

*Caribbean Journal of Science*, Vol. 44, No. 1, 132-135, 2008  
Copyright 2008 College of Arts and Sciences  
University of Puerto Rico, Mayagüez

**Observations of the insect  
*Arachnocoris trinitatis*  
(Heteroptera: Nabidae) as an  
inquiline of the spider  
*Mesabolivar aurantiacus*  
(Araneae: Pholcidae)**

JO-ANNE N. SEWLAL<sup>1</sup> AND CHRISTOPHER K.  
STARR<sup>2</sup> *Department of Life Sciences, University of the West Indies, St Augustine, Trinidad & Tobago. Corresponding author: jo\_anneseowlal@yahoo.com*

**ABSTRACT.**—The pholcid spider *Mesabolivar aurantiacus* (Mello-Leitão 1930) is common in forests of Trinidad, West Indies. Its webs are often found to contain the nabid bug *Arachnocoris trinitatis* (Bergroth 1916). In a lowland forest in August-September 2003 (wet season) we censused 81 *M. aurantiacus* webs for occupancy by the spider and the insect. *A. trinitatis* showed no significant preference for webs occupied by either juvenile or adult spiders. However, it showed a preference for empty webs, suggesting that it utilizes these as a ready-made prey-capture device, and possibly as a site for finding mates.

**KEY WORDS.**—*Arachnocoris trinitatis*, Nabidae, *Mesabolivar aurantiacus*, Pholcidae, predation, symbiosis

*Mesabolivar aurantiacus* (Mello-Leitão 1930) is a web-building spider of the family Pholcidae, widespread in the northern neotropics (Huber 2000). It is common in lowland and middle-level forest in Trinidad, West Indies, where it is most often found in the spaces between adjacent buttress roots of trees. *Arachnocoris* (Scott 1881) is a small neotropical genus of the family Nabidae (Hemiptera). These insects are often found in spider webs (Kerzhner 1990), mostly of the family Pholcidae. Coexistence between this nabid genus and pholcid spiders has previously been reported from Costa Rica (Kerzhner 1990) and Guadeloupe (Lopez 1990). It has been assumed that *A. trinitatis* is a kleptoparasite, feeding on prey caught in the webs (Harris 1928).

*Arachnocoris* spp. show physical adaptations for life in spider webs. These were investigated in detail by Myers (1925) for *A. albomaculatus* (Scott 1881). Their body colouration consists of white markings on a dark ground colour, rather similar to the kleptoparasitic spider genus *Argyrodes* (Simon 1864) and to some extent some genera of orb-weaving that spend extended periods of time suspended in the centre of their webs, e.g. example *Cyclosa* (Menge 1866), *Nephila* (Leach 1815) and *Argiope* (Audouin 1826).

Webs of the pholcid *Mesabolivar aurantiacus* (Mello-Leitão 1930) in Trinidad, West Indies consist of a sticky sheet web of haphazardly organized irregular polygons (Sewlal 2005). A tangle of non-sticky webbing above the sheet raises it to form a dome. Juvenile and adult spiders build webs utilizing the same design. The presence of the nabid *Arachnocoris trinitatis* (Bergroth 1916) in the webs of this spider raises the question of the relationship between the two species. If *A. trinitatis* feeds on prey trapped in the host spider's web, is it kleptoparasitic or simply commensal? We approached this question through observations of the incidence and position of *A. trinitatis* in *M. aurantiacus* webs.

This study was carried out in the Arena Forest Reserve, Trinidad, West Indies (10°34'N 61°14'W). This reserve initially utilised the shelterwood system, in which species of commercial value are harvested,

leaving non-commercial species to preserve the canopy. Five years after its inception, this system was further modified so that natural regeneration replaced artificial regeneration. Timber harvesting ceased about 20 years before this study, and the area is now a seasonal evergreen forest (Beard 1946). Currently, the Arena Forest Reserve is used for watershed protection and a variety of recreational and minor economic purposes. Average monthly temperature varies from 18.8°C to 28.3°C, with recorded annual rainfall between 203.2 cm and 304.8 cm (Bell 1980). The ground is mostly gently undulating, varying in elevation from about 22 to 88 m (Bell 1980).

We recorded the incidence of *A. trinitatis* in webs, their general position (middle or periphery of the sheeting or on supporting threads), and their position relative to any *M. aurantiacus* in the web, as well as the number and ages (juvenile or adult) of resident *M. aurantiacus*.

We gently agitated the sheeting of some webs with a dry twig in order to mimic ensnared prey, noting the reactions of *A. trinitatis* and *M. aurantiacus* to the disturbance. *A. trinitatis* was also directly disturbed by touching with a dry twig to simulate contact by *M. aurantiacus*, sometimes with attempts to nudge it toward any *M. aurantiacus* in the web. This also served to indicate the maturity of the nabids, since adults fly readily and juveniles not at all.

*Arachnocoris trinitatis* can be found year-round in *M. aurantiacus* webs at the study site, but in our experience it is much less common in the dry season. In August and September 2003 (wet season) we examined 81 *M. aurantiacus* webs. Of these, 20 webs contained at least one *A. trinitatis* (Table 1). In each of 12 webs we found one *A. trinitatis*, in each of seven webs we found two, while the remaining web had three. One pair of *A. trinitatis* comprised an adult and a juvenile, while all other conspecifically associated individuals were adults. In the six adult pairs the individuals were approximately 0.5 to 4 cm apart from each other. In the adult-juvenile pair, the juvenile remained mostly at the periphery of the web, about 6 cm from the adult.

