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NATURAL HISTORY NOTES

The Natural History Notes section is analogous to Geographic Distribution. Preferred notes should 1) focus on observations in the field, with little human intrusion; 2) represent more than the isolated documentation of developmental aberrations; and 3) possess a natural history perspective. Individual notes should, with few exceptions, concern only one species, and authors are requested to choose a keyword or short phrase which best describes the nature of their note (e.g., Reproduction, Morphology, Habitat, etc.). Use of figures to illustrate any data is encouraged, but should replace words rather than embellish them. The section's intent is to convey information rather than demonstrate prose. Articles submitted to this section will be reviewed and edited prior to acceptance.

Electronic submission of manuscripts is requested (as Microsoft Word or Rich Text format [rtf] files, as e-mail attachments). Figures can be submitted electronically as JPG files, although higher resolution TIFF or PDF files will be requested for publication. Please DO NOT send graphic files as imbedded figures within a text file. Additional information concerning preparation and submission of graphics files is available on the SSAR web site at: http://www.ssarherps.org/HRinfo.html. Manuscripts should be sent to the appropriate section editor: **Marc P. Hayes** (crocodilians, lizards, and *Sphenodon*; mhayesrana@aol.com); **Charles W. Painter** (amphibians; charles.painter@state.nm.us); **Andrew T. Holycross** (snakes; AndrewHolycross@gmail.com); and **James Harding** (turtles; hardingj@msu.edu).

Standard format for this section is as follows: SCIENTIFIC NAME, COMMON NAME (for the United States and Canada as it appears in Crother [ed.] 2008. *Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico*. SSAR Herpetol. Circ. 37:1–84, available from SSAR Publications Secretary, ssar@herplit.com; for Mexico as it appears in Liner and Casas-Andreu 2008, *Standard Spanish, English and Scientific Names of the Amphibians and Reptiles of Mexico*. Herpetol. Circ. 38:1–162), KEYWORD. DATA on the animal. Place of deposition or intended deposition of specimen(s), and catalog number(s). Then skip a line and close with SUBMITTED BY (give name and address in full—spell out state names—no abbreviations). (NCN) should be used for common name where none is recognized. References may be briefly cited in text (refer to this issue for citation format).

Recommended citation for notes appearing in this section is: Medina, P., and R. L. Joglar. 2008. *Eleutherodactylus richmondi*: reproduction. Herpetol. Rev. 39:460.

CAUDATA — SALAMANDERS

ANEIDES FERREUS (Clouded Salamander). **ARBOREAL ACTIVITY.** *Aneides ferreus* inhabits the forests of western Oregon and extreme northwestern California. Although thought to be primarily terrestrial, *A. ferreus* has occasionally been found as high as 60 m up in trees (Jones et al. 2005. Amphibians of the Pacific Northwest. Seattle Audubon Society. 227 pp.), and two recent reports suggest that it may be more arboreal than previously believed (Spickler et al. 2006. Herpetol. Conserv. Biol. 1:16–26; Forsman and Swingle 2007. Herpetol. Conserv. Biol. 2:113–118). However, it is difficult to evaluate the amount of arboreal activity by this species because almost all sampling efforts have been focused on terrestrial habitats.

On 23 May 2008 near the Coquille River in southwest Oregon we observed two adult *A. ferreus* in a cavity 75 m above ground in a Douglas-fir tree (*Pseudotsuga menziesii*) that was 78 m tall and 195 cm diameter at breast height (43.1797°N, 123.8122°W; WGS 84). Exposed when a limb broke off, the small cavity in the trunk contained copious amounts of Red Tree Vole (*Arborimus longicaudus*) fecal pellets. Two days later we photographed what we presumed to be the same two salamanders in the cavity (Fig. 1). Based on the shape of their heads, we suspected they were a male and female. These observations add to the increasing evidence that *A. ferreus* is more active in the canopy of Douglas-

FIG. 1. *Aneides ferreus* inside a cavity 75 m above ground in the top of an old-growth Douglas-fir (*Pseudotsuga menziesii*), Coquille River, Oregon, USA.

fir forests than is generally known and also support the hypothesis that nests of arboreal rodents may be important microhabitats for *A. ferreus* (Spickler et al. 2006, *op. cit.*; Forsman and Swingle 2007, *op. cit.*). It remains unknown if use of the forest canopy by *A. ferreus* is restricted to foraging and shelter, or includes occasional breeding as well.

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CRYPTOBRANCHUS ALLEGANIENSIS ALLEGANIENSIS (Eastern Hellbender). **SECRETION PRODUCTION.** Of the potential antipredator mechanisms exhibited by amphibians, noxious skin secretions are considered the most effective against potential predators (Brodie et al. 1979. Copeia 1979:270-274). Many species produce toxic and irritating skin secretions as adults, but the larvae of many salamanders are palatable to various predators because toxic and distasteful secretions generally do not develop until after metamorphosis (Formanowicz and Brodie 1982. Copeia 1982:91–97).

FIG. 1. Larval Eastern Hellbenders (*Cryptobranchus alleganiensis alleganiensis*) immediately after producing a white secretion composed of sticky and foamy components.

Adult *Cryptobranchus alleganiensis* are large amphibians (60+ cm) and probably have few predators. When stressed or being captured, adult hellbenders often produce a milky secretion that is bitter and distasteful when applied to the tongue (Brodie 1971. Herpetol. Rev. 3:8), and the secretion may be unpalatable to predators. Larval hellbenders hatch between 23 and 30 mm total length and metamorphose 1.5–2 yrs after hatching, and are probably highly vulnerable to predation due to their small size and slow developmental rate (Nickerson and Mays 1973. The Hellbenders. Milwaukee Public Museum. Wisconsin. 106 pp.). It is unknown when the ability to produce secretion develops in hellbenders. In Oct–Nov 2007 several Eastern Hellbender egg clutches were collected in Missouri for captive rearing. On 29 April 2008 at 0900 h, 12 larval hellbenders (25 weeks post hatching, mean TL ± SE = 91.75 ± 1.8 mm) were collected in a small net for transport to a separate container for behavioral observations. The larvae immediately produced copious amounts of a secretion that appears to have two components. The first component was water-soluble and had a "foamy soap" appearance (Fig. 1). The second component was very sticky and was not soluble in water (Fig. 1); it remained adhered to the individual hellbenders for up to 48 h. Both components are similar in appearance to those produced by adult hellbenders (Nickerson and Mays 1973, *op. cit.*).

Immediately after secretion production, BGG put a small amount of the foamy secretion on his tongue and experienced a strong bitter sensation lasting for ca. 5 sec. The sensation was not accompanied with burning or numbness. The larval secretion tasted very similar to that produced by adult hellbenders.

Our observations suggest that, unlike most salamanders with aquatic larvae, larval hellbenders are capable of producing noxious skin secretions that might function to deter potential predators.

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