ANeT Newsletter

No. 10 — May 2008

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International Network for the Study of Asian Ants

ANeT 6: MYRMECOLOGISTS CONVERGE ON THE PUNJAB

John R. Fellowes

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The 6th ANeT workshop was held on 10–13 October 2007 at the Punjabi University in Patiala, Punjab, India. The first "ANeT" to be held in India, and indeed the first outside Southeast Asia, was hosted by Network vice-president Dr. Himender Bharti and the university's Department of Zoology. ANeT president Prof. Datin Dr. Maryati Mohamed was unable to attend in person but sent her blessings, and over half the ANeT Committee were present among some 70 delegates from 16 countries. In an opening ceremony attended by Professor M.S. Saini and other senior staff of the Department, Dr. Rudy Kohout from Australia was fittingly honoured with a special award for his contribution to myrmecology in Asia.

This year I had the privilege of giving the opening keynote lecture, on ants in biodiversity conservation and possible functions of a new global Ant Specialist Group, which might build on the preliminary work for an action plan on the ants of Asia. The final "keynote" was by Dr. Martin Pfeiffer, who reported his own and others' progress in elucidating ecological patterns, and who raised exciting possibilities for a globalised www.antbase.net, offering pages for Asian collections and curators. Between these came some 60 talks over two days, on an array of topics. Recurring themes included ants in biological control, succession, functional groups (ever-controversial in Asia, and in need of thoughtful adaptation), ant community composition in oilpalm plantations, and ant navigation. Highlights included slick behavioural expositions by Dr Ajay Narendra and Dr Simon Robson, and excellent reports from undergraduate and even school projects (respectively, Ivy So from Hong Kong, and Kazuma Tashiro & Hiromi Yadori from Japan). Importantly Rudy Kohout reported

on progress in piloting a coding system for all ants (named and unnamed) in ANeT collections, starting with *Polyrhachis*. Also in the mix were a lot of talks on honeybees and other Hymenoptera, broadening the myrmecologists' horizons. The packed programme could only pique rather than sate curiosity in many projects, but the relaxed buffet mealtimes allowed speakers to be quizzed at greater length.

A special feature of the meeting was the lavish welcome laid on by the students of the Department, beginning with the "colour architecture" floor decorations (more poetically, rangoli in Punjabi), made of multicoloured chalk-dust, rice and petals. It culminated in a vibrant performance of Punjabi song and dance: after a stirring rendition of the Tarana-e-Hindi (Anthem of the People of Hindustan) by young Urvija Bharti, sets included a fusion of Bollywood-style love story and social-insect life cycle, graceful patriotic solo dances, the male bhangra – staff-wielding acrobatics in traditional attire to a powerful drumbeat and other-worldly chanting – and the pulsating female giddha, with boliyan songs punctuated by vigorous clapping in a swirl of bright colour. The evening turned into a celebration of the wedding anniversary of our hard-working hosts, Drs Himender and Meenakshi Bharti. Certain delegates were even persuaded to join in the dancing, with admittedly more good-will than flair.

A field trip to the Himalayan foothills allowed a little collecting and relaxation, as well as some glimpses of rural life. Throughout, students and staff provided friendly support and hospitality. Meanwhile on the campus the likes of *Camponotus compressus* and *Cataglyphis setipes*, among the various birds and plants, diverted us during interludes in the sun.

The ANeT Committee met on the evening of 14 October, and arrived (more by ant- than bee-line) at several conclusions, which were reported and further discussed among the wider membership the following morning. It was agreed that the main officers of ANeT should for now remain unchanged, with Datin Maryati Mohamed asked to remain in the honorary position of president, Himender Bharti as vice president, Dr. Bakhtiar Effendi as secretary and Petherine Jimbau as treasurer. The terms of reference of the committee were to be more clearly articulated, and Bakhtiar, now with a permanent base at the UMS office, was to take up a more central coordinating role for more efficient communication. It was proposed that the roles of country representatives be more clearly defined, and that members from each Asian country or region were to be invited to select a representative based on their expected effectiveness as a network "node". Further details will emerge shortly.

