A REVIEW OF THE ANTS OF THE GENUS
LASIUS FABRICIUS, 1804, SUBGENUS DENDROLASIUS
RUZSKY, 1912 (HYMENOPTERA: FORMICIDAE)
FROM EAST PALAEARCTIC

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Abstract.— The taxonomy of the ant subgenus Dendrolasius Ruzsky, 1912 is reviewed on
the base of the investigation of types and of non-type material of several species. L. fuliginosus
is described as a new species, which includes former L. fuliginosus (Latreille, 1798) from the
East Palaeartic. L. nipponensis Forel, 1912, proposed by Espadaler et al. 2001 as the replace-
ment name for "oriental fuliginosus", actually is a good species and the senior synonym of L.
crispus Wilson, 1955; L. orientalis Karawajew, 1912 is revived from synonymy and is consid-
ered as the senior synonym of L. teranishii Wheeler, 1928; L. capitatus Kusnetzov-Ugamsky,
1928 is considered as a good species, different from L. crispus. A key to Dendrolasius
workers and queens from the Eastern Palaeartic is also given.

Key words.— Ants, taxonomy, Lasius, Dendrolasius, new species, new synonyms, East
Palaeartic.

INTRODUCTION

The ants of the subgenus Dendrolasius Ruzsky, 1912 are the most peculiar both morphologically and
biologically among all Lasius Fabricius, 1804 species. These
so-called jet black ants have a quite high level of social
organisation, form large colonies, usually build big car-
ton nests in living trees, and are characterised by their
specific, strong smell. All of them are distinctly bigger
than other Lasius species (workers' body size up to 4.5 – 5.5 mm), have shiny black or dark brownish-black
body, and a distinctly emarginate occipital margin of the
head in most species.

This subgenus includes eight species only (taking into account the present revision), two of which distrib-
uted in the Western Palaeartic (as far east as the Altai
Mts.), and six others found in the eastern part of the
Region, e. g. in the southern part of Russian Far East (as
far west as the Amurksy Region), north-eastern China,
Korean Peninsula, and Japan; one species was also found
in Taiwan.

Ruzsky (1912) described the subgenus Dendrolasius
including one species – L. fuliginosus (Latreille, 1798).
In the same year, two new forms belonging to this sub-
genus were described: L. fuliginosus var. nipponensis
Forel, 1912 from Japan, and L. fuliginosus var. orientalis
Karawajew, 1912 from Korea. A little earlier Wheeler
(1910), based on the single very peculiar queen found in
Japan, described L. spathepus, which also belongs to the
subgenus Dendrolasius.

Later on, several Dendrolasius species and infra-
specific forms were described: Acanthomyops fuligin-
osus var. capitatus Kusnetzov-Ugamsky, 1928 from
Russian Far East; L. teranishii Wheeler, 1928 from Japan;
L. ouchii Teranishi, 1940 from Japan; L. buccatus Stärcke,
1942 from Bosnia; L. crispus Wilson, 1955 from Japan
and Korea; L. morisitai Yamauchi, 1978 from Japan.

After complete or local revisions and reviews of the
genus Lasius or its subgenus Dendrolasius (Wilson
1955; Yamauchi and Hayashida 1968; Yamauchi 1978;
Kupynskaya 1989, 1990; Espadaler et al. 2001; see also
Bolton 1995) the number of the valid Dendrolasius spe-
cies was reduced to seven.

Despite the presence of many publications dealing
with the subgenus Dendrolasius, there were still quite a
lot of unresolved taxonomic questions. I had the oppor-
tunity to investigate the types of several species and
infra-specific forms, what allowed to me to solve some
problems and clarify the taxonomic situation of this
Palaeartic subgenus.
MATERIAL AND METHODS

This work is based on the investigation of some collected personally material and of type and non-type specimens, preserved in different museums and institutions: Museum of the Comparative Zoology of Harvard University, Cambridge, Massachusetts, USA (MCZ); Muséum d’Histoire naturelle, Geneva, Switzerland (MHNG); Institute of Zoology of the Ukrainian National Academy of Sciences, Kiev, Ukraine (IZK); Museum and Institute of Zoology of the Polish Academy of Sciences, Warsaw, Poland (MIZ); Jagiellonian University, Cracow, Poland (JUK); Zoological Museum of the Moscow State University, Russia (ZMMU); Zoological Institute of the Russian Academy of Sciences, St.-Petersburg, Russia (ZIN); Biological and Soil Institute of the Russian Academy of Sciences, Vladivostok, Russia (BPI).

The following measurements (in mm) and indices are used:

- HL1 – head length in full-face view, measured from the mid-point of the occipital margin to the mid-point of the anterior clypeal margin; HL2 – head length in full-face view, measured as a diagonal line from the upper-most point of an occipital corner to the mid-point of the anterior clypeal margin; HW1 – maximum head width in full-face view, excluding eyes; HW2 – minimum head width near the level of the mandibular insertion; SL – maximum straight-line length of the antennal scape in profile; OL – maximum diameter of the eye; AL – diagonal length of the alitrunk seen in profile, from the neck shield to the posterior margin of propodeal lobes (workers), or from the anterio-dorsal point of alitrunk to posterior margin of propodeal lobes (queens).

