

## Discovery of the Subgenera *Austrolasius* and *Dendrolasius* of the Ant Genus *Lasius* (Hymenoptera, Formicidae) from Mongolia

Ulykpan AIBEK

Faculty of Biology, National University of Mongolia, Ulaanbaatar, 210646 Mongolia

and

Seiki YAMANE

Graduate School of Science and Engineering, Kagoshima University, Kagoshima, 890–0065 Japan

**Abstract** The subgenera *Austrolasius* and *Dendrolasius* of the genus *Lasius* are recorded from Mongolia for the first time. A brief review of the *Lasius* fauna of Mongolia is given, with a list of known species.

### Introduction

PFEIFFER *et al.* (2007) published a critical list of the Mongolian ants based on all the previous publications and recently collected materials. In the genus *Lasius* five species are listed, *i.e.*, two species in each of the subgenera *Lasius* and *Chthonolasius*, and one in the subgenus *Cautolasius*. During our intensive surveys in 2008 and 2009 we have found species of two additional subgenera from the North-central and Eastern Mongolia (Khentii aimag and Dornod aimak, Fig. 1). Here we report our results and discuss the present status of the taxonomy of the genus *Lasius* in Mongolia.

### Key to the subgenera of the Mongolian *Lasius*

(Based on the worker caste)

1. Body brownish, minutely sculptured and dull (at most weakly shining). Head in profile with posterior margin rounded to straight. Maxillary palpus long, almost reaching the juncture of head with prothorax. .... *Lasius*
  - Body blackish brown to black, largely smooth and shining. Head in full-face view heart-shaped, with posterior margin rather strongly emarginated medially. Maxillary palpus much shorter, extending only to the midlength of the ventral face of head. .... *Dendrolasius*
  - Body yellow to brownish yellow, minutely sculptured and dull. Head in full-face view at most weakly emarginated medially. Maxillary palpus length variable. .... 2
2. Petiole in profile thick, broadly rounded at apex. Head in full-face view with strongly convex sides so that strongly narrowed near mandibles. .... *Austrolasius*
  - Petiole in profile thinner, distinctly narrowed apicad, more or less acute at apex. Head in full-face view with the sides only weakly convex so that gradually narrowed towards mandibles. .... 3
3. Ventral surface of head without distinct standing hairs, at most with weak and sparse suberect hairs in addition to short pubescence. Petiole seen from back relatively broad, broadest near apex. .... *Cautolasius*



Fig. 1. Map of Northeastern and Eastern Mongolia, with the localities for the two *Lasius* species. ★: *L. reginae*, ●: *L. fuji*.

- Ventral surface of head with standing or obliquely standing hairs that are much stronger than underlying pubescence. Petiole seen from back narrower, distinctly longer than broad, generally gradually narrowed toward apex. .... *Chthonolasius*

