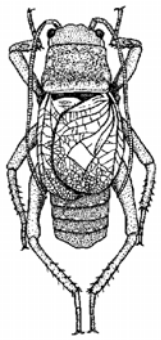

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THE ANTS (HYMENOPTERA, FORMICIDAE) OF THE KURIL ISLANDS

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A review of the taxanomic, distributional, and ecological data for the thirty two species, across thirteen genera, of ants recorded from the Kuril Islands is given. In addition, new records - collected during the International Kuril Island Project (IKIP) - of *Myrmica ruginodis kotokui*, *M. kamtschatica*, *Leptothorax acervorum* and *Formica lemani* are included from the following eight islands of the archipelago: Matua, Raikoke, Shiashkotan, Onekotan, Makanrushi, Antsiferova, Shumshu and Atlasova. Two species, *Crematogaster matsumurai* Forel and *Lasius neoniger* Emery, previously reported by Kuwayama (1967) and Collingwood (1962), respectively, have never been confirmed, despite four large expeditions to the islands, and are considered to be doubtful records for the archipelago. A discussion of the biogeographical distribution of the listed taxa concludes.

KEY WORDS. Hymenoptera, Formicidae, ants, Kuril Islands.

А. Н. Купянская[1)], А. С. Лелей[1)], Б. К. Урбайн[2)]. Муравьи (Hymenoptera, Formicidae) Курильских островов // Дальневосточный энтомолог. 2000. N 92. С. 1-21.

Для Курильских островов приведен список 32 видов муравьев из 13 родов с данными по таксономии, экологии и распространению. На восьми островах (Матуа, Райкоке, Шиашкотан, Онекотан, Маканруши, Анциферова, Шумшу

и Атласова) муравьи (*Myrmica ruginodis kotokui*, *M. kamtschatica*, *Leptothorax acervorum* и *Formica lemani*) собраны впервые во время Курильского международного проекта (МКП). Нахождение 2 видов (*Crematogaster matsumurai* Forel и *Lasius neoniger* Emery), указанных до этого соответственно Kuwayama (1967) и Collingwood (1962), не подтверждено материалами МКП, несмотря на 4 большие экспедиции. Обсуждается биогеографическое распространение перечисленных видов.

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Introduction

Until recently, only small, occassional, collections of ants have been taken from the Kuril Archipelago. The first such collections were made by Mr. Kobayashi (Teranishi, 1931), N.N. Konakov in 1946 (about 50 specimens) and G.O. Krivolutskaya during 1961-1964 (about 60 specimens). Some of the first species recorded, from the southern islands in the literature include *Camponotus obscuripes* Mayr, reported by Yasumatsu & Brown (1951) and Collingwood (1962), *Formica lemani* Bondroit, reported by Collingwood (1962), *F. fusca* Linnaeus (current *F. hayashi* Terayama et Hashimoto) and *F. truncorum* Fabricius, reported by Dlusskiy (1967), *Lasius niger* (Linnaeus), reported by Yamauchi & Hayashida (1970), and *Stenamma kurilense* K. Arnoldi, reported by Arnoldi (1975). In addition, S. Kuwayama (1967) recorded 13 ant species (7 of which were new records) and G.O. Krivolutskaya (1973) mentioned the occurrence of about 19 ant species but did not provide a taxa list.

Since these early records, there have been two major biotic survey and inventory expeditions to the Kuril Islands whose material account for the remaining known ant species, and their distribution records, from the archipelago. The first was made by A.N. Kupianskaya, a Russian entomologist, during July-September 1975 and targeted the southern islands of Kunashir and Shikotan. Kupianskaya's collecting efforts was focused on the ant fauna and she collected a large amount of material (deposited in the Institute of Biology and Soil Sciences, Vladivostok, Russia), included in her monograph on the ants of the Russian Far East (Kupianskaya, 1990), which elevated the recorded number of Kuril Island ants to thirty.

The second major biodiversity expedition to the Kuril Islands the International Kuril Island Project (IKIP), begun in 1994 and currently scheduled for completion in 2000. IKIP is a collaboration between a large group of American, Japanese, and Russian biologists to survey and inventory select major floral and faunal groups of the Kuril Archipelago. The IKIP ant material reviewed here represents over 1,000 collected by numerous people (see below) during the summer months of

1994-1997 (and new data of 1998-99 for some species) and is deposited in the following institutions: Institute of Biology and Soil Sciences, Vladivostok, Russia; California Academy of Sciences, San Francisco, U.S.A. The results of IKIP ant material collected on Shikotan and Habomai in 1998 will be given separately.

Next collector names are abbreviated: - N. A. Azarova (NA), A. Yu. Berezantsev (AB), G. Chebanov (GC), R. L. Crawford (RC), A. B. Egorov (AE), S. Gage (SG), N. N. Konakov (NK), Z. A. Konovalova (ZK), G. O. Krivolutskaya (GK), A. N. Kupianskaya (AK), V. N. Kuznetsov (VK), G. Sh. Lafer (GL), A. S. Lelej (AL), N. Minakawa (NM), P. Oberg (PO), T. W. Pietsch (TP), T. Ritchie (TR), V. Roth (VR), E. M. Sayenko (ES), J. Schweikert (JS), D. Stevenson (DS), S. Yu. Storozhenko (SS), B. K. Urbain (BU). New records for the islands are asterisked (*) in the distribution. The symbol "☿" is used for the workers in the material. The field numbers are given for IKIP materials only.

list of the species

The distribution of 32 ant species across the Kuril islands are given in the Table 1. The detail collecting data for each species are given below. The distribution data of the species across the Russia follow A. Kupianskaya (1990) and within Japan follow M. Terayama (1999).

Subfamily Ponerinae Lepeletier, 1836

1. *Ponera japonica* Wheeler, 1906

SPECIMENS EXAMINED. KUNASHIR: Alyokhino, exit of hot gas, 6.VIII 1970, 10☿ (Tikhomirova).

DISTRIBUTION. Russia: Primorskii krai, Kuril Islands (Kunashir); Japan (from Hokkaido to Kyushu); Korea; Malaysia; Indonesia.

ECOLOGY**.** Inhabits moist, shady, broad-leaved forests. Constructs "non-perfect" nests in upper part of soil litter and decaying wood. Never active above ground. Workers prey on small soil-dwelling arthropods. Allate adults occur from August until mid-September.

Subfamily Myrmicinae Lepeletier, 1836

2. *Myrmica ruginodis kotokui* Forel, 1911

=*Myrmica orientalis*: Kupianskaya, 1990: 101 (part., Kurils); Terayama et al., 1998: 10 (Kunashir).