Indices:

\[ CI = \frac{HW_1}{HL_1}; \quad CLI = \frac{HL_2}{HL_1}; \quad CWI = \frac{HW_1}{HW_2}; \quad SI_1 = \frac{SL}{HL_1}; \quad SI_2 = \frac{SL}{HW_1}; \quad OL = \frac{OI}{HW_1}. \]

TAXONOMY

Lasius (Dendrolasius) nipponensis Forel, 1912, stat. rev. (Figs 1-7, 15-21)

*Lasius fuliginosus* var. *nipponensis* Forel 1912: 339, w, nec q, Japan.
*Lasius nipponensis*: Santschi 1941: 278 (raised to species).

*Lasius crispus* Wilson, 1955: 144, w, q, m, Japan (unresolved primary homonym of *Lasius crispus* Théobald, 1935: 68, France, Mio-Pliocene); Yamauchi and Hayashida 1968: 401, 402; Yamauchi 1978: 174, syn. nov.

Material examined. Paralectotypes, 3 workers on the same pin, "L. fuliginosus* Latr., worker, Tokyo (Yano)".

"v. nipponensis* Forel, worker, Type, Tokyo" (both hand written by Forel), "Coll. Forel", "Typus" (red printed label) (MHNG); "paralectotype" queen, "L. fuliginosus* Latreille, q, Japan (Yano)", "v. nipponensis* Forel, q, Type, Tokyo" (both hand written by Forel), "Coll. Forel", "Typus" (red printed label) (MHNG) (really this queen is *L. fusi*, see below). Non-type material: more than 20 workers, 2 queens from the Russian Far East, North Korea and Japan (IZK, MIZ, ZMMU, BPI, JUK).

Measurements and indices of the paralectotype workers: HL1 = 1.09–1.25, HL2 = 1.15–1.30, HW1 = 1.09–1.26, HW2 = 0.67–0.76, SL = 1.01–1.18, OL = 0.23–0.25, AL = 1.26–1.51; CI = 1.00–1.01, CLI = 1.04–1.05, CWI = 1.63–1.67, SI1 = 0.92–0.94, SI2 = 0.92–0.94, OL = 0.20–0.21.

**Diagnosis of workers and queens.** Workers: petiolar scale (seen in profile) thin, distinctly narrowing to the top and with flattened dorsal crest, symmetrical; seen in front or from behind, it is the widest at the level of the spiracles, clearly tapering to the top, its dorsal crest narrowly rounded, without notch; head in full face view distinctly narrowing anteriorly and with shallowly emarginate occipital margin; scape, mid and hind tibiae not flattened, elliptical in cross-section; ratio of min/max diameters of the scape > 0.7; scape and legs with numerous subdecumbent hairs; promesonal dorsum and occipital margin with rather long standing hairs; body with sparse, short decumbent pubescence.

Queens: petiolar scale (seen in profile) thin, narrowing to the top; head in full face view distinctly narrowing anteriorly, with almost straight lateral margins in front of the eyes, and with hardly emarginate occipital margin; scape, mid and hind tibiae not flattened, elliptical in cross-section; ratio of min/max diameters of the scape > 0.7; legs and scape with dense decumbent pubescence and numerous subdecumbent hairs; head, alitrunk and gaster with very abundant, long, often curved standing hairs.

Notes. Forel (1912) described *L. fuliginosus* var. *nipponensis* from workers and queen from Japan (vicinity of Tokyo). The most important features, separating the workers of this form from those of *L. fuliginosus*, have been emphasised in the original description: "... l’écaillère est assez tranche... et non obuste, la tête est plus rétrécie devant..." [e.g.: the petiolar scale of the worker is rather sharp (thin) and not blunt, the head is narrower anteri- orly] (loc. cit., p. 339). These features fully correspond to those of the type specimens (see above).

The taxonomic position of *L. nipponensis* is somewhat confused because the queen, described by Forel (1912), indeed belongs to the "oriental fuliginosus". It has a thick, slightly narrowing to the top petiolar scale (seen in profile); mid and hind tibiae and tarsi with dense decumbent pubescence only, without subdecumbent hairs; the head in full face view only slightly narrowing anteriorly, with distinctly emarginate occipital margin, and with abundant, though relatively short,
and molecular evidence that ants from the eastern Palearctic, previously determined as *L. fuliginosus*, are not conspecific with the “typical” *L. fuliginosus* (Latreille), distributed in the western Palearctic (e.g. as far east as the Altai Mts.), and proposed for this species the name *L. nipponensis* Forel (as the oldest name attributed to “oriental fuliginosus”). Yet, they did not examine the types of var. *nipponensis*. Actually, *L. nipponensis* is not conspecific with “oriental fuliginosus”, whose workers have a much thicker, not narrowing at the top petiolar scale (seen in profile), a less anteriorly narrowing head with distinctly emarginate occipital margin, etc. (compare Figs 1–7 and 52–58). Furthermore, queens of these species differ even more than their workers (see above).

