica lemani Bondroit 1917b
Formica fusca lemani: Müller, 1923
Formica (Serviformica) lemani: Emery, 1925b
Formica fusca subsp. borealis Vaskevich 1924b

Distribution: Hokkaido, Honshu (the central part and northwards; Mt. Misen, Nara Pref.; Mt. Daisen, Tottori Pref.), Shikoku (Mt. Ishizuchi etc.); Korean Peninsula, northern Eurasia.

Total length of workers around 3.5 - 5.5 mm. Body somewhat shining; brownish black; mandibles, funiculi and legs brown; scapes and tibiae yellowish. When indistinguishable by body color from F. japonica, the two species can be discriminated by the ratio of middle-leg tibial length to head width, or the density of pubescence on the second gastric tergite. The number of erect setae on the dorsa of the first and second gastric tergites in F. lemani average 10 and 20 respectively, and are thus relatively more abundant than in F. japonica. This is the case also for setae on the pronotal dorsum, which are more abundant on average in F. lemani than in F. japonica, though the two species are not readily distinguishable by this character because their separate ranges overlap.

F. lemani nests in the soil under stones and near grass roots. Reproductive alates fly after mid August at Mt. Zao, Miyagi Prefecture.

Formica japonica Motschoulsky

Fig. p 42

Original Reference: Motschoulsky, V. de. (1866)

Synonym(s): Formica japonica Motschoulsky, 1866
Formica fusca var. nipponensis Forel, 1900
Formica fusca var. japonica: Emery, 1909
Formica fusca japonica: Emery, 1925
Formica japonica: Dlussky, 1967

Distribution: Hokkaido, Honshu, Shikoku, Kyushu, Yaku I.; Sakhalin, Kuril Is, east Siberia, Mongolia, Mainland China, Korean Peninsula, Taiwan.

Total length of workers 4.5 - 6 mm. Body color greyish black or brownish black. The most dully colored of Japanese Serviformica species. Very similar to Formica hayashi (Japanese name: Hayashi-kuroyama-ari), but distinguished by the usual presence of 10 or more erect setae on the second gastric tergite (the average 13), and by the dorsum of the first gastric tergite usually bearing a few erect setae (averaging 4, but lacking in some cases).

Common in lowlands and open mountainous regions all over Japan. This species nests in the soil. Its nests open directly at the ground surface and are nearly vertical, with a depth of 1 - 2 m. The number of workers in a colony may reach 16,000 (Kondoh, 1968a; Yamauchi & Suzuki, 1987). Sexual alates fly during early June to mid July in Tokyo (Kawai, 1942) and from August to September in Kochi (Okamoto, 1957). Pseudogynes are found in some colonies (Sonobe, 1974). Known inquilines are a histerid beetle, Hetaerus gratus Lewis (Kubota, 1965) and a short-winged mold beetle, Kigatodes gracilis (Sharp) (Sawada, 1974). Chromosome number 2n=54 (Imai & Yosida, 1964). There are three larval instars in the males (Imai, 1965).

Formica gagatoides Ruzsky

Fig. p 42

Original Reference: Ruzsky, M. (1904)

Synonym(s): Formica fusca var. gagatoides Ruzsky 1904a
F. (Serviformica) gagatoides: Emery, 1925b
Formica picea var. gagatoides: Emery, 1925b

Distribution: Central Honshu; northern Eurasia.
Total length of workers 4 - 5 mm. Body color greyish black or brownish black. Similar to *F. japonica*, but distinguished to the experienced naked eye by the mesosoma being strongly reddish (versus almost without reddish color in mature *F. japonica* workers). Gaster more polished than in *F. japonica*. *F. gogatoides* is distinguished from *F. candida* by its first gastral tergite being densely covered with pubescence, and from other species of the genus by its blackish color and relative sparsity of pubescence on its third gastral tergite.

This species was reported for the first time from Japan by Sonobe & Dlussky (1977) and Kondoh (1976). The records are few, but *F. gogatoides* is widely distributed at localities 2700 m. or more above sea level in central Honshu (North, South and Central Alps, Yatsugatake Mountains (Sonobe, 1979)). Nuptial flights probably occur after late August.

**Formica yessensis** Wheeler

*Fig. p 43*

**Original Reference:** Wheeler, W. M. (1913)

**Synonym(s):** *Formica rufa truncicola* var. *yessensis* Forel, 1901  
*Formica truncicola* var. *yessensis* Wheeler, 1913  
*Formica truncicola yessensis*: Ruzsky, 1926  
*Formica truncorum* var. *yessensis*: Wheeler, 1933  
*Formica yessensis*: Collingwood, 1976

**Distribution:** Southwest parts of Hokkaido, Honshu (the central part and northwards); Siberia, northeast Mainland China, Korean Peninsula, Taiwan.

Total length of workers 4.5 - 7 mm. Head, mesosoma, petiole and legs yellowish red-brown; head and mesosomal dorsa and legs a little darker; gaster black, its base somewhat reddish. Very similar to *F. truncorum*, but distinguished from it by the near absence of erect setae on the extensor surfaces of the hind tibiae and the scapes. The median portion of the upper petiolar border slightly convex to nearly flat.

This species builds discrete nests at relatively well insulated places. The mounds are up to 1 m in diameter, and constructed from dead grass or conifer needles. A huge supercolony consisting of 45,000 nests, which extend by budding, is present along the coast of Ishikari Bay, Hokkaido (Higashi & Yamauchi, 1979). Females are not particularly large when compared to workers, implying that *F. yessensis* is possibly a temporary social parasite, like *F. fukaii*. Reproductive alates fly in August (Ito & Imamura, 1974). Various studies have been carried out on the ecology of this species (Higashi, 1974, 1978a, 1978b; Imamura, 1974, 1978, 1982). The southernmost known locality in Honshu is Mt. Kintoki, Kanagawa Prefecture (Kondoh, 1961).

**Formica truncorum** Fabricius

*Fig. p 43*

**Original Reference:** Fabricius, J. C. (1804)

**Synonym(s):** *Formica truncicola* Nylander, 1846  
*Formica simulata* Smith, F. 1878  
*Formica rufa var. truncicoloopratensis* Forel, 1874  
*Formica truncorum* var. *menozii* Stitz, 1939  
*Formica rufa var. rufotritcum* Ruzsky, 1896  
*Formica truncorum* ab. *stizii* Stitz, 1939

**Distribution:** Northeastern parts of Hokkaido; Sakhalin, central parts of Eurasia and northwards.

Total length of workers 4.5 - 7 mm. Body color very similar to that of *F. yessensis*, but many workers are somewhat more yellowish. *F. truncorum* is distinguished from other species of *Formica* by the numerous erect setae on the extensor surfaces of its hind tibiae, and the presence of erect setae on the scapes. Erect, frequently long setae are densely present all over the body.

Variation is observed in the abundance of erect hairs on the extensor surfaces of the hind tibiae and scapes. In Japan the known geographical range of *F. truncorum* is nearly separate from that of *F. yessensis*, but further distributional analysis is desirable. This species builds discrete nests in well insulated situations. Mounds are up to 1 m. in diameter and constructed from dead grass or conifer needles. According to Kupianskaja (personal communication) there are differences in nest site preference and nesting habits between *F. truncorum* and *F. yessensis* in the Maritime Province of Siberia.

![F. yessensis](image) ![F. sanguinea](image)  
![F. yessensis](image) ![F. truncorum](image)

**Formica fukaii** Wheeler

*Fig. p 44*

**Original Reference:** Wheeler, W. M. (1914)

**Synonym(s):** *Formica exsecta var. fukaii* Wheeler, W.M., 1914  
*Formica (Coptiformica) mesasiatica* Dlussky, 1964  
*Formica fukaii*: Sonobe & Dlussky, 1977
**Distribution:** Hokkaido, Honshu; Sakhalin, central Asia (a closely similar form collected in the Maritime Province of Siberia probably represents this species).

Total length of workers around 4.5 - 6.5 mm. Head, mesosoma and petiole yellowish brown to reddish brown; crown of head, median dorsal area of pronotum, antennal scapes, and tibiae darker. Distinguishable from other species of *Formica* by the distinctly concave posterior border of the head. Dorsal border of petiole strongly concave at the center. No erect hairs on the head (except for the mandibles and clypeus), mesosoma, petiole or gastric tergites I and II.

Females usually construct founding nests singly, but in some cases they are temporary parasites of *F. japonica* Motschulsky (Kubota & Kondoh, 1954; Hayashida, 1963) or *F. lemani* Bondroit (Yamaoka, 1977). *F. fukaii* builds small mounds of dead grass and attends aphids and scale insects (Teranishi, 1934; Kono & Sugihara, 1939). It is the most westerly distributed of the red-colored Japanese *Formica* species, with many records from the Chugoku District. The westernmost collections are from Hiroshima and Tottori prefectures.

**Formica sanguinea** Latreille

*Fig. p 44*

**Original Reference:** Latreille, P. A. (1798)

**Synonym(s):** *Formica* (Raptiformica) *sanguinea*: Forel, 1913

*Formica dominula* Nylander, 1846

*Formica sanguinea* subsp. *arenicola* Kuznetsov-Ugamsky, 1928

*Formica* (Raptiformica) *sanguinea* var. *borea* Santschi, 1925

*Formica* (Raptiformica) *sanguinea* var. *clarior* Ruzsky, 1905

*Formica sanguinea* var. *fusciceps* Emery, 1895

*Formica sanguinea* var. *flavorubra* Forel, 1909

**Distribution:** Hokkaido, Honshu (the central part and northwards); northeast Mainland China, Sakhalin, Korean Peninsula, central Eurasia and northwards.

Total length of workers around 6 - 7 mm. Head dark red to black; mesosoma, petiole and legs red; gaster black. Dully shining. This species is distinguished from others in *Formica* by the median anterior border of its clypeus being concave. The body has only a few erect setae. Males of *F. sanguinea* are distinguishable from those of other *Formica* species by their mandibular dentition (the masticatory border has 5 or more prominent denticles) and concave median anterior clypeal border.

*F. sanguinea* does not build mounds. It is sometimes found in independent nests, but its colonies frequently assemble mixed nests by raiding one or two species from a set comprising *F. japonica*, *F. lemani*, *F. candida*, and *F. hayasii*. Hayashida (1966) observed *F. sanguinea* attacking *Myrmica yessensis* and stealing its larvae. Nuptial flights occur from July to August. The southernmost known locality in Honshu is Mt. Fuji.

**Lasius teranishii** Wheeler

*Fig. p 45*

**Original Reference:** Wheeler, W. M. (1928)

**Synonym(s):** *Lasius Ouchii* Teranishi (Teranishi, 1940)

**Distribution:** Hokkaido, Honshu (central Honshu and northwards); Korean Peninsula.

Total length of workers around 3.0 - 3.5 mm: somewhat smaller than the four other Japanese species of subgenus *Dendrolasius*. Color jet black. Petiole with an inverted U-shaped profile; the scale widest near its dorsal margin when viewed frontally; dorsal margin almost straight, without a median notch. In females, scapes very strongly flattened, with numerous decumbent hairs; mesonal dorsum also with many short decumbent hairs; petiole thick and low, the scale with an inverted U-shaped profile.

This species is distributed in mountainous areas and might be a temporary parasite of *L. flavus*. Nuptial flights take place during July (Yamauchi et al., 1986).

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**Lasius spathepus** Wheeler

*Fig. p 45*

**Original Reference:** Wheeler, W. M. (1910)

**Distribution:** Hokkaido, Honshu, Shikoku, Kyushu; Korean Peninsula.

Total length of workers around 4 - 5 mm. Color jet black. Petiole with an inverted V-shaped profile; anterior margin with a weak, blunt angle at its lower section. Dorsal margin of petiole with a shallow median notch in frontal view. In females, scapes flattened and with abundant hairs; mesonotal dorsum almost or completely lacking hairs; petiole with an inverted V-shaped profile.

This species is found as commonly as *L. nipponensis*. It might be a temporary social parasite of *L. japonicus*. Nuptial flights occur during June and August.
**Lasius morisitai Yamauchi**

*Fig. p 46*

**Original Reference:** Yamauchi, K. (1979)

**Distribution:** Honshu (Tochigi, Gifu, Ishikawa, Nagano, Kyoto).

Total length of workers around 4.5 mm. Color jet black. Petiole high, with an inverted V-shaped profile, more than 0.6 mm in height; lateral margins of scale parallel, dorsal margin with a median shallow notch when viewed frontally. In females, scapes covered with short decumbent hairs but lacking erect hairs; mesonotal dorsum with very sparse erect hairs; petiole with an inverted V-shaped profile.

A rare species. Nuptial flights take place during July.

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**Lasius nipponensis Forel**

*Fig. p 46*

**Original Reference:** Forel, A. (1912)

**Synonym(s):** Lasius fuliginosus (Latreille) (sensu Matsumura, 1898)  
Lasius fuliginosus var. nipponensis Forel (Forel, 1912)

**Distribution:** Hokkaido, Honshu, Shikoku, Kyushu; Korean Peninsula, Far East Russia.

Total length of workers around 4 - 5 mm. Color jet black. Petiole with an inverted U-shaped profile; the dorsal margin with a median notch in frontal view. In females, scapes lacking erect hairs but covered with decumbent hairs; petiole with an inverted U-shaped profile.

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**Lasius capitatus**  
(Kuznetsov-Ugamsky)

*Fig. p 47*

**Original Reference:** Kuznetsov-Ugamsky, N. N. (1927)

**Synonym(s):** Acanthomyops fuliginosus capitatus Kuznetsov-Ugamsky (Kuznetsov-Ugamsky, 1927)  
Lasius (Dendrolasius) fuliginosus capitatus (Kuznetsov-Ugamsky) (Wilson, 1955)  
Lasius (Dendrolasius) crispus Wilson (Wilson, 1955)

**Distribution:** Hokkaido, Honshu, Shikoku; Far East Russia, Korean Peninsula, Taiwan.

Total length of workers around 4 - 4.5 mm. Color jet black. Petiole with an inverted V-shaped profile; in frontal view, the scale is broadest at about its midlength and tapers towards its dorsal margin, which is acutely convex, without a median notch. In females, scapes and mesonotal dorsum with abundant erect hairs; petiole thin and high, with an acute dorsal angle in profile.

In one case a female of *L. capitatus* has been found in a nest of *L. productus* (Sonobe, 1984), suggesting that this species is perhaps a temporary social parasite of *productus*. The nuptial flights take place in Gifu Prefecture during September (Yamauchi et al., 1986). *Lasius crispus* Wilson, 1955, was synonymized with this species by Kupianskaya (1989).

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**Lasius umbratus**  
(Nylander)

*Fig. p 47*

**Original Reference:** Nylander, W. (1846)

**Synonym(s):** Formica umbrata Nylander (Nylander, 1846)  
Lasius umbratus (Nylander)Mayr, 1861)  
Lasius umbratus var. mixto-umbratus Forel (Forel, 1874)  
Lasius rabaudi Bondroit (Bondroit, 1917)  
Lasius silvestrii Wheeler (Wheeler, 1928)  
Lasius silvestrii var. osakana Santschi (Santschi, 1941)

**Distribution:** Hokkaido, Honshu, Shikoku, Kyushu; Europe, central and eastern Asia, North America.

Total length of workers around 4 - 4.5 mm, body color yellow. This species is distinguished from *L. hikosanensis* workers by the straight posterior margin of its propodeum, viewed in profile. Its females are separated from those of *L. meridionalis* by their relatively short, scapes, which are circular in section and lack erect


Lasius hikosanusi Yamauchi
Fig. p 48
Original Reference: Yamauchi, K. (1979)
Distribution: Honshu (Aomori, Gifu), Kyushu (Mt. Hiko-san).

Total length of workers around 4.5 mm. Body color yellow. *L. hikosanusi* is easily distinguished from *L. umbratus* and *L. meridionalis* by the convex posterior margin of the propodeum in profile.

Nests of this rare species are found at forested sites in the trunks of standing trees, usually near the roots.

Lasius meridionalis (Bondroit)
Fig. p 48
Original Reference: Bondroit, J. (1920)
Synonym(s): Formicina meridionalis Bondroit (Bondroit, 1919)
*L. umbratus* var. *meridionalis* (Bondroit)(Viehmeyer in Emery, 1922)
*L. rabaundi* Bondroit (Wilson, 1955)
*L. meridionalis* (Bondroit)(Pisarski, 1975)
Distribution: Hokkaido, Honshu, Kyushu; Europe.

Total length of workers around 4 - 4.5 mm. Color yellow. This species differs from *L. hikosanusi* in possessing a straight posterior margin to the propodeum when viewed in profile. Its workers are difficult to distinguish from those of *L. umbratus*, but the females differ from those of *umbratus* by their relatively long, flattened scapes, which carry many long, erect hairs.

This species is found in forests and at forest margins; it nests in tree trunks, near the roots of standing trees. It might be a temporary social parasite of *L. japonicus* and *L. hayashi*. Nuptial flights occur from July to September.

Lasius sonobei Yamauchi
Fig. p 49
Original Reference: Yamauchi, K. (1979)
Distribution: Honshu, Shikoku, Kyushu, Yaku I., Kuchino-erabu I.; Korean Peninsula, Taiwan(?).

Total length of workers around 2.5 - 3.5 mm. Color yellow. Scapes and tibiae with many erect hairs. Eyes small, usually 0.08 mm in diameter; each comprising 6-17 facets.

Like *Lasius sonobei*, this species is commonly found in the forests of southern Japan, but it is rare in the Tohoku district. The northernmost distribution record is from Sendai, Miyagi Prefecture. Nuptial flights occur during August and September. There has been a putative record from Taiwan, which needs confirmation.

Lasius talpa Wilson
Fig. p 49
Original Reference: Wilson, E. O. (1955)
Synonym(s): *Lasius flavus myops* Forel (Wheeler, 1906)
*L. talpa* Wilson (Wilson, 1955)
Distribution: Honshu, Shikoku, Kyushu, Yaku I., Kuchino-erabu I.; Korean Peninsula, Taiwan(?).

Total length of workers around 2 - 3 mm. Color yellow. Scapes and tibiae with many erect hairs. Eyes small, usually 0.08 mm in diameter; each comprising 6-17 facets.

Like *Lasius sonobei*, this species is commonly found in the forests of southern Japan, but it is rare in the Tohoku district. The northernmost distribution record is from Sendai, Miyagi Prefecture. Nuptial flights occur during August and September. There has been a putative record from Taiwan, which needs confirmation.

Lasius flavus (Fabricius)
Fig. p 50
Original Reference: Fabricius, J. C. (1782)
Synonym(s): *Formica flava* Fabricius (Fabricius, 1781)
*L. flavus* (Fabricius) (Mayr, 1861)
*L. flavus* var. *myops* Forel (Forel, 1894)
Distribution: Hokkaido, Honshu; NE China, Korean Peninsula, Siberia, central Asia, Europe.

Total length of workers around 2 - 3.5 mm. Color yellow to yellowish brown. Scapes short, their length 0.85 times head width. Eyes more than 0.11 mm in diameter, relatively the largest among Japanese species of this subgenus; each with more than 20 facets. Scapes and tibiae without erect hairs.

This species is rare in southern parts of Japan, but it is found commonly in northern regions such as Hokkaido and the Tohoku district. In the Kanto district it commonly occurs in mountainous regions, and there are a few lowland records. *L. flavus* occurs in grasslands and at forest margins, nesting in the soil and under stones. Nuptial flights take place during August and September.
Lasius sakagamii
Yamauchi & Hayashida

Distribution: Hokkaido, Honshu, Kyushu, Yakushima.

Total length of workers around 2.5 - 3.5 mm. Color brown. Scapes as long as the head is wide, and with more than 30 erect hairs. Anterior tibiae with many erect hairs. Petiole thick and low, anterior margin with a weak, blunt angle in lateral view.

This species nests in the soil in dry environments such as grasslands at riversides or seashores. Nests are polygynous and polycyclic, and multiply by budding. The number of contained individuals is large, sometimes reaching several hundred thousand (Yamauchi, 1981; Yamauchi et al., 1981, 1982). The nuptial-flight period is relatively long for a species of subgenus Lasius with records from June to October. Collections of L. sakagamii from Okinawa (Naha City) probably represent an introduction by human commerce. Diploid males are known to occur in this species (Yamauchi et al., 2001).

Lasius productus
Wilson

Original Reference: Wilson, E. O. (1955)
Distribution: Honshu, Shikoku, Kyushu.

Total length of workers around 3.5 - 4.5 mm. Head and gaster dark brown, mesosoma brown. Scapes proportionately longer than in other Japanese Lasius species, each with length exceeding 1.12 times the head width measurement. Scapes and anterior tibiae usually without erect hairs. Petiole in lateral view with an acutely angulate dorsum.

L. japonicus
This species nests in rotting wood and stumps, or dead portions of tree trunks in broad-leaved deciduous forests. The nuptial flights take place in August and September.

Lasius japonicus Santschi

Original Reference: Santschi, F. (1941)
Synonym(s): Lasius emarginatus var. japonicus Santschi (Santschi, 1941)
Lasius niger (Linnaeus) (Wilson, 1955)
Lasius niger (Linnaeus) (Yamauchi & Hayashida, 1970)
Distribution: Hokkaido, Honshu, Shikoku, Kyushu, Yakushima, Korean Peninsula, Taiwan.

Total length of workers around 2.5 - 3.5 mm. Body blackish brown, with the mesosoma often slightly lighter in color than the head and gaster. Scape length similar to head width. Scapes each with 5 to 25 erect hairs. Dorsal pronotal width in workers from mature colonies can exceed 0.70 mm. Petiole in profile with its dorsal margin bluntly angulate; anterior margin with a blunt angle.

The Japanese form has long been represented as Lasius niger, a species widely distributed in Eurasia. It was formally identified as L. japonicus by Seifert (1992). Worker specimens from incipient colonies have fewer erect hairs on their scapes than others (fewer than 10), so they are difficult to separate from L. alienus workers. However, L. japonicus females are separated from those of L. alienus by the presence of erect hairs on the scapes and anterior tibiae. This species is most commonly found in grasslands and forests. It has a wide elevational range, from lowlands to mountainous areas in central Japan, up to 2000 m above sea level. A distribution record from Okinawa Island (Naha City) might represent a population introduced by human commerce. Nests are found in the soil and rotting wood. The nuptial flights occur in July and August.
Lasius hayashi Yamauchi & Hayashida
Fig. p 52
Distribution: Hokkaido, Honshu, Shikoku, Kyushu, Yaku I.; Kurile Is, Korean Peninsula.
Total length of workers around 2 - 4 mm. Head and mesosoma light brown, gaster dark brown. Antennal scapes usually slightly shorter than the head width, and with erect hairs. Petiole high, its tip acutely angulate; anterior margin of petiolar scale not angulate.
This species nests in dead portions of tree trunks, especially at or near the roots. Nuptial flights occur in July and August.

Lasius alienus (Foerster)
Fig. p 52
Original Reference: Foerster, A. (1850)
Synonym(s): Formica alienus Foerster (Foerster, 1850)
Lasius alienus (Foerster) (Mayr, 1861)
Distribution: Hokkaido, Honshu, Shikoku; Korean Peninsula, Eurasia.
Total length of workers around 2 - 2.5 mm. Body blackish brown. This species closely resembles L. japonicus, and it is especially difficult to separate specimens of the two if they are derived from incipient colonies. However, when specimens from mature colonies are compared L. alienus is distinguished by the following characteristics: (1) scapes and anterior tibiae either lacking erect hairs or with fewer than 10 hairs; (2) body relatively small, dorsal pronotal width less than 0.70 mm. In females, L. alienus is easily distinguished from L. japonicus by the absence of erect hairs on the antennal scapes and anterior tibiae.
This species is rarely encountered. It has been recorded from Japan since the early 20th century (e.g. Wheeler, 1906; Teranishi 1915, 1930; Morisita, 1945).

Paratrechina sp. 11
Fig. p 53
Distribution: Izu Islands (Aoga-shima island).
Small ants, total length of workers around 1 - 1.5 mm. Body blackish brown and shining; tibiae light brown. Second to 4th funicular segments each wider than long. Mandibles with 6 teeth. Scapes exceeding posterior margin of head; lacking erect hairs. Three ocelli present but obscure. Mesosoma short, as about as long as head. Proposomal dorum convex in profile, pronoatal slope steeper than that of mesonotum. Propodeal dorum short. Metanotal groove shallow and short. Pronotal and propodeal dora each with a pair of erect hairs. Hind femora and tibiae without erect hairs.
Workers are usually taken at well insolated sites on the ground. This species is known only from Aoga-shima island in the Izu Islands.

Paratrechina yambaru Terayama
Fig. p 53
Distribution: Okinawa Is, Volcano Is.
Total length of workers around 1.5-2 mm. Head and lateral surfaces of mesosoma dark brown; mesosomal dorsum, antennae and gaster blackish brown; legs largely dark brown, the tarsi whitish. Mandibles each with 6 teeth. Antennal scapes exceeding posterior margin of head by half their length, without hairs. Dorsum of mesonotum with a pair of short erect hairs. Propodeum, hind femora and tibiae without erect hairs. Body with fragile, easily collapsed cuticle.
This species is known only from northern Okinawa.

Paratrechina ogasawarensis Terayama
Fig. p 54
Distribution: Ogasawara Is, Volcano Is.
Total length of workers around 2 mm. Head and mesosoma yellowish brown; gaster dark brown. Pronotal dorsum with two pairs of long, erect hairs and three pairs of short hairs; mesonotal dorsum with two pairs of long erect hairs; hairs lacking on propodeal dorsum. Very similar to P. amia: but the head and mesosoma are lighter in color than in that species (which is dark- to blackish brown); mesonotal dorsum with two pairs of erect hairs (more than two pairs in P. amia).
This species is found in grasslands and forests, nesting in the soil, leaf litter and rotting wood.

Paratrechina otome Terayama
Fig. p 54
Total length of workers around 1.5-2 mm. Head and lateral surfaces of mesosoma pale brown; antennae, dorsum of mesosoma, petiole and legs brownish white; gaster brown. Mandibles with 6 teeth. Antennal scapes exceeding posterior margin of head by half their length; without erect hairs. Eyes small; maximum eye length less than the 1/4 head length. Ocelli distinct. Mesosoma relatively long. Metanotal groove incised. Erect hairs on head and gaster shorter and more spaced than in P. longicornis. Mesonotal dorsum with a pair of erect hairs. Propodeum, hind femora and tibiae without erect hairs. Body cuticle thin, easily collapsed.
This species resembles P. longicornis and P. yambaru. It is easily distinguished from P. longicornis by its shorter antennal scapes and the 3 pairs of setae on its mesosomal dorsum, and from P. yambaru by its distinctive coloration. P. otome is found in grasslands and at forest margins.
**Paratrechina yaeynamensis** Terayama


*Distribution:* Yaeyama Is, Taiwan.

Total length of workers around 2 mm. Head and mesosoma yellowish brown; 1st gastric tergite yellowish brown; anterior half of 2nd tergite and anterior 1/3 of 3rd gastric tergite yellowish brown, the rest of gaster dark brown; antennae and legs yellowish. Antennal scapes with moderately abundant subdecumbent pubescence and with erect hairs, which are longer than the width of a scape. Very similar to *P. flavipes* and *P. yaeyamensis*: mesosoma darker than that of *P. flavipes* (where it is usually yellow to yellowish brown - lighter than head and gaster in *P. flavipes*); gaster uniformly dark brown except for the 1st tergite, which is lighter brown (2nd and 3rd tergites each with yellowish brown anterior half and dark brown posterior half in *P. yaeyamensis*). Erect hairs on antennal scapes longer than those of *P. flavipes*; the pubescence much more abundant than in *P. yaeyamensis*. Female with head and mesosoma brown and gaster largely a uniformly dark brown.

The species nests in leaf litter, rotting wood and the soil, in grasslands and forests.

**Paratrechina nubatama** Terayama


*Distribution:* Shikoku (Kochi Pref.), Amami-oshima I.

Total length of workers around 2 mm. Body color uniformly blackish brown; antennal scapes and legs yellowish brown. Mandibles each with 6 teeth. Antennal scapes exceeding posterior margin of head by 2/5 their length; with short erect hairs, which are shorter than the width of a scape shaft, and moderately abundant subdecumbent pubescence. Funicular segments each as long as wide or longer than wide. Eyes moderate in size. Pronotal dorsum convex in profile; mesonotal dorsum almost straight; metanotal groove incised dorsally. Head and gaster with erect hairs. Pronotal dorsum with four long erect hairs, mesonotal dorsum with four hairs, none on propodeum. Hind femora and tibiae with suberecct hairs.

This species resembles *P. flavipes*, *P. ryukyuensis*, and *P. yaeynamensis*. It may be distinguished from the latter by its dark body coloration, the shorter erect hairs and moderately abundant pubescence of the antennal scapes.

**Paratrechina ryukyuensis** Terayama


*Distribution:* Nansei Is.

Total length of workers around 2 mm. Head, mesosoma and 1st gastric tergite brown; 2nd to terminal gastric segments dark brown. Antennal scapes with moderately abundant subdecumbent pubescence and with erect hairs, which are longer than the width of a scape. Very similar to *P. flavipes* and *P. yaeynamensis*: mesosoma darker than that of *P. flavipes* (where it is usually yellow to yellowish brown - lighter than head and gaster in *P. flavipes*); gaster uniformly dark brown except for the 1st tergite, which is lighter brown (2nd and 3rd tergites each with yellowish brown anterior half and dark brown posterior half in *P. yaeynamensis*). Erect hairs on antennal scapes longer than those of *P. flavipes*; the pubescence much more abundant than in *P. yaeynamensis*. Female with head and mesosoma brown and gaster largely a uniformly dark brown.

The species nests in leaf litter, rotting wood and the soil, in grasslands and forests.

**Paratrechina amia** (Forel)

*Original Reference:* Forel, H., (1913)

*Synonym(s):* *Prenolepis* (*Nylanderia*) *bourbonica* var. *amia* Forel (Forel, 1913)

*Paratrechina* (*Nylanderia*) *bourbonica amia* (Forel) (Emery, 1925)

*Paratrechina amia* (Forel)(Terayama, 1999)

*Distribution:* Honshu (Hiroshima Pref.), Kyushu, Yaku I., Nansei Is, Ogasawara Is.

Total length of workers around 2.5 - 3 mm. Body dark brown to blackish brown; legs dark brown except for femora and tibiae, which are lighter brown. Mandibles each with 6 teeth. Antennal scapes each exceeding posterior margin of head by half its length, and with relatively abundant erect hairs. Each funicular segment as long as wide or longer than wide. Eyes moderately large. Mesosoma slightly longer than head length; pronotal dorsum convex in profile; mesonotal dorsum almost straight; metanotal groove deeply incised. Head and gaster with abundant erect hairs. Pronotal dorsum with two pairs of long erect hairs and three pairs of shorter hairs; mesonotal dorsum with three pairs; none on propodeum. Hind femora and tibiae with erect or suberecct hairs.

This species is found in rather dry habitats and nests in leaf litter and rotting wood or in the soil of grassland, or at forest margins. *P. amia* occurs distributed in Japan and Taiwan, and is commonly found in the Ogasawara and Nansei Islands. It has been recently collected in city parks and at road sides in Kagoshima and Hiroshima cities. It has also been found in plant pots at a Tokyo aquarium.
FORMICINAE

Paratrechina sakurae (Ito)


FORMICINAE

Paratrechina longicornis (Latreille)

FORMICINAE

*Paratrechina flavipes* (F. Smith)


FORMICINAE

*Prenolepis* sp.

Workers 2 mm. Blackish brown. Long, fine, suberect hairs everywhere abundant. Eyes large, about 1/4 head length; anterior or margins at midlength of head. Petiole low, long, inclined anteriorly. 1st gastral segment anteriorly concave, receiving petiole. Mesothoracic constriction relatively weak. Rare.
**FORMICINAE**

*Anoplolepis gracilipes* (F. Smith)

Workers 4 mm. Yellow, gaster brownish. Antennae, legs remarkably long. Antennae 11-segmented, length of 2nd to terminal segments 3+ times their width; scapes 2x head length. Pronotal profile almost straight. Propodeal profile convex. Petiole thick, crest an inverted-U-shape. Erect hairs on head, gaster; lacking on mesosomal dorsum.

This well-known tropical pest protects aphids and coccids injurious to crops.

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**FORMICINAE**

*Plagiolepis flavescens* Collingwood

Workers ca. 2 mm. Pale to darker yellow. Scapes exceeding occiput by ca. 1/2 length of 2nd antennal segment. Pronotum: paired short erect hairs, serrate when viewed by scanning electron microscopy.

Nests under stones, woodland margins to open land.
FORMICINAE

Plagiolepis alluaudi Emery

Workers 1.5-2 mm. Yellow to light reddish. Scapes exceeding occiput by the length of second antennal segment. Pronotum without erect hairs.