SPECIMENS EXAMINED**.** ZELENYI: 9.IX 1975, 20♂ (ZK). SHIKOTAN: Krai Sveta Cape, 14.VIII 1975, 35♀, 42☿ (AK); Otradnaya Bay, 15.VIII 1975, 20♀, 40☿ (AK); Tserkovnaya Bay, 16, 17.VIII 1975, 11♀, 1♂, 70☿ (AK). KUNASHIR: Alyokhino, 23.VIII 1975, 10.VI 1976, 8☿ (AK); 11.VIII 1982, 1☿ (GL); Tret'yakovo,

22.VII 1975, 15☿ (AK); 20-22.VIII 1980, 2☿ (SS); Sernovodsk, 30.V 1976, 26☿ (T. Vshivkova); Yuzhno-Kuril'sk, Goryachiy plyazh, 14.VII-2.VIII 1975, 3♀, 47☿ (AK); 25.VIII 1996, 1♀, 7☿ (AL); Mendeleyevo: 20.VII 1975, 1♀, 25☿ (AK); Lagunnoye Lake: 17.VII 1975, 1♀, 8☿ (AK); road to Goryacheye Lake: 24.VII 1975, 16☿ (AK); Golovnina volcano: 16.VII 1962, 1☿ (GK); 24.VII 1975, 2☿ (AK); Yuzhno-Kuril'sk, Presnaya River: 23.VI 1946, 3☿ (NK); Kislaya River, 13.VIII 1983, 1♀, 1♂, 8☿ (V. Basarukin); KU-95-VR-040A, Kislyi hot springs, 2.IX 1995, 2☿ (VR); KU-96-BKU-091, -094, -096, 17 km S Yuzhno-Kuril'sk, hot springs, 25, 26.VIII 1996, 22☿ (BU); KU-97-BKU-001, -002, -006, -009, -010; KU-97-JSS-001; KU-97-TWP-004; KU-97-RLC-001, -002; KU-97-TIR-006; the same place, 27.VII 1997, 195☿ (BU, RC, TP, TR, JS); KU-97-ASL-002, Lesnaya River, 28.VII 1997, 17☿ (AL). ITURUP: IT-96-ASL-018, 5 km N Reydovo 18.VIII 1996, 20☿ (AL); IT-96-ASL-023, Dobroye nachalo Bay, 23.VIII 1996, 11☿ (AL); IT-95-BKU-003, -009, Kitovy, 3.VIII 1995, 1♀, 74☿ (BU, SG); IT-96-TWP-039, Dobroye Nachalo Bay, 23.VIII 1996, 111☿ (TW); IT-96-SG-061, at Natasha Lake, 22.VIII 1996, 31☿ (SG); IT-97-ASL-003, IT-97-BKU-013, -017, -018; IT-97-JSS-004, -008, 7 km W Reydovo, 29.VII 1997, 145☿ (AL, JS, BU); IT-96-TWP-033, 5 km N Reydovo, 23.VIII 1996, 36☿ (TW); IT-97-BKU-021, IT-97-TWP-008, IT-97-ASL-004, -025, the same place, 30.VII 1997, 1♀, 115☿ (AL, BU, TP). SHIASHKOTAN: SA-96-ASL-013, Zakatnaya Bay, 11.VIII 1996, 4☿ (AL).

DISTRIBUTION. Russia: Kuril Islands (Zelenyi, Shikotan, Kunashir, Iturup, *Shiashkotan); Japan (from Hokkaido to Yakushima).

ECOLOGY. Lives in the following types of forests: broad-leaved, oaks, birch, etc. but they prefer open areas of the forest such as those from cuts, tree-falls, meadows, and sparsly dense. They nest mainly in wood such as stumps and in rotting logs. Rare in soil and under stone. Allate (winged) adults form end of August through September.

REMARKS. The workers differ from ones of nominative subspecies by darker color of body, by weaker sculpture of petiolus and by weak grooves on epinotal hind face. Anterior clypeal margin of larger specimens of *M. ruginodis kotokui* slightly acuminated and epinotal denticles shortened.

3. *Myrmica rubra* Linnaeus, 1758

=*Myrmica orientalis*: Terayama et al., 1998: 11 (part., Iturup).

SPECIMENS EXAMINED. ITURUP: Atsonupuri volcano, 21.VII 1963, 1 ☿ (GK); the same place, 21.VIII 1975, 1☿ (VK); IT-96-PO-070, IT-96-SG-061, at Natasha Lake, 22.VIII 1996, 2♀, 15☿ (PO, SG).

DISTRIBUTION. Widely distributed in Palaearctic including Kuril Islands (Iturup). It was recorded for Kurils and Sakhalin by Onoyama (1989).

ECOLOGY. It is most hydrophilous species among *Myrmica*. Widely distributed in various forests, prefer moist, shady ones. Nests in decaying or rotting stumps and logs, under moss, in hillocks etc.

REMARKS. European populations of *M. rubra* differ from ones of related *M. ruginodis* Nylander by smaller body length, by paler color of body, by shorter propodeal spines, by ifraspinal area smooth or very faintly striate (transversaly striate in *ruginodis*), by petiole and postpetiole almost smooth and shining above (rugose above in *ruginodis*) (Onoyama, 1989). Eastern population of these species less differentiated because *M. ruginodis kotokui* has shorter propodeal spines (as in *rubra*) and the sculpture of petiole and postpetiole weaker than in European populations. We identified the specimens above as *M. rubra* with great doubt. For detail separation of *M. rubra* additional specimens are needed, especially males.

4. *Myrmica luteola* Kupianslaya, 1990

SPECIMENS EXAMINED. KUNASHIR: Goryacheye Lake, 24.VIII 1975, 22☿ (AK); KU-98-SYS-014, Aliger Lake, 11.VIII.1998, 15☿ (SS).

DISTRIBUTION. Russia: south of Primorskii krai, Kuril Islands (Kunashir).

ECOLOGY. Lives in mixed broad-leaved forest, found very rarely. Nests in decaying or rotting wood, but only in stumps and logs.

5. *Myrmica jessensis* Forel, 1901

SPECIMENS EXAMINED. KUNASHIR: Alyokhino, 25.VIII 1975, 14☿, 1♀, 1♂ (AK); Mendeleyeva volcano, 23.VIII 1980, 1☿ (AL); Yuzhno-Kuril'sk, Goryachiy plyazh, 8.VIII 1975, 14☿ (AK); KU-96-BKU-091, 17 km S Yuzhno-Kuril'sk, hot springs, 25.VIII 1996, 1☿ (BU). ITURUP: 25.VIII 1946, 4♀, 2♂ (NK); IT-96-BKU-070, 5 km N Reydovo, 3☿ (PO).

DISTRIBUTION. Russia: Primorskii krai, south of Khabarovskii krai, Amurskaya oblast', Sakhalin, Kuril Islands (Shikotan, Kunashir, Iturup); Japan (Hokkaido, Honshu); North Korea.

ECOLOGY. Distributed in forest zone but rare in shady areas, prefer open areas (like meadows, sides of roads, open slopes) but also found along gravel sides of streams and rivers. Nest in soil, under stones, in hillock. The nest consists of separate cells with different forms and they are connected by narrow (or thin) tunnels. The cells are layered such that the queen(s) with eggs are in bottom most layer and allate adults in the upper cells. In one nest the average number of workers is 500. Each nest can contain one or several (3-5) queens. Allate (winged) adults form in July through August and emerge in August.

6. *Myrmica carinata* Kupianskaya, 1990

=*Myrmica orientalis*: Terayama et al., 1998: 11 (part., Iturup).

SPECIMENS EXAMINED. KUNASHIR: Alyokhino, near hot spring, 23.VII 1975, 1♀, 15☿ (AK); Tret'yakovo, seashore, 21.VII 1975, 8☿ (AK). ITURUP: IT-96-VR-060, IT-96-PO-070, at Natasha Lake, 22.VIII 1996, 4☿(VR, PO); IT-98-ASL-011, Slavnaya Bay, 6.VIII 1998, 1☿ (AL, SS).

DISTRIBUTION. Russia: Primorskii krai, Khabarovskii krai, Amurskaya oblast', Sakhalin, Kuril Islands (Kunashir, *Iturup), Chitinskaya oblast'.

ECOLOGY. Distributed in various forests but prefer sparse and open parts but also found in canopies of trees. Nests mainly in soil and under stones. Allate adults emerge in July through August.

