

NATURAL HISTORY NOTES

GYMNOPHIONA — CAECILIANS

CAECILIA ABITAGUAE (Abitagua Caecilian). ATTEMPTED CANNIBALISM. *Caecilia abitaguae* is a large caecilian native to the eastern slope of the Andes in Ecuador (Taylor and Peters 1974. Univ. Kansas Sci. Bull. 50:333–346) and nothing is known about its feeding habits (O'Reilly 2000. In Schwenk [ed.], Feeding, Form, Function and Evolution in Tetrapod Vertebrates, pp. 149–166. Academic Press, New York). In this note I describe attempted predation involving two specimens of *C. abitaguae*. At 2130 h on 4 July 2013, I collected two caecilians intertwined with wooden supports for stairs on a trail that they appeared to be crossing. The larger individual was biting the smaller one. They were found on the Piha Trail at Wildsumaco Wildlife Sanctuary about 100 m downhill from the junction of the Piha and Mannakin Trails (0.6867°S, 77.5995°W, WGS84; 1415 m elev.). The larger specimen (QCAZ 56884) was 592 mm total length (mass not determined), with a lighter blue head and 151 annuli, and exhibited bite wounds located dorsally at 40 mm and 83 mm posterior to the snout (Fig. 1). The smaller individual (QCAS 56883) was 365 mm total length (183 g) and had 152 annuli. This specimen had a large bite mark 32 mm posterior to the snout and an open wound 95 mm posterior to the snout (Fig. 1) and was bleeding profusely when captured. Both were put in separate damp cloth bags over night and, unexpectedly, were alive and not bleeding the following morning. Few vertebrates and no caecilians have been reported in the diets of caecilians (O'Reilly 2000, *op. cit.*). Given the amount of blood present, I think that it is unlikely this was some sort of social interaction such as courtship or agonistic behaviors.



FIG. 1. Two *Caecilia abitaguae* collected 4 July 2013 at Wildsumaco Wildlife Sanctuary in eastern Napo Province, Ecuador. The specimen on the left (QCAZ 56884) was biting the specimen on the right (QCAS 56883) when caught. Arrows indicate bite marks that were bleeding at the time of capture.

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CAUDATA — SALAMANDERS

CRYPTOBRANCHUS ALLEGANIENSIS ALLEGANIENSIS (Eastern Hellbender). REPRODUCTIVE BEHAVIOR AND HABITAT. *Cryptobranchus alleganiensis alleganiensis* occurs across the southeastern United States (Petranka 1998. Salamanders of the United States and Canada. Smithsonian Institution Press, Washington, DC. 587 pp.). During the breeding season males excavate and actively guard nest sites under large rocks (Smith 1907. Biol. Bull. 13:5–9). Nest guarding and egg deposition have been observed in Georgia during early fall, however, few accounts exist which document breeding behavior of multiple individuals at single nest rocks in the field (Jensen et al. 2008. Amphibians and Reptiles of Georgia. University of Georgia Press, Athens, Georgia. 575 pp.). The purpose of this note is to add information on the reproductive behavior and nest site selection from field observations for this cryptic species.

Between 1100–1145 h on 5 September 2014, five adult Eastern Hellbender individuals (gravid female ~40 cm total length, den master ~38 cm total length, small male ~30 cm total length, small female ~34 cm total length, larger male ~34 cm total length), were observed at a nest rock in a first order tributary of the Toccoa River within the Chattahoochee National Forest, Union Co., Georgia, USA (precise location withheld due to conservation concerns) and recorded with a Canon Powershot D10 underwater video camera (Table 1). Approximate total length and sex was determined by visual inspection and presence or absence of cloacal swelling. The nest rock was situated in a bedrock main channel pool directly below a riffle, measured ~1.75 m (length) by 64 cm (width) at 54 cm water depth, with 3 confirmed entrances, 2 downstream entrances (entrance 1 = 12 cm, entrance 2 = 8 cm, length respectively) and one side entrance (entrance 3 = 10 cm length). We measured the nest rock and obtained ~150 cm² of gravel from entrance 1 one hour after behavioral observation to measure gravel and cobble-sized bed substrate of the nest rock using a Wildco® gravelometer following standard pebble count methods. Gravel size within entrance 1 consisted primarily of fine to medium sized gravel, range = 5.6–11 mm, mean = 14.5 mm, while cumulative gravel distribution ranged from 2.5 to 47.5, mean = 20 mm.