Wilson (1955) described *L. crispus* from workers, queens and males from Japan and Korea. The most important diagnostic features of the workers were: “…femora with numerous outstanding decumbent to suberect hairs. Cephalic and gastric pilosity denser than in fuliginosus. Petiolar crest viewed from the side thinner and sharper than in *L. fuliginosus*, the anterior and posterior faces less convex…” (loc. cit., p. 144). According to this and the detailed treatment of *L. crispus* given by Yamauchi (1978) and Kupynskaya (1989, 1990, as junior synonym of *L. capitatus*), it is obvious that *L. crispus* has the same diagnostic features of *L. nipponensis*. First of all, the thin petiolar scale, the distinctly anteriorly narrowing head, the hairy legs and scape, etc., combined with the not flattened scape; all these led me to formally synonymise *L. crispus* with *L. nipponensis*.

**Distribution.** Southern part of Russian Far East (Primorsky Region), Korean Peninsula, Japan (Hokkaido, Honshu, Shikoku), Taiwan.

*Lasius capitatus* (Kusnetzov-Ugamsky, 1928) (Figs 22–28)

*Acanthomyops fuliginosus* subsp. *capitatus* Kusnetzov-Ugamsky 1928: 18, w, Russian Far East (Kusnetzov-Ugamsky 1927: 187, nomen nudum); transferred to *Lasius* as the junior synonym of *L. fuliginosus* (Latreille):
Wilson 1955: 138; revived from synonymy and raised to species as the senior synonym of L. crisps Wilson; Kupynskaya 1989: 785, w, q, m; Kupynskaya 1990: 229; Bolton 1995: 222 ("Turkestan" is erroneously given as the type locality); Imai et al. 2003: 60.

**Material examined.** Lectotype worker, "Okeanskaya nr. Vladivostok, Siberia, VIII-1926, N. Kusnetzov" (probably hand written by Wilson); "Lasius fuliginosus capitatus Kusnetzov LECTOTYPE" (hand written by Wilson); "M.C.Z. Type 30143" (MCZ, designated by Wilson, 1955); paralectotype worker, "Okeanskaya nr. Vladivostok, Siberia, VIII-1926, N. Kusnetzov" (hand written by Wilson); "Turkestan N. Kusnetzov" (Sic!) (printed original label from Kusnetzov's collection); "Lectotype nest series" (hand written by Wilson); "Cotype" (red printed label); "Lasius fuliginosus capitatus Kuzn.-Ugams. det. E. O. Wilson" (hand written by Wilson); "M.C.Z. Type 30143"; paralectotype worker, "Acanthomyops fuliginosus orientalis (= capitatus m.) East Far Station Okeanskaya near Vladivostok" (probably hand written by Kusnetzov); "Turkestan N. Kusnetzov" (Sic!) (original printed label from Kusnetzov's collection); "Lectotype nest series" (hand written by Wilson); "Cotype" (red printed label); "M.C.Z. Type 30143" (MCZ). Non-type material: 5 workers from the Russian Far East (IZK, BPI).

Labels of paralectotype specimens are misleading for the presence of the labels "Turkestan N. Kusnetzov" together with the locality "Far East Station Okeanskaya near Vladivostok". Probably it is simply a labelling error in Kusnetzov's collection.

Measurements and indices of the type specimens (data of the lectotype are in brackets): HL = 1.25–1.29 (1.29), HL2 = 1.32–1.36 (1.36), HW1 = 1.22–1.27 (1.27), HW2 = 0.78–0.85 (0.85), SL = 1.11–1.12 (1.12), OL = 0.24–0.27 (0.27), AL = 1.34–1.44 (1.44); CI = 0.97–1.00 (0.99), CLI = 1.05–1.07 (1.05), CWI = 1.49–1.59 (1.49), SI1 = 0.87–0.89 (0.87), SI2 = 0.89–0.92 (0.88), OI = 0.19–0.21 (0.21).

Queens and males are unknown.

**Diagnosis.** Workers: petiolar scale (seen in profile) relatively thin, though not flattened at the top, approximately inversely V-shaped; when seen in front or from behind, it is slightly narrowing, not tapering to the dorsal crest; head with convex sides, gradually and slightly narrowing anteriorly, with rather shallowly emarginate occipital margin; scape, mid and hind tibiae not flattened, elliptical in cross-section; ratio of min/max diameters of the scape > 0.7; scape and legs with decumbent pilosity only; promesonotal dorsum and occipital margin with short and sparse standing hairs; third joint of maxillary palps is the longest, each following joint is somewhat longer than the next one; The combination of these features distinctly separates this species both from L. nipponensis (see above and Figs 1–7) and from L. fujii (see below and Figs 52–58).

**Notes.** The type specimens of var. capitatus generally correspond to the original description, except that their petiolar scale is somewhat thicker than in Fig. 4 of Kusnetzov-Ugamsky (1928).

