

Ants (Hymenoptera: Formicidae) from Korea, 2\*

By

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**Abstract:** Collections taken during a Third Expedition to Democratic People's Republic of Korea by the Hungarian Natural History Museum have been examined. Among the 23 species of ants recognised, six are additional to those listed in a previous paper bringing the known total for North Korea to 70 recorded forms. The additional species include Aphaenogaster famelica (Smith), Leptothorax acervorum (Fabricius), Camponotus itoi Forel, Lasius flavus (Fabricius) and Prenolepis melanogaster Emery.

A further collection of Formicidae from the Democratic Peoples' Republic of Korea was sent to me by Dr. J. PAPP of the Hungarian Natural History Museum. A full account of this third expedition undertaken during July 1975, is given by PAPP and VOJNITS (1976). Collections were made variously by sweep net, singling, soil extraction, Malaise and mercury vapour light traps. In addition to this material some specimens from the earlier expeditions that had not been examined, are included in the present study. The results from the three expeditions so far undertaken by the Hungarian Natural History Museum bring the total recorded ant fauna of North Korea to 70 species.

The areas visited include: Ryang Gang Province: the coniferous forests of the Chann-Pay plateau and the Pektusan mountain, Nos 194, 196, 275-297 eleven species. South Pyongyan Province: mixed vegetation including Castanea woodland clearings and gardens, Nos 264-274, 298-311 eighteen species. Pyong-Sung Province: Bek-sung-li Castanea woodland five species. Gang-von Province: Diamond Mountains valley shrub vegetation, coniferous woodland and gardens Nos 312-331 twenty species.

The additional species found include the following:

	Province	Range
<u>Myrmica yoshiokai</u> Weber, 1947	Gang-von	Japan
<u>Aphaenogaster famelica</u> (F. Smith, 1874)	Gang-von	Japan
<u>Leptothorax acervorum</u> (Fabricius, 1793)	Ryang Gang	Euro-Siberia and Japan
<u>Lasius flavus</u> (Fabricius, 1781)	Ryang Gang, Gang-von	Euro-Siberia and Japan
<u>Camponotus itoi</u> Forel, 1912	Ryang Gang	China, Japan
<u>Prenolepis melanogaster</u> Emery, 1894	South Pyongyan	China, Upper Burma

## The Species Collected

### PONERINAE

Pachycondyle astuta (F. Smith) - Locality Nos 315, 322, 325; Gang-von Province, Om-Dzong district, Kum-gang san near Hotel. 66. - These were collected at my lamp set in a coniferous-locust tree wood. Previous records were from Kaesong province.

### DOLICHODERINAE

Dolichoderus sibiricus Emery - Locality No. 304; Pyong-Sung Province, Bek-sung-II district, Za-mo-san. 1 ♂. - This was taken in a Castanea woodland.

Tapinoma sinense Wheeler - Locality No. 273; South Pyongan Province Nam Po district; 317 Gang-von Province On-dzong district Kum-gang san. ♀♀. - These were taken by netting shrubs at the borders of a Castanea Robinia woodland and along a shrubby pathway. A specimen from the previous expedition, Locality No. 238 South Pyongan Province Guk-san-gong mountains, was omitted from the previous paper.

Myrmica yoshiokai Weber stat. n. (= Myrmica rubra subsp. yoshiokai Weber 1947: 451) - Locality No 317 Gang-von Province, On-Dzong, Kum-gang san near Hotel Go-song. 1 ♂. This was netted along a shrubby pathway. The specimen compares well with a large sample of workers with associated males from Japan sent by M. KONDOH to Dr. G.W. ELMES who kindly passed them to me for examination and also with other material including two series of workers sent me by M. KUBOTA from Japan. Included in the original description by WEBER (1947) are the following slight differences from Myrmica ruginodis Nyl: Frontal triangle smooth except for several median striae (absent in M. ruginodis); declivous surface of propodeum smooth except for faint transverse striae between the spine, which grow coarser towards the dorsal margin (coarsely striate in M. ruginodis). The workers which have been assigned to this species have, in addition, suberect hairs on the scapes, more crowded but otherwise similar to those of M. rubra L.; in M. ruginodis they are thinner, sparser and subdecumbent. The propodeal spines are long but sharper and finer than in M. ruginodis and longer than in M. rubra.