7. *Myrmica kamtschatica* Kupianskaya, 1986

SPECIMENS EXAMINED. ITURUP: IT-97-DES-010, 5 km N Reydovo, 30.VII 1997, 23☿ (DS). URUP: UR-95-VR-033A, Barkhatny Bay, 28.VIII 1995, 1♀, 1♂, 14☿ (VR); UR-96-ASL-021, Kama River, 21.VIII 1996, 2♀ (AL). SHIMUSHIR: Skalisty, 12.IX 1964, 6☿ (GK); SI-95-BKU-042A, Malaya Bay, 18.VIII 1995, 1♀ (BU). KETOI: KE-95-VR-023E, Storozheva Cape, 15.VIII 1995, 1♀, 23☿ (VR); KE-95-VR-025B, Stochny River, 19.VIII 1995, 1☿ (VR). SHIASHKOTAN: SA-96-ASL-013, -014, Zakatnaya Bay, 11, 12.VIII 1996, 16♀, 2♂, 22☿ (AL). ONEKOTAN: ON-96-ASL-008, Rezvy Stream, 7.VII 1996, 1♂ (AL). SHUMSHU: SU-97-ASL-014, SU-97-JSS-32, Yuzhanka River, 10.VIII 1997, 7♀, 5♂, 135☿ (AL, JS). PARAMUSHIR: NW cost, 15.VII 1981, 1☿ (AE); PA-96-BKU-003, Utyosnaya River, 1.VIII 1996, 1♂, 15☿ (BU); PA-97-TWP-052, Tukharka Bay, 17.VIII 1997, 1☿ (TP); PA-97-ASL-017, PA-97-BKU-074, PA-97-JSS-038, Shelekhovo, 13.VIII 1997, 55♀, 10♂, 143☿ (AL, BU, JS); PA-97-ASL-018, PA-97-TWP-038, Krasheninnikova Bay, 14.VIII 1997, 2♀, 20 ☿ (AL, TP).

DISTRIBUTION. Russia: North of Khabarovskii krai, Magadanskaya oblast', North Sakhalin, Kamchatka, Kuril Islands (*Iturup, *Urup, Shimushir, *Ketoi, *Shiashkotan, *Onekotan, Paramushir, *Shumshu).

ECOLOGY. Distributed in various forests in the northern Russian far east. Prefer wet places and nests in hillocks covered bryophytes and decaying and rotting wood. Allate adults emerge in end of July through August.

8. *Stenamma kurilense* K. Arnoldi, 1975

SPECIMENS EXAMINED. KUNASHIR: VIII 1970, 2☿ (Tikhomirova).

DISTRIBUTION. Russia: Kuril Islands (Kunashir).

ECOLOGY. Very rare but has been discovered in the litter of mixed broad-leaved forests.

9. *Aphaenogaster (Attomyrma) japonica* Forel, 1911

=*Aphaenogaster (Attomyrma) sinensis*: Kupianskaya, 1990: 119.

SPECIMENS EXAMINED. KUNASHIR: Yuzhno-Kuril'sk, 8.VIII 1975, 1☿ (AK); Mendeleyevo, 4.VIII 1975, 90♂, 70☿ (AK); KU-97-TWP-002, 17 km S Yuzhno-Kuril'sk, hot springs, 17.VII 1997, 14☿ (TP).

DISTRIBUTION. Russia: south of Primorskii krai, Kuril Islands (Kunashir), Japan (from Hokkaido to Yakushima); North Korea; North and Central China.

ECOLOGY. Lives in broad-leaved forests mainly on south-facing sunny slopes. They shallow nests without the characteristic upper part. The nest entrance is hardly visible, usually under stones or twigs. They are most commonly found in the litter preying on various arthropods. Allate adults emerge in August.

10. *Pheidole fervida* F. Smith, 1874

SPECIMENS EXAMINED. KUNASHIR: Alyokhino, 26.VII 1970, 6☿ (Tikhomirova); Tret'yakovo, 21.VII 1975, 1♀, 86☿ (AK).

DISTRIBUTION. Russia: south of Primorskii krai, Kuril Islands (Kunashir); Japan (from Hokkaido to North Ryukyus); Korea.

ECOLOGY. Lives in broad-leaved forests prefering extremely warm, wind-protected, habitats. In Kunashir, usually south eastern part along seashore near hot springs. Nests are built in soil under stones and decaying and rotting wood. Rare species. Allate adults form in the nest in August.

11. *Solenopsis japonica* (Wheeler, 1928)

SPECIMENS EXAMINED. KUNASHIR: Alyokhino, 22.VII, 25-26.VIII 1975, 3♀, 187♂, 680☿ (AK, GL).

DISTRIBUTION. Russia: Kuril Islands (Kunashir); Japan (from Hokkaido to North Ryukyus); North Korea.

ECOLOGY. Lives in the south-western coast of Kunashir in habitats with warm, wet climate near hotsprings. Forms large nests under planks, under stones and under decaying wood. Allate adults occur (emerge or found in ground not specified) in August through September.

12. *Crematogaster matsumurai* Forel, 1901

DISTRIBUTION. Russia: ? Kuril Islands (Shikotan); Japan (Hokkaido, Honshu, Shikoku, Kyushu) (Kuwayama, 1967).

ECOLOGY. Lives in subtropical evergreen and secondary oak forests in Japan (Kondoh, 1978). Forms nest with small number of individuals under *Pinus* and *Cryptomeria* bark (Wheeler, 1906).

REMARKS. This species recorded for Kurils by Kuwayama (1967), but not repeated by our material.

13. *Myrmecina graminicola nipponica* Wheeler, 1906

=*Myrmecina graminicola*: Kupianskaya, 1990: 135 (part., Kunashir).

SPECIMENS EXAMINED. KUNASHIR: Goryacheye Lake, 8.VIII 1970, 1☿ (Tikhomirova); Alyokhino, 6.VIII 1970, 8☿ (Tikhomirova).

DISTRIBUTION. Russia: Kuril Islands (Kunashir); Japan (from Hokkaido to North Ryukyus).

ECOLOGY. Discovered in warm, wet habitats of broad-leaved forests. Lives in the forest litter but never on surface.

14. *Leptothorax kurilensis* Radtschenko, 1994

=*Leptothorax kurilensis* Radtschenko, 1994: 32, fig.7, ♀, ☿ (Kunashir).

SPECIMENS EXAMINED. KUNASHIR: Goryacheye Lake, 24.VII 1975, 5☿ (AK); 18 km SW Yuzhno-Kuril'sk, 4.VIII 1975, 1☿ (AK).

DISTRIBUTION. Russia: Kuril Islads (Kunashir).

ECOLOGY. This species lives in the broad-leaved forest litter.

15. *Leptothorax acervorum* (Fabricius, 1793)

=*Leptothorax acervorum*: Kuwayama, 1967: 203 (Shikotan).

SPECIMENS EXAMINED. KUNASHIR: Golovnina volcano, 24.VII 1975, 1♀, 1♂, 15☿ (AK). CHIRPOI: CI-99-ASL-018, Peschanaya Bay, 10.VIII 1999 (V. Bogatov). SHIASHKOTAN: SA-96-ASL-014, Zakatnaya Bay, 12.VIII 1996, 4☿ (AL). MAKANRUSHI: 97-DES-055, 18.VIII 1997, 23♂, 158☿ (DS). PARAMUSHIR: PA-97-JSS-020, 4 km NW Severo-kuril'sk, 5.VIII 1997, 11 ☿ (JS); PA-97-ASL-018, Krasheninnikova Bay, 14.VIII 1997, 30♂, 70☿ (AL).

DISTRIBUTION. Russia: forest zone of European part, Siberia and Far East including Kurils (Shikotan, Kunashir, *Chirpoi, *Shiashkotan, *Makanrushi, *Paramushir), southward in the mountains; Japan (from Hokkaido to Kyushu); North Korea; Europe.

ECOLOGY. Typical forest species - lives in the forest and in open areas and cut places. Mostly lives in wood: in old holes, under bark, in trunk and thick branches, stumps. But also nests under stones, in soil, in hillocks covered bryophytes. Nest size varies from 100 to extremely large numbers of individuals.

