

PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON THE SALAMANDERS OF THE NORTH  
CAROLINA MOUNTAINS WITH DESCRIPTIONS  
OF TWO NEW FORMS.

BY C. S. BRIMLEY.

Raleigh, N. C.

This paper is based on collections of salamanders made in various parts of the mountains of North Carolina, between the years 1902 and 1912, both inclusive, by F. Sherman, entomologist of the State Department of Agriculture, H. H. Brimley, curator of the State Museum, Z. P. Metcalf, professor of zoology and entomology, North Carolina A. and M. College, and myself.

The counties in which more or less collecting has been done by us are Buncombe, Cherokee, Haywood, Macon, Mitchell, Transylvania, Watauga, and Yancey, at elevations ranging from 2000 feet up to the tops of some of the highest mountains, 6500 feet elevation.

Besides our own records a few from other sources are added to round out and complete the list, the species not collected by us being marked with a star (\*).

My thanks are due to Professor Metcalf for valuable help in drawing up the descriptions of the two new forms, as well as for the illustrations accompanying this paper, while Mr. Sherman is due especial credit for his zeal in collecting salamanders in past years.

FAMILY CRYPTOBRANCHIDÆ.  
***Cryptobranchus alleghaniensis*** Daudin.  
HELLBENDER.

Found only in the streams belonging to the Mississippi drainage. Our records are from Pensacola, Yancey Co., Oct. 3, 1902; Cane River, Yancey Co., Oct. 2, 1902 (FS & HHB); and Andrews, Cherokee Co., May 13, 1908 (FS).

FAMILY AMBYSTOMIDÆ.

**\**Ambystoma jeffersonianum*** Green.

JEFFERSON'S SALAMANDER.

"Very numerous under logs below the fir belt on Roan Mt., Mitchell Co." (Rhoads, Proc. Acad. Nat. Sc. Phil., 1895, p. 402.)

***Ambystoma punctatum*** Linn.

SPOTTED SALAMANDER.

Andrews, Cherokee Co., May 13, 1908, two small specimens (CSB).

**\**Ambystoma talpoideum*** Holbr.

MOLE SALAMANDER.

"Abundant in the high valley in northwestern North Carolina, in which the French Broad River takes its origin from mountain streams." (Cope, *Batrachia of North America*, 1889, p. 53.)

FAMILY SALAMANDRIDÆ.

***Diemyctylus viridescens*** Raf.

AMERICAN NEWT.

Taken at Blantyre, Transylvania Co., Highlands, Macon Co., May, 1908 (FS & CSB); Grandfather Mt., Watuga Co., Sept. 11, 1908 (ZPM), and at Sunburst, Haywood Co., May, 1912 (CSB). The highest elevation of which we have record is 5000 feet on Grandfather Mt. According to my observations at Raleigh and in the mountains this species would appear to live in water only during the cooler portions of the year and to aestivate on land under dead logs and similar hiding places.

FAMILY PLETHODONTIDÆ.

**\**Desmognathus nigra*** Green.

BLACK TRITON.

Not taken by any of us. Rhoads records two adults from Roan Mt. (Proc. Acad. Nat. Sc. Phil., 1895, p. 400), and Moore calls it abundant in the vicinity of Grandfather Mt. (Proc. Acad. Nat. Sc. Phil., 1899, pp. 316-323), but we are inclined to think the latter record is a mistake as Sherman, Metcalf and H. H. Brimley have all collected salamanders in numbers on Grandfather, but have never taken this species, hence we think Dr. Moore mistook the large dark-bellied specimens of *D. quadrimaculatus* for this species.

***Desmognathus ochrophaea*** Cope.

ROUND-TAILED TRITON.

