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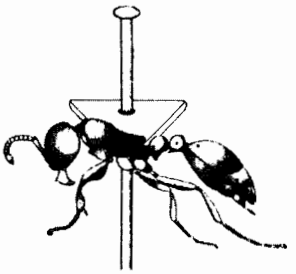
ANeT Newsletter

International Network for the Study of Asian Ants / DIWPA Network for Social Insect Collections / DIVERSITAS in West Pacific and Asia



Proceedings of Committee Meeting of 5th ANeT Workshop

Minutes prepared by:
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Place and Date of the Committee Meeting

Committee meeting of 5th ANeT Workshop was held on 30th November 2005 at the National Museum, Kuala Lumpur. The meeting started at 12.30 with a discussion on the draft of Action Plan tabled by Dr. John Fellowes and meeting then chaired by Prof. Maryati Mohamed at 1.00 pm. Meeting adjourned at 3.00 p.m.

Members Attending

Prof. Maryati Mohamed, the President of ANeT (Malaysia)
Prof. Seiki Yamane (Japan)
Prof. Kazuo Ogata (Japan)
Dr. Rudy Kohout (Australia)
Dr. John R. Fellowes (Hong Kong/UK)
Mr. Suputa (Indonesia)
Dr. Yoshiaki Hashimoto (Japan)
Dr. Decha Wiwatwitaya (Thailand)
Dr. Bui Tuan Viet (Vietnam)
Dr. Himender Bharti (India)
Dr. Sriyani Dias (Sri Lanka)
Mr. Bakhtiar Effendi Yahya, the Secretariat of ANeT (Japan)
Ms. Petherine Jimbau, the Secretariat of ANeT (Malaysia)

Agenda Agreed

1. Discussion on Proposal on Action Plan as tabled by Dr. John Fellowes
2. Proceedings/Journal
3. Next meeting – 6th ANeT Seminar and Meeting (date and venue)
4. New members and structure of committee membership
5. Any other business

Agenda Item 1 : Discussion on Proposal on Action Plan as tabled by Dr. John Fellowes

Draft of Proposal was distributed. During the discussion no amendments were proposed to the draft Action Plan objectives. The main issue discussed was setting up of a common coding system for ants of Asian region. Members agreed:

1. Due to the slow process of taxonomic review and the need for internationally-standardised nomenclature, we need a coding system to cover both described and undescribed species from Asia, as held in the ANeT collections.
2. Geographical range of collection to use the common coding system for ANeT ant is the Oriental region plus Sulawesi and Iran.
3. Code agreed is exemplified as: *Tetramorium* (subgenus) ANET 001 (the ANET spelling is all capital letters and the number of 0s depend on size of genus. Subgenus is optional. Genus and subgenus in italics.)
4. All ants will be coded. This means that some may have even had confirmed species name. Example: *Tetramorium* ANET 001 is *Tetramorium bicarinatum*.
5. For the next two years (November 2005 to November 2007) Dr. Rudy Kohout is given the honour to start the system going using *Polyrhachis* and *Echinopla*. The system will be reviewed in the 6th ANeT Seminar and Meeting. If it is successful and practical, and acceptable to many members, then allocation of other members who are keen to be manager of particular genera will follow. This will then become the unified system of species coding for ants for ANeT. The list is to be databased on Excel.
6. The draft objectives of the Action Plan will be given out to members for comment, which should be submitted to Dr. John Fellowes by middle of December 2005. Members will also be invited to participate in the Plan.
7. John will then coordinate the Plan compilation, ready for discussion of recommended actions at ANeT 2007.

Agenda Item 2: Proceedings/Journal

1. The President proposed that a journal be initiated because ANeT is now 7 years old and has a good number of members doing high quality research on ants. The journal would give ANeT an identity and provide opportunity for younger members to start writing good scientific papers on ants. However, it is not a must that all members must submit to the journal.
2. The names of the journal proposed were ASIAN MYRMECOLOGY and ASIAN ANTS, the first being favoured by the committee. The President will seek an ISSN number and registration that will also determine the name.
3. A committee for the journal was proposed and they are:
    i. Advisor : Prof. Maryati Mohamed
    ii. Editors : Dr. Martin Pfeiffer and Dr. John Fellowes
    iii. Editorial board (to be confirmed after further discussion)
4. Rudy volunteered to design the cover and the size agreed is B5. Format is as in ANeT first Proceedings.
5. A managing editor (Ms. Petherine Jimbau) will be stationed at Universiti Malaysia Sabah.

Submitted manuscripts will be sent to the Editors to handle the review process. Final accepted manuscripts will be sent to either Ms. Petherine / Mr. Bakhtiar or both for journal publication.

6. Where appropriate, members are encouraged to submit their presentations made during the 5th ANeT Seminar and Meeting to the journal by August 2006. A six-month editing period is expected, followed by 2 months of finalization and printing. The first journal is expected to be out by mid-2007.

7. Besides presentations made at the 5th Seminar and Meeting, members may send other papers about ants from their research [from time to time]. The scope will include Taxonomy and Biogeography, Ecology and Conservation and Applied Myrmecology.

8. The President will find funding to cover the cost of managing and printing the journal and it will be published every two years.

[9. Post-meeting note: Martin Pfeiffer agreed to be co-editor of the journal; John and Martin were to draft guidelines for submission, and a proposed editorial board, for approval by the ANeT Committee in May 2006.]

Agenda Item 3: Next Meeting - 6th ANeT Seminar and Meeting (Date and Venue)

After some discussions, members agreed that the 6th ANeT Seminar and Meeting will be in India at the end of October 2007.

