

FIG. 1. One of two *Crotalus horridus* collected during surveys in Houston County, Minnesota, USA, that tested positive for *Chrysosporium* sp.; note facial dermatitis circled in red.

looking facial dermatitis (Fig. 1). Both individuals were pre-ecdysis when found and were held for approximately five weeks before biopsy samples were sent for analysis; during this time they completed ecdysis. Small biopsies from the head of Snake A and body of Snake B, as well as shed skins from both animals, were sent to the US Geological Survey – National Wildlife Health Center in Madison, Wisconsin for testing.

Tissue from the biopsies and affected areas of skin from the sheds were subjected to fungal culture at an incubation temperature of 24°C. Fungal isolates were examined microscopically for tentative identification. Most isolates were common environmental fungi that likely represented normal skin flora (e.g., *Aspergillus* and *Penicillium* spp.). However, two isolates (one from the biopsy of Snake A and one from the shed skin of Snake B) could not be identified by microscopic examination. A portion of the internal transcribed spacer region of the ribosomal RNA gene for both isolates was amplified and sequenced using universal primers. The sequences were identical to one another and >99.6% nucleotide match with *Chrysosporium ophioidiicola* (GenBank accession EU715819), a species isolated from a facial mass of a *Pantherophis alleghaniensis* (Eastern Ratsnake; Rajeev et al. 2009. J. Clin. Microbiol. 47:1264–1268). However, further analyses are necessary to determine whether the isolates from the *C. horridus* represent the same species as that from the *P. alleghaniensis*. Histopathology was performed on a small portion of the skin from one of the biopsies using special stains for fungi. No fungal elements were observed, but the sample was taken from the edge of the biopsy and likely did not contain the actual lesion; histopathology could not be performed on the remaining biopsy as that sample was used for culture analysis.

This is the first documented occurrence of a *Chrysosporium* sp. on free-ranging wild snakes in Minnesota; while mortality has been associated with *Chrysosporium* fungi elsewhere (Allender et al. 2011, *op. cit.*; Rajeev et al. 2009, *op. cit.*), it is not known whether this *Chrysosporium* sp. is impacting snake survival in Minnesota. Rajeev et al. (2009) reported that the infected *P. alleghaniensis* died in captivity two months after surgically removing the lesions; similarly, Allender et al. (2011) noted that all three of the *Sistrurus catenatus catenatus* (Eastern Massasauga Rattlesnakes) with *Chrysosporium* infections from Illinois died in captivity within three weeks after discovery. However, both of the Minnesota animals have improved over the course of 10 weeks in captivity without a specific course of treatment; Snake B now appears asymptomatic.

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CROTALUS HORRIDUS (Timber Rattlesnake). REPRODUCTION. *Crotalus horridus* is a widely distributed species native to the eastern United States; however, most research has focused on northern populations. In Georgia, *C. horridus* typically mates from August to October and gives birth from mid-August to mid-September. However, there have been reports of snakes at higher elevations delaying birth until early October (Jensen et al. 2008. The Amphibians and Reptiles of Georgia. Univ. Georgia Press, Athens. 575 pp.). On 19 October 2011, we collected a road killed female *C. horridus* with a distended lower body in Baker Co., Georgia, USA. No body size measurements were taken on the specimen due to its advanced state of decomposition. Upon dissection, we observed between 8–12 fetuses (SVL range = 291–330 mm) in the latter stages of development. This observation is evidence of late season pregnancy in *C. horridus* in the southeastern Coastal Plain.

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CROTALUS VIRIDIS (Prairie Rattlesnake). DIET. *Crotalus viridis* feeds on small mammals (mice, ground squirrels, rats, small rabbits); it will also consume lizards, amphibians, and other snakes. On 3 July 2012, an adult *C. viridis* was photographed attempting



FIG. 1. Adult *Crotalus viridis* attempting to consume an adult male *Falco sparverius*.

to consume a still quivering adult male *Falco sparverius* (American Kestrel) at the Chihuahuan Desert Rangeland Research Center, Summerford Mountain (32.532536°N, 106.790825°W; datum WGS84), New Mexico, USA (Fig. 1). On 06 July 2012, the site was revisited and the kestrel was found, apparently regurgitated, after being swallowed down to the top of the wings. To our knowledge, this represents the first case of attempted predation on *F. sparverius* by *C. viridis*.

