

ARGYRODES ATTENUATUS (THERIDIIDAE):
A WEB THAT IS NOT A SNARE*

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INTRODUCTION

Spiders of the large theridiid genus *Argyrodes*, whose natural history was reviewed by Exline and Levi (1962), seem to have generally abandoned the usual theridiid habit of spinning webs to capture insect prey. A few spin their own webs, but more often they live in the webs of other, larger web-building spiders where they remove prey from the host's web (e.g. Kullmann 1959, Vollrath 1978). The apparently kleptoparasitic species *A. trigonum* (*trigonum* species group) actually preys on its hosts on occasion. *Argyrodes* species in the *Rhomphaea* group have also been found feeding on web spiders, but some in circumstances which suggest a strict predator-prey relationship rather than kleptoparasitism. Exline and Levi (1962) note two observations of *A. (R.) fictilium* preying on web weavers although *fictilium* "often make small theridiid webs of their own". I have found an *A. (R.) projiciens* (O.P. Camb.) feeding on a *Metazygia* sp. which leaves its web up only during the night, thus making kleptoparasitism unlikely; the state of the prey's web indicated that it was attacked as it was building its web early in the evening. I have also seen an unidentified species feeding on an *Araneus* (?) sp., a species which leaves its web up only two to three hours in the early evening and then removes it completely.

Clyne (1979) showed that a species from the *Ariamnes* group, *Argyrodes colubrinus*, uses still another tactic. These spiders also specialize on spider prey, but attack ballooning mature male spiders which walk onto their webs of long, non-sticky threads. Roberts (1952) notes that *A. (A.) flagellum* also spins a web consisting of only a few long, very fine threads; perhaps mistakenly he states that the lines are sticky.

*Manuscript received by the editor February 15, 1980.

This note describes the web and predatory behavior of another species of the *Ariamnes* group, *Argyrodes attenuatus*, which attacks ballooning immature and mature male spiders, and also minute "trapeze" flies which use its web as a resting place. This spider's web serves not as a trap, but rather as a resting site for both types of prey, and as a substrate for the spider's stealthy attacks.

OBSERVATIONS

Argyrodes attenuatus is widely distributed in Central and South America (Exline and Levi 1962). The observations reported here were made on Hacienda Mozambique about 15 km SW of Puerto Lopez, Meta, Colombia (el. approx. 200 m) between June and August 1978 in two patches of periodically flooded forest from which some trees had been cut. The forest at one site was in at least an advanced secondary stage with some relatively large trees, while the other was younger. Voucher specimens have been placed in the Museum of Comparative Zoology, Cambridge, Mass.

Resting Position and Web

More than 40 spiders were seen from 1-3 m above the ground, resting on sparse, irregular, three-dimensional networks of long threads (Fig. 1). The networks ranged from two or three up to seven threads, some of which reached lengths of up to 1-2 m; careful inspection showed that none of the threads were sticky.

During the day the spiders usually rested with all their legs pressed tightly together, with I and II directed forward and III and IV backward, and the abdomen straight or nearly so, giving the animal a stick-like appearance. At night the legs, especially the front ones, were often spread. The spider always rested at a junction of two or more threads. Although the spider could control the form of its long thin abdomen, and sometimes curled it into a tight spiral, I never saw an individual move it in an undulatory or inchworm-like fashion as Göldi (in Exline and Levi 1962) saw *A. (A.) longissimus* do (I did not disturb the spiders as Göldi apparently did, however). The adaptive significance of the extraordinary abdomen of *A. attenuatus* may be at least partly outline camouflage rather than imitation of inch worms as proposed by Exline and Levi (1962).

The spiders replaced the threads they walked along as they moved, and thus probably held one broken end with a leg and spanned the gap with the body as they rested on the web, but they did not tense the lines or sag them suddenly when disturbed as do other spiders with similar reduced webs such as *Miagrammopes* (Akerman 1932, Lubin et al. 1978) and *Ulesanis* (Marples 1955).

