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Urspelerpes brucei

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Catalogue of American Amphibians and Reptiles.

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Urspelerpes, *U. brucei*.

***Urspelerpes* Camp, Peterman, Milanovich,
Lamb, Maerz, and Wake
Parallel Brook Salamanders**

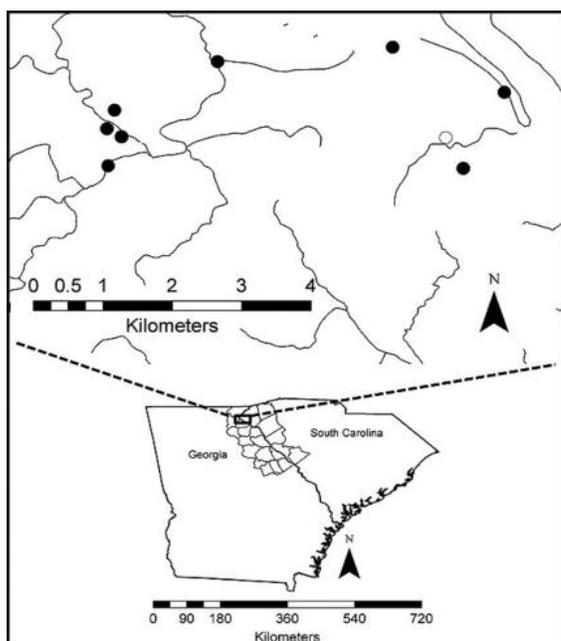
Urspelerpes Camp, Peterman, Milanovich, Lamb,
Maerz, and Wake 2009:87. Type-species, *Urspe-
lerpes brucei* by monotypy.

• **CONTENT.** One species has been described, *U.
brucei*.

• **DEFINITION.** A small form of the tribe Spelerpini in the family Plethodontidae, with adult snout-vent lengths (SVL) of 25–26 mm, this salamander has the smallest average adult size of any recognized spelerpine. The tail is approximately the same length as the body. Although the sexes do not differ in size, they do exhibit significant sexual dimorphism in color and pattern. Adult males (Fig. 1) are yellow, yellowish brown, or greenish brown with black dorsolateral stripes, similar in overall appearance to members of the Two-lined Salamander (*Eurycea bislineata*) complex (Petranka 1998). Adult females (Fig. 1) are more muted in color, their bodies being uniformly yellowish brown. Adult males also have distinct, circular mental glands and prominent nasal cirri. A single submature male has been observed, and it was greenish brown in overall color and lacked dorsolateral stripes. All post-metamorphic individuals, regardless of sex, possess a yellow patch on the dorsal surface of the snout, a thin, yellow stripe running down the dorsal surface of



FIGURE 1. *Urspelerpes brucei* larva (top), adult male (middle), and adult female (bottom).



MAP. Range of *Urspelerpes brucei*. The circle represents the type-locality, dots mark other records.

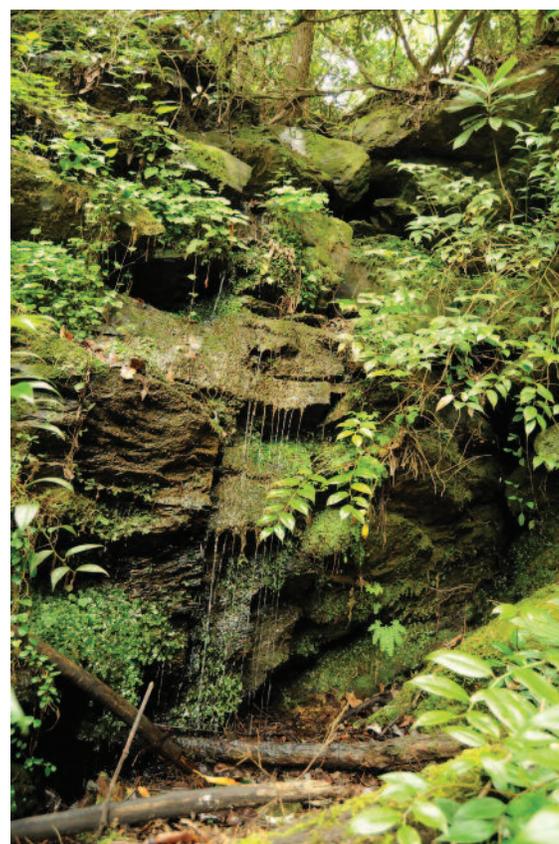


FIGURE 2. Habitat of *Urspelerpes brucei*.