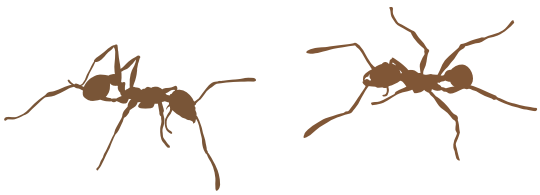
No firm conclusion could be reached on the venue for "ANeT 7" in 2009. Candidates to be assessed for feasibility were Indonesia, Sri Lanka and southern Thailand, with a decision expected by December 2007. Himender Bharti, Bakhtiar, Prof. Yamane and other committee members expressed willingness to help the workshop coordinators based on their experience. A particular point to work on will be scheduling, which has caused difficulties in some workshops and which needs to be fixed in advance to ensure all delegates know the time allotted for their presentations. The idea was also raised, "in the corridors," of some capacity-building seminars within the meeting, to help students and others with techniques such as effective public speaking, study design and scientific writing. The committee welcomes all ideas.

ANeT membership fees were discussed, and most members present were prepared to consider paying fees higher than the current (US$5) rate, if this helped subsidise student membership; the secretariat was asked to clarify the pros and cons of this with reference to previous income and expenditure. The discussion overlapped with that on subscription for the journal, for which only the first volume has confirmed funding.

Following some printing hitches it was impossible to unveil the first issue of the new journal Asian Myrmecology at the workshop. Instead some draft copies were circulated, and the initial response seemed favourable. A brief meeting of the journal's Editorial Board agreed that Simon Robson will become co-editor with Martin Pfeiffer and myself, bringing his valuable biological and statistical expertise to the team as well as some English-editing support. Another proposal endorsed by the Board was to invite, as appropriate, an additional (third) review of each paper by a more junior scientist, giving them experience of this important role and perhaps nudging all authors toward a style accessible to beginners.

Not all the papers submitted to this meeting will be suited to Asian Myrmecology, and it was agreed that a proceedings will be published by the Punjabi University, edited by Himender Bharti. Authors of abstracts will be contacted in due course to invite full papers for review and publication; the ANeT committee will help decide the most appropriate channel for publication (including journal, proceedings or newsletter). Authors will then be contacted for a final say.

In all the sixth ANeT workshop offered a great networking opportunity for all concerned, and allowed a lot of friendships to be begun or rekindled. The new members from India and elsewhere will undoubtedly enrich the Network, and there was enthusiasm for a national ANeT subgroup for India – perhaps one of many such subgroups. On behalf of all the guests heartfelt thanks go to our hosts, and roll on number seven.



A NEW INTERNET DATABASE ON ANT RESEARCHERS COMES WITH HOMEPAGES FOR ALL ANeT MEMBERS

Martin Pfeiffer and Hans Peter Katzmann

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Linking to the scientific community by establishing a homepage in the Internet is very easy for myrmecologists with the latest project of www.antbase.net. In an attempt to improve communication between scientists of ANeT, www.antbase.net now provides net space for those ant researchers that want to present their work on an own homepage in English language. At the same time we have started to build up a database on ant researchers that will be searchable for keywords, names and addresses. This will also be an effort to provide better access to Asian ant literature, especially to those publications that are not yet included into free accessible international literature databases.

At the end of 2007 we have sent an Excel sheet to all ant researchers that are on the ANeT mailing list, other interested people may download the sheet at www.antbase.net. On the sheet you can give your personal information, including name, institution, address, email, research interests and publication list (with English titles). Those who want may also include pdfs of their publications, links to their personal homepages, etc.. We hope that you will also include a photograph to make it easier for the people to remember and identify you.

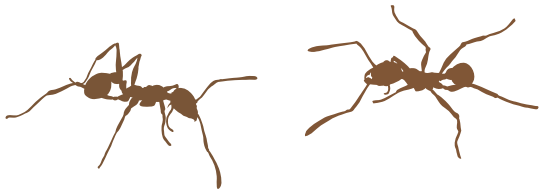
From these datasheets we will generate homepages that are searchable by Google and will present the information in the internet. For every researcher www.antbase.net will present an own personal homepage with a permanent web address. Of course these homepages are standardized and not very individual; however, those who want may send us an additional html file that can be linked to the form. There is also the possibility to include your CV in a pdf file linked to the page. We will provide links to your personal homepage, so everybody that will find your name in the database will be redirected to your website.

