

**TYPHLOTTRITON**  
**T. NEREUS**  
**T. SPELAEUS**

**AMPHIBIA: CAUDATA: PLETHODONTIDAE**

BRANDON, RONALD A. 1965. *Typhlotriton*, *T. nereus*, and *T. spelaeus*, p. 20. In W. J. Riemer (ed.), Catalogue of American Amphibians and Reptiles. American Society of Ichthyologists and Herpetologists, Kensington, Maryland.

***Typhlotriton* Stejneger**  
**Grotto salamanders**

*Typhlotriton* Stejneger, 1893:115. Type-species *Typhlotriton spelaeus* Stejneger, 1893, by monotypy.

• **CONTENT.** Two species are described, *T. spelaeus* and *T. nereus*; but see COMMENT.

• **DEFINITION.** The tongue is attached in front by a fine membrane only. The premaxilla is single; nasal processes are separate in larvae, but fused after metamorphosis. Prevomerine and paravomerine (= parasphenoid) tooth series are usually continuous. Eyes of metamorphosed individuals are reduced in diameter and structure from the larval condition and are covered by eyelids in various stages of fusion. Eyes of larvae are small in diameter when compared with those of *Eurycea* larvae from the same area. The genus includes the only known blind, transformed salamanders.

• **DESCRIPTIONS and ILLUSTRATIONS.** Stejneger (1893) and Dunn (1926) describe the diagnostic characteristics of the genus. Noble (1931:94) figures both a functional and a blind eye. For descriptions and illustrations of included species see accounts below.

• **DISTRIBUTION.** The genus is restricted to cave and spring waters of the Salem and Springfield Plateaus of the Ozark region in Arkansas, Kansas, Missouri, and Oklahoma.

• **FOSSIL RECORD.** None.

• **PERTINENT LITERATURE.** See the account of *T. spelaeus*.

• **ETYMOLOGY.** The name *Typhlotriton* derives from the Greek, *typhlos* meaning "blind," and *triton* meaning "salamander." The name is of masculine gender.

**COMMENT**

Although two species of *Typhlotriton* are described and both are included here, the validity of *T. nereus* is questioned. See COMMENT under that species.

***Typhlotriton nereus* Bishop**  
**Spring grotto salamander**

*Typhlotriton nereus* Bishop, 1944:1. Type-locality, "York Spring, Imboden, Lawrence Co[unty], Arkansas." Holotype, Chicago Nat. Hist. Mus. 93143, a female, collected by Byron C. Marshall, 15 February 1927.

• **CONTENT.** No subspecies are described.

• **DIAGNOSIS.** This species is described as differing from *T. spelaeus* in being neotenic and in having one more trunk vertebra—20, as compared with 19 in *T. spelaeus*.

• **DESCRIPTIONS.** In the original description, Bishop (1944) separates this form from *T. spelaeus* mainly on the basis of its supposed neoteny; he also notes that it has slightly more intercostal folds and generally fewer premaxillary teeth. If his counting was consistent, then on the basis of my counts for specimens of *T. spelaeus*, following Highton's (1957) method, (17–18 costal grooves, 18–19 trunk vertebrae), *T. nereus* should have 20–21 trunk vertebrae. In other external features and in pigmentation *T. nereus* is indistinguishable from larval *T. spelaeus*.

• **ILLUSTRATIONS.** Bishop (1944) provides a drawing of an adult, plus several photographs of poor quality.

• **DISTRIBUTION.** The species is known from the Ozark Plateaus, and from almost wholly within the distributional range of *T. spelaeus*. In several instances, both species are reported from the same caves and springs.

• **PERTINENT LITERATURE.** In addition to the original description, the literature consists of only a few distributional reports (e.g., Blair, 1952).

• **ETYMOLOGY.** The name *nereus* comes from the Greek *Nereis*, a mythological sea nymph. In modern Greek folklore a nereid is a nymph of springs, and the specific name of this salamander refers to its spring-dwelling habits.

**COMMENT**

The validity of this species is open to question. Dowling (1957) synonymizes it with *Typhlotriton spelaeus*. Some authors (e.g., Conant, 1958) have followed Dowling, but no sound refutation of its validity exists. The taxon is recognized here only because material on which it is based has not been re-examined. Such a study is under way by the writer.

