be *Shorea talura*. The insect was a new species which has been named *Kerria mysorensis*. It gives three crops of lac per thirteen lunar months. In the above area I found the nest of a small ant. The nest was built of spores and residues of fungi growing on the leaves of *Shorea talura* infected with lac. The insects excrete honey-dew copiously and much of it falls on the leaves below where saprophytic fungi grow profusely upon it. The predominant fungus was *Aspergillus niger*. This accounted for the black appearance of the miniature ant's nest, shown almost natural size. The ant had so constructed the nest that there was one hole which was used as entrance and the other as exit. I was able to find another nest of the same ant in its earliest stage of construction. A portion of a twig was colonized by young lac insects soon after they had fixed themselves. Finding that there was a small colony of lac insects the ants came to construct a nest using the saprophytic fungi as the building material. The motive of constructing the nest was the same as of the larger nest by the weaver ants *O. smaragdina* and *O. longinoda*.

The species that built the nests, could not be ascertained, as, unfortunately this information was contained in a file which I had taken to Pabna, Bangladesh, and which was subsequently lost. Its nest is fully formed with two holes, as entrance and as exit, which suffice to speak of the ants' intelligence. The nest was also constructed in order to be sure of supply of honey-dew.

SUMMARY

Ants build nests to exploit scale-insects as a constant supply of honey-dew, as do two species of *Oecophyla*, Asiatic and African. A miniature ants' nest has been found covering a colony of young lac insects also as source of honew-dew.

S. MAHDIHASSAN

SD, 34 - BLOCK A,
NORTH NAZIMABAD,
KARACHI 33,
September 26, 1986.

REFERENCE

HOELLDOBLER, B. K. & WILSON, EDWARD O. (1981): Weaver Ants. *In*: H. Topoff, Animal Society and Evolution. Scientific American Publication.

30. RECORD OF *SIMA ALABORANUS* (WALKER), A HONEYDEW SCAVENGER ANT (HYMENOPTERA: FORMICIDAE: MYRMECINAE) KILLING APHIDOPHAGOUS SYRPHID MAGGOT IN WESTERN HIMALAYA

In nature, there exists a symbiotic association between plant lice and attending ants (Nixon 1951, Bodenheimer and Swirski 1957, Way 1963, Bradley and Hinks 1968) where the latter, to some extent provide protection to the aphid colony from predators (Bank 1959) and get nourished with sugar excreta of the aphids. The experiments of El-Ziady and Kennedy (1956) indicated that *Aphis fabae* Scopoli multiplies more rapidly when attended by *Lasius niger* L. whether the aphid's enemies are present or not. Ants have never been found to kill aphid predators, although Capinera and Roltsch (1981) observed that

they might prey upon lepidopterous pests of the same plants where aphids are also pests and are attended by the same ant species.

During our present investigation on aphids and related organisms of Garhwal range of western Himalaya, *Sima alaboranus* (Walker), a high altitude ant species distributed in western India and Bengal (Bingham 1903) was found in association with *Prociphilus* sp. (Homoptera: Aphididae) causing leaf galls on honeysuckle, *Lonicera quinquelocularis*. These ants, due to their peculiar foraging habit, collect semisolid honeydew droplets discharged by the aphids and carry them to their nests following a trail. The relationship is facultative as ants are attracted only with the dehiscence of the gall and subsequent exposure of honeydew droplets already stored inside the gall. This is the probable reason for such type of ephemeral association being observed only during early summer (April-May). *Prociphilus* sp. on its secondary host, in the pine root, was observed to be attended by *Acanthomyops latipes* Walsh in Manitoba (Bradley and Hinks 1968). Catherine *et al.* (1977) found *Prociphilus* sp. in the nest of *Lasius pallitarsis* (Provancher). However, there is no specificity of such association and it rather depends on the availability of ant nests in the vicinity of aphid infestation. Bradley and Hinks (1968) distinguished two categories of ants, viz., a true aphid attendant, and a honeydew scavenger, foraging in the territory but actively avoiding contact with the attendant species of ants. But in our observation on honeysuckle leaf gall aphid, we never got a true aphid attendant species of ant.

S. alaboranus shows a strong aggressive behaviour towards the predatory syrphid maggot, *Episyrphus balteatus* (de Geer) (Diptera), the major limiting factor of aphids in general and leaf gall inhabiting aphid in particular in the area. Due to the sluggish nature of syrphid maggots, the ants have little trouble in attacking them, whereas other predatory species like coccinellids, anthocorids, spiders etc. being speedy and agile can easily escape from the attack of ants. The ants carrying syrphid maggots were traced during the summers of 1984 and 1985 and it was seen that after getting down to the ground they drop them. We picked up a few of the dropped maggots and found that they were nearly dead and had a few punctures on their body. We tried to feed a few of these maggots with prey aphids or water soaked cotton (often syrphid maggots can thrive on plain water up to 7 days), but they refused to accept any food and gradually succumbed to the injuries. This observation is interesting since *S. alaboranus* attacks aphid predators, the predatory efficiency naturally decreased to keep the pest population below damaging level.

