

PROCEEDINGS
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THE OCCURRENCE OF WEHRLE'S SALAMANDER,
PLETHODON WEHRLEI FOWLER AND DUNN, IN
VIRGINIA

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The eastern boundary of the range of *Plethodon wehrlei* Fowler and Dunn, as mapped by both Bishop¹ and Grobman,² lies slightly west of the border of Virginia. It appears desirable, therefore, to call attention to certain specimens which demonstrate the occurrence of this salamander in Virginia. This new state record, although of interest as an addition to the already large herpetofauna of Virginia, does not merit extended treatment as such. Nor do we attach any great significance to the fact that these appear to be the first examples of *wehrlei* obtained in the Atlantic Drainage, since the ultimate destination of local run-off can scarcely affect purely terrestrial salamanders living along a divide. The new locality records do indicate, however, that *Plethodon wehrlei* is not so strictly limited physiographically as was formerly believed. This should stimulate more careful search for the species in suitable habitats elsewhere in the folded Appalachians, and even in the Blue Ridge!

On May 30, 1940, we visited the portion of Allegheny Mountain known as Tamarack Ridge. The collecting site was about eight and a half miles (airline) southeast of Durbin, West Virginia, at the point where U. S. highway 250 crosses the ridge. The West Virginia-Virginia state line, in this area, follows the crest of Tamarack Ridge, Pocahontas County, West Virginia, lying to the west, and Highland County, Virginia, to the east. We searched along the ditches and roadcuts of the main highway, along the low banks of an intersecting dirt road, and in the woods adjacent to each, at elevations between 4,350 and 4,400 feet on both slopes.

¹Bishop, Sherman C., *Handbook of Salamanders*: 262, 1943.

²Grobman, Arnold B., *Ann. N. Y. Acad. Sci.*, 45: 286, 1944.



The ridge is largely covered with mixed second-growth forest, but occasional pastures with scattered trees border the highway. Small red spruce (*Picea rubra*), yellow birch (*Betula lutea*), striped maple (*Acer pennsylvanicum*), red-berried elder (*Sambucus pubens*), and brambles (*Rubus canadensis*) are well represented. Numerous decaying logs of chestnut, birch, and spruce lie scattered on the forest floor.

Within forty-five minutes, during a hard afternoon rain, we obtained twelve specimens of *Plethodon wehrlei* (three of them, CM 19,597-99, being taken in Virginia), nine *P. cinereus cinereus* (both states represented), and two *P. glutinosus glutinosus* (West Virginia only). Of the dozen *wehrlei* found, most were in or under spruce logs, a few were under rocks, and one was in a chestnut log that also contained a specimen of *glutinosus*. The other *glutinosus* was found under a large rock, and the nine *cinereus* were in or under spruce logs. Our examination of birch logs here confirmed previous experiences, for, although many were torn apart, none contained salamanders. Birch decays as a soggy mass within its bark shell, and is usually either too wet or too spongy to be attractive to *Plethodons*.

We returned to the same spot in the evening and collected from 9:30 to 10:30 P.M. The air temperature was 43° F. and intermittent rain was falling. In one hour we obtained thirteen *wehrlei* (ten, CM 19,600, from the Virginia side) and four *glutinosus* (five additional specimens were observed). A careful search was made for *cinereus*, but no specimens were found, probably because the temperature was too low for nocturnal activity on the part of this species, which certainly appears to be less cold-resistant than *glutinosus*, although it is *reputed* to be more tolerant of low humidity. (In high-altitude collecting in West Virginia we have found that temperatures below 45° F. largely inhibit the nocturnal activities of many terrestrial plethodontids, but, on rainy evenings, *wehrlei*, *glutinosus*, and *nettingi* are sometimes active at somewhat lower temperatures.) Most of the specimens of *P. wehrlei* were found walking along the leaf-filled drainage ditches, but one was in a rock crevice, and one was on top of a log. One specimen of *wehrlei* regurgitated a centipede. Although several *glutinosus* were walking on the bare soil of the roadcut, the majority observed were resting in their burrows in the bank, their bright eyes sometimes glowing pink when caught by the beam of a headlamp.

Two additional specimens of *wehrlei* (CM 19,801-02) were obtained on June 2, along U. S. 250, at a point somewhat farther down the east slope of Tamarack Ridge, about one-half mile beyond the first locality.

Through the courtesy of Prof. H. W. Jackson, Virginia Polytechnic Institute, we are privileged to record *P. wehrlei* at a second area in Virginia; namely, the vicinity of Blacksburg, Montgomery County. The senior author has examined one specimen (VPI No. C19) collected in the twilight zone of Nellie's Cave, two miles southeast of Blacksburg, at an elevation of 2,100 feet, on February 9, 1943, and two specimens (VPI Nos. A3-4) collected under a log in a gully two miles east of Blacksburg, at an estimated elevation of 1,700 feet, on March 30, 1943. Professor Jackson stated (letter of Nov. 18, 1943):

It might interest you to know that this species is not at all un-

common and could be recorded as generally distributed. Although this species is frequently observed near the entrance of caves, it is not at all confined to caves and may be collected under stones or logs on moist wooded hillsides; for example, Trillium Vale, a valley one mile east of Blacksburg, and at an average elevation of 2,100 ft., is a very reliable source which we use for class demonstrations.