Abundant throughout the regions collected in, particularly at the higher elevations. Mostly found in water, but to some extent under logs. Over thirty taken from one spring near the summit of Mount Mitchell, at an elevation of 6500 feet, by Sherman and H. H. Brimley on Oct. 2, 1902. Other localities are Bald and Sampson Mts. and Cane River, Yancey Co.; Blantyre, Transylvania Co.; Highlands, Wayah Bald Mt., and Aquone, Macon Co.; Sunburst, Haywood Co.; and Grandfather Mt. It does not

seem to range much below 3000 feet. Two specimens having a yellow patch on each side of the neck were taken at Highlands and on Wayah Bald Mt. in May, 1908.

**Desmognathus quadrimaculatus** Holbr.

MOUNTAIN TRITON.

Abundant; the most characteristic salamander of the rocky mountain streams, swimming and burrowing with great strength and agility among the loose stones or debris lying in the beds of the little streamlets. Old and large specimens are black-bellied, while younger and smaller ones are light colored below and much resemble *D. fusca*, except in size. The larvae attain a much larger size than those of *D. fusca*. Collected in numbers on Grandfather Mt. and at Blantyre, Cane River, and Sunburst, and in less numbers, but still common, at various points in Yancey Co., and at Highlands, Wayah Bald, and Aquone, Macon Co.; Andrews, and Joanna Bald, Cherokee Co.; Spruce Pine, Mitchell Co.; and Weaverville, Buncombe Co. This species is not uncommon at least as far down as 2,000 feet.

**\*Leurognathus marmoratus** Moore.

MOORE'S TRITON.

Three taken in pool in stream on south side of Grandfather Mt. in July, 1898 (see Moore, Proc. Acad. Nat. Sc. Phil., 1899, pp. 316-323).

The types, taken by Dr. J. Percy Moore, are the only specimens of this species known to have been taken anywhere so far as I know. Apparently our first specimens of *Desmognathus quadrimaculatus* came from the very same pool in which Dr. Moore got his types, and in that case one small pool has provided a new species and furnished also specimens to resurrect an old one.

**Plethodon erythronotus** Green.

RED-BACKED SALAMANDER.

Taken by Rhoads on Roan Mt., and by myself at Andrews, in Cherokee Co., May, 1908, the last specimens at an elevation of about 2000 feet.

**Plethodon glutinosus** Green.

VISCID SALAMANDER.

Common up to about 3000 or 3500 feet elevation, above which it seems to be wholly replaced by other forms. Taken more or less commonly at Blantyre, 2200 feet; at Sunburst, Haywood Co., up to about 3300 or 3500 feet; at Cane River, and at Andrews, 2000 feet. Two specimens were taken on Grandfather Mt. by Metcalf, but particular elevation not noted.

Two specimens, a small one and a good sized adult, taken by Sherman between Blowing Rock, Watauga Co., and Linville, Mitchell Co., are worthy of mention. In life they were of the usual color, but had a broad chestnut band down the back as in *P. erythronotus*. This, however, disappeared after the specimens had been placed in preserving fluid, and Dr. Stejneger, to whom I sent them, could not see that they differed

from average southern specimens of this species. I presented them, with Mr. Sherman's consent, to the U. S. National Museum. Whether this curious occurrence has any bearing on the next species remains to be seen.

***Plethodon shermani* Stejn.**

RED-LEGGED SALAMANDER.

The type specimen is recorded as having been taken "on Nantahala Mt., between Andrews and Aquone." The only other specimens that are known to have been taken anywhere were secured by Sherman and myself when traveling from Franklin to Aquone, over the Wayah Bald Mt., in May, 1908. We were on the Franklin side of the gap, but not very far from it, when Mr. Sherman remarked that he believed this was the very spot where he had originally taken the species, and sure enough right there, under logs near a little stream, we got six more specimens, all with brick-red legs. While travelling a little later from Aquone to Andrews, we looked for suitable localities, but found none nor did we get any more specimens, and Mr. Sherman is now of the opinion that he made a mistake in giving the locality of the type as "between Aquone and Andrews," and that it was actually where we collected the additional specimens in May, 1908. The type was collected by Mr. Sherman in August, 1904.