FORMICINAE

Acropyga kinomurai Terayama & Hashimoto

FORMICINAE

*Acropyga nipponensis* Terayama


FORMICINAE

*Acropyga yaeyamensis* Terayama & Hashimoto

**FORMICINAE**

*Acropyga sauteri* Forel


**DOLICHODERINAE**

*Linepithema humile* (Mayr)

Workers 2.5 mm. Dark brown. Eyes located anteriorly on dorsal surface of head. Promesonotum weakly raised. Petiolar scale apex below level of propodeal spiracle. Integument thin, easily collapsed. This is the notoriously pestiferous Argentine ant, native to South America, distributed throughout much of the world by human commerce.
**DOLICHODERINAE**

*Technomyrmex gibbosus* Wheeler

Workers 2.5 mm. Head, mesosoma reddish to brown; gaster dark brown; mandibles, antennae, legs yellowish brown. Head longer than wide; eyes more anterior than *T. albipes*. Mandibles with ca. 15 serrate teeth, apical most largest, basal most smallest. Scapes slightly exceeding occiput. Head, mesosoma microreticulate, gaster weakly microreticulate. Mesosoma, gaster without erect hairs. Nests in dead twigs and dead bamboo stems. Nuptial flights in September.

**DOLICHODERINAE**

*Technomyrmex albipes* (F. Smith)

Workers 2.5 mm. Black to blackish brown; funiculi, tarsi yellowish white. Head as long as wide. Ca, 15 serrated mandibular teeth, apical two largest. Eyes near cranial midlength. Scapes relatively long, microreticulate. Pronotum, mesonotum, propodeum each with a pair of erect hairs. Polycalic nests in rotting wood, stumps, twigs, in grasslands, forest margins, populations up to several millions. Reproductives include ergatoid females and males. Alates present March/June.
**DOLICHODERINAE**

*Tapinoma sp. 3*

Workers ca. 1.5 mm. Pale yellow to yellow. Scapes short, just reaching posterior cephalic border. Clypeal border almost straight medially. Eyes smaller than *T. melanocephalum*, each with about 6 facets spanning long axis. No erect setae on mesosoma.

Nests soil or hollow twigs.

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**DOLICHODERINAE**

*Tapinoma melanocephalum* (Fabricius)

Workers ca. 1.5 mm. Bicolored: funiculi, sides of pro- and mesonota, propodeum, gaster brown (some variation); remainder pale yellow. Scapes long, surpassing occiput. First funicular segment longer than second plus third. Eyes: 9-10 facets spanning long axes. Anterior clypeal margin slightly concave medially. No erect mesosomal setae.

Nests in soil, under stones, logs, tree bark etc. A tropical domestic pest.
**DOLICHODERINAE**

*Ochetellus glaber* (Mayr)

Workers 2 mm. Black, metallic gastral reflections. Legs, antennae brownish. Head longer than wide; sides converging anteriorly. Mandibles: 4 large apical, ca. 10 smaller teeth. Scapes not reaching cephalic border. Metanotal groove deep. Posterodorsal propodeal corner angulate; declivity concave to straight. Node, 2.5 x as high as long. Head (excluding clypeus, vertex), mesosoma, almost hairless, weakly microreticulate; gaster shining. Nests in dead twigs, rotting wood, under stones in grasslands, forest margins.

**DOLICHODERINAE**

*Dolichoderus sibiricus* Emery

MYRMICINAE

*Strumigenys emmae* (Emery)

Workers 1.5 mm. Yellowish brown. Apical mandibular fork: 2 spiniform teeth, 1 or 2 intercalary denticles. Spiniform preapical tooth at apical third of mandible. Pronotum anteriorly rounded. Metanotal groove absent. Propodeal spines small, with propodeal lamellae. Hairs on head, mesosoma, petiolar scale-like or orbicular. Uniquely distinguished by 4-segmented antennae.

MYRMICINAE

*Strumigenys lacunosa* Lin & Wu

Workers 2 mm. Reddish brown. Mandibles almost straight, no subapical teeth. Infradental lamellae weak. Mesopleuron, lateral parts of propodeum finely punctate. Body hairs abundant, some long, flagellate. The lack of subapical mandibular teeth is unique among Japanese *Strumigenys*.
Strumigenys minutula Terayama & Kubota


Strumigenys exilirhina Bolton

**MYRMICINAE**

*Strumigenys stenorhina* Bolton

Workers 2 mm. Yellow-brown. Eyes: ca. 20 facets. Mandibles elongate, half as long as head, stout, straight, subapical teeth stout, no intercalary denticles. Head weakly convex ventrally. Infradental lamellae thin, half as broad as propodeal spine length, without spongiform appendage. Mesopleuron, propodeal sides unsculptured, shining. Distinguished from *S. exilirhina* by long, straight mandibles. Nests under stones, decayed wood. Polygynous.

**MYRMICINAE**

*Strumigenys strigatella* Bolton

Workers 2 mm. Brown. Head not distinctly constricted anteriorly, frontally trapezoidal. Distance between apical fork and subapical mandibular teeth short. Dorsal mesosomal outline straight. Infradental lamellae with widely concave outer margins. Distinguished from *S. lewisi* by fine punctures on mesopleuron and lateral surfaces of propodeum, and shape of head. Rare.
**MYRMICINAE**

*Strumigenys* sp. 9

Workers 2 mm. Brown, difficult to distinguish from *S. lewisi* and *S. sp. 4*. Dorsal portion of postpetiole with spongiform appendage relatively long compared to *lewisi*. Females: Separable from *S. lewisi* and *S. sp. 4* by thick mesonotum (thin in *lewisi*); posterior ocelli small, indistinct (large, distinct in *S. sp. 4*). Nests under stones, decayed wood in woodland. Polygyrous.

**MYRMICINAE**

*Strumigenys* sp. 4

Workers 2-2.5 mm. Yellowish brown. Almost indistinguishable from *S. lewisi* and *S. sp. 9*. Dorsal portion of postpetiole with spongiform appendage long compared to *lewisi*. Female: posterior paired ocelli well developed, distinctly margined with dark-colored spots; eyes large; mesonotum thick. Distinguished by large posterior ocelli and eyes in females. Nesting as in *S. lewisi*. Generally monogynous.
**MYRMICINAE**

*Strumigenys solifontis* Brown

Workers 2.5-3 mm. Yellowish brown. Distinguished *S. lewisi* by longer head, less convex in profile; mandibles relatively long, elongate subapical teeth; Scapes, funiculi relatively long; mesosoma slender; dorsal mesosomal outline somewhat concave; infradental lamellae strongly concave. Females: eyes large, mesonotum relatively raised. Nests under stones in woodland, usually polygynous with < 200 colony workers.

**MYRMICINAE**

*Strumigenys lewisi* Cameron

**MYRMICINAE**

*Pyramica terayamai* Bolton


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**MYRMICINAE**

*Pyramica hirashimai* (Ogata)

MYRMICINAE

*Pyramica hexamera* (Brown)


MYRMICINAE

*Pyramica mutica* (Brown)

Workers 1.5 mm. Reddish brown. Body surfaces from head to postpetiole finely reticulate. Paired scale-like hairs on head, mesonotum. Propodeum without teeth or lamellae. Spongiform material relatively weak on petiole, postpetiole. Rare. Found at forest margins and nearby open situations, nests in soil, decaying wood.
**Paratrechina sakurae (Ito)**

Fig. p 65

**Original Reference:** Ito, T. (1914)

**Synonym(s):** Prenolepis sakurae Ito (Ito, 1914)

**Paratrechina sakurae (Ito)**(Emery, 1925)

**Distribution:** Hokkaido, Honshu, Shikoku, Tsushima I., Kyushu, Yaku I., Nansei Is (Tokunoshima I. and northwards); Korean Peninsula.

Small ants, total length of workers around 1 - 1.5 mm. Body color brown; antennae and legs yellowish brown. Easily separated from other Japanese *Paratrechina* species by the short antenmal funiculi (with 2nd to 4th segments each wider than long). Mandibles with 6 teeth. Scapes exceeding posterior margin of head by twice their individual width; lacking erect hairs. Three ocelli present but obscure. Mesosoma short, about as long as head. Promesonot al dorsum convex in profile, the slope of pronotal dorsum steeper than that of mesonotum. Propodeal dorsum short. Metanotal groove shallow and short. Pronotal and propodeal dorsa each with a pair of erect hairs. Hind femora and tibiae without erect hairs.

Nests are found in rotting wood, leaf-litter and under stones in drier habitats than *P. flavipes*. Nuptial flights occur in October and November. A widely distributed species.

**Paratrechina longicornis (Latreille)**

Fig. p 65

**Original Reference:** Latreille, P. A. (1802)

**Synonym(s):** Formica longicornis Latreille (Latreille, 1802)

**Prenolepis longicornis (Latreille)** (Roger, 1863)

**Paratrechina longicornis (Latreille)**(Emery, 1925)

**Distribution:** Kyushu, Yaku I., Nansei Is, Ogasawara Is, Volcano Is; pantropical.

Total length of workers around 2.5 - 3 mm. Color brown to black. Easily separated from Japanese congeners by the long, slender antennal scapes and the shape of the mesosoma. Head elongate. Mandibles narrow, each with 5 teeth. Antennae very long; scapes each exceeding posterior margin of head by 2/5 its length and lacking erect hairs. Eyes large, maximum diameter 0.3 times head length. Ocelli small but distinctly recognizable. Mesosoma slender, dorsum almost straight from anterior portion of pronotum to propodeal dorsum, the pro- and mesonotal dorsa weakly convex in profile. Metanotal groove slightly incised. Propodeal spiracles distinct. Head and gaster with abundant whitish, long erect hairs. Propodeum without erect hairs. Petiole low. Legs long. Hind femora and tibiae bearing suberect hairs with length almost equal to the width of the femora.

This species is commonly distributed in the tropics and often invades houses. The workers are fast-moving.

**Paratrechina flavipes (F. Smith)**

Fig. p 66

**Original Reference:** Smith, F. (1874)

**Synonym(s):** Tapinoma flavipes F. Smith (F. Smith, 1874)

**Prenolepis flavipes (F. Smith)**(Mayr, 1886)

**Paratrechina flavipes (F. Smith)**(Emery, 1925)

**Distribution:** Hokkaido, Honshu, Shikoku, Tsushima I., Kyushu, Yaku I., Kuchino-erabu I., Tokara Is; Mainland China, Korean Peninsula, Taiwan (?), United States (introduced).

Total length of workers around 2 - 2.5 mm. Head and gaster blackish brown; mesosoma and legs yellow to yellowish brown (mesosoma blackish brown in some specimens - a matter of unknown possible taxonomic significance). Mandibles each with 6 teeth. Scapes longer than in *P. sakurae*; each exceeding posterior margin of head by 1/3 its length, and with several suberect hairs. Funiculi longer than wide. Eyes relatively small. Ocelli small and rather obscure, but 3 are recognizable. Mesosoma slightly longer than head length; pronotal dorsum convex in profile; mesonotal dorsum straight, posterior margin angulate. Metanotal groove deeply incised. Head and gaster with abundant erect hairs. Pronotal dorsum with several erect hairs, mesonotal dorsum with four, none on propodeum. Hind femora and tibiae with erect or suberect hairs.

This species nests in leaf litter, rotting wood, and in the soil of grasslands and forests. It feeds on plant nectar and small dead animals. On mainland Japan newly emerged queens overwinter in their mother nests. Nuptial flights occur from May to June.

**Prenolepis sp.**

Fig. p 66

**Distribution:** Shikoku (Kochi Pref.): Usa, Cape Ashizuri and Cape Muroto [Masaaki Morisita leg.1], Kyushu (Kumamoto Pref.): Amakusa [Masaaki Morisita leg.1].

Total length of workers about 2 mm. Whole body blackish brown. Long, fine, suberect hairs everywhere abundant. Eyes large, about 1/4 as long as head; their anterior margins situated at midlength of head. Petiole low and long, strongly inclined anteriorly. Anterior surface of 1st gastral segment concave, so as to receive the petiole. Mesothoracic constriction less conspicuous than in other
Prenolepis species.
In the field this species looks like a blackish Paratrechina. Workers are active on the ground. A rare species, with only a few collection records.

**Anoplolepis gracilipes** (F. Smith)  
**Fig. p 67**  
**Original Reference:** Smith, F. (1857)  
**Synonym(s):** Formica longipes Jerdon (Jerdon, 1851)  
**Plagiolepis longipes** (Jerdon)(Emery, 1887)  
**Anoplolepis (Anoplolepis) longipes** (Jerdon) (Emery, 1925)  
**Distribution:** Nansei Is, Volcano Is; tropical and subtropical areas, essentially worldwide; North America.

Total length of workers around 4 mm. Body color yellow, gaster brownish (it can be greenish in some non-Japanese specimens). Antennae and legs remarkably long. Head oval. Clypeus produced medially, with convex anterior margin. Eyes relatively large and produced. Mandibles with 8 teeth. Antennae 11-segmented; scapes twice as long as the length of the head, or longer; their second to terminal segments each more than three times as long as wide. Mesosoma slender. Pronotum narrow, with almost straight dorsum in profile. Anterior portion of mesonotal dorsum, back to the propodeum, gently concave in profile. Propodeal dorsum convex in profile. Petiole thick, with an inverted-U-shaped crest. Erect hairs present on head and gaster, lacking on dorsum of mesosoma.

This species is commonly found in grasslands, and at woodland margins and road sides in Okinawa Prefecture. It is also seen frequently foraging on tree trunks. Anoplolepis gracilipes (= A. longipes) might be native to tropical Africa (Wilson & Taylor, 1967) or tropical Asia (Kempf, 1972). Its distribution has clearly been expanded by human commerce, so that it is now widespread in tropical and subtropical regions of the globe. It is a well-known pest species, because it protects aphids and coccids which injure tropical crops. In this role it has been rated a secondary agricultural pest (Reimer et al., 1990, etc.).

**Plagiolepis flavescens** Collingwood  
**Fig. p 67**  
**Original Reference:** Collingwood, C. A. (1976)  
**Distribution:** Kyushu (northern part), Tsushima I (southern part); Korean Peninsula.

Total length of worker ca 2 mm. Body color pale to darker yellow. Antennal scapes relatively shorter than in P. alluaudi; exceeding posterior margin of head by around half the length of the 2nd antennal segment. Pronotum with paired short erect hairs, which are serrate when viewed using scanning electron microscopy.

Found in woodland margins ranging to open land, nesting under stones. Workers sometimes forage on plants to collect honeydew. *P. flavescens* is rather common on Tsushima I., but rare on mainland Kyushu (Ogata, 1986).

**Plagiolepis alluaudi** Emery  
**Fig. p 68**  
**Original Reference:** Emery, C. (1894)  
**Synonym(s):** Plagiolepis alluaudi Emery, 1894  
**Plagiolepis augusti** Emery, 1921  
**Plagiolepis foreli** Mann, 1920  
**Plagiolepis mactavishi** Wheeler, 1908  
**Plagiolepis foreli var. ornata** Santschi, 1920  
**Plagiolepis alluaudi var. ornata** Emery, 1921  
**Distribution:** Ogasawara Is; Oceania, Southern part of Mainland China, West Indies, Africa.

Total length of workers around 1.5 - 2 mm. Body color yellow to light reddish yellow. Antennal scapes exceeding posterior margin of head by the length of second antennal segment. Pronotum without erect hairs.

Found in open land. In Japan, this species is known from the Ogasawara Islands (Shindo, 1979; Masuko & Terayama, 1984), but it has not been recorded from the Nansei Islands. *P. alluaudi* is widespread in tropical and subtropical regions of the world. It is considered to be Afrotropical in origin and spread by human commerce (Wilson & Taylor, 1967).

**Acropyga kinomurai**  
**Terayama & Hashimoto**  
**Fig. p 68**  
**Original Reference:** Terayama, M. & Hashimoto, Y. (1996)  
**Distribution:** Ishigaki I.

Total length of workers around 2 mm. Body color yellow. Head wider than long. Mandibles each with 4 acute teeth. Antennae 11-segmented; scapes not reaching posterior margin of head. Eyes small, each consisting of 5 or 6 indistinct facets. Promesonotal
dorsum almost straight in profile. Metanotal groove absent. Propodeum with straight dorsal outline and broadly rounded post-erdorsal corner in profile. Dorsa of head and mesosoma with abundant short erect hairs.

*A. kinomurai* belongs to subgenus *Rhizomyrma*. It is known only from Ishigaki Island, and a single collection was taken under a stone on the ground together with ant-attended mealybugs, *Eumyrmococcus kinomurai*. A rare species.

**Acropyga nipponensis** Terayama

*Original Reference:* Terayama, M. (1985b)

*Distribution:* Honshu (Mikura-jima I., Izu Is), Shikoku, Kyushu, Yaku I., Nansei Is.

Total length of workers around 2 mm. Body color pale yellow. Head nearly square in frontal view, slightly longer than wide. Mandibles each with 5 teeth, the apical 4 triangular; the basalmost largest rectangular and apically truncated. Eyes small, each of 1 or 2 facets. Palpal formula 2:3. Antennae 11-segmented; scapes not reaching posterior margin of head. Promesonotum convex in profile; propodeal dorsal also convex. Petiolar scale thinner and higher than those of *A. sauteri* and *A. yaeyamensis*.

*A. nipponensis* belongs to subgenus *Atopodon*. The nests are found in soil under stones or rotted wood in broad-leaved forests. A myrmecophilous mealy bug, *Eumyrmococcus nipponensis*, lives in the nests, and the ants feed on its honeydew (Terayama, 1985, 1986).

![Acropyga spp.](image)

**Acropyga yaeyamensis**

*Original Reference:* Terayama & Hashimoto, Y. (1996)

*Distribution:* Nansei Is (Ishigaki I., Iriomote I.).

A small species; total length of workers around 1.5 - 2.0 mm. Body color yellow. Head almost square in full face view. Mandibles with 4 relatively large, triangular teeth. Antennae 10-segmented; scapes short, not reaching posterior margin of head. Eyes each a single facet. Promesonotum convex in profile; propodeal dorsal also convex. Petiolar scale subtriangular in profile.

*A. yaeyamensis* belongs to subgenus *Rhizomyrma*. It is known only from the Yaeyama Islands, collections are from litter in broad-leaved forest. A relatively rare species.

**Acropyga sauteri** Forel

*Original Reference:* Forel, A. (1912)

*Distribution:* Honshu (southern part), Shikoku, Kyushu, Nansei Is; Mainland China (southern part), Taiwan.

Total length of workers around 2-2.5 mm. Body color yellow. Head almost square in full face view; mandibles with 3 well-developed teeth. Antennae 11-segmented; scape reaching posterior margin of head. Eyes minute, each a single facet. Promesonotum gently convex and propodeum convex in profile. Mesosoma with numerous short erect dorsal hairs.

This species is assigned to *Acropyga* subgenus *Rhizomyrma*. The symbiont mealy bug *Eumyrmococcus smithii* is tended in its nests. Nuptial flights may be observed from late March to June. Each alate female leaves the parent nest with a gravid female *Eumyrmococcus* in her mandibles (Uye, 1928, 1933; Teranishi, 1929). *A. sauteri* is found in grasslands or at the margins of woods. It nests under stones or directly in the soil.

**Subfamily DOLICHODERINAE**

**Linepithema humile** (Mayr)

*Original Reference:* Mayr, G. (1868b)

*Synonym(s):* Hypoclinea humilis Mayr, 1868

*Hypoclinea* (*Iridomyrmex*) *humilis*: Mayr, 1870

*Iridomyrmex humilis*: Emery, 1888

*Linepithema humile*: Shattuck, 1992

Total length of workers around 2.5 mm. Body color dark brown. Eyes distinct located anteriorly on the dorsal surface of the head. Promesonotum weakly raised. Petiolar scale present, its apex situated below the level of the propodeal spiracle. Integument thin and easily collapsed.

This is the notoriously pestiferous Argentine ant, formerly known as *Iridomyrmex humilis*. Its colonies are large and polygynous, sometimes comprising hundreds of queens and many thousands of workers. New nests are founded by migration or budding. The Argentine ant commonly infests houses and other premises, contaminating and spoiling stored food and other products. It tends homopterous agricultural and horticultural insect pests, and severely damages and depletes populations of native ant species in infested areas. An overview of the pest status of *L. humile* in the United States was published by Thompson (1990).

*L. humile* is native to parts of South America (Brazil and Argentina) and has been distributed throughout much of the world by human commerce. There have been no former Asian recordors, but Sugiyama (1999) recently reported collections from Hatsukaichi city dating from 1993.
Quadrirstruma emmae (Emery): Brown, 1949
Strumigenys emmae (Emery): Bolton, 1999

**Distribution:** Ogasawara Is, Nansei Is (Minami Daito I); pantropical and subtropical.

Total length of workers around 1.5 mm. Body color yellowish brown. Apical fork of mandible consisting of 2 spiniform teeth: intercalary denticles between them numbering 2 on the left mandible and 1 or 2 on the right. A spiniform preapical tooth situated at about the apical third of the length of each mandible. Eyes very small, situated at ventral margin of antennal scrobes. Pronotum anteriorly rounding into the sides. Metanotal groove absent. Propodeal spines small, partly incorporated below into posterolateral propodeal lamellae. Hairs on head, mesosoma and peti-ole mostly scale-like or orbicular.

*S. emmae* is easily distinguished from other Japanese ants by its 4-segmented antennae. A pantropical species, dispersed by human commerce (Brown, 1949b) and natural dispersal (Taylor in Kubota, 1976). Detailed biology is unknown. For recent taxonomic information see Bolton (1983, 1999, 2000). Formerly known as *Quadrirstruma emmae*. The genus *Quadrirstruma* was synonymized with *Strumigenys* by Bolton (1999). This species has been recorded in Japan only from the Ogasawara Islands (Kubota, 1976; Shindo, 1979).

Strumigenys minutula
Terayama & Kubota
Fig. p 75


**Distribution:** Tokunoshima I., Okinawa I., Iriomote I.; Taiwan.

Total length of workers around 1.5 - 2 mm. Body color brown, Outer border of mandibles rather strongly convex; apical fork with one intercalary denticle. Infradental lamellae of propodeum well developed, convex; propodeal spine relatively poorly developed. Most parts of mesothorax and propodeum unsculptured, smooth and shining.

The species is easily distinguished by its relatively short and strongly convex mandibles, and well-developed infradental propodeal lamellae. Nests are found under stones or in the soil of grassland or sugarcane fields. Polygynous.

Strumigenys exilirhina
Bolton
Fig. p 75

**Original Reference:** Bolton, B. (2000)

**Distribution:** Okinawa I.

Total length of workers around 2 mm. Body color brown, Mandibles rather short and stout, less than half as long as head; their outer margins weakly convex. Ventral outline of head rather strongly convex. Most parts of mesothorax and propodeum smooth. Infradental lamellae of propodeum thin, about half as broad as propodeal spines, lacking spongiform appendage. Nests in the soil of open land and sugar-cane fields.

Strumigenys stenorhina
Bolton
Fig. p 76

**Original Reference:** Bolton, B. (2000)

**Distribution:** Ishigaki I., Iriomote I., Yonaguni I.

Total length of workers around 2 mm. Body color yellow to brown. Eyes large, each consisting of around 20 facets. Mandibles elongate, almost half as long as head; shafts stout and almost straight; apical forks without intercalary denticles; subapical teeth stout. Ventral outline of head weakly convex in profile. Infradental lamellae of propodeum thin, about half as broad as propodeal spines, without spongiform appendage. Mesopleuron and lateral portion of propodeum unsculptured, smooth and shining.

The species is similar to *Strumigenys exilirhina*, but distinguished by its long, straight mandibles. Nests under stones or decayed wood. Polygynous.

Strumigenys lacunosus
Lin & Wu
Fig. p 74

**Original Reference:** Lin, C.-C. & Wu, W.-J. (1996)

**Distribution:** Okinawa I. (Mt. Nishime-dake); Taiwan.

Total length of workers around 2 mm. Body color reddish brown. Mandibles almost straight, without subapical teeth. Infradental lamellae almost lacking. Mesopleuron and lateral parts of propodeum with fine punctures. Body hairs abundant, some of them long and flagellate.

The absence of subapical teeth on the mandibles is unique to this species among Japanese *Strumigenys*, so that it is easily distinguished from the others. Rare in Japan - with only one record to data, from the floor of broadleaf forest in northern Okinawa Island.

Strumigenys strigatella
Bolton
Fig. p 76

**Original Reference:** Bolton, B. (2000)

**Distribution:** Northern part of Okinawa I. (Yona, River Fukugawa, Mt. Terukubi).
Total length of workers around 2 mm. Body color brown. Anterior portion of head at the level of antennal insertions not distinctly constricted, so that the head is somewhat trapezoidal in full-face view. Distance between dorsal tooth of apical fork and subapical tooth on mandibles rather short. Dorsal outline of mesosoma from posterior half of mesonotum to base of propodeal spine almost straight. Infradental lamellae of propodeum with widely concave outer margins.

This species is similar to S. lewisi in general appearance, but separable in having fine punctures on the mesopleuron and lateral surfaces of the propodeum, and by the shape of its head. A rare species, found on several occasions in big chinquapin tree trunks at a wood-chipping factory, and from natural forests.

**Strumigenys sp. 9**

*Fig. p 77*

**Distribution:** Amami Is, Okinawa I., Ishigaki I., Iriomote I.

Total length of workers around 2 mm. Body color brown. Very similar to *S. lewisi* and *Strumigenys* sp. 4, but the workers difficult to distinguish. Dorsal portion of postpetiole surrounded by spongiiform appendage relatively long compared to that of *S. lewisi*.

The females of this species are separable from *S. lewisi* and *Strumigenys* sp. 4 by the following combination of characters: mesonotum thick (thin in *S. lewisi*); posterior paired ocelli small and indistinct (larger and more distinct in *S. sp. 4*). Nests under stones or decayed wood in woodland. A polygynous species.

**Strumigenys sp. 4**

*Fig. p 77*

**Distribution:** Hokkaido (southern part), Honshu, Kyushu; Korea.

Total length of workers around 2 - 2.5 mm. Body color yellowish brown to brown. Very similar to *S. lewisi* and *Strumigenys* sp. 9 [Minami-uroko-ar1; the workers almost indistinguishable. The dorsal portion of the postpetiole surrounded by spongiiform appendage is relatively long compared to that of *S. lewisi*. In female: posterior paired ocelli well developed, distinctly margined with dark-colored spots; eyes relatively large; mesonotum relatively thick.

The species is distinguished by its females having relatively large posterior ocelli and eyes. The shape of the mesosoma is similar to that of *Strumigenys* sp. 9. Nesting sites are almost the same as for *S. lewisi* (Masuko et al., 1985). Colonies are in general monogynous (Masuko et al., 1985). *Strumigenys* sp. 4 material from Hokkaido (Matsumae-kojima Island) was misidentified as *S. lewisi* by Munakata (1972).

**Strumigenys solifontis** Brown

*Fig. p 78*

**Original Reference:** Brown, W. L., Jr. (1949)

**Distribution:** Honshu (Kanto District and southwards), Shikoku, Kyushu, Nansei Is (Okinawa I.), Ogasawara Is; Taiwan.

Total length of workers around 2.5 - 3 mm. Body color yellowish brown to brown. Similar to *S. lewisi*, but distinguished by the following characters: head proportionally longer and less convex in profile; mandibles relatively long, with elongate subapical teeth; antennal scapes and funiculi relatively long; mesosoma more slender; dorsal outline of mesosoma from pronotum to base of propodeal spine rather concave; infradental lamellae of propodeum quite strongly concave.

The females of this species have large eyes and a relatively raised mesonotum. Nests are found under stones or in cavities of stones in woodland margins (Masuko, 1980). Colonies are usually polygynous comprising over 200 workers (Masuko, 1980). Rather rare in Honshu, but common on Okinawa Island.
Pyramica terayamaei Bolton

Fig. p 79

Distribution: Mt. Yamizo, Tochigi Pref.


This species was described by Bolton (2000) and corresponds to Pyramica sp. 12 of Terayama (2000). Murata (1990) reported it as Smithistrama rostrataeformis. Pyramica terayamaei is similar to P. masukoi (Terayama, 2000), but distinguishable by the following character: dorsal surface of mesosoma with simple and club-shaped hairs in P. terayamaei vs. with simple and flagellate hairs in P. masukoi. It is known only from Mt. Yamizo in Tochigi Prefecture.

Pyramica hirashimai (Ogata)

Fig. p 79

Synonym(s): Epitritus hirashimai Ogata, 1990
Pyramica hirashimai (Ogata): Bolton, 1999
Distribution: Honshu, Shikoku, Kyushu, Nansei Is.

Total length of workers around 1 mm. Smaller than Pyramica hexamera. Body color yellowish brown. Mandibles without small teeth on their shafts; dorsal spiniform tooth of apical dentition less distinct than in P. hexamera. Anterior margin of clypeus fringed with scale-like hairs. Mesonotum not overhanging propodeum. Propodeal spines absent. Spongiform appendages on posterolateral portion of propodeum developed.

Rarer in Japan than P. hexamera. Nests in the soil of broadleaf forests.

Pyramica hexamera (Brown)

Fig. p 80

Original Reference: Brown, W. L., Jr. (1958)
Synonym(s): Epitritus hexamerus Brown, 1958

Strumigenys hexamera (Brown): Baroni Urbani & De Andrade, 1994
Epitritus hexamerus: Bolton, 1995
Pyramica hexamera (Brown): Bolton, 1999
Distribution: Honshu (Kanto District and southwards), Shikoku, Kyushu, Ogasawara Is, Nansei Is; Korean Peninsula, Taiwan.

Total length of workers around 2 mm. Body color yellowish brown. Mandibles with 2 pairs of preapical teeth; apical dentition including a distinct dorsal spiniform tooth. Anterior margin of clypeus without peculiar hairs. Dorsal outline of mesosoma horizontal from pronotum to mesonotum; the latter overhanging the propodeum. Propodeal spine distinct. Spongiform appendages on posterolateral portion of propodeum relatively weakly developed.

A rare species nesting in the soil of broadleaf forests.

Pyramica mutica (Brown)

Fig. p 80

Original Reference: Brown, W. L., Jr. (1949)
Synonym(s): Kyidris mutica Brown, 1949
Kyidris nuda Brown, 1949
Polyhomoa itoi Azuma, 1950
Pyramica mutica (Brown): Bolton, 1999
Distribution: Honshu, Shikoku, Kyushu; Korean Peninsula, Taiwan, Indonesia (Bogor).

Small ants: total length of workers around 1.5 mm. Body color reddish brown. Body surfaces from head to postpetiole finely reticulate. Paired scale-like hairs present on head and mesonotum. Posterior portion of propodeum simple, without teeth or lamellate structures. Spongiform material on petiole and postpetiole relatively weakly developed.

A rare species. The full synonymy of Pyramica mutica was given by Wilson & Brown (1965) and Bolton (2000). Imai et al. (1985) reported this species from Indonesia. Its full distribution could extend widely in tropical Asia. P. mutica is found at forest margins extending to more open situations, nesting in soil or decaying wood.
**MYRMICINAE**

*Pyramica morisitai* (Ogata & Onoyama)

Workers 1 mm. Brownish yellow. Mandibles as long as clypeus; anterior third bent strongly downwards. Antennae 6-segmented. Scapes broad basally, not elbowed; apical funicular segment as long as scape. Head twice as long as wide. Anterior clypeal margin narrowly convex. Pronotal humeri not angulate; mesosomal profile gently convex; propodeum with lamellate appendages, spiniform processes. Spongiform appendage on petiole, postpetiole. Hairs narrow, scale-like, appressed. Rare.

**MYRMICINAE**

*Pyramica membranifera* (Emery)

Workers 2 mm. Yellowish brown. Pilosity almost lacking, a pair of erect scale-like hairs posteriorly on head. An accomplished pantropical tramp species.
**MYRMICINAE**

*Pyramica sauteri* (Forel)

Workers 2 mm. Yellowish brown. Distinguished from *P. canina* by smaller size; shorter mandibles, which teeth almost even in size; anterior corners of clypeus more rounded; anterior clypeal margin more deeply concave. A rare species found on the floor of broadleaf forests.

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**MYRMICINAE**

*Pyramica canina* (Brown & Boisvert)

Workers 2.5-3 mm. Yellowish brown. Mandibles long, 1.5 times as long as preapical (5th) antennal segment or longer; largest tooth at mid-length of masticatory margin. Clypeus anteriorly angulate, anterior border slightly concave. Preapical (5th) antennal segment longer than length of 3rd and 4th together. Rare, found on the floor of broadleaf forests.
**MYRMICINAE**

*Pyramica kichijo* (Terayama, Lin & Wu)

Workers 2 mm. Reddish brown. Clypeus about as wide as long; anterior margin produced medially. Leading margin of scape not an angulate elbow. Head and mesosoma covered with long flagellate hairs and irregular reticulation. Rare. Distinguished from *S. masukoi* by clypeal shape.

**MYRMICINAE**

*Pyramica hiroshimensis* (Ogata & Onoyama)

Workers 2 mm. Reddish brown. Clypeus fringed with spatulate hairs; anterior margin straight, corners rounded. Scapes broadened at basal third, elbowed. Head, mesosoma covered with suborbicular hairs. Distinguished from *S. circothrix*, by larger size, relatively long mandibles; well developed postpetiolar spongiform appendage. Rare. Nests in soil in broadleaf forests.
MYRMICINAE

*Pyrimica circothrix* (Ogata & Onoyama)

Workers 1.5 mm. Reddish brown. Clypeus: straight anterior margin, rounded corners, a fringe of spatulate hairs. Leading margins of Scapes angulate. Head, mesosoma covered with suborbicular hairs. Rare. Nests in soil in broadleaf forests.