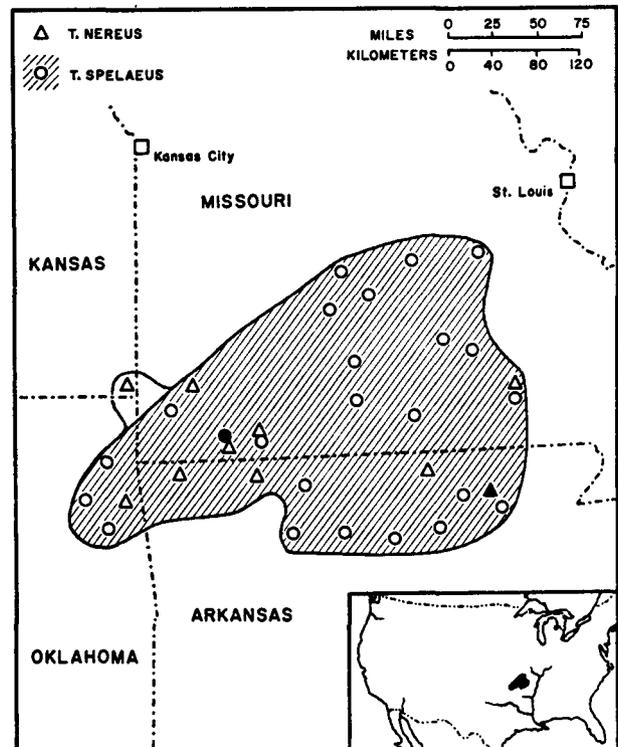
***Typhlotriton spelaeus* Stejneger**  
**Grotto salamander**

*Typhlotriton spelaeus* Stejneger, 1893:116. Type-locality, "Rock House Cave, [Barry County], Missouri." Holotype, U. S. Natl. Mus. 17903, collected 24 July 1891, by F. A. Sampson.

• **CONTENT.** No subspecies are described.

• **DIAGNOSIS.** This species supposedly differs from *T. nereus* by transforming from the larval stage to that of the adult before reaching sexual maturity, and by having 19 trunk vertebrae; the neotenic *T. nereus* has 20–21 (Bishop, 1944).

• **DESCRIPTIONS.** The adults are slender and known to range from 39 to 70 mm snout to vent, but the usual size is around 45–55 mm. There are usually 17 costal grooves (18 trunk vertebrae). The tail makes up about 54 percent of the total length and is weakly keeled or rounded dorsally. The degenerate eyes appear as small black spots, are recessed into the rather broad, flattened head, and are covered by eyelids in



MAP. Solid symbols mark the type-localities. Hollow ones indicate other sites of collection. Shown is the total known distribution of the genus. The presumed distributional range shown for the genus is based on known localities and the limits of the Salem and Springfield Plateaus. The distributional range of *T. nereus* is not separately delimited. For an explanation see DISTRIBUTION and COMMENT in the species accounts.

various stages of fusion. The lip, at the end of the nasolabial groove, is swollen, and in sexually active males is extended into a small cirrus. In addition to having cirri, males differ from females in having an internally papillose vent (it is internally folded in females) and a mental gland. The mental gland is circular. Dark pigment uniformly scattered over the dorsum gives the animal a light flesh to brownish-purple color. The tongue is rather intermediate between the boletoid and "attached" conditions. It is oval in outline and attached to the floor of the mouth by a small pedicel. The only other attachment is by a fine membrane just anterior to the pedicel. The prevomerine and paravomerine tooth series are usually continuous.

The smallest larvae known are 23 mm in total length; transformation occurs at about 85-96 mm. Although the eyes are smaller than those of *Eurycea lucifuga* and *E. longicauda*, they are structurally complete and functional; degeneration occurs during and after metamorphosis. Larvae have a dark dorsum and sides. There is usually no distinct pattern; pigmentation is uniform or sometimes mottled or streaked, especially on larvae found in above-ground situations.

Major features of larval and metamorphosed individuals are adequately described by Dunn (1926) and Bishop (1943). Eggs obtained by induced ovulation are described by Barden & Kezer (1944).

• ILLUSTRATIONS. Barden & Kezer (1944) also include a diagram and photographs of eggs. Bishop (1943) contains photographs of an adult and larvae; rather poor photographs of a larva are found in Bishop (1944). Mittleman (1950) and Noble (1927) provide good photographs of the head.

• DISTRIBUTION. The distribution of this species is practically the same as that of the genus.

• PERTINENT LITERATURE. The number of articles dealing with *Typhlotriton* is small, and general treatments are few. The most complete accounts are found in Dunn (1926) and Bishop (1943). A summary of nondistributional works is found in Brandon (1962). Several articles deal with the structure of the "degenerate" eyes (e.g., Alt, 1910; Eigenmann, 1899, 1909; Eigenmann & Denny, 1898, 1900; Noble & Pope, 1928). A few other anatomical (Hilton, 1909, 1945, 1953, 1956; Moore, 1900), ecological (Hendricks & Kezer, 1958; C. Smith, 1960; P. Smith, 1948a, b), and physiological (Barden & Kezer, 1944; Noble & Pope, 1928; Wells, *et al.*, 1954) papers have appeared, as well as a modest number of distributional reports (Blair, 1951; Bragg & Hudson, 1951; Dowling, 1956, 1957). Noble (1931) provides remarks on sensory behavior.

• ETYMOLOGY. The name *spelaeus* comes from the Greek *spelaiōn*, meaning "cave."

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Issued 15 October 1965. Publication is supported by National Science Foundation grant G24231. © American Society of Ichthyologists and Herpetologists 1965.