***Plethodon metcalfi* sp. nov.**

UNSPOTTED SALAMANDER.

*Description.*—Bluish plumbeous above, pale grayish below, the two colors meeting somewhat abruptly on the median line of the sides. Under a lens the pale color of the lower parts is seen to be formed by the obliteration of the dark borders of the minute pale dots which are sprinkled over the whole surface of this species, *P. glutinosus* and *P. shermani*, so that the underparts consist of an irregular scattering of dark dots on a pale ground. Throat wholly pale, unmarked. From *P. glutinosus* this species is distinguished by the entire absence of whitish spots on the back, sides and throat, by the paler underparts, and smaller average size. From *P. shermani* it differs by having the parasphenoid teeth in a single patch divided only by a groove down the center, instead of in two patches, and by having legs colored like the neighboring portions of the body, instead of brick red in sharp contrast. The absence of color markings distinguishes it also from *P. jordani* and *P. aeneus*. In dental characters it agrees fairly well with *P. glutinosus*, having from four to ten teeth on either side in the vomero-palatine series, which are shaped about as in that species. The parasphenoids as mentioned above are about as in *glutinosus*, but the teeth are smaller and shorter. Costal furrows 14. Tail measured from hind edge of vent, about one-half of total length, slightly shorter in some, and slightly longer in other specimens. The largest specimen measures 140 mm., tail 72, the type is 112 mm., tail 52.

Described from thirty-nine specimens, twenty-two of them taken near Sunburst, Haywood Co., N. C., in late May, 1912, at elevations of about 3500 to 4000 feet, by Mr. Sherman and myself; the other seventeen



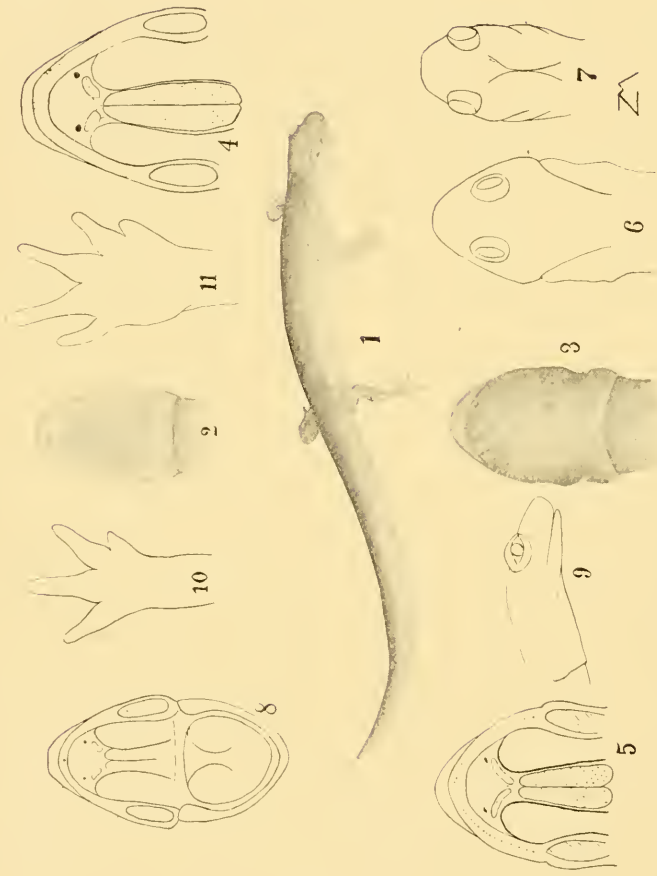


FIG. 1. *Plethodon metcalfei* sp. nov., dorso-lateral view, three-fourths natural size.

FIG. 2. *P. metcalfei*, ventral view of throat,  $\times 1\frac{1}{2}$ .

FIG. 3. *P. glutinosus*, ventral view of throat,  $\times 1\frac{1}{2}$ .

FIG. 4. *P. metcalfei*, teeth,  $\times 3$ .

