

NOTES ON THE BEHAVIOR OF
THALASSIUS SPINOSISSIMUS
(ARACHNIDA: ARANEAE: PISAURIDAE)

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INTRODUCTION

The present paper reports predatory, copulatory and parental behavior as observed in *Thalassius spinosissimus* (Karsch, 1879) in its natural habitat and in the laboratory. Spiders of this species have been reported to hunt on the surface of freshwater and to catch fish (Abraham 1923, Lawrence 1970). *Thalassius spinosissimus* is the most widespread and commonly collected species in the genus. It is distributed over Africa south of the Sahara.

OBSERVATIONS

Habitat

Thalassius spinosissimus inhabits banks with lush vegetation close to freshwater. A population of a small freshwater pond in an indigenous forest five miles north of Pietermaritzburg (Natal, South Africa) was observed for one year (1980). The abundance of *T. spinosissimus* was high (2.8–6.4 spiders per m² in the study area; recorded at 20 visits at the study site during the summer season). The distances between individuals hunting on the water surface varied between 5 and 20 cm (distances were measured between the tips of extended legs of individuals; recorded 11 times).

Life cycle

At the study site, *T. spinosissimus* overwintered from May to September; specimens were found immobile hiding under rocks and logs near the pond. The active season is the summer between October and May. Adults were found during November through March; in April and May only juveniles were observed.

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Fig. 1. Hunting position of *Thalassius spinosissimus*.

Daily activity pattern

During the summer season, spiders of all instars spend apparently most of the day on the water surface, unless hindered by heavy rain and storm (observations at study site between 9 am and 11 pm). Spiders kept in aquaria under a tent, exposed to daily temperature fluctuations demonstrated similar activity patterns. They were found in the hunting position nearly 24 hours a day and accepted prey at any hour (fed with tadpoles of *Bufo rangeri* and fruit flies).

Hunting position

In the hunting position, the spider anchors itself by one or two hind legs to a stone, log or vegetation. The other legs are extended, with metatarsi and tarsi touching the water surface (Fig. 1). During observation periods of up to two hours at the study site, the observed spiders did not change their location significantly unless they attacked prey or were disturbed. Single legs were frequently groomed with the chelicerae.

Animals "resting" on the vegetation near the water often moved to the surface and assumed the hunting position in response to minor disturbances, a behavior observed frequently both in the habitat and in the laboratory, presumably serving camouflage. The white lateral stripes of the body blend well with the vegetation, disrupting the visual body profile.

Diving

If disturbed by touch or strong, close movement, *T. spinosissimus* submerges by climbing along the substrate. They are not able to break freely through the water tension nor can they swim under water. The spiders remained submerged for an average of five to ten minutes, although longer periods of up to 35 minutes were recorded.

Prey capture

T. spinosissimus hunts for appropriately sized prey (insects, crustaceans, fish, tadpoles, and toads) exclusively on the water surface. In the laboratory and in the field, prey was put on the water surface in different distances and positions from the spider. To capture mobile prey, e.g., swimming water insects or tadpoles, the spiders waited until the prey had come close enough to be grasped with the front legs. A few spiders continuously orientated the spread front legs towards the moving prey.

Prey struggling on the water surface such as terrestrial insects

which have fallen on the water surface elicited a different prey catching behavior. Capture attempts were made after reorientation of the spread front legs towards the source of waves and motionless periods of varying length. The spiders responded to close stimuli (within 6 cm) by jumping on the prey. More distant prey (6–25 cm away) was reached by “rowing”: the front legs remain spread out on the water surface at a fixed angle, while legs II and III perform rowing motions, pushing the spider forward. The IV pair remains extended on the water.

Since the spiders did catch ants (but dropped them quickly) and hunted regularly at night, chemical and visual stimuli are probably not involved in prey detection.

T. spinosissimus chewed its prey with the chelicerae, turning it with the aid of its pedipalps. While feeding, the spiders frequently discharged clear drops of liquid from their anus.

Mating behavior (twelve matings observed)

Two to four weeks following the final molt, the females stopped hunting and spun a loosely woven three-dimensional mesh (mating-web). While resting in the web, the females hung upside down and assumed a distinct posture: all femora were held upright, the patellae nearly touching each other above the prosoma; tibiae and metatarsi were bent downwards.

Males did not hunt after the final molt but built small triangular sperm webs during the night. Charging of the palps was not observed. Males responded to threads from mating-webs placed in their aquaria with courtship behavior by touching and hitting the threads with their front legs. Threads of subadult females did not elicit courtship behavior.

Males reaching a mating-web initiated courtship by pulling at the threads with their pedipalps and beating them with their front legs. Intense trembling of the male opisthosoma was observed. The female's response consisted of pulling at the threads with her palps and front legs and enforcing her “resting” posture. Once the female responded, the male entered her web and continued his courtship. After each female response, the male moved closer to the female until he reached her. Courtship lasted 3 to 75 minutes.

The male touched the female's prosoma first with his front legs, then beat rapidly at the female's opisthosoma. The male climbed onto the female from the side and positioned his prosoma over her

opisthosoma. The male then spun broad threads around the female's patellae (Fig. 2). To insert the embolus, the male reached under the female's opisthosoma with the right or left palp along the female's right or left side, respectively (Fig. 3).

The males expanded the bulb in front of the epigynum (Fig. 4); insertions lasted five to twenty seconds for each bulb. In ten out of twelve copulations both bulbs were used alternately, three to five insertions occurred during copulations. After copulation, the male left the fastened, inactive female. Females began to remove the threads around the patellae two to seven minutes after copulation.