Still more recently (letter of Sept. 17, 1945), Professor Jackson reported:

You might be interested to know that we also have collected this species from Dixie Caverns which are located near the west border of Roanoke county on Route 11 about 300 yards north of the Roanoke River.

Dixie Caverns are about six miles west-southwest of Salem, approximately fourteen miles east of the Blacksburg stations, and only about eleven miles northwest of the crest of the Blue Ridge. Collectors in Virginia should make an especial attempt to locate *wehrlei* on Poor Mountain just south of the Roanoke River, and should also search for it at Slings Gap and Mason Knob in the adjacent Blue Ridge. The eastern slope of Tamarack Ridge is drained by northeast-flowing Laurel Fork, which combines with Straight Fork (in Pendleton County, West Virginia) to form the North Branch of the Potomac River. Blacksburg is actually in the New River drainage, but the three specific *wehrlei* localities are drained by short tributaries of the North Fork of the Roanoke River. Dixie Caverns are close to the Roanoke itself.

The occurrence of *P. wehrlei* in three counties in Virginia, as listed above, also establishes for the first time the presence of this species in two Atlantic drainage systems, apparent indication that the species can spread readily across environmentally suitable divides. Whether or not large rivers are a barrier to the dispersal of *wehrlei* remains to be established. It is beyond the scope of this paper to consider Grobman's discussion of the Ohio River as a modern barrier, but we do wish to point out in this connection that this author's statement, "It may be that the New-Kanawha Rivers restrict the southwestern spread of *wehrlei*," is contraverted by his own distribution map, which includes dots representing stations in Mercer and Raleigh counties, West Virginia, southwest of the New-Kanawha. (The specimens supporting these records are: CM 7,483 from Brush Creek Falls, near Athens, Mercer County; CM 15,874-76 from one mile south of Daniels, Raleigh County; and CM 15,873 from two miles west of Eccles, Raleigh County.) Although we are disinclined to regard water itself as a barrier to *wehrlei*, we cannot deny the possibility that a broad, hot flood-plain bordering a river might prove a very effective barrier indeed.

Plethodon wehrlei is widespread and locally numerous in suitable habitats in the middle eastern portion of the Appalachian Plateaus Province. Except for the localities discussed above, the forty-seven stations represented by the 391 specimens of *wehrlei* in the Carnegie Museum collection are all within this Province. In eastern West Virginia the Plateaus Province boundary, recently delimited by Fenneman,³ leaves the Allegheny Front just south of the thirty-ninth parallel and curves

³Fenneman, Nevin M., *Physiography of Eastern United States*: 250, 1938.

westward to Back Allegheny Mountain. From a strictly physiographic point of view it is correct, therefore, to consider that the specimens reported here constitute the first stations for *wehrlei* in the Valley and Ridge Province. Such treatment, however, implies a discontinuity in habitat that does not in fact occur. Allegheny Mountain, on which the Tamarack Ridge specimens were taken, is actually a continuation of the Allegheny Front, environmentally if not physiographically. Similarly, the Blacksburg stations, although well within the Valley and Ridge Province, are situated in an area where the Great Valley is completely blocked by a maze of short, high ridges and hills which are well interconnected with the dissected plateau to the west. To the best of our knowledge, *P. wehrlei* has not yet been collected at Mountain Lake, Giles County. In 1938, however, Prof. Maurice Brooks saw a large *Plethodon* in a hemlock log there. The specimen eluded capture, but he noted at the time that it was "not *glutinosus*."

We believe that virgin spruce forest provides the optimum conditions of moisture, food, and shelter for *P. wehrlei*, at least in the southern half of its range. Caves, although probably a secondary habitat, appear to provide nearly optimum conditions, also, but access to their twilight zones must be by external routes through vegetative cover that is, or has been, suitable. The caves of the Shenandoah Valley offer apparently satisfactory habitats for *wehrlei*, yet much exploration by speleologists has not resulted in the finding of the species there. Its absence probably reflects the lack of present or former high-humidity migration lanes across the floor of the Great Valley.

On the basis of the records discussed here, we believe that it is safe to conclude that the folded ridges of the western portion of the Valley and Ridge Province—the Allegheny Ridges of some physiographers—may be expected to harbor *wehrlei* wherever spurs interconnect the ridges and plateau. Further search for *wehrlei* at Mountain Lake is indicated, for the absence of the species at this locality is difficult to understand in the light of the Blacksburg records. Extensive collecting between Blacksburg and the Blue Ridge should be productive of additional stations and should indicate whether or not the species has actually reached the Blue Ridge.

In conclusion, we believe that it is desirable to regard *Plethodon wehrlei* as essentially an Appalachian Plateaus endemic,⁴ which enters the Valley and Ridge Province in places where there is, or has recently been, continuity of habitat, and which may possibly have gained access to the Blue Ridge via the jumbled ridges which block the southern portion of the Great Valley.

⁴Mayr has recently (Wilson Bull., 58: 11, 1946) differentiated between endemic, "restricted to a given region," and autochthonous, "having originated in a given region; now sometimes found beyond the borders of that region." Using this terminology, *P. wehrlei* is an autochthonous rather than an endemic Appalachian Plateaus species.



Netting, M. Graham, Green, N. Bayard, and Richmond, Neil D. 1946. "The occurrence of Wehrle's salamander, *Plethodon wehrlei* Fowler and Dunn, in Virginia." *Proceedings of the Biological Society of Washington* 59, 157–160.

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