FIG. 5. *P. glutinosus*, teeth,  $\times 3$ .

FIG. 6. *P. glutinosus*, dorsal view of head,  $\times 1\frac{1}{2}$ .

FIG. 7. *P. metcalfei*, dorsal view of head,  $\times 1\frac{1}{2}$ .

FIG. 8. *P. metcalfei*, tongue and roof of mouth,  $\times 2.3$ .

FIG. 9. *P. metcalfei*, lateral view of head,  $\times 2.3$ .

FIG. 10. *P. metcalfei*, fore foot,  $\times 3$ .

FIG. 11. *P. metcalfei*, hind foot,  $\times 3$ .

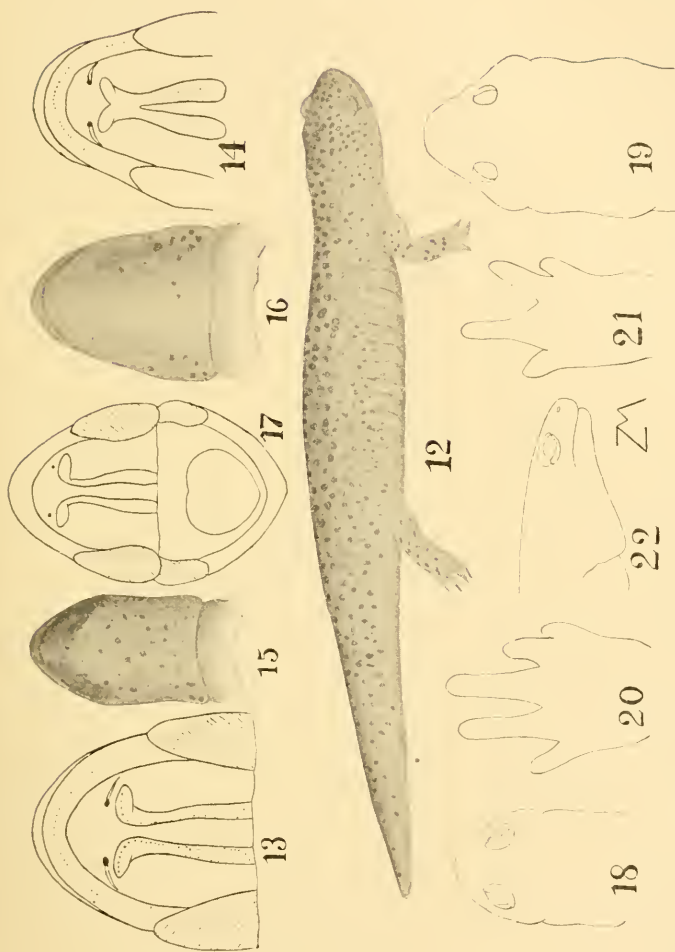


FIG. 12. *Speleotyphlops ruber schencki* sub. sp. nov., dorso-lateral view.

Natural size.

FIG. 13. *S. ruber schencki*, teeth. x2.7.

FIG. 14. *S. ruber ruber*, teeth. x2.

FIG. 15. *S. ruber schencki*, ventral view of throat. x1.4.

FIG. 16. *S. ruber ruber*, ventral view of throat. x1.1.

FIG. 17. *S. ruber schencki*, tongue and roof of mouth. x2.

FIG. 18. *S. ruber schencki*, dorsal view of head. x1.4.

FIG. 19. *S. ruber ruber*, dorsal view of head. x1.1.

FIG. 20. *S. ruber schencki*, hind foot. x1.4.

FIG. 21. *S. ruber schencki*, fore foot. x1.4.

FIG. 22. *S. ruber schencki*, lateral view of head. x1.1.





collected by Mr. Z. P. Metcalf, on Grandfather Mt., in September, 1908, at an elevation of about 5000 feet. To this form are also ascribed two specimens taken at Highlands, Macon Co., 3500 feet, in May, 1908, and another taken on the Tuskwitty Range, 3500 feet, between Aquone and Andrews, a day or two later by Sherman and myself. These last three are not now in my possession, but so far as I remember they were exactly like the other thirty-nine.