16. *Leptothorax muscorum* (Nylander, 1846)

SPECIMENS EXAMINED. KUNASHIR: Yuzhno-Kuril'sk, 26.VI 1984, 11☿ (AE); KU-96-BKU-096, 17 km S Yuzhno-Kurilsk, hot springs, 25.VIII 1996, 1☿ (BU).

DISTRIBUTION. Holarctic species. Russia: forest zone of European part, Siberia and Far East including Kuril Islands (Kunashir); Caucasus; North and Middle Europe; North America.

ECOLOGY. Forest species but prefers thinly dense and cut areas. Nests made in stumps, logs, and dead, standing trunks, and branches. Nests rarely found in soil and under stones.

Subfamily Formicinae Latreille, 1802

17. *Camponotus japonicus* Mayr, 1866

SPECIMENS EXAMINED. KUNASHIR: Alyokhino, 8.VIII 1962, 3☿ (GK); Tret'yakovo, 27.VIII 1975, 1☿ (AK); Lagunnoye Lake, 17.VII 1975, 9☿ (AK); Valentin River, 22.VIII 1975, 1☿ (Kautin).

DISTRIBUTION. Russia: south of Far East including Kuril Islands (Kunashir); Japan (from Hokkaido to North Ryukyus); Korea; China; Philippines; Myanmar.

ECOLOGY. Distributed in open areas within forests. Nests made in soil. In the upper parts of nests there are groups of exit holes shaped as inverted cones (viewed from above). As other species of this group, this species makes underground tunnels that all come lead back to central cavern where the fungus is grown on the wood. Usually dwell in soft soil but when they encounter hard soil (such as a beaten path or trail) they form an exit/entrance hole on either sides of the trail and use the holes to cross it.

18. *Camponotus obscuripes* Mayr, 1878

SPECIMENS EXAMINED. SHIKOTAN: 26-28.VII 1975, 1♂, 7☿ (AK); Tserkovnaya Bay, 16.VIII 1975, 1♀ (AK); Otradnaya Bay, 24.VIII 1963, 1☿ (GK). KUNASHIR: Alyokhino: 3-8.VIII 1962, 5♀ (NA, GK, ZK); 9.VII 1962, 1☿ (Safronova); 23.VIII 1975, 1♀, 4☿ (AK); 15, 16.VIII 1980, 2♀ (AL); Mendeleyeva volcano: 26-28.VII 1962, 2♀, 2☿ (GK); 20.VII 1975, 3♀, 3♂, 3☿ (AK); 20.VII 1975, 1♀ (AE); 4, 13.VIII 1975, 1♀, 1☿ (AB); 4.IX 1975, 1♀, 1☿ (GL); 23-26.VIII 1980, 1♀, 1☿ (AL); Tret'yakovo: 21.VI 1975, 1♀ (AK); 20.VIII 1980, 1♀ (AL); 30.VII 1982, 1♀ (VK); Stolbchaty Cape, 1.VIII 1982, 1♀ (VK); Golovnina volcano, 24.VIII 1975, 1♀, 2☿ (AK); Lagunnoye Lake: 4.VIII 1974, 1♀ (V. Makarkin); 18.VIII 1975, 5♀, 1♂, 6☿ (AK); Kosmodem'yanskoye, 29.VII 1964, 8☿ (NA, GK, ZK); KU-96-BKU-091, KU-96-TWP-042, 17 km S Yuzhno-Kuril'sk, hot springs, 25.VIII 1996, 2☿ (BU, TW); KU-97-BKU-001, -002, -003, -006, -009, KU-97-NM-001, -003, the same place, 27.VII 1997, 1♂, 27☿ (BU, NM). ITURUP: Kuril'sk, 5.VII 1963, 2♀ (NA); Lesozavodsk: 19-20.VII 1963, 2♀ (NA); 24.VIII 1963, 1♀ (GK); Atsonupuri volcano: 13.VIII 1975, 3☿ (GL); 15-22.VIII 1975, 3☿ (VK); IT-95-BKU-004, Kitovy, 3.VIII 1995, 1♀ (BU); IT-96-ASL-023, Dobroye Nachalo Bay, 23.VIII 1996, 1♀ (AL); IT-97-ASL-004, IT-97-JSS-005, 5 km N Reydovo, 30.VII 1997, 1♀, 1☿ (AL, JS).

DISTRIBUTION. Russia: Sakhalin, Kuril Islands (Shikotan, Kunashir, Iturup); Japan (from Hokkaido to North Ryukyus); Korea.

ECOLOGY. Lives in southernly shady, mixed forests. They are typical dendrobionts (lives in wood). Makes nests in central part (core) of old trees. Allate adults emerge in July through August.

19. *Formica (Serviformica) hayashi* Terayama et Hashimoto, 1996

=*Formica (Serviformica) fusca*: Dlusskiy, 1967: 58 (part., Kunashir); Kuwayama, 1967: 203 (part., Kunashir); Kupianskaya, 1990: 183 (part., Kunashir).

=*Formica hayashi*: Terayama et al., 1998: 11 (Kunashir)

SPECIMENS EXAMINED. KUNASHIR: 20 km SW Yuznno-Kurilsk, 5.VIII 1975, 14☿ (AK); Tret'yakovo, 27.VIII 1975, 1♀, 7☿ (AK); Tret'yakovo, 20.VIII 1980, 2♂ (SS); KU-96-BKU-094, 17 km S Yuzhno-Kurilsk, hot springs, 25.VIII 1996, 6☿ (BU); KU-97-RLC-002, KU-97-BKU-005, the same place, 27.VII 1997, 23☿ (RC, BU).

DISTRIBUTION. Russia: Kuril Islands (Kunashir); Japan (from Hokkaido to North Ryukyus); Korea (Terayama & Hashimoto, 1996).

ECOLOGY. Prefers low-lying grassy plains. Make nests in wood, under stone, more often in soil with hillocks. Allate adults emerge in August.

20. *Formica (Serviformica) lemani* Bondroit, 1917

SPECIMENS EXAMINED. SHIKOTAN: Kray Sveta Cape, 14.VIII 1975, 5♀, 30☿ (AK); Tserkovnaya Bay, 16.VIII 1975, 16☿ (AK). KUNASHIR: Kislaya River, 5.VIII 1975, 28☿ (AK); Alyokhino, 23.VIII 1975, 1☿ (AK); Alyokhino, 4.VIII 1982, 1♂ (AL); Tyatino, 10.VIII 1975, 1♂, 20 ☿ (AK); Rubezhny volcano, 11.VIII 1974, 18☿ (AK); Veslovskiy Cape, 30.VII 1975, 1☿ (AK); Golovnino, 5, 6.IX 1970, 20☿ (GC); Dubovoye: 31.VII 1975, 5☿ (AK); 6-8.VIII 1980 (SS); Golovnina volcano: 25.VII 1975, 1♀, 2☿ (AK); 19.VIII 1975, 1♂ (AB); Goryacheye Lake, 13.IX 1976, 2♂ (VK); Alyokhino, 26.VIII 1975, 5♀, 1♂, 58☿ (AK); 15.VIII 1980, 3♂ (AL); Tret'yakovo, 22.VIII 1975, 15☿ (AK); 20.VIII 1980, 4♂ (AL); Mendeleyevo, 20.VII, 27.VIII 1975, 2♀, 40☿ (AK); Goryachiy plyazh, 8.VIII 1975, 1♀, 38☿ (AK); Peschanoye Lake, 17.VIII 1980, 2♂ (AL); Lagunnoye Lake, 17.VII 1975, 8♀, 75☿ (AK); 9 km SW Yuzhno-Kuril'sk, 5.VIII 1975, 17☿ (AK); 18 km SW Yuzhno-Kuril'sk, 5.VIII 1975, 10☿ (AK); Yuzhno-Kuril'sk, 26.VIII 1980, 2♂ (AL); Tyatya volcano, 11.VIII 1975, 7☿ (AK); Saratovka River, 9.VIII 1975, 17☿ (AK); KU-97-JSS-001, 17 km S Yuzhno-Kurilsk, hot springs, 27.VII 1997, 2 ☿ (JS); KU-97-ASL-002, Lesnaya River, 28.VII 1997, 13 ☿ (AL). ITURUP: 5.IX 1946, 3☿ (NK); Atsonupuri volcano: 21.VII 1963, 6☿ (GK, Krylov); 15.VIII 1975, 6☿ (VK); IT-96-ASL-018, IT-96-BKU-069, 5 km N Reydovo, 18, 19.VIII 1996, 2♀, 33☿ (AL, PO); IT-97-ASL-004, -025, IT-97-BKU-013, -017, -018, -020, -021, IT-97-JSS-008, 052, IT-97-DES-010, IT-97-TIR-009, the same place, 30.VII, 22.VIII 1997,

