
At 07:30 h on 18 November 1999, while radio-tracking a female *P. barbata* (23.6 cm SVL), I noticed a ca. 1.5-m *P. textilis* to my right, coming around the base of a large (1.5 m DBH) Grey Box tree (*Eucalyptus microcarpa*). The snake was moving across my field of view, heading in the direction of my radio signal. The *P. barbata* was perched on a relatively thick (> 5 cm diam) branch ~15 cm above the ground. The female was facing away from me at a distance of ~2 m, but had the antenna of the transmitter (attached to the base of the tail) pointed towards me. The snake lifted its head above the ground and seemed distracted, so that it appeared not to notice me. As it continued to move forward slowly, it rapidly jerked its head from side to side constantly flicking its tongue.

The dragon seemed aware of the snake, as it was trying to peer backwards while moving its body as little as possible. Suddenly, the snake lifted its head and its tongue flicked the radio-transmitter. It then slowly opened its mouth and grabbed the right rear thigh of the dragon. The dragon simultaneously arched its head back, opened its mouth, pulled out its beard, then let go of the branch. This caused the snake to lose its grip and the dragon ran towards a wire fence ~1 m away. The snake moved after it quickly, raising about one third of its body off the ground. The dragon appeared to have been momentarily stuck in the mesh of the fence and by the time I had taken the few steps to peer over it, the snake had the dragon’s snout in its mouth and had wrapped several coils around its body.

The snake used more than one method in attempting to engulf the large dragon. Initially, it tried to walk its jaws over the dragon’s head (Fig. 1). After about 10 minutes, it then wrapped several coils around the animal’s body and seemed to be trying to push the dragon into its mouth. Failing this, the snake then uncoiled fully and tried to pull the dragon through the grass, possibly aimed at stretching the animal out to aid its ingestion (Valderrama 2001, Herpetol. Rev. 32:46–47).

Despite moving relatively little and pale in color, the dragon actively pushed its beard outward. Every time the snake loosened its grip to change position, the dragon would quickly suck in air and inflate itself even more. Eventually it appeared divested, as captured wild individuals sometimes appear in the hand (J. Smith, unpubl. data).

About 40 minutes after the initial attack, the snake let go and moved off. Only when I stood up to watch its departure did the snake appear to notice me, inflating its throat slightly and increasing its speed in the opposite direction. The dragon did not move at all in the ensuing minutes and its body retained the same pale color. There were scattered blood spots on top of its head. When I returned at 11:00 h, the dragon had moved under a large log nearby that it had frequented previously. Subsequent tracking during the following weeks gave no indication of a change in the behavior of this dragon, and she eventually became gravid.

None of the adult dragons (6 females, 3 males) that I telemetered during this study were killed by snakes. *Pseudonaja textilis* is known to consume juvenile *P. barbata* (Oliver 1998, Herpetofauna 28:54); however, the width of this dragon’s head, including the inflated beard, presented a very large prey item for even an adult *P. textilis* to consume. The residual blood seen on the dragon’s head may have been left by the snake. I did not see an obvious bite on the dragon but the snake may have broken some teeth off as I could hear them scraping over the dragon’s head. If the blood was from the dragon (and assuming the snake injected any venom), this poses interesting questions about the potency of brown snake venom on eastern bearded dragons. Nevertheless, some defense mechanisms of adult *P. barbata* appear sufficient to repel a major predator. Conversely, episodes such as this one may also occur because snakes attempt ingestion when the large size of prey is unrecognized.

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**SISTRURUS CATENATUS CATENATUS** (Eastern Massasauga). MALE-MALE AGGRESSION. Selection for traits that confer a mating advantage (e.g., bright plumages, elaborate ornaments, large body size) can occur through female choice and/or male-male competition (Darwin 1871, The Descent of Man, and Selection in Relation to Sex. Murray, London, 898 pp.). In many species, competition for mates results in aggressive interactions between members of the same sex, usually males. Aggressive behavior has been previously reported for many species of pitvipers in which...