Agenda Item 4: New Members and Structure of Committee Membership

1. By December 2004, there were 54 members. By 30th November 2005 the total number of members was 61. The updated list of names of members will be provided by the secretariat. The breakdown of representation is as below:

1. Australia -	2 people	11. Malaysia -	9 people
2. Bangladesh -	1 person	12. Mongolia -	1 person
3. Belgium -	1 person	13. Myanmar -	1 person
4. China -	1 person	14. S.Korea -	1 person
5. Denmark -	1 person	15. Sri Lanka -	3 people
6. Germany -	3 people	16. Thailand -	7 people
7. India -	2 people	17. United Kingdom -	2 people
8. Indonesia -	5 people	18. United States -	4 people
9. Iran -	1 person	19. Vietnam -	1 person
10. Japan -	24 people		

2. The President reported that there is about RM 683.35 from previous fee collection, and Bakhtiar reported about RM1,000 fee had been collected in this meeting.

3. Members decided to set up a more structured Committee to reflect the size of ANeT and ensure effective division of responsibilities. A clear and simple constitution will be proposed and discussed for members' approval at ANeT 2007. In the meantime the committee is as follows, with the names of members volunteering to assist in the respective portfolios:

President: Prof. Datin Dr. Maryati Mohamed
Vice President / Coordinating Secretariat for 6th ANeT Seminar & Meeting 2007:
Dr. Himender Bharti

Secretaries: Mr. Bakhtiar Effendi Yahya (Kagoshima University, Japan) &
Ms. Petherine Jimbau (UMS, Malaysia)
Treasurer: Ms. Petherine Jimbau
Committee Members:
Action Plan: Dr. John Fellowes
Newsletter: Prof. Seiki Yamane, Dr. Decha Wiwatwitaya & Dr. Katsuyuki Eguchi
Journal: Dr. John Fellowes & Dr. Martin Pfeiffer
Other members: Dr. Bui Tuan Viet (Vietnam); Dr. Sriyani Dias (Sri Lanka); Dr. Yoshiaki Hashimoto (Japan); Dr. Rudy Kohout (Australia); Prof. Kazuo Ogata (Japan); Mr. Suputa (Indonesia).

4. There was a suggestion that other ANeT members may be nominated for Committee Membership, when there is a proposal by any member of ANeT and endorsed by Committee Members, during the next meeting. This suggestion will be incorporated in the draft constitution.

Agenda Item 5: Any Other Business

These are some comments and suggestions by members:

J. R. Fellowes: I'm not sure about previous members such as Prof. Kim, Dr. Erwin etc. who couldn't attend this workshop, or Dr. Rosli who could not attend the committee meeting. Also Eguchi san, who has been a central player in ANeT throughout. I would suggest all these are included in the provisional committee membership, but that by 2007 we need greater clarity on committee membership, its responsibilities and its duration, so that all members can understand the system.

Sk. Yamane: Also remind secretariat to inform members that articles for the newsletter must be submitted by the second week of December 2005, so that it can be published by the end of December 2005. [Post-meeting note: deadline postponed until the end of March?]

H. Bharti: Suggest that other members of ANeT should also start work on coding species of their specific genus.

J. R. Fellowes: Suggest that more communication between committee members be made through emails.

[Research Plan]

A First Step toward a Classification of *Crematogaster* in Asia

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Background

Many myrmecologists know that the genus *Crematogaster* is one of the most common ants occurring worldwide and most speciose in the tropics. The ants are easy to recognize but difficult to identify to species. The genus is conventionally divided into 16 subgenera, with approximately 400 described species in the world (Bolton, 1993). In Asia, about 200 species and subspecies have been named, in 11 subgenera, but the taxonomy is far from complete. If we could have more reliable groupings, we would be able to add further information to unnamed species (or those that are difficult to identify), like "subgenus A" or "sp. cf. x group". Here I would like to give a brief outline of *Crematogaster* in Asia as a first step to a comprehensive revision.

Subgenus-level classification was established in the slightly different systems of Wheeler (1922) and Emery (1922). The former included 13 subgenera and the latter 11 subgenera: *Rhachiocrema* and *Neocrema* were independent subgenera in Wheeler's but were included in *Orthocrema* in Emery's; *Eucrema* was independent in Wheeler's but was included in *Crematogaster* in Emery's, while conversely *Acrocoelia* was separated from *Crematogaster* in Emery's. Soulie (1965) treated the taxa in Emery's system as genera and did not cover all the additional ones including *Apterocrema*, *Colobocrema*, *Eucrema* and *Mesocrema*.

Table 1 compiles the number of species and subspecies, remarks and taxonomic references. Asian endemic subgenera are *Colobocrema*, *Paracrema*, *Physocrema*, *Rhachiocrema* and *Xiphocrema*. All of these include relatively small numbers of species. The subgenera *Crematogaster* and *Orthocrema* are difficult taxa. There is no justification for the monophyly of most of the present subgenera.

Tools for Identification

So far, there are no complete keys to species of *Crematogaster* in Asia. Several papers gave partial keys that could be helpful to some extent. For example, Menozzi (1935) gave a key to species of the subgenus '*Orthocrema*' in SE Asia. His key included 21 species of the Indo-Malayan region, some of which were transferred to the subgenus *Mesocrema* by Santschi (1928, 1937). Donisthorpe (1941) listed 7 species of *Physocrema* and gave a key to them, but it seems out of date. Creighton (1945) listed 4 *Rhachiocrema* species that could be identified with his key. In addition to those references, some regional keys are also available in India (Bingham, 1903), China (Wu & Wang, 1995) and Japan (Onoyama, 1998).