The type specimen, Brimley No. 6766, collected at Sunburst as above stated, will be deposited in the U. S. National Museum.

*Habitat*.—Mountains of North Carolina, about 3500 feet.

Named after Mr. Z. P. Metcalf, who first collected the species in any numbers.

***Spelerpes bilineatus* Green.**

STRIPED SALAMANDER

Generally distributed throughout the mountains, having been taken by us at Cane River, Yancey Co.; Mt. Mitchell, elevation 6500 feet; Grandfather Mt., up to 5000 feet, and at Blantyre, Toxoway, Highlands, Andrews, Weaverville, Sunburst and Black Mt.

***Spelerpes guttolineatus* Holbr.**

HOLBROOK'S TRITON.

Taken at Andrews, elevation 2000 feet, and also sent us from Weaverville, in Buncombe Co. Cope records it from the upper valley of the French Broad River (Cope, *Batrachia of North America*, p. 172). This is an austral species not ranging above the lower mountain valleys.

***Spelerpes ruber schencki* sp. nov.**

BLACK-LIPPED TRITON.

Generally similar to *S. ruber*, but differing in brighter coloration and in having the black spots on the back numerous, never coalescing to any extent, and never obscured nor overlaid with purplish brown. General color orange red, brightest on back, and a little paler on belly; back with numerous small round black spots, these varying in size, but never obscured by the color of the back. Throat with scattering black spots, those on the lower lips fusing so that the lips are almost wholly black. Parasphenoid series well separated from each, not closely approximated in front as in Raleigh specimens of *ruber*. The specimens so far taken are smaller than large *ruber*, not exceeding 120 mm. in length. Length of type, 108; tail, 31. Costal folds, 15. Apparently more terrestrial than *ruber*, as all the specimens were taken under logs and none in water. Type, Brimley No. 6789, taken at Sunburst, at an elevation of 3200 feet will be deposited in U. S. National Museum. Described from 9 specimens, 8 from Sunburst, 1 from Highlands.

This form which I name after Dr. C. A. Schenck, Director of the Biltmore Forest School, has been taken at Sunburst, Haywood Co. (8 specimens); Highlands, Macon Co. (3 sp.); Blantyre, Transylvania Co. (4 sp.). Specimens from Andrews were noted by me at the time as agreeing with the Blantyre and Highlands specimens, but are not now in

my possession. Two specimens one each from Burnsville, and Cane River in Yancey Co., agree in general color and in the separation of the parasphenoid series, but lack the black lips of *schencki*, and may be looked upon as intermediates between this and *ruber*. No true *ruber* have been taken in the same localities as *schencki*, and I look upon *schencki* as a geographical race of the former.

***Spelerpes danielsi* Blatchley.**

DANIELS TRITON.

Cane River, Sept. 25, 1902, one taken by Sherman and H. H. Brimley under a log lying in water. Five taken at Blantyre in May, 1908, and two at Sunburst in May, 1912, by myself.

This rare salamander is red in life with black spots, but somewhat paler in color than *ruber*. It has a more serpentine motion in life than most salamanders, and seems to be wholly aquatic and of somewhat mud-burrowing habits. The vomero-palatine series curve forward and meet the parasphenoid series at an acute angle, while in *ruber* they curve backward and meet the latter at an obtuse angle. So far we have not taken this species above 3500 feet, nor below 2500 feet, and only in places where the bed of the stream is somewhat boggy in character.

***Gyrinophilus porphyriticus* Green.**

PURPLISH SALAMANDER.

Rhoads records one from Roan Mt. (Proc. Acad. Nat. Sci. Phil., 1895, p. 401). Our only record is of three large larval salamanders (total length, 115 mm.), taken by Sherman on Black Mt. in May, 1911, which we were not able to place, but which Dr. Stejneger said were probably second year larvae of this species.