Males and females of *spinosissimus* were able to mate more than once either with the same or with other mates (three males and two females were used twice for matings).

Parental care

Egg laying and cocoon building were not observed. The cocoons are round and whitish and carried by the female in the chelicerae under the prosoma. Between 150 and 200 spiderlings hatched after 19–21 days (at 20° to 25° C) from each of 7 cocoons observed in the laboratory. Shortly before hatching, the females spun an irregular nursery-web and fastened the cocoon in its center. The spiderlings remained in the nursery-web for up to six days; they tended to stay in a central cluster, spinning additional threads. The females remained almost inactive at the edge of the web (Fig. 5). Without molting, the spiderlings began to disperse and moved to the upper corners of the laboratory windows.

DISCUSSION

The copulatory position of *T. spinosissimus* agrees with that of other hunting spiders (Gerhardt & Kästner 1937/38: 547; type three in Foelix 1982: 194). The same position is described for *Dolomedes fimbriatus* (Clerck, 1758) by Gerhardt (1926: 7). Spinning threads around the females legs by the males prior to copulation has been observed in *Pisaurina mira* (Bruce & Carico 1986).

The parental care as displayed by *T. spinosissimus* occurs in other Pisauridae as well: *Pisaura* and *Dolomedes* (Gerhardt & Kästner 1937), *Afropisauria* (Blandin 1979: 82), *Pisaurina* (Carico 1972: 303), *Tinus* (Carico 1976: 301), *Megadolomedes* (Davies & Raven 1980: 139) and *Architis* (Nentwig 1985: 301). The results obtained



Fig. 2. Copulation of *T. spinosissimus*. Male spins threads (arrow) around female's legs.

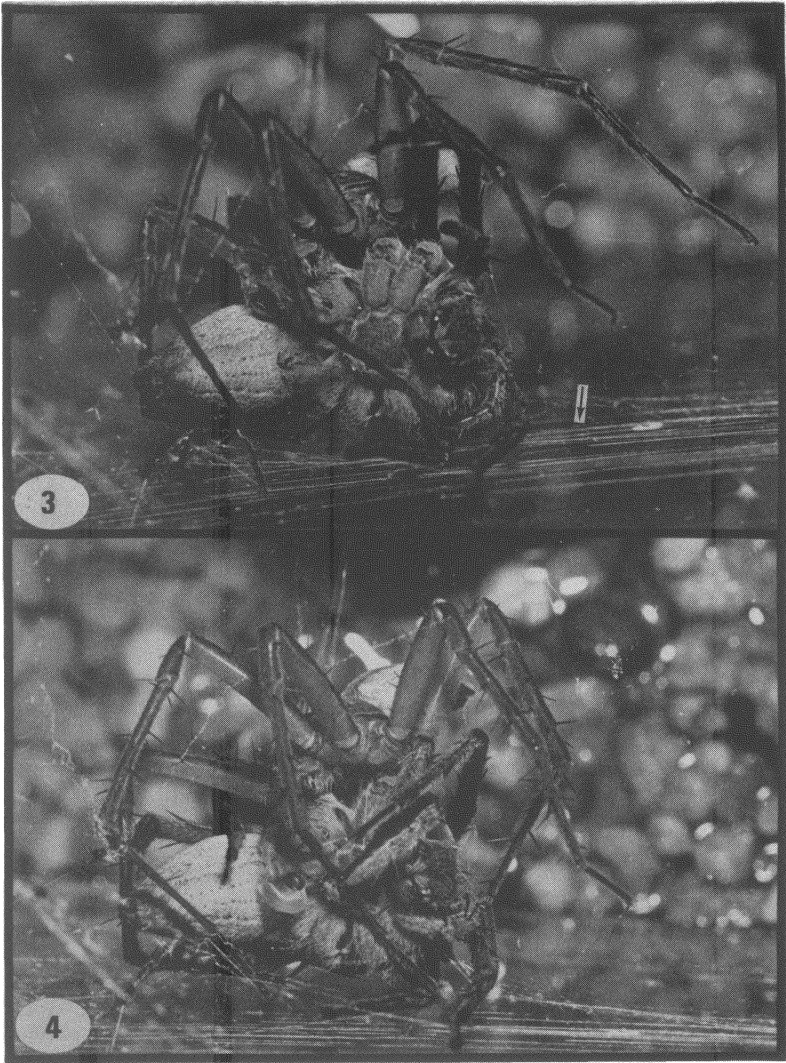


Fig. 3-4. Copulation of *T. spinosissimus*. (3) Male positions his palp in front of the female epigynum. Arrow indicates threads of the mating-web. (4) Expansion of the male bulb in front the epigynum. Body length of spiders approximately 15 mm.



Fig. 5. Female *T. spinosissimus* with nursery-web.

from the present study indicate that *Thalassius* is related to *Dolomedes*, *Pisaura* and *Pisaurina*. Lehtinen's placement (1967) of *Thalassius* in the Ctenidae appears to be unjustified (see Sierwald 1987).

The prey catching behavior of *T. spinosissimus* is similar to that of some species of *Dolomedes* which hunt on the water surface as well (*Dolomedes triton*: Bleckmann 1982, Bleckmann & Barth 1984, Bleckmann & Rovner 1984; *D. aquaticus* and other New Zealand species: Williams 1979). Rowing movements over the water surface have been described in *D. fimbriatus* by Ehlers (1939: 485); diving behavior is known from *Dolomedes* species as well (McAlister 1959: 109).

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