Attack Behavior and Prey

Twenty seven spiders were found feeding on or resting near enswathed prey (Table 1). In addition I saw mature females move after but fail to capture a mature male theridiid spider and a small unidentified spiderling on lines in their webs. Some of the spiders' prey were judged to be substantially heavier than the *A. attenuatus* which captured them. In general, small *A. attenuatus* fed on small flies, and larger ones fed mostly on immature non web-building spiders. The ways these prey were secured was determined by direct observation and experiment.

When small spiderlings of several species were placed on webs of mature female *A. attenuatus*, the owners consistently responded by moving toward them and attempting to attack. In a typical capture sequence a spiderling was held dangling from its trail line, and

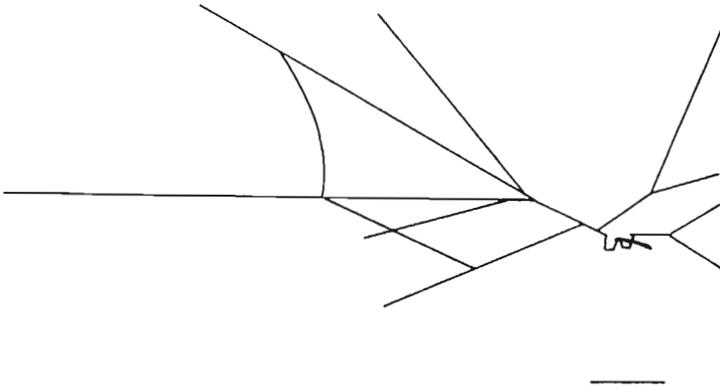


Fig. 1. Web of a mature female *Argyrodes attenuatus*. None of the lines were sticky. (Drawn from a photograph; scale line = 10 cm).

Table 1. Prey found being fed on by *Argyrodes attenuatus* in the field.

Mature and penultimate females	spiderlings
2 small juv. sparassids	18 small flies (5 Cecidomyiidae, 1 Mycetophilidae,
1 imm. salticid	12 ? other Nematocera)
1 imm. ctenid (?)	1 tiny spiderling
1 penult. <i>Theridiosoma</i> (?)	3 (?)

allowed to grab one of the lines of the web of a mature female *A. attenuatus* about 50 cm from where the spider was resting. The spiderling rested immobile after I cut its trail line, while the *A. attenuatus* advanced toward it slowly and smoothly. When the female was about 15 cm away, the spiderling began walking toward her along the line, and she suddenly began approaching more rapidly. Then, before she had reached the advancing spiderling, she quickly turned 180° and pulled a line of wet sticky silk from her spinnerets with her legs IV, apparently contacting the line with the outer surfaces of the tarsi (Figs. 2 and 3). The instant the spiderling came in range, she wrapped it in this thread with a quick movement of the hind legs, then bit it and wrapped it further in apparently dry silk. Finally she carried it dangling from her leg III to the place where she had been resting, and began to feed on it.

Aggressive responses such as these were usually elicited when spiderlings were placed on occupied webs, but *Philoponella* sp. and



Fig. 2. Mature female *A. attenuatus* attacking an immature ctenid walking on a line in its web. The female has drawn sticky silk (covered with small balls) with both hind legs, and is about to apply it to the spiderling.

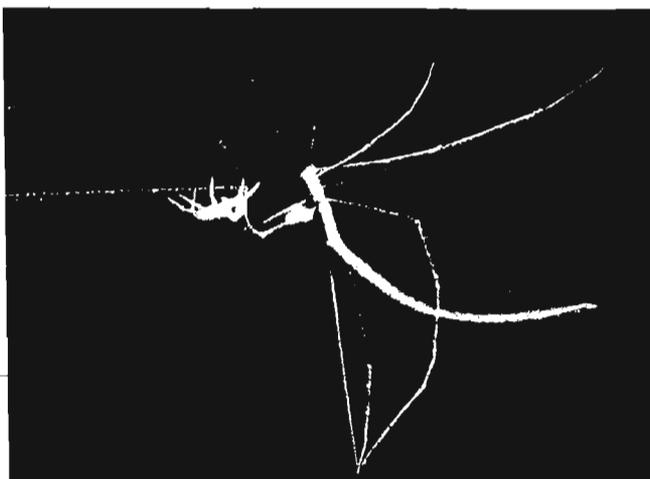


Fig. 3. Same as Fig. 2. Note that the sticky line is held on the lateral surface of the spider's right leg IV. The line to the left of the *A. attenuatus* is coated with white powder, while that to the right is uncoated and thus invisible.

