

RESPONSE OF *NEPHILA CLAVIPES* TO MOCK PREDATION CHANGES WITH THE PROXIMITY OF THE MOLT

Disturbance and predation attempts have been recognized as being important determinants of web-site tenacity in orb-weaving spiders (Eberhard 1971; Enders 1976). Response to simulated predation by vibrating the web and dropping from the web have been documented for a variety of orb-weavers, including *Nephila clavipes* (Linn.) (Araneae: Tetragnathidae) (Tolbert 1975). To investigate the role of failed predation attempts on web-site abandonment in *N. clavipes*, I subjected juveniles collected in the field to a strong stimulus: a leg was pinched, causing autotomization.

Intact spiders of 0.3 to 0.4 cm leg I tibia + patella length were collected from Barro Colorado Island and Gigante Peninsula in the Barro Colorado Island National Monument, Panama. These spiders were housed in an insectary in the laboratory clearing on the island, where they spun webs in 23-25 cm diameter frames consisting of two 0.5 cm strips of fiberglass fixed at right angles and hung from one of the points of intersection. These frames were uncovered, and the spiders were always at liberty to move within the insectary. Spiders were fed two 6 mm live prey items daily, usually small moths or *Trigona* Jurine stingless bees that were placed in the orb. After about 10 days in captivity, five spiders were subjected to a mock predator attack involving pinching the tibia with dissection forceps. Seven or 14 days later, the remaining five were attacked.

The response to mock-predation involving leg autotomization was immediate abandonment of the web, but not necessarily of the web site. Nine spiders autotomized either a first or a second leg; one spider eluded the forceps and escaped the web. Six spiders abandoned the web site by dropping on a drag-line and spinning an air-borne bridge thread, and were later found building a new web within the insectary. The remaining four hid on the fiberglass web support and later returned to the original web. Three of these four spiders molted within five days of the attack (range 2-4; mean 2.7 days), one molted seven days after the attack. The spiders that abandoned their webs were all more than five days away from the next molt (range 6-8, mean 7.4 days). The response to the attack was significantly affected by the proximity of the molt (within five

days vs. more than five days to molting: $N=10$, likelihood ratio "G" test = 6.43, $df=1$, $p=0.005$).

The failure of premolt spiders to abandon their webs after a predation attempt is probably related to the physiological processes involved in preparing for molting. Orb-web size declines in the last four or five days before the molt, and spiders cease spinning viscid orbs one to three days before molting (Higgins 1990). About when spiders cease spinning, the principal major ampullate silk glands are reconstructed (M. Townley and E. Tillinghast, pers. comm.). These glands are the source of the orb-web frame lines and probably also of the barrier-web silk (E. Tillinghast, pers. comm.). *N. clavipes* undergoes ecdysis suspended from the dorsal side of the orb or the dorsal barrier web-hub connection (Higgins 1990). Premolt spiders may have a greatly reduced or negligible capacity to spin a new web, and surviving the molt without a web is highly unlikely.

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