11♀, 2♂, 191☿ (AL, BU, JS, DS, TR); IT-96-ASL-022, IT-96-BKU-086, Dobroye Nachalo Bay, 22.VIII 1996, 2♀, 17☿ (AL, BU); IT-97-ASL-003, 7 km W Reydovo, 29.VII 1997, 16☿ (AL). URUP: 10.VIII 1963, 1 ☿ (GK); UR-95-BKU-021, Vesyolaya River, 6.VIII 1995, 21☿ (BU); UR-95-BKU-028, Obzhitaya River, 7.VIII 1996, 2☿ (BU); UR-95-BKU-030, Novo-Kuril'skaya Bay, 8.VIII 1995, 19☿ (BU); UR-95-ASL-020, Ukromnaya Bay, 20.VIII 1996, 3☿ (AL); UR-96-ASL-021, Kama River, 20.VIII 1996, 3☿ (AL). UR-96-BKU-021, Ukromnaya Bay, 20.BIII 1996, 3♀ (BU). CHIRPOI: CI-95-PO-086, Peschanaya Bay, 23.VIII 1995, 1☿ (PO). SIMUSHIR: 9.IX 1964, 1☿ (ZK); SI-95-BKU-042B, Malaya Bay, 18.VIII 1995, 1☿ (BU); SI-95-VR-O27C, Srednyaya Bay, 22.VIII 1995, 9☿ (VR); SI-95-BKU-047B, Srednyaya Bay, 22.VIII 1995, 103☿ (BU). KETOI: KE-95-VR-023E, KE-95-BKU-041, Storozheva Cape, 15.VIII 1995, 5☿ (BU, VR); KE-95-EMS-032, KE-95-PO-074, KE-95-VR-025B, Stochnyi River, 19.VIII 1995, 13☿ (ES, NM, VR). MATUA: MA-96-RLC-042, MA-96-ASL-016, MA-96-TWP-030, Dvoinaya Bay, 14.VIII 1996, 7♀, 118☿ (RC, AL, TP). RAIKOKE: RK-96-ASL-015, RK-96-SG-041, RK-96-TWP-027, -028, 13.VIII 1996, 45☿ (AL, SG, TP). MAKANRUSHI: MK-97-ASL-023, MK-97-BKU-107, 18.VIII 1997, 1♀, 49☿ (AL, BU). ANTSIFEROVA: AN-97-ASL-019, 15.VIII 1997, 2☿ (AL). PARAMUSHIR: 19.VII, 10.VIII 1964, 4☿ (ZK); 15.VII 1981, 1♀, 18☿ (AE); PA-96-BKU-003, Utyosnaya Bay, 1.VIII 1996, 20☿ (BU); PA-97-TWP-038, -041, PA-97-ASL-018, Krasheninnikova Bay, 14.VIII 1997, 1♀, 275☿ (AL, TP); PA-97-ASL-010, PA-97-JSS-020, PA-97-TIR-021, -23, PA-97-BKU-039, 4 km NW Severo-Kurilsk, 5.VIII 1997, 8♀, 34☿ (AL, JS, TP, BU). ATLASOVA: AL-97-ASL-016, AL-97-TWP-033, AL-97-DES-029, -030, AL-97-RLC-040, AL-97-NM-054, AL-97-VAT-030, -033, 12.VIII 1997, 31♀, 1♂, 226☿ (AL, TP, DS, RC, NM, V. Teslenko).

DISTRIBUTION. Russia: Far East (except Chukotka) including Kuril Islands (Shikotan, Kunashir, Iturup, *Urup, Chirpoi, Simushir, Ketoi, *Matua, *Raikoke, *Makanrushi, *Antsiferova, Paramushir, *Atlasova), southern Siberia; Japan (Hokkaido, Honshu, Shikoku); North Korea; northern and mountain regions of Europe.

ECOLOGY. Widely distributed everywhere. Lives mainly in upper parts of mountain plateaus and hill slopes. Make nests in the stumps, in logs, and under soil of decaying wood. In one excavated nest there were discovered about 6,000 workers (Kupianskaya, 1990). Allate adults emerge in August. Similar to *F. fusca*, they prey on small arthropods. The ecology is very similar to *F. fusca* and therefore hard to distinguish with *fusca* based solely on ecological information.

21. *Formica (Serviformica) transkaucasica* Nasonov, 1889

= *Formica picea*: Kuwayama, 1967: 203 (Shikotan).

=*Formica (Serviformica) picea*: Kupianskaya, 1990: 186 (Kunashir).

SPECIMENS EXAMINED. KUNASHIR: Alyokhino, 25.VII, 26.VIII 1975, 24☿ (AK); Golovnino, 30.VII 1975, 21☿ (AK); Dubovoye, 31.VII 1975, 1☿ (AK); Mendeleyevo, 19.VIII 1975, 1♂ (AK).

Table 1

Distribution of the ants of Kuril Islands

N	Species	Islands																
		ZE	SH	KU	IT	UR	CI	SI	KE	MA	RK	SA	ON	MK	AN	PA	SU	AT
1.	*Ponera japonica*	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.	*Myrmica ruginodis kotokui*	*	*	**	**	-	-	-	-	-	-	N	-	-	-	-	-	-
3.	*Myrmica rubra*	-	-	-	**	-	-	-	-	-	-	-	-	-	-	-	-	-
4.	*Myrmica luteola*	-	-	**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.	*Myrmica jessensis*	-	*	**	**	-	-	-	-	-	-	-	-	-	-	-	-	-
6.	*Myrmica carinata*	-	-	*	N	-	-	-	-	-	-	-	-	-	-	-	-	-
7.	*Myrmica kamtschatica*	-	-	-	N	N	-	**	N	-	-	N	N	-	-	**	N	-
8.	*Stenamma kurilense*	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.	*Aphaenogaster japonica*	-	-	**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.	*Pheidole fervida*	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.	*Solenopsis japonica*	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.	*Crematogaster matsumurai*	-	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.	*Myrmecina graminicola nipponica*	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.	*Leptothorax kurilensis*	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.	*Leptothorax acervorum*	-	*	*	-	-	N	-	-	-	-	N	-	N	-	N	-	-
16.	*Leptothorax muscorum*	-	-	**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.	*Camponotus japonicus*	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18.	*Camponotus obscuripes*	-	*	**	**	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 1 (continued)

