AN ASSOCIATION OF EARWIGS (DERMAPTERA) AND BUGS (HETEROPTERA) IN A SPIDER'S (ARANEAE) WEB?

This paper reports an interesting association of Dermaptera and Heteroptera found in the egg-sac spinning of an African Eresidae spider. In a split of the bark of an *Adansonia digitata* tree (Bombacaceae) of about 3 m diameter the web of a spider was found near Damagum, 204 km W Maiduguri, Nigeria. It was approximately 5 cm wide, 20 cm long and contained in the upper half an egg-sac of about 3-4 cm diameter. Additionally, the web contained a large number of living insects and chitinous remains. It was removed intact for examination and found to contain:

- 130 living specimens of *Forficula senegalensis* Serville (Dermaptera: Forficulidae) (det. Brindle, Manchester);
- 41 living specimens of *Carbula pedalis* Bergroth (Heteroptera: Pentatomidae) (det. Dolling, London);
- 16 living ants of 2.5 - 3.0 mm body length (still undetermined);
- chitinous remains of *Forficula, Carbula*, and Coleoptera (2 Chrysomelidae 3.5 mm, 1 Cantharidae 7 mm, 1 unidentified 4 mm, 1 larva 6.5 mm).

The web had apparently been made by *Adonea sp.* (Eresidae) determined by exuviae found in it (det. Heimer, Dresden). The egg-sac contained some 100 eggs with beginning ontogenesis. The web of a theridiid spider was found 30 cm away on the same tree. Prey entangled in the theridiid web included the integral, evacuated exoskeletons of 22 *Carbula*, eight *Forficula*, and numerous chitinous fragments, as well as four undamaged ants.

In the eresid web, bugs and earwigs moved unhindered by the cribellate threads. During the day both were found only here in a dense cluster, and nowhere else on the tree, indicating that they had moved to the web actively and were not entangled as prey insects. Such an association is not known to any of the three taxonomists who determined the species. The biology of these arthropods is largely unknown, and this apparently peaceful coexistence of Dermaptera, Pentatomidae, and spiders (resp. eggs) poses an interesting question.

Carbula is a plant-sucking bug, *Forficula* is probably omniphagous. Some African Pentatomidae and Forficulidae appear sometimes in large numbers, the latter perhaps being migratory. This study occurred during the dry season and all *Adansonia* trees had already lost their leaves, so it seems possible that the insects survive the dry season in such aggregations. The smooth bark structure of the *Adansonia* trees and the surroundings (harvested millet fields) offered hardly any other protected places. Placed in a small split of the bark as it was, the spider's web offered a protection during the day. At night earwigs and bugs walk on the bark near the web, presumably to look for food, probably causing some of them to become entangled in the sticky threads of the nearby theridiid web. Possibly due to the greater mobility of the Dermaptera, the Pentatomidae were captured three times more often than the Forficulidae. The special character of the hackled band cribellate silk of the Eresidae may account for the nearly unimpeded mobility of these insects in it, but since this type of silk is known to be highly effective in entrapping some insects the question remains unanswered.

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