MYRMICINAE

*Pyrimica masukoi* (Ogata & Onoyama)

**Pyramica mazu** (Terayama, Lin & Wu)

Workers 1.5 mm. Yellowish brown. Leading margins of scapes not angulate. Clypeus not fringed with spatulate hairs, anterior margin almost straight. Head posteriorly, mesosoma dorsally, unsculptured, smooth, shining. Mesosomal profile roundly convex, with long hairs. Propodeum: without spines, well developed spongiform appendage posteriorly. Rare. Nests in soil, broadleaf forest.

**Pyramica benten** (Terayama, Lin & Wu)

Workers 1.5 to 2 mm. Clypeus broad; anterior margin convex, not fringed with spatulate hairs. Leading margins of scapes not angulate. Promesonotal region not raised. Distinguished from *P. leptothrix* by pilosity: hairs on head shorter, more sparse and clavate; those anteriorly, in particular, depressed. Nests in broadleaf forest margins and adjacent open land.
MYRMICINAE

*Pyramica rostrataeformis* (Brown)

Workers 1.5 mm. Clypeus fringed with spatulate hairs, anterior margin straight, without emargination or projection. Scapes angulate at basal third. Promesonotum raised. Pronotal humeri lacking flagellate hairs; a scale-like pair anterolaterally on mesonotum. The scale-like pronotal hairs distinguish *rostrataeformis* from the more common *P. incerta*.

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MYRMICINAE

*Pyramica leptothrix* (Wheeler)

Workers 1.5 mm. Clypeus broad, not fringed with spatulate hairs, anterior margin projecting. Promesonotum not raised. The hairs of *P. leptothrix* are simple, longer, more dense than *P. benten*; those on the head and mesosoma erect. Found in broadleaf forests.
Pyramica japonica (Ito)

Workers 2 mm. Yellowish to reddish brown. Head slender, posterior corners angulate. Clypeus ca. as long as broad, without fringe of spatulate hairs; anterior margin projecting medially. Eyes large, diameter exceeding length of apical antennomere. Scapes flattened, not angulate. Promesonotal area not raised. Propodeal spines distinct. Dorsal surfaces of head, pronotum, with dense scale-like hairs, lacking standing hairs.

Pyramica incerta (Brown)

MYRMICINAE

*Crematogaster suehiro* Terayama


Distinguished from *C. osakensis*, by posteriorly widened postpetiole; protrusive eyes, smooth mesonotal sides.

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MYRMICINAE

*Crematogaster osakensis* Forel

MYRMICINAE

*Crematogaster* sp. 5


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MYRMICINAE

*Crematogaster vagula* Wheeler

MYRMICINAE

*Crematogaster teranishii* Santschi


MYRMICINAE

*Crematogaster matsumurai* Forel

MYRMICINAE

Crematogaster nawai Ito


Distinguished by convex thoracic dorsum, unmarginated laterally; petiole longer than wide.

MYRMICINAE

Pristomyrmex yaeyamensis Yamane & Terayama

**Pristomyrmex pungens** Mayr

**Myrmicinae**


**Myrmecina ryukyuensis** Terayama

MYRMICINAE

Myrmecina amamiana Terayama

Workers 3 mm. Black; mesopleuron, petiole, postpetiole reddish; legs, antennae, mandibles yellowish brown. Eyes convex, 10+ facets; longer than 10th antennal segment. Scapes basally simple, no covering lamellae. Small median clypeal process. Propodeal spines upwardly curved. Subpetiolar process rounded. Rugulae on head, mesosoma broad, longitudinal; interspaces shining; several longitudinal rugulae lateral of eyes. Distinguished from M. nipponica by longitudinal rugulae on head, mesosoma; convex eyes.

MYRMICINAE

Myrmecina nipponica Wheeler

MYRMICINAE

*Myrmecina flava* Terayama

Workers 2.5 mm. Yellow/yellowish brown; gaster darker; legs yellow. Eyes small, several facets; diameter far less than length of 10th antennomere. Semibulbous lamellae covering antennal articulations. No median anterior clypeal process. Propodeal spines directed backwards. Subpetiolar process distinct, acute, pointed forwards. Head, mesosoma irregularly longitudinally rugulose, interspaces punctate. Areas lateral to eyes punctuate, not rugulose.

MYRMICINAE

*Lordomyrma azumai* (Santschi)

MYRMICINAE

Rhopalomastix omotoensis Terayama


MYRMICINAE

Recurvidris recurvispinosa (Forel)

A social parasite of the short winged form of *V. emeryi*, which occurs in and near riverside forests. Females easily distinguished from *V. emeryi* by: postpetiole smooth, shining (shagreened in *emeryi*); head broader than mesosoma in dorsal view (almost equally wide in *emeryi*); body size distinctly smaller.

Workers indistinguishable from *Vollenhovia okinawana*. However, all known females are wingless ergatoids. Those of *V. okinawana* are winged. Known only from native forests in northern Okinawa.
**Pyramica morisitai** (Ogata & Onoyama)  
*Fig. p 89*


**Synonym(s):** Smithistruma morisitai Ogata & Onoyama, 1998

**Pyramica morisitai** (Ogata & Onoyama): Bolton, 1999

**Distribution:** Okinawa I.

Total length of workers around 1 mm. Body color brownish yellow. Mandibles elongate, as long as clypeus; the anterior third of each shaft bent strongly downwards to form an obtuse but distinct angled corner when viewed laterally; the subapical portion slightly concave in lateral view, and forming a shallow space in frontal view, when the mandibles are closed. Antennae 6-segmented. Scapes broadened at the basal third, and not forming an angular elbow; apical funicular segment elongate, as long as the scape or the remaining funicular segments together. Head twice as long as wide; Clypeus longer than broad; anterior margin narrowly convex.

General shape of mesosoma similar to that of *Pyramica incerta*, but without angulate pronotal humeri; dorsal outline gently convex; posterior margin of propodeum with thin bilateral lamellate appendages and dorsal spiniform processes. Spongiform appendage present on petiole and postpetiole. Body hairs narrow, scale-like and appressed.

A rare species, known only from 2 records of specimens taken under stones in a rather open situation. *P. morisitai* was assigned to an "unnamed genus" in "A List of the Ants of Japan with Common Japanese Names" (1988) and "A Guide for the Identification of Japanese Ants (III)" (1992) by Myrmecological Society of Japan Editorial Committee. This corresponds to the "unnamed new genus?" of Onoyama (1976). The peculiarly curved mandibles of this species resemble those of Asketogenys, a monotypic genus described by Brown (1972) from Malaysia. But the dentition, the shape of the clypeus and mesosoma and the pilosity are quite different.

**Pyramica membranifera** (Emery)  
*Fig. p 89*

**Original Reference:** Emery, C. (1869)

**Synonym(s):** Strumigenys (Trichoscapa) membranifera Emery, 1869

*Strumigenys membranifera* var. similis Emery, 1890

*Strumigenys membranifera* var. santschi, Forel, 1904

*Strumigenys (Cephaloxyx) membranifera* Emery: Emery, 1916

*Strumigenys (Cephaloxyx) vitensis* Mann, 1921

*Strumigenys (Cephaloxyx) silvestriana* Wheeler, 1928

*Strumigenys (Cephaloxyx) foocowensis* Wheeler, 1928

*Strumigenys (Cephaloxyx) membranifera* var. marioni Wheeler, 1933

*Strumigenys (Cephaloxyx) membranifera* var. williamsi Wheeler, 1933

*Trichoscapa membranifera* (Emery): Brown, 1948

*Pyramica membranifera* (Emery): Bolton, 1999

**Distribution:** Honshu (Kanto District and southwards), Shikoku, Kyushu, Ogasawara Is, Nansei Is; Mainland China, Taiwan, Samoa, Hawaii, Fiji, Africa, S Europe (Italy), N America, W Indies.

Total length of workers around 2 mm. Body color yellowish brown. Pilosity almost lacking except for a pair of erect scale-like hairs on posterior portion of head.

*P. membranifera* is an accomplished tramp species. It has been recorded widely from tropical and warm temperate regions of the world. Brown & Wilson (1959) suggested an African origin, but this was questioned by Bolton (1983). This species is found in the soil of rather open habitats. Japanese records are generally from the south, ranging northwards to southern Honshu. The most northern record is from Tokyo (Kubota & Terayama, 1988). Wilson (1954) reported *P. membranifera* feeding on a wide range of small soft-bodied arthropods.

![P. membranifera](image)

**Pyramica sauteri** (Forel)  
*Fig. p 90*

**Original Reference:** Forel, A. (1912)

**Synonym(s):** Penetastruma sauteri Forel, 1912a

**Pyramica sauteri** (Forel): Bolton, 1999

**Distribution:** Nansei Is (Okinawa I., Ishigaki I.); Taiwan.

Total length of workers around 2 mm. Body color yellowish brown. Very similar to *Pyramica canina* but with the following differences: smaller size; shorter mandibles, which have the teeth on their masticatory margins almost even in size; anterior corners of clypeus more rounded and anterior clypeus margin more deeply concave.

![P. sauteri](image)

**Pyramica canina** (Brown & Boisvert)  
*Fig. p 90*

**Original Reference:** Brown, W. L., Jr. & Boisvert, R. G. (1979)

**Synonym(s):** Pentaspixma canina Brown & Boisvert, 1979

**Pyramica canina** (Brown & Boisvert): Bolton, 1999

**Distribution:** Honshu (Kanto District and southwards), Shikoku, Kyushu.
Total length of workers around 2.5 - 3 mm. Body color yellowish brown. Mandibles rather long, 1.5 times as long as preapical (5th) antennal segment or longer; largest tooth present at about mid-length of masticatory margin. Anterior portion of clypeus rather angulate, with slightly concave anterior border. Preapical (5th) antennal segment longer than length of 3rd and 4th segments together.

This species resembles Smithistruma circothrix, but is distinguished by its larger size, relatively long mandibles and well-developed spongiform appendage on the postpetiole.

**Pyramica circothrix**
(Ogata & Onoyama)

*Fig. p 92*


**Synonym(s):** Smithistruma circothrix Ogata & Onoyama, 1998

**Pyramica circothrix** (Ogata & Onoyama): Bolton, 1999

**Distribution:** Okinawa I., Ishigaki I.

Total length of workers around 1.5 mm. Body color reddish brown. Clypeus with straight anterior margin, rounded corners, and a fringe of spatulate hairs. Leading margins of antennal scapes angulate. Head and mesosoma covered with suborbicular hairs, similar to those of species formerly assigned to Epitritus and Quadristruma.

**Pyramica masukoi**
(Ogata & Onoyama)

*Fig. p 92*


**Synonym(s):** Smithistruma masukoi Ogata & Onoyama, 1998

**Pyramica masukoi** (Ogata & Onoyama): Bolton, 1999

**Distribution:** Honshu (Manazuru, Kanagawa Pref.; Kaketouyama, Geihoku-cho, Hiroshima Pref.)

Total length of workers around 1.5 mm. Body color yellowish brown. Head generally somewhat elongate. Clypeus distinctly longer than broad, anterior margin projecting, without fringing spatulate hairs. Eyes small. Promesonotum not raised. Body hairs abundant, those on head and mesosoma long and flagellate.

The species is similar to the *Smithistruma* species *S. japonica*, *S. leptoithrix* and *S. benten*, but easily distinguished from them by the smaller eyes, elongate head, and distinctive pilosity. It is very rare and is found on the floor of broadleaf forest, nesting in the soil. **Pyramica masukoi** corresponds to S. sp. 7 of the Myrmecological Society of Japan Editorial Committee (1992).

**Pyramica hiroshimensis**
(Ogata & Onoyama)

*Fig. p 91*


**Synonym(s):** Smithistruma hiroshimensis Ogata & Onoyama, 1998

**Pyramica hiroshimensis** (Ogata & Onoyama): Bolton, 1999

**Distribution:** Honshu (Hiroshima Pref.)

Total length of workers around 2 mm. Body color reddish brown. Clypeus fringed with spatulate hairs and with a straight anterior margin and rounded corners. Leading margin of antennal scape broadened at basal third to form an angulate elbow. Head and mesosoma covered with suborbicular hairs, like those of other **Pyramica** species formerly assigned to *Epitritus* and *Quadristruma*.

**Pyramica mazu**
(Terayama, Lin & Wu)

*Fig. p 93*


**Synonym(s):** Smithistruma mazu Terayama, Lin & Wu, 1996

**Pyramica mazu** (Terayama, Lin & Wu): Bolton 1999

**Distribution:** Honshu, Shikoku, Kyushu, Nansei Is.
Total length of workers around 1.5 mm. Body color yellowish brown. Leading margins of antennal scapes not angulate. Clypeus not fringed with spatulate hairs, its anterior margin almost straight. Posterior part of head and dorsal surface of mesosoma unsculptured, smooth and shining. Dorsal profile of mesosoma roundly convex, with rather long hairs. Propodeum without spines, but with well developed spongiform appendage posteriorly.

**Pyramica benen (Terayama, Lin & Wu)**


*Synonym(s):* Smithistruma benen Terayama, Lin & Wu, 1996

*Pyramica benen* (Terayama, Lin & Wu): Bolton, 1999

*Distribution:* Honshu, Shikoku, Kyushu, Nansei Is.

Total length of workers around 1.5 to 2 mm. Clypeus broad; anterior margin convex, not fringed with spatulate hairs. Leading margins of antennal scapes not angulate. Promesonotal region not raised.

The species is similar to *Pyramica leptothrix*, but distinguished by its pilosity: the hairs on the head of *Pyramica benen* are shorter, more sparse and somewhat clavate, and those on the anterior portion, in particular, are depressed. It should be noted that the pilosity of *P. benen* is variable. Samples from the Kanto District tend to have shorter, more sparse hairs on the head than those from Kyushu, where the hairs are longer and more dense. The first gastrall segment sometimes lacks hairs. The species nests at the margins of broadleaf forests and adjacent open land. It is most common in the southern part of Honshu south to Kyushu.

Touya (1998) reported that hairs on the vertex may be often lacking in *P. benten*. Bolton (2000) described the hairless form as a separate new species named *P. alecto*. We believe the separate specific status of "alecto" from *P. benten* to be questionable, requiring further study. For this reason we do not recognize *P. alecto* at this time.

**Pyramica rostrataeformis (Brown)**

*Original Reference:* Brown, W. L., Jr. (1949)

*Synonym(s):* Smithistruma rostrataeformis Brown, 1949

*Pyramica rostrataeformis* (Brown): Bolton, 1999

*Distribution:* Honshu, Shikoku, Kyusyu

Total length of workers around 1.5 mm. Clypeus fringed with spatulate hairs, anterior margin straight, without median emargination or projection. Antennal scapes with angulate leading edges at the basal third. Promesonotum more or less raised. Elongate flagellate hairs absent on pronotal humeri, but a pair of scale-like hairs present on anterolateral areas of the mesonotum.

**Pyramica leptothrix (Wheeler)**

*Original Reference:* Wheeler, W. M. (1929)

*Synonym(s):* Strumigenys (Cephaloxys) leptothrix Wheeler, 1929

Smithistruma (Weberistruma) leptothrix (Wheeler): Brown, 1948b

Weberistruma leptothrix (Wheeler): Brown, 1949

Smithistruma leptothrix (Wheeler): Terayama & Kubota, 1989

*Pyramica leptothrix* (Wheeler): Bolton, 1999

*Distribution:* Okinawa I., Iriomote I.; Taiwan

Total length of workers around 1.5 mm. Clypeus broad, not fringed with spatulate hairs; anterior margin projecting. Promesonotum not raised.

The species is similar to *Pyramica benen*, but distinguished by its pilosity: the hairs of *P. leptothrix* are simple, longer and more...
dense than in *P. benten*, and those on the head and mesosoma, in particular, are erect. *P. leptothrix* is found on the floor of broadleaf forests.

**Pyramica japonica** (Ito)

**Original Reference**: Ito, T. (1914)

**Synonym(s)**: *Strumigenys japonica* Ito, 1914

*Strumigenys* (Cephalotaxy) *japonica* Ito: Emery, 1924

*Smithistruma* (Smithistruma) *japonica* (Ito): Brown, 1948

*Weberistruma japonica* (Ito): Brown, 1953

*Smithistruma japonica* (Ito): Bolton, 1983

**Pyramica japonica** (Ito): Bolton, 1999

**Distribution**: Kyoto, Miyajima (Hirosashi Pref.), Nagato (Yamaguchi Pref.), Okinawa I.; Korea.

Total length of workers around 2 mm. Body color yellowish to reddish brown. Head somewhat slender in general shape, its posterior corners rather angulate. Clypeus almost as long as broad, not fringed with spatulate hairs; anterior margin projecting in the middle. Ventral margin of antennal scrobes reaching as far as eyes. Eyes large, maximum diameter greater than the length of the apical antennal segment. Antennal scapes flattened, without angulate leading edges. Promesonotal area not raised. Propodeal spines distinct. Dorsal surfaces of head and pronotum without standing hairs, but with dense depressed, scale-like hairs.

**Pyramica incerta** (Brown)

**Original Reference**: Brown, W. L., Jr. (1949)

**Synonym(s)**: *Smithistruma incerta* Brown, 1949

*Smithistruma habeie* Azuma, 1951

*Pyramica incerta* (Brown): Bolton, 1999

**Distribution**: Honshu, Shikoku, Kyushu.

Total length of workers around 1.5 mm. Body color yellowish to reddish brown. Lateral margins of head roundly convex. Clypeus fringed with spatulate hairs, and with a slightly concave anterior margin. Leading edges of antennal scapes angulate at the basal third. Promesonotum more or less convex. Dorsal surface of mesosoma with numerous standing hairs. Pronotal humeri with elongate paired flagellate hairs.

This species is similar to *S. rostrataeformis*, but can be distinguished by the shape of the anterior margin of its clypeus and the mesosomal hairs. Found on the floor of broadleaf forests, and nests in rotting wood or leaf litter.

**Crematogaster suehiro** Terayama


**Distribution**: Ishigaki I.

Total length of workers around 2 mm. Body color wholly bright yellow. Antennal club 2-segmented. Antennal scape long, distinctly surpassing posterior border of head. Eyes a little protrusive, their anterior borders situated at the midlength of the sides of the head. Promesonotal suture indistinct, the dorsal margin in lateral view nearly straight. Pronotal pleuron and mesonotal dorsum and pleuron smooth. Metanotal groove distinctly impressed, but obstructed by a lamella at the lateral border of its dorsum. Propodeal spines slender and rather long, acutely pointed and raised at an angle of slightly more than 45 degrees in lateral view. Subpetiolar process small, projecting anteriorly. Petiolar sides in dorsal view slightly widened posteriorly. Petiole with a pair of hairs on posterolateral border and another pair on posterior border. These hairs longer than the petiole. Postpetiolar dorsum without a median furrow.

This species resembles *C. osakensis*, but is easily distinguished because its postpetiole is progressively widened posteriorly; its eyes are protrusive and its mesonotal pleuron is smooth. It nests in dead trees in forests.

**Crematogaster osakensis** Forel

**Original Reference**: Forel, A. (1900)

**Synonym(s)**: *Crematogaster sordidula* var. *osakensis* Forel, 1900

*Crematogaster sordidula* var. *osakensis*: Emery, 1912

*Crematogaster sordidula* var. *japonica* Forel, 1912

*Crematogaster osakensis*: Collingwood, 1976

**Distribution**: Hokkaido (Sapporo), Honshu, Shikoku, Tsushima I., Kyushu, Yaku I., Tanegashima I., Nakanoshima I., Amami-Oshima I.; Mainland China, Korean Peninsula.

Total length of workers around 2 - 3 mm or slightly more. Body color yellow, dorsum of head and posterior half of gastric tergites a little darker. Antennal club 2-segmented. Antennal scape slightly surpassing the posterior border of head. Promesonotal suture indistinct, the dorsum in lateral view forming a curve. Pronotal pleuron and mesonotal dorsum smooth. Mesonotal pleuron punctured and rough. Metanotal groove distinctly impressed, but obstructed by a lamella at the lateral border of its dorsum. Propodeal spines slender and rather long, acutely pointed; raised at an angle of less than 45
Crematogaster sp. 5
Fig. p 97

Distribution: Kuchinoerabu-jima I., Amami-oshima I.

Total length of workers around 3 mm. Body color brown. Antennal club 3-segmented. Clypeus with fine, longitudinal striae. Promesonotal suture indistinct or distinct; in the latter case the anterior border of the mesonotal dorsum is triangular. Pronotal and mesonotal dorsa smooth. Anterior half of mesonotal dorsum nearly flat, posterior third depressed, but only a little concave in the middle; margined posterolaterally. Mesonotal pleuron wholly punctured. Metanotal groove distinctly impressed, the lateral borders of the dorsum not lamellate. Propodeal spines slender and long, each about twice as long as the width of its base. Petiole wider than long, the sides in dorsal view abruptly narrowed posteriorly. Subpetiolar process in lateral view acutely triangular, projecting anteriorly. Postpetiolar dorsum with a median furrow.

This species resembles C. teranishii, but is distinguishable because the pronotal sides are smooth and shining, and the posterior half of the mesonotal dorsum is concave.

Crematogaster teranishii Santschi
Fig. p 98

Original Reference: Santschi, F. (1930)
Synonym(s): Crematogaster (Acrocoelia) brunnea st. teranishii Santschi, 1930
Crematogaster (Acrocoelia) brunnea st. ruginota var. azumai Santschi, 1941
Crematogaster teranishii: Onoyama, 1998

Distribution: Honshu, Shikoku, Tsushima I., Kyushu, Okinawa I., Ishigaki I.; Korean Peninsula.

Total length of workers around 2 - 4 mm. Body color brown to blackish brown. Antennal club 3-segmented. Clypeus rough, with fine longitudinal striae or punctures. Promesonotal suture indistinct to distinct; in the latter case the mesonotal border in dorsal view is triangular anteriorly. Pronotum laterally and dorsally finely, longitudinally striate. Mesonotal dorsum nearly flat at the anterior half and lowered at the posterior half; margined posterolaterally. Mesonotal dorsum with a faint, longitudinal median carina. Mesonotal pleuron wholly punctured. Metanotal groove distinctly impressed, barely closed by a small lamella at the lateral border of its dorsum. Propodeal spines slender and long, each about 3 times as long as the width of its base. Petiole wider than long, the sides in dorsal view abruptly narrowed posteriorly. Subpetiolar process barely developed. Postpetiolar dorsum with a median furrow.

Arboreal, nesting in dead twigs or dead bamboo stems.

Crematogaster matsumurai Forel
Fig. p 98

Original Reference: Forel, A. (1901)
Synonym(s): Crematogaster laboriosa var. matsumurai Forel 1901
Crematogaster (Acrocoelia) matsumurai: Emery, 1922
**Crema
tagaster matsumurai:** Wheeler, 1928
**Crema
tagaster brunnea subsp. matsumurai:** Wheeler, W.M, 1929
**Crema
tagaster (Acrocoelio) matsumurai var. iwatensis:** Santschi 1937

**Crema
tagaster matsumurai:** Onoyama, 1998

**Distribution:** Hokkaido, Honshu, Shikoku, Tsushima I, Kyushu; Korean Peninsula.

Total length of workers around 2 - 3.5 mm. Body color yellowish brown to blackish brown, dorsum of head and posterior half of gastr al tergites sometimes a little darker. Antennal club 3-segmented. Mesonotal dorsum flat at the anterior half and lowered at the posterior half; margined posterolaterally. The whole of the pronotum and the mesonotal dorsum almost smooth, or with fine striae. Mesonotal pleuron wholly punctured. Metanotal groove distinctly impressed, not obscured by a lamella at the lateral border of its dorsum. Propodeal spines short, triangular in lateral view, each as long as the width of its base. Subpetiolar process hardly developed, not produced or spine-like. Petiole wider than long, the sides in dorsal view abruptly narrowed posteriorly. Postpetiolar dorsum essentially without, but sometimes with, a very shallow median furrow.

Nests under bark or rotting parts of trees and forages for honey dew. Reproductive alates fly from late July to September.

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**Crema
tagaster nawai Ito**

**Original Reference:** Ito, T. (1914)

**Synonym(s):** Crema
tagaster auberti var. nawai Ito 1914
Crema
tagaster (Acrocoelio) nawai: Emery, 1922
Crema
tagaster laboriosa nawai: Santschi, 1930d
Crema
tagaster laboriosa Smith, F. 1874
Crema
tagaster nawai: Onoyama, 1998

**Distribution:** Honshu, Shikoku, Tsushima I, Kyushu, Yaku I, Tanegashima I, Amami I, Okinawa I; Korea, Taiwan(?).

Total length of workers around 4 - 5.5 mm. Body color brown to blackish brown, dorsum of head and posterior half of gastr al tergites sometimes slightly darker. Antennal club 3-segmented, Promesonotal suture indistinct. Thoracic dorsum in lateral view raised at anterior border of mesonotum. The whole of the pronotum and the mesonotal dorsum smooth. Mesonotal dorsum convex and not margined laterally and with a faint, longitudinal median carina. Posterior half of mesonotal pleuron punctured. Metanotal groove distinctly impressed, not closely by a lamella at the lateral border of its dorsum. Propodeal spines rather long, slenderly triangular in lateral view. Subpetiolar process small, denticulate and produced anteriorly. Petiole a little longer than wide, the sides in dorsal view narrowed posteriorly. Postpetiolar dorsum with a median furrow.

This species abundant near sea shores and nests under stones.

**Pristomyrmex yaeyamensis**

*Yamane & Terayama*

**Fig.** p 99


**Synonym(s):** Pristomyrmex brevispinosus sulcatus var. formosae Forel (Myrmecological Society of Japan Editorial Committee, 1988)

**Pristomyrmex brevispinosus sulcatus** Emery (Ogata, 1991)

**Distribution:** Iriomote I.

Total body length of workers around 2.5 - 3 mm. Body yellowish brown to reddish brown. Head largely rounded, with a relatively straight posterior margin in full face view; posterolateral corners round, not forming angles. Clypeus with a median carina; its anterior margin with 3 teeth. Mandibles with 5 teeth, the apical 3 larger than the others. Antennal scapes proportionately shorter than in *P. pungens*, slightly exceeding posterior margin of head. Dorsal margin of pronotum straight in profile, its dorsolateral corners each with a short spine. Propodeal spines short, their tips turned upwards; seen from the side the spines do not reach the level of the posterior end of the propodeum. Anterior margin of petiolar node weakly convex; dorsal outline convex, sloping posteriorly; the posterodorsal border not forming an angle. Head and dorsum of mesosoma with moderately large punctures; lateral surfaces of mesonotum and propodeum, petiolar peduncle, postpetiole and gaster smooth and shining.

Colony size is small in *Pristomyrmex yaeyamensis*, with less than 20 workers per nest. Ergatoid females are present. Found in rotting wood or under stones in forested habitats. Related species occurs in Taiwan and southern China, but it has normal alate queens and no ergatoids.

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**P. yaeyamensis**

**P. pungens**
**Pristomyrmex pungens Mayr**  
Fig. p 100

**Original Reference:** Mayr, G. (1866)  
**Synonym(s):** *Pristomyrmex japonicus* Forel (Viehmeyer, 1922)  
**Distribution:** Hokkaido, Honshu, Shikoku, Kyushu, Tsushima Is., Nansei Is; Mainland China, Korea, Taiwan, E India to Malacca and Borneo.

Total length of workers around 2.5 mm. Body color brown to reddish brown; legs yellowish; gaster blackish brown. Head rounded, posterolateral corners not angulate in full face view; posterior margin straight. Eyes prominent. Clypeus with a median carina; anterior margin with 7 blunt teeth. Mandibles each with 2 large apical and 2 smaller basal teeth. Antennal scapes long, exceeding posterior margin of head in full face view. Mesosoma relatively short. Pronotal dorsum straight in profile; anterior border marginate in dorsal view. Dorsa of mesonotum and propodeum almost straight in profile. Propodeal spines long and acute, exceeding the posterior extensions of the propodeum, and reaching the midlength of the petiole. Petiolar node subtriangular in profile; subpetiolar process absent. Sculpture of head and mesosoma strongly reticulate, gaster smooth, subopaque.

This species is queenless. The workers produce further workers by thelytoky. Males are rarely produced, if so they are found in summer. *P. pungens* is commonly found in Japan, but is less common and sometimes rare in other areas.

**Myrmecina ryukyuensis** Terayama  
Fig. p 100

**Original Reference:** Terayama, M. (1996)  
**Distribution:** Nansei Is.

Total length of workers around 2 - 2.5 mm. General body color black; mesopleuron, petiole, mandibles, clypeus and antennae reddish brown; legs yellowish brown. Eyes small, each consisting of around 5 facets; the longest diameter shorter than the length of the 10th antennal segment. Bases of antennal scapes simple in structure, without covering lamellae. Median process on anterior margin of clypeus low. Propodeal spines directed backwards, each longer than its width. Subpetiolar process variously developed, but generally directed forwards. Head and mesosoma longitudinally rugulose, but the rugulae somewhat slender and obscure, their interspaces punctate; the spaces between the eyes and the ventral extensions of the longitudinal carinae extending from the occipital region punctate.

Found on the floor of broadleaf forests, nesting under stones.

**Myrmecina amamiana** Terayama  
Fig. p 101

**Original Reference:** Terayama, M. (1996)  
**Distribution:** Amami-oshima I., Tokunoshima I.

Total length of workers around 3 mm. General body color black; mesopleuron, petiole and postpetiole reddish brown; legs, antennae and mandibles yellowish brown. Eyes rather large and convex, each consisting of over 10 facets; the longest diameter as long as or longer than the length of the 10th antennal segment. Bases of antennal scapes simple in structure, without covering lamellae. Anterior margin of clypeus with a small median process which may vary in size. Propodeal spines more or less upwardly curved. Subpetiolar process with rounded apex pointing forwards. Rugulae on head and mesosoma broad, longitudinal, with smooth, shining interspaces; the spaces between the eyes and the ventral extensions of the longitudinal carinae running from the occipital region on each side with several longitudinal rugulae.

The species is similar to *M. nipponica* in size and coloration, but distinguished by the broad longitudinal rugulae on the head and mesosoma, and the convex eyes. Found on the floor of broadleaf forests, nesting in the soil or under stones.

**Myrmecina nipponica** Wheeler  
Fig. p 101

**Original Reference:** Wheeler, W. M. (1906c)  
**Synonym(s):** *Myrmecina graminicola nipponica* Wheeler, 1906c  
**Distribution:** Hokkaido, Honshu, Shikoku, Kyushu, Yaku I.: Korean Peninsula.

Total length of workers around 3 mm. General body color black; mesopleuron, petiole and postpetiole reddish brown; legs, antennae and mandibles yellow to yellowish brown. Eyes rather large, each consisting of over 10 facets; the longest diameter as long as or longer than the length of the 10th antennal segment. Bases of antennal scapes simple in structure, without covering lamellae. Anterior margin of clypeus with a small median process which varies in size. Propodeal spines more or less upwardly curved. Subpetiolar process obscure. Head and mesosoma irregularly longitudinally rugulose, with smooth, shining interspaces; the spaces between the eyes and the ventral extensions of the longitudinal carinae extending from the occipital region smooth and shining, almost without sculpture.

Found on the floor of woodland or its margins, nesting in the soil, or fallen twigs, or under stones.
**Myrmecina flava** Terayama

*Original Reference*: Terayama, M. (1985a)

*Distribution*: Honshu, Shikoku, Kyushu.

Total length of workers around 2.5 mm. Body color yellow to yellowish brown; gaster darker; legs yellow. Eyes small, consisting of several facets; their greatest diameter far less than the length of the 10th antennal segment. Basal portion of each antennal scape with a semilobulate lamella covering the articulation condyly. No median process on anterior margin of clypeus. Propodeal spines directed backwards. Subpetiolar process more or less distinct, with acute apex, pointed forwards. Head and mesosoma irregularly longitudinally rugose, with punctate interspaces; the spaces between the eyes and the ventral extensions of the longitudinal carinae extending from the occipital region punctuate, not rugulose.

**Lordomyrma azumai** (Santschi)

*Original Reference*: Santschi, F. (1941)

*Synonym(s)*: Rogeria (Rogeria) azumai Santschi, 1941

*Lordomyrma nobilis* Yasumatsu, 1950

*Lordomyrma azumai*: Brown, 1952

*Distribution*: Honshu, Shikoku, Kyushu.


Found in the soil of broadleaf forests, nesting under stones or in the hollow cores of fallen twigs. A rather rare species.

**Rhopalomastix omotoensis** Terayama


*Distribution*: Ishigaki I.

Total length of workers around 2 mm. Body color yellowish brown. Antennae 10-segmented. Scapes about half as long as the head width. Apical funicular segment large and flat, twice as long as wide, almost equal in length to the remaining funiculus. Eyes small. Dorsum of mesosoma straight in profile. Promesonotal suture absent dorsally, and obscure laterally. Legs short, trochanters and tibiae flattened. Petiole high, with short peduncle; subpetiolar process forming an obtuse triangle. Postpetiole higher than long in side view, posterior surface attached to first gastral tergite.