The males which were unclued with associated workers sent me by KEICHI ONOYAMA, MASAO KUBOTA and GRAHAM ELMES from various localities in Japan have long hairs on the hind tarsi while the dorsum of the head is coarsely sculptured, both features as in European M. rubra and not as in M. ruginodis. They have the second funiculus segment relatively longer than in either of the Euro-Siberian species.

### MYRMICINAE

Myrmica ruginodis (Nylander) - Locality No. 282; Ryang Gang Province Chann-Pay plateau Sam-zi-yan 1700 m. ♀♀ ♀; 273 South Pyongan Nam-po. ♂. - These were taken by sweeping in Larix-Betula and Castanea-Robinia woodland respectively. The ♀♀ are typical of this wide ranging euro-siberian species having a distinctly truncate petiole and clearly visible lateral striae between the long propodeal spines.

Myrmica silvestrii Wheeler - Locality No. 196; Ryang Gang Province Chann Pay plateau. ♀♀. - This record was omitted from the previous paper. The specimens were taken by sweeping in a Larix-Betula forest clearing. This species is very similar to M. kurokii but has the petiole segments thinner and less rounded and the funiculus segments more elongate. (Figure 1, 2).

Myrmica kurokii Forel - Locality No. 281; Ryang Gang Province Chann Pay Plateau. ♀♀. - These were taken in coniferous forest clearings at 2000 m about 24 km from Sam-zi-yan on the road to Mt. Pektusan.

Aphaenogaster famelica (F. Smith) - Locality No. 317; Gang-von Province On-Dzong district, Kum-gang san. 1 ♂. - This single worker was taken along the Okra-dong valley by sweeping shrubs along the pathway. This species is known from several localities in Japan and China and is a first record from North Korea.

Pheidole pieli Santschi - Locality Nos. 317, 324; Gang-von Province On-Dzong district. ♀♀. - These were taken along the Okra-dong valley by sweeping shrubs and in coniferous forest.

Stenamma owstoni Wheeler - Locality No. 266; South Pyongan Province Pyongan Hungarian Embassy garden. 1 ♂. - This single specimen was caught in a Malaise trap. It is assumed to be S. owstoni already recorded for North Korea in the previous paper but the male has probably not yet been described. Unfortunately a whole antenna on one side and the funiculus

on the other are missing. The specimen is heavily sculptured and has the features of the genus including the bicarinate clypeus narrow frons short, broad based propodeal spines and long petiole. They shaped notauli are hard to distinguish among the coarse longitudinal rugosities of the mesonotal dorsum. The eyes are large and protuberant occupying more than half the distance between occiput and clypeus. The short scape is about half the head width across the eyes. Body length 3.1 mm.

Crematogaster matsumurai Forel - Locality No. 267; South Pyongan Province De-sang san 00; 302 Pyongan Hotel 0; 317 Gang-von Province On-Dzong district Kum-gang san 0. - The workers were taken by sweeping along a coniferous forest 12 km north east of Pyongan and along a shrubby pathway. The alate queen was taken at mercury vapour lamp at a Pyongan hotel.

Crematogaster sp. - Locality No. 267; South Pyongan Province De-sang san 2 00. - Among the C. matsumurai were two smaller darker individuals with relatively shorter propodeal spines. These may represent a different species but more probably spine length varies allometrically with size, the two workers being the smallest in a variable size range.

Pristomyrmex pungens Mayr - Locality Nos. 267; South Pyongan Province; 305 Pyong-Sung Province Bek-sung-li Sa-mo san; 314, 318 Gang-von Province Om-dzong Kum-gan san 00. - These were taken by general sweeping among shrubby vegetation and in coniferous woodland.