Some websites offer helpful photos of certain species, e.g. the "Formicidae" section provided by Lim & Pickerd under the "Discover Life" site of the University of Georgia *et al.*

Table 1. Asian subgenera of the genus Crematogaster.

Subgenus	Spp. & subspp. in Asia	Remarks	Reference
*Atopogyne**	1	11-segmented antenna with 3-segmented club. Promesonotal suture impressed. Mesonotum carinate in front. Also in Afrotropical, Palearctic & Neotropical regions.	
*Colobocrema**	1	11-segmented antenna with 2-segmented club. Head of the female truncate. Monotypic subgenus, similar to *Orthocrema*. Endemic to the Indo-Australian region.	
Crematogaster	91	11-segmented antenna with 3-segmented club. Most speciose, most difficult to identify. Worldwide.	
Decacrema	16	10-segmented antenna, small species. Arboreal. Also in Afrotropical & Malagasy regions.	
*Mesocrema**	11	11-segmented antenna with 2-segmented club. Postpetiole of female not enlarged. Similar to *Orthocrema*. Also in Afrotropical & Australian regions.	Menozzi, 1935
Orthocrema	32	11-segmented antenna with 2-segmented club. Petiole with parallel sides or nearly so. Worldwide.	Menozzi, 1935
Oxygyne	12	11-segmented antenna with 3-segmented club. Frontal carina short. Also in Afrotropical & Malagasy regions.	
Paracrema	16	11-segmented antenna with 4-segmented club or without a distinct club. Endemic to the Oriental + Indo-Australian regions	
Physocrema	14	11-segmented antenna with 3-segmented club. Propodeum bulbous. Endemic to the Oriental + Indo-Australian regions. Arboreal.	Donisthorpe, 1941
Rhachiocrema	4	11-segmented antenna with 2-segmented club. Propodeal spines well developed Endemic to the Oriental + Indo-Australian regions.	Creighton, 1945
Xiphocrema	7	11-segmented antenna with 3-segmented club. Spines present on pronotum. Endemic to the Indo-Australian region.	
Total	205		

* Identity unknown to me.

(http://www.discoverlife.org/nh/tx/Insecta/Hymenoptera/Formicidae/), "Antweb" by California Academy of Science (http://www.antweb.org/), "Ants of Costa Rica" by Longino (http://home.ripway.com/2004-9/170871/ants/genera/crematogaster/home.html), and "The Ants of Africa" by Taylor (http://www.antbase.org/ants/africa/clog10f.htm).

Specimens Wanted!!

This is the present situation of *Crematogaster* taxonomy in Asia. To solve the taxonomic impediment, we might start by distinguishing morphospecies regionally or revising conventional subgeneric classification. I am tackling the taxonomy of the genus now but the specimens I have are limited. Please show me those specimens of *Crematogaster* that might be put aside just labeled "*Crematogaster* sp." in your collection. I will give you more information on the specimens and hopefully identify them after careful study.

References

Bingham, C.T. 1903. *The fauna of British India, including Ceylon and Burma*. Hymenoptera 2. Ants and Cuckoo-Wasps. 506 pp. London.

Bolton, B. 1993. *A New General Catalogue of the Ants of the World*. 504 pp. Harvard University Press, Cambridge, Mass.

Creighton, W.S. 1945. Observations on the subgenus *Rhachiocrema* with the description of a new species from Borneo. *Psyche*, **52**: 109–118.

Donisthorpe, H. 1941. Description of a new species of *Crematogaster* Lund, subgenus *Physocrema* Forel, with a list of, and a key to, the known species of the subgenus. *Entomologist*, 74: 225–227.

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Soulie, J. 1965. Contribution a la systematique des fourmis de la tribu des Crematogastrini. *Annales de l'Universite d'Abidjan* (Sciences), **1**: 69–83.

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Wu, J. and Wang, C. 1995. *The Ants of China*. 214 pp. China Forestry Publishing House, Beijing. (In Chinese.)

[REGIONAL REPORT]

Overview of Ant Research in Sri Lanka: 2000 – 2004

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Subfamilies, Genera and Species Recorded from Sri Lanka

Research on the diversity of ants in Sri Lanka was started in January, 2000 under a grant offered by the National Science Foundation of Sri Lanka (RG/ZSSL/99/02) and I was able to list the ants kept at the National Museums, Colombo and the Department of Zoology, University of Kelaniya in ANeT NEWSLETTER No. 4. During this investigation, worker ants were collected by baited method, litter sieving and manually from four districts of Sri Lanka - Gampaha (including the premises of Kelaniya

University, other places outside this university, Maimbula forest and Pilikuththuwa forest), Colombo, Galle and Ratnapura (including the forest associated with the city reservoir - "Pompakelle") - Sooriyakanda forest in the range of Sinharaja) and identified to the furthest possible taxonomic level, with the kind assistance of Prof. Seiki Yamane, Kagoshima University, Japan and Associate Prof. M. B. Dubois, Myrmecological Museum of the Midwest, Illinois, U. S. A. Professor Seiki Yamane's assistance for this research was invaluable and he visited Sri Lanka in April, 2001; he donated the copies of very important books, research articles, equipment and other materials and advised me on this work. Several other members of ANeT also supported me in various ways such as donating books and research articles, discussion, via e-mail etc. This research was the basis for identifying the subfamilies, genera and some species of ants in Sri Lanka (Table 1) and focused only on the morphology of the workers. Most of the species are yet to be identified and identification to the species level needs the assistance of ant taxonomists.