**Recurvirdis recurvispinosa** (Forel)

*Original Reference*: Forel, A. (1890)

*Synonym(s)*: Recurvirdis recurvispinosa (Forel) (Bolton, 1992)

*Trigonogaster recurvispinosus* Forel (1890)

*Distribution*: Ishigaki I., Iriomote I.; Taiwan, China, Myanmar, Nepal, India.

Total length of workers around 2 mm. Body color yellow, gaster somewhat darker. Head rectangular, 1.1 times as long as wide, with weakly concave posterior margin in full face view. Anterior margin of clypeus broadly convex. Mandibles each with 4 teeth; the apical tooth largest; basal tooth subrectangular, with 2 acute angles. Antennal scapes slightly exceeding dorsal margin of head; apical 3 funicular segments forming a club, which is slightly longer than the preceding funicular segments together. Eyes relatively small, each with about 25 facets and tear-drop shaped, with an acutely angulate anterior corner. Propodeal spines strongly curved, with the tips pointing forwards. Petiole with a long, slender peduncle. Subpetiolar process triangular, with an acute ventral angle. Postpetiole with very gently convex dorsal margin. Postpetiole trapezoidal, broadest posteriorly; its maximum width 1.4 times the minimum width. Erect hairs present on pronotal dorsum (3 pairs), mesonotal dorsum (a single hair), petiole (2 pairs), and postpetiole (2 pairs). Head, mesonotal dorsum, petiole and postpetiole microreticulate; other parts smooth and shining.

**Vollenhovia nipponica**

*Kinomura & Yamauchi*


*Distribution*: Honshu (Gifu), Kyushu (Kumamoto).

A social parasite of the short winged form of *Vollenhovia emeryi*, which occurs in and near riverside forests. *V. nipponica* females are easily distinguished from those of *V. emeryi* as follows: (1) postpetiole smooth and shining (shagreened in *V. emeryi*); (2) head broader than mesosoma in dorsal view (the two almost equally wide in *V. emeryi*); (3) body size distinctly smaller than in *V. emeryi*.

**Vollenhovia yambaru** Terayama


*Distribution*: Okinawa I.

We are unable to distinguish workers of this species from those of *Vollenhovia okinawana*. However, we treat it as a separate species because all of its known females are wingless ergatoids, while those of *V. okinawana* are winged.
Vollenhovia okinawana Terayama & Kinomura

Workers 2.5 mm. Yellowish brown/reddish brown. Resembles V. benzai, easily distinguished by: (1) promesonotal dorsum smooth, shining, no sculpturing on median strip; (2) dorsal profile of postpetiole slightly concave posteriorly; (3) subpetiolar process larger, lamellate, about 0.04 mm deep.

Vollenhovia benzai Terayama & Kinomura

**MYRMICINAE**

*Vollenhovia amamiana* Terayama & Kinomura

Workers 3 mm. reddish brown; legs, antennae, mandibles lighter. Head width measurement relatively small; head width/length ratio 0.71. Anterior clypeal margin rounded. Mandibles 7-toothed. Eyes relatively strongly convex. Posterolateral propodeal margins angulate, without teeth. Petiolar node high, posterior margin steep. Subpetiolar process large, lamellate, ca. 0.07 mm deep. Head, mesosoma, petiole, postpetiolar shagreened; gaster, legs smooth. Nests: rotten wood, forests.

**MYRMICINAE**

*Vollenhovia sakishimana* Terayama & Kinomura

Workers 2 mm. yellow/pale brown; antennae, legs yellowish. Head width/length ratio 0.83. Mandibles 6-toothed. Propodeal processes dentiform. Subpetiolar process large. Head, mesosoma, petiole, postpetiole shagreened; postpetiolar dorsum shining; gaster, legs smooth. Resembles *V. emeryi*, distinguished by: (1) frons without black spot behind clypeus; (2) postpetiolar sternum anteriorly almost straight in profile. Nests: soil, rotten wood, forests. Polygynous, averaging 3.8 queens/nest.
MYRMICINAE

Vollenhovia emeryi Wheeler

Workers 2.5 mm. Reddish brown/dark brown; gaster darker; blackish spot anteriorly on frons; legs yellowish. Head width/length ratio 0.83. Mandibles 6-7-toothed. Metasomal profile flat; metanotal groove weak. Propodeum: acute dentiform processes. Subpetiolar process: large, lamellate, ca. 0.05 mm deep. Cephalic dorsum, mesosoma with many longitudinal rugae.

Nests: decaying wood. Colonies monogynous, with long-winged females, or polygyneous with short-winged females.

MYRMICINAE

Oligomyrmex sauteri Forel

Strongly dimorphic. Soldier (illustrated) 2 mm (workers 1 mm). Light reddish brown, head darker, 1.1-1.2x longer than wide, sides weakly convex; posterior margin moderately concave; a pair of frontal tubercles; vertex, occiput smooth; vertex with 4-6 transverse rugae; antennae 9-segmented; eye diameter < scape width; posterodorsal propodeal corners rounded, not angulate; posterolateral propodeal margins flanged; subpetiolar process small, triangular.
**Oligomyrmex borealis** Terayama

Strongly dimorphic. Soldier (illustrated) 3.5 mm (workers 1.5 mm). Yellowish brown. Head 1.1x longer than wide, sides converging anteriorly, posterior margin concave, frontal tubercles present; mandibles 6-toothed; antennae 9-segmented; eyes 5-faceted; pronotal mesonotal dorsa distinctly produced; mesonotum, mesopleuron divided; propodeum: posterodorsally toothed; posterolateral margins carinate; subpetiolar process bluntly triangular. Head: punctate, many longitudinal rugae; remaining body smooth or finely punctate.

**Oligomyrmex oni** Terayama

Strongly dimorphic. Soldier (illustrated) 3.5 mm (workers 1 mm). Reddish brown, head darker, 1.1x longer than wide, posterior margin concave; frontal tubercles obscure/absent; sometimes a median ocellus; mandibles 6-toothed; eyes 10-faceted, hairy; antennae 9-segmented; mesonotum, mesopleuron divided; propodeal teeth triangular, apices rounded; posterolateral propodeal margins carinate; subpetiolar process an acute tooth; head: numerous longitudinal rugae, small punctures; dorsa of pronotum, mesonotum shining, remainder finely punctate.
MYRMICINAE

Oligomyrmex hannya Terayama

Strongly dimorphic. Soldier (illustrated) 1.5 mm (workers 1 mm - the smallest Japanese myrmicines). Yellowish brown. Head 1.3x longer than wide, sides parallel; frontal tubercles present; occiput concave medially; eyes: several facets; mandibles 5-toothed; antennae 9-segmented; pronotal, mesonotal dorsa produced; mesonotum, mesopleuron unidivided; propodeal spines small; propodeum flanged posterolaterally; subpetiolar process spinose; head anteriorly longitudinally striate, posteriorly impunctate; pronotum shining; remainder finely punctate.

MYRMICINAE

Oligomyrmex yamatonis Terayama

Strongly dimorphic. Soldier (illustrated) 2 mm (workers 1 mm). Light reddish brown, head blackish, 1.3x longer than wide, sides parallel; frontal tubercles present, occiput strongly concave; mandibles 5-toothed; antennae 9-segmented; eyes: 2-3 facets; pronotal, mesonotal dorsa raised; mesopleuron undivided; postero-lateral propodeal margins flanged; subpetiolar process bluntly triangular; head, mesosoma, petiole, postpetiole densely punctate; head: many longitudinal rugae. Relatively common.
**MYRMICINAE**

*Pheidologeton diversus* (Jerdon)

Polymorphic, 2.5-11.0 mm. Minors yellowish/reddish brown. Head rectangular, occiput convex; mandibles 5-toothed; scape not exceeding occiput; apical two funicular segments together longer than remainder; promesonotal profile convex; metanotum groove deep; propodeal dorsum convex; propodeal spines long. Majors darker; head: disproportionately large, almost square, occiput convex; clypeal border: straight, notched medially; mandibles: triangular, apical teeth acute, others indistinct; eyes small; ocelli present; scape half as long as head.

**MYRMICINAE**

*Solenopsis tipuna* Forel

MYRMCINAE

*Solenopsis japonica* Wheeler

Workers dimorphic, ca. 1.5 mm. Yellow/yellowish brown. Head rectangular, 1.35x longer than wide. Scapes not reaching occiput. Eyes small, 2-4 facets. Dorsal mesosomal outline weakly convex; metanotal groove deep. Propodeum weakly convex; posterodorsal corner obtusely angled. Ventral petiolar margin straight/weakly convex. Head, mesosoma, petiole, postpetiole with short, sparse, erect hairs. All body surfaces smooth, shining.

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MYRMCINAE

*Solenopsis geminata* (Fabricius)

Polymorphic ca. 3-8 mm. Reddish brown, head brown. Majors: head almost square, posteriorly convex; mandibles: robust, outer margins strongly convex, 4 blunt teeth, remainder obscure; clypeus longitudinally bicornate; eyes small, +20 facets; anterior ocelli often present; scapes nearly reaching occiput; 2-segmented club longer than 3rd-9th segments combined. Legs, body hairy. Minors: mandibles 4-toothed; scapes reaching occiput; clypeus longitudinally bicornate; posterolateral propodeal corners carinate.
**MYRMICINAE**

*Monomorium hiten* Terayama


**MYRMICINAE**

*Monomorium triviale* Wheeler

**MYRMICINAE**

*Monomorium pharaonis* (Linnaeus)


**MYRMICINAE**

*Monomorium latinode* Mayr

**MYRMICINAE**

*Monomorium intrudens* F. Smith


**MYRMICINAE**

*Monomorium sechellense* Emery

MYRMICINAE

Monomorium floricola (Jerdon)


MYRMICINAE

Monomorium destructor (Jerdon)

Workers 3-3.5 mm. Size variable. Generally yellowish/reddish brown; gaster darker. Mandibles 4-toothed. Eyes ca. 20-faceted. Clypeal carinae obscure. Metanotal groove distinct. Posterodorsal propodeal border angulate. Ventral petiolar profile relatively strongly convex. Postpetiole 1.1-1.2x longer than wide. Mesopleuron, propodeal sides finely punctate; Propodeal dorsum transversely rugose. Distinguished from *M. latinode* by mandibles (5-toothed in *latinode*), distinct metanotal groove, narrower postpetiole (1.5x longer than broad in *latinode*).
MYRMICINAE

*Monomorium chinense* Santschi


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MYRMICINAE

*Strongylognathus koreanus* Pisarski

**MYRMICINAE**

*Tetramorium tonganum* Mayr


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**MYRMICINAE**

*Tetramorium smithi* Mayr

MYRMICINAE

*Tetramorium simillimum* (F. Smith)

Workers 2.5 mm. Yellowish/reddish brown to postpetiole, gaster dark brown. Antennae 12-segmented. Anterior clypeal margin without median notch. Lateral mesosomal margins sinuate, mesonotal region expanded laterally. Propodeal spines dentiform, directed upward. Body hairs short, stout, blunt, shorter than interspaces. Sculpture fine, longitudinally rugose; interspaces with fine, dense reticulate-punctuation or granulation.

MYRMICINAE

*Tetramorium nipponense* Wheeler

Workers 3 mm. Uniformly yellow/yellowish brown. Antennae 12-segmented; scape almost reaching posterior corners of head. Anterior clypeal margin with median notch. Propodeal spines long, acute, curved upward. Head to postpetiole irregularly reticulate-rugose; longitudinal rugae on cephalic dorsum.
**MYRMICINAE**

*Tetramorium lanuginosum* Mayr


**MYRMICINAE**

*Tetramorium kraepelini* Forel

MYRMICINAE

*Tetramorium tsushimae* Emery


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MYRMICINAE

*Tetramorium bicarinatum* (Nylander)

Workers 3 mm. Bicolored: Yellow/yellowish brown to postpetiole; gaster dark brown. Anterior clypeal margin with median notch. Antennae 12-segmented; scapes almost reaching posterior cephalic corners. Propodeal spines long, acute, curved upward. Head to postpetiole densely, irregularly reticulate-rugose; longitudinal rugae prominent on cephalic dorsum. Distinguished from *T. nipponense*, by shorter body hairs, dark-colored gaster, contrasting with remaining body, higher posterior petiole margin in profile.
**Vollenhovia okinawana**  
Terayama & Kinomura  
Fig. p 113  
*Distribution*: Okinawa I.

Total length of workers around 2.5 mm. Body color yellowish brown to reddish brown. This species closely resembles *Vollenhovia benzaiz*, from which it is easily distinguished as follows: (1) no sculpturing on a median strip of the promesonotal dorsum, which is smooth and shining; (2) dorsal profile of postpetiolar slightly concave posteriorly. Subpetiolar process relatively small, but larger than that of *V. benzaiz*, the lamella about 0.04 mm deep.

Widely distributed on Okinawa Island, nesting in decaying wood in forests. The females are winged. *Vollenhovia yamburai*, which produces ergatoid females and workers identical to those of *V. okinawana*, is found in the native forests of northern Okinawa.

**Vollenhovia benzaiz**  
Terayama & Kinomura  
Fig. p 113  
*Distribution*: Shikoku, Kyushu, Yaku I., Nansei Is.

Total length of workers around 2.5 mm. Body color yellowish brown to reddish brown; legs lighter. Head width/head length ratio 0.83. Mandibles each with 6 teeth. Posterolateral corners of propodeum rounded, lacking processes. Subpetiolar process the least developed among Japanese *Vollenhovia* species; its height about 0.03 mm. Postpetiolar dorsum semicircular in profile. Head, mesosoma, petiole and postpetiolar shagreened, the sculpturing weaker on postpetiole than petiole; gaster and legs smooth. Head and promesonotal dorsum with longitudinal rugae.

This species is polygynous. It nests in decaying wood or in the soil in forests. Wingless ergatoid females are known from the Amami-oshima Island population, in which normal winged females are also present.

**Vollenhovia amamiana**  
Terayama & Kinomura  
Fig. p 114  
*Distribution*: Amami-oshima I., Tokunoshima I.

Total length of workers around 3 mm. Body color reddish brown; legs, antennae and mandibles lighter. The head width measurement is relatively small compared to other Japanese species; head width/head length ratio 0.71. Anterior margin of clypeus rounded. Mandibles each with 7 teeth. Eyes more strongly convex than in other Japanese species. Posterolateral margin of propodeum angular, without dentiform processes. Petiolar node high, its posterior margins steep. Subpetiolar process well developed, forming a large lamellate plate about 0.07 mm deep. Head, mesosoma, petiole and postpetiolar shagreened, gaster and legs smooth.

**Vollenhovia sakishimana**  
Terayama & Kinomura  
Fig. p 114  
*Distribution*: Nansei Is (Sakishima Is), Ogasawara Is.

Total length of workers around 2 mm. Body color yellow to pale brown; antennae and legs yellowish brown. Head width/length ratio 0.83. Mandibles each with 6 teeth. Propodeal processes dentiform. Subpetiolar process large. Head, mesosoma, petiole and postpetiolar shagreened; postpetiolar dorsum feebly sculptured and strongly shining; gaster and legs smooth.

Reminiscent of *V. emeryi*, but can be distinguished from it as follows: (1) head without a median black spot just behind the clypeus; (2) anterior border of postpetiolar sternum almost straight in profile. Nests in the soil or rotten wood in forests. Polygynous; on average 3.8 queens are present per nest.

**Vollenhovia emeryi**  
Wheeler  
Fig. p 115  
*Original Reference*: Wheeler, W. M. (1906)  
*Distribution*: Hokkaido, Honshu, Shikoku, Kyushu, Yaku I., Kuchino-erabu I.
Total length of workers around 2.5 mm. Body color reddish brown to dark brown; gaster darker; head with a blackish brown spot just above clypeus; legs yellowish brown. Head rectangular; head width/head length ratio 0.83. Mandibles with 6 or 7 teeth. Mesosoma flat in profile; metanotal groove weakly developed. Propodeum with dentiform processes; their apices acute. Subpetiolar process well developed, forming a large lamellate plate about 0.05 mm deep. Dorsal areas of head and mesosoma with many longitudinal rugae.

*V. emeryi* has colonies of two types: Type 1 colonies are usually monogynous with alate females, the reproductive offspring of which are also alate females; Type 2 colonies are usually polygynous and have short-winged reproductive females, the reproductive female offspring of which are also short-winged. Type 1 colonies are found mainly in montain forests, nesting in decaying wood. Type 2 colonies are found in or near riverside forests, also nesting in decaying wood. These two colony types might represent two separate species, or might be products of genetic polymorphism within a single species, as suggested by Kubota (1984). We tentatively treat them here as conspecific, while indicating the need for further studies on their status. In both types the alate females and males hibernate within the nests. *V. nipponica* is a parasite frequently found in Type 2 colonies of *V. emeryi*.

### Oligomyrmex sauteri Forel

**Fig. p 115**

**Original Reference:** Forel, A. (1912)

**Distribution:** Senkaku Is.; Taiwan, Mainland China(?).

Total length around 2 mm in soldiers, 1 mm in workers. Body light reddish brown, head of soldier darker. In soldiers: head 1.1 to 1.2 times as long as wide, with weakly convex sides in full face view; vertex with a pair of tubercles, posterior margin of head moderately concave; vertex and occiput largely smooth; vertex with 4 to 6 distinct transverse rugae; antennae 9-segmented; eyes small, smaller than the maximum width of an antennal scape; posterodorsal corners of propodeum rounded, not forming an angle; posterolateral margins of propodeum each with a thin lamellate flange; subpetiolar process small, triangular. In workers: head and pronotum largely smooth; antennae 9-segmented; pronotal and mesonotal dorsa moderately convex in profile; posterodorsal corners of propodeum rounded, not forming angles or spines; thin lamellar flanges on posterolateral margins of propodeum; subpetiolar process bearing a small blunt tubercle.

### Oligomyrmex borealis Terayama

**Fig. p 116**

**Original Reference:** Terayama, M. (1996)

**Distribution:** Honshu (Aomori, Akita, Yamanashi).

Total length around 3.5 mm in soldiers, around 1 mm in workers. One of the larger Japanese *Oligomyrmex* species. Body color reddish brown, except the head which is blackish brown in soldiers, yellowish brown in workers. In soldiers: head 1.1 times as long as wide, posterior margin slightly concave at midline in full face view; a single median ocellus present in many individuals; tubercles on vertex variously present, ranging to obscure or absent; mandibles each with 6 teeth; eyes each with more than 10 facets, situated laterally on anterior portion of head capsule, and bearing hairs which are longer than the diameter of a single facet; antennae 9-segmented; mesonotal dorsum produced, divided into mesoscutum and scutellum; mesopleura divided by an oblique furrow.
Oligomyrmex hannya Terayama

**Fig. p 117**

**Original Reference:** Terayama, M. (1996)

**Distribution:** Okinawa I.

Total length around 1.5 mm in soldiers, around 1 mm or less in workers. The smallest known Japanese myrmicine ant. Body color yellowish brown. In soldiers: head 1.3 times as long as wide, with parallel sides in full face view; vertex with a pair of tubercles; posterior cephalic margin very weakly concave in the middle; eyes small, with only several facets, situated laterally on the anterior portion of head; mandibles each with 5 teeth; antennae 9-segmented; pronotal and mesonotal dorsi weakly produced; mesonotum simple, not divided into mesoscutum and scutellum; mesopleuron simple; propodeal spines present but small; posterolateral margin of propodeum with a thin lamellate flange extending from the propodeal spine; subpetiolar process spinose; anterior half of head with numerous longitudinal striae, posterior half mostly smooth and impunctuate; pronotum smooth and shining; mesonotum, propodeum, petiole and postpetiole covered with small punctures. In workers: head slightly longer than wide in frontal view; antennae 9-segmented; mandibles each with 5 teeth; eyes each with only a single facet, situated laterally on anterior portion of head capsule; propodeum without teeth; posterolateral margins each with a thin lamellate flange which reaches back to the posterodorsal corners of the propodeum; head covered with shallow punctures; pronotum smooth and shining; mesonotum, propodeum, petiole and postpetiole covered with small punctures.

Oligomyrmex yamatonis Terayama

**Fig. p 117**

**Original Reference:** Terayama, M. (1996)

**Synonym(s):** Oligomyrmex suteri Forel (Azuma, 1951; not O. suteri)

**Distribution:** Honshu, Shikoku, Kyushu, Yaku I., Nansei I.

Total length around 2 mm in soldiers, around 1 mm in workers. Body color light reddish brown, heads of soldiers blackish. In soldiers: head 1.3 times as long as wide, with parallel sides in frontal view; vertex with a pair of tubercles, posterior margin of head strongly concave; mandibles each with 5 teeth; antennae 9-segmented; eyes small, with 2 or 3 facets, situated on the anterior portion of the head capsule; pronotal and mesonotal dorsa raised in profile; mesopleuron simple, not divided by an oblique furrow; posterolateral margins of propodeum with a thin lamellate flange below the propodeal tooth; subpetiolar process small, forming a blunt triangle; head, mesosoma, petiole and postpetiole covered with punctures; head with many longitudinal rugae. In workers: Head slightly longer than wide in frontal view; mandibles each with 5 teeth; eyes each with only one facet, situated at midlength of head capsule in side view; thin lamellar flanges on posterolateral margins of propodeum; subpetiolar process obscure; head, mesosoma, petiole and postpetiole covered with small, coarse punctures. A relatively common ant.

Pheidologeton diversus (Jerdon)

**Fig. p 118**

**Original Reference:** Jerdon, T. C. (1851)

**Synonym(s):** Ocodoma diversa Jerdon (Jerdon, 1851) Pheidologeton diversus (Jerdon) (Roger, 1863)

**Distribution:** Nansei Is., Ogasawara Is.; tropical and subtropical Asia.

Total length of workers between 2.5 and 11 mm. Body color yellowish brown to reddish brown in minor workers: reddish brown to blackish brown in majors. In minor workers: head rectangular with weakly convex posterior margin in full face view; mandibles each with 5 teeth; antennal scapes short, not exceeding posterior margin of head; each of the apical two funicular segments long, their combined length longer than the rest of funiculus; promesonotum relatively strongly convex in profile; metanotal groove deeply incised;
dorsum of propodeum convex; propodeal spines long, with acute apices. In major workers: head proportionately large, almost square, with convex posterior margin in frontal view; anterior margin of clypeus straight, with a shallow median notch; mandibles large, triangular, with an acute apical tooth; masticatory margins without distinct teeth; eyes relatively small; ocelli present; antennal scapes 0.5 times as long as head; subpetiolar process present.

P. diversus forms large colonies, often found in the soil or under stones. It regularly forms long foraging columns. There are only two Japanese field records, respectively from the Nansei Islands (Okinawa Island) and the Ogasawara Islands (Chichi-jima Island). Specimens taken at the U.S. Air force base at Zama City, Kanagawa Prefecture, must have originated from a commercial introduction from SE Asia (Kubota, 1988).

Solenopsis tipuna Forel

Original Reference: Forel, A. (1912)
Distribution: Nansei Is; Taiwan.

Total length of workers around 1.5 mm. Body yellow to yellowish brown. Eyes small, each consisting of 2-4 facets. Metanotal groove deeper than in S. japonica. Posterodorsal corners of propodeum rounded, not angulate. Petiole with a much more strongly convex ventral margin than that of S. japonica.

Polygynous. The nests are found in the soil or under stones.

Solenopsis japonica Wheeler

Original Reference: Wheeler, W. M. (1928)
Synonym(s): Solenopsis fugax var. japonica Wheeler (Wheeler, 1928)
Solenopsis japonica Wheeler (Collingwood, 1976)
Diplorhoptrum fugax var. japonicum (Wheeler) (Onoyama, 1980)
Distribution: Hokkaido, Honshu, Shikoku, Tsushima I., Kyushu, Yaku L, Tokara Is; Korea.

Worker caste weakly dimorphic. Total length of workers around 1.5 mm. Body color yellow to yellowish brown. Head rectangular, about 1.35 times as long as wide. Antennal scapes short, not reaching posterior margin of head. Eyes small, each consisting of 2 to 4 facets. Dorsal outline of mesosoma weakly convex; metanotal groove deeply incised dorsally. Propodeum weakly convex; posterodorsal corner forming an obtusely rounded angle. Ventral margin of petiole almost straight, at most very weakly convex. Head, mesosoma, petiole and postpetiole with short, sparse, erect hairs. All body surfaces smooth and shining.

The nests of this thief ant are connected to those of other ant species by narrow galleries which are used by the S. japonica workers to steal food from their hosts.

Solenopsis geminata (Fabricius)

Original Reference: Fabricius, J. C. (1804)
Synonym(s): Atta geminata Fabricius (Fabricius, 1804)
Solenopsis geminata (Fabricius) (Mayr, 1867)
Distribution: Nansei Is (Okinawa Is, Ie L), Volcano Is (Iwo I.); pantropical and subtropical.

Workers polymorphic, total body length ranging 3 to 8 mm. Body reddish brown, head brown. In major workers: head almost square, posterior margin distinctly convex in full face view; mandibles robust, each with a strongly convex outer margin and 4 blunt teeth on the masticatory margin; mandibular teeth obscure in some individuals; clypeus with a pair of longitudinal carinae; eyes rather small, each with more than 20 facets; anterior ocelli often present; antennal scapes reaching nearly to posterior border of head; antennal club longer than the 3rd to 9th antennal segments combined; legs, mesosoma and gaster with numerous erect hairs. In minor workers: head almost square in full face view; mandibles 4-toothed; antennal scapes reaching posterior margin of head; clypeus with a pair of longitudinal carinae; posterolateral corners of propodeum carinate, the carinae reaching the dorsal surface of the propodeum; subpetiolar process absent.

The distribution of S. geminata has been extended to many tropical and sub-tropical areas of the world by human activities. The species is well known as one of the several pestiferous Solenopsis "fire ants". It has been found in the Nansei Islands, around the U.S. Army base on Okinawa Island and at the radar site on Ie-jima Island. It was almost certainly introduced to these areas by human commerce (Kubota, 1983; Terayama, 1999). This omnivorous species lives in open land, including barren areas and grassland. It nests in the soil.

Monomorium hiten Terayama

Distribution: Yaku L, Nansei Is.


Similar to M. intrudens and M. triviale, but identified by the characteristic paired spots on its gaster. Found in open land to woodland margins, nesting under stones.
Monomorium triviale Wheeler

Fig. p 120

Original Reference: Wheeler, W. M. (1906c)

Distribution: Honshu; Korean Peninsula.


Apart from coloration, the species is similar to M. intrudens and M. hiten. It is found in open land and at woodland margins, and is quite rare.

Monomorium pharaonis (Linnaeus)

Fig. p 121

Original Reference: Linnaeus, C. (1758)

Synonym(s): Formica Pharaonis Linnaeus (Linnaeus, 1758)

Monomorium pharaonis Mayer (Mayer, 1862)

Distribution: Honshu, Shikoku, Kyushu, Nansei Is, Ogasawara Is; worldwide.

Total length of workers around 2 to 2.5 mm. Body unicolorated: yellow to reddish brown. Eyes each with around 20 facets. Mandibles each with 4 teeth. Paired longitudinal carinae on clypeus distinct. Metanotal groove distinct. Posterodorsal margin of propodeum more or less angulate. No standing hairs on propodeal dorsum. Ventral outline of petiole not strongly convex. Body surfaces from head to postpetiole finely, densely, and distinctively punctate and opaque.

M. pharaonis is essentially world-wide in distribution, and is well known as a household, hospital and store pest capable of nesting within buildings and ships. It inhabits open land or grassland in the Nansei Islands, but there have been no reports of its presence outdoors from Kyushu or more northern areas of Japan.

Monomorium latinode Mayr

Fig. p 121

Original Reference: Mayr, G. (1872)

Distribution: Nansei Is (Okinawa I); pantropical and subtropical.

Total length of workers around 3 mm. The largest Monomorium species from Japan. Body bicolored: yellowish to reddish brown from head to postpetiole; the gaster blackish brown. Eyes large, each consisting of around 20 facets. Mandibles each with 5 teeth. Clypeus with paired longitudinal carinae. Metanotal groove shallow dorsally. Posterodorsal margin of propodeum angulate. Ventral outline of petiole more or less roundly convex. Postpetiole 1.4 times as long as broad. Mesopleuron and sides of propodeum with fine longitudinal rugation; dorsal surface of propodeum with transverse rugae.

Similar to M. destructor in size and coloration, but the 5-toothed mandibles and shallow metanotal groove distinguish M. latinode.

Monomorium intrudens F. Smith

Fig. p 122

Original Reference: Smith, F. (1874)

Synonym(s): Not Monomorium floricola (Jerdon) (Jerdon, )

Monomorium nipponense Wheeler (Wheeler, 1906)

Monomorium nipponense var. gracilum Teranishi (Teranishi, 1940)

Monomorium nipponense var. robustum Teranishi (Teranishi, 1940)

Monomorium nipponense var. satoi Teranishi (Teranishi, 1940)

Distribution: Honshu, Shikoku, Kyushu, Nansei Is; Korean Peninsula.

Total length of workers around 1.5 mm. Body bicolored: yellow to yellowish brown from head to postpetiole; the gaster brown to blackish brown. Mandibles each with 4 teeth. Eyes each with 10 or more facets. Paired longitudinal carinae on clypeus obscure. Metanotal groove distinct. Posterodorsal border of propodeum rounded; the area of petiolar insertion not carinate. Ventral outline of petiole roundly convex. Body surfaces smooth and shining, without sculpture.

Monomorium sechellense Emery

Fig. p 122

Original Reference: Emery, C. (1894)

Synonym(s): Monomorium fossulatum subsp. sechellense Emery, 1894a

Monomorium fossulatum Emery, 1895k

Distribution: Nansei Is, Ogasawara Is; Taiwan, SE Asia, Oceania.

Total length of workers around 1.5 mm. Body essentially uniform in color: yellow to yellowish brown. Eyes small, each with only 1 or 2 facets. Mandibles each with 4 teeth. Paired longitudinal carinae on clypeus obscure; median part of clypeus distinctly raised. Metanotal groove distinct. Posterodorsal portion of propodeum angulate. Ventral outline of petiole roundly convex in profile.
Surface of mesopleuron and lateral portions of propodeum with fine punctures; remainder of the body smooth and shining.

**Monomorium floricola (Jerdon)**

*Original Reference:* Jerdon, T. C. (1851)

*Synonym(s):* Atta floricola Jerdon, 1851

*Monomorium floricola:* Emery in Dalla Torre, 1893

**Distribution:** Nansei Is, Ogasawara Is; pantropical, subtropical.

Total length of workers around 1.5 mm. Body bicolored: head and gaster dark brown; the rest yellowish brown, with the mesosoma variable in hue. Eyes each with around 10 facets. Mandibles each with 4 teeth. Paired longitudinal carinae on clypeus distinct. Promesonotum depressed and elongate. Metanotal groove distinct. Propodeum with a rounded posterodorsal margin in profile. Ventral outline of petiole almost straight in profile. Body surfaces without sculpture, smooth and shining. Found in open land, nesting under bark on trees or in hollow twigs.

![M. floricola, M. intrudens, M. triviale, M. hiten](image)

**Monomorium destructor (Jerdon)**

*Original Reference:* Jerdon, T. C. (1851)

*Synonym(s):* Atta destructor Jerdon, 1851

*Monomorium destructor:* Emery in Dalla Torre, 1893

**Distribution:** Nansei Is; pantropical, subtropical.

Total length of workers around 3 to 3.5 mm. A relatively large *Monomorium* species, variable in size. Body yellowish brown to reddish brown from head to postpetiole; gaster blackish brown. Mandibles each with 4 teeth, the basalmost sometimes obscure. Eyes large, each with around 20 facets. Median paired carinae of clypeus obscure. Metanotal groove distinct. Propodeum with angular posterodorsal border; the area of petiolar insertion carinate. Ventral outline of petiole less convex than in other species. Postpetiole 1.1-1.2 times as long as broad. Mesopleuron and sections of lateral surfaces of propodeum with fine punctuation; dorsal surface of propodeum with transverse rugae.

*M. destructor* is similar to *M. latinode*, but distinguished by the presence of 4 teeth on each mandible (versus 5 in *latinode*), the distinct metanotal groove (shallow and indistinct in *latinode*) and the narrower postpetiole (1.5 times as long as broad in *latinode*). *M. destructor* is a significant pest species, known to gnaw holes in fabrics, some plastics and rubber goods, to remove rubber insulation from electrical or telephone wires, and to damage polyethylene cable. It is distributed throughout tropical and subtropical regions of the world as a commercially-dispersed tramp species.

**Monomorium chinense Santschi**

*Original Reference:* Santschi, F. (1925)

*Synonym(s):* Monomorium minutum var. chinensis Santschi, 1925

*Monomorium chinense:* Bolton, 1987

**Distribution:** Honshu, Shikoku, Kyushu, Nansei Is, Ogasawara Is; Mainland China, Taiwan.

Total length of workers around 1.5 mm. Body essentially uniform in color: brown to blackish brown. Mandibles each with 4 teeth. Eyes each with 10 or more facets. Median portion of clypeus with a pair of longitudinal carinae. Metanotal groove distinct. Propodeum with rounded posterodorsal border. Ventral outline of petiole roundly convex. Body surfaces without sculpture, smooth and shining. Found in woodland margins and grassland, nesting in the soil near the bases of plants.

