

Electronic appendix to: Avilés L, WP Maddison, PA Salazar, G Estévez, P Tufiño & G Cañas (2001) Social spiders of the Ecuadorian Amazonia, with notes on six previously undescribed social species. *Revista Chilena de Historia Natural* 74: 619-638.

Notes on six spider species whose sociality is described here for the first time, translated from the main text. See text for information on collecting locations and on the types of spider sociality.

TERRITORIAL PERMANENT SOCIAL SPECIES

Cyclosa sp. (*Araneidae*)

This is a spider of an elongated shape measuring in length about 5.6 mm (median, range = 5.4-6.0 mm, n = 3 adult females). Its brownish coloration mottled with white mimics the detritus that, as is typical of the genus, accumulates along a vertical line that bisects the individual orbwebs (Fig. 2). We observed two groups in Terra Firme areas (Valencia et al. 1994) of the RPFC (Reserva de Producción Faunística Cuyabeno, see the text), one in 1986 and the other in 1989 (L. Avilés & W. Maddison unpublished results). Both groups occurred at ground level and consisted of 20 to 30 individual orbwebs clustered together (Fig. 2). Four adult females collected from the 1989 group were guarding from 1 to 3 egg sacs each. We examined four egg sacs which contained nine to 11 eggs. Buskirk (1981) and D'Andrea (1987) mention the existence of two colonial species in the genus, one in Australia, New Zealand, and Tasmania, and the other in Costa Rica.

Plesiometes sp. (*Tetragnathidae*)

This is a large spider (adult male's abdomen length: range 5-8 mm, median = 7 mm, n = 4) of a black coloration with red and yellow abdominal patches (Fig. 4). It is taxonomically close but not identical to *Leucage argyra* (= *Plesiometes argyra*) (H. Levi personal communication). We have observed groups of these spiders occupying orbweb clusters over deep-forest creeks in the RPFC and the EBJS (Estación Biológica Jatun Sacha). The orbweb clusters may occupy up to 3 m³ (G. Estévez unpublished results). A nest measuring 1.5 m in length by 1.4 m in width and 0.6 m in height contained 25 adult and subadult

spiders. The spiders occupied individual orbwebs, but when their nest was shaken they took refuge under the superior leaves supporting the cluster.

NON TERRITORIAL PERIODIC-SOCIAL SPECIES

Tapinillus sp. 2 (*Oxyopidae*)

This species has a similar appearance as the permanent-social *Tapinillus* described by Avilés (1974) (see also *Tapinillus* sp. 1, text), except that both females and males reach a larger size and their abdomen displays contrasting yellow stripes (Fig. 5) (total length, range and median; females: 9.0-10.6 mm, 9.8 mm, n = 3; males: 7.0-7.3 mm, 7.2 mm, n = 2) (W. Maddison & L. Avilés, unpublished results). We have observed nests of this species on the lower branches of trees and shrubs in forest edge areas of the RPFC and the EBJS. The nests—a light irregular web surrounding the distal part of a branch—are similar to those of the social *Tapinillus* (see *Tapinillus* sp. 1), but smaller than 20 cm in length. Out of 21 nests examined in the RPFC in 1988, 1989 and 1994, eight contained one adult female with her offspring—either an egg sac (n = 2 nests), small juveniles (< 2.3 mm in length) (n = 5 nests), or juveniles plus an egg sac (n = 1 nest). The remaining nests contained solitary individuals—either adult males or females, or juveniles measuring \bar{x} 2.7 mm in length. On two occasions, we observed that the juveniles dispersed from the maternal nest when, given their size (1.8 mm in length), they appeared to have already molted at least once since emerging from the egg sac. After the juveniles had dispersed the mother in one of these nests laid a second egg sac. Another species in the genus in which extended maternal care is present was collected by W. Maddison (unpublished results) in Charapotó, Manabí Province. It is possible that the species described by Griswold (1983) from Costa Rica is also periodic-social since one of the nests he observed contained several cohabiting juveniles.

Other social species of the Ecuadorian Amazonia

The following are additional species we have found forming tight enough aggregations to consider them social or colonial, but of which we do not have sufficient information to place them within a particular type of social organization:

ELECTRONIC APPENDIX (continuation)

Along the banks of the Cuyabeno River we observed groups containing adults of both sexes, juveniles, and egg sacs of a species in the genus *Achaeearanea*, close to *Achaeearanea mundula* (= *tesselata*) (Theridiidae) (H. Levi personal communication). The nests were light three-dimensional webs, apparently resulting from the aggregation of refugia occupied by a female and shared by males and juveniles. As is characteristic of the genus *Achaeearanea*, the refugia consisted of slightly curled leaves placed vertically within the web (Fig. 13). Between 1988 and 1989 we found 18 nests in four nests clusters of two, three, four, and nine nests, respectively. The nests ranged in volume from 1 dm³ to around 1 m³. We examined the contents of seven nests. A nest measuring 1.4 x 0.4 x 0.4 m contained 10 adult females, five adult males, five egg sacs, and a dozen preadult females of various instars. Three nests of about 3 dm³ contained either a solitary subadult female, a subadult female plus two adult males, or an adult female plus four adult males. We were not able to determine whether cooperative prey capture occurred in this species. *Achaeearanea tesselata*, a species synonymized to *A. mundula*, has been described as solitary in Colombia (Eberhard 1972). In the genus *Achaeearanea* there are three non-territorial permanent social species, two in New Guinea (Lubin 1991) and one in Gabón (Darchen 1968). The species from Gabon is, according to Darchen & Ledoux (1978), morphologically indistinguishable from *A. tesselata*.

We observed an apparently social Pholcid in the RPFC, along the channels leading to Lake

Canangueno (L. Avilés unpublished results). In August 1989 the vegetation along these channels was covered by what appeared to be communal nests of this species. The nests were light three-dimensional structures surrounding a piece of vegetation. A nest measuring 1.8 m in length and occupying around 200 dm³ contained about a hundred individuals, including 20 males (adult and subadult), 17 adult females of different sizes, but smaller than the males, 5 egg sacs and around 60 juveniles of various instars. A second nest contained 7 males and 6 females, both adults and subadults. We also observed nests containing an adult spider plus her offspring (Fig. 14). Some type of gregarious or social behavior has been described in at least six Pholcid genera (Eberhard 1983, Jakob 1991).

The strangest case of social behavior we have observed at the RPFC is a species in the Family Sparassidae. On three different occasions, we observed groups of juveniles moving as a group—22, 70 or 131 juveniles, respectively (W. Maddison & L. Avilés unpublished results). The groups consisted of juveniles of a relatively homogenous instar that given their size—2.3–3.3 mm in length—had apparently molted once or twice following their emergence from the egg sac. Rowell & Avilés (1995) described an Australian social sparassid in the genus *Delena* living under the bark of fallen trees in groups of up to nine adult females and 300 juveniles. As we note in the Discussion (see also Rowell & Avilés 1995), sociality in the Sparassidae may represent a novel type of social organization for spiders.