Although only nine subfamilies have been found during this work, subfamily Leptanillinae has also been recorded from Sri Lanka (Bolton, 1995). I was awarded another Research Grant of NSF, Sri Lanka in December, 2003 (RG/2003/ZOO/06) to continue my research on Sri Lankan ants and we identified the members belonging to the tenth subfamily, Leptanillinae, during the present study. *Protanilla* (identification was confirmed by Mr. Barry Bolton, Natural History Museum, London) and *Leptanilla* were identified from the soil samples collected from "Pompakelle" and Gilimale forest, respectively. Some ants formerly belonging to subfamily Ponerinae were recently placed in separate subfamilies by Bolton (2003) and consequently, the number of subfamilies recorded from Sri Lanka rose to twelve including Amblyoponinae (*Amblyopone* sp. has been identified recently) and Ectatomminae (*Gnamptogenys* sp. is kept at the National Museums, Colombo).

Economically Important Ants

In addition to identification work, worker ants associated with pineapple fields in the wet zone (Gampaha district) were also studied as these ants are believed to spread the pineapple mealybug.

Table 1. Subfamilies (9), genera (35) and species (33) of worker ants identified during the previous investigation (NSF RG/ ZSSL/ 99/ 02)

AENICTINAE	DORYLINAE	MYRMICINAE	PONERINAE
Aenictus	*Dorylus*	*Cataulacus*	*Anochetus*
A. fergusoni	*D. orientalis*	*Crematogaster*	*Diacamma*
ANEURETINAE	FORMICINAE	*C. dohrni*	*D. rugosum*
Aneuretus	*Acropyga*	*Lophomyrmex*	*D. ceylonense*
A. simoni	*A. acutiventris*	*L. quadrispinosus*	*Hypoponera*
CERAPACHYINAE	*Anoplolepis*	*Meranoplus*	*Leptogenys*
Cerapachys	*A. gracilipes*	*M. bicolor*	*L. ocellifera*
DOLICHODERINAE	*Camponotus*	*Monomorium*	*Odontomachus*
Dolichoderus	*C. sericeus*	*M. destructor*	*O. simillimus*
Ochetellus	*C. variegatus*	*M. floricola*	*Pachycondyla*
O. glaber	*Lepisiota*	*M. pharaonis*	*P. luteipes*
Tapinoma	*L. capensis*	*Myrmicaria*	*Platythyrea*
T. melanocephalum	*Oecophylla*	*Pheidologeton*	*P. parallela*
T. indicum	*O. smaragdina*	*P. diversus*	PSEUDOMYRMECINAE
Technomyrmex	*Paratrechina*	*Pheidole*	*Tetraponera*
T. bicolor	*P. longicornis*	*Solenopsis*	*T. rufonigra*
T. elatior	*Polyrhachis*	*S. geminata*	*T. allaborans*
T. albipes	*P. rastellata*	*Strumigenys*	
	Prenolepis	*Tetramorium*	

Laboratory experiments were conducted to find out if some species of ants contribute to the spread of pineapple mealybug. Workers of *Paratrechina longicornis* and *Solenopsis geminata* were found to carry the mealybug from one pineapple fruit to another during this experiment (Hewavitharane, 2003; Sumanasinghe, 2001).

The Sri Lankan Relict Ant, *Aneuretus simoni* Emery

This species has been listed as a Critically Endangered and a threatened species in Sri Lanka by IUCN (Social Insects Specialists Group, 1996) and I suggest that more research must be carried out to find out if this is true!! As I mentioned during the presentation in Hanoi (Third ANeT Meeting), Prof. Seiki Yamane identified this species in April, 2001 in a sample from "Pompakelle" (the forest associated with the city reservoir) in Ratnapura. We observed this species in "Pompakelle" in April - May, 2002, August, 2003 and January - February 2004. The relative abundance of the workers of this species estimated by the laying of 30 quadrats in a selected region of "Pompakelle" in May, 2002 was 7 individuals m^2 and this was the dominant species in that region (Perera, 2003). This ant species was also observed in Gilimale forest, Ratnapura in February, 2004.

Current Research on Ants of Sri Lanka

1. A comparative study on the worker ant fauna in "Pompakelle", Gilimale forest and Sinharaja forests:

   This research is funded by the National Science Foundation of Sri Lanka (NSF RG/2003/ZOO/06) and a Ph. D. student (Miss. K. A. M. Perera) is working under the supervision of Prof. Sk. Yamane, Dr. Sriyani Dias and Dr. Nirmalee Pallewatta, University of Colombo, Sri Lanka.

2. Diversity of worker ants collected from two selected tree species in Gilimale forest:

   An undergraduate student is working on this project.

Publications/Oral Presentations on Ants

Chaminda, K.M.G.R. and Dias, R.K.S. 2001. *Taxonomic key for the identification of Sri Lankan ants: Subfamilies.* Third ANeT Seminar and Workshop held at the Institute of Ecology and Biological Resources, Hanoi, Vietnam on 4th Nov. 2001.

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Sumanasinghe, H.P.W. and Dias, R.K.S. 2002. Diversity of worker ants collected from four *Dysmicoccus brevipes* Cockerell infested and uninfested pineapple fields in Attanagalla and a preliminary study on the association between *Paratrechina longicornis* Latreille and *Dysmicoccus brevipes* (Abstract). Proceedings of the 58 th Annual Sessions of SLAAS, p. 168.