In my opinion, for several reasons L. capitatus had the most ambiguous taxonomic position among all Dendroasius species. First of all, even the usage of the name "capitatus" was misleading. It was introduced by Kusnetzov-Ugamsky (1927) as nomen nudum. He wrote "...Generally, this species [e.g. L. fuliginosus] is very stable on its characters; only the separate subspecies, recently described by me, A. fuliginosus capitatus, nov. (manuscript), lives in the Far East (South Ussuri Region)..." (loc. cit., p. 187). Later he has primarily used for this form the name "Acanthomyops fuliginosus orientalis Karawaijew" and noted "...all specimens of Acanth. (Dendroasius) fuliginosus Latr., collected by me in Ussuri Region [now Primorsky Region of Russia], belong to the separate taxonomic unit, which Karawaijew described as separate subspecies. Discriminating features of this subspecies are: maxillary palps rather long, 6-jointed, their third joint is the longest, each subsequent joint is shorter than the preceding one...Head without emargination on the occipital margin, or, at most, very shallowly emarginate,... with broadly rounded occipital corners...Petiolar scale "flattily-rounded" [I do not understand properly what the author correctly meant even in Russian] ...The main features [e.g. separating this form from L. fuliginosus] are: lack of the emargination on the occipital margin of the head and a different structure of the maxillary palps..." (Kusnetzov-Ugamsky 1928, p. 17). Then, on p. 18 of that paper, the author unexpectedly used for this subspecies the name "Ac. f. capitatus"; he also used the same name (as "subsp. nov.") in the legend for Figs 1–4. In the following paper (Kusnetzov-Ugamsky, 1929) he used for the same Far Eastern form of L. fuliginosus the Karawaijew's name "orientalis". Formally, the name "capitatus" could be considered as an unnecessarily proposed replacement name for var. orientalis, but in fact, L. orientalis is another species, that differs both from "oriental fuliginosus" and from capitatus (see below).

For many years the taxonomic status of the subspecies capitatus was enigmatic, until Wilson (1955) designated the lectotype of this form and considered it as a junior synonym of L. fuliginosus with such comments: "[the lectotype]...Possessing a shallow occipital emargination and short petiolar hairs, both of which characters seem to predominate in north-eastern Asia..." (loc. cit., p. 143).

On the contrary, Kupynskaya (1989), according to Kusnetzov-Ugamsky's original description and drawings (see above) believed that the main diagnostic features of L. capitatus and L. crisps are actually the same. Hence, she revived the name capitatus from synonymy, raised it to species rank as senior synonym of L. crisps Wilson and provided some details characteristic of all of the three castes, although she considered the types of L. capitatus as probably lost. However, Kupynskaya's
Lasius orientalis Karawajew, 1912, stat. rev., stat. nov. (Figs 29–37)


Lasius (Chthonolasius) ouchii Teranishi, 1940: 76, q. Japan; as junior synonym of L. teranishii: Wilson 1955: 146, syn. nov. (I have never seen any material referred to L. ouchii and this new synonym is established following Wilson's, 1955 objective synonymy for L. teranishii).

Material examined. Neotype worker (designated here, see below), “Buhta Gaidamak, No. 3196, 21.V.1900, leg. P. Shmidt”, “Lasius fuliginosus var. orientalis Karawajew Typus” (both labels hand written by Karawajew) (IZK). Neotype material: 16 workers from the nest of neotype; more than 20 workers from the Russian Far East, North Korea and Japan (IZK, MIZ, ZMMU, BPJ).

Measurements and indices of the neotype of L. orientalis (data are in brackets) and of the workers from the nest of the neotype specimen (n = 16) [mean data are in square brackets]: HL1 = 1.06–1.26 (1.22) [1.17], HL2 = 1.12–1.33 (1.32) [1.25], HW1 = 1.04–1.23 (1.19) [1.15], HW2 = 0.70–0.80 (0.77) [0.75], SL = 1.01–1.12 (1.09) [1.06], OL = 0.18–0.27 (0.25) [0.23], AL = 1.18–1.44 (1.34) [1.32]; CI = 0.96–1.00 (0.98) [0.98], CLI = 1.05–1.09 (1.08) [1.07], CWT = 1.49–1.57 (1.55) [1.54], SL1 = 0.88–0.95 (0.90) [0.90], SL2 = 0.89–0.96 (0.92) [0.92], OI = 0.18–0.22 (0.21) [0.20].

Diagnosis of workers and queens. Workers: petiolar scale (seen in profile) thick, low, not narrowing to the top; when seen in front or from behind, it gradually widens to the top; scale distinctly flattened, ratio of min/max diameters of the scale ≤ 0.5; head with convex sides, gradually and slightly narrowing anteriorly,
with emarginate occipital margin; scape and legs with numerous short subdecumbent hairs; promesonotal dorsum and occipital margin with a few quite short standing hairs.

Queens: petiolar scale (seen in profile) thick, low, not narrowing to the top; when seen in front or from behind it gradually widens to the top; scape and legs, including the first tarsal joint, remarkably flattened, ratio of min/max diameters of scape and hind tibiae ≤ 0.4; head with emarginate occipital margin, but not cordiform and at most slightly wider than long; legs and scape with very dense decumbent pubescence; head, alitrunk and gaster with very dense decumbent pubescence; alitrunk dorsum with sparse, short erect hairs.

