

# A Preliminary List of Ants (Hymenoptera: Formicidae) of the Tawau Hills Park, Sabah

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## Abstract

*A five-day collection from November 28 to December 3, 1989, at the Tawau Hills Park area, resulted in 50 morphospecies of ants. In this report a list of ants found at the two camp sites is given. A total of six subfamilies was represented by the 50 morphospecies. The subfamily Formicinae were represented by 17 species, of which 9 were of the genus Polyrhachis. Collections made from various parts of Malaysia had not resulted in as many species of Polyrhachis. Myrmecinae was represented by 13 species, followed by Ponerinae with 12. Dorylinae and Pseudomyrmecinae were represented by 3 species each. As for Cerapachyinae and Dolichoderinae, each was represented by 1 species. A brief comparison was made with collection from Gunung Danum, Kuala Lompat and Bangi Forest.*

## Abstrak

*Koleksi fauna semut yang dilakukan selama 5 hari (28hb. Nov.-3hb. Dis. 1989) di kawasan Taman Bukit-Bukit Tawau telah menghasilkan sebanyak 50 morfospesies semut. Dalam laporan ini satu senarai semut yang dikutip dari dua tapak perkhemahan di kawasan taman tersebut telah disediakan. Sebanyak 6 subfamili semut diwakili oleh 50 morfospesies. Subfamili Formicinae diwakili oleh 17 spesies, di mana sembilan daripadanya adalah dari genus Polyrhachis. Koleksi yang dibuat dari kawasan-kawasan lain di Malaysia belum pernah menghasilkan sebegitu banyak spesies bagi Polyrhachis. Subfamili Myrmecinae diwakili oleh 13 spesies, diikuti oleh Ponerinae dengan 12 spesies. Dorylinae dan Pseudomyrmecinae masing-masing diwakili oleh 3 spesies tiap satunya. Bagi Cerapachyinae dan Dolichoderinae, masing-masing diwakili oleh satu spesies. Perbandingan kasar diberikan bagi koleksi Taman Bukit-bukit Tawau dengan koleksi-koleksi dari Gunung Danum, Kuala Lompat dan Hutan Bangi.*

## INTRODUCTION

The abundance of ants in the Malaysian forest ecosystem has been reported by Marina Wong (1984). The role of ants as seed dispersers was established in species such as those of the genus *Meranoplus*. However, there are doubts about their roles as pollinators. Being abundant in the forest ecosystem, reported mainly from leaf litter and in soil, they play an important role in nutrient recycling. They also could help in the aeration of soil and in drainage which would eventually lead to the reconditioning of forest soil.

Systematic of ants is a dynamic phenomenon. From a family with 5 subfamilies (Bingham, 1903), it is now represented by 9. A discussion with one of the well known ant systematists (Mr. Barry Bolton of the Natural History Museum, British Museum London) revealed that there are possibilities that the family would be represented by 15 subfamilies in the near future. As to whether this classification would be well received by new workers such as the author, remain to be seen. In this report, classification of the family Formicidae is based on 9 subfamilies. Bolton (in Holldobler and Wilson 1990) gave generic keys to 8 subfamilies. Nevertheless, the author agreed with Bolton (1990) in placing Cerapachyinae as a separate subfamily. Also, the subfamily Myrmeciinae is acknowledged as existing only in Australia and New England (Brown and Taylor, 1973). Therefore the family Formicidae is represented by Ponerinae, Myrmecinae, Formicinae, Cerapachyinae, Dorylinae, Dolichoderinae, Leptanillinae, Aneuritinae, Pseudomyrmecinae and Myrmeciinae.

## METHODOLOGY

The collection at the Tawau Hills Park area was done at two sites (Figure 1). No separation was made of collection from the two sites. This was because collection was also made along the trail between the 2 sites. At site A, collection was carried out for three days and at site B for two days.

Ants were collected using fine forceps. They were mainly found on the forest floor, on tree trunks and branches at eye level. At every opportunity, ants were also collected from the soil. Most of the collection was done between sites A and B where the expedition party was based throughout the 10-day period. The ants were put into coded vials filled with 75% ethanol. In the laboratory these specimens were mounted onto card points.