Up to now we have put about 30 researcher homepages to the internet, including those of professors and doctors, as well as of advanced students and scientific engaged amateur entomologists. We invite all other ANeT members and other ant researchers to establish their homepages, too. The homepages are accessible at http://www.antbase.net/researchers/index.html. In order to provide proper information we will recheck your data regularly and continually update the websites.

Those who did not want to establish an own homepage are invited to put their data only to the researcher database. All homepage data will be later included in this database, too. Especially, all publications on the publication lists will be incorporated in a literature database of Asian ant research that will be finally included into the Formis database (see l).

If you still have no own English homepage, the easiest way to get one is to cooperate in our project that will be hopefully a step towards a better cooperation among myrmecologists. Please pass the information about our projects on to those of your colleagues that are not on the ANeT list.

For further questions on the project send an email to: hanspeter.katzmann@antbase.net and refer to our website www.antbase.net.



ANTS AND SPECIATION PATTERNS

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The process of speciation has been a debated issue among evolutionary biologists for a long time now. How new species originate in nature and which selective agents force them to do so has been a puzzling question. Various models have been proposed theoretically, but the most accepted model to date is allopatric speciation, i.e. reproductive isolation attained by geographical separation. The late evolutionary biologist Ernst Mayr argued throughout his life in favour of allopatric speciation, but other models gained momentum as well. Guy Bush's findings in 1969 on fruitflies set the tone with the sympatric mode (in which reproductive isolation occurs without geographical separation). Subsequently there was recognition of other modes: peripatric (speciation by modification of peripherally isolated founder populations), parapatric (where populations have contiguous but not overlapping ranges) and stasipatric (speciation by chromosomal rearrangements giving homozygotes which are adaptively superior in part of the original range). Although it is hard to conceive of the forces that can prevent gene exchange in sympatry, scientific evidence has been pouring in consistently (Butlin & Tregenza, 1997; Dieckmann & Doebeli, 1999; Coyne & Orr, 2004; Feder *et al.*, 2005; Balakrishnan & Sorenson, 2006).

Ants could act as model organisms for the study of speciation patterns. Scattered evidence has trickled in from studies conducted on ants, but no serious effort has been made to investigate ants as model organisms. I wish to present here some plausible reasons to do so. They have been haunting my mind for a long time now; it seems timely to share them, as perhaps we will reach a pinnacle of myrmecological work in the coming years, given the efforts being put forth by ANeT and other myrmecologists around the globe.

1. The mode of reproduction in ants is based on the haplodiploidy phenomenon, the males being haploid and the workers and queens being diploid. Males receive only one genetic

complement (say either N_1 or N_2) whereas females receive two genetic complements (N_1 and N_2). Males with either the N_1 or N_2 genetic complement from the same mother queen may fertilize a female, depending upon their reproductive fitness. So either type of male can fertilize the egg, and consequently some future queens will be heterozygous, others homozygous. In the case that these different populations are subject to different selection pressures for a long time, they may end up as different species through the fixation of certain homozygous genes with favourable pleiotropic effects.

The increase in population variability associated with fixation of certain genes is also favoured by the fact that oogenesis in Hymenoptera is a continuous process (Buning, 1994). The more eggs are produced, the more cell divisions are required to produce each egg. If large number of eggs destined to be workers are produced before laying the eggs destined to be reproductives, then the overall number of cell divisions taken to produce sexual offspring will be much higher than in non-social species. The rate of DNA copy error mutations is higher in sexual offspring (Bromham & Leys, 2005). So, more mutations occur per generation and species with shorter generation turnover time are assumed to have more DNA replications.

Furthermore, the number of reproductive individuals which contribute alleles to the next generation is lower in the case of ants and other social insects. So, small populations of reproductives are subject to drift and selection as compared with large populations. In one instance Shoemaker & Ross (1996) examined variation in mitochondrial DNA and two unique nuclear genes in *Solenopsis invicta* demonstrating the potential for social selection to generate significant barriers to gene flow and to initiate reproductive isolation. Interestingly sympatric speciation has been predicted to be faster and involve fewer loci than allopatric (Via, 2001).