ACKNOWLEDGEMENTS

We thank Dr. R. N. Tiwari, Zoological Survey of India, Calcutta, for confirming the identification of ant species, and the Department of Science and Technology for financing the study.

BIOSYSTEMATICS RESEARCH UNIT,
DEPARTMENT OF ZOOLOGY,
UNIVERSITY OF KALYANI,
KALYANI 741 235,
WEST BENGAL,
September 25, 1986.

D. GHOSH
S. CHAKRABARTI

REFERENCES

BANKS, C. J. (1959): Effects of ants on the physiology and development of aphids. Publishing House of the Czechoslovak Academy of Sciences, 329-332.

BINGHAM, C. T. (1903): The fauna of British India including Ceylon and Burma — Hymenoptera. Vol. II. Ants and Cuckoo wasps. Taylor & Francis, London 506 pp.

BODENHEIMER, F. S. & SWIRSKI, E. (1957): The Aphidoidea of the Middle East. The Weismann Science Press of Israel, Jerusalem, 378 pp.

BRADLEY, G. A. (1968): Ants, aphids and jack pine in Manitoba. *Can Ent. 100*(1): 40-50.

CAPINERA, J. L. & ROLTSCH, W. J. (1981): The predatory ant *Formica neoclara*: effect on within-field bean aphid distribution, and activity in relation to thermal condition. *J. Kans. Ent. Soc. 54*(3): 578-586.

CATHERINE, M., O'NEILL, A. & ROBINSON, A. G. (1977): Ant-aphid associations in the province of Manitoba. *Manitoba Ent. 11*: 74-88.

EL-ZIADY, S. & KENNEDY, J. S. (1956): Beneficial effects of the common garden ant, *Lasius niger* L., on the black bean aphid, *Aphis fabae* Scopoli. *Proc. Roy. Entomol. Soc.* London (A) *31*: 61-65.

NIXON, B. A. (1951): The association of ants with aphids and coccids. *Comm. Inst. Ent.* London, 36 pp.

WAY, M. J. (1963): Mutualism between ants and honeydew-producing Homoptera. *A. Rev. Ent. 8*: 307-344.

31. DUNG AND DUNG BEETLES IN KANHA TIGER RESERVE, CENTRAL INDIAN HIGHLANDS

During zoological fieldwork in Kanha Tiger Reserve, Mandla District, Madhya Pradesh, dung beetles were collected from the faeces of a variety of mammals. As data on dung beetles in Kanha have not been previously published the results are presented here.

Kanha Tiger Reserve is a 1945 km^2 tract of dry deciduous, moist deciduous (sal, *Shorea robusta*) forest and anthropogenic meadow in the Maikal Hills (Schaller 1967, Newton 1984, 1985). It holds abundant large mammals including tiger (*Panthera tigris*) and ten species of ungulate. Dung beetles were collected (1980-1982) from dung deposited on and around the central Kanha maidan (80° 38′ 3″ E, 22° 17′ 15″ N, 600 m above m.s.l.) immediately east of Kanha Forest Village in sal forest and meadow. The identity of the dung was determined by PNN and Mungal Baiga, and the beetles by Mr. L. Jessop of the British Museum (Natural History), London.

The species of coprophagous beetle collected and the identity of the mammal responsible for the dung are listed in Table 1. All beetles belong to the subfamily Scarabaeinae. In addition, an *Anomala* species (Rutelinae) was collected from elephant dung (*Elephas maximus*). A total of 22 species of Scarabaeinae were collected with one species of *Garreta* (near *G. smaragdifer* Walker) apparently undescribed (Jessop, pers. comm.). Of the 29 collections of the large genus *Onthophagus*, *O. griseosetosus* could be identified, while the remaining specimens were sorted into nine "Recognizable Taxonomic Units" which are probably separate species.

Dung beetles were collected in February, March and May to August with the peak in frequency of collection in the monsoon months of June and July. With the exception of two species collected from chital (*Cervus axis*) rumen contents at a dhole (*Cuon alpinus*) kill, the few beetles collected outside the monsoon were at elephant faeces. The apparent specialization on elephant dung and rumen contents by beetles foraging outside the