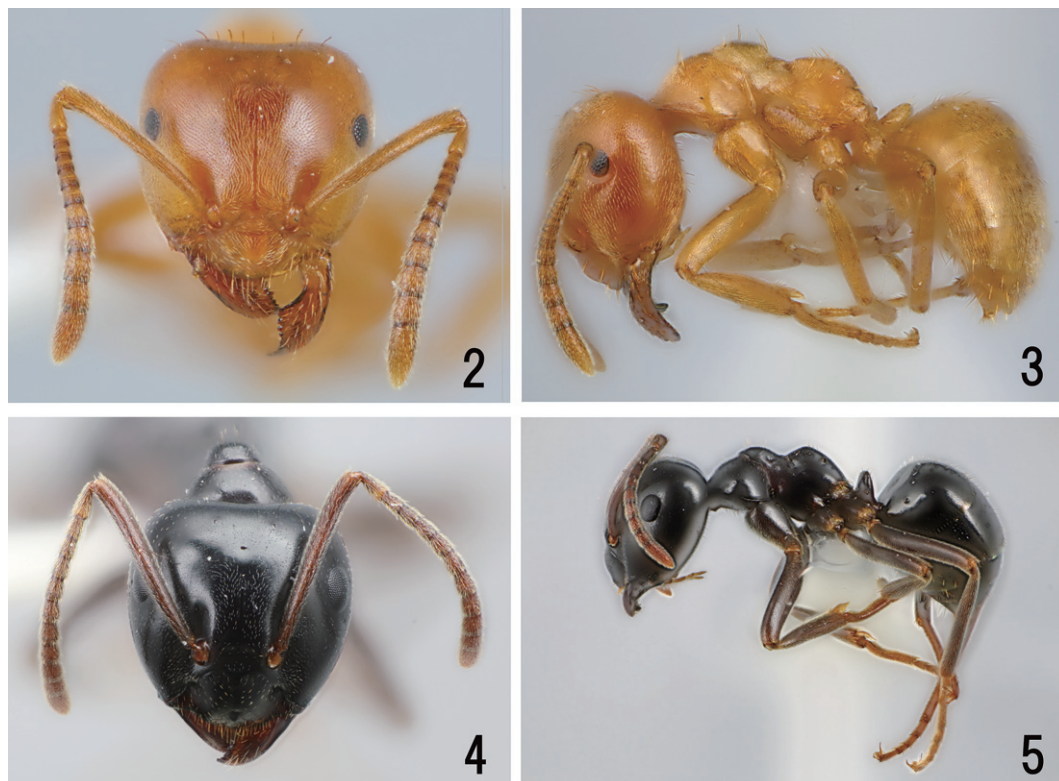
### ***Lasius (Austolasius) reginae* FABER**

(Figs. 2 and 3)

*Lasius (Austolasius) reginae* FABER, 1967: 75. Type locality: Austria.

*Lasius reginae*: SEIFERT, 2007: 164 (key), 288.

**Worker.** Ten workers from Colony MG08-SKY-47 were measured. Body 2.0–2.5 mm long. Head 0.88–0.98 mm broad (mean: 0.92) and 0.90–0.95 mm long (mean: 0.94). Antennal scape 0.73–0.78 mm long (mean: 0.74). Scape index: 0.77–0.83 (mean: 0.80). Head in full-face view almost as long as broad, with posterior margin very weakly and broadly concave. Sides of head strongly narrowed toward mandibular bases. Eye rather small, as long as 11th antennal segment. Clypeus in profile with posterior one-third rather flat and anterior two-thirds steeply sloping. Masticatory margin of mandible with nine teeth. Maxillary palpus very short, only slightly extending posteriorly beyond oral cavity. In profile pro-mesonotum distinctly higher than propodeum. Metanotal depression shallow. Propodeum in profile dorsally weakly convex, with its junction round and declivity almost straight. Petiole in profile rather thick with rounded apex, in anterior view with convex sides and rather narrow and convex apex.



Figs. 2–5. *Lasius* spp. — 2 and 3, *Lasius (Austrolasius) reginae* FABER, head in full-face view (2) and habitus in profile (3). — 4 and 5, *Lasius (Dendrolasius) fuji* RADCHENKO, head in full-face view (4) and habitus in profile (5).

Frons and sides of head very minutely punctate and rather shining. Mesosoma with sides very superficially sculptured and shining, and dorsum rather strongly sculptured and dull. Clypeus and vertex with sparse standing hairs (around 8 on vertex); sparse hairs on the dorsum of mesosoma slightly longer; most of the gastral hairs oblique or decumbent. Ventral surface of head without strong standing hairs, but sometimes with a few weak hairs. Gena, antennal scape and legs without standing hairs. Head (including clypeus) and mesosoma with sparse and gaster with dense pubescence. Body orangish yellow; head and gaster slightly darker; mandible reddish brown.

*Specimens examined.* Near Numrug, 812 m alt., Dornod aimag, E. Mongolia, 24 VII 2008, MG08-SKY-47 (Sk. YAMANE) and UAi-139-08 (U. AIBEK and T. ULZII).