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CROTALUS VIRIDIS (Prairie Rattlesnake). REPRODUCTION/COMBAT. Male-male combat behavior is a component of the reproductive cycle of pitvipers (Aldridge and Duvall 2002. Herpetol. Monogr. 16:1–25). The occurrence of male-male combat behavior is reported in North America during spring (Gloyd 1947. Nat. Hist. Misc. 12:1–4) and summer (Klauber 1972. Rattlesnakes: Their Habits, Life History, and Influence on Mankind, 2nd ed. Univ. California Press, Berkeley; Holycross 1995. Herpetol. Rev. 26:37–38). Here we report field observations of two combat episodes between *C. viridis* in early autumn and spring in northern Chihuahua, Mexico.

At 1130 h on 23 September 2008, 1 km W of the gap that leads to “El Vergel,” at km 304 of the Ciudad Juárez–Chihuahua Federal Highway 45, municipality of Juárez, Chihuahua, Mexico (31.20223889°N, 106.51834444°W, datum WGS84; elev. 1285 m) one of us (EMR) encountered two male *C. viridis* (ca.1100 mm SVL) engaged in combat (Fig. 1). The observation occurred in dune habitat with vegetation composed primarily of *Prosopis glandulosa* and *Gutierrezia sarothrae*, about 20 m away from the location of a female *C. viridis* and her newborn offspring. Combat continued for ca. 10 min, after which the defeated male withdrew. A film and photos of the combat are deposited in the scientific collection of vertebrates of the Autonomous University of Juárez UACJ (CHI-VER-189-08-06). The second combat event took place on 15 April 2003, at 1100 h, on the campus of the Autonomous University of Juárez (UACJ) (31.49132095°N, 106.41687207°W; datum WGS84). These observations are unusual in that they occurred outside of the typical summer breeding season of the species.

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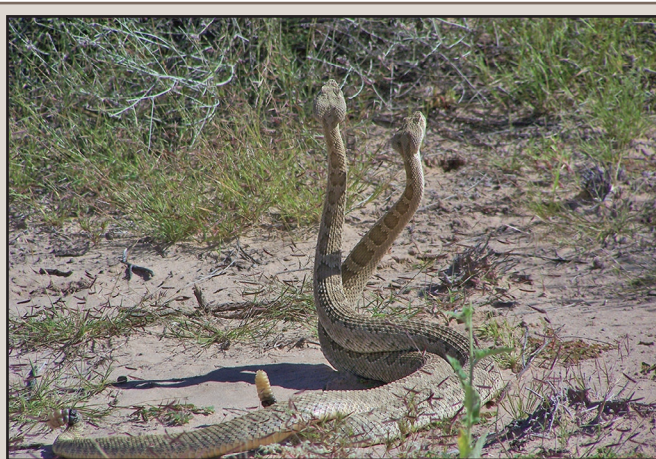


FIG. 1. Male-male combat between two *Crotalus viridis* observed in September in northern Chihuahua, Mexico.

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DIPSAS ALTERNANS (Jan's Snail-Eater, Dormideira). DEFENSIVE BEHAVIOR. The genus *Dipsas* comprises small and non-venomous Neotropical snakes that show several defensive strategies, some of which are thought to mimic venomous snakes of the genus *Bothrops* (Sazima 1992. In Campbell and Brodie Jr. [eds.], Biology of Pitvipers, pp. 199–216. Selva, Tyler, Texas). Recently, Maia-Carneiro et al. (2012. Biotemas 25:207–210) described three defensive behaviors in *Dipsas alternans*: immobility, spherical body coiling, and hiding the head among the body coils. In our long-term studies of snakes in the Atlantic forest region of the state of Paraná, southern Brazil, we have collected seven *D. alternans*. Five of these demonstrated the same defensive behaviors described by Maia-Carneiro et al. (*op. cit.*), but two exhibited a unique defensive behavior: spiral coiling. The two snakes were found moving within the leaf-litter on the ground of the forest. Both stayed immobile, but after manipulation, rolled their body into a perfect plain spiral, with their heads completely visible in the center (Fig. 1), displaying three spots on the dorsum of the head, as described by Maia-Carneiro et al. (*op. cit.*). In captivity, the specimens never showed any other defensive behaviors, but always forming the spiral when stimulated. Although the exact function of this behavior remains unknown, the spiral shape might confuse a potential predator or mimic the spiral-shaped dead leaves of common tree fern in the area, *Dicksonia sellowiana* (Cyatheaaceae). The specimens are deposited in the herpetological collection of the Museu de História Natural Capão da Imbuia (MHNCL.691, Camarinhos, municipality of Campo Largo, Paraná; 25.43°S, 49.63°W, datum WGS 84; MHN-CI.3005, Rio do Meio, municipality of Antonina, Paraná; 25.33°S, 48.75°W, datum WGS 84).

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FIG. 1. *Dipsas alternans* (MHNCL.691) from Paraná, Brazil, showing spiral defensive behavior.

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