Spilasma artifex spiderlings consistently escaped because they did not stay on the *A. attenuatus* lines, but descended on lines of their own, and as the *A. attenuatus* approached them or tried to reel them in, they let out silk faster until the *A. attenuatus* finally turned away.

As noted by Eberhard (1980) and Lahmann and Zuñiga (in prep.), it is common to find small insects, mostly nematocerous flies, hanging at night from spider threads in some forested areas. These "trapeze" flies seem to prefer more or less horizontal lines, but do not discriminate between threads from different spider species, and will even hang on cotton thread (Lahmann and Zuñiga in prep.). Young *A. attenuatus* were frequently found with small flies as prey, and the supposition that these prey had been captured while hanging on the spiders' webs was reinforced when I observed an attack on such a fly. When I first noticed the fly, it was hanging on one of the threads of a spider's web, and the spider was about 5 cm away, facing toward it. As I watched, the spider moved very slowly and smoothly toward the fly, stopping frequently to hang motionless; it took nearly five minutes to cover the 5 cm. There were occasional gentle vibrations of the line, but I could not tell whether they were caused by the spider or a sporadic gentle breeze. As the spider neared the fly, it began waving its front legs slowly; it touched the fly

gently with one of these movements, and immediately withdrew its leg and turned slowly 180° so that its abdomen was toward the prey. Carefully it drew out a strand of sticky silk with first one IV and then the other (as in Figs. 2 and 3) and then suddenly, with the only quick movement of the entire sequence, swung its hind legs upward to bring the sticky thread around the fly, and immediately began wrapping it with dry silk.

Egg Sac

Five different *A. attenuatus* were found with egg sacs. All sacs were elongate and white with a soft papery wall and small yellowish eggs loose inside the central portion. The spider rested either under the sac or adjacent to it with the legs extended in front and behind so that its outline merged with that of the sac.

DISCUSSION

One of the unusual features of *A. attenuatus* is the presence of serrated bristles on the prolateral side of tarsus IV, and the absence of the comb on its inner surface that is usual for theridiids (Exline and Levi 1962). It is thus interesting that, at least in the single case in which leg and thread positions were observed in detail (right leg IV in Fig. 3), the sticky wrapping thread contacted the outer rather than the inner surface of the leg. This association is in accord with the general belief that serrated bristles and combs on the tarsi IV of theridiids serve to manipulate the wet wrapping silk which is apparently peculiar to this family. The advantage of holding the thread on the outer rather than the inner surface of the tarsus is not clear; perhaps it is related to the way in which the spider holds sticky thread poised just before wrapping (Fig. 2), a behavior unique to my knowledge in theridiids.

The web structure, attack behavior, egg sac, and cryptic postures of *A. attenuatus* appear to be very similar to those of *A. colubrinus* (Clyne 1979). *A. flagellum* also apparently assumes the same cryptic posture. *A. attenuatus* differs from what is known of the other two in that it captures small flies and immature spiders as well as mature male spiders, apparently applies less wet silk as it wraps prey, and does not always rest facing up on webs. These spiders appear to be unique in having webs that serve as attractive resting sites and walkways for their prey.

ACKNOWLEDGEMENTS

I am grateful to Mr. Dixon Stroud and Dr. Luis Arango for generously allowing my family and me to stay at Finca Mozambique, and to Dr. H.W. Levi for kindly identifying the spiders. Drs. Levi and F. Vollrath helped with useful references. Financial support was provided by the Comité de Investigaciones of the Universidad del Valle, Cali, Colombia.

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