**Strongylognathus koreanus Pisarski**

*Original Reference:* Pisarski, B. (1966)

**Distribution:** Honshu (Masutomi, Yamanashi Pref.; Washu-zan, Hiroshima Pref.); Korean Peninsula.

Total length of workers around 3 mm. Body yellowish brown. Head approximately square, 1.1 times as long as wide; posterior margin almost straight, very weakly convex medially in full face view. Anterior margin of clypeus broadly convex. Antennal scapes short, 0.7 times as long as head length. Mesonotal dorsum almost straight in profile; dorsum of propodeum gently convex. Posterodorsal corner of propodeum with a pair of obtuse spines. Petiole triangular, with a short peduncle. Subpetiolar process low, anteroventrally angled. Viewed from above the postpetiole 1.45 times as wide as long and wider than the petiole. Front of head and areas surrounding the eyes with longitudinal rugae; head elsewhere smooth and shining. Dorsa of head, mesosoma, petiole, postpetiole, and gaster with scattered stout hairs. Female around 7 mm long; color brown; mandibles remarkably sickle-shaped, as in the workers. This species was found from nests of *Tetramorium tsushimae* but is very rare.

**Tetramorium tonganum Mayr**

*Original Reference:* Mayr, G. (1870)

**Distribution:** Ogasawara Is; SE Asia, New Guinea, Oceania.

Total length of workers around 2.5 mm. Body color yellow to yellowish brown from head to postpetiole; gaster dark brown. Antennae 12-segmented. Anterior margin of clypeus without median notch. Propodeal spines dentiform, directed upward. Petiole
with short peduncle and rounded node. Sculpture rugulose.

**Tetramorium smithi** Mayr

*Fig. p 125*

**Original Reference:** Mayr, G. (1879)

**Distribution:** Nansei Is; SE Asia, India, Sri Lanka.

Total length of workers around 2 mm. Body color yellowish to reddish brown from head to postpetiole; gaster darker. Antennae 11-segmented. Anterior margin of clypeus without median notch. Lateral margin of mesosoma sinuate; mesonotal region expanded laterally in dorsal view. Propodeal spines acute, directed posteriorly. Sculpture somewhat coarse, longitudinally rugulose.

**Tetramorium simillimum** (F.Smith)

*Fig. p 126*

**Original Reference:** Smith, F. (1851)

**Synonym(s):** *Triglyphothrix lanuginosa* Emery (Emery, 1891)

**Distribution:** Nansei Is; SE Asia.

Total length of workers around 2.5 mm. Body color yellowish brown to reddish brown to yellowish brown. Antennae 12-segmented. Anterior margin of clypeus concave. Dorsal outline of mesosoma roundly convex in profile. Petiolar node low, without angulate corners. Head to postpetiole covered with reticulation. Body hairs abundant, some of them bifid or trifid.

**Tetramorium lanuginosum** was formerly assigned to the genus *Triglyphothrix* Forel, which was thought to be distinguished from *Tetramorium* by the presence of branched (bifid or trifid) body hairs. This character has proved insufficient to sustain the separate status of *Triglyphothrix*, which was synonymized under...
Tetramorium by Bolton (1985). In Japan *T. lanuginosum* is found in somewhat open land, and nests under stones or logs.

**Tetramorium kraepelini** Forel

Fig. p 127

Original Reference: Forel, A. (1905)

**Distribution:** Kyushu (southern part), Nansei Is; Mainland China, SE Asia.

Total length of workers around 2 mm. Body color yellow to yellowish brown, gaster sometimes darker. Antennae 12-segmented; scape short, their apices far from reaching the posterior corners of head. Anterior margin of clypeus without median notch. Lateral margin of mesosoma not sinuate in dorsal view. Propodeal spines long, spiniform, curved upward. Petiolar node with rounded posterior angle. Head and mesosoma covered with irregular reticulations.

Bolton (1977) described a taxon which he named *T. tanakai* from Ishigaki I., Ryukyus, Japan. He considered it to be "closely related" to *T. kraepelini*. The cited characters distinguishing *T. tanakai* were the color pattern (with head and gaster blackish-brown) and the shape of the petiolar node (dorsal length greater than height of tergal portion in profile). We do not consider these differences sufficient to define a species separate from *T. kraepelini*, and thus here suspend recognition of *T. tanakai* as a distinct species. *T. kraepelini* is found in grassland and woodland margins; it nests under stones.

**Tetramorium tsushimae** Emery

Fig. p 128

Original Reference: Emery, C. (1925c)

**Synonym(s):** Tetramorium caespitum semileve var. jacoti Wheeler, 1923 [unavailable]

*Tetramorium caespitum* subsp. *tsushimae* Emery, 1925c

*Tetramorium caespitum* subsp. *jacoti* Wheeler, 1927d

*Tetramorium caespitum* subsp. *jacoti* var. *annectens* Wheeler, 1927d [unavailable]

*Tetramorium annectens* Pisarski, 1969a

*Tetramorium tsusimae:* Bolton, 1995

**Distribution:** Hokkaido, Honshu, Shikoku, Kyushu, Tsushima I.; Holarctic.

Total length of workers around 2.5 mm. Body color brown to dark brown. Antennae 12-segmented. Anterior margin of clypeus slightly convex, without median notch. Frontal carina short, obscure behind the level of the eyes. Propodeal spines small, dentiform. Petiolar peduncle short and broad. Dorsum of head covered with fine longitudinal rugation. Sculpture on mesosoma more irregular, but mostly longitudinal.

**Tetramorium bicarinatum** (Nylander)

Fig. p 128

Original Reference: Nylander, W. (1846)

**Synonym(s):** Formica bicarinata Nylander (Nylander, 1846)

*Tetramorium guineense* (Fabricius, 1793) sensu Mayr (Mayr, 1862)

*Tetramorium bicarinatum* Bolton (Bolton, 1977)

**Distribution:** Honshu, Shikoku, Kyushu, Yaku I., Nansei Is, Ogasawara Is; Pan-tropical/subtropical (except for the Afrotropical region).

Total length of workers around 3 mm. Body bicolorous: yellow to yellowish brown from head to postpetiole; gaster dark brown. Anterior margin of clypeus with a median notch. Antennae 12-segmented; scapes almost reaching posterior corners of head. Propodeal spines long and acute, curved upward. Body surfaces from head to postpetiole covered with irregular reticulate-rugosity; longitudinal rugae prominent on dorsum of head.

Similar to *T. nipponese*, but distinguished by its shorter body hairs, dark-colored gaster, contrasting with the light yellowish remainder of the body, and higher posterior margin of the petiole in profile. *T. bicarinatum* is found in grassland and areas of bare coastal soil. It prefers more open and dryer situations than *T. nipponese*. Nests are found under stones and logs. Widely distributed to many parts of the world by human commerce.
MYRMICINAЕ

Cardiocondyla sp. 6


MYRMICINAЕ

Cardiocondyla yamauchii Terayama

**MYRMICINAE**

*Cardiocondyla tsukuyomi* Terayama


**MYRMICINAE**

*Cardiocondyla kagutuchi* Terayama

Workers 2 mm. Blackish brown-black. Similar to *C. nuda* (morphological descriptions almost identical) but petiolar node generally narrower anterodorsally (sometimes undependable). *C. kagutuchi* has 27 chromosomes, *C. nuda* 28. Male caste systems differ: *kagutuchi* is dimorphic, with both alate and ergatoid males, *nuda* is known only to have ergatoid males.
MYRMICINAE

Cardiocondyla wroughtonii (Forel)


MYRMICINAE

Cardiocondyla nuda (Mayr)

MYRMICINAE

*Leptothorax santra* Terayama & Onoyama


Rare.

MYRMICINAE

*Leptothorax kinomurai* Terayama & Onoyama

Workers 2.5 mm. Yellow. Scapes reaching occiput. Metanotal groove not incised. Propodeal profile straight; spines long, thin. Petiole: peduncle relatively long; node an inverted U-shape; anterior margin steeper than posterior. Distinguished from *L. indra* by absence of rugae on mesosomal dorsum, much steeper anterior slope of petiolar node.

Workers 2 mm. Head, gaster brownish, remainder yellow. Scapes reaching occiput. Mesosomal dorsum convex; metanotal groove not indented. Propodeal spines relatively long, length ca. 2x distance between their bases. Petiolar peduncle short; node low, anterior margin straight. Subpetiolar process relatively large, triangular.
MYRMICINAE

Leptothorax bikara Terayama & Onoyama


MYRMICINAE

Leptothorax antera Terayama & Onoyama

**MYRMICINAe**

*Leptothorax kubira* Terayama & Onoyama

Workers 2.5-3 mm. Reddish brown-brown; head, gaster sometimes darker than mesosoma, grading brown-blackish brown; legs yellow. Scapes long, reaching occiput. Metanotal groove usually distinct; sometimes obscure. Propodeum: dorsum straight; spines narrowly triangular, longer than distance separating them. Petiolar node triangular, subpetiolar process small.

Inhabits mountainous regions. There are several variant forms.

**MYRMICINAe**

*Leptothorax makora* Terayama & Onoyama


Distinguished from *L. spinosior* by inverted U-shaped node, (versus triangular); from *L. anira* by convex mesosomal profile. Nests: dead twigs on trees, forests, forest margins.
MYRMICINAE

*Leptothorax anira* Terayama & Onoyama

Workers 2.5-3 mm. Black-blackish brown. Scapes reaching occiput. Dorsal mesonotal profile straight. Metanotal groove weak. Propodeal spines acute, narrow, shorter than *L. spinosior*, each 2.5-3 times as long as its basal width. Petiolar node an inverted U-shape. Distinguished from *L. spinosior* and *L. makora*, by straight dorsal mesosomal profile.

MYRMICINAE

*Leptothorax indra* Terayama & Onoyama

**MYRMICINAE**

*Leptothorax koreanus* Teranishi

Workers 2-2.5 mm. Head, gaster black, mesosoma yellowish brown-blackish brown. Antennae 11-segmented; Scapes failing occiput. Pronotal shoulders distinctly angled dorsally. Distinguished from Japanese congeners by distinctly angulate pronotal humeri. Collected in open situations, seashore, parks, shrine sites. Rare.

**MYRMICINAE**

*Leptothorax spinosior* Forel

**MYRMICINAE**

*Leptothorax congruus* F. Smith


**MYRMICINAE**

*Leptothorax arimensis* Azuma


Nests: soil, dead twigs, lowlands, mountains to ca. 1000 m. Rare.
**MYRMICINAE**

*Leptothorax acervorum* (Fabricius)

Workers 3-3.5 mm. Head, gaster black; mesosoma, petiole, postpetiole reddish brown, dorsa blackish brown; legs brown. Antennae 11-segmented; Scapes failing occiput. Pro-, mesonotal profile depressed. Propodeum: dorsum convex, spines longer than wide, tips acute. Petiolar node high, triangular; anterior margin sloping steeply forwards; peduncle obscure.

Both monogynous and polygynous colonies known.

**MYRMICINAE**

*Pheidole bugi* Wheeler

Strongly dimorphic. Soldier (illustrated) 2.5 mm (workers 1.5 mm). Soldiers: yellowish brown; mandibles, clypeus, gaster darker. Cephalic dorsum concave posteriorly; gular dentition: paired lateral processes, three median projections; pronotum, mesonotum a single convexity; propodeal spines pointed, bases broad; postpetiole shorter than petiole. Workers: occiput concave.
MYRMICINAE

Pheidole susanowo Onoyama & Terayama

Strongly dimorphic. Soldier (illustrated) 3.5 mm (workers 2 mm). Blackish-brown. Soldiers: gular dentition: 3 distinct median projections; head ca. as long as wide; mesonotal area not separately raised from pronotum; mesosoma, petiole, postpetiole finely punctate. Workers: occiput weakly concave, no occipital carina; gular dentition undeveloped; median longitudinal carina on clypeus; otherwise as for soldier. Rare.

MYRMICINAE

Pheidole ryukyuensis Ogata

Strongly dimorphic. Soldier (illustrated) 3.5 mm (workers 2 mm). Reddish-brown. Soldiers: gular dentition: 3 median projections; head elongate, ca. 1.2x longer than wide; mesonotal area not separately raised from pronotum. Workers: occiput flat, posterior margin concave, no occipital carina; gular dentition undeveloped; median longitudinal carina on clypeus; pronotum laterally smooth, shining; remaining features as for soldier.
**MYRMICINAE**

*Pheidole pieli* Santschi

Strongly dimorphic. Soldier (illustrated) 3 mm, <1.04 mm (workers 1.5 mm, head width <0.45 mm). Yellow-yellowish-brown. Soldiers: gular dentition: 3 median projections; head ca. as long as wide; promesonotum a single convexity. Workers: occiput flat, posterior margin concave, no occipital carina; gular dentition undeveloped; clypeal carina lacking; pronotum laterally smooth, shining; remainder as in soldier.

**MYRMICINAE**

*Pheidole noda* F. Smith

Strongly dimorphic. Soldier (illustrated) 4.5 mm (workers 3 mm). Head, gaster blackish brown, remainder reddish brown. Soldiers: gular dentition: paired lateral projections, obscure median projections; postpetiole larger than petiole. Workers: occiput rounded, occipital carina more or less distinct. Easily distinguished by enlarged postpetiole. Open land, woodland, woodland margins. Colonies are large, up to 3,000 individuals.
MYRMICINAE

Pheidole megacephala (Fabricius)

Strongly dimorphic. Soldier (illustrated) 3.5 mm (workers 2 mm). Head, gaster dark brown, elsewhere brown. Soldiers: gular dentition: paired lateral projections, no median projections; occiput smooth, shining. Workers: occiput rounded, occipital carina more or less distinct; gular dentition undeveloped; remainder as in soldier. Distinguished by sculpturing of head in soldiers and shape of promesonotum in soldiers and workers.

MYRMICINAE

Pheidole indica Mayr

Strongly dimorphic. Soldier (illustrated) 4 mm (workers 2.5 mm). Reddish brown, head, gaster darker. Soldiers: 3 low median gular projections; cephalic dorsum sculptured; eye diameter > length of 10th antennomere; mesonotum raised separately from pronotum; propodeal spines directed upwards; postpetiole shorter than petiole. Workers: occiput: rounded, unsculptured, with occipital carina; gular dentition undeveloped; otherwise as for soldier.
**MYRMICINAE**

*Pheidole fervida* F. Smith

Strongly dimorphic. Soldier (illustrated) 3.5 mm (workers 2.5 mm). Yellowish brown-reddish brown, gaster sometimes darker. Soldiers: 3 median gular projections; Scapes reaching 2/3 length of head; pronotum, mesonotum usually separately raised, mesonotal convexity variable. Workers: occiput flat, scultured; Scapes exceeding occipital corners; mesonotum more or less raised; otherwise as for soldier.

**MYRMICINAE**

*Pheidole fervens* F. Smith

Strongly dimorphic. Soldier (illustrated) 4.5 mm (workers 3 mm). Light reddish brown, head, gaster darker, mesosoma lighter. Soldiers: head reticulated scultured; eye ca 0.18 mm; paired lateral + 3 indistinct median gular processes; pronotum, mesonotum separately raised; propodeal spines slender, curved posteriorly; postpetiole shorter than petiole. Workers: occiput rounded, smooth, carinate; eye 0.26-0.30 mm; gular dentition undeveloped; otherwise as soldier.
**MYRMICINAE**

*Messor aciculatus* (F. Smith)

Workers 4-5 mm. Black. Head longer than wide. Scapes surpassing occiput. Ventral cephalic hairs not relatively long. Metanotal groove deep, distinct. Dorsal and declivitous propodeal faces straight, junction rounded, ca. 120 degrees, aspinose. Petiolar node nearly triangular in lateral view; postpetiole rounded. Middle, hind leg tibial spurs simple. Mandibles to postpetiolo rugose; gaster smooth, shining. Yellowish-white setae generally abundant.

**MYRMICINAE**

*Aphaenogaster minutula* Watanabe & Yamane

Workers 3.5-5 mm. Yellowish brown, head (except mandibles), mesosoma darker. Antennal club pale. Distinguished from relatives *A. concolor*, *A. luteipes*, *A. kumejimana* by smaller size, 4-segmented maxillary palpi (versus 5-segmented), and chromosome number 2n=28. Nests: soil, with distinctive surrounding wood chip pile, open sites in forests, forest edges.
Cardiocondyla sp. 6
Fig. p 137

**Distribution:** Volcano Islands (Iwo-jima island).

Total length of workers around 1.5 mm. Bicolored: head, mesosoma, petiole and postpetiole yellowish brown; gaster black; legs yellowish brown. Antennae yellowish brown except for the club, which is dark brown. Head rectangular; occipital border almost straight. Eyes relatively large and convex. Scapes not reaching occipital border of head. Mandibles each with 5 teeth; apical tooth largest, the others gradually smaller. Promesonotal area depressed, almost straight in profile; pronotal humeri slightly angulate in dorsal view. Metanotal groove indistinct. Dorsal outline of propodeum weakly convex in profile; propodeal spines longer than their basal width. Petiole with a relatively long peduncle and high node. Anterior margin of postpetiole convex in dorsal view. Head, mesosoma, petiole and postpetiole shagreened; gaster smooth.

The males are dimorphic, alate and ergatoid. Workers are similar to those of *C. nuda*, but distinguished by their more angulate propodeal spines and shorter petiolar peduncles. Chromosome number 2n=30 (Imai & Yamauchi, unpublished).

![C. tsukuyomi and C. nuda](image)

Cardiocondyla kagutuchi Terayama

**Original Reference:** Terayama, M., (1999)

**Distribution:** Ishigaki I.

Total length of workers around 2 mm. Body color blackish brown to black. Closely similar to *C. nuda*. The worker petiolar node tends to be much narrower anterodorsally than in that species, but this character is not always dependable.

*C. kagutuchi* and *C. nuda* are so similar that their morphological descriptions given here are almost identical. However, *C. kagutuchi* has 27 chromosomes, while *C. nuda* has 28 (Imai & Yamauchi, unpublished). Also, the male caste system of *C. kagutuchi* differs from that of *C. nuda*. The former is dimorphic, and has both alate and ergatoid males, while *C. nuda* is believed to have only ergatoid males.

Cardiocondyla wroughtonii (Forcl)

**Original Reference:** Forcl, A. (1890)

**Synonym(s):** Emeryia wroughtonii Forcl (1890)

**Distribution:** Nansui Is, Ogasawara Is, Volcano Is; pantropical, pansubtropical.

Total length of workers around 1.5 - 2 mm. Bicolored: head, mesosoma, petiole and postpetiole yellow; gaster brown. Head rectangular; occipital border almost straight, but slightly concave in the middle. Eyes feebly convex. Mandibles each with 5 teeth. Scapes short, not reaching occipital border. Promesonotal area depressed, almost straight in profile. Metanotal groove absent. Dorsal outline of propodeum broadly rounded in profile; propodeal teeth triangular. Petiolar peduncle short. Head, mesosoma, petiole and postpetiole shagreened; gaster smooth.

The males are dimorphic, alate and ergatoid. Workers are similar to those of *C. nuda*, but distinguished by their more angulate propodeal spines and shorter petiolar peduncles. Chromosome number 2n=30 (Imai & Yamauchi, unpublished).

Cardiocondyla tsukuyomi Terayama

**Original Reference:** Terayama, M., (1999)

**Distribution:** Nansui Is, Daito Is, Senkaku Is, Ogasawara Is.

Total length of workers around 1.5 mm. Body color blackish brown. Head rectangular, 1.2 times as long as wide. Occipital border almost straight. Anterior margin of clypeus rounded. Eyes feebly convex. Mandibles each with 5 teeth. Scapes short, not reaching occipital border. Promesonotal area depressed, almost straight in profile. Metanotal groove absent. Dorsal outline of propodeum broadly rounded in profile; propodeal teeth triangular. Petiolar
The males of this species are dimorphic, comprising both alates and ergatoids. Ergatoid males are further divided into 3 types: the first has 13-segmented antennae and falcate mandibles; the second has 12-segmented antennae; and the third has 9-segmented antennae. This species is arboreal and typically nests in hollows in decaying branches. It is thought to have originated in tropical Africa and to have extended its range very widely in the tropics and subtropics through human agency. Chromosome number 2n=52 (Imai & Yamauchi, unpublished).

**Cardiocondyla nuda (Mayr)**

**Original Reference:** Mayr, G. (1866)

**Synonym(s):** *Leptothorax nudus* Mayr (1866)

**Cardiocondyla nuda** (Mayr) (Forcl, 1881)

**Distribution:** Honshu, Shikoku, Kyushu, Nansei Is, Ogasawara Is, Volcano Is; India to Pacific Is, N America.

Total length of workers around 2 mm. Body color blackish brown to black; legs, antennae and mandibles brown. Head rectangular, 1.15 times as long as wide; occipital border slightly convex. Mandibles each with 5 teeth, the apical largest. Scapes long, almost reaching occipital border of head. Metanotal groove shallow and weak in side view. Propodeal spines weakly developed, right-angled in profile. Petiole with a long peduncle, and with the node an inverted U-shape in profile; subpetiolar process small and spinose, situated on anteroventral portion of petiole. Postpetiole slightly lower than petiole in profile, 1.25 times as wide as long in dorsal view. Head and mesosoma shagreened; petiolar node, postpetiole and gaster smooth.

Males are ergatoid - alate males have never been reported in this species. There are three types of ergatoid males: (1) with 12-segmented antennae and mandibles with 3 or 4 teeth, (2) with 12-segmented antennae and mandibles with 5 teeth, (3) with 11-segmented antennae. Ergatoid males mate with both alate females and dealedal females in the nests. Nests are polygynous, with a high queen-worker ratio (reported to average 1.2 by Shindo, 1980). Colonies multiply by budding. It has been suggested that *C. nuda* originated in tropical Africa and extended its range almost worldwide as a tramp species, but there have been no records of this species from Africa. *C. nuda* is found in open habitats, as at the sea shore and on bare ground. It nests in the soil or under stones. Chromosome number 2n=28 (Imai & Kubota, 1981).

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**Leptothorax santra**

**Terayama & Onoyama**

**Fig. p 140**

**Original Reference:** Terayama, M. & Onoyama, K. (1999)

**Distribution:** Ogasawara Is.

Total length of workers around 2.5 mm. Body color yellowish brown; head darker than mesosoma and gaster. Antennal scapes slightly exceeding posterior margin of head in full face view. Dorsal outline of metanotum weakly convex. Metanotal groove very weakly incised dorsally. Propodeal spines acute and relatively short: each longer than its basal width when viewed laterally, with the dorsal margin forming a blunt angle and the posterior half of the spine somewhat downcurved. Petiolar peduncle relatively short: node in profile an inverted U-shape, its lateral margins gradually converging towards the dorsum. Sides of metanotum and propodeum with predominantly longitudinal rugulae.

A rare species. The known specimens were collected from leaf litter samples using a Berlese funnel.

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**Leptothorax kinomurai**

**Terayama & Onoyama**

**Fig. p 140**

**Original Reference:** Terayama, M. & Onoyama, K. (1999)

**Distribution:** Honshu (Gifu Pref.).

Total length of ergatoid queen around 3 mm. Head, mesosoma, petiole, postpetiole and legs yellow; gaster brown. Antennal scapes not reaching posterior margin of head in full face view. Ocelli distinct. Dorsal outline of pro- and mesoscutum weakly convex. Metanotal groove not incised dorsally. Propodeal spines acute, with relatively broad bases; each spine longer than its basal width and somewhat downcurved. Petiole short and high, node in profile an inverted U-shape. Postpetiole high, with strongly convex dorsal margin in profile. Gaster with acutely angulate anterolateral corners in dorsal view.

*Leptothorax kinomurai* might be a social parasite of other *Leptothorax* species. Four series have been collected from nests of *Leptothorax makura*. All consisted entirely of ergatoid queens. Therefore, it is considered likely that *L. kinomurai* has no worker caste.

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**Leptothorax basara**

**Terayama & Onoyama**

**Fig. p 141**

**Original Reference:** Terayama, M. & Onoyama, K. (1999)

**Distribution:** Ishigaki I., Irionote I.

Total length of workers around 2.5 mm. Body color yellow. Antennal scapes reaching posterior margin of head in frontal view. Metanotal groove not incised dorsally. Dorsum of propodeum straight in profile; propodeal spines long and thin. Petiole with rel-
actively long peduncle; node in profile essentially an inverted U-shape; its anterior margin much more steeply sloping than the posterior margin.

This species resembles *Leptothorax indra*, but is distinguished by the absence of rugae on the mesosomal dorsum and the much more steeply sloping anterior margin of the petiolar node. The type material from Iriomote Island was collected from a rotting fallen tree which was partly buried in the ground.

*Leptothorax haíra*

**Terayama & Onoyama**


*Distribution:* Ogasawara Is.

A small species: total length of workers around 2 mm. Head and gaster brownish, rest of body yellow. Antennal scapes reaching posterior margin of head in full face view. Dorsum of mesosoma weakly convex; metanotal groove not indented in profile. Propodeum with relatively long spines, their length about twice the distance separating them in dorsal view. Petiolar peduncle short; node low, with straight anterior margin. Subpetiolar process relatively large, triangular.

*L. haíra* is known only from two individuals collected on Anijima Island, Ogasawara Islands.

*Leptothorax bikara*

**Terayama & Onoyama**


*Distribution:* Honshu (Gifu Pref.).

Total length of workers around 2 mm. Body color black to blackish brown. Antennal scapes not reaching posterior margin of head in frontal view. Dorsal outline of mesosoma straight in profile. Dorsal disc of propodeum flat. Metanotal groove weakly incised dorsally. Propodeal spines long, acute and narrow; each distinctly longer than its basal width. Petiolar peduncle short, with parallel dorsal and ventral margins in lateral view; node in profile a relatively narrow inverted U-shape; viewed anteriorly it has a straight dorsal margin, parallel sides and angulate dorsolateral corners. Petiopetiole trapezoidal in dorsal view, broadest posteriorly.

*Leptothorax bikara* might be a social parasite of other *Leptothorax* species. Twenty-six workers have been collected from a nest of *Leptothorax spinosior*, and a putative alate female has been taken in a nest of *Leptothorax makora*. This species is distinguished from *L. spinosior* and *L. makora* by the straight dorsal outline of its mesosoma, the parallel dorsal and ventral margins and parallel sides of its petiolar peduncle, and the transverse, trapezoidal postpetiolar dorsum.

*Leptothorax antera*

**Terayama & Onoyama**


*Distribution:* Shikoku, Izu Is, Nansei Is.

Total length of workers around 3 mm. Body color black to blackish brown. Antennal scapes long, exceeding posterior margin of head in full face view. Dorsal outline of mesonotum straight. Metanotal groove not incised dorsally. Propodeal spines acute and long, each distinctly longer than its basal width and somewhat downcurved. Petiolar peduncle relatively the longest among Japanese *Leptothorax* species. Petiolar node essentially an inverted U-shape, but the posterior margin much more steeply sloping than the anterior margin.

*Leptothorax kubira*

**Terayama & Onoyama**


*Distribution:* Hokkaido, Honshu, Shikoku, Yaku I.
Total length of workers around 2.5 - 3 mm. Body color reddish brown to brown; in some individuals the head and gaster are darker than the mesosoma, grading brown to blackish brown; legs yellow. Antennal scape long, reaching posterior margin of head in full face view. Metanotal groove usually distinctly incised dorsally; obscure in some individuals. Dorsum of propodeum straight. Propodeal spines narrowly triangular, longer than the distance between them in dorsal view. Petiolar node triangular, subpetiolar process present but small.

This species inhabits mountainous regions and is known from about 600 m to 2,000 m above sea level in central Honshu, and from 1,300 - 1,900 m on Yaku Island. There are several variant forms, known respectively from Hokkaido, Honshu and Yaku Island, which we treat here as geographical variants of the single species *L. kubira*. Further comparative studies are needed to assess possible alternative taxonomic relationships.

**Leptothorax makora**
Terayama & Onoyama

Distribution: Hokkaido, Honshu, Shikoku, Kyushu.

Total length of workers around 2 - 2.5 mm. Body color black to blackish brown. Antennal scape long, reaching posterior margin of head in full face view. Dorsum of mesosoma weakly convex in profile. Metanotal groove distinctly incised, propodeal spines relatively long, longer than their basal width. Petiolar node high and with an inverted U-shape.

This species resembles *Leptothorax spinosior* and *Leptothorax anira*. It is distinguished from *L. spinosior* by its inverted U-shaped, opposed to triangular, petiolar node, and from *L. anira* by its convex mesosomal dorsum. *Leptothorax makora* nests in dead twigs on standing trees in forests or forest margins, while *L. spinosior* nests in the soil of open habitats or grasslands.

**Leptothorax anira**
Terayama & Onoyama

Distribution: Honshu, Kyushu, Nansei Is.

Total length of workers around 2.5 - 3 mm. Body color black to blackish brown. Antennal scape long, reaching posterior margin of head in frontal view. Dorsal outline of mesonotum straight in profile. Metanotal groove present but weak. Propodeal spines acute and narrow but somewhat shorter than those of *L. spinosior*; in lateral view, each is 2.5 - 3 times as long as its basal width. Petiolar node an inverted U-shape.

This species resembles *Leptothorax spinosior* and *Leptothorax makora*, but is separable by the straight dorsal outline of the mesosoma in profile.

**Leptothorax indra**  
Terayama & Onoyama

Distribution: Okinawa I.

Total length of workers around 3 mm. Body color yellow. Antennal scape long, reaching posterior margin of head in full face view. Metanotal groove distinctly incised, some specimens obscure to absent. Dorsum of propodeum flat; propodeal spines acute, narrow and somewhat downcurved; each distinctly longer than its basal width. Petiole with a long peduncle, the node shaped like an inverted U. Subpetiolar process present, triangular. Head and dorsum of mesosoma with numerous distinct rugae.

*L. indra* nests in dead twigs on standing trees.

**Leptothorax koreanus**  
Teranishi

Original Reference: Teranishi, C. (1940)  
Synonym(s): *Leptothorax (Nesomyrmex) koreanus* Teranishi  
(Teranishi, 1940)

Distribution: Hokkaido, Honshu, Shikoku, Kyushu; Korea.

Total length of workers around 2 - 2.5 mm. Head and gaster black, mesosoma yellowish brown to blackish brown. Antennae 11-segmented; scape short, not reaching posterior margin of head. Anterolateral corners of pronotum distinctly angled in dorsal view.

*L. koreanus* is easily distinguished from its Japanese congeners by its distinctly angulate pronotal humeri. It is often collected in open situations such as the seashore, parks and shrine sites.

**Leptothorax spinosior**  
Forel

Original Reference: Forel, A. (1901)  
Synonym(s): *Leptothorax congener* var. *spinosior* Forel (Forel, 1901)
Leptothorax (Leptothorax) congrous var. spinosior Forel (Emery, 1922)
Leptothorax (Myracht) congrous var. spinosior Forel (Onoyama, 1980)
Leptothorax spinosior Forel (Terayama & Satoh, 1990)

**Distribution:** Hokkaido, Honshu, Shikoku, Kyushu, Yaku I; Korean Peninsula.

Total length of workers around 2 mm. Body color black to blackish brown. Antennal scapes almost reaching posterior margin of head in full face view. Dorsal outline of mesosoma weakly and evenly convex in profile. Metanotal groove incised dorsally. Propodeal spines long, acute and narrow; somewhat downcurved. Petiolar node triangular in profile, with weakly convex posterior margin (almost straight in some specimens).

*L. spinosior* is found in dry open areas, such as grasslands and bare places. It nests in the soil. Workers are usually found on the ground, seldom on trees. There is a queen body-size dimorphism in this species. Nuptial flights occur in July. The chromosome number is 2n = 24 (Imai & Yoshida, 1965).

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**Leptothorax arimensis Azuma**

**Fig. p 146**

**Original Reference:** Azuma, M. (1977)

**Distribution:** Hokkaido, Honshu, Shikoku.

A small ant: total length of workers around 2 mm. Body color yellow to yellowish brown from mesosoma to gaster, head brown. Antennal scapes long, exceeding posterior margin of head. Dorsal outline of mesosoma gently and simply convex, without interruption in the metanotal section (propodeal dorsum almost straight in some individuals). Metanotal groove not incised dorsally. Propodeal teeth relatively short, slightly longer than their basal width. Petiolar node triangular, with straight anterior margin. Subpetiolar process very small to obscure.

*L. arimensis* ranges from lowlands to mountainous areas, up to about 1000 m above sea level. It nests in soil or dead twigs, and is relatively rare.

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**Leptothorax acervorum (Fabricius)**

**Fig. p 147**

**Original Reference:** Fabricius, J. C. (1793)

**Synonym(s):** Formica acervorum Fabricius (Fabricius, 1793) Leptothorax acervorum (Fabricius)(Mayr, 1855)

**Distribution:** Hokkaido, Honshu, Shikoku, Kyushu; Sakhalin, Korean Peninsula, Eurasia, North America.

Total length of workers around 3 - 3.5 mm. Head and gaster black; mesosoma, petiole and postpetiole reddish brown, their dorsa blackish brown; legs brown. Antennae 11-segmented; scapes short, not reaching posterior margin of head in frontal view. Dorsum of propodeum weakly convex. Propodeal spines longer than wide in side view, with acute tips. Petiolar node high, triangular; anterior margin slopping steeply forwards in profile; peduncle obscure.

