

## SHORT COMMUNICATION

### ***HOMALONYCHUS THEOLOGUS* (ARANEAE, HOMALONYCHIDAE): DESCRIPTION OF EGGSACS AND A POSSIBLE DEFENSIVE POSTURE**

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**ABSTRACT.** Presented here is a description of the cryptic, sand-covered eggsacs of *Homalonychus theologus*. Additionally, when this species is gently harassed, it adopts a rigid, paired-leg position which may be a defensive posture functioning in immobility and possibly mimicking cactus spines.

**Keywords:** Spider, eggsac, defensive behavior, immobility

The spider family Homalonychidae is represented by a single North American genus consisting of two species. *Homalonychus* spiders are found in the deserts of extreme southeastern California, the southern tip of Nevada, southwestern Arizona, northwestern Sonora, and Baja California. These spiders are not commonly encountered, and the sparse information that is known regarding its natural history was presented by Roth (1984). We had the opportunity to examine a few individuals of *H. theologus* Chamberlin 1924 and present our observations on two aspects.

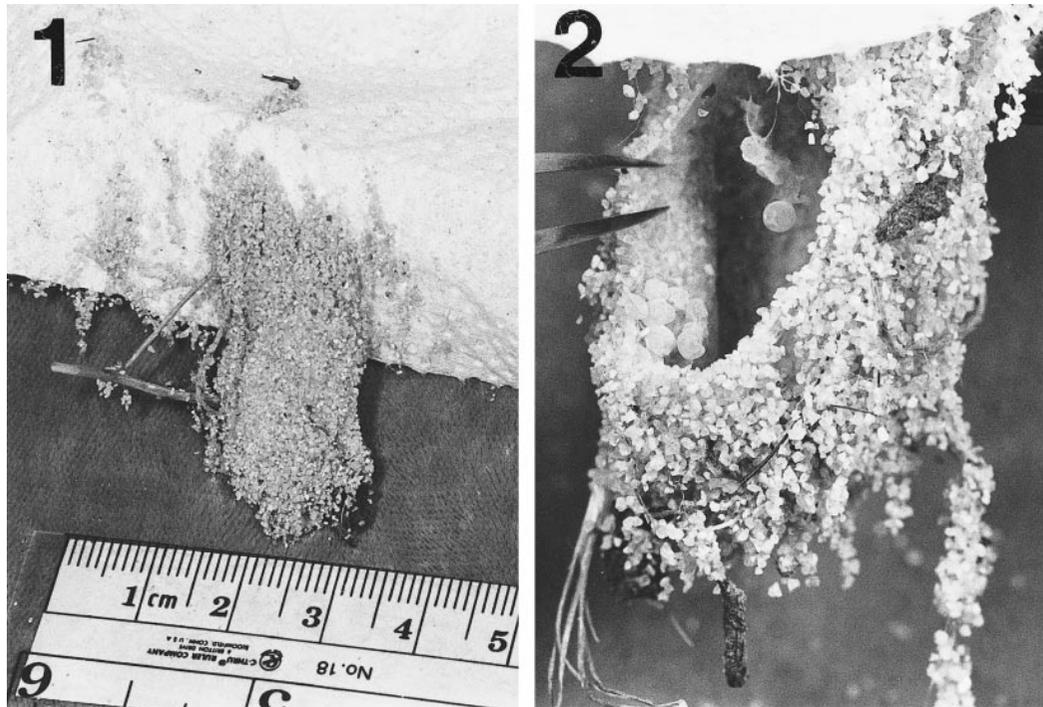
**Eggsacs.**—Roth (1984) mentioned only one eggsac for the genus that was collected in April but “nothing is recorded regarding either the placement of the egg sac or its description.” In the original description of *H. positivus* (= *H. selenopoides* Marx 1891), Chamberlin (1924) reported a collection from Guaymas, Sonora, Mexico, in which three females were “taken under stones with egg sacks” on 12 April 1921. Because the specimens reported by Chamberlin were type specimens which Roth might have studied for his revision, it is possible that the eggsac mentioned by Roth was from the same collection. Apparently, Roth overlooked the information presented by Chamberlin.