Of the 29 *A. trinitatis* found in webs, 17

TABLE 1. Incidence of *Arachnocoris trinitatis* in webs of *Mesabolivar aurantiacus* in Trinidad, West Indies.

	Occupancy of <i>Mesabolivar</i> webs				Total
	No <i>Mesabolivar</i>	Juvenile <i>Mesabolivar</i>	Single adult <i>Mesabolivar</i>	Two adult <i>Mesabolivar</i>	
<i>Arachnocoris</i> absent	9	25	23	4	61
<i>Arachnocoris</i> present	9	8	2	1	20
Total	18	33	25	5	81

were the sheet, 10 in the tangle, and the positions of the remaining two were not recorded. In terms of the relative proximity of *A. trinitatis* to *M. aurantiacus* in occupied webs, 17 out 19 *A. trinitatis* were found in the tangle or, if in the sheeting, on its periphery, while *M. aurantiacus* was in the middle of the sheeting. One spider was near the middle of the sheeting of its web, and the location of the remaining pholcid on its web was not recorded. The locations of the remaining two nabids were not recorded.

It is harder to be certain of finding all *A. trinitatis* in a web than it is of finding all *M. aurantiacus*. Accordingly, for statistical purposes we record *A. trinitatis* simply as either present or absent. They showed no significant preference for the webs of either adult or juvenile spiders ( $\chi^2 = 1.33$ ;  $df = 1$ ;  $p = 0.29$ ). However, there is a decided preference for webs without *M. aurantiacus* present ( $\chi^2 = 6.32$ ;  $df = 1$ ;  $p = 0.01$ ).

*A. trinitatis* was often observed either walking or stationary on threads of the underside of the web. When disturbed while in the sheet, the nabid retreated to the tangle or a supporting thread or flew out of the web. *A. trinitatis* also did not move towards *M. aurantiacus* when we tried to stimulate them to do so.

In contrast, when disturbed while in the tangle, the nabid would retreat to an individual supporting thread and shake it. On one occasion, while in a web with *M. aurantiacus*, a nabid attacked prey that became entangled, but it then retreated when *M. aurantiacus* approached the prey.

Observations during this study show that *A. trinitatis* can utilize the sheet of sticky silk of a *M. aurantiacus* web as a prey-capture device. This was seen indirectly when nabids moved to areas of the sheet

that were agitated to mimic struggling prey. Our observation of *A. trinitatis* attacking prey caught in the web and retreating at the approach of *M. aurantiacus* suggest a kleptoparasitic habit. Besides acting as a prey-capture device, the web can also shield *A. trinitatis* from predators and *M. aurantiacus*. The non-sticky tangle threads appear to act as a retreat for the *A. trinitatis*. This is seen in observations of *M. aurantiacus* that did not retreat to the tangle but to other parts of the sheet when disturbed. Thus, the web architecture of *M. aurantiacus* webs evidently facilitates both prey capture and protection from predators for *A. trinitatis*. In addition, we think it is likely that *A. trinitatis* treat webs as a favoured venue to seek mates. This latter hypothesis is supported by the observation that six out of seven (86%) of the pairs of *A. trinitatis* found sharing a web each comprised one adult of each sex.

*A. trinitatis*'s preference for vacant webs strongly suggests that the nabids depend not on the pholcid but on its web as a means of catching prey. In occupied webs, *M. aurantiacus* appeared to be treated with caution, as seen in the distance that *A. trinitatis* keeps from the spider, as well as the one observation of the nabid retreating at the approach of a spider.

*Acknowledgements.*—We thank Bernhard Huber for identifying *Mesabolivar aurantiacus*, Tom Henry for identifying *Arachnocoris trinitatis*, Izya Kerzhner for advice and Bill Eberhard, Jerry Rovner and an anonymous reviewer for suggesting improvements in the paper.

#### REFERENCES

- Bell, T. I. W. 1980. *Arena Forest Reserve Working Plan 1971-1980*. Forestry Research Inventory and Man-

- agement, Forestry Department, Ministry of Agriculture, Trinidad and Tobago.
- Beard, J. S. 1946. *The natural vegetation of Trinidad*. Oxford: Clarendon Press.
- Harris, H. M. 1928. A monographic study of the hemipterous family Nabidae as it occurs in North America. *Entomol. Amer. (N.S.)*. 9:1-97.
- Kerzhner, I. M. 1990. Neotropical Nabidae (Heteroptera), 3: Species of the genus *Arachnocoris* from Costa Rica. *J. New York Ent. Soc.* 98(2):133-138.
- Lopez, A. 1990. *Arachnocoris karukerae* new-species Hemiptera Heteroptera a commensal nabid of the Pholcidae araneae in the French Antilles. *Bull. Soc. Sci. Nat.* 65:3-7.
- Myers, J. G. 1925. Biological notes on *Arachnocoris albomaculatus* Scott (Hemiptera; Nabidae). *J. New York Ent. Soc.* 33:136-146.
- Sewlal, J. N. 2005. Autecological studies of web-building spiders. MPhil thesis. Univ. of the West Indies, St Augustine, Trinidad and Tobago.