N	Species	Islands																
		ZE	SH	KU	IT	UR	CI	SI	KE	MA	RK	SA	ON	MK	AN	PA	SU	AT
19.	*Formica hayashi*	-	-	**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.	*Formica lemani*	-	*	**	**	N	**	**	**	N	N	-	-	N	N	**	-	N
21.	*Formica transkaucasica*	-	*	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.	*Formica sanguinea*	-	*	**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23.	*Formica truncorum*	-	-	*	-	*	-	-	-	-	-	-	-	-	-	-	-	-
24.	*Lasius niger*	-	*	**	N	-	-	-	-	-	-	-	-	-	-	-	-	-
25.	*Lasius hayashi*	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.	*Lasius flavus*	-	*	*	N	-	-	-	-	-	-	-	-	-	-	-	-	-
27.	*Lasius umbratus*	-	*	**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.	*Lasius affinis*	-	*	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29.	*Lasius fuliginosus*	-	*	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30.	*Lasius teranishii*	-	*	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31.	*Lasius neoniger*	-	-	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32.	*Paratrechina flavipes*	-	-	**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	total	1	14	28	9	3	2	2	2	1	1	3	1	2	1	3	1	1

Abbreviations. Islands: AN - Antsiferova, AT - Atlasova, CI - Chirpoi, IT - Iturup, KE - Ketoi, KU - Kunashir, MA - Matua, MK - Makanrushi, ON - Onekotan, PA - Paramushir, RK - Raikoke, SA - Shiashkotan, SH - Shikotan, SI - Simushir, SU - Shumshu, UR - Urup, ZE - Zelyonyi. Records: * - previous (non-IKIP) expeditions, ** - previous, confirmed by IKIP expeditions, N - new for island from IKIP expeditions, ? - questionable.

DISTRIBUTION. Russia: European part, Siberia, Far East (except Chukotka) including Kuril Islands (Shikotan, Kunashir); Central Asia (Pamir, Tyan'-Shan'); Caucasus; Japan (from Hokkaido to Kyushu); Central China; Mongolia; Europe.

ECOLOGY. Widely distributed in many types of habitats. Mainly lives in well-lighted and warm places; along riverbanks on gravel, open slopes, roadsides. Makes nest mainly under stones and in the warmest places of soil. Prey items includesmall arthropods, often visiting aphid colonies on grass for honeydew. Allate adults emerge in August.

22. *Formica (Raptiformica) sanguinea* Latreille, 1798

SPECIMENS EXAMINED. SHIKOTAN: Otradnaya Bay, 15.VIII 1975, 4☿ (AK).KUNASHIR: Dubovoye, 31.VII 1975, 14☿ (AK); 9 km SW Yuzhno-Kuril'sk, 5.VIII 1975, 10☿ (AK); KU-96-ASL-024, Goryachiy plyazh, 25.VIII 1996, 1☿ (AL).

DISTRIBUTION. Russia: European part, South Siberia, Far East (except Chukotka) including Kuril Islands (Shikotan, Kunashir); Central Asia (Western Tyan'-Shan'); Central China; Japan; Korea; Mongolia; Europe.

ECOLOGY. Lives in well-lighted, open habitats: meadow, roadsides, open slope, forest edges. Make nests in stumps, logs and (rarely warmest slopes), in soil, under stones. Often make small hillocks near stumps with small twigs, needles and dry leaves under which is the nest entrance which can lead up to 1 meter deep. Number of individuals can be as high as 20,000. Usually 70% of the individuals of a single nest are species (all from subgenus *Serviformica* which are the dominates species in that area) from other nests that serve as slaves. In gravel habitats the slave species is *F. transkaucasica*, in mountain habitat is *F. lemani*. Allate adults emerge in July through August.

23. *Formica (Formica) truncorum* Fabricius, 1804

SPECIMENS EXAMINED. KUNASHIR: Dubovoye, 31.VII 1971, 26☿ (AK), 7.VIII 1980, 9♂, 1☿ (AL), 6-8.VIII 1980, 8♂, 3☿ (SS); Golovnina volcano, 24-26.VII 1975, 1♀, 3♂, 70 ☿ (AK), 3.VIII 1980, 3♀, 7♂, 2☿ (AL), 7.IX 1976, 7☿ (VK); Golovnino, 31.VIII, 1-6.IX 1970, 30☿ (GC); Alyokhino, 25.VII 1975, 7☿ (AK), 13-16.VIII 1980, 1♀, 5♂, 3☿ (AL); Yuzhno-Kuril'sk, 3.VIII 1980, 1♀, 11♂, 80 ☿ (AK), 26.VIII 1980, 1♂ (AL); Lagunnoye Lake, 17.VII 1975, 7☿ (AK); Sernovodsk, 28.VII 1975, 8☿ (AK); Mendeleyevo, 20.VIII 1975, 12☿ (AK); road to Golovnina volcano, 4.VII 1946, 17☿ (NK). URUP: Mishima Wan [Novokuril'skaya Bay], 3.VIII 1946, 1☿ (NK).

DISTRIBUTION. Russia: European part, south of Far East including Kuril Islands (Kunashir, Urup); Central Asia (Pamir, Tyan'-Shan'); Japan; Korea; North-East China; Mongolia; North and Middle Europe.

ECOLOGY. Distributed in broad-leaved forests but found mainly at forest edges, meadows, cut places, in bushes. In Kunashir they make dense nest aggregations [180 nests/hectare (Kupianskaya, 1990)]. The cone of the nest is made of thick twigs, dry grass, dry leaves, and at the base branches of bushes or small stumps. The cone diameter has been found to be 60 cm diameter at the base and 30 cm high. Number of individuals per nest can be as high as 1,000. Prey mainly on insects. Allate adults emerge in August. Found to be common in Kunashir but rare in other areas throughout range.

24. *Lasius (Lasius) niger* (Linnaeus, 1758)

=*Lasius japonicus*: Terayama et al. 1998: 11 (Kunashir).

SPECIMENS EXAMINED. SHIKOTAN: Svobodnaya River, 12.VI 1946, 7☿ (NK); Malo-Kuril'sk, Krai Sveta Cape, 13.VIII 1961, 27.VIII 1963, 2♀ (AK), 14.VII 1975, 3☿ (AK, Zheltonozhko). KUNASHIR: Dubovoye, 6-8.VIII 1980, 2☿ (SS), 14.VI 1984, 10☿ (A. Meshtsheryakov); Golovnino, 2.IX 1970, 9☿ (GC); Alyokhino, 22.VII 1975, 4♀, 2♂, 6☿ (AK), 14-16.VIII 1980, 3☿ (SS); Tret'yakovo, 21.VII, 27.VIII 1975, 2♀, 18☿ (AK), 20.VIII 1980, 19♂, 1☿ (AL); Yuzhno-Kuril'sk, 8.VIII 1975, 4♀, 25☿ (AK), 26.VIII 1980, 2☿ (AL), 26.VI 1984, 7☿ (AE), 26.VIII 1980, 5♀, 5☿ (SS); Mendeleyevo, 19, 27.VIII 1974, 20.VII 1975, 1♀, 9♂, 65☿ (AK), 4.IX 1970, 4☿ (GC); Sernovodsk, 23.VI 1962, 1♀, 9☿ (GK); Peschanoye Lake, 17.VIII 1980, 3♀ (AL); KU-96-ASL-025, 3 km S Yuzhno-Kuril'sk, 25.VIII 1996, 7♀, 22☿ (AL); KU-96-BKU-091, 17 km S Yuzhno-Kuril'sk, 25.VIII 1996, 2☿ (BU); KU-97-BKU-003, -009, KU-97-SG-001, KU-97-RLC-001, KU-97-NM-001, the same place, 27.VII 1997, 26☿ (BU, SG, RC, NM). ITURUP: IT-97-ASL-003, IT-97-TWP-010, 7 km W Reydovo, 29.VII 1997, 51☿ (AL, TP).

DISTRIBUTION. Transpalaearctic species. Russia: European part, southern and middle regions of Siberia and Far East including Kuril Islands (Shikotan, Kunashir, *Iturup); Japan (from Hokkaido to Central Ryukyus); Korea; Europe; North Africa.