*Taxonomic remarks.* The examined specimens agreed with *L. reginae* (sensu SEIFERT, 2007), which is northern Palearctic in distribution ranging from 9°E to 80°E (SEIFERT, 2007). This species is easily separated from the other yellowish *Lasius* from Mongolia by the following characteristics: 1) body relatively small (2.0–2.5 mm in total length), 2) ventral surface of head without distinct standing hairs, and 3) head in full-face view, almost as long as broad and strongly narrowed toward mandibular bases.

*Distribution.* Northern Palearctic (9°E to 119°E) including Mongolia (new record).

*Bionomics.* The species inhabits open dry forest edge and steppe habitats in eastern Mongolia. The nest was built in soil with a mound around entrance.



***Lasius (Dendrolasius) fuji* RADCHENKO**

(Figs. 4 and 5)

*Lasius (Dendrolasius) fuji* RADCHENKO, 2005: 191. Type locality: North Korea.

*Worker.* Ten workers from Colony MG08-SKY-49 were measured. Body 3.5–4.5 mm long. Head 1.23–1.40 mm broad (mean: 1.32), and 1.28–1.43 mm long (mean: 1.37). Antennal scape 1.08–1.23 mm long (mean: 1.15). Scape index: 0.86–0.89 (mean: 0.88). Head in full-face view heart-shaped, with posterior margin distinctly concave medially, convex sides, and posterolateral corner rounded. Masticatory margin of mandible with eight to nine teeth. Maxillary palpus just reaching midlength of ventral surface of head. With mesosoma in profile, pro-mesonotum forming a dome; posterior half of mesonotum sloping toward metanotal groove, which is shallow; dorsal outline of propodeum almost straight, rising posteriad; propodeal junction round; posterior face of propodeum in profile weakly convex. Petiole in profile rather thick, tapering apicad, with posterior outline almost straight; petiole in anterior view relatively narrow, with sides weakly convex, apically round and entire or medially shallowly notched.

Whole body surface smooth or superficially sculptured, and shining, but metanotal groove and upper portion of mesopleuron more strongly sculptured. Posterior margin of head in full-face view and mesonotum in lateral view with a few longer standing hairs; posterolateral corners of head without standing hairs. Clypeus, frons, posterior margin of head, alitrunk, coxae and gaster with relatively short standing hairs. Gena and hind tibia without standing hairs. Clypeus, head, alitrunk and gaster with sparse pubescence. Scape, femora and tibiae with dense pubescence. Head, alitrunk, and gaster shiny black or brownish black; mandible reddish brown; scape and legs blackish brown.

*Specimens examined.* Near Numrug, 812 m alt., Dornod aimag, E. Mongolia, 25 VII 2008, MG08-SKY-49 (Sk. YAMANE) and UAi-140-08 (U. AIBEK); Numrug, Dornod aimag, E. Mongolia, 25 VII 2008, MG08-SKY-63 (Sk. YAMANE) and Ulz-08-144 (T. ULZII); nr. Dadal, 1,050m alt., mixed forest, NE Khentii, NE. Mongolia, 8 VIII 2009, MG09-SKY-56 (Sk. YAMANE); same data MG09-SKY-61 and UAi-09-E11 (U. AIBEK and T. ULZII); Dadal, Hajuu bulag, 974 m alt., *Betula* forest, NE Khentii, NE. Mongolia, 8 VIII 2009, 99-UAi-09 (U. AIBEK and T. ULZII).

*Taxonomic remarks.* Some of the specimens collected by SKY were identified by Dr. M. MARUYAMA (Kyushu University). Although we found some variation in the shape of the petiole, all the specimens may belong to the same species.

*Distribution.* Far East Russia, northern China, Mongolia (new record), North Korea, and Japan.

*Bionomics.* This species inhabits at low altitudes (700–1,050 m) in the forest area in Eastern and North-eastern Mongolia. Nests are built under the base of live tree and decaying stumps.