In summary, the den master repeatedly defended several nest rock entrances, repeatedly bit an incoming gravid female, and presumably drove out the smaller male. The observation of females attempting repeated entry into unguarded entrances suggest females may selectively choose to enter unguarded entrances to avoid den master antagonistic behavior (biting) in

TABLE 1. Behavioral observations for 5 adult *Cryptobranchus alleganiensis alleganiensis* documented at nest rock. Abbreviations are as follows: entrance 1 (ent. 1), entrance 2 (ent. 2), and entrance 3 (ent.3). F = female, M = male.

Lapsed Time	Den Master M (~38 cm TL)	Large F (~40 cm TL)	Small M (~30 cm TL)	Small F (~34 cm TL)	Large M (~34 cm TL)
0:00	First observed protruding head, ent 1				
2:30		Approached ent 1			
3:35	Bit Large M on nose				
4:00			Entered ent 2		
4:05	Retreated into ent 1		Forced out of ent 1		
4:50		Attempted entry, ent 3		Attempted entry, ent 3	
7:32	Protruded head, ent 2	Moves up nest rock edge			Appears below ent 3
8:22	Retreated into ent 1; protruded head, ent 2	Drifts ~1 m downstream of nest rock			
9:48	Retreated into ent 2		Completes entry, ent 1		
10:12	Protruded head, ent 2; retreated into ent 2	Rests under downstream boulder (5 min)			
12:45	Protruded head, ent 2			Probed edge of nest rock; entry ent 3	
13:51	Bit Large F on neck	Probes right side of nest rock; approaches ent 2			
14:46	Retreated into ent 2	Approaches and enters ent 1			
15:12					Approaches and enters ent 1

nest rocks with multiple entrances. Observations of “breeding congregations” at nesting sites are rarely reported due to the cryptic behavior of these salamanders, making the observation of multiple males and females entering a single nest rock valuable for future behavioral studies.

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DICAMPTODON TENEBROSUS (Coastal Giant Salamander). **DIET.** The diet of larval *Dicamptodon tenebrosus* is comprised predominantly of invertebrates (Cudmore and Bury 2014. Am. Midl. Nat. 172:191–199). Amphibians are also a known secondary diet component in some populations of larval *Dicamptodon*. For example, *Ascaphus montanus* (Rocky Mountain Tailed Frog) tadpoles have been documented in the diet of *Dicamptodon aterrimus* (Idaho Giant Salamander) larvae in Idaho (Metter 1963. Copeia 1963:435–436). In California, we have observed *D. tenebrosus* larvae consuming *Ascaphus truei* (Coastal Tailed

Frog) tadpoles (RMB, unpubl. obs). Although it is suspected that larval *D. tenebrosus* may also feed on *A. truei* embryos, no records exist documenting this behavior (Petranka 1998. Salamanders of the United States and Canada. Smithsonian Institution Press, Washington DC. 587 pp., Dodd 2013. Frogs of the United States and Canada. Johns Hopkins University Press, Baltimore, Maryland. 1032 pp.). Here, we augment the dietary data of *D. tenebrosus* with an observation of ingested *A. truei* embryos.

At 1250 h on 8 September 2015, we captured a larval *D. tenebrosus* (SVL = 69.5 mm; 15.6 g) as part of a mark-recapture project in a fourth order stream on managed timberlands within Tectah Creek, a tributary to the Klamath River, in Humboldt Co., California, USA (41.2630°N, 123.9659°W, WGS84; 352 m elev.). The larva was anesthetized in a 250 ml solution of 0.2% tricaine methanesulfonate in preparation for marking. The animal's stomach was noticeably distended prior to marking although the contents were not discernible, but while marking the ventral side of the larva it regurgitated some of its stomach contents (Fig. 1A). Eighteen *A. truei* embryos were counted. Nine were fully intact, seven of which were approximately stage