

## Catalogue of American Amphibians and Reptiles.

Tilley, S.G. 2000. *Desmognathus santeetlah*.

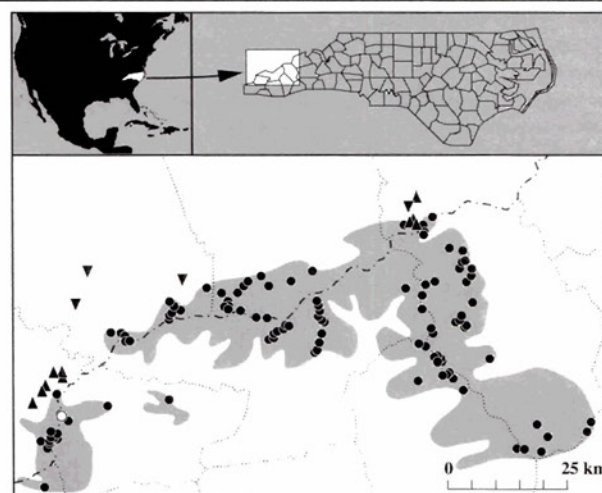
***Desmognathus santeetlah* Tilley**  
**Santeetlah Dusky Salamander**

*Desmognathus santeetlah* Tilley 1981:3. Type locality, "...a seepage area at ca. 1219 m (4000') in the headwaters of the N. Fork of Citico Cr. below Cherry Log Gap, Unicoi Mtns., Monroe Co., TN." Holotype, National Museum of Natural History (USNM) 214218, an adult female collected 26 June 1979 by S.G. Tilley and R.L. Jones (examined by author).

*Desmognathus fuscus santeetlah*: Petranks 1998:175. Reduction to a subspecies of *D. fuscus*.

• **CONTENT.** *Desmognathus santeetlah* is a monotypic species.

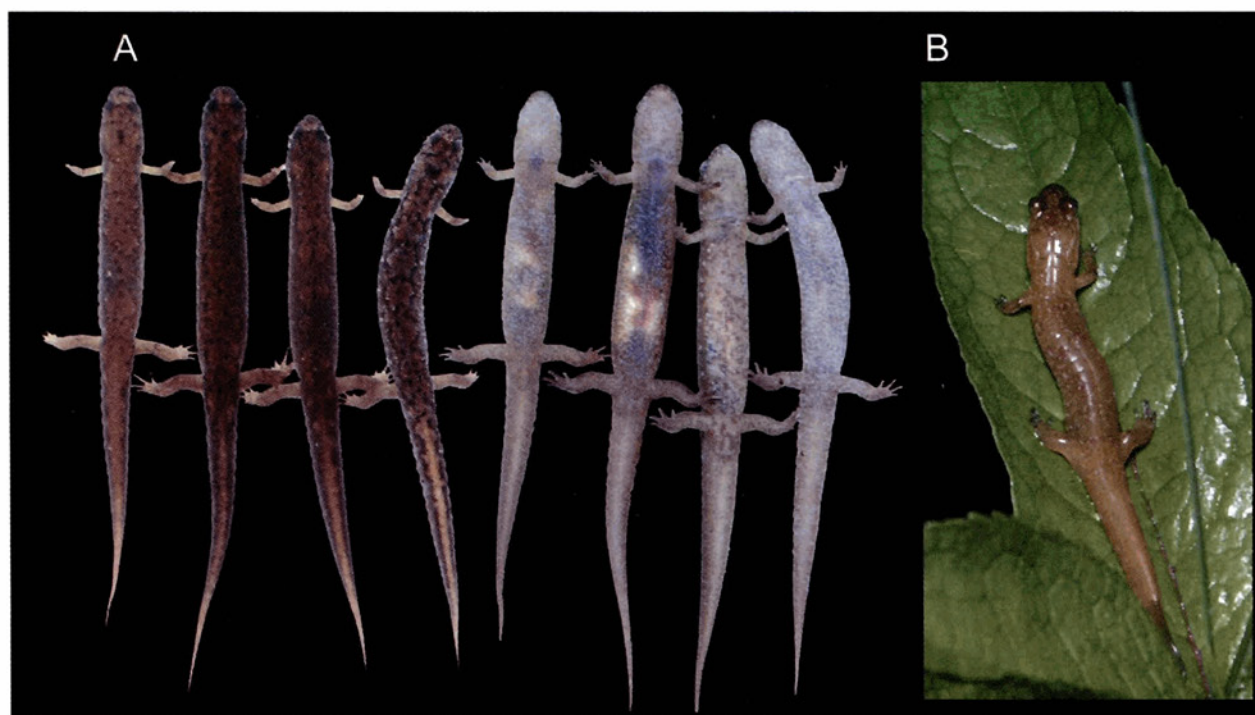
• **DEFINITION.** *Desmognathus santeetlah* is a medium-sized species of *Desmognathus* (females to 45 mm, males to 55 mm SVL in the vicinity of the type locality) with a tail that is weakly keeled or trigonal distally, uncornified toe tips, and sharply-pointed teeth on the posterior dentary. Most specimens are yellowish or greenish dorsally, the yellow pigment being most prominent along the ventrolateral surfaces and under the base of the tail. Straight or slightly undulating dorsolateral melanophore stripes are usually present, but may be thin, diffuse, and/or broken. These stripes often enclose reddish pigment on the dorsum, particularly in younger specimens. Many specimens have numerous patches of iridophores scattered over their dorsal, lateral, and ventral surfaces. Alternating patches of melanophores and iridophores produce a "salt and pepper" pattern on the venters of many specimens. Old individuals, particularly males, are usually greenish-brown dorsally and laterally,