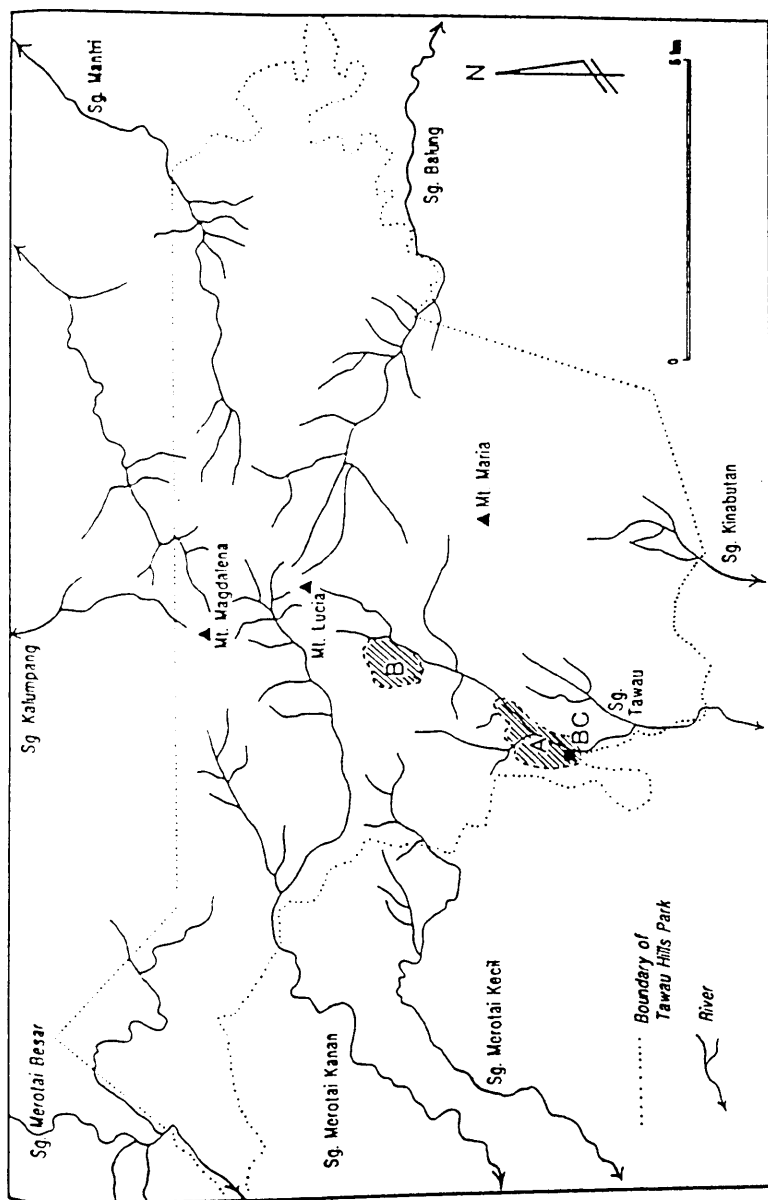


Figure 1 Tawau Hills Park, Sabah — Sites of Ants Collection (A & B).

These were initially identified with keys in Bingham (1903). However, during cross reference work carried out in the Natural History Museum (British Museum) London, specimens were rekeyed using keys by Bolton as found in Holldobler and Wilson (1990). However, for the identification of some species reference could still be made to Bingham (1903).

## RESULTS AND DISCUSSION

A list of ants identified at least to the generic level is presented in Table 1. The subfamily Formicinae was represented by 17 species. The genus *Polyrhachis* has the most number of species, that was 9. This is a considerable representation as compared to collections from other parts of Malaysia (Maryati Mohamed, 1990a, 1990b, 1991). Interestingly both the morphologically similar species, *P. ypsilon* and *P. bihamata* were found here. One species that had never been collected elsewhere but was very common here and seen scurrying around was *P. chalybea*. Its purplish metallic tinge was very obvious and was initially identified as *P. venus*.

However, for the genus *Colobopsis*, apparently only one species was collected, that was *C. saundersii*. The other species, *C. pubescens* was not found. At Danum, (Maryati Mohamed, 1990b) both species were available. From the other two areas in Peninsular Malaysia (Bangi forest, Selangor and Kuala Lompat, Pahang) *C. saundersii* had not been collected so far. The coloration of *C. saundersii* was found to be quite variable. Some specimens had an overall red body, from head to gaster; some, the red color was confined to certain parts of the body. *Anoplolepis longipes*, the crazy ants, was collected close to human dwellings, that is near the Park Rangers' quarters. None was collected from the forest. *Camponotus gigas* was seen constructing nests in the soil around the tree base near site A. This was also observed at Kuala Lompat. However, this phenomenon was never observed at Bangi forest and one colony of *C. gigas* was noted having a nest in a fallen tree trunk.

As for the subfamily Myrmecinae, there were undoubtedly be more species available which was not collected. A noteworthy point was the presence of 3 species of *Myrmecaria*. Up till then this species was thought to be associated with high altitude because it was commonly found at the altitude of 500-750m at Danum and also in the Cameron Highland at the altitude of

2000m (Maryati Mohamed, 1990b). However in this survey, they were commonly found especially at site B. Also common was *Crematogaster inflata* which was observed building nests in tree trunks (in bark crevices) near the riverside at site A. In Kuala Lompat this species was found to have built a nest high up a tree trunk.