**Notes.** Karawajew’s (1912) description of *L. fuliginosus* var. *orientalis* (workers) was very short and insufficient, and the most important diagnostic features of this form were not pointed at. The type localities of this species are “Koredschi und Dore, Halbinsel von Korea” (19.VII.1900, P. Schmidt)” (Karawajew 1912, p. 582). In Karawajew’s collection (IZK) I have found a couple of workers from Russian Far East and Korea, determined by Karawajew as *L. fuliginosus* var. *orientalis*. All of them undoubtedly belong to the same species. Furthermore, 17 workers among this material, collected in Primorsky Region of Russia (“Buhta Gaidamak, No. 3196, 21.V.1900, leg. P. Shmidt”), bear also the additional Karawajew’s label “*Lasius fuliginosus var. orientalis* Karaw. Typus”. However, they cannot formally belong to the type series, because in the original description another type locality and date of collecting were given. I do not know why Karawajew did such a mistake, especially because he usually worked very accurately and left his own collection for the next generations of myrmecologists in perfect conditions. Though types of var. *orientalis* seem lost, I believe that specimens, collected about in the same region as the types, and originally determined by Karawajew as the species he described, really belong to var. *orientalis*. Hence, I designate as the neotype of *L. fuliginosus* var. *orientalis* Karawajew the worker from “Buhta Gaidamak, No. 3196, 21.V.1900, leg. P. Shmidt”, labelled by Karawajew as “Typus”.

Wilson (1955) synonymised var. *orientalis* with *L. fuliginosus* with such comments: “… Since the types are not available, synonymy in this case is tentative. The differences stated in the original description are of a trivial nature, and it would seem that if Karawajew had really had spatheus before him instead of fuliginosus, he would have noticed at least one of the several excellent characters which separate workers of these two species…” (loc. cit., p. 143), though he never saw the types of this form. Yamauchi (1978) and Kupynanskaya (1989, 1990) repeated this Wilson’s synonymy, while Espadaler et al. (2001) considered var. *orientalis* as the junior synonym of *L. nipponensis* (see Notes to the latter species, above). The name “orientalis” was also used by Kusnetzov-Ugamsky (1928, 1929); however, the specimens from Russian Far East, collected and investigated by him, belong to another species (see Notes to *L. capitatus*, above).

The most astonishing fact is that var. *orientalis* is neither *L. capitatus*, nor “oriental fuliginosus”, nor *L. nipponensis*. All specimens from Karawajew’s collection mentioned above, including the neotype, have the distinctly flattened antennal scape and the very thick, low petiolar scale (seen in profile), which is gradually widened to the apex when seen in front or from behind (see Figs 29–35). These diagnostic features completely match...
those of *L. teranishii* Wheeler (see Yamauchi and Hayashida 1968; Yamauchi 1978; Kupianskaya 1989, 1990), what let me consider *L. orientalis* Karawajew, 1912 as the senior synonym of *L. teranishii* Wheeler, 1928.

**Distribution.** Southern part of Russian Far East (Amursky and Primorsky Regions, Islands Shikotan and Kunashir), Korean Peninsula, Japan (Hokkaido, northern and central Honshu).

*Lasius spathepus* Wheeler, 1910 (Figs 38–51)


**Material examined.** Holotype queen: "Japan, Kuwana coll., 1910", "Type", "Holotype Lasius spathepus Wheeler", "M.C.Z. type 71691" (MCZ). Non-type material: about 30 workers, 1 queen from the Russian Far East, North Korea and Japan (MCZ, IZK, MIZ, ZMMU, BPI, JUK).

Measurements and indices of the holotype queen: HL₁ = 1.66, HL₂ = 1.85, HW₁ = 2.03, HW₂ = 1.28, SL = 1.55, OL = 0.43, AL = 2.53 mm;
CI = 1.22, CLI = 1.11, CWI = 1.59, SI₁ = 0.93, SI₂ = 0.76, OI = 0.21.

**Diagnosis of workers and queens.** Workers: petiolar scale (seen in profile) thin, distinctly narrowing to the top, asymmetrical; when seen in front or from behind it gradually narrowing to the top, with straight or slightly notched dorsal crest; scape distinctly flattened, ratio of min/max diameters of the scape ≤ 0.5; head with convex sides, gradually and slightly narrowing anteriorly, with emarginate occipital margin; scape and legs with numerous short subdecumbent hairs; promesonal dorsal and occipital margin of the head with relatively sparse and long standing hairs.

Queens: petiolar scale (seen in profile) thin, distinctly narrowing to the top, asymmetrical; head with deeply emarginate occipital margin, cordiform, distinctly wider than long; scape and legs, including the first tarsal joint, remarkably flattened, ratio of min/max diameters of scape and hind tibiae ≤ 0.4; legs with dense decumbent to subdecumbent pubescence; antennal scape with abundant subdecumbent to suberect hairs; head, alitrunk and gaster with very short and sparse decumbent pubescence, alitrunk dorsum without standing hairs.

Figures 38–51, *Lasius spathepus* Wheeler, 1910 (38–44, worker; 45–51, queen, holotype); (38, 45) head, frontal view; (39, 46) alitrunk and petiole, in profile; (40, 47) petiolar scale, frontal view; (41, 48) scape, dorsal view; (42, 49) same, lateral view; (43, 50) hind tibia and first tarsal joint, lateral view; (44, 51) same, dorsal view. Scale bar = 1 mm.
Notes. Lasius spathepus is the most peculiar species of the genus, especially for the characters of its queens (see above and Figs 45–51). Workers are similar to those of L. orientalis by their distinctly flattened scape, but well differ from the latter by the much thinner, narrowing at the top petiolar scale (seen in profile, compare Figs 39, 40 and 30, 31). On the other hand, the shape of petiolar scale recalls L. nipponensis, but in the latter the scape is not flattened.