**Discussion**

Until now most of the *Lasius* samples collected by us come from North-central, Northeastern and Eastern Mongolia. Among the specimens of the subgenus *Lasius* we have recognized around five species, although PFEIFFER *et al.* (2007) listed only two species, *L. niger* (LINNAEUS) and *L. gebaueri* SEIFERT, suggesting that the records of *L. alienus* (FORESTER) and *L. obscuratus* STITZ are not very reliable. Since the material from

western and southern parts of Mongolia is quite restricted, we refrain from revising this group until more material is amassed. DNA analysis should be useful because sorting of specimens into species is very difficult (cf. SEIFERT, 1992).

Two species are listed in PFEIFFER *et al.* (2007) in the subgenus *Chthonolasius*, i.e., *L. distinguendus* (EMERY) and *L. przewalskii* RUZSKY. This is also a difficult group, and species are sometimes not separable in the worker caste (YAMAUCHI, 1978). WILSON (1955) synonymized both *L. distinguendus* and *L. przewalskii* with *L. umbratus* (NYLANDER), a wide-ranging Holarctic species (but see SEIFERT, 2007). We have examined many colony series of this group, but found any reliable morphological characters useful in sorting specimens into supposed biological species. Pilosity on antennal scape and hind tibia, which is often thought to show important specific differences, varies even within a colony. However, as the nests were found in various habitat types from dry open sites to forest interior and nest sites also varied considerably from rotting wood to soil (sometimes with a distinct mound around entrance), it is highly possible that more than one species is involved.

*Lasius (Cautolasius) flavus* (FABRICIUS) was once recorded by HOLGERSEN (1943) from Cha-Kul, Mongolia based on a single queen specimen covered with oil or grease. Despite the recent effort by several excellent collectors, this species has not been found thereafter. Although the occurrence of this species in Mongolia is quite possible because it inhabits Far Eastern Russia (KUPIANSKAYA, 1990, 1995) and Japan (YAMAUCHI, 1978; Japanese Ant Database Group, 2003), we need more complete material including workers to confirm its presence in Mongolia.

### List of *Lasius* species so far recorded from Mongolia

*L. (Austrolasius) reginae* FABER, 1967

Comments: New record for Mongolia (present study).

*L. (Cautolasius) flavus* (FABRICIUS, 1781)

HOLGERSEN, 1943: 163; PFEIFFER *et al.*, 2007: 4.

Comments: We did not find this species in our material. Possibility exists that HOLGERSEN misidentified his single queen specimen, which might be actually of another yellow *Lasius* species.

*L. (Chthonolasius) distinguendus* (EMERY, 1916)

PISARSKI, 1969a: 231, 1969b: 306; PFEIFFER *et al.*, 2007: 4.

*L. (Chthonolasius) przewalskii* Ruzsky, 1915

PISARSKI and KRZYSZTOFIK, 1981: 161; PFEIFFER *et al.*, 2007: 4.

Comments: WILSON (1955) synonymized *L. umbratus* var. *przewalskii* with *L. umbratus*.

*L. (Dendrolasius) fuji* RADCHENKO, 2005

Comments: New record for Mongolia (present study)

*L. (Lasius) alienus* (FOERSTER, 1850)

DLUSSKY and PISARSKI, 1970: 87; PISARSKI, 1969a: 231, 1969b: 306; PISARSKI and KRZYSZTOFIK, 1981: 160.

*L. (Lasius) gebaueri* SEIFERT, 1992

PFEIFFER *et al.*, 2007: 4.

*L. (Lasius) niger* (LINNAEUS, 1758)

DLUSSKY and PISARSKI, 1970: 87; HOLGERSEN, 1943: 163; PFEIFFER *et al.*, 2007: 4; PISARSKI, 1969b: 305; PISARSKI and KRZYSZTOFIK, 1981: 160; SEIFERT, 1992: 29.

*L. (Lasius) obscuratus* STITZ, 1930

PFEIFFER *et al.*, 2003: 1935.

Comments: PFEIFFER *et al.* (2007) excluded this species from the list of Mongolian ants, though they suggested the possibility of its occurrence in Mongolia.