On 20 August 2001 at 12:55 h, while radio-tracking a male *S. c. catenatus* at Eldon Hazlet State Park, Clinton County, Illinois, USA, we noticed some aberrant behavior. The snake (#186) was moving through the vegetation while rapidly tongue flicking and probing the ground cover with his head. We followed the snake for ca. 4 m where he encountered a copulating pair of *S. c. catenatus*. The pair was straightened out, but facing opposite directions. Male #186 moved over the pair to an outstretched position on top of the male (#245). Male #186 then elevated the anterior portion of his body vertically, forming an S-shape, and laterally undulated. Male #245 remained still except for hitting male #186 with his thrashing tail. Male #186 continued his elevated body undulations then moved around toward the female resulting in a looped position on top of the male. Male #245 then moved his head to a position above male #186 at mid-body. Next, the female moved her anterior end around to face male #186, who began moving toward her while making jerky head movements. Male #186 assumed an outstretched position on top of the female and started making rapid full-body flexions. Male #186 next moved back toward male #245 while head bobbing and elevating the anterior portion of his body. Male #186 began laterally undulating the elevated portion of his body above male #245 and took a position stretched out on top of him. Next, male #186 paused his elevated undulations, moved toward the female, and began tongue flicking the cloacal regions of the copulating pair. During this time, the female moved around to the same direction as male #245. Male #186 next moved back toward male #245 while head bobbing and resumed the elevated undulating behavior. The female slowly started moving away, dragging male #245 behind her with male #186 straightened out on top of him. Male #186 moved across and tongue flicked the cloacal regions again then moved to where the female had been previously, elevated his anterior end, and began undulating. After ceasing his undulations, male #186 remained still for a short period then moved away from the pair at 1308 h. Shortly thereafter, the female slowly moved off in the opposite direction dragging the conjoined male #245 behind her. We subsequently captured the snakes and measured snout–vent length (SVL) to the nearest millimeter with a flexible measuring tape and mass to the nearest gram with a Pesola spring scale. Sizes were as follows: male #186 (SVL = 68.1 cm, mass = 426 g), male #245 (SVL = 66.7 cm, mass = 315 g), female #246 (SVL = 61.9 cm, mass = 277 g).

When male #186 was initially encountered, he presumably was following a scent trail exuded by the female. On a previous occasion, one of us (DBS) observed the behavior of rapid tongue flicking and head probing by a different male *S. c. catenatus* after a female had recently been in the area. This behavior is undoubtedly a trail following behavior since male #186 led us to the female several meters away and moved in a seemingly direct path. Some behaviors exhibited by male #186 were not aggressive, but rather courtship behaviors directed toward the female. Specifically, the jerky head movements and full body flexions are involved in courtship and have been observed previously in *S. c. tergeminus* male-female pairs (Chiszar et al. 1976. Herpetologica 32:337–338). The behavior of vertically elevating the anterior portion of the body into an S-shape and laterally undulating has not been reported previously in *S. catenatus* and is probably specific to male-male aggressive interactions. The aggressive behavior of male #186 closely resembled that reported for *S. miliarius* (Carpenter 1979, op. cit.) in that both species elevate the anterior portion of the body at about a 45° angle, rarely perpendicular, and always in an S-shape, and laterally undulate with the objective to gain a superior position.

There is little opportunity for female choice in snakes because most mating is determined through male-male competition (Duvall et al. 1993. In Seigel and Collins [eds.], Snakes: Ecology and Behavior, pp. 165–200. McGraw-Hill, Inc., New York). In species where males compete directly for females, males are predicted to be larger and the largest males should have the highest reproductive success (Shine 1994. Copeia 1994:326–346). In the genus *Sistrurus*, larger males are more likely to be associated with females during the mating season than smaller conspecifics (Bishop et al. 1996. Herpetologica 52:360–364; Phillips, unpubl. data). Even though male #186 was larger and theoretically should win in a bout, male #245 had already secured the mating. It appears that by tongue flicking the cloacal regions of the snakes, male #186 determined the pair was already copulating, and consequently moved away. In *S. c. catenatus*, males often remain with females for several days as part of an extended courtship/mate guarding association (D. Mauger, pers. comm.; Phillips, unpubl. data). It is during this period when a male is present with the female that the potential for male-male combat is highest as other males may be attracted to the area by female pheromones. Had male #245 not already been copulating, he may have responded aggressively toward the intruding male #186.

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**TANTILLA MELANOCEPHALA** (Black-headed Snake). **PREDATION.** The small colubrid *Tantilla melanocephala* is widely distributed from southern Guatemala to Peru, Bolivia, Brazil, and northern Argentina. It is considered mostly nocturnal in southeastern Brazil (Marques and Puorto 1998. Amphibia-Reptilia 19:311–318) and diurnal in the Amazonian region (Martins and Oliveira 1998. Herpetol. Nat. Hist. 6:78–150). During a nocturnal driving avian census, we observed predation on *T. melanocephala* by the Burrowing Owl, *Athene cunicularia* (Aves: Strigidae). The observation occurred on 26 February 2002 at 1924