ECOLOGY. Mainly lives in open areas: meadows, roadsides, barren slopes. Occurs in sparsly dense forsests. They make different types of nests in different habitats: in meadows found within forests, nests are made in soil and without the cone or in small hillocks; on river terrace, they make nests under stones; in forests, they make nests in stumps, logs, hollow trees.

25. *Lasius (Lasius) hayashi* Yamauchi et Hayashida, 1970

SPECIMENS EXAMINED. KUNASHIR: Goryachiy Plyazh, 14.VII 1975, 16☿ (AK); Lagunnoye Lake, 17.VII 1975, 6☿ (AK); Alyokhino, 14-16.VIII 1980, 8♀ (SS); Peschanoye Lake, 15.VIII 1982, 6♀ (GL).

DISTRIBUTION. Russia: Kuril Islands (Kunashir); Japan (from Hokkaido to Yakushima); Korea.

ECOLOGY. Lives in broad-leaved forests. Discovered near hot springs. Probably lives in habitats that are more warm then *L. niger*.

26. *Lasius (Cautolasius) flavus* (Fabricius, 1781)

SPECIMENS EXAMINED. KUNASHIR: Alyokhino, 25.VIII 1975, 15☿ (AK); Lagunnoye Lake, 17.VII 1975, 11☿ (AK); Tret'yakovo, 3☿ (AK); Yuzhno-Kuril'sk, 8.VIII 1975, 1♀ (AK); Golovnino, 30.VIII-1.IX 1970, 1♀, 16☿ (GC), 7.IX 1976, 3♀ (VK); Mendeleyevo, 3.IX 1970, 8♂, 3☿ (GC), 27.VII 1975, 26☿ (AK). ITURUP: IT-96-ASL-023, Dobroye Nachalo Bay, 23.VIII 1996, 14☿ (AL); IT-97-ASL-025, 5 km N Reydovo, 22.VIII 1997, 2♀, 66☿ (AL).

DISTRIBUTION. Transpalaearctic species. Russia: European part, south and middle regions of Siberia and Far East including Kuril Islands (Shikotan, Kunashir, *Iturup); Caucasus; Japan Hokkaido, Honshu); North Korea; Europe.

ECOLOGY. Lives in broad-leaved forests along river valley and small hills with open areas. More common in the meadow, cut places, barren slope. Occur in dry places in the river valley and along seashore. Can be found in the soil everywhere. Make soil nests under the stone or under small rises without any cone. In wet places they inhabit hillocks with cone consisting of granulated soil. It's possible to see the nest base surrounding grasses and bushes (i.e. the graases or bush stem comes out of the cone). Usually they are nocturnal, do not appear on surface. They probably eat the dew of root aphids. Allate adults have been seen in the nest from end of July through mid-September.

27. *Lasius (Chthonolasius) umbratus* (Nylander, 1848)

=*Lasius* (*Chthonolasius)* sp.: Terayama et al., 1998: 11 (Kunashir).

SPECIMENS EXAMINED. SHIKOTAN: Malo-Kuril'sk, 26.VII 1974, 1♀ (AK); Tserkovnaya Bay, 16.VIII 1975, 1♀ (AK). KUNASHIR: Alyokhino, 25.VIII 1975, 24☿ (AK); Yuzhno-Kuril'sk, 8.VIII 1975, 1♀ (AK), 4.VIII 1980, 1♀ (AL); Golovnina volcano, 3.VIII.1980, 1♀ (AL); road Golovnino-Mendeleyevo, 12.VIII 1975, 3♀ (AB); KU-96-PO-072, KU-96-VR-039, 17 km S Yuzhno-Kuril'sk, hot springs, 25.VIII 1996, 1♀, 1☿ (PO, VR).

DISTRIBUTION. South and middle zones of Palaearctic. Russia: European part, south regions of Siberia and Far East including Kuril Islands (Shikotan, Kunashir); Caucasus; Japan (Hokkaido, Honshu); Korea; Europe.

ECOLOGY. Lives in broad-leaved forests. Nests are found in wet, decaying wood or in the soil underneath big stones. Only male and females have been seen on the surface. Probably the workers (like *L. flavus*) are located in the nest and eat dew of root aphids or mold. Allate adults emerge in August.

28. *Lasius (Chthonolasius) affinis* (Schenck, 1852)

SPECIMENS EXAMINED. SHIKOTAN: 28.VII 1974, 1♀ (AK). KUNASHIR: Dubovoye, 7-8.VIII 1980, 8♀ (AL); Mendeleyevo, 13.VIII 1975, 1♀ (AB); road Golovnino-Mendeleyevo, 12.VIII 1975, 4♀ (AB); Golovnina volcano: 10.VIII 1980, 4♀ (SS), 11.VIII 1980, 2♀ (AL).

DISTRIBUTION. Russia: European part, south of Far East including Kuril Islands (Shikotan, Kunashir); Caucasus; Europe.

ECOLOGY. Has been seen in open meadow. Allate adults emerge in July through August.

29. *Lasius (Dendrolasius) fuliginosus* (Latreille, 1798)

SPECIMENS EXAMINED. SHIKOTAN: Krai Sveta Cape, 14.VIII 1975, 1♂, 1☿ (AK, Zheltonozhko); Tserkovnaya Bay, 16.VIII 1975, 18☿ (AK). KUNASHIR: Alyokhino, 5.VI 1976, 6☿ (T. Vshivkova); Lagunnoye Lake, 17.VI 1975, 1☿ (AK); Mendeleyevo, 19.VIII 1974, 8♂ (AK); Golovnina volcano, 10.VIII 1980, 3♂ (SS).

DISTRIBUTION. Russia: European part, southern regions of Siberia and Far East including Kuril Islands (Shikotan, Kunashir); Caucasus; Japan (from Hokkaido to Kyushu); Korea; Europe.

ECOLOGY. Forest species - lives mainly in broad-leaved forests but prefers wet places in the shallow (i.e. not steep) slopes and valleys. Typical species that lives in wood (dendrobiont). Makes nest in the wood. Usually lives in old, living trees (rarely in dead trees) both broad-leaved and coniferous trees: oak, linden, birch, Phellodendron amurense, Pinus koraiensis, firs and others). Nest usually located of lower trunk and associated roots. In the winter time the ants go down in to the soil. The nest consists of aggregations of cells and holes in the wood. This species is constant trophobiont (i.e. rely on scavenging, not preying, on products) - they eat mainly aphid dew which is collected by the ants during the whole summer. Each nest has a constant pathway that they use to go to specific trees for collecting the aphids dew. Allate adults emerge in August.

30. *Lasius (Dendrolasius) teranishii* (Wheeler, 1928)

SPECIMENS EXAMINED. SHIKOTAN: Malo-Kuril'sk, 26.VIII 1974, 40☿ (AK). KUNASHIR: Dubovoye, 8.VIII 1980, 1♀ (AL); Golovnino, 6.IX 1972, 45☿ (GC); Mendeleyevo, 4.IX 1972, 20☿ (GC).

DISTRIBUTION. Russia: south of Far East including Kuril Islands (Shikotan, Kunashir); Japan (Hokkaido, Honshu); North Korea.

ECOLOGY. Known as social parasite of *L. flavus*. Lives along seashore, river banks, roadsides, meadows (Yamauchi, 1979). Large perennial nests have been

seen in the trunks of trees. Females and workers have been found separately in broad-leaved forest (Kupianskaya, 1990). Allate adults emerge in beginning of August in Japan (Yamauchi, 1979).

31. *Lasius (Lasius) neoniger* Emery, 1893

DISTRIBUTION. South Alaska, Pacific coast of southern Canada and northern USA, ? Kuril Islands (Kunashir).