the tail, and a yellow venter. There are 15 costal grooves. The osteology is similar to that of other spelERPines, especially to *Eurycea*, although *UrspelERPes* exhibits more complete osteological development in expansion of membrane bones. Cartilages of the hyobranchial apparatus are particularly well formed in comparison to those of similarly sized *Eurycea*. Trunk vertebrae, similar in form to *Eurycea* (Wake and Lawson 1973), number 15 and 16 in males and females, respectively. Each forefoot has 4 toes, and each hind foot has five. Larvae (Fig. 1), which reach a minimum of 22.4 mm SVL prior to metamorphosis, possess stream-type morphology (*sensu* Valentine and Dennis 1964). The smallest larva found so far measured 7.9 mm SVL. Gills have short secondary fimbriae, and the tail fin is low and relatively short, delimiting less than 75% of the length of the tail. The larvae are uniformly brownish in color, sometimes with a pinkish or grayish hue, with a white patch on the dorsal surface of the snout and a middorsal white line running down the tail.

• **DIAGNOSIS.** *UrspelERPes* can be distinguished from members of the dwarf salamander complex (*E. quadridigitata* and *E. chamberlaini*) by the presence of 5 digits on the pes as opposed to four. The dwarf salamanders also possess significantly longer tails than bodies. Male *UrspelERPes* are similar in size to newly metamorphosed members of the *E. bislineata* complex but can be distinguished by the presence of nasal cirri, indicating sexual maturity. All individuals of *UrspelERPes* can be distinguished from any species of *Eurycea* by the unique patch on the snout (yellow in adults, white in larvae) and the thin, middorsal stripe (yellow in adults, white in larvae) down the top of the tail.

• **DESCRIPTIONS, ILLUSTRATIONS, DISTRIBUTION, FOSSIL RECORD, and PERTINENT LITERATURE.** See the species account.

• **ETYMOLOGY.** The name *UrspelERPes* is a combination of the German prefix “ur” (mistakenly listed as Greek in Camp et al. 2009), which means “original,” and the generic name *SpelERPes*, a primary synonym of *Eurycea*. The name *UrspelERPes* is, therefore, informative of the basal relationship that *UrspelERPes* has with *Eurycea*. The name *SpelERPes*, originally applied to the type species of *Eurycea*, the Cave Salamander (*E. lucifuga*), is itself a combination of the Greek words for “cave” and “crawler,” *SPELAIION* and *HERPES*, respectively. The name *SpelERPes* persists in modified form as the larger taxon to which *UrspelERPes* and *Eurycea* both belong, whether recognized as a subfamily (SpelERPinae; Chippindale et al. 2004) or a tribe (SpelERPini; Vieites et al. 2007).

• **REMARKS.** The gross morphology resembles that of the historically conceived *Eurycea* (Bishop 1947). However, the genus *Eurycea* now includes an array of morphologically distinct forms (Chippindale et al. 2000; Hillis et al. 2001; Bonett and Chippindale

2004), and the historical conception of *Eurycea* morphology no longer has significant taxonomic meaning. Camp et al. (2009) erected the genus *UrspelERPes*, in part, because the genetic divergence between *UrspelERPes* and *Eurycea*, as measured by sequences of the nuclear encoded recombination-activating gene 1 (Rag-1), typifies intergeneric distances within the tribe SpelERPini. The basal phylogenetic relationship that *UrspelERPes* has to *Eurycea* resembles that between the monotypic *Phaeognathus* and its polytypic sister genus *Desmognathus* (Titus and Larson 1996; Chippindale et al. 2004).

***UrspelERPes brucei* Camp, Peterman,
Milanovich, Lamb, Maerz, and Wake
Patch-nosed Salamander**

UrspelERPes brucei Camp, Peterman, Milanovich, Lamb, Maerz, and Wake 2009:87. Type-locality, “Small, first-order stream located at the foot of the Blue Ridge escarpment in Stephens County, GA, USA (34° 39' N, 83° 18' W).” Holotype, National Museum of Natural History (USMN) 558253, an adult female, collected on 30 March 2007 by W.E. Peterman, J.R. Milanovich, K. Holcomb, D. Soltenberger, A. Grosse, and S. Sterrett.

• **CONTENT.** The species is monotypic.

• **DEFINITION and DIAGNOSIS.** See the generic account.

• **DESCRIPTIONS.** Camp et al. (2009) described adult males, adult females, and larvae. Eggs have not been described. Large larval *UrspelERPes* (23 mm SVL) are nearly the size of adults (25–26 mm), and a single submature male (24 mm) possessed enlarged testes. This indicates that sexual maturity is achieved shortly after metamorphosis.

• **ILLUSTRATIONS.** Photographs published in Camp et al. (2009) include whole-body shots as well as close-ups of the heads for both the female holotype and the male allotype. Camp et al. (2009) also included close-up photographs of the head of a larval paratype as well as a drawing of the skeleton of the hind foot of an adult. A photograph of a male and female *UrspelERPes* is also in Mitchell and Gibbons (2010).

