Research Station of Kyoto University, Nantan City, Kyoto Prefecture, Japan (35.340°N, 135.762°E; WGS 84; 630 m elev.). After the salamander swallowed the toad, we caught and kept it in a tank until the next day. We measured the salamander (685 mm total length), examined the stomach contents regurgitated by gentle massage, and injected a PIT tag for individual identification. The *A. japonicus* weighed 1815 g after regurgitation. The SVL of the toad was 89 mm. The other stomach contents included three freshwater crabs (*Geothelphusa dehaani*), a plecopteran larva (*Oyamia* sp.), a freshwater goby (*Rhinogobius* sp.), a pharyngeal bone of a cyprinid fish, and a digested frog with an egg mass (unknown rhacophorid species; Fig. 1B). We released the giant salamander back to the stream where we found it at on 18 May 2019.

It may be rare to find a *B. japonicus* in a stream, and this should be the first report of predation on this species by *A. japonicus*. We guess that the salamander attacked the toad at the edge of the riverbank. Moreover, species of *Bufo* including *B. japonicus* have toxic steroids (bufadienolides) in the skin secretions that inhibit the sodium-potassium pump, causing arrhythmia (Melero et al. 2000. Molecules 5:51–81). Introduced *Rhinella marina* (Cane Toad) have been reported to kill endemic predators with their toxins in several countries and regions (Kidera and Ota 2008. Cur. Herpetol. 27:23–27; Letnic et al. 2008. Biol. Conserv. 141:1773–1782). However, the giant salamander did not die after swallowing the *B. japonicus* and seemed to be unaffected by the toxins. Furthermore, an *A. japonicus* showed no effect from toxins after eating a poisonous *Rhabdophis tigrinus* (Tiger Keelback Snake; Tanaka and Mori 2000. Curr. Herpetol. 19:97–111), which obtain and store toxins from their bufonid prey (Hutchinson et al. 2013. J. Zool. 289:270–278). Thus, *A. japonicus* may have resistance to the bufadienolides and may be able to feed on toads.

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***CALOTRITON ARNOLDI* (Montseny Brook Newt). AGONISTIC BEHAVIOR.** Behavioral observations on *Calotriton arnoldi* are scarce due to the rarity of this micro-endemic amphibian. Its sister species, *C. asper* (Pyrenean Newt), is not considered territorial but exhibits agonistic behavior between males consisting of biting the trunk, head, and extremities. Herein, we report male-male combat in *C. arnoldi*. On 31 May 2019, we observed and filmed agonistic behavior between two male *C. arnoldi* (www.youtube.com/watch?v= S9ZAfiw2ewc) that was very similar to observations of agonistic behavior in *C. asper*. Although the cause of male-male combat in this genus is uncertain, it may be related to female access. The biting behavior observed is enhanced by the large size of male heads and can produce serious lesions leading to the amputation of limbs that can be fully regenerated.

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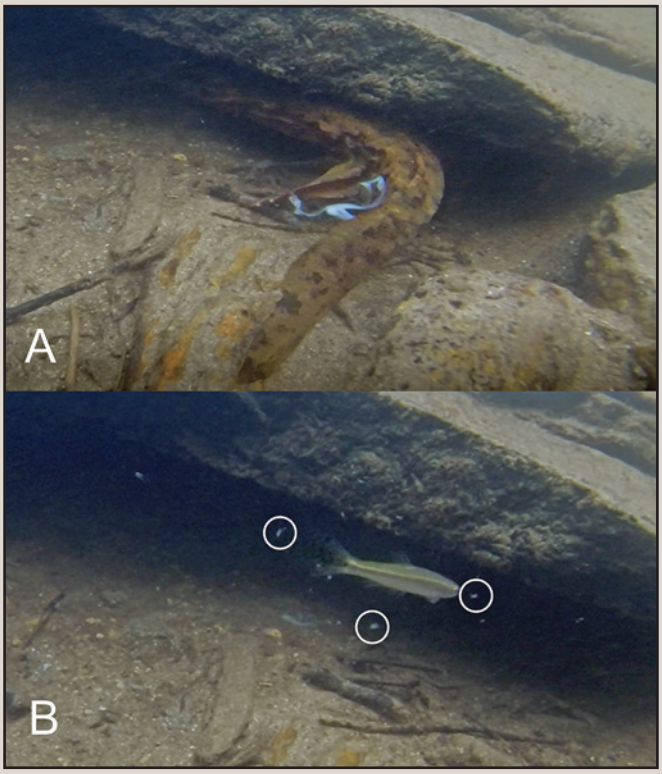
***CRYPTOBRANCUS ALLEGANIENSIS* (Hellbender). MILT PREDATION.** Spermatophagy or ingestion of seminal products has been documented in marine and terrestrial habitats across several invertebrate taxonomic groups as part of ritualized courtship or nuptial gifts whereby males provide spermatophores to females for consumption (Sakaluk 1984. Can. J. Zool. 63:1652–1656; Wegener et al. 2013. Behav. Ecol. 24:668–671). However, few reports exist of consumption of spermatozoa products produced by freshwater herpetofauna. *Notophthalmus viridescens* (Eastern Newt) has been observed in ponds to consume *Ambystoma maculatum* (Spotted Salamander) spermatophores (Hartzell 2018. Herpetol. Rev. 49:511). *Cryptobranchus alleganiensis* is a fully aquatic salamander found throughout Appalachia, breeding via external fertilization during the fall (Nickerson and Mays 1973. The Hellbenders: North American Giant Salamanders. Milwaukee Public Museum, Milwaukee, Wisconsin. 106 pp.).