**MAP.** Distribution of *Desmognathus santeetlah*. The circle marks the type locality; dots indicate other records. Triangles indicate records for *D. conanti* in the vicinities of the Great Smoky and Unicoi mountains. Inverted triangles indicate records for hybrids between *D. conanti* and *D. santeetlah*. Shading indicates areas above the 1000 m contour.

often with abundant iridophore patches but no other discernible dorsal pattern. A modal number of 10 larval spots is present anterior to the axilla. The positions of the larval spots are often evident in adults as depigmented areas or areas containing concentrations of reddish pigment.

• **DIAGNOSIS.** *Desmognathus santeetlah* occurs syntopically in various parts of its range with *D. quadramaculatus*, *D. monticola*, *D. ocoee*, *D. imitator*, and *D. wrighti*. *Desmognathus quadramaculatus* and *D. monticola* reach larger adult body sizes than do *D. santeetlah* and their tails are more prominently keeled.



**FIGURE.** Dorsal and ventral views of adult specimens of *Desmognathus santeetlah* from the type series, Cherry Log Gap, Unicoi Mountains, Monroe County, Tennessee (A). An adult specimen abroad at night on Waterrock Knob, Great Balsam Mountains, Swain County, North Carolina (B). A and B are not to the same scale.

*Desmognathus ocoee*, *D. imitator*, and *D. santeetlah* reach similar adult body sizes but the tails of *D. ocoee* and *D. imitator* are round, rather than triangular, in cross section, and adult males of these species have more sinuate jaw margins than those of *D. santeetlah*. The lateral and ventral surfaces of *D. santeetlah*, particularly those of the tail, are usually distinctly yellow, in contrast to the predominantly gray venters of *D. ocoee* and *D. imitator* and pink venter of *D. monticola*. These coloration characters distinguish *D. santeetlah* from parapatric populations of *D. conanti* (nomenclature of Titus and Larson 1996), which are typically more boldly patterned and lack the prominent yellow pigment on their sides and venters, as well being more robust and reaching larger adult body sizes. Parapatric *D. conanti* from the Unicoi Mountains also have a modal number of 12, rather than 10 larval spots anterior to the axilla.

• **DESCRIPTIONS.** Tilley (1981) described the holotype, paratypes, and larvae, and discussed variation in body size and proportions. Briefer descriptions appear in Conant and Collins (1991, 1998) and Petranks (1998, as *D. fuscus santeetlah*). Tilley and Schwerdtfeger (1981) and Tilley (1988) described allozymic variation.

• **ILLUSTRATIONS.** Tilley (1981) provided black and white photographs of the holotype and paratypes, and a drawing of a hatchling. Tilley (1988) provided black and white photographs of a series of specimens from the Great Smoky Mountains, together with a series of *D. conanti* and hybrids between the two.

• **DISTRIBUTION.** *Desmognathus santeetlah* is restricted to the Unicoi, Cheoah, Great Smoky, and Great Balsam mountain ranges of the southwestern Blue Ridge Physiographic Province in western North Carolina and eastern Tennessee. The southern extent of its range in the Unicoi Mountains has not been established. The species ranges along the crest of the Great Balsam Mountains and Pisgah Ledge at least as far as Pigeon Gap, Haywood-Transylvania County, North Carolina (Tilley 1981) and to elevations at least as low as 1000 m. These salamanders are probably more widespread in that mountain range than the available records indicate. *Desmognathus santeetlah* is generally a high elevation species that inhabits seepage areas and small streams above 1000 m, but Tilley (1988) reported allozymically "pure" *D. santeetlah* from localities as low as 640 m along the northwestern escarpment of the Great Smokies.