2. Another important aspect which can provide vital clues about sympatric speciation is social parasitism in ants. Buschinger (1990), a pioneer in the study of social parasites in ants, addressed the issue comprehensively. Even Ernst Mayr agreed that socially parasitic ants are the most convincing example for the existence of sympatric speciation (A. Buschinger, pers. comm., dated 29/4/2007, 12:12AM). Recently mitochondrial DNA studies conducted on social parasites by Savolainen & Vepsalainen (2003) provided some evidence for this mode of speciation. Bromham & Leys (2005) predicted that most social parasites should have faster rates of molecular evolution than their social relatives, which is consistent with an effect of reduced population size. In this pretext if more molecular studies were conducted on social parasites the results could be intriguing.

3. Since MacArthur and Wilson's (1963) theory of island biogeography many arguments had cropped up regarding its application, before Emerson & Kolm (2005) provided evidence based on their studies on the Canary and Hawaiian islands. The central tenet of their theory was that species diversity may itself promote speciation. They argued that the number of endemic species is expected to increase with an increase in species diversity. The applicability of the theory has proven equally good for mountain systems like the Himalaya. Studies conducted by the author reveal that about 45% of the Himalayan ant fauna (at more than 1000 metres above sea level) is endemic, though most of them have wide altitudinal ranges (Bharti,2008). The only plausible reason for such a high level of

endemism is local speciation; under the alternative explanation, that these populations originated in adjoining regions and spread to the Himalaya, where they evolved into new species, we might expect to encounter the parent species throughout the adjoining regions and the Himalaya, which is not the case up to now. On the contrary allied ant species reported from high-altitude regions show pronounced differences among them – other interpretation of character displacement, as noted by Brown & Wilson (1956) – is possible through sympatric speciation.

4. Finally it's interesting to wonder why some ant genera, like *Pheidole*, *Camponotus*, *Polyrhachis* etc., are more diverse/hyperdiverse. What factors have driven speciation rates to be faster in these as compared to others (or else made extinction rates slower)? Which mode of speciation accounts for this radiation? Can allopatry drive speciation at such a high rate (keeping in mind the number of new genera and species reported in ants in recent years)?

   Is this hyperdiversity general or patchy? Within the Himalayas, the genus *Myrmica* has the highest number of species (above 1000 m asl), more than *Pheidole* or any other genus, and the highest number of endemic species. Results in the coming years may reveal similar patterns in *Leptothorax* and *Lasius*. Probably species diversity leads to more diversity and endemism too in a region like the Himalaya; this does not seem conceivable under the banner of the allopatric mode. As put forth by Wilson (2003), "strong variation in species richness among genera, families and still higher taxa is a universal but still poorly understood biological phenomenon."

These are a few aspects which need some serious thinking on the part of evolutionary biologists/myrmecologists. I don't doubt the importance of the allopatric mode of speciation, but what has happened over the years is that when somebody has come up with evidence for sympatric or some other mode, it has been seen as a threat to the allopatric model and refuted immediately, seemingly with a closed mind.

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A RECORD OF THE ANeT COMMITTEE MEETING HELD IN INDIA IN OCTOBER 2007

Compiled by

Bakhtiar Effendi Yahya*, Himender Bharti, John R. Fellowes & Katsuyuki Eguchi

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The following agenda items were discussed in the committee meeting held as a part of the 6th ANeT workshop and meeting (Punjabi University, Punjab, India, 2007).

1. Venue of the 7th workshop and meeting
2. ANeT's Species-coding System

3. Committee structure and membership
4. Subscriptions to the ANeT and the journal
5. Proceedings of the workshop

1. Venue of the 7th workshop and meeting

The committee deliberated on the venue of the 7th ANeT, and three possible host countries were discussed:

a) Indonesia
b) Sri Lanka
c) Thailand

[Post-meeting note: Indonesia was confirmed as the host country in December 2007, with Dr. Roshichon willing to help. Updates on this will be reported from time to time to all members by e-mail.]

2. ANeT's species-coding system

In the 5th meeting (Kuala Lumpur, 2005) we requested Dr. Kohout to pilot the ANeT's Species-coding System dealing with his target taxon, *Polyrhachis*, as an example. In the committee meeting he presented a progress report in which a form of the system prepared mainly using Excel was shown.