**Table 1**  
**List of ants collected from Bukit-Bukit Tawau**

**FORMICINAE (17)**

*Polyrhachis bellicosa* Smith  
*Polyrhachis armata* Le Guill  
*Polyrhachis vindex* Fabricius  
*Polyrhachis chalybea* Fabricius  
*Polyrhachis ypsilon* Emery  
*Polyrhachis rufipes* Fabricius  
*Polyrhachis bicolor* Smith  
*Polyrhachis nigropilosa* Mayr  
*Polyrhachis bihamata* Drur  
*Hemioptica* sp. Roger  
*Colobopsis saundersii* Emery  
*Colobopsis?* *stricta* Jerdon  
*Acropyga acuentris* Roger  
*Anoplolepis longipes* Mayr  
*Echinopla melanarctos* Smith  
*Camponotus gigas* Latr.  
*Camponotus intrepidus* Mayr

**MYRMECINAE (13)**

*Myrmecaria carinata* Smith  
*Myrmecaria brunnea* Saunders  
*Myrmecaria luteiventris* Emery  
*Crematogaster difformis* Smith  
*Crematogaster inflata* Smith  
*Pheidolegeton* sp. Mayr  
*Tetramorium pacificum* Mayr  
*Tetramorium bicarinatum* Nylander  
*Tetramorium* sp. Mayr  
*Rhoptromyrmex wroughtoni* Forel

*Vollenhovia mashea* Bolton  
*Aphaenogaster longipes* Smith

### PONERINAE (12)

*Drepanognathus venator* Smith  
*Leptogenys diminuta* (Smith)  
*Leptogenys? chinensis? processionalis*  
*Leptogenys mutabilis* (Smith)  
*Diacamma rugosum* Le guillon  
*Diacamma intricatum* Smith  
*Odontoponera transversa* smith  
*Anochetus princeps* Emery  
*Odontomachus rixosus* Smith  
*Gnamptogenys* sp. Mayr  
*Ponera* sp. Latr.  
*Technomyrmex* sp. Mayr

### PSEUDOMYRMECINAE (3)

*Tetraponera alloborans* Walker  
*Tetrapopnera petiolata* Smith  
*Tetraponera attenuata* Smith

### DORYLINAE (3)

*Aenictus* sp. Shuck  
*Aenicts gracilis* emery  
*Dorylus* sp. Fabr.

### DOLICHODERINAE (1)

*Dolichoderus? sulcaticeps* Mayr

### CERAPACHYINAE (1)

*Cerapachys* sp. Smith

**Total: 50 species**

*Drepanognathus venator* is a distinct species of ponerine ants. The very long crossing over pair of mandibles is very obvious. Unfortunately the only specimen of this species was collected towards the end of the expedition. Another interesting observation was that of a procession of *Leptogenys* dragging a 30-cm millipede. This was a fascinating sight as the millipede was dragged by two "strings" of the ants. The "string" was formed by

one ant holding onto the other ant's waist with its mandible. When the trailing end of the dead millipede was purposely pressed onto the ground, the ants would lose their grips and form more strings to drag the anterior portion of the prey. This formation, presumably, might produce a greater dragging force. According to Bingham and due to its purplish blue metallic lustre the species was identified as *L. venus*. Nevertheless, on cross referencing at the Natural History Museum, London, the specimen was identified as *L. processionalis*. The nest shifting of *L. diminuta* which had once been observed at Danum, was again seen near site A. With regards to *Leptogenys* moving nests and forming a procession, these have also been studied by Maschwitz *et al.* (1989). The *Diacamma* collected was bigger in size than those ever collected from other parts of the country. It was identified as *D. intricatum*. The common *Diacamma rugosum* was also found. Only *Odontomachus rixosus* was collected, while the common *O. simillimum* was not represented. The three subfamilies mentioned above were relatively well represented. A similar pattern was also seen when works such as Brown and Taylor (1973) Forel (1911) Wheeler (1992) and Bingham (1903) were analysed. Maryati Mohamed (1990a, 1990b, and 1991) found a similar trend, that is Formicinae, Myrmicinae and Ponerinae are the three well represented subfamilies in terms of species numbers. The other subfamilies are of relatively smaller groups, with a lesser number of species. However, this does not mean that they are poorly represented as reported here. This is because the present collection was limited by space and time constraints. One should also bear in mind that ants are normally more active during the night time. Perhaps, there are members of the smaller subfamilies which come out during the night time.

The Pseudomyrmecinae genus collected was *Tetraponera*, represented by 3 species: *T. alloborans*, *T. petiolata*, and *T. attenuata*. This genus was called *Sima* and placed under Myrmicinae by Bingham (1903). Similarly the subfamily Dorylinae was represented by 3 species. However, in this case, there were two genera, *Dorylus*, of which the species could not be identified; and *Aenictus* of which only 1 species, *A. gracilis*, was ascertained. Both Dolichoderinae and Cerapachyinae have 1 species each. The species for *Dolichoderus* and *Cerapachys* could not be ascertained.

On the whole, the collection made at the Tawau Hills Park area gave a more diverse picture of the ant fauna. Together with the results from Danum, there are about 59 species which could be recognized to the generic level. If there had been more taxonomic or faunistic data available, there would be more species that could be identified. As seen in the author's recent visit to the Natural History Museum, London, there are a number of collected specimens from Sabah, Sarawak and Peninsula Malaysia which has not been named. Although there are scattered reports on new species or genera collected from Malaysia (Brown, 1972; Bolton, 1977, 1988), the numbers are very few. More taxonomic research had to be carried out in this region.

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