In Japan this species is distributed in the lowlands of Hokkaido and mountainous areas of Honshu, Shikoku and Kyushu. In central Honshu *L. acervorum* is found at 1300-2600 m above sea level; at 1920 - 1980 m on Mt. Ishizuchi in Shikoku, and at 1740 m on Mt. Kuju, Kyushu. Monogynous and polygynous colonies are present, but research indicates that in Japan only one of the colony queens has functional ovaries and lays eggs. Three socially parasitic ant species are known to associate with *L. acervorum* in Europe, but none of them are yet known to occur in Japan.

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**Leptothorax congrous F. Smith**

**Fig. p 146**

**Original Reference:** Smith, F. (1874)

**Synonym(s):** Leptothorax congrous F. Smith (F. Smith, 1874) Leptothorax (Myracht) congrous F. Smith (Onoyama, 1980)

**Distribution:** Hokkaido, Honshu, Shikoku, Kyushu; Korean Peninsula.

Total length of workers around 2.5-3 mm. Body color black to blackish brown. Antennal scapes short, not reaching posterior margin of head. Dorsal outline of mesosoma almost straight in profile. Propodeum with short, triangular spines of variable size. Petiolar node triangular, its dorsal margin angulate in profile.

This is an arboreal species, nesting in dead twigs on standing trees. Nuptial flights occur on mid July. Chromosome number is 2n = 18 (Imai & Kubota, 1972). It is common in Honshu, Shikoku and Kyushu, but rare in Hokkaido.
**Pheidole bugi** Wheeler

Fig. p 147

Original Reference: Wheeler, W. M. (1919)

Distribution: Nansei Is; Myanmar, E. Malaysia, Indonesia, S. China

Total length of body around 2.5 mm in soldiers, around 1.5 mm in workers. Body color yellowish brown, mandibles, clypeus and gaster darker. In soldiers: dorsal surface of head slightly concave posteriorly; gular dentition with paired lateral processes and three median projections; pronotum and mesonotum forming a single convexity; propodeal spines pointed and with broad bases; postpetiole shorter than petiole. In workers: posterior portion of head weakly concave.

This species was originally described from Sarawak, Borneo, and is known to occur in SE Asia, including Myanmar, E. Malaysia, Indonesia and southern China.

**Pheidole susanowo**

Onoyama & Terayama

Fig. p 148


Distribution: Ishigaki I.

Total length of body around 3.5 mm in soldiers, around 2 mm in workers. Body color blackish-brown. In soldiers: gular dentition with 3 distinct median projections; head almost as long as wide; mesonotal area not raised separately from pronotum; mesosoma, petiole and postpetiole covered with fine punctures. In workers: posterior portion of head flat, with weakly concave posterior margin and no occipital carina; gular dentition undeveloped; median longitudinal carina present on clypeus; remaining features as given for soldier.

A rare species. No biological observations have been reported.

**Pheidole ryukyuensis** Ogata

Fig. p 148


Distribution: Ishigaki I., Iriomote I.

Total length of body around 3.5 mm in soldiers, around 2 mm in workers. Body color reddish-brown. In soldiers: gular dentition with 3 distinct median projections; head elongate, about 1.2 times as long as wide; mesonotal area not raised separately from pronotum. In workers: posterior portion of head flat, with weakly concave posterior margin and no occipital carina; gular dentition undeveloped; median longitudinal carina present on clypeus; lateral portion of pronotum smooth and shining, without sculpturing; remaining features as given for soldier.

*P. ryukyuensis* is found in rather moist habitats, nesting in decayed wood, in the soil or under stones in woodland. Soldiers may store liquid food in their crops.

**Pheidole pieli** Santschi

Fig. p 149

Original Reference: Santschi, F. (1925)

Distribution: Honshu (southern part), Shikoku, Kyushu, Nansei Is; Mainland China, Korean Peninsula.

Total length of body around 3 mm in soldiers, around 1.5 mm in workers. The smallest known Japanese *Pheidole* species (head width 1.04 mm or less in soldiers, 0.45 mm or less in workers). Body color yellow to yellowish-brown. In soldiers: gular dentition with 3 distinct median projections; head almost as long as wide; pro- and mesonota forming a single convexity. In workers: posterior portion of head flat, with weakly concave posterior margin and no occipital carina; gular dentition undeveloped; median longitudinal carina absent on clypeus; lateral portion of pronotum smooth and shining, without sculpturing; the remainder as in soldier.

Sculpturing on the head of workers from the Nansei Islands is less-developed and the propodeal spines smaller than in material from mainland Japan. Found in rather moist woodland habitats, nesting in decaying wood and in the soil, often under stones. Colonies include at most around 2,000 individuals. Soldiers may be utilized for the storage of liquid food in their gasters, in addition to their other functions.

**Pheidole noda** F. Smith

Fig. p 149

Original Reference: Smith, F. (1874)

Synonym(s): *Pheidole nodus* Fr. Smith (Fr. Smith, 1874) *Pheidole nodus var. praevexata* Wheeler (Wheeler, 1929)

Distribution: Honshu, Shikoku, Kyushu, Nansei Is; Mainland China, Korean Peninsula, Taiwan, India, Sri Lanka.

Total length of body around 4.5 mm in soldiers, around 3 mm in workers. Head and gaster blackish brown, remainder reddish brown. In soldiers: gular dentition with paired lateral projections...
Pheidole megacephala (Fabricius)

Original Reference: Fabricius, J. C. (1793)
Synonym(s): Formica megacephala Fabricius (Fabricius, 1793)
Pheidole megacephala Roger (Roger, 1863)
Distribution: Nansei Is; pantropical, subtropical.

Total length of body around 3.5 mm in soldiers, around 2 mm in workers. Head and gaster dark brown, body otherwise brown. In soldiers: gular dentition with paired lateral projections but lacking median projections; posterior portion of head without sculpture, smooth and shining. In workers: posterior portion of head rounded, with more or less distinct occipital carina; gular dentition undeveloped; the remainder as in soldier.

P. megacephala is easily distinguished from other Japanese Pheidole species by the sculpturing of the head in soldiers and the shape of the mesonotum in soldiers and workers. This ant is found worldwide in the tropics and subtropics. It is generally considered to be of Afrotropical origin and to have been dispersed by human commerce. In Japan, it occurs on Okinawa Island and southwards in open land, sugar-cane fields and coastal barrens, nesting in the soil, often under stones or logs. Minato et al. (1990) observed hygienic behavior involving the heaping away from nests of bodies of dead colony members by this ant.

Pheidole indica Mayr

Original Reference: Mayr, G. (1879)
Distribution: Honshu (southern part), Shikoku, Kyushu, Nansei Is; India, Sri Lanka, SE Asia.

Pheidole fervida F. Smith

Original Reference: Smith, F. (1874)
Distribution: Hokkaido, Honshu, Shikoku, Kyushu, Yaku I.; Korean Peninsula.

Total length of body around 3.5 mm in soldiers, around 2.5 mm in workers. Body color yellowish brown to reddish brown, gaster sometimes darker. In soldiers: gular dentition with 3 median pro-
Pheidole fervens F. Smith

Fig. p 151

Original Reference: Smith, F. (1858)

Distribution: Kyushu (southern part), Nansei Is; Mainland China, Taiwan, SE Asia, Sri Lanka, Oceania.

Total length of body around 4.5 mm in soldiers, around 3 mm in workers. Body color light reddish brown, head darker, mesosoma lighter, gaster blackish brown. In soldiers: head covered with reticulate sculpturing; eyes rather small, their maximum diameter (ca. 0.18 mm) less than length of 10th antennal segment; gular dentition with paired lateral processes, the three median projections indistinct; pronotum and mesonotum separately raised; propodeal spines slender, curved posteriorly; postpetiole shorter than petiole. In workers: posterior portion of head rounded, smooth and shining, with distinct occipital carina; eyes small, like those of soldiers (0.26 - 0.30 mm in diameter); gular dentition undeveloped; remaining features as given for soldier.

This species occurs in southern Kyushu and the Ryukyus. It is found nesting under stones in open land grading to forest margins (Ogata, 1981). Colonies can include hundreds of workers (Yano, pers. commun.). Habitat preference, body size and coloration are similar to Pheidole indica, P. nodda and P. megacephala. In fact, these species are sometimes closely sympatric in the Ryukyus. P. fervens can be distinguished by its lighter body color, smaller eyes, the relatively fine reticulation on the heads of its soldiers, the shape of the propodeal spines and the proportions of its postpetiole.

Messor aciculatus F. Smith

Fig. p 152

Original Reference: Smith, F. (1874)

Synonym(s): Aphaenogaster aciculata F. Smith, 1874
Stenamma (Messor) aciculata; Forel, 1901
Stenamma (Messor) aciculatum var. brunneicorne Forel, 1901
Messor barbarus var. lobulifera Emery, 1901
Aphaenogaster (Attomyrna) aciculata; Emery, 1921
Messor aciculata: Forel, 1922

Distribution: Honshu, Shikoku, Kyushu, Yaku I.; Mainland China, Korean Peninsula, Mongolia.

Total length of workers around 4 - 5 mm. Body color black. Head slightly longer than broad. Antennal scapes slightly surpassing posterior border of head. Long hairs absent from ventral surface of head, those present about as long as other body hairs. Metanotal groove rather deeply impressed and distinct both dorsally and laterally. Dorsal and declivitous faces of propodeum almost straight in lateral view, meeting at an angle of about 120 degrees, the junction rounded, without spines. Petiolar node nearly triangular in lateral view; postpetiolar node rounded. Tibial spurs of middle and hind legs simple. Almost all surfaces of body from mandibles to postpetiole rugose; the gaster entirely smooth and shining. Yellowish-white setae rather abundant over nearly the whole body.

This species nests in bare areas near standing grasses and in open grasslands. Its nests open directly at the ground surface. Underground there is a nearly vertical shaft and many chambers; total nest depth may be up to 4 meters. In autumn workers collect grass seeds. Foraging workers show individual site tenacity: each returning repeatedly to search a particular area, though foraging methods vary according to food conditions. Winged sexuals fly from April to May (Onoyama, 1981).

The number of larval instars is three (Onoyama, 1981; Onoyama, 1982). Chromosomal number 2n=44 (Imai & Yosida, 1965). In Japan Messor aciculatus is distributed from Iwate Prefecture to Yaku Island. It is also found widely on the Asian continent.

Aphaenogaster minutula

Watanabe & Yamane

Fig. p 152


Distribution: Nansei Is.

Total length of workers 3.5-5 mm. Body yellowish brown, with head (excepting mandibles) and mesosoma slightly darker. Antennal club pale in color. This species is distinguished from its close relatives (A. concolor, A. luteipes and A. kenejimana) by the smaller body size, 4-segmented maxillary palp (5-segmented in the other species), and the chromosome number 2n=28.

A. minutula nests in relatively open sites in forests and at forest edges. Nests are excavated in the soil, with a distinctive pile of wood chips around each entrance.
**MYRMICINAE**

*Aphaenogaster luteipes* Watanabe & Yamane

Workers 3.5-5 mm. Reddish light brown-dark brown. Flagellum progressively paler in color, club palest. Distinguished from *A. concolor* by more laterally produced eyes, presence of 4 strong bristles on anteriorly produced median clypeal margin (2 in *A. concolor*), higher chromosome number (2n=32 vs. 30). 

Nests: soil, forests, forest margins.

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**MYRMICINAE**

*Aphaenogaster kumejimana* Watanabe & Yamane

Workers 4.5-5.5 mm. Light brown, head, gaster slightly darker. Legs yellow. Seen from above a large gap separates pronotum from mesonotum, not distinguished from *A. concolor* by worker morphology, but they differ in chromosome number (2n=26 in *kumejimana*, 2n=30 in *concolor*). 

Nests: in rotting wood, tree holes.
**MYRMICINAE**

*Aphaenogaster concolor* Watanabe & Yamane

Workers 4.5-6 mm. Head, mesosoma brown-yellowish brown; gaster blackish dark brown; legs yellowish brown. Similar to *Aphaenogaster famelica*, and *Aphaenogaster erabu*, distinguished by striation, punctuation on pronotal dorsum, angulate pronotal humeri. Varies in form, color, perhaps comprising several similar species. Nests: soil, under wood, wood cavities, woodland margins.

**MYRMICINAE**

*Aphaenogaster erabu* Nishizono & Yamane

Close to *A. famelica* in form, sculpture. Consistently distinguished by yellowish brown body color, shorter propodeal spines, lower chromosome number (2n=32 vs. 2n=34).
**MYRMICINAE**

*Aphegnogaster donann* Watanabe & Yamane


**MYRMICINAE**

*Aphegnogaster tokarainsulana* Watanabe & Yamane

Workers 3-5.5 mm. Head, mesosoma dark reddish brown; mandibles, petiole, postpetiole, legs lighter; gaster often darker; scapes paler toward apices; funiculi light reddish brown. Scapes, mesosoma, legs relatively short. Head: abundant striae, punctures, striae on frons fail occipital carina, posteriorly dull. Pronotal humeri angulate. Mesonotum: raised, often above pronotum, striae, punctures. Mesopleura dull, punctate, parallel striae. Chromosome number 2n=34.
MYRMICINAE

_Aphaenogaster irrigua_ Watanabe & Yamane


Distinguished from _A. osimensis_ by shallow, small punctures on occiput, pronotal dorsum; dull propodeal surfaces; striae, punctures on mesopleura laterally.

MYRMICINAE

_Aphaenogaster rugulosa_ Watanabe & Yamane

MYRMICINAE

*Aphaenogaster edentula* Watanabe & Yamane


MYRMICINAE

*Aphaenogaster gracillima* Watanabe & Yamane

MYRMICINAE

Aphaenogaster tipuna Forel


MYRMICINAE

Aphaenogaster japonica Forel

MYRMICINAE

_Aphaenogaster osimensis_ Teranishi


MYRMICINAE

_Aphaenogaster famelica_ (F. Smith)

Workers 3.5-8 mm. Dark reddish brown; head, gaster blackish brown. Scapes, mesosoma, legs relatively long. Pronotum: feebly-distinctly punctate; rugae laterally on larger workers; humeri not angulate. Mesonotum: densely rugose, dorsum variably raised. Propodeal spines acute, broad basally, dorsal profile straight, ventral profile concave. Chromosome number 2n = 34.

Nests: soil, under stones, woodlands, lowlands to mountains.
MYRMICINAE

*Stenamma owstoni* Wheeler

Workers 2.5-4 mm. Yellowish brown-dark reddish brown. Similar to *S. nipponense*; eyes larger (longest diameter exceeding length of 9th antennal segment). A rare species.

MYRMICINAE

*Stenamma nipponense* Yasumatsu & Murakami

**MYRMICINAES**

*Manica yessensis* Azuma


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**MYRMICINAES**

*Myrmica* sp. 8

MYRMICINAE

*Myrmica* sp. 7


MYRMICINAE

*Myrmica* sp. 6

Workers 3.5-4 mm. Brown-blackish brown; gaster darker. Posterior clypeal margin crenate in front of antennal insertions, so that each is circularly enclosed. Anterior clypeal margin almost straight. Frons, pronotal dorsum longitudinally rugose (the latter coarsely). Distinguished by crenate posterior clypeal margin, scape bent at right-angle, with corner rounded. Nests: under stones, bare sites, grasslands, in mountains of central Honshu.
MYRMICINAE

*Myrmica luteola* Kupyanskaya


MYRMICINAE

*Myrmica rubra* (Linnaeus)

Workers 4–5.5 mm. Yellow-yellowish brown. Difficult to distinguish from *M. kotokui*, due to morphological, color variation, in latter. Unraised rugae posterodorsally on mesonotum usually characteristic. Lower half of mesonotal pleura, smooth, fewer strong rugae than *kotokui*; propodeal spines shorter, rugae at anterior base of 1st gastric tergite relatively weak, sparse. Nests: soil, grassland, seashores, lowlands. Rare. Identification of this species still obscure.
MYRMICINAE

*Myrmica kurokii* Forel


MYRMICINAE

*Myrmica kotoku* Forel

**MYRMICINAE**

*Myrmica jessensis* Forel


Nests: under stones, open grasslands bare areas.

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**LEPTANILLINAE**

*Protanilla* sp. 1

Workers 2.5 mm. Yellowish-reddish brown. Almost entirely smooth, shining, unsculptured. Mandibles long, triangular, down-curved; inner surfaces with peg-like setae. Scape exceeding occiput. Head ca. 1.3 x longer than wide. Mesosoma slender; promesonotum arched; metanotal groove deep. Propodeum as large as pronotum; dorsum longer than declivity. Petiole, postpetiole of similar size. Petiole ventrally rounded, with subtrapezoidal projection. First gastral segment large. Sting long, a triangular structure apically.
LEPTANILLINAE

Anomalomyrma sp. 1

Workers 2.5 mm. Reddish brown. Groove on outer surface of mandible from base to terminal quarter. Metanotal groove crossed by several short striae. Petiolar node rounded in profile; ventral portion prominent.

Very rare.

LEPTANILLINAE

Leptanilla sp. 6

Workers 1 mm. Mandibles 3-toothed. Occipital border slightly concave. Similar to L. morimotoi, but apical segment of antenna relatively short, shorter than length of preceding 10th, 11th segments together.
LEPTANILLINAE

Leptanilla tanakai Baroni Urbani

Workers 1 mm. Mandibles 3-toothed. Occipital border slightly concave. Postpetiole more or less marginate posteriorly, forming a vertical face, posterior portion appears straight, corners rounded in dorsal view. First gastric segment narrowed anteriorly, anterior width as broad as postpetiole or narrower.

LEPTANILLINAE

Leptanilla oceanica Baroni Urbani

Workers 1 mm. Mandibles 3-toothed. Anterior clypeal margin produced, with median incision - a configuration unique among Japanese Leptanilla species. Posterior margin of head concave.
LEPTANILLINAE

Leptanilla morimotoi Yasumatsu

Workers 1 mm. Mandibles 3-toothed. Apical antennal segment longer than preceding 10th, 11th segments together. Posterior cephalic margin concave. First gastral segment with almost parallel sides, corners rounded anteriorly in dorsal view.

LEPTANILLINAE

Leptanilla kubotai Baroni Urbani

Workers ca 1.5 mm. The largest Japanese Leptanilla species. Mandibles 3-toothed. Occipital border almost straight. Ventral portion of petiole not prominent; almost straight (a major distinguishing characteristic). First gastral segment with somewhat convergent sides.
Aphaenogaster luteipes
Watanabe & Yamane
Fig. p 161

Distribution: Nansei Is (Amami-oshima I. to Okinawa I., Senkaku Is).

Total length of workers 3.5-5.5 mm. Body reddish light brown to dark brown. Antennal flagellum progressively more pale towards its apex; the club paler than the remainder. Very similar to A. concolor, but distinguished by the more laterally produced eyes, the presence of 4 strong bristles on the anteriorly produced median margin of the clypeus (there are 2 bristles in A. concolor), and the higher chromosome number (2n=30 vs. 32).

Nests are found in the soil in forests and at forest margins. The gasters of foraging workers are turned downwards, and death-feigning behavior is absent.

Aphaenogaster kumejimana
Watanabe & Yamane
Fig. p 161

Distribution: Nansei Is (Kumejima I.).

Total length of workers 4.5-5.5 mm. Body light brown, the head and gaster slightly darker. Legs yellow. As seen from above a large gap separates the pronotum from the mesonotum. This species is not separable from A. concolor in worker morphology but the two differ in chromosome number (2n=26 in kumejimana, 2n=30 in concolor).

This species nests in rotting wood, tree holes etc. Workers turn their gasters downwards while foraging, and perform death-feigning behavior.

Aphaenogaster concolor
Watanabe & Yamane
Fig. p 162

Distribution: Nansei Is (Okinoerabujiima, Okinawa I.).

Total length of workers 4.5 - 6 mm. Head and mesosoma brown to yellowish brown; gaster blackish to dark brown; legs yellowish brown. Similar to Aphaenogaster famelica and erabu, but separable in having striation and punctuation on the pronotal dorsum, and angulate pronotal humeri.

The taxon varies in form and color. As conceived here it could include several closely similar species. Nests are found in woodland or its margins, in the soil, under wood or in wood cavities.

Aphaenogaster erabu
Nishizono & Yamane
Fig. p 162

Synonym(s): Aphaenogaster famelica erabu Nishizono & Yamane, 1990; Watanabe & Yamane, 1992

Very similar to A. famelica in body shape and sculpture. A. erabu is, however, consistently distinguished from famelica by its yellowish brown body color, shorter propodeal spines, and lower chromosome number (2n=30 vs. 34).

The population on Kuroshima I. is undoubtedly closely related to the others listed above, but there is some uncertainty concerning its relative taxonomic status. A. erabu nests underground in forests. Workers turn their gasters downwards while foraging.

Aphaenogaster donann
Watanabe & Yamane
Fig. p 163

Distribution: Yonaguni I.

Total length of workers 6 - 7 mm. Body unicolorous blackish brown. Antennae, mesosoma and legs distinctly relatively long. Propodeal spines large and long. Similar to Aphaenogaster gracillima, but separable by its unicolorous body color. Chromosome number 2n=28.

Nests in the soil of woodland. Turned-down gasters are frequently observed in foraging workers.

Aphaenogaster tokarainsulana
Watanabe & Yamane
Fig. p 163

Distribution: Nansei Is (Tanegashima I., Tokara Is.).

Total length of workers around 3 - 5.5 mm. Head and mesosoma dark reddish brown; mandibles, petiole, postpetiole and legs lighter; gaster often darker; scapes gradually lightening in color toward their apices; funiculi light reddish brown. Scapes, mesosoma and legs relatively rather short compared to other Japanese Aphaenogaster species. Head covered with striae and punctures; longitudinal striae on frontal area not reaching occipital carina;
posterior portion of head dull, with irregular striation and punctures. Pronotal humeri angulate. Mesonotum distinctly raised, often higher than pronotum, covered with striae and punctures. Mesopleural dull, covered with minute, dense punctures and parallel striae. Chromosome number 2n=34.

Foraging workers turn their gasters downwards. This species is found from coastal to inland regions in woodland or its margins. It nests in the soil, under stones or in rotting wood.

Total length of workers around 5 mm. Head and mesosoma blackish brown; antennae, mandibles, legs, petiole, postpetiole and gaster dark brown. Antennae, mesosoma and legs relatively rather short compared to other Japanese Aphaenogaster species. Posterior border of head nearly flat in full face view. Head shining, covered with distinct striae and punctures; longitudinal striae on frontal area reaching occipital carina. Striation on pronotal dorsum more distinct than on head, interspaces shining. Pronotal humeri not angulate. Mesosoma distinctly raised, often higher than pronotum, covered with striae and punctures. Lateral portions of mesopleura covered with striae and punctures, but lacking reticulate sculpture. Propodeal spines rather slender, with acute apices. Similars in body shape to A. japonica and A. edentula. Chromosome number 2n=34.

Nests in the soil of woodland, including its margins. Both gastric turn-down while foraging and death-feigning have been observed in the workers.

Aphaenogaster irrigua
Watanabe & Yamane

Fig. p 164


Distribution: Nansei Is (Tanegashima I., Amami Is. & Okinawa Is.).

Total length of workers around 4 - 6 mm. Head brown to light brown, mesosoma light brown, gaster dark brown to brown, legs light brown. Scapes, mesosoma and legs relatively rather long compared to other Japanese Aphaenogaster species. Anterior portion of clypeus with transverse striae. Basal margin of mandibles often weakly serrate. Mesonotum only weakly raised, predominantly covered with punctures. Chromosome number 2n=32.

Similar to Aphaenogaster osimensis, but separable by the presence of shallow, small punctures on the occiput and pronotal dorsum, and the dull surfaces of the propodeum and lateral parts of mesopleura, which are covered with striae and punctures. This species prefers moist situations; it nests in the soil in woodlands, near banks of streams and dry river beds. Foraging workers do not turn their gasters downwards.

Aphaenogaster rugulosa
Watanabe & Yamane

Fig. p 164


Distribution: Yonaguni Is.

Aphaenogaster edentula
Watanabe & Yamane

Fig. p 165


Distribution: Ogasawara Is (Muko-jima I., Haha-jima I.).

Total length of workers 4 - 6 mm. Body color dark brown; legs, petiole and postpetiole more brownish; mandibles, the four apical antennal segments and tarsi lighter. Head and pronotal dorsum with numerous standing hairs, which are longer and denser than those on gaster. Posterior border of head flat in full face view. Posterior portion of head shining, with simple, sparse striation. Funicular segments strongly constricted between them. Mesonotum raised, but lower than pronotum; covered with striae and shallow punctures. Lateral portions of mesopleurae with strong longitudinal striae and punctures. Propodeal spines weakly developed, low (each shorter than its basal width), with blunt apices.

Nests in the soil in woodland. Known only from the Ogasawara Islands.
Aphaenogaster gracillima

Watanabe & Yamane

Fig. p 165


Distribution: Yaeyama Is.

Total length of workers around 3.5 - 8 mm. Head and mesosoma reddish brown; mandibles lighter; scapes, legs and gaster dark brown. Scapes, mesosoma and legs distinctly long and slender. Head elongate behind eyes, in full face view strongly but gradually narrowed posteriorly. The funicular segments each elongate; the apical four lighter in color than the others. Mesonotum weakly raised and covered with irregular striation and punctuation. Propodeal spines varying in shape from long and slender to short and broad. Chromosome number 2n=28. Similar to A. donann, but distinguished by worker coloration and male morphology.

This species nests in the soil or rotting wood.

Aphaenogaster tipuna Forel

Fig. p 166

Original Reference: Forel, A. (1913)

Synonym(s): Aphaenogaster rathneyi tipuna Forel (Forel, 1913)

Aphaenogaster tipuna Santschi (Santschi, 1937)

Distribution: Ishigaki I., Iriomote I.; Southern islands of Korea, Taiwan.

Total length of workers around 3 - 5.5 mm. Head and mesosoma reddish brown; gaster dark brown. Scapes, mesosoma and legs relatively rather short compared to other Japanese Aphaenogaster species. Posterior border of head flat. Occipital area opaque, covered with punctures. Dorsal surface of pronotum predominantly punctate medially, and with feeble, transverse marginal striae. Pronotal humeri angulate. Mesonotum distinctly raised, sometimes higher than pronotum, forming an angulate convexity covered with punctures and striae. Lateral areas of mesopleurae covered with punctures. Propodeal spines broad, their apices acute.

The ant is found on the plains of eastern Japan (Mizutani & Imamura, 1980), and at higher elevations in the west, nesting in the soil or under stones in woodland or its margins. Chromosome number 2n = 22 (from Asamushi, Aomori Prefecture: Imai, 1969). Nishizono & Yamane (1990) reported a form with stronger sculpture from a mountainous region in Kagoshima Prefecture at 400 to 500 m elevation. It has the dorsal surface of the pronotum almost completely transversely striate.

Aphaenogaster japonica Forel

Fig. p 166

Original Reference: Forel, A. (1911)

Synonym(s): Aphaenogaster Schmitzi japonica Forel (Forel, 1911)

Aphaenogaster (Atomyrma) syriaca japonica Emery (Emery, 1921)

Aphaenogaster (Atomyrma) smythies japonica Wheeler (Wheeler, 1928)

Distribution: Hokkaido, Honshu, Izu Is, Shikoku, Tsushima I., Kyushu, Yaku I.; Korean Peninsula, Jeju-do I.

Total length of workers around 3 - 5 mm. Body color dark-to light-brown; legs dark brown to dark yellowish brown. Scapes, mesosoma and legs relatively rather short compared to other Japanese Aphaenogaster species. Posterior border of head flat in full face view. Occipital area opaque, covered with punctures. Dorsal surface of pronotum predominantly punctate medially, and with feeble, transverse marginal striae. Pronotal humeri angulate. Mesonotum distinctly raised, sometimes higher than pronotum, forming an angulate convexity covered with punctures and striae. Lateral areas of mesopleurae covered with punctures. Propodeal spines broad, their apices acute.

The ant is found on the plains of eastern Japan (Mizutani & Imamura, 1980), and at higher elevations in the west, nesting in the soil or under stones in woodland or its margins. Chromosome number 2n = 22 (from Asamushi, Aomori Prefecture: Imai, 1969). Nishizono & Yamane (1990) reported a form with stronger sculpture from a mountainous region in Kagoshima Prefecture at 400 to 500 m elevation. It has the dorsal surface of the pronotum almost completely transversely striate.

Aphaenogaster osimensis Teranishi

Fig. p 167

Original Reference: Teranishi, C. (1940)

Synonym(s): Aphaenogaster famelica var. osimensis Teranishi (Teranishi, 1940)

Aphaenogaster lepida? Okamoto (Okamoto, 1966)

Aphaenogaster osimensis Imai (Imai, 1971)

Distribution: Honshu, Izu Is, Ogasawara Is, Shikoku, Kyushu, Nansei Is.

Total length of workers around 4 - 6 mm. Head and gaster dark brown to reddish brown; mesosoma, petiole and postpetiole light brown; legs brown. Scapes relatively rather short compared to other Japanese Aphaenogaster species. Clypeus with transverse striae on its anterior portion. Basal margin of mandibles weakly
serrate. Posterior part of head and dorsal part of pronotum smooth and shining, lacking sculpture. Mesonotum not distinctly raised, and with poorly developed striation and punctures. Propodeum and sides of metanotum shining, with little sculpture.

*A. osimensis* generally nests in the soil, crevices in rocks, or under stones in open rocky seashore habitats. On small islands the range of occupied habitats is extended to include forests and their margins, or inland rocky areas. Foraging workers turn their gasters downwards. Chromosome number 2n = 32 (from Manazuru, Kanagawa Prefecture: Imai, 1969).

**Aphaenogaster famelica (F. Smith)**

*Original Reference:* Smith, F. (1874)

*Synonym(s):* Aphaenogaster famelica Fr. Smith (Fr. Smith, 1874)

*Aphaenogaster famelica* Mayr (Mayr, 1878)

*Stenamma (Aphaenogaster) famelicum* Wheeler (Wheeler, 1906)

*Aphaenogaster (Attemyrrma)* famelica Emery (Emery, 1921)


Total length of workers around 3.5 - 8 mm. Body color dark reddish brown; head and gaster blackish brown. Scapes, mesosoma and legs relatively long. Pronotum varying from feebly punctate with weak luster to distinctly punctate and opaque. Rugae are sometimes developed on the lateral pronotal surfaces of larger workers. Pronotal humeri not angulate. Mesonotum covered with rugae, and with its dorsum raised to a variable degree. Propodeal spines broadly basally and acute apically, their dorsal outlines straight and ventral outlines concave in lateral view.

This is the most common Japanese *Aphaenogaster* species. It is found in lowland areas of eastern Japan, and ranges from lowlands to mountainous areas in the west. Nests are found in open soil or under stones in woodlands and their margins. Gastral turn-down is apparently absent in foraging workers. Chromosome number 2n = 34 (from Tanzawa, Kanagawa Prefecture: Imai, 1969).

*Aphaenogaster erabu*, which inhabits Kuchinoerabu-jima and the Tokara Islands, is distinguished from the *A. famelica* by its yellowish brown body color and elongate propodeal spines, and by the downwards turning of the gasters in foraging workers.

Total length of workers around 2.5 - 4 mm. Body color yellowish brown to dark reddish brown. Similar to *S. nipponense*, but the eyes larger (longest diameter exceeding length of 9th antennal segment).

Judging from Arnoldi's (1975) description of the Russian species *S. kurilense*, *S. owstoni* is similar, but kurilense is smaller and less slender. Arnoldi indicated that the petiole of *S. kurilense* is shorter and higher than that of *S. owstoni*. But *S. owstoni* is more variable in size, so that the proportions and the shape of the petiole are substantially variable. Thus, the identity of *S. kurilense* versus *S. owstoni* needs examination. *S. owstoni* is found in woodland or its margins, and nests in the soil. Kubota (1988) reported many species of the plant *Clethra barbinervis* from a nest. This suggests that *S. owstoni* is a graminivore, which harvests seeds for larval food. Forel (1911) recorded it from Hokkaido, but we suppose this record to be a misidentification. The northernmost confirmed distribution record is from Iwate Prefecture (Tanaka, 1974a). A rather rare species.

**Stenamma nipponense**

*Yasumatsu & Murakami*


*Distribution:* Hokkaido, Honshu, Shikoku, Kyushu, Yaku I.

Total length of worker 2.5 - 3.5 mm. Body color yellowish-brown to dark reddish-brown. Head and mesosoma covered with irregular reticulation. Antennal scapes reaching posterior margin of head. Eyes small, longest diameter shorter than the 9th antennal segment. Anterodorsal portion of propodeum sometimes marginate.

The species is found in woodland or its margins, and nests in the soil. *Stenamma nipponense* is not rare in Hokkaido, but less common in other regions. Winged reproductives can be observed in late September in Hokkaido. The southernmost record is from Yaku Island (Terayama & Yamane, 1984).

**Manica yessensis**

*Azuma*

*Original Reference:* Azuma, M. (1955)

*Distribution:* Hokkaido, Honshu (the central part and northwards).