Leptothorax acervorum (Fabricius) - Locality No. 281; Ryang Province Chann Pay Plateau 00. - These alate queens were taken by sweep net in a Larix-Betula forest clearing. These have the general form, colour and pilosity of northern samples of this common and widely distributed Euro-Siberian species which is also recorded from Japan.

Leptothorax nassonovi Ruzsky - Locality No. 267; South Pyongan Province De-sang san; 305 Pyong-Sung Province, Bek-sung li, Za-mo san. 00. - These were collected by sweeping and as single specimens along the border of a coniferous wood and in a Castanea woodland respectively.

Leptothorax servicus Ruzsky - Locality No. 317; Gang-von Province On-dzong district, Kum-gang san. 00. - These were taken at 600 m by sweeping among shrubs along the Okru-dong valley.

Tetramorium caespitum Linné - Locality No. 267; South Pyongan Province Pyongan, De-sang san. 00. - These were collected by sweeping herbage in a coniferous wood. This time only four workers were taken contrasting with several hundred collected during the previous expeditions.

Monomorium pharaonis Linné - Locality No. 238; Pyongan 10 km north east of Nam-po. 1 0. - This record was omitted from the previous paper and the single worker was netted in Castanea woodland whereas all previous specimens were taken in the hotel premises at Pyongan a much more likely habitat for this common cosmopolitan species.

#### FORMICINAE

Formica yessensis Forel - Locality No. 238; South Pyongan Province Nam-po 1 0; Gang von Province On-dzong Kum-gang san 1 0. - The Nam-po record was apparently omitted from the earlier paper. Both workers were taken by sweeping in woodland.

Formica sanguinea Latreille - Locality Nos. 283; Ryang Gang Province Chann Pay plateau; 295 river Karim. 0 00. - A queen and four workers were taken by hand collection among shrubby vegetation at 100 m.

Formica lemani Bondroit - Locality Nos. 280, 281, 295, 297; Ryang Gang Province 0 00. - The queen was taken in a Malaise trap, the workers by sweeping and singling in Larix-Betula forest. One of the workers locality no. 295 was probably taken in company with F. sanguinea as it is likely to be the auxiliary species associated with the slave raiding ant.

Formica japonica Motschulsky - Locality Nos. 267, 274; South Pyongan Province; 304, 306, 331 Pyong Sang Province; 320, 324, 326 Gang von Province. 00. - Workers of this apparently common species were all swept variously from herbage in woodland clearings.

Lasius niger (Linné) - Locality Nos. 273, 276, 282, 304, 306, 322. 00 00 00. - This common species was taken variously in several localities in South Pyongan, Ryang-gang, Pyong-Sung and Gang-von provinces. This is evidently widely distributed through North Korea and was the most numerous species collected during the previous expeditions. This ant generally flourishes in disturbed habitats where there has been major human interference with the natural vegetation.

Lasius alienus (Foerster) - Locality Nos. 196 Ryang Gang Province Chann Pay plateau Sam-zi-yan 00; 317 Gang-von Province On-Dzong district Kum gang san 00. - The Ryang Gang record was omitted from the earlier paper. The species was taken by sweeping along pathways in Betula-

