

DESMOGNATHUS MARMORATUS
(Shovel-nosed Salamander).

TERRESTRIALITY. On 9 November 2017, I observed a young, metamorphosed *Desmognathus marmoratus* under a rock approximately 0.3 m from the edge of Cold Springs Creek in Haywood County, North Carolina (35.7450°N; 83.0079°W). The stream was high and turbulent, and it is possible that the salamander was driven from its aquatic refuge due to high flow or low oxygen. Bishop (1941) described this species as “[e]ssentially aquatic but occasionally on land” (A Handbook of Salamanders: The Salamanders of the United States, of Canada, and of Lower California, Comstock Publishing Company, Ithaca, New York. 555 pp.). One has been discovered ~ 1.5 m from a stream following a heavy rain (Niemiller pers. comm.), and one has been discovered sitting out of the water, upon a rock in a stream (Tilley pers. comm.). Southerland (1986) found *D. marmoratus* in pens that they should not have been able to enter without climbing and inferred that this species must make brief movements out of the water (Herpetol. Rev. 17:45). Published documentation of terrestriality in *D. marmoratus* is rare, but these direct and indirect observations of terrestrial movement in this species suggest that the behavior is infrequent but possible.

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GYRINOPHILUS PORPHYRITICUS (Spring Salamander). **COURTSHIP.** Extensive collections and examinations of reproductive anatomy suggest that *Gyrinophilus porphyriticus* reproduces between late fall and early spring both in the southern Appalachians (Bruce 1972. Herpetologica. 28:230–245; Bruce 1978. Herpetologica. 34:53–64) and further north in its range (Dieckmann 1927. Biol. Bull.

53:258–274,276–280; Bishop 1941. N. Y. State Mus. Bull. 324:1–365). Successful courtship trials in captivity have been conducted between November and March (Beachy 1996. Copeia. 1996:199–203; Beachy 1997. Herpetologica. 53:289–296). However, to our knowledge, there exist no published accounts of definitive courtship behaviors observed in the field, although Bishop (1941) described one brief observation of an interaction that could alternatively be interpreted as agonistic behavior. From approximately 2015 to 2300 on 5 December 2017, we observed 14 adult *Gyrinophilus porphyriticus* surface-active in a light rain along the Little Pigeon River and its tributaries (from approximately 35.7384°N; 83.4163°W to 35.6948°N; 83.3898°W) in Great Smoky Mountains National Park in Sevier County, Tennessee. At approximately 2200 h, we observed two adults in close proximity on the forest floor, approximately 1 m from a small, muddy spring. One appeared to be following the other, but we observed no specific courtship behavior. We left them undisturbed and returned at approximately 2300 h to find them approximately 1 m from where we last saw them, with one following directly behind the other. We suspect that we witnessed a male pursuing a female or a female being led in the early stages of tail-straddle walk, but we did not interrupt their activity to confirm sex of the animals. This research was conducted under permits GRSM-2017-SCI-1197, TWRA Scientific Collection Permit 1213, and University of Tennessee Knoxville IACUC 2372-0616.

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