

**CROTALUS SCUTULATUS (Mohave Rattlesnake). MAXIMUM SIZE.** Here, we report the longest accurately measured *Crotalus scutulatus*. The adult male *C. scutulatus* was captured mid-morning on 16 September 2014, in Eloy, Pinal Co., Arizona, USA (32.780383°N, 111.613144°W; WGS84). The snake was coaxed into a clear plastic tube and triplicate measurements were taken with the anterior part of the snake in the tube and the posterior part straightened out by hand along a measuring tape (Fig. 1). Mean measurements ( $\pm$  Standard Deviation) were: SVL = 1136.7 ( $\pm$  5.7) mm, tail length = 90.3 ( $\pm$  2.4) mm. Therefore the total length of the specimen (excluding the rattle) is 1236 mm.

*Crotalus scutulatus* measuring over 1000 mm are not common, and the maximum verified total length (excluding rattle) to date is 1135 mm (Cardwell 2015. Rattlesnakes of Arizona. *In press*. ECO Publishing, Rodeo, New Mexico). While there have been a few previous reports of animals over 1200 mm long, none of these reports have been authenticated (Cardwell 2015, *op. cit.*). A male specimen of length 1231 mm reported by Klauber remains unconfirmed as the datasheet has not been located (Cardwell 2015, *op. cit.*). Tennant (1984. The Snakes of Texas. Texas Monthly Press, Austin, Texas. 561 pp.) initially reported a male measuring 1373 mm from Brewster Co., Texas, USA, but later questioned this due to possible misidentification (Cardwell 2015, *op. cit.*). Finally, Lowe et al. (1986. The Venomous Reptiles of Arizona. Arizona Game and Fish Dept., Phoenix. 115 pp.) described the maximum length of *C. scutulatus* as 1321 mm, but the source of this is untraceable and is suspected to be a digit-switching error while reporting Klauber's data (Cardwell 2015, *op. cit.*). Our specimen, with a total length of 1236 mm is consequently the longest *C. scutulatus* that has been accurately measured and reported. The specimen is now in the live collection of the Chiricahua Desert Museum, Rodeo, New Mexico.

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FIG. 1. Longest recorded *Crotalus scutulatus* being measured.

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**CROTALUS WILLARDI (Ridge-nosed Rattlesnake). REPRODUCTION / MALE COMBAT.** In certain lineages of snakes, males compete for priority-of-access to females as mates by way of direct fighting, often called male combat (Carpenter et al. 1976. Copeia

1976:764–780; Shine 1978. Oecologia 33:269–277; Schuett 1997. Anim. Behav. 54:213–224). In rattlesnakes and numerous other pitviper species, male combat involves rearing, vertical posturing, entwining, constriction, and thrashing (Schuett, *op. cit.*; Schuett et al. 2001. Acta Ethol. 4:31–49). Here, we report on male combat in *Crotalus willardi* from a population in Arizona. To the best of our knowledge, male combat has not been described in *C. willardi* in the wild or in captivity (Shine 1994. Copeia 1994:526–546; Schuett et al., *op. cit.*; Ernst and Ernst 2012. Venomous Reptiles of the United States, Canada, and Northern Mexico. vol. 2, Johns Hopkins University Press, Baltimore, Maryland. 399 pp.).

On 8 August 2008, at 0955 h, on a small hillside (elev. 1646 m) in the Patagonia Mountains (Arizona, Santa Cruz Co., USA, 31.416°N, 110.733°W; datum Conus 27; highest elev. 2201 m), one of us (BPO) observed two adult *C. willardi* engaged in male combat (Fig. 1A). The snakes were similar in size, but were easily distinguishable by their body color (dark brown vs. light brown) and number of rattle segments (Fig. 1B). Neither individual was captured; thus, sex was not directly confirmed. Combat proceeded in typical stereotypic fashion, with both individuals raising their bodies above the substrate and attempting to attain a superior position (Schuett et al., *op. cit.*). Other acts included swaying, entwining, and falling. After several minutes they would rest then reinitiate combat. Both individuals used a rock and low-lying branches for stability during vertical postures of combat. At 1011 h, observations of the snakes were halted for 20 min; when observation resumed, the light male was found about 7 m up slope along a rock cut where he



FIG. 1. Male combat in *Crotalus willardi* in the Patagonia Mountains, Arizona. A) Males in vertical postures. B) Males entwined, constricting, and one is exhibiting a superior position.

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was stretched out and in a relaxed position. The dark male was not located after searching for 10 min. Actual combat was observed for approx. 16 min, and the total duration of the observation was 56 min. Although a female *C. willardi* was not located in the immediate vicinity, this does not preclude a female's presence owing to this species' extremely cryptic behavior. The combat observation we document occurred during the time of summer that is commonly reported as the mating season for this species in the northern region of its range (Holycross and Goldberg 2001. Copeia 2001:473–481; Ernst and Ernst 2012, *op. cit.*).