Total length of workers around 5 - 7 mm. Head and gaster black, other parts brown, yellowish brown, or reddish brown. Mandibles armed with two large apical teeth and 10 or 11 denticles. Anterior clypeal margin slightly concave in the middle. Antennal scapes just
reaching posterior border of head; abruptly bent at the base. Dorsal margin of promesonotum in lateral view smoothly connected with the metanotal groove. Metanotal groove deeply impressed both dorsally and laterally. Both sides of the transition area between the dorsal and declivitous faces of the propodeum slightly raised and obtusely angulate in lateral view. Dorsal faces of head, mesosoma and petiole longitudinally rugose. Standing hairs abundant on body. Tibial spurs of middle and hind legs simple (they are more or less pectinate in the other Manica species).

The larvae of this species were described under the name "Manica sp." by Wheeler & Wheeler (1977). M. yessensis nests in the soil of volcanic mountains at gravelly sites with patchy vegetation, or under stones in dry river-beds. Dietary items include insects and honey dew. Winged reproducitives emerge in August. Manica yessensis is sporadically distributed, perhaps in relation to its particular habitat preferences.

**Myrmica sp. 8**

*Fig. p 169*

**Distribution:** Hokkaido.

Total length of workers around 4 mm. Body color somewhat darkish brown. Anterior margin of clypeus concave in the middle. Antennal scape narrowed near their bases, where they are bent; the angle of the dorsal margin of the bend is about 100 degrees when viewed parallel to the flexing face of the funiculus. The dorsum of the bend is margined at a right-angle to the axis, and has a small, thin, projecting, blackish-brown lamella. Third funicular segment wider than long. Rugae on dorsa of mesosoma and petiole strongly impressed. Metanotal groove impressed, with a broadly U-shaped profile. Propodeal spines shorter than in M. jessensis, and in many cases strongly directed upwards. Posterodorsal border of petiolar node angulate.

This species closely resembles M. jessensis, but is distinguished by its shorter petiole. It nests in open sites and is found in the mountains of Hokkaido up to higher elevations. Rather rare.

**Myrmica sp. 7**

*Fig. p 170*

**Distribution:** Hokkaido, Honshu (the Kinki District and northwards).

Total length of workers around 4 mm. Body color brown. Anterior margin of clypeus concave in the middle. Antennal scape bent, each weakly lamellate on the dorsal surface of the bent at a right-angle to its axis. A further extension of this lamella is developed in large workers. The angle of the dorsal margin of the bend is about 120 degrees, viewed parallel to the flexing face of the funiculus. Antennal scape barely narrowed near their bases. Third funicular segment wider than long. Rugae on dorsa of head, mesosoma and petiole strongly impressed; the spaces between them wide. Metanotal groove shallow. Propodeal spines long. Petiolar node low and long.

Myrmica sp. 7 resembles M. jessensis, but is distinguished by the morphology of the bent section of the antennal scape and the petiolar structure. This species is rather rare. It is found in forests with sparsely vegetated floors and at the margins of woods in mountainous regions.

**Myrmica sp. 6**

*Fig. p 170*

**Distribution:** Hokkaido, Honshu (the central part and northwards).

Total length of workers around 3.5 - 4 mm. Body color brown to blackish brown; gaster darker. Posterior margin of clypeus carinate in front of the antennal insertions, so that the latter are each circularly enclosed, as if in a basin. Anterior margin of clypeus almost straight in the middle. Frontal area sculptured with longitudinal rugae. Coarse longitudinal rugae present on pronotal dorsum.

Easily distinguished from other Japanese Myrmica species because the posterior margin of its clypeus is carinate and the antennal scape is bent at a right-angle, with the corner rounded. Myrmica sp. 6 was referred to as M. scabrinodis in Morisita (1945), and by the Japanese name Shiga-kushike-ari in Sonobe (1976) and Myrmecological Society of Japan Editorial Committee (1988). This rather rare species nests under stones at bare sites and in grasslands. Distribution in the mountains of central Honshu is from 500 to 1500 m above sea level.
Myrmica luteola Kupynskaya

Distribution: Hokkaido, Honshu (the central part and northwards); East Siberia, Sakhalin, Taiwan.

Myrmica sp. 5

Total length of workers around 5 - 5.5 mm. Body color ochreous to brown. The gaster of foraging workers often appears waxy. Head relatively broad. Antennal scapes rather strongly curved near their bases and a little thickened at the bend. Anterior margin of clypeus straight or slightly concave in the middle, lacking denticles. Rugae on thoracic dorsum rather weak and irregular. Subpetiolar process developed anteriorly. Ventral border of petiole convex in the middle when viewed laterally. Tibial spurs of middle and hind legs small, essentially simple or with a few spines.

This species resembles M. kurokii, but is easily distinguished from it and other species because the ventral border of its petiole is convex in the middle in lateral view, and by the characteristic morphology of the antennal scapes. In the worker, the propodeal spines are long, but in the female they are very small and short, sometimes reduced and merely angulate, to absent. The females are a little smaller than the workers. This species is a temporary parasite of M. jessensis. A species "Manica sp. 2" (with Japanese name: Tsuya-kushike-ari) was recognized in "Identification Guide III" (Myrmecological Society of Japan, 1992) from a female specimen, which is here identified as M. luteola. M. luteola nests under stones and around the roots of trees at rocky sites and in sparse woodlands. Workers forage on the leaves of Sasa bamboos and attend aphids. Nuptial flights occur from September to mid-October.

Myrmica rubra (Linnaeus)

Original Reference: Linnaeus, C. (1758)
Synonym(s): Formica rubra Linnaeus, 1758
Myrmica rubra (Linnaeus): Latreille, 1804
Myrmica laevinodis Nylander, 1846
Myrmica laevinodis var. brueisi Weber, 1947
Myrmica rubra r. champlaini Forel, 1901
Myrmica longiscapaus Curtis, 1854
Distribution: Hokkaido, Honshu (Kyoto Pref.); Sakhalin, Kunashiri I., Mainland China, Korean Peninsula, north Eurasia.

Total length of workers around 4 - 5.5 mm. Body color yellow to yellowish brown. In the field workers are clearly yellowish.

This species closely resembles M. kotokui, and is at times difficult to distinguish, due to variation in morphology and color in M kotokui. However, the unraised rugae on the postero-dorsal portion of the mesonotum are usually characteristic, though some M. kotokui workers have this character. It is best in the field to examine the body coloration of a number of workers from each colony. Also, M. rubra has fewer strong rugae, and is more smooth on the lower half of the mesonotal pleura than M. kotokui; its propodeal spines are shorter, and the rugae on the anterior basal portion of the 1st gastric tergite are relatively weak and fewer in number. Although Japanese specimens differ morphologically from European M. rubra material, and resemble M. kotokui in petiolar morphology, the name Myrmica rubra is applied to them for the present. This species nests in the soil of grassland on seashores and lowlands (Onoyama, 1989). Rare in Japan.

Myrmica kotokui Forel

Original Reference: Forel, A. (1907)
Synonym(s): Myrmica rubra subsp. kotokui Forel, 1907e
Myrmica kotokui: Emery, 1908a
Distribution: Hokkaido, mountains of central Honshu; Sakhalin, Korean Peninsula.

Total length of workers around 4.5 - 5.5 mm. Body bicolored: head, gaster and legs black, mesosoma reddish brown. Antennal scapes curved rather strongly near the base. Anterior margin of clypeus convex at the center, without projecting denticles. Pronotal dorsum with fine, irregular rugae; mesonotal dorsum with fine rugae, which are in many cases transverse; smooth, shining areas small. Petiolar node short; postero-dorsal border in lateral view curving rather gently posteriorly. Subpetiolar process developed, projecting anteriorly.

This species nests in grasslands, under stones at rocky sites, and near the roots of trees. Its altitudinal distribution is the most extreme among Japanese Myrmica species - it attains 1900 m or more above sea level in central Honshu (Morisita, 1945) and 1000 m or more on Hokkaido (Hayashida, 1971; Sonobe, 1981).
Total length of workers around 4 - 5.5 mm. Body color brown to blackish brown; legs lighter. Antennal scape gently curved near the base. Anterior margin of clypeus convex in the middle; the clypeal rugae projecting anteriorly to appear as denticles. Thoracic dorsum with strong rugae, many of them longitudinal. Rugae on posterior border of mesonotal dorsum raised. Propodeal spines usually long. Anterior base of 1st gastric tergite with longitudinal rugae.

This species is not very different from the European *M. ruginodis* Nylander and probably properly conspecific. Onoyma (1989) suggested that it might best be considered a subspecies of *ruginodis*. Detailed study, including comparison with *ruginodis* specimens from the Far East, is required. Mizutanii (1981) stated that the populations of dry riverbeds near Sapporo are polygynous, while those of mountainous regions are monogynous, and that reproductive methods and head width are different in these two areas. He recognized small-female "microgyna" and large-female "macrogyna" variants. Future study is clearly required (no relevant specimens are currently hand).

This species nests under stones, in the soil, and in fallen rotting logs, etc. It is very common in cool regions. Winged reproducive fly from September to early October.

**Myrmica jessensis** Forel

*Fig. p 173*

**Original Reference:** Forel, A. (1901)

**Synonym(s):** *Myrmica lobicornis jessensis* Forel, 1901

*Myrmica jessensis* [1] Collingwood, 1976

*Myrmica lobicornis* subsp. *littoralis* Weber 1948a

**Distribution:** Hokkaido, Honshu (the central part and northwards); Sakhalin, Kunashiri I.

Total length of workers around 3 - 4.5 mm. Body color brown to reddish brown, head and gaster relatively dark. Antennal scape bent at the base; the angle of the dorsal margin of the bend about 100 degrees, viewed parallel to the flexing face of the funiculus. Dorsum of the bend margined at a right angle to the axis, and usually with a thin projecting blackish brown lamella. Antennal scape slender near the base. Anterior margin of clypeus concave in the middle. Rugae on the dorsa of head and mesosoma rather weakly impressed, the intervening spaces narrow. Metanotal groove variable, shallow to deep. Propodeal spines rather short. Petiolar node short, posterodorsal border not angular.

This species nests under stones or in the soil of open grasslands or bare lands, and can be abundant in dry riverbeds. It ranges from 200 to 1700 m above sea level in central Honshu (Morisita, 1945), and has been found at 20 m elevation in the dry bed of the Sagami River, Kanagawa Prefecture (Kubota, 1983).

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**Subfamily LEPTANILLINAE**

**Protanilla sp. 1**

*Fig. p 173*

**Distribution:** Kyushu, Nansei Is; Taiwan.

Total length of workers around 2.5 mm. Color yellowish to reddish brown. Mandibles long and triangular, down-curved at apical 1/3; inner surface with peg-like setae. Antennal scape slightly exceeding posterior margin of head. Head about 1.3 times as long as broad. Mesosoma slender. Promesonotum weakly arched; metanotal groove deeply impressed. Propodeum almost the same size as pronotum; dorsal surface longer than declivity in profile. Petiole and postpetiole almost matching in size. Ventral portion of petiole rounded, with a small subtrapezoidal projection. First gastric segment large. Sting long, with a triangular structure apically and a small tooth subapically. Body surface almost smooth, shining, without sculpture.

This species has been referred to as "Ponerinae ? sp." (Sonobe, 1972), "Gen. C sp. 1" [Japanese name: Okinawa-juzufushi-ari] and Gen. C sp. 2 [Senkaku-juzufushi-ari] of Myrmecological Society of Japan (1988). A colony collected by Seifaa-utaki, Okinawa I. in March contained one dealate female, 77 adult workers, 168 larvae and 17 eggs (Onoyma, unpublished). The postpetiole of the female is separated from the petiole by a marked constriction. A single, fused sternal plate, like that of *Anomalomyrma*, is not present. Found in Kyushu and the south, and also from Taiwan (Terayama, 1999). Not common.

**Anomalomyrma sp. 1**

*Fig. p 174*

**Distribution:** Honshu, Kyushu.

Color reddish brown. Longitudinal groove on outer surface of mandible running from the base to the terminal quarter of the jaw. Metanotal groove interrupted by several short striae. Petiolar node rounded in profile; ventral portion prominent.

Hölldobler & Wilson (1990: Fig. 16-19, p. 592) published two scanning electron micrographs of this species prepared by Taylor as "*Anomalomyrma kubotai*". That name is a nomen nudum, due to the lack of a formal description. This species is very rare: only three individuals have been collected. A worker from Hikimi, Shimane Prefecture was found on the ground at a woodland margin (Ogata, 1988).
**Leptanilla sp. 6**
Fig. p 174

**Distribution:** Okinawa I.

Total length of workers around 1 mm. Mandibles with 3 teeth. Posterior margin of head slightly concave. Similar to *L. morimotoi*, but apical segment of antenna relatively short, shorter than the length of the preceding 10th and 11th segments together.

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**Leptanilla tanakai** Baroni Urbani

*Original Reference:* Baroni Urbani, C. (1977)

*Distribution:* Yaku I.

Total length of workers around 1 mm. Mandibles with 4 teeth. Posterior margin of head slightly concave. Postpetirole more or less marginate posteriorly, forming a vertical face, so that the posterior portion appears straight, with rounded corners in dorsal view. First gastral segment narrowed anteriorly, its anterior width as broad as postpetirole, or narrower.

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**Leptanilla oceanica** Baroni Urbani

*Original Reference:* Baroni Urbani, C. (1977)

*Distribution:* Ogasawara Is.

Total length of workers around 1 mm. Mandibles with 3 teeth. Anterior margin of clypeus produced, and with a median incision - a configuration unique among Japanese *Leptanilla* species. Posterior margin of head concave.

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**Leptanilla morimotoi** Yasumatsu

*Original Reference:* Yasumatsu, K. (1960)

*Distribution:* Kyushu (Fukuoka).

Total length of workers around 1 mm. Mandibles with 3 teeth. Apical segment of antenna longer than length of preceding 10th and 11th segments together. Posterior margin of head concave. First gastral segment with almost parallel sides, and with corners rounded anteriorly in dorsal view.

This was the first *Leptanilla* species discovered in Japan (Yasumatsu, 1960). Known only from the type material.
LEPTANILLINAE

Leptanilla japonica Baroni Urbani

Workers 1 mm. Mandibles 3-toothed. Apical antennomere longer than 2 preceding together (10th + 11th). Occipital border almost straight. First gastral segment with almost parallel sides, not narrowed anteriorly in dorsal view. Distinguished from L. Morimotoi, L. sp. 6, by 4 teeth on mandible (versus 3). Second tooth from apex, sometimes small, low, obscure.

AENICTINAE

Aenictus ceylonicus (Mayr)

AENICTINAE

*Aenictus lifuiae* Terayama

Worker ca. 2-2.5 mm. Yellowish brown; head, gaster, legs yellow. Mandibles sub-triangular, 7-toothed. Antennae 10-segmented. Promesonotal dorsal profile weakly convex. Propodeum: posterodorsal corner angulate; sides without rugae. Subpetiolar process low, a small lobe.

PSEUDOMYRMECINAE

*Tetraponera attenuata* F. Smith

Female ca 10 mm. Black. Mandibles with 5 teeth. Anterior clypeal margin with a pair of low teeth.
CERAPACHYINAE

*Cerapachys hashimotoi* Terayama


CERAPACHYINAE

*Cerapachys daikoku* Terayama

CERAPACHYINAE

*Cerapachys humicola* Ogata

Workers ca. 2.5 mm. Reddish brown. Antennae 11-segmented. Body densely, finely reticulate; hairs short, pale yellow. Eyes absent. Pronotum without anterior margination. Petiole about as long as wide, corners rounded; subpetiolar process distinct, projecting ventrally, apex rounded. Constriction between 1st, 2nd gastral segments less distinct than *C. biroi*. Second gastral segment as long as petiole + 1st gastral segment.

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CERAPACHYINAE

*Cerapachys biroi* Forel

**PONERINAE**

*Pachycondyla sakishimensis* Terayama

Workers 4.5-5 mm. Mandibles each with a basal pit. General shape, size close to *P. pilosior*; color generally lighter. Subpetiolar process triangular, a major distinguishing feature versus *P. pilosior*. Nests: in soil, forest margins.

**PONERINAE**

*Pachycondyla pilosior* (Wheeler)

Workers ca 4.5-5 mm. Dark reddish to blackish brown; antennae, mandibles, legs reddish brown. Head slightly longer than wide in frontal view. Mandibles each with a basal pit. Eyes small, ca. 10 faceted. Subpetiolar process trapezoidal; its anterodorsal and posterodorsal corners sub-angulate. Relatively rare. Inhabits forest leaf-litter.
PONERINAE

Pachycondyla darwinii (Forel)

Workers: ca 4 mm; females ca 5 mm. Body color yellowish brown. Mandibles with 7 irregular teeth. Basal mandibular pits (found in other Japanese Pachycondyla species) lacking. Usually collected as winged females attracted to lights.

PONERINAE

Pachycondyla luteipes (Mayr)

Workers 3.5 mm. Color, habitus similar to P. chinensis. Scapes relatively short, exceeding occipital border by less than length of second segment. Propodeum unsculptured, smooth, shining. Males distinguished from chinensis by dark color, well developed mandibles.
Ponerinae

*Pachycondyla chinensis* (Emery)

Workers 3.5 mm. Black; mandibles, legs light brown. Scapes exceeding posterior occipital border by length of second antennal segment. Lateral surfaces of propodeum more or less sculptured, opaque. Male characteristically pale in color, with reduced mandibles.

Ponerinae

*Pachycondyla javana* (Mayr)

PONERINAE

Anochetus shohki Terayama

Workers 4.0 mm. Head, mandibles, antennae brown; mesosoma, petiole dark brown; gaster blackish brown; legs yellowish brown. Mandibles 0.8 x head length, apical portions each with 3 acute teeth; inner margins straight; shafts only weakly broadened anteriorly; dorsal margins without teeth. Scapes failing occipital corners. Eyes moderately large. Anterior pronotal margin carinate. Petiole thin, dorsally carinate; anterior margin straight, posterior margin weakly convex in profile.

PONERINAE

Odontomachus sp. 2

PONERINAE

Odontomachus monticola Emery

Workers 10-13 mm. Blackish brown-dark brown. Truncate (subapical) tooth of apical mandibular dentition short, only about 1.5 times as long as wide. Posterior cephalic dorsum covered with fine striae. Nests: under stones, rotten wood.

PONERINAE

Leptogenys confucii Forel

PONERINAE

_Hypoponera gleadowi_ (Forel)

Workers 2.5 mm. Yellow-yellowish brown. Scapes failing occipital border. Eyes 1-3 faceted, very near posterior clypeal margin (separation 2x eye diameter). Petiole thick, 1.5 times broader than long. Subpetiolar process subtriangular. Distinguished from _H. bondroiti_, by thick petiole, location of eyes. Nests: soil. Rare.

PONERINAE

_Hypoponera bondroiti_ (Forel)

Workers 2.5 mm. Yellow-reddish brown. Scapes failing occipital border. Eyes 1-3 faceted, separated from posterior clypeal margin by 3-4x eye diameter. Petiole narrow, 2x as broad as long. Subpetiolar process subtriangular. Nests: in soil, polycalic, polygynic. Queens of two types, winged and apterous. Males also dimorphic: large, apterous, dark brown; or small, apterous, yellow. Rare.
PONERINAE

_Hypoponera beppin_ Terayama


PONERINAE

_Hypoponera sauteri_ Onoyama

**Ponerinae**

*Hypoponera nubatama* Terayama & Hashimoto

Workers 2.5 mm. Dark brown-black. Eyes 3 faceted; separated from clypeus by 2x eye diameter. Mesonotal-mesopleural suture indistinct, obscured by pubescence. Metanotum constricted. Propodeal declivity laterally angulate. Petiole thin, 2x as broad as long; dorsum narrow, convex above. Subpetiolar process trapezoidal, with posteroventral lateral carinae. Distinguished from *H. opaciceps*, by smaller size, narrow petiole, essentially lacking a dorsal face. Ergatoid males known.

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**Ponerinae**

*Ponera kohmoku* Terayama

Workers 3.5-4 mm. The largest Japanese *Ponera*. Black. Distinguished from *P. scabra*, *P. yakushimensis*, by large eyes with 20 or more facets; and by posterior petiolar surface, viewed dorsally, being straight, not concave.

Nests: soil, broad-leaved forest. Alate queens collected in mid August. Rare.
PONERINAE

_Hypoponera zwaluwenburgi_ (Wheeler)

Workers 2.5 mm. Yellow. Distinguished from other _Hypoponera_ species by presence of a circularly margined swelling on posteroventral corner of mesopleuron, and by petiolar structure. Eyes absent. Lateral borders of propodeal declivity rounded.

PONERINAE

_Hypoponera nippona_ (Santschi)

Workers ca. 2.5 mm. Yellow-yellowish brown. Eyes 1 faceted, separated from clypeus by +5x eye diameter. First gastral tergite twice as wide as petiole. Metanotum prominently, deeply constricted. Petiole broad, elliptical in posterior view.

PONERINAE

_Ponera tamon_ Terayama

Workers 2.5 mm. Blackish brown. Distinguished from _P. japonica_, by wider head, thinner petiole; from _P. bishamon_ by morphology of first gastral segment, head structure, subpetiolar process.
PONERINAE

*Hypoponera opaciceps* (Mayr)

Workers 3 mm. Dark brown-blackish brown. Eyes 4-5 faceted, separated from clypeus by 2x eye diameter. Mesonotal-mesopleural suture shallow, indistinct, obscured by pubescence. Lateral borders of propodeal declivity angulate. Petiole 2x as broad as long. Subpetiolar process trapezoidal. Distinctly larger than wide in dorsal view; thick petiole; relatively small, blunt, bilaterally paired teeth on subpetiolar process. Nests: soil. Rare.

PONERINAE

*Ponera bishamon* Terayama

PONERINAE

_Ponera takaminei_ Terayama

Workers 3-3.5 mm. Yellowish brown-dark reddish brown. Eyes small, several indistinct facets. Petiole thick, raised in lateral view; posterior surface more distinctly projecting above than below; dorsal surface flat; posterior border strongly concave in dorsal view. Body sculpture coarse; propodeal declivity and posterior surface of petiole sculptured.

Nests: in soil. Rare.

PONERINAE

_Ponera swezeyi_ (Wheeler)

Worker: less than 2 mm. Yellow. Suture between mesonotum, mesopleuron lacking. Body surfaces smooth, with few punctures.

Known from broad-leaf forest, Ogasawara Islands.
PONERINAE

Ponera yakushimensis Tanaka

PONERINAE

Ponera scabra Wheeler

PONERINAE

Ponera japonica Wheeler

Workers 2.5 mm. Brown-blackish brown. Scapes failing median occipital border by at least 1/5 maximum scape thickness. Nests: under stones, soil, especially in humus. Larvae do not spin cocoons, pupae are thus naked (a characteristic rare among ponerines).

PONERINAE

Cryptopone tengu Terayama

Workers 3.5-4 mm. Yellowish brown-reddish brown. Mandibles 8-toothed, apical 4 teeth largest. Dorsal clypeal profile produced, right-angled in side view. Petiolar node thick; subpetiolar process a small rounded projection anteriorly, the remaining ventral petiolar margin straight. Distinguished from C. sauteri by configuration of clypeus, petiolar node, subpetiolar process. Nests: leaf litter, soil, forests.
PONERINAE

*Cryptopone sauteri* (Wheeler)


Nests: rotting wood, leaf litter, forests.

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PONERINAE

*Diacamma* sp.

Workers 10 mm. Black, mandibles, legs reddish brown. Hairs sparse, erect, light brown. Distinctive paired spines directed posterodorsally on petiolar dorsum. Head regularly longitudinally striate; mesosoma, petiole striate; anterior portion of 1st gastral segment with striae in concentric arches pointing forwards; remaining gaster smooth, shining.

Male: characterized by toothed tarsal claws, distinct median spines at terminal end of last gastral tergum.
**PONERINAE**

*Discothyrea kamiteta* Kubota & Terayama

Workers slightly > 2 mm. Slightly larger than *D. sauteri*. Reddish brown. Antennae 9-segmented. Eyes large, prominently protruding. Mesosoma shorter, higher than sauteri. Punctures on gastric tergites etc. deeper, more distinct, wider spaces between punctures. Inhabits floor of broad-leaved forest.

**PONERINAE**

*Discothyrea sauteri* Forel

Workers 2 mm. Yellowish brown-reddish brown. Antennae 8-segmented. Eyes small (several facets), not notably protrusive. Petiole short, broadly attached to first gastric segment; dorsum weakly raised. Punctures on first gastric tergite shallow, indistinct. Rare.
PONERINAE

Proceratium morisitai Onoyama & Yoshimura

Workers 3-3.5 mm. Reddish brown. Similar to *P. itoi*; frontal carinae narrower, overhanging antennal insertions more vertically; subpetiolar process larger, with tip usually acutely pointed. Anterodorsal paired projections of petiole prominent; in dorsal view emargination between them dark-colored. Rare.

PONERINAE

Proceratium watasei (Wheeler)

Workers 3.5-4 mm. The largest Japanese *Proceratium* species. Light yellowish brown-reddish brown. Anterior clypeal border projecting anteriorly in middle. Scapes nearly reaching occipital border - relatively the longest among Japanese *Proceratium*. Petiole relatively long, slender, dorsal face weakly raised medially.

Workers 3 mm. Yellowish brown-reddish brown. Similar to P. morisitai: anterior clypeal margin projecting in middle, frontal carinae wider, more horizontally overhanging antennal insertions. Scapes short, reaching about 2/3 length of head. Posterior emargination of propodeum in dorsal view usually not prominent, sometimes with dorsolateral protrusion. Petiole in side view subtriangular, anterior face gently sloping. Subpetiolar process small to well-developed.
**PONERINAE**

*Probolomyrmex longinodus* Terayama & Ogata

Sole known worker ca. 2.5 mm. Reddish brown. Slender. Scapes long, reaching clearly beyond midlength of head. Petiole long, narrow, longer than high. Subpetiolar process low, with small anteroventral projection.

**PONERINAE**

*Probolomyrmex okinawensis* Terayama & Ogata

Workers 2 mm. Smaller than *P. longinodus*. Reddish brown. Scapes shorter than longinodus, reaching only to midlength of head. Petiole short, higher than long. Subpetiolar process more developed, forming a vertical lamella. Rare.
PONERINAЕ

Amblyopone sakaii Terayama

Workers 2 mm. Yellowish brown. Antennae 11-segmented. Mandibles with denticles in double rows. Subpetiolar process well developed, produced in middle in lateral view.

PONERINAЕ

Amblyopone caliginosa Onoyama

PONERINAE

*Amblyopone fulvida* Terayama

Workers ca. 1.5mm. Pale yellow. Distinguished from other Japanese species by small size; 10-segmented antennae. Mandibles each with 6 denticles in a single row (a relatively small number). Subpetiolar process small, produced anteriorly. Dorsa of body tagmata covered densely with short hairs. Rare.

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PONERINAE

*Amblyopone silvestrii* (Wheeler)

Workers 3.5-4.5 mm. Yellowish brown-reddish brown. The largest Japanese *Amblyopone* species. Distinguished from others by 12-segmented antennae; mandibular dentition of numerous double-ranked denticles. Frontal lobes well separated; covering antennal insertions.
**Leptanilla japonica** Baroni Urbani  
Fig. p 185  
**Original Reference:** Baroni Urbani, C. (1977)  
**Distribution:** Honshu (Manazuru, Kanagawa Pref.; Kii Nagashima, Mie Pref.)

Total length of workers around 1 mm. Mandibles each with 4 teeth. Apical segment of antenna longer than total length of preceding 2 segments (10th + 11th). Posterior margin of head almost straight in frontal view. First gastral segment with almost parallel sides, not narrowed anteriorly in dorsal view.

Similar to *L. morimotoi* and *L. sp.* 6, but distinguished in having 4 teeth on the mandible (where *morimotoi* and *sp.* 6 have 3). The second tooth, counting from the apex, is sometimes small, low and obscure. *L. japonica* nests in small hollows in the soil (Kondoh, pers. comm.). Masuko (1989) reported that workers sometimes feed on exudations of larval haemolymph (LHF: larval haemolymph feeding), secreted from a special gland on the 3rd larval abdominal segment, and that the queens are nourished by LHF alone.

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**Subfamily AENICTINAE**

*Aenictus ceylonicus* (Mayr)  
Fig. p 185  
**Original Reference:** Mayr, G. (1866)  
**Distribution:** Okinawa I.; South and Southeast Asia, Australia.

Total length around 3 mm. Body brown; legs yellow. Mandibles slender and subtriangular, with 5 or 6 teeth in the Okinawa population. Antennae 10-segmented. Propodeal sides with irregular rugae. Subpetiolar process small, bearing a small lobe.

The Okinawa population is provisionally assigned to the widely distributed and highly variable *A. ceylonicus*.

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*Aenictus lifuiae* Terayama  
Fig. p 186  
**Original Reference:** Terayama, M. (1984)  
**Distribution:** Nansei Is (Iriomote I.); Taiwan.

A relatively small *Aenictus* species: total body length about 2 - 2.5 mm. Color yellowish brown; head, gaster and legs yellow. Mandibles subtriangular, with 7 teeth. Antennae 10-segmented. Promesonotal dorsum weakly convex in profile; posterodorsal cor-

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**Subfamily PSEUDOMYRMECINAE**

*Tetraponera attenuata* F. Smith  
Fig. p 186  
**Original Reference:** Smith, F. (1877)  
**Synonym(s):** Sima attenuata var. tenuissima Emery, 1900: 675.  
[Synonymy by Forel, 1912b: 54]  
Sima attenuata var. thagatensis Forel, 1902: 249. [Synonymy by Ward, 2001: 622]  
**Distribution:** Okinawa I. (Mt. Yonaha-dake).

Known in Japan only from a single dealated female collected in northern Okinawa. The specimen was identified by Ward (2001). A large species: total length of female around 10 mm. Body color black. Mandibles with 5 teeth. Anterior margin of clypeus with a pair of low teeth.

*T. attenuata* is distributed widely in Asia, ranging from northeast India, through continental and insular SE Asia to southern China, Taiwan and Japan. The known female was collected by sweep-net and has the head and mandibles partly broken. It might have flown to the collection site from elsewhere. Workers have not been collected in Japan.
Subfamily CERAPACHYINAE

*Cerapachys* hashimotoi Terayama

*Fig. p 187*


Distribution: Nansei (Iriomote I.).


The true status of this species is uncertain. It is similar to *C. reticulatus* Emery from Taiwan, *C. dohertyi* Emery from Sumatra and Borneo, and *C. salmant* Karavaiev from Java. Very rare.

*Cerapachys* daikoku Terayama

*Fig. p 187*


Distribution: Honshu (Izu Peninsula).

Total length of workers around 3 mm. Body color black. Antennae 12-segmented. Body surface sparsely covered with punctures with smooth, shining interspaces; hairs yellowish. Eyes large, about 1/3 the length of head in diameter, situated anteriorly. Lateral areas anterior to eyes each with a longitudinal groove. Pronotum marginate anteriorly. Hind coxa with a small vertical lamella dorsally. Petiole broad, flat above, with angulate anterior corners. Second gastric segment shorter than total length of petiole + 1st gastric segment.

Very rare. An apparently undescribed species belonging to the group formerly assigned to genus *Liophonera* (now a synonym of *Cerapachys*). Other "*Liophonera*" species are known to be arboreal, nesting in hollow twigs.

*Cerapachys* humicola Ogata

*Fig. p 188*


Distribution: Honshu (the Kanto District and southwards), Kyushu, Tsushima I.

Total length of workers about 2.5 mm. Body color reddish brown. Antennae 11-segmented. Body surface densely covered with fine reticulation and short pale yellowish hairs. Eyes absent. Pronotum without anterior margination. Petiole almost as long as wide, with rounded corners; subpetiolar process distinct, projecting ventrally and apex rounded. Constriction between 1st and 2nd gastric segments less distinct than in *C. biroi*. Second gastric segment as long as total length of petiole + 1st gastric segment.

Found on the floor of broad-leaved forest. Colonies include several tens of workers. Rare.

*Cerapachys* biroi Forel

*Fig. p 188*

Original Reference: Forel, A. (1907)

Synonym(s): *Cerapachys (Syscia) silvestrii* Wilson & Taylor (Wilson & Taylor, 1967)

*Syscia typhla* Sonobe (Sonobe, 1973)

Distribution: Nansei Is (Amami-oshima I. and southwards); Mainland China, Taiwan, SE Asia, India, Polynesia, West Indies.


A widespread tropical and subtropical species. In Japan, *C. biroi* occurs in the Nansei Islands, and is found on the floor of broad-leaved forests, nesting in soil or under stones. Colonies may include a few hundred workers and ergatoid queens.
Subfamily PONERINAE

Pachycondyla sakishimensis Terayama

Fig. p 189

Original Reference: Terayama, M (1999a)

Distribution: Nansei Is (Miyako Is. and the Yaeyama Is).

Total length of workers around 4.5 - 5 mm. Mandibles each with a basal pit. General shape and body size close to Pachycondyla pilosior, but the color generally lighter. Subpetiolar process triangular, providing the major feature distinguishing this species from P. pilosior.

