

***AGELENA CONSOCIATA* (ARANEAE, AGELENIDAE) AND
ITS NEST ASSOCIATES: INSECT CLEANERS**

The density of cooperative spiders within their communal nests can be high: hundreds and sometimes thousands of individuals. Refuse, such as insect carcasses and metabolic waste, present a problem to these colonies. While the cooperative spiders themselves are known to perform cleaning activities (pers.

obs.), other arthropods associated with the nests, in particular lepidopteran larvae, have been reported to play a role in refuse removal (Pocock 1909; Robinson 1977). Pocock (1909) observed small larvae of the moth, *Batrachedra stegodyphobius* Walsingham, eating insect carcasses in the nest of an unidentified species of social eresid, *Stegodyphyus* sp. in South Africa. Robinson (1977) studied this cleaning behavior under laboratory conditions in another moth larva, *Neopalthis madates* Druce, that is found in the nests of the new world social theridiid, *Anelosimus eximius* (Keyserling).

We report here on our field observations of arthropod nest associates of the West African social spider, *Agelena consociata* Denis. Five nests of this species located on the M'Passa Reserve of The Institut de Recherche en Ecologie Tropicale, near Makokou, Gabon, were intensively studied during the period from October 16 to December 5, 1987. Forty-eight hours during this period, made up of 30-minute segments, was devoted to direct observation on the nests for prey encounters. The presence and activity of insects in the nest area as well as the spiders' reactions to this activity, was recorded for each encounter. Each nest was rotated through a schedule such that all nests were observed for equal amounts of time at the same set times each day. Field identifications only were made of most of these taxa because we wished to avoid disruption of colony activities. We were able to collect ants without disruption because of their numbers. These were identified to genus.

A total of 791 individual insects were seen in the nests of *A. consociata* during the course of these observations. Fifty-two of these insects were attacked and eaten. Others escaped or were repelled. Three types of insect were tolerated, lepidopteran larvae, tenebrionid beetles and some small ant species.

Lepidopteran larvae were only observed in the largest, and presumably oldest, nest under observation. Brach (1977) noted that the older nests of *Anelosimus studiosus* (Hentz) were more likely to contain inhabitant arthropods. Brach observed these larvae to move in rapid and seemingly random spaced jerks with long intervals of motionlessness. Catepillars in the *Agelena* nest were never seen to move across the surface of the webbing but remained in the leaf and web tangle that made up the central retreat, where there tends to be a build-up of detritus. There were no observations of spiders approaching these larvae or even orienting toward them.

In addition to the lepidopterans that may be common to social spider nests, beetles were frequently seen in all nests regardless of nest size and presumed age. At least three species of tenebrionids were observed to have free access to most areas of the colony, walking across the surface of the sheet or inside the nest retreats. These beetles were occasionally touched by spiders but for the most part were otherwise ignored. Twice an attack occurred when a tenebrionid beetle came very close to a cluster of egg sacs. The beetles were driven away by groups of mature female spiders, that tended to be found hanging from the underside of these eggs. In these cases the beetles were not killed but merely expelled from the immediate proximity of the eggs. *Agelena consociata* discriminated this beetle type from others such that upon contact, varying forms were eaten or carried to the edge of the sheet and dropped over the side.

All of the nests under regular observation housed ants which were seen to be active in all but one nest in at least 20% of the observation periods. The ants, of the genera *Pheidole* and *Technomyrmex*, were approached by the spiders as they

walked across the surface of the webbing. They were also sometimes touched by *Agelena* but were never attacked. Other ants discovered by the spiders on the sheet, even much larger species, were attacked.

A simple experiment, completed at six nests other than those under daily observation, demonstrated the nest cleaning activity of these ants. Plastic petri dishes enclosing freshly killed (by freezing) moths were placed on the webbing of each nest. The lids were closed such that *Agelena* could not enter them. After 6 hours the nests were revisited. All dishes were found to contain ants and in two of the cases the carcasses had already been completely consumed.

In summary, lepidopteran larvae inhabiting the webs of social spiders in the families Theridiidae and Eresidae have been reported. To our knowledge this is the first account of a similar system in the social agelenids. The lepidopteran larvae reported for other social spiders were less prominent than ants and beetles in this system. Although we have documented cleaning activity only for the ants, observations by others suggest that the larvae at least function in this capacity as well.

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