Wheeler (1910) described L. spathepus from the single queen from Japan (he described workers and males in 1928). This queen has a so peculiar shape of legs and head that Wheeler discussed the possibility of the existence of two different morphs of queens in that Lasius species. Further investigations showed that L. spathepus has unusual queens only, rather than normal ones (Wilson 1955; Yamauchi 1978; Kupynskaya 1989, 1990; Imai et al. 2003).

Distribution. Southern part of Russian Far East (known only from one locality: Primorsky Region, Anisimovka), Korean Peninsula, Japan (all four main Islands).

Lasius morisitai Yamauchi, 1978 (Figs 66–79)


Material examined. About 20 workers, 2 queens from the Russian Far East, North Korea and Japan (IZK, MIZ, ZMMU, BPI, JUK).

Diagnosis of workers and queens. Workers: petiolar scale (seen in profile) relatively thin, though not flattened at the top, apparently inversely V-shaped; when seen in front or from behind, it is only slightly narrowing to the dorsal crest; head shorter than broad (CI ≥ 1.04), with convex sides, gradually and slightly narrowing anteriorly, and with distinctly emarginate occipital margin; scape, mid and hind tibiae not flattened, elliptical in cross-section; ratio of min/max diameters of the scape > 0.7; scape and legs with decumbent pilosity only, without standing hairs; promesonotal dorsum and occipital margin with abundant, quite short standing hairs;

Queens: petiolar scale (seen in profile) is relatively thin, though not flattens at the top; head with convex sides, gradually and slightly narrowing anteriorly, and with shallowly emarginate occipital margin; scape, mid and hind tibiae not flattened, elliptical in cross-section; ratio of min/max diameters of the scape > 0.7; legs and scape with dense decumbent pubescence only; head, alitrunk and gaster with very sparse short standing hairs, and with extremely short and sparse decumbent pubescence, appears shiny.
Notes. *Lasius morisitai* was the last species, described in the subgenus *Dendrolasius* (Yamauchi 1978). Its workers most resemble *L. capitatus*, differing from them mainly by the wider, transverse head and by the absence of subdecumbent hairs on the antennal scape; they are also similar to *L. fujii* and differ from the latter by the wider head, shorter standing hairs on the alitrunk dorsum and somewhat thinner petiolar scale (compare Figs 52–58 and 22–28, 66–72). However, queens of *L. morisitai* well differ from those of *L. fujii* by the very sparse deciduous pubescence of the body and much shorter and less abundant standing hairs on the alitrunk dorsum (compare Figs 59–65 and 73–79).

**Distribution.** Southern part of Russian Far East (Primorsky Region, Ussuriysky Natural Reserve), Korean Peninsula, Japan (central Honshu).

As mentioned above, Espadalet al. (2001) provided both morphological and molecular evidence that the "oriental fuliginosus" is a distinct species, differs from the "typical" *L. fuliginosus* (Latreille) distributed in the western part of the Palearctic Region (e.g. as far east as the Altai Mts.), and have proposed for it the replacement name *L. nipponensis* Forel (as the oldest name referred to this species). Nevertheless, neither *L. nipponensis*, nor any other name referable to *Dendrolasius*, can not be used instead of "oriental fuliginosus", since all of them are assigned to other species. In such a situation I have to described as new the following species.

**Lasius fujii** sp. nov.
(Figs 52–65)


**Material examined.** Holotype, worker, North Korea, Prov. Chagang, Myohyang-san Mts., way to Pirobong, No. 275–85, 25.VI.1985, leg. M. Woyciechowski (IZK); paratypes: 15 workers, 6 queens from the same nest as the holotype; more than 50 workers: North Korea, Prov. Hwanghae-pukto, 8 km W Haeju, Sujang-san Mts, 55 m a.s.l., *Pinus-Quercus* forest, No. 44–85, 15.VI.1985; ibid., 600 m a.s.l., young *Quercus* forest, No. 81–85, 17.VI.1985; Prov. Chagang, Myohyang-san Mts, below Chonju Rock, No. 169–85, 22.VI.1985, 230 m a.s.l., deciduous forest; Prov. Chagang, Myohyang-san Mts, near monastery Plidoea, No. 217–85, 24.VI.1985, 540 m, a.s.l., pine-

Since all three castes of *oriental fuliginosus* were described and characterised comprehensively several times by different authors (Wilson 1955; Yamauchi 1978; Kupynskaya 1989, 1990; Espadaler et al. 2001; Imai et al. 2003), I do not provide formal description, just give the diagnosis of workers and queens, and the drawings and measurements of type specimens. The main differential features of it and *L. fuliginosus* are given in Table 1. The differences between *L. fiji* and other East-Asian *Dendrolacia* species are given in the Key.