REMARKS. Collingwood (1962) recorded from Kunashir I. one worker of *Lasius neoniger* (f. *sitkaensis*), which differs from related *L. niger* Mayr by reddish-brown body color, by wider mandibles with shortened basal denticles, by weak chaetotaxy of scape and legs. According to Wilson (1955) *L. neoniger* make the nests in decaying wood or in the soil underneath big stones in the canopies of trees in forest. It is difficult to say more definitely about those single specimen, most probably it belongs to *L. hayashi* described from Japan (Yamauchi & Hayashida, 1970) and now discovered in Kunashir also.

32. *Paratrechina flavipes* (F. Smith, 1874)

SPECIMENS EXAMINED. KUNASHIR: Alyokhino, 8.VIII 1962, 5☿ (GK); Tret'yakovo, 26.VIII 1970, 5☿ (Tikhomirova), 21, 22, 27.VIII 1975, 15♀, 7♂, 125☿ (AK); 16 km S Yuzhno-Kuril'sk, 6.VIII 1975, 28☿ (AK); Yuzhno-Kuril'sk, 26.VI 1984, 7☿ (AE); KU-97-TWP-002, 17 km S Yuzhno-Kurilsk, hot springs, 27.VII 1997, 2♀, 4☿ (TP); KU-97-BKU-094, the same place, 24.VIII 1997, 7☿ (BU); KU-98-ASL-014, Kislaya River, hot springs, 11.VIII 1998, 3☿ (AL).

DISTRIBUTION. Russia: Kuril Islands (Kunashir); Japan (from Hokkaido to North Ryukyus); Korea; China.

ECOLOGY. Discovered in broadleaved forests in southwest Kunashir near the hotsprings. Nest without external cone. Allate adults emerge in August.

BIOGEOGRAPHY AND HABIT ASSOCIATION

Kuril Islands are the Eastern border of Palaearctic, southern part of them belongs to Palaearchearctic subregion. In the Kuril Islands there are 14 species which distributed in temperate zone of Palaearctic and 17 species distributed in Eastern Palaearctic (Table 2).

First group consist of widely distributed and common Palaearctic species [P]: *Formica transkaucasica, F. sanguinea, Lasius niger, L. flavus, L. umbratus.* They are eurybiont but prefer open area. Boreopalaearctic [BP] species belong to this group also. They originated from the forest and prefer mountain and forest biotops (*Leptothorax acervorum, L. muscorum, Formica lemani, F. truncorum*). Probably *Myrmica kamtschatica* distributed in Northern Kurils belongs to this group also. Two species of this group have Amphipalaearctic [A] range which is

Table 2

Habitat associations and biogeography of ants of Kuril Islands

N	Species	Range type	Living form	Relation to		Habitats		
				Warmth	Moisture	Forest	Medow	Hot sping
1.	*Ponera japonica*	O	G	mes	mph	-	-	+
2.	*Myrmica ruginodis kotokui*	UK	D	mes	mph	+	+	-
3.	*Myrmica rubra*	P	D	mes	mph	+	-	-
4.	*Myrmica luteola*	UK	D	mes	mph	+	-	-
5.	*Myrmica jessensis*	MJ	H	mes	mph	-	+	-
6.	*Myrmica carinata*	UK	H	mes	mph	+	+	-
7.	*Myrmica kamtschatica*	BS	H	mes	mph	+	+	-
8.	*Stenamma kurilense*	KE	G	mes	mph	+	-	-
9.	*Aphaenogaster japonica*	MJ	H	mac	mph	-	-	+
10.	*Pheidole fervida*	JUK	H	mac	mph	-	-	+
11.	*Solenopsis japonica*	JK	G	mac	hks	-	-	+
12.	*Crematogaster matsumurai*	JK	H	mac	mph	-	-	+
13.	*Myrmecina graminicola nipponica*	JK	G	mes	mph	-	-	+
14.	*Leptothorax kurilensis*	KE	H	mes	mph	+	-	-
15.	*Leptothorax acervorum*	BP	D	mic	mph	+	-	-
16.	*Leptothorax muscorum*	BP	D	mic	mph	+	+	-
17.	*Camponotus japonicus*	MJ	H	mes	mph	-	+	-
18.	*Camponotus obscuripes*	JK	D	mes	mph	+	-	-
19.	*Formica hayashi*	MJ	H	mes	mph	-	+	-
20.	*Formica lemani*	BP	H	mic	mph	+	+	-
21.	*Formica transkaucasica*	P	H	mic	mph	+	+	-
22.	*Formica sanguinea*	P	D	mac	hks	-	+	-
23.	*Formica truncorum*	BP	D	mic	mph	+	+	-
24.	*Lasius niger*	P	H	mes	mph	-	+	-
25.	*Lasius hayashi*	MJ	D	mes	mph	+	-	-
26.	*Lasius flavus*	P	G	mes	mph	-	+	-
27.	*Lasius umbratus*	P	G	mes	mph	+	-	-
28.	*Lasius affinis*	A	G	mac	hks	-	+	-
29.	*Lasius fuliginosus*	A	D	mes	mph	+	-	-
30.	*Lasius teranishii*	MJ	D	mes	mph	+	-	-
31.	*Lasius neoniger*	NA	G	? mes	mph	+	-	-
32.	*Paratrechina flavipes*	JK	H	mac	hks	-	-	+

Abbreviations. A – Amphipalaearctic, BP – Boreal-Palaearctic, BS – Boreal-Siberian, D – dendrobiont, G – geobiont, H – herpetobiont, hks – hemikserophill, JK – Japanese-Kuril, JUK – Japanese-Ussurian-Kuril, KE – Kuril endemic, mac – macroterm, mes – mesoterm, mic – microterm, MJ – Manchurian-Japanese, mph – mesophill, NA – North American, O – Oriental, P – Palaearctic, UK – Ussurian-Kuril.

characteristic for broad-leaved forests in South Eurasia and absent in Siberia (*Lasius affinis, L. fuliginosus*).

Second group includes the species distributed in the warmest places on Southern Kurils. Six Manchurian-Japanese species [MJ] widely distributed in Eastern Palaearctic (Primorskii krai, south of Khabarovskii krai, Sakhalin, North-East China, North Korea and Japan): *Myrmica jessensis, Aphaenogaster japonica, Formica hayashi, Lasius hayashi, L. teranishii, Camponotus japonicus*. The other species of this group have smaller range: Japanese-Kurilian species [JK] (*Diplorhoptrum japonica, Crematogaster matsumurai, Myrmecina graminicola nipponica, Camponotus obscuripes, Paratrechina flavipes*); Japanese-Ussurian-Kurilian species [JUK] (*Pheidole fervida*); Ussurian-Kurilian species [UK] (*Myrmica luteola, M. carinata, M. ruginogis kotokui*); Oriental species [O] (*Ponera japonica*); Kurilian endemic [KE] (*Stenamma kurilense, Leptothorax kurilense*).

Most of the species are temperate warmth-like and mesophilouse and prefer wind-protected sunny open area: meadow, forest edges. Some species originated from the forest are less warmth-like and can live in mountain area and under the trees. There are most warmth-like species which concentrated near the hot springs and exit of sulfurous gas and can not be found in other places.

Most species including Eastern Palaearctic and warmth-like ones concentrated in south-western Kunashir with warmest and mild climate. Mixt broad-leaved and coniferous liana forest with open area near the hot spring are most preferable for warmth-like species. The ant fauna of South Kunashir has 21 common species with Primorskii krai and 20 common species with Japan and probably is the poorer kind of fauna of Hokkaido. To the northwards the species number is rapidly decreased. Practically all Kuril Islands inhabit by three species (*Myrmica kamtschatica, Formica lemani* and *Leptothorax acervorum*). These species live in the south of Kamtschatka where the ant fauna getting poorer strongly.

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