Dias, R. K. S. and Perera, K. A. M. 2004. Estimation of the relative abundance of *Aneuretus simoni* Emery in "Pompakelle" using four sampling methods (Abstract). In: Sri Lanka Association for Advancement of Science Press.

Theses (Unpublished) Based on Ant Research Submitted as a Partial Requirement for B. Sc. (Special) Degrees in Zoology at University of Kelaniya, Sri Lanka:

Sumanasinghe, H.P.W., 2001. Diversity of worker ants (Hymenoptera, Formicidae) collected from four pineapple fields and some biological aspects of *Paratrechina longicornis* Latreille, a selected formicine ant found in the pineapple fields infested with *Dysmicoccus brevipes.*

Perera, K.A.M., 2003. The relative abundance and density of *Aneuretus simoni* Emery (Hymenoptera, Formicidae) in a selected region in the forest associated with water pumping station in Ratnapura.

Hewavitharane, H. M.P., 2003. Diversity and community composition of foraging worker ants (Order: Hymenoptera) collected from pineapple plants infested with *Dysmicoccus brevipes* Cockerell and a laboratory study on the association between *Dysmicoccus brevipes* and two common ant species, *Anoplolepis gracilipes* and *Solenopsis geminata.*

Other References Cited

Bolton, B. 1995. *A New General Catalogue of the Ants of the World.* Cambridge, Mass. 504 pp.

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Social Insects Specialist Group 1996. *Aneuretus simoni.* In: IUCN 2003. 2003 IUCN Red List of Threatened Species. <www.redlist.org>. Downloaded on 22 September 2004.

[Research Article]

A Preliminary Survey on the Species Composition and Nesting Habits of Ants in the Bogdkhan Mountain Region, North Central Mongolia

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Introduction

The ants of the Bogdkhan mountain region, north central Mongolia, have been studied by Dlussky (1965), Pisarski (1969a, b), Dlussky and Pisarski (1970), Pisarski and Krzysztofiak (1981). They recorded 26 species belonging to six genera in two subfamilies. However, since the 1990s several important taxonomic papers on the ants of the northern Palaearctic region have appeared (e.g., Seifert, 1992, 2000; Radchenko, 2004), with descriptions of new species and changes in name and taxonomic status of a number of species. Thus care should be taken when citing some of the earlier papers. Recently Pfeiffer *et al.* (in press) has listed all the known species of ants from Mongolia, but localities for each species are often not stated.

We collected ants from this mountain region in 2003, 2004 and 2005. Although the area covered was rather restricted, our data are based on colony collection and thus provide information on nesting habits of ants in this region. Since we did not examine the materials used in the studies by *previous* authors, it was not easy to match the species names between our list and theirs. Here we present the list of ants collected by us with information on nesting habits. A list of species recorded by previous authors is prepared separately, and comments are made regarding some species.

Research Sites and Methods

Mongolia stretches across Central Asia and has an average elevation of 1,580 m above sea level, almost 80% being located at elevations of more than 1,000 m and with an extreme continental climate. The Bogdkhan mountains (47°45'N, 107°11'E) are located at the south-western boundary of the Khentii Mountain range in north central Mongolia, and characterized by cold winters, cool summers and sharp continental climatic features. In this mountain system four vegetational subzones, i.e., alpine taiga, alpine forest, forest steppe and arid steppe, are recognised. The annual mean air temperature ranges from -2.5 to -3.1°C, with the coldest mean air temperature in January being -19°C to -24°C, and the highest mean temperature in July being +14.5°C to +16.8°C.

We conducted myrmecological surveys mainly in late June to early July 2003 and April and early August 2004. Ants were collected from several gullies of the mountain. Colonies were found by searching the ground surface, and nest site types were recorded.

Results

Species collected

Seventeen species belonging to six genera were collected (Table 1). All the species belong to either of Formicinae or Myrmicinae. The most speciose genus was *Formica*, of which eight species in three subgenera were found. In one case *F.* (*Serviformica*) *candida* was collected together with *F.* (*Raptiformica*) *sanguinea* from one and the same nest, and in another case *F.* (*Formica*) *lugubris* was collected together with *F.* (*Serviformica*) *lemani* from under the same stone. Among ten colonies of *Myrmica* collected only one was of *M. pisarskii*, all the others being of *M. angulinodis*.

Nesting Sites

Ants were collected from a total of 43 colonies. Three types of nesting were recognised:

1) Nests with a mound on the ground level (mounds were made mainly of dead larch leaves, with pebbles, pieces of dead twigs etc.), but nest chambers often extended underground. Species of the subgenus *Formica* constructed larger and taller mounds, while in those of the subgenus *Coptoformica* mounds were smaller, with a flat upper surface.

Table 1. List of ant species collected in 2003 and 2004.

Species	Habitat	Nest site/type*
FORMICINAE		
Camponotus japonicus		
Camponotus sachalinensis	*Larix* forest	Rotting wood (1); dead stump (1)
Camponotus saxatilis		Under stone (1)
Formica (*Coptoformica*) *exsecta*	Grassland; *Larix* forest; NPO plantation site	Mound (2); rotting wood (1)
Formica (*Coptoformica*) *pisarskii*		
Formica (*Formica*) *aquilonia*	NPO plantation site	Mound (3)
Formica (*Formica*) *lugubris*	Sparse *Betula* forest	Mound (1); under stone/in soil (1) (with *F. lemani*)
Formica (*Raptiformica*) *sanguinea*	Very sparse grassland	Under stone (1) (with *F. candida*)
Formica (*Serviformica*) *candida*		Under stone (2); unknown (1)
Formica (*Serviformica*) *kozlovi*	Sparse *Larix* forest, etc.	Under stone (2); under log (1); rotting wood (3)
Formica (*Serviformica*) *lemani*	Forest steppe, *Larix* forest	Under stone (1); rotting wood (1)
Lasius gebaueri		Under stone (1)
MYRMICINAE		
Leptothorax acervorum	Relatively dark forest	Rotting wood (3)
Leptothorax muscorum	Forest	Under stone (6)
Myrmica angulinodis	*Larix-Betula* mixed forest, etc.	Under stone (2); rotting wood (6); rotting stump (1)
Myrmica pisarskii		Under stone (1)
Temnothorax nassonovi		

* The number of nests sampled is given in parentheses. Nests under stones usually extended into soil.