P. sakishimensis nests in soil. Single foraging workers are often observed on the ground at forest margins.

Pachycondyla pilosior (Wheeler)

Fig. p 189

Original Reference: Wheeler, W. M. (1928)

Synonym(s): Euponera (Trachymesopus) sharpi pilosior Wheeler, 1928
Euponera (Trachymesopus) choosenensis Teranishi, 1940
Trachymesopus pilosior Brown, 1963

Distribution: Honshu, Shikoku, Kyushu, Tsushima I., Nansei Is (Okinawa I. and northwards); Korean Peninsula.

Total body length of workers about 4.5 - 5 mm. Color dark reddish brown to blackish brown; antennae, mandibles and legs reddish brown. Head almost square in frontal view, slightly longer than wide. Mandibles each with a basal pit. Eyes small, each with about 10 facets. Subpetiolar process trapezoidal, with sub-angulate anteroventral and posteroverentral corners.

This species is relatively rare. It inhabits forest leaf-litter.

Pachycondyla darwinii (Forel)

Fig. p 190

Original Reference: Forel, A. (1893)

Synonym(s): Belonopelta Darwinii Forel (Forel, 1893)
Trachymesopus darwinii Wilson (Wilson, 1958)

Distribution: Nansei Is (Okinawa I., Iriomote I.); S. Africa, S. Asia, SE Asia, Melanesia, northern Australia.

This species was originally described from alate females and there are few known worker/female collections. Terayama (1990) discovered a colony including a single worker in the Ryukyus. The specimen is smaller in size (total length ca 4 mm) than females (ca 5 mm), but has the same basic morphology, body color, and number of mandibular teeth. It also lack the basal mandibular pits found in other Japanese Pachycondyla species.

P. darwinii is widely distributed from southern Africa, through Southeast Asia to Melanesia and northern Australia. Alate queens are often collected at lights. Japanese distribution is apparently limited to the Ryukyus (Terayama, 1985).

Pachycondyla luteipes (Mayr)

Fig. p 190

Original Reference: Mayr, G. (1862)

Distribution: Nansei Is.

Total length of workers around 3.5 mm. Body color and habitus similar to Pachycondyla chinensis, but luteipes has relatively short antennal scapes which exceed the posterior margin of the head by less than the length of the second antennal segment. Its propodeum is unsculptured, smooth and shining.

Males are easily distinguished from P. chinensis in having the body darkly colored and the mandibles well developed. This species was recognized as Brachyponera sp.2 in Japan Myrmecological Society (1989) and first identified from Japan by Terayama (1999).

Pachycondyla chinensis (Emery)

Fig. p 191

Original Reference: Emery, C. (1895)

Synonym(s): Ponera solitaria Fr. Smith (Fr. Smith, 1874)
Euponera (Brachyponera) nigrita chinensis Emery (Emery, 1894)
Brachyponera chinensis Brown (Brown, 1958)

Distribution: Honshu, Shikoku, Kyushu, Nansei Is, Ogasawara Is; Mainland China, Korean Peninsula, Taiwan, New Zealand (introduced).
Total length of workers around 3.5 mm. Body color black, with light brown mandibles and legs. Antennal scape exceeding posterior margin of head by the length of the second antennal segment. Lateral surface of propodeum more or less sculptured, opaque. The male is characteristically pale in color and has reduced mandibles. Teranishi (1929) suggested that *P. chinensis* is a predator of termites, but there are no relevant field observations. *P. chinensis* is found at the margins of woodlands. It is common in southern Honshu and the more southern Japanese islands.

**Pachycondyla javana (Mayr)**

*Fig. p. 191*

**Original Reference: Mayr, G. (1867)**

**Synonym(s): Pachycondyla (Ectomomyrmex) japonica Emery, 1902)**

*Ectomomyrmex japonicus*; Santsche, 1925
*Ectomomyrmex javanus Mayr, 1867*
*Pachycondyla (Ectomomyrmex) javana: Emery, 1900*
*Pachycondyla (Ectomomyrmex) japonica Emery, 1902*
*Ectomomyrmex japonicus: Santsche, 1925*
*Pachycondyla (Ectomomyrmex) astuta cambodjana Forel, 1911*
*Ectomomyrmex denticeps Wheeler, 1929*
*Pachycondyla (Ectomomyrmex) horni Forel, 1913*
*Ectomomyrmex javanus race maternus Forel, 1900*
*Ectomomyrmex sudaicus Mayr, 1867*

**Distribution:** Kyushu (southern part), Tsushima I., Nansei Is.; Mainland China, Korean Peninsula, Taiwan, and part of SE Asia.

The largest known Japanese ponerine ant. Total length of workers around 7 mm. The body generally black in color. Lateral margins of head forming blunt keels. Antennae 12-segmented. Head, mesosoma and petiole more or less heavily sculptured; the gaster smooth and shining. Mesopleuron subdivided by an oblique furrow.

*P. javana* nests under stones at forest margins. Workers may be found foraging individually on the ground; they do not form trails, and are able to sting painfully. The male is characterised by the presence of a distinct V-shaped carination on the dorsal surface of the propodeum, derived from its anterior margin. *P. javana* is distributed mainly in tropical Asia. In Japan it was originally described from Tsushima I. as *Pachycondyla japonica* Emery. Wheeler (1928) recorded it from Honshu, but queried its true identity. *P. javana* is rather common on Tsushima I., but is not known from northern Kyushu. Its nomenclature is still uncertain. Yasumatsu (1962), for example, suggested that the species epithet *sauteri* was a possible synonym of *javana*, while Collingwood (1976) considered *javana* a junior synonym of *astuta* F. Smith. Terayama (1999) believed the Japanese species to be different from true *P. javana*, and identified it as *Pachycondyla sp.* The provisional species name *javana* is retained here, because the species is a member of the *P. javana* complex.

**Anochetus shohki** Terayama

*Fig. p. 192*

**Original Reference:** Terayama, M. (1996)

**Distribution:** Ishigaki I.

Total length of workers around 4.0 mm. Head including mandibles and antennae brown, mesosoma and petiole dark brown, gaster blackish brown, legs yellowish brown. Mandibles 0.8 times head length, with straight dorsal inner margins; shafts only weakly broadened anteriorly; dorsal margins without teeth; apical portions each with 3 acute teeth. Antennal scapes not reaching the postero-lateral corner of head. Eyes moderate in size. Pronotum with a carinate anterior margin. Petiole thin, carinate dorsally, with straight anterior margin and weakly convex posterior margin in profile.

Known only from Ishigaki Island, Nansei Islands.

**Odontomachus sp. 2**

*Fig. p. 192*

**Original Reference:** Emery, C. (1892)

**Synonym(s): Myrtopterus kuroiwaeki Matsumura, 1912**

**Odontomachus monticola var. formosa** Forel, 1912

**Distribution: **Kyushu (Kagoshima Pref.), Yaku I., Tanegashima I., Kuchinoerabu-jima I.; Mainland China, Taiwan, SE Asia, Myanmar, India.

A large ponerine ant: total length of workers around 10 - 13 mm. Body color blackish brown to dark brown. Truncate (subapical) tooth of apical mandibular dentition short, only about 1.5 times as long as wide. Posterior dorsum of head covered with fine striation.

This species nests under stones and rotten wood. When escaping, workers will often jump backwards for some centimeters propelled by the force of their jaws snapping on the ground. On Yaku Island it occurs at altitudes as high as 1200m. *O. monticola* is widespread in Asia, including India, Myanmar, mainland China and Taiwan. In China, its range extends north of Beijing to beyond 40 degrees N latitude (Teranishi, 1936, the species there reported as *O. haematodus* Linnaeus; see also Yasumatsu, 1962).

**Odontomachus monticola** Emery

*Fig. p. 193*

**Original Reference:** Emery, C. (1892)

**Synonym(s): Myrtopterus kuroiwaeki Matsumura, 1912**

**Odontomachus monticola var. formosa** Forel, 1912

**Distribution: **Kyushu (Kagoshima Pref.), Yaku I., Tanegashima I., Kuchinoerabu-jima I.; Mainland China, Taiwan, SE Asia, Myanmar, India.
**Leptogenys confucii Forel**

*Fig. p 193*

**Original Reference:** Forel, A. (1912)

**Distribution:** Kyushu (Cape Sata, Kagoshima Pref.), Nansei Is; Taiwan.

Total body length of workers around 4.5 mm. Body dark reddish brown to blackish brown; legs yellow. Head slender, anterior margin of clypeus triangular. Mandibles elongate, toothless. Eyes well developed, situated anteriorly on the head capsule. Mesosoma slender; pro- and mesonota slightly convex dorsally; metanotal groove distinctly incised dorsally. Petiole long, with convex dorsal outline in profile; narrow in dorsal view. Legs long, tarsal claws pectinate (a feature unique in ants to *Leptogenys*).

Nests are found under stones or rotting wood, or in forest leaf-litter. They include only a few tens of workers. When nests are breached the workers disperse rapidly, so it is difficult to census colonies. Reproductive females are ergatoid. Males are winged and typically ponerine in habitus, but with pectinate tarsal claws.

**Hypoponera gleadowi Forel**

*Fig. p 194*

**Original Reference:** Emery, C. (1895)

**Synonym(s):** *Ponera gleadowii* Forel in Emery, 1895

*Ponera gleadowii* Forel: Forel, 1900

*Ponera japonica* t. *formosae* Forel, 1913

Not *Ponera gleadowii* Forel: Azuma, 1952, 1953

*Ponera gleadowi* Forel: Wilson, 1958

*Hypoponera gleadowi* (Forel): Taylor, 1967

**Distribution:** Shikoku, Nansei Is (Tokashiki I., Ishigaki I., Iriomote I.); Korean Peninsula, Taiwan, India, Hawaii, North America.

Total length of workers around 2.5 mm. Body color yellow to yellowish brown. Scapes not reaching median posterior border of head. Eyes of 1 - 3 facets, situated very near the posterior margin of clypeus (the distance from clypeus to anterior margin of eyes is twice the eye diameter). Petiole thick, 1.5 times as broad as long. Subpetiolar process subtriangular.

Very similar to *H. bondroiti*, but distinguished by the thick petiole and the location of the eyes. *H. gleadowi* nests in the soil. A rare species, first reported after publication of "A List of the Ants of Japan with Common Japanese Names" (Myrmecological Society of Japan Editorial Committee, 1988).

**Hypoponera bondroiti Forel**

*Fig. p 194*

**Original Reference:** Forel, A. (1911)

**Synonym(s):** *Ponera ergatandria* subsp. *Bondroiti* Forel, 1911

*Ponera bondroiti* Forel: Santschi, 1937

*Hypoponera bondroiti* (Forel): Onoyama, 1989

**Distribution:** Hokkaido (shore of Lake Kussharo), Nansei Is (Okinawa I.), Daito Is (Kita-daito I., Minami-daito I.), Ogasawara Is (Chichi-jima I., Nishi-jima I.); Taiwan, Belgium (possibly introduced elsewhere from tropical America).

Total length of workers around 2.5 mm. Body color yellow to reddish brown. Scapes not reaching median posterior border of head. Eyes each with 1 - 3 facets, situated at the sides of the head, somewhat separated from posterior margin of clypeus (the distance between anterior margins of eyes and posterior margin of clypeus is 3 - 4 times eye diameter). Petiole narrow, twice as broad as long. Subpetiolar process subtriangular.

*H. bondroiti* nests in the soil. A rare species. It was cited as "Hypoponera sp. 7" in "A List of the Ants of Japan with Common Japanese Names" (Myrmecological Society of Japan Editorial Committee, 1988). Nests in the soil. Polygynic and polycalic. Two types of queen are present, winged and apterous. Males are also dimorphic, they may be, large, apterous and dark brown, or small, apterous and yellow.

**Hypoponera beppin Terayama**

*Fig. p 195*

**Original Reference:** Terayama, M. (1999)

**Distribution:** Honshu (the Chubu District and southwards), Shikoku, Kyushu, Nansei Is, Senkaku Is; Taiwan

Total length of workers around 3 mm. Body color brown to blackish brown. Eyes each a single black facet; the distance from posterior margin of clypeus to anterior margin of eyes 4 - 5 times eye diameter. Antennal club 6-segmented, the sixth segment from the apex indistinctly swollen (antennal clubs are 5-segmented in other Japanese species). Metanotum slightly constricted. Lateral borders of propodeal declivity angulate. Petiole narrow in posterior view; its dorsal surface slightly pointed. Subpetiolar process subtriangular.

This species corresponds to *Hypoponera* sp. 6 of Myrmecological Society of Japan Editorial Committee (1988). Nests in the soil. Rather rare.
Hypoponera sauteri Onoyama

Fig. p 195


Synonym(s): Ponera Gledowi R. decipiens v. Sauteri Forel, 1912
Not Ponera excoecata: Wheeler, 1928
Ponera excoecata Wheeler, 1928
Hypoponera excoecata? : Onoyama, 1976
Hypoponera sauteri Onoyama, 1989
Hypoponera excoecata [sic]: Bolton, 1995

Distribution: Hokkaido (Okushit-to I.), Honshu, Shikoku, Kyushu, Tsushima I., Nansei Is; Korera, Taiwan.

Total length of workers around 2.5 mm. Body color pale yellow to yellowish brown. Eyes each a single unpigmented facet, situated away from the posterior clypeal border (distance from clypeus to anterior margin of eyes 4 - 5 times eye diameter). Subpetiolar process rounded posteroventrally, without lateral carinae. The female is a little larger than the worker.

H. sauteri was designated "Hypoponera sp. 5" in "A List of the Ants of Japan with Common Japanese Names" (Mycological Society of Japan Editorial Committee, 1988). Most of the Japanese ants formerly identified as H. excoecata are in fact this species (H. excoecata was originally described from China; none of its former records from Japan are now considered valid). It nests under stones, in rotting logs and in the soil, especially the humus layer. Common at many places in Japan.

H. sauteri

H. opacipes

H. nubatama

H. nippona

H. zwaluwenburgi

H. nippona

Hypoponera nubatama

Terayama & Hashimoto

Fig. p 196


Distribution: Honshu (the Kanto District and southwards).

Total length of workers around 2.5 mm. Body color dark brown to black. Eyes each consisting of 3 facets; situated near the posterior margin of clypeus (the distance from posterior margin of clypeus to anterior margin of eyes is twice the eye diameter). Suture between mesonotum and mesopleuron shallow, indistinct, obscured by pubescence. Metanotum constricted. Lateral borders of propodeal declivity angulate. Petiole thin, twice as broad as long; its dorsal surface narrow, convex above. Subpetiolar process trapezoidal, with posteroventral lateral carinae.

Very similar to H. opaciceps, distinguished by smaller size and the petiole being narrowed above, essentially lacking a dorsal face. Ergatoid males are known.

Ponera kohmoku Terayama

Fig. p 196


Distribution: Honshu (southern parts), Shikoku, Tsushima I., Kyushu, Yaku I., Kuchino-erabu I.

The largest Japanese Ponera species: total length of workers around 3.5 - 4 mm. Body color black. Similar to P. scabra and P. yakuhi-mensis, but distinguished by the large eyes, each consisting of 20 or more facets, and by the posterior petiolar surface in dorsal view being straight, not concave.

This species inhabits the floor of the broad-leaved forest, and nests in the soil. Alate queens have been collected in the middle August on Yaku Island. Rather rare.

Hypoponera zwaluwenburgi (Wheeler)

Fig. p 197

Original Reference: Wheeler, W. M. (1933)

Synonym(s): Pseudocryptopone zwaluwenburgi Wheeler, 1933
Ponera zwaluwenburgi (Wheeler): Wilson, 1957
Hypoponera zwaluwenburgi (Wheeler): Taylor, 1967

Distribution: Okinawa I.; Taiwan, Hawaii, Polynesia.

Total length of workers around 2.5 mm. Body color yellow. Easily distinguished from other species of Hypoponera by the presence of a circularly margined swelling on the posterdorsal corner of the mesopleuron and by petiolar morphology. Eyes absent. Lateral border of propodeal declivity rounded. Petiole 1.5 or less times as broad as long; its dorsal face distinctly defined; anterior and posterior borders tapering in lateral view.

Reproductive alates apparently emerge in June on Okinawa. Rare.
Hypoponera nippona (Santschi)

Total length of workers averaging slightly less than 2.5 mm. Body color yellow to yellowish brown. Eyes each a single facet, situated well away from posterior margin of clypeus (the distance from clypeus to anterior margin of eyes is more than 5 times the eye diameter). First gastral tergite twice as broad as petiole. Metanotum prominently and deeply constricted. Petiole broad and elliptical in posterior view.

Some specimens formerly identified as H. excoecata are in fact this species. H. nippona is monogynous and monocalic. It nests in the soil and is rather rare. Reproductive alates are attracted to light and fly during late August in Kyoto.

Ponera tamon Terayama

Total length of workers around 2.5 mm. Body color blackish brown. Similar to P. japonica, distinguished by the wider head and thinner petiole. Ponera tamon differs from P. bishamon in the morphologies of the first gastral segment, head and subpetiolar process.

This species nests in the soil. Larvae spin cocoons within which they pupate. Common in the Nansei Islands.

Hypoponera opaciceps (Mayr)

Total length of workers around 3 mm. Body color dark brown to blackish brown. Eyes each of 4 or 5 facets, situated near posterior margin of clypeus (the distance from the posterior margin of clypeus to the anterior margin of eyes is twice the eye diameter). Suture between mesonotum and mesopleuron shallow and indistinct, obscured by pubescence. Lateral borders of propodeal declivity angulate. Petiole twice as broad as long. Subpetiolar process trapezoidal.

Very similar to H. nubatama, distinguished by larger size and the petiole not being so narrowed above. Winged and apterous forms occur in both queens and males. A rare species.

Ponera bishamon Terayama

Total length of workers around 2 mm. Body color brown to black. Similar to P. japonica and P. tamon, distinguished by the first gastral tergite being slender and distinctly longer than wide in dorsal view, the thick petiole, and the bilaterally paired teeth on the subpetiolar process being relatively small and blunt.

This rare species nests in the soil.

Ponera takaminei Terayama

Total length of workers around 3 - 3.5 mm. Body color yellowish brown to dark reddish brown. Eyes small, each consisting of several indistinct facets. Petiole thick, raised in lateral view; its posterior surface more distinctly projecting above than below; dorsal surface flat; posterior border strongly concave in dorsal view. Body sculpture coarse; propodeal declivity and posterior surface of petiole sculptured.

This rare species nests in the soil.
**Ponera yakushimensis** Tanaka

**Fig. p 200**

**Original Reference:** Tanaka, M. (1974)

**Distribution:** Yaku I.

Total length of workers around 3.5 mm. Body color blackish brown. Similar to *P. scabra* and *P. kohmoku*. *P. yakushimensis* is distinguished from *P. scabra* by the anterior and posterior petiolar surfaces being parallel and the posterior petiolar surface being angulate above in lateral view, by the second gastric tergite being more shallowly and sparsely punctate than the first, and by the dorsal and posterior surfaces of the propodeum and petiole being more sparsely punctate. *P. yakushimensis* is distinguished from *P. kohmoku* by its small eyes, consisting of only several indistinct facets, and by its posterior petiolar border being distinctly concave in dorsal view.

*P. yakushimensis* nests under moss, and is known only from mountainous sites on Yaku Island.

**Ponera scabra** Wheeler

**Fig. p 200**

**Original Reference:** Wheeler, W. M. (1928)

**Distribution:** Honshu, Shikoku, Kyushu, Tsushima I.; Korean Peninsula.

Total length of workers around 3.5 mm. Body color blackish brown to black. Eyes small, each consisting of several indistinct facets. Petiole more or less trapezoidal in lateral view; its posterior border distinctly concave in dorsal view.

This species nests in the soil. The larvae spin cocoons (Okamoto, 1972). Not rare in some localities.

**Ponera japonica** Wheeler

**Fig. p 201**

**Original Reference:** Wheeler, W. M. (1906c)

**Synonym(s):** *Ponera japonica* var. *atroca* Santschi (Santschi, 1941)

**Distribution:** Hokkaido, Honshu, Shikoku, Kyushu; Korean Peninsula, Malaysia(?), Indonesia(?).

Total length of workers around 2.5 mm. Body color brown to blackish brown. Scapes not reaching median posterior border of head, failing to do so by at least 1/5 maximum scape thickness.

*P. japonica* nests under stones and in the soil, especially in the humus layer. Okamoto (1972) reported that larvae do not spin cocoons and the pupae are thus naked. This species is widely distributed from Hokkaido to Kyushu. It is found from low-lying to mountainous sites in Hokkaido and Honshu, but mainly on mountains in Shikoku and Kyushu. It has been recorded from Malaysia and Indonesia, but the records are questionable.

**Cryptopone tengu** Terayama

**Fig. p 201**

**Original Reference:** Terayama, M. (1999)

**Distribution:** Nansei Is (Amami-oshima I. and southwards), Ogasawara Is.

Total length of workers around 3.5 - 4 mm. Body color yellowish brown to reddish brown. Mandibles each with 8 teeth, the apical 4 larger than the others. Dorsal outline of clypeus distinctly produced, forming a right-angle in lateral view. Petiolar node thick; subpetiolar process present on anterior portion, forming a small rounded projection; the remaining ventral margin of petiole straight.

This species resembles *C. sauteri*, but is easily distinguished by the configuration of the clypeus, petiolar node, and subpetiolar process. *Cryptopone* sp. of Onoyama (1976) and *C. sp. 2* in Myrmecological Society of Japan Editorial Committee (1989) correspond to this species. It is distributed on Amami-oshima Island and southwards, and nests in the leaf litter and soil in forests. Relatively common in the Nansei Islands.

**Cryptopone sauteri** (Wheeler)

**Fig. p 202**

**Original Reference:** Wheeler, W. M. (1906c)

**Synonym(s):** *Pachycondyla* (*Trachymesopus*) *sauteri* Wheeler (Wheeler, 1906)

*Euponera* (*Pseudoponera*) *sauteri* (Wheeler) (Emery, 1909)

*Euponera* (*Trachymesopus*) *sauteri* (Wheeler) (Emery, 1911)

*Cryptopone sauteri* (Wheeler) (Brown, 1963)

**Distribution:** Honshu, Shikoku, Kyushu, Tsushima I., Yaku I., Nansei Is (Amami-oshima I. and northwards); Korean Peninsula.
Total length of workers around 3.5 - 4 mm. Color yellow to yellowish brown. Body covered thickly with golden hairs. Mandibles with 9 or 10 teeth. Dorsal outline of clypeus gently sloping in lateral view. Subpetiolar process developed, subtriangular and with an angled ventral tip.

This species nests in rotting wood and leaf litter in forests. Colony size is relatively large compared to other Japanese ponerine ants. C. sauteri is a predator of dipterous and coleopterous larvae (Murata, 1988). It is commonly collected in appropriate sites.

**Diacamma sp.**

*Fig. p 202*

**Distribution:** Nansei Is (Amami-oshima I., Tokunoshima I., Kume I., Okinawa I.).

Large ponerine ant. Total length of workers around 10 mm. Body color black, mandibles and legs reddish brown. Hairs sparse, erect, light brown. Distinctive paired spines on petiolar dorsum, directed posterodorsally. Head regularly longitudinally striate; trunk and petiole striate; anterior portion of 1st gastric segment with all striae in concentric arches pointing forwards; the rest of gaster smooth and shining.

The male of this species is large, characterized by toothed tarsal claws and distinct median spines at the terminal end of the last gastric tergum. On Okinawa this species is found in limestone areas, nesting in the soil, tree cavities or spaces between rocks at forest margins (Fukamoto, 1983). Colonies comprise 20 to 400 workers. Nesting sites are frequently changed under unfavorable conditions (Fukamoto & Abe, 1983; Abe & Uezu, 1977). This species is found on several islands of the Nansei Archipelago, but its distribution is rather sporadic. Recent karyological studies of *Diacamma* show that there are many possible sibling species in tropical Asia (Imai et al., unpublished). Wilson (1958b) synonymized many names under *D. rugosum* Le Guillou, but this nomenclature needs reappraisal, since morphological features distinguishing species can be very subtle. The Japanese species has often been cited as *D. rugosum* or *D. rugosum geometricum* v. anceps. Its morphology is consistent with *D. rugosum*, in the broad sense proposed by Wilson, but its exact status nomenclature must await better understanding of the genus at large, including karyological analysis of all possible taxa.

**Diacamma sp.**

*Fig. p 202*

**D Discothyrea sauteri Forel**

*Fig. p 203*

**Original Reference:** Forel, A. (1912)

**Synonym(s):** *Discothyrea globus* var. *sauteri* Forel, 1912

**Discothyrea sauteri:** Brown, 1958

**Distribution:** Honshu (the Kanto District and southwards), Shikoku, Kyushu, Nansei Is, Senkaku Is; Taiwan.

Total length of workers around 2 mm. Body color yellowish brown to reddish brown. Antennae 8-segmented. Eyes small, composed of several facets, not notably protrusive. Petiole short, broadly attached to first gastric tergite; the dorsum weakly raised. Punctures on first gastric tergite shallow and indistinct.

This species feeds on the eggs of spiders and centipedes (Masuko, 1981). It nests in rotting stumps. Rare.

**Proceratium morisitai**

*Onoyama & Yoshimura*

*Fig. p 204*


**Distribution:** Honshu, Iki I.

Total length of workers around 3 - 3.5 mm. Body color reddish brown. Similar to *P. itoi*, but the frontal cariniae are narrower and overhang the antennal insertions more vertically than in *P. itoi*. Anterodorsal paired projections of petiole prominent; in dorsal view the margination between them dark-colored. Subpetiolar process larger than in *P. itoi*, with the tip usually acutely pointed (though variable).

This recently named species corresponds to *P. sp. 4* of Myrmecological Society of Japan Editorial Committee (1988). Sometimes formerly reported as *P. itoi*. For example, Sonobe's (1974) figure of "*P. itoi" in fact depicts *P. morisitai*. The distribution overlaps that of *P. itoi*, but morisitai is more sporadic. Rare.

**Discothyrea kamiteta**

*Kubota & Terayama*

*Fig. p 203*

**Original Reference:** Kubota, M. & Terayama, M. (1999)

**Distribution:** Okinawa I.

Total length of workers slightly greater than 2 mm. Similar to *D. sauteri* but a little larger. Body color reddish brown. Antennae 9-segmented. Eyes large, prominently protruding. Mesosoma shorter and higher than in *D. sauteri*. Punctures on gastric tergites etc. deeper and more distinct, spaces between punctures wider.

**D. kamiteta**

**D. sauteri**

Inhabits the floor of broad-leaved forest. Known only from Okinawa. This species corresponds to *D. sp. 2* of Myrmecological Society of Japan Editorial Committee (1988).

**Proceratium watasei**

*Wheeler*

*Fig. p 204*

**Original Reference:** Wheeler, W. M. (1906c)

**Synonym(s):** *Syphincta watasei* Wheeler, 1906

Total length of workers around 3 - 3.5 mm. Body color reddish brown. Similar to *P. itoi*, but the frontal cariniae are narrower and overhang the antennal insertions more vertically than in *P. itoi*. Anterodorsal paired projections of petiole prominent; in dorsal view the margination between them dark-colored. Subpetiolar process larger than in *P. itoi*, with the tip usually acutely pointed (though variable).

This recently named species corresponds to *P. sp. 4* of Myrmecological Society of Japan Editorial Committee (1988). Sometimes formerly reported as *P. itoi*. For example, Sonobe's (1974) figure of "*P. itoi" in fact depicts *P. morisitai*. The distribution overlaps that of *P. itoi*, but morisitai is more sporadic. Rare.
**Proceratium watasei** (Wheeler): Brown, 1958  
**Distribution:** Honshu, Shikoku, Kyushu; Korean Peninsula.

Total length of workers around 3.5 - 4 mm. The largest Japanese *Proceratium* species. Body color light yellowish brown to reddish brown. Anterior clypeal margin projecting anteriorly in the middle. Antennal scapes nearly reaching the posterior margin of head - relatively the longest in any Japanese *Proceratium* species. Petiole relatively long and slender, the dorsal face weakly raised medially.

*P. watasei* lives in the soil of glossy-leaved evergreen forests.

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**Proceratium japonicum** Santschi  
Fig. p 205  
**Original Reference:** Santschi, F. (1937)  
**Synonym(s):** *Proceratium formosicola* Terayama, 1985  
**Distribution:** Honshu (the Kanto District and southwards), Shikoku, Kyushu, Nansei Is.

Total length of workers around 2.5 mm. The smallest Japanese *Proceratium* species. Body color yellow to yellowish brown. Anterior clypeal margin straight, not projecting anteriorly in the middle. Frons with a weak median longitudinal carina. Antennal scapes short, reaching about 3/4 the length of head. Petiole scale-like in form; shorter than in other Japanese *Proceratium* species; its anterior and posterior faces nearly vertical.

*P. japonicum* lives on the ground in evergreen forests.

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**Proceratium itoi** (Forel)  
Fig. p 205  
**Original Reference:** Forel, A. (1918)  
**Synonym(s):** *Syphincta itoi* Forel, 1918  
**Proceratium itoi** (Forel): Brown, 1958  
**Distribution:** Honshu (the Kanto District and southwards), Shikoku, Kyushu, Nansei Is.; Mainland China (?); Korean Peninsula.

Total length of workers around 3 mm. Body color yellowish brown to reddish brown. Similar to *Proceratium morisitai*. Anterior clypeal margin projecting in the middle. Frontal carinae wider and overhanging the antennal insertions more horizontally than in *P. morisitai*. Antennal scapes short, reaching about 2/3 the length of head. Posterior margination of propodeum in dorsal view usually not prominent, but in some cases there is much dorsolateral protrusion of the propodeum. Petiole in lateral view subtriangular, its anterior face gently sloping. Subpetiolar process usually small, but sometimes well-developed.

*P. itoi* lives in the soil of glossy-leaved evergreen forests. Recent records from China (Tang, Wu & Wang) require confirmation.

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**Probolomyrmex longinodus**  
Terayama & Ogata  
Fig. p 206  
**Original Reference:** Terayama, M. & Ogata, K. (1988)  
**Distribution:** Nansei Is (Ishigaki I., Yonaguni I.); Taiwan.

A slender species. Total length of sole known worker around 2.5 mm. Body color reddish brown. Antennal scapes long, reaching more than midlength (about 3/4) of head. Petiole long and narrow, longer than high. Subpetiolar process low, with a small anteroventral projection.

*P. longinodus* is very rare and known in Japan only from Ishigaki and Yonaguni Islands. The holotype was collected from the floor of broad-leaved forest. Corresponds to sp. 2 in Myrmecological Society of Japan Editorial Committee (1988).

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**Probolomyrmex okinawensis**  
Terayama & Ogata  
Fig. p 206  
**Original Reference:** Terayama, M. & Ogata, K. (1988)  
**Distribution:** Okinawa I.
Amblyopone sakaii Terayama

**Original Reference:** Terayama, M. (1989)

**Distribution:** Okinawa I. (Naha). I. (type locality).

Total length of workers around 2 mm. Body color reddish brown. Antennae II-segmented. Mandibles each with 6 denticles in a single row (a relatively small number). Subpetiolar process well developed, produced anteriorly. Dorsa of body tagmata covered densely with short hairs.

Rare, known at present only from the 2 records cited above.

Amblyopone caliginosa Onoyama

**Original Reference:** Onoyama, K. (1999)

**Distribution:** Honshu (Cape Manazuru, Kanagawa Pref.), Kyushu (Kirishima Mountains).


This species was reported from Mt. Kirishima by Sonobe (1972) as "Amblyopone sp.", and corresponds to the Amblyopone sp. 3 of Myrmecological Society of Japan Editorial Committee (1988). Rare.


Errata in "Ants of Japan"

p.16 (Key to the genera: DOLICHODERINAEE)
Linepithem p70, 83 → **Ochetellus** P 73, 85
Ochetellus p 73, 85 → **Linepithem**a P 70, 83

**Cardiocondyly kagutsuchi** Terayama

*C. kagutsuchi* and *C. nuda* are so similar that their morphological descriptions given here are almost identical. However, *C. kagutsuchi* has 27 chromosomes, while *C. nuda* has 28 (Imai & Yamauchi, unpublished). Also, the male caste system of *C. kagutsuchi* differs from that of *C. nuda*. The former is dimorphic, and has both alate and ergatoid males, while *C. nuda* is believed to have only ergatoid males.

p.153
*Cardiocondyly kagutsuchi* Terayama

→ *Cardiocondyly kagutsuchi* Terayama
*C. kagutsuchi* → *C. kagutsuchi*
*C. kagutsuchi* → *C. kagutsuchi*
*C. kagutsuchi* → *C. kagutsuchi*

**Cerapachys humicola** Ogata

*Ogata*

those of *V. okinawana* are winged. The size of *V. yambaru* workers is 2.5 mm.

p.138
*Cardiocondyly kagutsuchi* Terayama

→ *Cardiocondyly kagutsuchi* Terayama

*kagutsuchi* → *kagutsuchi*

node generally narrower anterodorsally (sometimes undependable). *C. kagutsuchi* has 27 chromosomes, *C. nuda* 28. Male caste systems differ: *kagutsuchi* is dimorphic, with both alate and ergatoid males, *nuda* is known only to have ergatoid males.

p.195
**Hypoponera suteri** Onoyama

→ **Hypoponera suteri** Onoyama

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*kagutsuchi* → *kagutsuchi* 138, 153