• **DISTRIBUTION.** *UrspelERPes brucei* is known from Stephens and Habersham counties, Georgia, and from Oconee County, South Carolina (Fig. 5). All sites are small (1st or 2nd order streams) located in steep-walled ravines (e.g. Fig. 2). They occur within the Piedmont Physiographic Province at the foot of the Blue Ridge Escarpment where the Tugaloo River crosses the Brevard Zone (Wharton 1978). This area, called the Tugaloo Mosaic by botanists, is characterized by considerable topographic relief and high plant diversity (Garst and Sullivan 1993).

• **FOSSIL RECORD.** None.

• **PERTINENT LITERATURE.** Camp et al. (2009) described gross morphology and osteology as well as the genetic relationships within the tribe Spelerpini and the family Plethodontidae. They also addressed certain features of ecology and life history. However, many aspects of the biology of this form have yet to be described. Kozak and Wiens (2010) included *Urspeleperpes* in a phylogeographic analysis of Appalachian salamanders, IUCN SSC Amphibian Specialist Group (2011) addressed conservation, and Powell et al. (2012) included the species in a key to salamanders of the continental United States and Canada.

• **ETYMOLOGY.** The name *brucei* honors the publication-rich career of Richard C. Bruce, longtime faculty member at Western Carolina University and director of the Highlands Biological Station in North Carolina. His research contributed significantly to our knowledge of the biology of plethodontid salamanders in general and of spelerpines in particular.

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LITERATURE CITED

- Bishop, S.C. 1947. Handbook of Salamanders: The Salamanders of the United States, of Canada, and of Lower California. Comstock Publishing Co., Ithaca, New York.
- Bonett, R.M. and P.T. Chippindale. 2004. Speciation, phylogeography and evolution of life history and morphology in plethodontid salamanders of the *Eurycea multiplicata* complex. Mol. Ecol. 13: 1189–1203.
- Camp, C.D., W.E. Peterman, J.R. Milanovich, T. Lamb, J.C. Maerz, and D.B. Wake. 2009. A new genus and species of lungless salamander (family Plethodontidae) from the Appalachian highlands of the south-eastern United States. J. Zool. 279:86–94.
- Chippindale, P.T., R.M. Bonett, A.S. Baldwin, and J.J. Wiens. 2004. Phylogenetic evidence for a major reversal of life-history evolution in plethodontid salamanders. Evolution 58:2809–2822.
- , A.H. Price, J.J. Wiens, and D.M. Hillis. 2000. Phylogenetic relationships and systematic revision of central Texas hemidactyliine plethodontid salamanders. Herp. Monogr. 14:1–80.
- Garst, J. and J. Sullivan. 1993. Tugaloo Mosaic. Tipularia 8:18–26.
- Hillis, D.M., D.A. Chamberlain, T.P. Wilcox, and P.T. Chippindale. 2001. A new species of subterranean blind salamander (Plethodontidae: Hemidactyliini: *Eurycea*: *Typhlomolge*) from Austin, Texas, and a systematic revision of central Texas paedomorphic salamanders. Herpetologica 57: 266–280.
- Kozak, K.H. and J.J. Wiens. 2010. Niche conservatism drives elevational diversity patterns in Appalachian salamanders. Am. Nat. 176:40–54.
- Mitchell, J. and W. Gibbons. 2010. Salamanders of the Southeast. Univ. Georgia Press, Athens.
- Petranka, J.W. 1998. Salamanders of the United States and Canada. Smithsonian Inst. Press, Washington, D.C.
- Powell, R., J.T. Collins, and E.D. Hooper, Jr. 2012. Key to the Herpetofauna of the Continental United States and Canada. 2nd ed, revised and updated. Univ. Press Kansas, Lawrence.
- Titus, T.A. and A. Larson. 1996. Molecular phylogenetics of desmognathine salamanders (Caudata: Plethodontidae): A reevaluation of evolution in ecology, life history, and morphology. Syst. Biol. 45:451–472.
- Valentine, B.D. and D.M. Dennis. 1964. A comparison of the gill-arch system and fins of three genera of larval salamanders, *Rhyacotriton*, *Gyrinophilus*, and *Ambystoma*. Copeia 1964:196–201.
- Vieites, D.R., M. Min, and D.B. Wake. 2007. Rapid diversification and dispersal during periods of global warming by plethodontid salamanders. Proc. Natl. Acad. Sci. USA 104:19903–19907.
- Wake, D.B. and R. Lawson. 1973. Developmental and adult morphology of the vertebral column in the plethodontid salamander *Eurycea bislineata*, with comments on vertebral evolution in the Amphibia. J. Morphol. 139:251–300.
- Wharton, C.H. 1978. The Natural Environments of Georgia. Georgia. Dept. Nat. Res., Atlanta.

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