### Acknowledgements

We thank Dr. Munetoshi MARUYAMA of Kyushu University Museum for his kindness in identifying *Lasius fuji*, and valuable comments. Ms. Jargalsaikhan PUREVDELGER and Mr. Tserensambuu ULZII (National University of Mongolia), and Ms. Etsuko YAMANE (Kagoshima-shi) for their help in collecting material. Mr. Takuya MAEDA of Kagoshima University kindly took the photos of *Lasius* specimens. This study was supported by JSPS Ronpaku Program (MECS-10731). We also thank the anonymous reviewers for their useful comments.

### References

- DLUSSKY, G. M. and PISARSKI, B., 1970. Formicidae aus der Mongolei. Ergebnisse der Mongolisch-Deutschen Biologischen Expeditionen seit 1962 Nr. 46. *Mitteilungen des Zoologischen Museums Berlin*, **46**: 85–90.
- HOLGERSEN, H., 1943. Insecta, ex Sibiria meridionali et Mongolia, in itinere Orjan Olsen 1914 collecta. C. Hymenoptera. 1. Formicidae. D. Hemiptera. 1. Homoptera cicadina. *Norsk Entomologisk Tidsskrift*, **6**: 162–163.
- Japanese Ant Database Group, 2003. *Ants of Japan*. 224 pp. Gakken, Tokyo.
- KUPYANSKAYA, A. N., 1990. *Murav'i Dal'nego Vostoka SSSR* (1989): 258 pp. Vladivostok.
- KUPYANSKAYA, A. N., 1995. Formicidae. In: P.A. LEHR (ed.), *Key to the Insects of Russian Far East*, **4** (1), pp. 325–268. Nauka, St. Petersburg. (In Russian.)
- PFEIFFER, M., CHIMEDREGZEN, L. and ULYKPAN, K. 2003. Community organization and species richness of ants (Hymenoptera/Formicidae) in Mongolia along an ecological gradient from steppe to Gobi desert. *Journal of Biogeography*, **30**: 1921–1935.
- PFEIFFER, M., SCHULTZ, R., RADCHENKO, A., YAMANE, Sk., WOYCIECHOWSKI, M., AIBEK, U. and B. SEIFERT, 2007. A critical checklist of the ants of Mongolia (Hymenoptera: Formicidae). *Bonner Zoologische Beiträge*, **55** (2006): 1–8.
- PISARSKI, B., 1969a. Fournis (Hymenoptera: Formicidae) de la Mongolie. *Fragmenta Faunistica*, **15**: 221–236.
- PISARSKI, B., 1969b. 175. Myrmicidae und Formicidae. Ergebnisse der zoologischen Forschungen von Dr. Z. KASZAP in der Mongolei (Hymenoptera). *Faunistische Abhandlungen Dresden*, **2** (29): 295–316.
- PISARSKI, B. and KRZYSZTOFIK, L., 1981. Myrmicidae und Formicidae (Hymenoptera) aus der Mongolei, II. *Folia Entomologica Hungarica Roaltani Közlemények*, **34** (2): 155–166.
- RADCHENKO, A. 2005. A review of the ants of the genus *Lasius* F., subgenus *Dendrolasius* RUZSKY (Hymenoptera, Formicidae) of East Palearctic. *Annales Zoologici*, **55**(1): 83–94.
- SEIFERT, B., 1992. A taxonomic revision of the Palaearctic members of the ant subgenus *Lasius* s. str. (Hymenoptera: Formicidae). *Abhandlungen und Berichte des Naturkundemuseums Görlitz*, **66** (5): 1–66.
- SEIFERT, B., 2007. *Die Ameisen Mittel- und Nordeuropas*. 368 pp. Lutra.
- WILSON, E. O., 1955. A monographic revision of the ant genus *Lasius*. *Bulletin of the Museum of Comparative Zoology*, **113**: 3–201, 2 pls.
- YAMAUCHI, K., 1978. Taxonomical and ecological studies on the ant genus *Lasius* in Japan (Hymenoptera: Formicidae). I. Taxonomy. *Science Report of the Faculty of Education, Gifu University (Natural Science)*, **6** (2): 147–181.

[Received September 8, 2010; accepted October 1, 2010]