2) Nests under stones (or sometimes under logs) but often with a larger portion in the soil. This type was seen in *Camponotus saxatilis*, *Formica* (*Raptiformica*) *sanguinea*, species of the subgenus *Serviformica*, *Lasius gebaueri*, *Leptothorax muscorum*, *Myrmica angulinodis* (one of nine nests sampled) and *Myrmica pisarskii*. *Formica* (*Formica*) *lugubris*, probably a mound maker, was once found from under a stone together with *F.* (*Serviformica*) *lemani*.

3) Nests in dead/rotting twigs, logs or stumps. The substrates were largely twigs/logs of white birch and larch in forest-steppe. This type was seen in *Leptothorax acervorum* (in rather dense forests), *Myrmica anguinodis*, *Camponotus sachalinensis*, *Formica* (*Coptoformica*) *exsecta* (only on one occasion), *F.* (*Serviformica*) *kozlovi* (three of six colonies sampled), and *F.* (*S.*) *lemani* (one of two colonies sampled).

Only one nest type was observed for each species, with some exceptions mentioned above. In the genus *Formica* each subgenus had a characteristic nesting type, though *Serviformica* species were rather flexible in nesting behaviour.

Table 2. List of ant species that were previously recorded from Bogdkhan.

Species	Literature	Remarks
FORMICINAE		
Camponotus japonicus aterrimus	Pisarski, 1969a,b; Dlussky & Pisarski, 1970; Pisarski & Krzysztofiak, 1981	Currently the subspecific name *aterrimus* is omitted
Camponotus herculeanus sachalinensis	Pisarski, 1969b; Dlussky & Pisarski, 1970; Pisarski & Krzysztofiak, 1981	Currently *sachalinensis* is raised to species rank
Formica (*Coptoformica*) *pisarskii*	Pisarski, 1969b	
Formica (*Formica*) *lugubris*	Pisarski, 1969a	
Formica (*Raptiformica*) *sanguinea*	Dlussky, 1965; Pisarski, 1969a	
Formica (*Serviformica*) *longiceps*	Pisarski, 1969b (environs d'Oulan-Bator)	Pfeiffer *et al.* (in press) omitted this species from the Mongolian fauna
Formica (*Serviformica*) *picea*	Pisarski, 1969a; Dlussky & Pisarski, 1970; Pisarski & Krzysztofiak, 1981	*F. picea* was replaced by *F. candida* (Bolton, 1995)
Formica (*Serviformica*) *kozlovi*	Pisarski, 1969a,b; Pisarski & Krzysztofiak, 1981	
Formica (*Formica*) *truncorum*	Pisarski, 1969a	
Formica (*Formica*) *polyctena*	Pisarski, 1969a	
Formica (*Serviformica*) *lemani*	Pisarski, 1969a; Dlussky & Pisarski, 1970; Pisarski & Krzysztofiak, 1981	
Formica brunneonitida	Pisarski, 1969b (environs d'Oulan-Bator)	
Formica uralensis	Pisarski, 1969a	
Lasius alienus	Pisarski, 1969a,b; Dlussky & Pisarski, 1970; Pisarski & Krzysztofiak, 1981	Pfeiffer *et al.* (in press) omitted this species from the Mongolian fauna
Lasius distinguendus	Pisarski, 1969a	Very probably *L. przewalskii* (see Pfeiffer *et al.*, in press)

Table 2. Continued.

Species	Literature	Remarks
MYRMICINAE		
Harpagoxenus zaisanicus	Pisarski, 1963, 1969a	Originally described from Zaisan, Bogdkhan (Pisarski, 1963)
Leptothorax acervorum nigrescens	Pisarski, 1969a,b; Pisarski & Krzysztofiak, 1981	Currently the subspecific name *nigrescensis* omitted
Leptothorax muscorum	Pisarski, 1969a,b; Dlussky & Pisarski, 1970; Pisarski & Krzysztofiak, 1981	
Leptothorax kaszabi	Pisarski and Krzysztofiak, 1981	Transferred to *Temnothorax* (Bolton, 1995; Radchenko, 2004)
Myrmica angulinodis	Pisarski, 1969a,b; Dlussky & Pisarski, 1970; Pisarski & Krzysztofiak, 1981	
Myrmica bergi divergens	Pisarski, 1969b; Dlussky & Pisarski, 1970	*M. divergens* is currently treated as a distinct species
Myrmica arnoldii	Pisarski, 1969b (environs d'Oulan-Bator)	
Myrmica sulcinodis	Pisarski, 1969a	
Myrmica forcipata	Pisarski, 1969a,b	
Myrmica kasczenkoi	Pisarski, 1969a,b	
Myrmica saposhnikovi saposhnikovi	Pisarski, 1969b	This is probably *M. pisarski*