Two female *H. theologus* were captured (California: *San Bernardino County*, ♀ #1, off Amboy Rd by Sheep Hole Pass, 640 m, 16 February 1997, M. Holman, O. Trout; ♀ #2, 5 km S Amboy, 150 m, on salt flat under a board, 25 April 1998, R. Vetter) and maintained in 2.5 liter plastic containers with sand substrate. (♀ #1 had beach sand and ♀

#2 had sand from its natural habitat.) Crumpled paper toweling served as refugia, and females were maintained until death. Upon cleaning out their containers within two days of each female’s death, it was discovered that in the hidden recesses of the paper towels, each spider had produced two rounded, sand-covered eggsacs (Fig. 1). The eggsacs were about 18 mm in diameter and smooth inside, being lined with silk (Fig. 2).

Eggsacs from ♀ #1 were transferred to a 4 liter plastic jar and maintained in the first author’s home at temperatures of 24–30 °C. Spiderlings were first noticed on the toweling 53 days later although the development time probably was longer because the date of oviposition was unknown. Seventeen spiderlings were collected, and examination of the eggsacs revealed 22 shed skins in one eggsac and no evidence of shed skins, spiderlings nor infertile eggs in the other. Eggsacs of ♀ #2 were removed from the female’s container and examined. One contained 17 shed skins and 8 desiccated, presumably infertile eggs; it is unknown where the spiderlings dispersed. The other eggsac contained 20 spiderlings and one desiccated egg. Sixteen of the 20 spiderlings appeared to have died molting from the 1st to 2nd instar; of the remaining four, two were dead and two were moribund. No spiderlings were found outside of the eggsacs.

Although the maintenance of these spiders was artificial, the eggsacs were similar in construction to one observed under a rock in Punta Diggs (17 km S San Felipe, Baja California Norte, Mexico, under rocks on sandy desert soil, S. Johnson, pers.



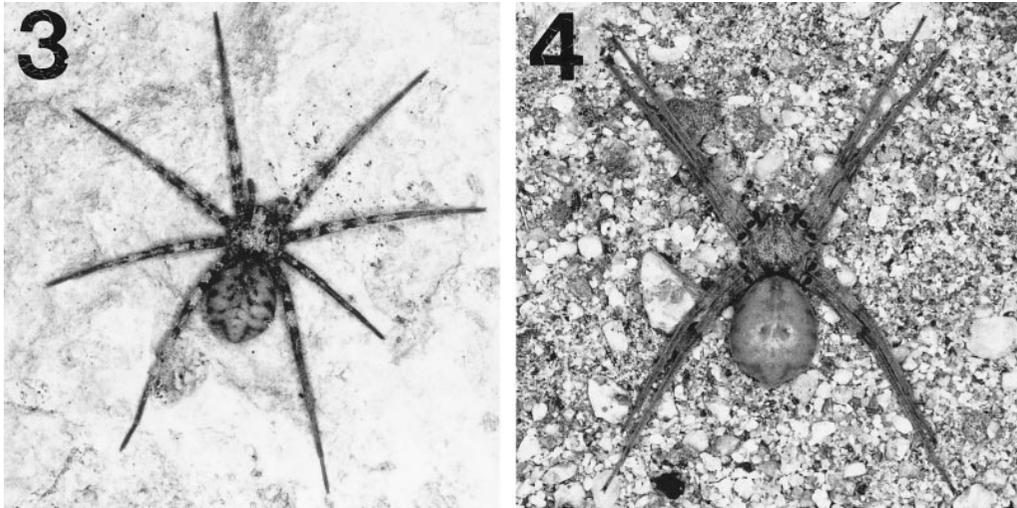
Figures 1, 2.—Eggsacs of *Homalonychus theologus*. 1. Sand-covered egg sac of *Homalonychus theologus* suspended from the underside of a paper towel; 2. Close-up of egg sac with view of inside. An egg is visible in the interior of the sac. (Photos by P. Kirk Visscher)