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**DRYMARCHON MELANURUS EREBENNUS** (Texas Indigo Snake). **DIET / SCAVENGING.** *Drymarchon melanurus erebennus* is a state (Texas) protected species with a wide distribution including all of the South Texas Plains and portions of the southern Edwards Plateau eco-regions. *Drymarchon m. erebennus* is an opportunistic generalist that feeds on a broad spectrum of vertebrates including rodents, birds, frogs, small turtles, lizards, and serpents. Smith and Antonio (2007. Herpetol. Rev. 38:88) report carrion feeding by the allopatric *D. couperi* (Eastern Indigo Snake) on a disarticulated shark head. Herein we report, to the best of our knowledge, the first observation of *D. m. erebennus* eating carrion in the wild.

On 27 March 2007, an adult *D. m. erebennus* was observed in the process of swallowing a dead *Crotalus atrox* (Western Diamond-backed Rattlesnake) (Fig. 1). The *C. atrox* had been killed two days earlier and draped over a barbed-wire fence. The carcass was bloated and exhibited an advanced state of decomposition. The carcass hung from a barb, causing the *D. m. erebennus* to rise from the ground during the early stages of consumption. Thereafter we removed the carcass from the fence and observed as consumption proceeded over the next two hours. The observation occurred approximately 4 km W of Yancey, Medina Co.,

Texas, USA (29.14894°N, 99.18679°W, datum WGS84; elev. 217 m). A photo voucher (TNHC 91021) was deposited in the Texas Natural History Collection at the University of Texas.

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**DRYOCALAMUS SUBANNULATUS** (Malayan Bridle Snake). **BEHAVIOR.** In Southeast Asia, two genera of climbing snakes, *Dryocalamus* and *Lycodon*, are morphological Batesian mimics of the highly venomous kraits in the genus *Bungarus*. *Bungarus* snakes exhibit a dark brown or black background with bands of white, yellow, or tan, which together provide an appearance of alternating dark and light bands. *Dryocalamus* and *Lycodon* snakes, although differing from *Bungarus* species in other morphological characters, mimic this alternating dark and light color pattern. In Thailand, the color pattern of *Dryocalamus subannulatus* is thought to mimic that of *Bungarus candidus*, and the ranges of these two species overlap by at least 50%. Hospitals in Thailand report (Viravan et al. 1992. Trans. Roy. Soc. Trop. Med. Hyg. 86:100–106) that *Dryocalamus* snakes are brought in by snakebite victims believing they have been bitten by a *Bungarus* species.

At 2122 h on 31 July 2014, we observed a *D. subannulatus* in a dry evergreen forest at Sakaerat Environmental Research Station in Nakhon Ratchasima Province, Thailand (14.5060°N, 101.9276°W, WGS84; 435 m elev.). The snake was stretched horizontally (Fig. 1A), 22 cm above the ground, across the trunk of

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FIG. 1. *Drymarchon melanurus erebennus* consuming a dead *Crotalus atrox* hanging from barbed-wire fence.

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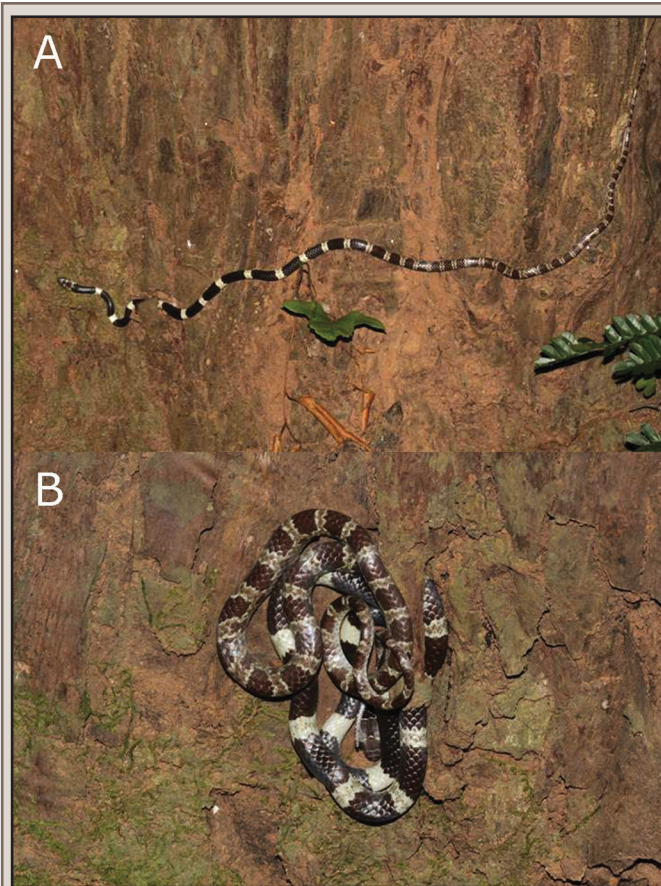


FIG. 1. *Dryocalamus subannulatus* when (A) first observed, and (B) mimicking head-hiding behavior of *Bungarus* species.