Discussion

Our list contains only 17 species, while previous authors recorded 26 species (Table 2; but for three of them the locality was described as "environs d'Oulan-Bator"). The largest difference lies in the number of *Myrmica* species, namely two versus eight. A social parasite of *Leptothorax* species, *Harpagoxenus zaisanicus*, originally described from the Bogdkhan mountains, was not collected this time. Among the "species" which were not collected by us, *Myrmica saposhnikovi* most probably corresponds to our *M. pisarskii*, and *Lasius alienus* possibly to *L. gebaueri*, the latter having been described recently from Tibet by Seifert (1992) and recorded by Pfeiffer *et al.* (in press) for the first time from Mongolia. Seifert (1992) did not examine any specimen of *L. alienus* from Mongolia. The record of *Formica* (*Coptoformica*) *longiceps* from north central Mongolia (Pisarski, 1969) is somewhat doubtful and Pfeiffer *et al.* (in press) omitted this species from the Mongolian fauna. Identification of some other species such as *Formica* (*Formica*) *truncorum*, *F.* (*F.*) *polyctena* and *Lasius distinguenda* also need reconfirmation. Species recorded here for the first time are *Camponotus saxatilis*, *Formica* (*Coptoformica*) *exsecta*, *Lasius gebaueri* (but see above), *Myrmica pisarskii* (but see above), and *Temnothorax nassonovi*.

Nesting types of ants are systematically reported for Bogdkhan ants for the first time. As mentioned above each species generally has a particular type of nesting habit. But although in *Formica* each subgenus tends to construct their nests in a particular way, some species can have different types of nests. Nest sharing or social parasitism further complicates the situation. When two species with different nesting types live together, a species may be found from an unusual site, e.g., a mound making species from under a stone. This time we did not examine dead parts of living trees, which are sometimes used by *Camponotus* species in other places in northern Mongolia. Underground

nesters that do not construct a mound (or species not utilizing stones) were also not detected during our surveys. We expect to find more types of nesting sites as more thorough surveys are made in the future.

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[Research Article]

Note on the Bait Trapping Method

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Introduction

In a survey for an inventory, the collecting method is required to cover as many species as possible. To make a rapid investigation there are several methods. Bait trapping with various substances is a kind of passive attractant methods to sample ants, which does not require special skill on the part of investigators. Because baiting is a simple, inexpensive, and rapid way of sampling, it is frequently used to estimate the composition and richness of the active ground-foraging ant fauna, although the community composition collected by baiting was noted to be biased by various factors (Bestelmeyer *et al.*, 2000). Conventionally various nutrients have been used as bait substances and a comparative study in the tropics was reported by Delabie *et al.* (2000). The present paper reports the results of bait trappings in forest and grassland habitats of the temperate area using different bait substances.

Material and Methods

Study Sites

The experiment was carried out in two kinds of habitats: forest (Kashii-gu Shrine, Fukuoka City) and grassland (Hakozaki Campus, Kyushu University, Fukuoka City). The site in Kashii-gu Shrine is an evergreen broadleaved forest with closed canopy (ca. 3 ha) preserved well over long term. The site in Hakozaki Campus of Kyushu University is a grassy area (ca. 1 ha) predominantly covered by *Poa pratensis*.

Kinds of Bait Substances and Trap Setting

Three kinds of bait substances were prepared: butter as fat bait, sugar solution as carbohydrate bait, and oil-free canned tuna as protein bait. Bait quantity was as follows: butter bait = 0.5 g; sugar bait = sanitary cotton (4 x 4 cm) immersed with 30 % sugar solution; tuna bait = 2 g. Each bait was put on a Petri dish (6 cm in diameter). In each habitat, a 145-m transect was set up randomly and divided into three sections, each of which included 10 traps placed at intervals of 5 m on a 45-m transect. To see the sampling effect in different bait substances, the trap settings were conducted three times: the first day is for butter bait, the second day for sugar bait and the third day for tuna bait. The traps were placed at exactly the same points and the same time of day. In the forest site, sampling was conducted on 27 and 29 August and 10 September, 2002, from 9:00 am to 10:30 am; in the grassland site, on 4, 5 and 9 September, 2002. All the sampling was executed under fine weather conditions. One and half hours after placing the bait trap on the ground, the lid of the Petri dish was closed and

the ants were killed with ethyl acetate. After the materials were brought back to the laboratory, ant species were identified and the number of individuals was counted.

Data Analysis

Species richness — In order to check whether species richness was different among bait substances, Friedman's test was applied.

Composition of species — To compare the species compositions collected by different bait substances, we used the Jaccard's coefficient of community.

Results and Discussion

Species Richness at the Baits

A total of 17 species of ants were collected in the present study: 11 species in forest and 12 in grassland, with 7 species common to both (Table 1). Seemingly Table 1 shows that some species preferred a particular bait substance. For example, *Camponotus vitiosus*, *Crematogaster matsumurai*, *Ochetellus glaber*, and *Tetramorium nipponense* were collected only by tuna bait. But we cannot conclude that tuna bait is the best choice for these ants, because the collected ants would be affected not only by their preference, but also by the behavioral dominance of colonies or by chance in finding the bait. In the case of *Lasius japonicus*, the species was collected only by tuna bait in the section 3 while only by sugar bait in the section 1 in the forest.

The number of ant species collected at a single bait trap was 1.73 on average with a rang of 0 to 4 species. The lower number of collected species at a single bait is caused by monopoly of dominant, mass-recruiting species (e.g., *Pheidole noda*, *Monomorium chinense*, *M. intrudens*, *Ochetellus glaber*, *Crematogaster osakensis*).