comm.). In our artificial setting, *H. theologus* produced 21, 22, and 25 eggs per egg sac. These females were probably fed only about once per month and, therefore, the egg total here may be low due to the sparse food supply. Because we collected one specimen at night while it roamed around in sparsely vegetated desert yet saw none during the day while conducting experiments over extensive periods of time in the same locale, we speculate that *H. theologus* spiders spend daytime in rodent burrows and under rocks where they easily could affix their egg sacs. The sand and silk covering would probably aid in humidity/temperature control as well as camouflaging the egg sac to avoid detection by potential predators or parasites. Although *Homalonychus* spiders are found partially buried in sand (Roth 1984; pers. obs.), they do not appear to construct burrows nor remain hidden in the sand during the daylight hours.

**Potential defensive posture.**—When at rest, *Homalonychus* spiders position themselves with all legs spread out from one another (Fig. 3; also see Roth 1984: fig. 14). When disturbed, *H. theologus* shifts its legs to a rigid “paired-leg” formation (first two legs forward, hind two legs rearward) (Fig. 4). When a mature (12 mm body length) female (California: *Riverside County*, Cactus City, 17 km W Chiriaco Summit off I-10, 400 m, at night wander-

ing, 23 March 1997, R. Vetter) was held by her legs with a pair of forceps she could be rotated in all positions without becoming limp or attempting to run. This behavior can also be elicited by touching the spider with a pencil or forceps, when at rest or while moving, day or night. However, a 3 mm *Homalonychus* juvenile from the same locale did not adopt this posture when chased for several minutes in two separate trials. Therefore, propensity to display this behavior may be size dependent (i.e., the spider’s potential as a prey item). When a penultimate *H. theologus* female (9 mm body length) was uncovered under a rubber tire, (California: *San Bernardino County*, 5 km S Amboy, 150 m, 26 April 1998, R. Vetter), she moved several cm from her initial spot, became immobile, adopted the “paired leg” stance (which was maintained while being maneuvered into a 40 dram vial), slid down the length of the vial and did not abandon this position until she was slid back out of the vial into the collector’s hand.

We did not have sufficient numbers of specimens to attempt additional tests and, therefore, we can only speculate on the mechanism of the behavior if, indeed, it is defensive in function. The primary defenses of *H. theologus* are nocturnal activity and crypsis including burial in sand, the cryptic aspect of which is enhanced by the spider’s dorsal hairs



Figures 3, 4.—Postures of *Homalonychus theologus*. 3. Characteristic resting posture of *Homalonychus* with legs held flat and spread equidistant from one another. This penultimate male molted and was not placed back on sand. Hence, it shows its natural coloration without sand trapped amongst hairs; 4. Posture of a female *H. theologus* with rigid body and paired legs, possibly a defense mechanism. (Photos by J. C. Cokendolpher)

which trap small sand grains (except in mature males) (Roth 1984). Immobility is a common general defense among animals (Cott 1940). Cloudsley-Thompson (1995) mentions death-feigning (thanatosis) in an exhaustive review of spider defensive behaviors; however, no behavior such as we have seen in *H. theologus* is mentioned. Additionally, thanatosis in spiders usually involves holding the legs tucked in close to the body. The rearrangement of the legs in *H. theologus* is somewhat puzzling as two legs held together would seem to increase the spider's conspicuousness, and hence belie its cryptic nature. Possibly, this leg orientation provides a novel image to a predator accustomed to eating spiders. Predators are known to avoid novel stimuli (Cott 1940) although we doubt that predators will care whether its prey have "4" or 8 legs. We would like to offer one additional speculative hypothesis. Because *H. theologus* is both nocturnal and a desert dweller, possibly the immobility in concert with paired-leg posture mimics the appearance of detached spines of dead cactus which could be an effective defense in the desert at night when visibility is poor.

Voucher specimens are housed at the California Academy of Sciences.

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