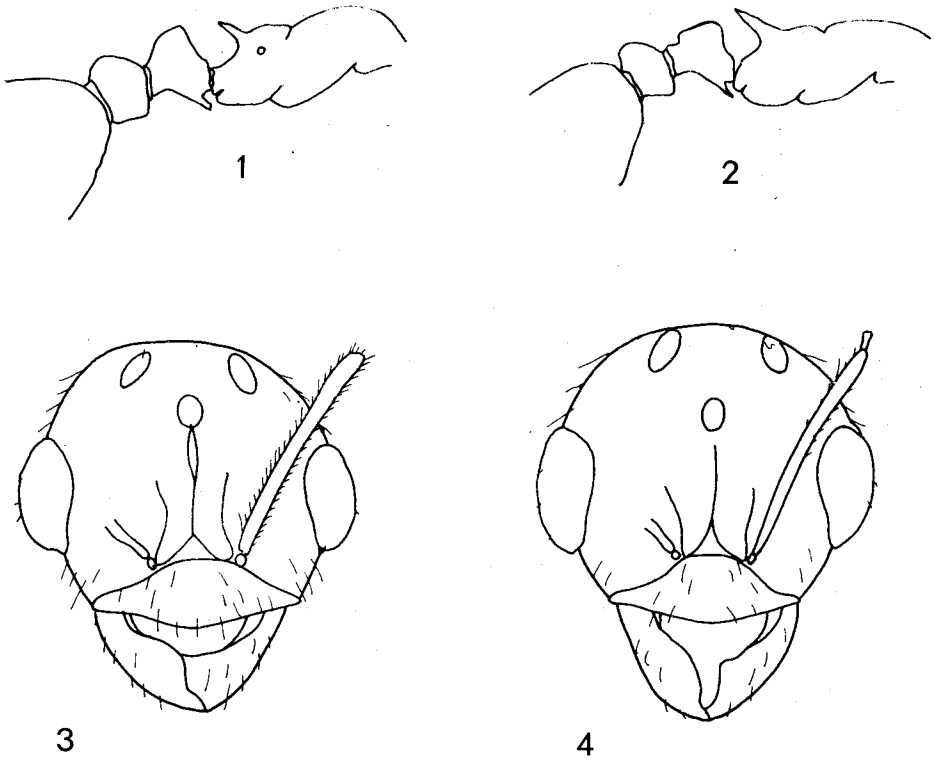


Fig. 1. Alitrunk of *Myrmica kurokii* Forel in profile - Fig. 2. Alitrunk of *Myrmica silvestrii* Wheeler in profile - Fig. 3. Head of *Lasius niger* Linné in dorsal view - Fig. 4. Head of *Lasius hayashi* Yamauchi et Hayashida in dorsal view

Larix forest and in the Okra dong valley. The Gang-von samples are quite typical being unicolourous greyish black with no appendage hairs on the antennal scapes or fore tibiae.

*Lasius hayashi* Yamauchi et Hayashida - Locality Nos. 194, 196 Ryang Gang Province; 273, 276 South Pyongan Province; 304, 305 Pyong Sang Province; 315 Gang-von Province. ♀♀ ♀♀. - These were taken variously by sweeping in woodland areas. Large numbers of males were caught by mv lamp at Hyesan. The males have much less appendage pilosity than *L. niger* and have a more bicoloured appearance with the alitrunk brownish rather than greyish black. (Figures 3, 4).

*Lasius flavus* (Fabricius) - Locality No. 275 Ryang Gang Province, Hyesan, Mt Ze-dong 1150 m, 1 ♀; 322 Gang-von Province On-Dzong Kum-gang san, 1 ♀. - Both specimens are typical *Lasius flavus* queens and are recorded from North Korea for the first time. The Ryang Gang example was taken by singling along the edge of a Larix wood while the Gang-von example was collected by mv light trap in a conifer/Robinia woodland.

*Lasius fuliginosus* (Latreille). Locality Nos. 324 Gang-von Province On-dzong district; 331 Pyong-Sung, Bek-sung-li, Za-mo san. ♀♀. - These were taken by sweeping along the Ok-radong and also in Castanea woodland in baited soil traps. This widespread species which also occurs in the Himalayas appears to be more common in North Korea than the other members of this group of jet black ants.