On 9 September 2018 at 1405 h, we observed two adult *Notropis* sp. (shiner) consuming milt or seminal fluid from an adult male *C. alleganiensis* actively extruding ejaculate (Fig. 1A). This took place in a tributary of the French Broad River of western North Carolina, USA (specific locality on file with the North Carolina Wildlife Resources Commission and withheld due to conservation concerns). The feeding took place for ca. 26 s and was captured on a GOPRO 4 action camera positioned at the rock shelter entrance during a breeding season snorkel survey. In total, eight individual floating clumps of milt were consumed by two fish (one fish consumed two while the other consumed six floating clumps) immediately after the *C. alleganiensis* entered a rock shelter after extruding the milt (Fig. 1B). This observation of spermatophagy is unusual and provides documentation of potential nutritional sources for aquatic organisms which may




PHOTOS BY S. UNGER

FIG. 1. A) Closeup of *Cryptobranchus alleganiensis* male releasing milt as it entered its shelter; and B) milt being consumed by a *Notropis* sp. outside the shelter immediately afterwards.

congregate opportunistically near *C. alleganiensis* shelters during the breeding season. Video available at https://youtu.be/UuRQkWQZE2A.

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***DICAMPTODON ENSATUS* (California Giant Salamander). LARVAL DIET.** *Dicamptodon ensatus* is a large ambystomatid salamander of coastal northern California known to prey on a variety of vertebrates (Bury 1972. Am. Midl. Nat. 87:524–526; Petranka 1998. Salamanders of the United States and Canada. Smithsonian Institution Press, Washington, D.C. 587 pp.). Documentation of the prey consumed by larval *D. ensatus* is needed since, relative to congeners, little is known about the diet of larvae (Petranka 1998, *op. cit.*). On 21 November 2019 around 1400 h, in Jack London State Historic Park in Sonoma County, California, USA, we encountered a number of larvae and recently transformed *D. ensatus* in small pools and among streamside rocks over the course of a few 100 m. At the Vineyard Trail crossing of nearby Asbury Creek (38.34713°N, 122.54525°W; WGS 84), a larval *D. ensatus* (ca. 150 mm total length) was observed consuming an adult *Pseudacris regilla* (Pacific Treefrog; ca. 35 mm SVL; Fig. 1). The treefrog appeared recently dead, but the initiation of the predation event was not witnessed. The habitat was a closed canopy, mixed oak-redwood forest community, providing considerable shade. Bury (1972, *op. cit.*) reported the consumption of *P. regilla* by an adult *D. ensatus* in captivity, but to our knowledge, this is the first such observation in the field for a larval *D. ensatus*.

FIG. 1. Larval *Dicamptodon ensatus* consuming an adult *Pseudacris regilla*.

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***HYNOBIUS NEBULOSUS* (Japanese Clouded Salamander). MORTALITY.** *Hynobius nebulosus* is a lentic-breeding salamander in Japan endemic to Kyushu Island. This species breeds in small pools or ditches. The female lays one egg sac, attaching the end of the sac to the substrate. The male then grasps and

FIG. 1. A dead female *Hynobius nebulosus* with partly protruded egg sac. Tadpoles of *Bufo japonicus* preyed on the dead body and eggs.

holds the female and pulls the sac from the body, an action referred to as midwife behavior (Usuda 1993. Japan. J. Herpetol. 15:64–70). On 25 February 2000 at 1400 h, I found a dead female *H. nebulosus* (62 mm SVL) with a partly protruded egg sac in a ditch adjacent to vegetable fields in Futajima, Kitakyushu City, Fukuoka Prefecture, Japan (33.8956°N, 130.7478°E; WGS 84; 23 m elev.). The air temperature at the site was 15.2°C, water temperature was 10.8°C, and ground temperature was 16.3°C. Since the female failed to lay the whole egg sac and the egg sac started to absorb water and swell, she may have died from trauma caused by increased abdominal pressure by the expanded sacs left in the oviducts. There were two breeding males at the same site, which could have performed the midwife behavior. The female might have failed to attach the end of the egg sac to a suitable substrate leading to its incomplete deposition.

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***LISSOTRITON VULGARIS* (Smooth Newt). TAIL BIFURCATION and ECTROMELY.** *Lissotriton vulgaris* is a small species of the family Salamandridae. On 18 June 2018 we captured a deformed individual in a minnow trap in a pond formed by the flooding of a former clay mining area. The study area is located within a floodplain forest located between the cities of Leipzig and Schkeuditz, Germany (51.37980°N, 12.24232°E). We captured an adult male *L. vulgaris* (72 mm total length, 2.1 g) with a bifurcated tail tip. To our knowledge, no individual of this species has previously been found with this rare anomaly (Henle et al. 2012. J. Herpetol. 46:451–455; Henle et al. 2017. Mertensiella 25:57–164). The bifurcation point was located at the end of the tail (22 mm from the cloaca) and the two tail branches had about the same length, measuring 11 mm each (Fig. 1). The additional tip originated dorsally from the normal tip. This newt showed no other deformities. No other individuals with anomalies were caught in 2018 among the *L. vulgaris* (106 adults) or sympatric *Triturus cristatus* (Great Crested Newt; 36 adults), and *Bombina bombina* (European Fire-bellied Toad;19 adults and subadults) sampled. The tail bifurcation frequency for *L. vulgaris* in 2018 was 0.9%.

During fieldwork in 2019, a number of anomalies were observed in the same study area. In that season, we caught a total of 493 adult *L. vulgaris*. Although no individual showed any sign of tail bifurcation, one male exhibited ectromely with