Measurements and indices of type specimens (the data of holotype are in brackets), [mean data are in square brackets] workers: HL = 1.19–1.43 (1.41) [1.33]; HL = 1.29–1.51 (1.51) [1.42], HW = 1.18–1.43 (1.43) [1.32], HW = 0.71–0.95 (0.92) [0.82], SL = 1.08–1.27 (1.27) [1.19], OL = 0.24–0.28 (0.28) [0.26], AL = 1.50–1.68 (1.68) [1.57] mm; CI = 0.95–1.10 (1.01) [0.99], CLI = 1.06–1.10 (1.07) [1.07], CWI = 1.53–1.57 (1.55) [1.60], SI = 0.86–0.92 (0.90) [0.89], SI = 0.88–0.93 (0.89) [0.90], OI = 0.18–0.21 (0.20) [0.19]; queens: HL = 1.36–1.40 (1.38); HL = 1.44–1.50 (1.47), HW = 1.40–1.46 (1.42), HW = 0.83–0.87 (0.84), SL = 1.26–1.27 (1.265), OL = 0.34–0.36 (0.345), AL = 1.90–2.04 (1.97) mm; CI = 1.03–1.04 (1.033), CLI = 1.06–1.07 (1.066), CWI = 1.68–1.70 (1.69), SI = 0.91–0.93 (0.92), SI = 0.88–0.90 (0.89), OI = 0.24–0.25 (0.243).

**Diagnosis of workers and queens.** Workers: petiolar scale (seen in profile) relatively thick, not flattened at the top, approximately inversely U-shaped; when seen in front or from behind, it is only slightly narrowing to the dorsal crest; head with convex sides, gradually and slightly narrowing anteriorly, and with distinctly emarginate occipital margin; scape, mid and hind tibiae not flattened, elliptical in cross-section; ratio of min/max diameters of the scape > 0.7; scape and legs with decumbent pilosity only; promesonotal dorsum and occipital margin with relatively short and abundant standing hairs.

Queens: petiolar scale (seen in profile) relatively thick, not flattened at the top, approximately inversely U-shaped; head with convex sides, gradually and slightly narrowing anteriorly, and with distinctly emarginate occipital margin; scape, mid and hind tibiae not flattened, elliptical in cross-section; ratio of min/max diameters of the scape > 0.7; legs and scape with dense decumbent pubescence only; head, alitrunk and gaster with abundant, but not very long standing hairs, and with well-developed decumbent pubescence.

**Distribution.** Russian Far East (Amursky, Khabarovsky and Primorsky Regions, Isl. Sakhalin, Southern Kurily Islands), north-eastern China, Korean Peninsula, Japan (all four main Islands); it is the most common *Dendrolacia* species in this area.

**Etymology.** The species is named after Fuji-san Mt., one of the greatest symbols of Japan.

**Key to Lasius (Dendrolacia) species of the East Palearctic**

Though there are several recent versions of the Keys to the identification of East Palearctic *Dendrolacia* species (Yamauchi and Hayashida 1968; Yamauchi 1978; Kupynskaya 1989, 1990; Imai et al. 2003), I proposed somewhat modified version of the Key, including one species more.

<table>
<thead>
<tr>
<th>L. fiji sp. nov</th>
<th>L. fuliginosus (Latreille)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>workers</strong></td>
<td></td>
</tr>
<tr>
<td>- head usually somewhat longer than wide (CI 0.95–1.01);</td>
<td>- head length equal to or less than its width (CI 1.00–1.03);</td>
</tr>
<tr>
<td>- scape relatively longer (SI 0.88–0.95);</td>
<td>- scape relatively shorter (SI 0.82–0.89);</td>
</tr>
<tr>
<td>- standing hairs on the upper margin of petiolar scale longer, the longest hairs distinctly longer than the half of the maximum diameter of the scape;</td>
<td>- standing hairs on the upper margin of petiolar scale shorter, the longest hairs shorter than the half of the maximum diameter of the scape;</td>
</tr>
<tr>
<td>- decumbent pubescence on the anterior (vertical) surface of first gastral tergite relatively dense, distance between hairs distinctly shorter than the hairs length;</td>
<td>- decumbent pubescence on the anterior (vertical) surface of first gastral tergite relatively sparse, distance between hairs not shorter (usually longer) than the hairs length;</td>
</tr>
<tr>
<td><strong>queens</strong></td>
<td></td>
</tr>
<tr>
<td>- eyes with somewhat longer hairs, length of the longest ones ≥ 0.040 mm</td>
<td>- eyes with somewhat shorter hairs, length of the longest ones ≤ 0.035 mm</td>
</tr>
</tbody>
</table>

Table 1. The main differential features of *L. fiji* and *L. fuliginosus*. 
Workers

1. Scape strongly dorso-ventrally flattened, ratio of its min/max diameters ≤ 0.5 (Figs 32, 33, 41, 42) ............................................. 2

   2. Scape not dorso-ventrally flattened, elliptical in cross-section, ratio of its min/max diameters > 0.7 (Figs 4, 5, 25, 26, 55, 56, 69, 70) ......................... 3

2(1). Petiolar scale (seen in profile) thick, low, not narrowing to the top, with widely rounded dorsal crest, symmetrical; seen in front or from behind, it is the widest at the dorsal crest (Figs 30, 31) ........................................ L. (D.) orientalis Karawajew