3. Committee structure and membership

Prof. Maryati is to remain as President for the next 2 years and we noted that the Presidency can be an honorary position. The following proposals/suggestions for the restructuring of the committee were put forward and discussed:

a) Formulation of a "core" functional committee and regional representatives.
b) Mode of electing "core" functional committee.
c) Role of "core" committee — c-1) coordinating communication and expenditure; c-2) drafting/upholding a constitution.
d) Mode of electing regional representatives — All members from every country and region are requested to nominate and choose their representative.
e) Role of the regional representatives — e-1) collecting membership fees; e-2) country level activities.

These issues should be continuously discussed among the present (provisional) committee members and functionaries by e-mail, and a tentative proposal for the restructuring should be drafted before the 7th ANeT. Until then the provisional committee members and functionaries are as follows (committee members who have not been active for a long time will step down; they are thanked for their past contributions).

President:
Maryati Mohamed (MALAYSIA)
Vice-President:
Himender Bharti (INDIA)
Secretary:
Bakhtiar Effendi Yahya (MALAYSIA)

Treasurer:
Petherine Jimbau (MALAYSIA)
Journal editors:
Martin Pfeiffer (GERMANY)
John R. Fellowes (UK/CHINA)
Simon Robson (AUSTRALIA)
Newsletter editors:
Katsuyuki Eguchi (JAPAN)
Yoshiaki Hashimoto (JAPAN)
Website editors:
Yoshiaki Hashimoto (JAPAN)
Himender Bharti (INDIA)
Other members of the provisional ANeT committee:
Tuan Viet Bui (VIETNAM)
Sriyani R.K. Dias (SRI LANKA)
Kazuo Ogata (JAPAN)
Omid Paknia (IRAN)
Suputa M.P. (INDONESIA)
Decha Wiwatwitaya (THAILAND)
Resource Person
Rudolf J. Kohout (AUSTRALIA)

4. Subscriptions to ANeT and the journal

Volumes of Asian Myrmecology were to be sent to members and also to renowned universities to enhance recognition of the journal. The 1st volume was subsequently sent to members free of charge. Subsequent issues will be charged (though the cost has not yet been fixed).

The majority of the members attending the 6th meeting agreed with an increase in membership fee to USD10.00 per year, subject to clarification on expenditure. This fee will be further clarified before the charge is raised. Students will not be charged more than the existing membership fee, i.e. USD5.00 per year.

5. Workshop proceedings

Proceedings of the workshop will be edited by Dr. Himender Bharti and published by the Punjabi University. ANeT is providing each speaker with various possible channels for publishing their presentations: the proceedings, Asian Myrmecology or the newsletter. Dr. Bharti and the editors of Asian Myrmecology and the Newsletter will select approximately three of the best presentations for submission to the next volume of Asian Myrmecology. Authors will of course be consulted before publication.

From Editors

We welcome research news, event information, self introductions, short essays, etc. Meeting records are also inserted. However, original papers including short communications should be submitted to our journal (Asian Myrmecology). Authors are encouraged to send their manuscripts as electronic versions attached to e-mail. Both text format (txt) and MS word format (doc) are accepted. Line drawings (jpg or tiff format, with a minimum of 400 pixels/inch) and grey-scaled and full-coloured illustrations (jpg or tiff format, with a minimum of 300 pixels/inch) are also accepted. The editors reserve the right to make minor textual corrections that do not alter the original meaning. Linguistic review will be done by a native speaker as the need arises. Proofs will be provided to authors as pdf files attached to e-mail. From No. 9 onward ANeT newsletter is available as pdf files on our website <http://homepage.mac.com/dorylus/newsletter.html>. We plan to publish our newsletter at least twice a year. It depends on your contribution! All correspondence should be addressed to:

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Editing this issue took nearly six months, and we apologise that some articles, notably that of Dr. John Fellowes, may contain information that is now outdated. Fellowes san carefully reviewed all articles. Many thanks to Fellowes san!

ANeT Newsletter No. 10

Available online: http://homepage.mac.com/dorylus/newsletter.html
Date: 25 May 2008.
Published: the International Network for the Study of Asian Ants (ANeT).
Editors: Katsuyuki Eguchi (Nagasaki University, Japan).
Yoshiaki Hashimoto (Museum of Nature & Human Activities, Japan).