Table 1. List of ants collected by three kinds of bait substances.

	Forest			Grassland		
Species	Section 1	Section 2	Section 3	Section 1	Section 2	Section 3
Aphaenogaster famelica	B T	B S	-	-	-	-
Camponotus japonicus	-	B S T	S	B S T	-	-
Camponotus vitiosus	-	-	-	-	T	T
Crematogaster matsumurai	-	-	-	-	T	T
Crematogaster osakensis	B S T	B S T	S T	-	-	-
Formica hayashi	-	B T	S T	-	-	-
Formica japonica	-	-	-	S T	S	S
Lasius japonicus	S	-	T	-	-	-
Monomorium chinense	-	-	S	B S T	B S T	B S T
Monomorium intrudens	B S	B S T	T	-	-	T
Ochetellus glaber	-	-	-	-	T	-
Paratrechina flavipes	S T	B S T	B S T	-	-	T
Paratrechina sakurae	-	-	-	-	-	S
Pheidole noda	B S T	B S T	B S T	B S T	B S T	B S T
Pristomyrmex punctatus	T	S T	-	S	-	-
Tetramorium nipponense	-	-	T	-	-	-
Tetramorium tsushimae	-	-	-	B S T	S	S
No. of collected species	7	8	9	6	6	9
Total no. of species		11			12	

Abbreviations: B, Butter; S, Sugar; T, Tuna

In each section, the number of collected species varied from 2 to 7 and there was no significant difference among the three bait substances in the number of species collected both in the forest and grassland habitats (Table 2). The average number of species in a section through all kinds of bait substances was 5.6 in the forest site and 4.6 in the grassland site. These figures would be a reference for setting bait traps.

Table 2. Number of species in different bait substances.

	Forest				Grassland			
	Section 1	Section 2	Section 3	χ^2_r	Section 1	Section 2	Section 3	χ^2_r
Tuna	5	7	7		5	6	7	
Sugar	5	7	6	3.71 n.s.[1]	6	3	5	3.82 n.s.[1]
Butter	4	7	2		4	3	3	

([1]: Friedman's test, n=3 in each habitat, Degree of freedom=2, $P<0.05$)

Composition of Species

Table 3 shows two kinds of similarity values of species composition expressed by the Jacquard's coefficient, those between bait substances (left) and between sections (right) in forest and grassland. The lowest similarity (0.29) was observed in sections 2–3 by butter bait of forest site. Butter–sugar baits in the section 3, sections 1–3 by tuna bait in forest site were also showed low value (0.33). Although we did not execute statistical test because of the lack of replicates, the present data suggested two points:

(1) Species compositions collected by different kinds of bait substances were not constant even in the same habitat.

(2) Similarity values between sections were not always consistent in different bait substances.

Table 3. Similarity of species composition (values are expressed by Jaccard's coefficient).

A. Forest sites

	Section 1	Section 2	Section 3		Butter	Sugar	Tuna
Butter–Sugar	0.50	0.75	0.33	Sections 1–2	0.43	0.50	0.50
Sugar–Tuna	0.43	0.75	0.50	Sections 2–3	0.29	0.44	0.56
Tuna–Butter	0.50	0.75	0.29	Sections 3–1	0.40	0.38	0.33

B. Grassland site

	Section 1	Section 2	Section 3		Butter	Sugar	Tuna
Butter–Sugar	0.67	0.50	0.60	Sections 1–2	0.75	0.50	0.38
Sugar–Tuna	0.83	0.43	0.33	Sections 2–3	1.00	0.60	0.63
Tuna–Butter	0.80	0.50	0.43	Sections 3–1	0.75	0.57	0.33

Bestelmeyer *et al.* (2000) referred to Brandao and Silvestre's experiment where they compared species composition collected by tuna or sardine with that by honey-water baits and found no significant difference. We cannot conclude whether different bait substances affect the composition of species by our experiment here but some practical matters should be noted: oily substances sometimes pollute the trapped ants and tuna tends to be stolen by small mammals and birds. Further detailed design of the experiment would be necessary in evaluating the choice of bait substance.

In the forest site of the present study, we have collected 32 species so far by various sampling methods (Kuboki, in Hosoishi 2006), and the present study covered only a part of them even in different bait substances. The ants collected by the bait traps were trophic generalists, and specialized predators (e.g., dacetines and ponerines) were not sampled in the present study. Delabie *et al.* (2000) suggested that the combination of different collecting methods, in particular the inclusion of Winkler extraction, is necessary for complete inventory.

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Notice!

This is the final issue of ANeT Newsletter which is printed on paper. From No. 9 onward the newsletter will be put on ANeT website. With this change editors also change to Dr. Katsuyuki Eguchi and Dr. Yoshiaki Hashimoto. A general guideline is as follows:

1. The ANeT Newsletter will be issued on our website with irregular intervals when articles up to 4 pages in A4 size are submitted.
2. We will accept research news, event information, self introduction, short essays etc. Meeting records are also inserted. In particular smaller items of news should be welcome. However, every original paper including a short communication should be pun on the new journal (Asian Myrmecology).
3. Manuscripts are accepted at any time. Please ask native English speakers to check English before submission. This is not obligate but highly recommended.
4. Send manuscripts to K. Eguchi (Katsuyuki.Eguchi@mc6.seikyou.ne.jp) as attached files (MS Word) or texts.

We wish to thank Dr. Rosli Hashim and his students for their arrangement of the 5th workshop. We enjoyed it very much!

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