• **FOSSIL RECORD.** None.

• **PERTINENT LITERATURE.** Early references to populations of "*D. f. fuscus*" from the Great Smoky Mountains by Dunn (1926), Weller (1931), and King (1939) concern populations that were very likely *D. santeetlah*. Conant and Collins (1991, 1998) provided general descriptive and distributional information. Petranks (1998) reviewed the literature on the species (as a subspecies of *D. fuscus*). Additional references are addressed by topic.

**Systematics:** Tilley and Schwerdtfeger (1981) first documented the electrophoretic distinctness of *D. santeetlah* from southern populations of lowland desmognathines currently referred to *D. conanti*. Their work led to the description of *D. santeetlah* as a distinct species by Tilley (1981), who also provided information on morphometric comparisons and genetic interactions with parapatric populations of *D. conanti*. Karlin and Guttman (1986) concluded from allozyme data that *D. santeetlah* was most closely related to *D. conanti*. Titus and Larson (1996) proposed a sister taxon relationship between the two species on the basis of mitochondrial ribosomal RNA data. Tilley (1981, 1988) showed that *D. santeetlah* and *D. conanti*

hybridize extensively along the northwestern escarpment of the Great Smoky Mountains, but occur parapatrically without evidence of gene exchange in the Unicoi Mountains. Petranks (1998) based his treatment of *D. santeetlah* as a subspecies of *D. fuscus* on this evidence of hybridization between *D. santeetlah* and *D. conanti*, which he regarded as a second subspecies of *D. fuscus*. Powell et al. (1998) included *D. santeetlah* in their key to species of *Desmognathus*.

**Life history:** Tilley (1981) provided information on brooding sites and ecology. Jones (1986) compared the reproductive biology of *D. santeetlah* and parapatric *D. conanti* in the Unicoi Mountains. Beachy (1993) provided information on clutch and egg size. Tilley and Bernardo (1993) compared the life history of *D. santeetlah* with those of other desmognathines.

**Behavior:** Verrell (1990a) found complete ethological isolation between *D. santeetlah* and sympatric *D. ocoee* and *D. imitator*. Verrell (1990b) investigated ethological reproductive isolation between *D. santeetlah* from the Great Smokies and parapatric *D. conanti* from the foothills of the Great Smokies. He found that *D. santeetlah* and *D. conanti* males exhibited statistically significant preferences for inseminating females of their own species, but that measurements of ethological isolation were affected by experimental design. Maksymovitch and Verrell (1992) described the courtship behavior of *D. santeetlah*. Maksymovitch and Verrell (1993) also documented statistically significant levels of ethological isolation among populations from the Unicoi, Great Smoky, and Balsam mountains. Verrell (1997, 1999) compared courtship behavior patterns in *D. santeetlah* with those in other *Desmognathus* species.

• **ETYMOLOGY.** The name *santeetlah* pertains to several geographic features (Lake Santeetlah, Santeetlah Gap, Big Santeetlah and Little Santeetlah creeks) in the Unicoi Mountains, near the type locality of the species. It may be derived from a word meaning "blue water" in the Cherokee language (Powell 1968).

• **COMMENT.** Petranks (1998), employing a biological species concept (Mayr 1942, Frost and Hillis 1990), treated *Desmognathus santeetlah* and *D. conanti* as subspecies of *D. fuscus*, citing evidence for hybridization between the first two forms in a narrow zone along the northwestern escarpment of the Great Smoky Mountains (Tilley 1988). The apparent lack of gene exchange between *D. santeetlah* and *D. conanti* in the Unicoi Mountains may be due entirely to allopatry on a microgeographic scale (Tilley 1981, Petranks 1998). Thus whether these two forms qualify as separate species under the biological species concept is uncertain. Their status as species under any of several other current species concepts (e.g., the "evolutionary," "phylogenetic," or "general lineage" concepts, reviewed by Frost and Hillis 1990 and de Quieroz 1998) is less questionable. Populations assigned to *D. santeetlah* are phenotypically distinctive both morphologically and biochemically, and clearly comprise an evolutionary lineage. Treating *D. santeetlah* and *D. conanti* as subspecies of *D. fuscus* obscures the apparent sister taxon relationship between the two (Karlin and Guttman 1986, Titus and Larson 1996), as well as the lack of evidence for hybridization between *D. conanti* and *D. fuscus*.

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