Lasius meridionalis Bondroit - Locality No. 276 Ryang-Gang Province Hyesan, ♂♂. - These were collected together with other Lasius males at my light trap at the Hyesan hotel. In the previous paper this species was referred to as L. rabaudi Bondroit but following correspondence with Dr. Bohdan PISARSKI and the gift of a set of all three castes of true L. rabaudi from Czechoslovakia by Petr WERNER it was realised that WILSON (1955) was incorrect in synonymising L. meridionalis as L. rabaudi and the two species were quite distinct. In fact the majority of European samples as well as those from Japan should be referred to L. meridionalis which has shorter much closer pubescence than L. rabaudi (Collingwood, 1979).

Prenolepis melanogaster Emery - Locality No. 296 Ryang-Gang Province, Karim river. 1 ♀. - This single worker was netted in shrubby vegetation along the river in a deep valley. It is an interesting addition to the North Korean fauna but the assumed identity is for the present uncertain. ONOYAMA (1980) lists an unnamed Prenolepis from Japan. CHAPMAN and CAPCO (1951) in their check list of ants of Asia list P. melanogaster subsp. carinifrons Santschi 1920 from Tonkin in China and P. melanogaster was recorded from Upper Burma.

This single specimen has the typical Prenolepis configuration with the eyes set well behind the middle of the head. The appendages lack setae and the body hairs are sparse. The dark propodeum and gaster contrast with the brownish red head and the rest of the alitrunk and the insect has a generally shining appearance.

Paratrechina flavipes (F. Smith) - Locality Nos. 267, 314, 317, 324, 326, 327 South Pyongan and Gang-von Provinces. ♀♀. - These were variously netted in the Pyongyang embassy garden and in coniferous forest also by soil bait trapping.

Paratrechina sakurae (Ito) - Locality Nos. 273, 305, 324, 330 South Pyongan. Pyong Sung and Gang von Provinces ♀♀. - These were taken by sweeping vegetation in Castanea woodland.

Paratrechina sauteri (Forel) - Locality No. 267 South Pyongan Province, De-Sang san; 317 Gang-von Province, Kum gang san. ♀♀. - Workers of this small Plagirolepis-like species were collected by sweeping in coniferous woodland and among shrubby vegetation in the Okru-dong valley respectively.

Camponotus japonicus Mayr - Locality Nos. 267 South Pyongan Province; 295 Ryang Gang Province; 306 Pyong Sung Province; 320, 324 Gang-von Province. ♀♀. - This species was variously netted and trapped in woodland areas. Three workers taken at locality 267 De-sang san district in coniferous woodland have the front of the head reddish as described for the form aterima Emery which was synonymised by YASUMATSU and BROWN (1951).

Camponotus atrox Emery - Locality No. 322 Gang-von Province, On-dzong district ♀♀. These were taken according to the locality no. at my lamp in coniferous woodland suggesting that this species may be nocturnal in its behaviour.

Camponotus sachalinensis Forel - Locality No. 280 Ryang-Gang Province Chann-Pay plateau. 3 ♀♀. - These queen ants were taken by singling in Larix-Betula woodland clearings.

Camponotus itoi Forel - Locality No. 267 South Pyongan Province De-sang san 1 ♀. - This single worker was netted from shrubby grassland in a coniferous wood and is presumed to be a first record for this Japanese species for North Korea.

Camponotus quadrinotatus Forel - Locality Nos. 304, 305 Pyong-Sung Province, Za-mo san ♀♀; 317, 319, 322, 324 Gang-von Province On-dzong district. ♂♂ ♀♀. - The males were taken at my light in coniferous woodland and the workers variously by sweeping.

Plagirolepis mandzurica Ruzsky - Locality No. 273 South Pyongan Province, Nam-po. ♀♀. - A few workers were taken by sweeping shrubs in Castanea/Robinia woodland.

Plagirolepis flavescens Collingwood - Locality No. 318 Gang-von Province On-dzong 1 ♀. - This single specimen was netted in a coniferous-locust tree wood at Kum-gang san near Go-song hotel. The locality is presumably not far from Kum-gang san given as Kaesong Province in the previous paper.

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