   3. Petiolar scale (seen in profile) thin, quite high, asymmetrical, narrowing to the top, with flattened dorsal crest; seen in front or from behind, it is the widest at the level of spiracles, then gradually narrowing to the dorsal crest (Figs 39, 40) ............................. L. (D.) spathepus Wheeler

3(1). Petiolar scale, seen in front or from behind, distinctly tapering to the top, with very narrowly rounded dorsal crest; seen in profile, it is thin, with flattened dorsal crest (Figs 2, 3). Occipital margin shallowly emarginate (Fig. 1) ........................................ L. (D.) nipponensis Forel

   4. Petiolar scale, seen in front or from behind, only slightly narrowing to the top, with widely rounded, straight or slightly emarginate dorsal crest; seen in profile, it is relatively thick, its dorsal crest never flattened (Figs 23, 24, 53, 54, 67, 68). Occipital margin of different shape (Figs 22, 52, 66) .......................... 4

4(3). Petiolar scale (seen in profile) thicker, very slightly narrowing to the top, approximately inversely U-shaped (Fig. 53). Occipital margin distinctly emarginated (Fig. 52) ............................. L. (D.) fujii sp. nov.

   5. Petiolar scale (seen in profile) somewhat thinner, distinctly narrowing to the top, approximately inversely V-shaped (Figs 23, 67). Occipital margin of different shape (Figs 22, 66) .......................... 5

5(4). Scape with short, but distinct subdenticulate hairs (Figs 25, 26). Occipital margin shallowly emarginate (Fig. 22). Head somewhat longer than broad, at most as long as wide (CI ≤ 1.00) ........................................ L. (D.) capitatus Kusnetzov-Ugamsky

   6. Scape with dense denticulate pubescence only (Figs 69, 70). Occipital margin distinctly emarginate (Fig. 66). Head somewhat wider than long (CI ≥ 1.04) ........................................ L. (D.) morisitai Yamauchi

Queens (queens of L. capitatus are unknown)

1. Scape and legs, including the first tarsal joint, remarkably flattened, ratio of min/max diameters of scape and hind tibiae ≤ 0.4 (Figs 36, 37, 48–51) ......................... 2

   2. Scape and legs not flattened, elliptical in cross-section, ratio of min/max diameters of scape > 0.6, same of hind tibia > 0.7 (Figs 11–14, 62–65, 76–79) ............................................. 3

2(1). Body and appendages with very dense denticulate pubescence, alitrunk dorsum with relatively sparse, short standing hairs; petiolar scale (seen in profile) low, thick, not narrowing to the top, with widely rounded dorsum (Fig. 37). Head with emarginate occipital margin, but not cordiform and at most slightly wider than its length (Fig. 36) ........................................ L. (D.) orientalis Karawajew

   3. Body (except the appendages) with very short and sparse denticulate pubescence, alitrunk dorsum without standing hairs; petiolar scale (seen in profile) quite high, narrowing to the top, with a very thin dorsal crest (Fig. 46). Head with strongly emarginate occipital margin, cordiform, distinctly wider than long (Fig. 45) ............................. L. (D.) spathepus Wheeler

3(1). Body appears shiny, with very sparse short standing hairs, and with extremely short and sparse denticulate pubescence (Fig. 74) ........................................ L. (D.) morisitai Yamauchi

   4. Body appears dull, with numerous, long standing hairs; denticulate pubescence abundant or sparse (Figs 16, 60) ................................. 4

4(3). Head in full face view distinctly narrowing anteriorly, its lateral margins in front of the eyes almost straight; occipital margin very shallowly concave or almost straight; head outline with very abundant, long, often curved, protruding standing hairs (Fig. 15). Petiolar scale (seen in profile) thin, distinctly narrowing to the top, with a somewhat flattened dorsal crest (Fig. 16). Hind tibiae and scape with dense denticulate pubescence and numerous subdenticulate hairs (Figs 18–21) ........................................ L. (D.) nipponensis Forel

   5. Head in full-face view weakly narrowed anteriorly, with regularly convex sides; occipital margin distinctly emarginate; head outline with less abundant, relatively short, straight standing hairs (Fig. 59). Petiolar scale (seen in profile) thick, at most slightly narrowing to the top, with a rounded dorsal crest (Fig. 60). Hind tibiae and scape with dense denticulate pubescence only (Figs 62–65) ........................................ L. (D.) fujii sp. nov.

Stärcke (1942) described L. buccatus from Bosnia, based on the queens and male. I have never seen neither the type specimens of this species, nor any other materials referred to it, and have not definitive opinion on the taxonomic status of this form. However, Wilson (1955) supposed L. buccatus to be a good species on the basis of several somewhat unusual characters of the queens, especially for their head narrower than the alitrunk. If Stärcke's description and drawings were correct, this feature would be unique for Dendrolasius species. This question may be clarified after obtaining the type specimens and additional material from the type locality or any adjacent regions.
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REFERENCES


Yamauchi, K. and K. Hayashida. 1968. Taxonomic studies on the genus Lasius in Hokkaido, with ethological and ecological notes. 1. The subgenus Dendrolasis or jet black ants. Journal of the Faculty of Sciences, Hokkaido University, Ser. 6, Zoology, 16: 396–412.

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