B A N I S T E R I A

A JOURNAL DEVOTED TO THE NATURAL HISTORY OF VIRGINIA

ISSN 1066-0712

Published by the Virginia Natural History Society

The Virginia Natural History Society (VNHS) is a nonprofit organization dedicated to the dissemination of scientific information on all aspects of natural history in the Commonwealth of Virginia, including botany, zoology, ecology, archaeology, anthropology, paleontology, geology, geography, and climatology. The society's periodical *Banisteria* is a peer-reviewed, open access, online-only journal. Submitted manuscripts are published individually immediately after acceptance. A single volume is compiled at the end of each year and published online. The Editor will consider manuscripts on any aspect of natural history in Virginia or neighboring states if the information concerns a species native to Virginia or if the topic is directly related to regional natural history (as defined above). Biographies and historical accounts of relevance to natural history in Virginia also are suitable for publication in *Banisteria*. Membership dues and inquiries about back issues should be directed to the Co-Treasurers, and correspondence regarding *Banisteria* to the Editor. For additional information regarding the VNHS, including other membership categories, annual meetings, field events, pdf copies of papers from past issues of Banisteria, and instructions for prospective authors visit **http://virginianaturalhistorysociety.com/**

Editorial Staff: Banisteria

Editor

Jackson C. Means
Virginia Museum of Natural History
21 Starling Avenue
Martinsville, Virginia 24112

Associate Editors

Philip Coulling, Nature Camp Incorporated
Clyde Kessler, Virginia Tech
Nancy Moncrief, Virginia Museum of Natural History
Karen Powers, Radford University
Stephen Powers, Roanoke College
C. L. Staines, Smithsonian Environmental Research Center

Copy Editor

Kal Ivanov, Virginia Museum of Natural History

Copyright held by the author(s). This is an open access article distributed under the terms of the Creative Commons, Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited.
http://creativecommons.org/licenses/by/4.0/

Banisteria 61: 210–219
© 2026 Virginia Natural History Society

RESEARCH ARTICLE

NOTES ON THE DISTRIBUTION OF *GYRINOPHILUS PORPHYRITICUS* (GREEN, 1827) IN MARYLAND, WITH COMMENTS ON HABITAT AND ABUNDANCE THROUGHOUT THE SPECIES' RANGE

ROBERT W. MILLER

803 Bomont Road, Timonium, Maryland 21093, USA

Corresponding author: Robert W. Miller (*opacum@hotmail.com*)

Editor: J. C. Means | Received 23 September 2026 | Accepted 12 November 2026 | Published 20 November 2026

https://virginianaturalhistorysociety.com/2026/01/14/number-61-2026/

Citation: Miller, R. W. 2026. Notes on the distribution of *Gyrinophilus porphyriticus* (Green, 1827) in Maryland, with comments on habitat and abundance throughout the species' range. Banisteria 61: 210–219.

ABSTRACT

Errors in a recent publication concerning the spring salamander, *Gyrinophilus porphyriticus*, in Maryland are corrected, and an updated specimen-based map is presented. Contrary to the assertions of three authors, there is no compelling evidence that this species occurs in the Piedmont of Maryland. Statements in the literature concerning this species' habitat requirements are refuted, as are claims of rarity and difficulty in collecting. This species is much more adaptable than is believed.

Keywords: Spring salamander.

INTRODUCTION

The spring salamander, *Gyrinophilus porphyriticus*, is a large plethodontid confined to montane and adjacent upland areas in the eastern United States and a small portion of Canada (Brandon, 1966, 1967; Petranka, 1998; Powell et al., 2016). The species is frequently noted for its long larval period, pristine habitat requirements, rarity, and penchant for consuming salamanders, including cannibalism. However, recent claims concerning habitat and abundance are almost always misstated, as discussed below.

Specimens cited are in the following collections: Academy of Natural Sciences of Drexel University (ANSP), American Museum of Natural History (AMNH), California Academy of Sciences (CAS), Carnegie Museum of Natural History (CM), Field Museum of Natural History (FMNH), Florida Museum of Natural History, University of Florida (UF), Monte L. Bean Life Science Museum, Brigham Young University (BYU), Museum of Biological Diversity, Ohio State

University (OSUM), Natural History Society of Maryland (NHSM), Natural History Society of Maryland/Herbert S. Harris, Jr. (NHSM/HSH), National Museum of Natural History (USNM), Natural History Museum of Los Angeles County (LACM), Ohio Museum Collection of Vertebrates (OUVC), Robert S. Simmons (RSS; NHSM uncatalogued), Towson University (TSU), University of Illinois Museum of Natural History (UIMNH), and University of Michigan Museum of Zoology (UMMZ). The abbreviation MARA is used in place of Cunningham & Nazdrowicz (2018).

DISCUSSION

A century has passed since Dunn (1926) first reported and mapped the distribution of the spring salamander in Maryland. This was based on one specimen from Jennings, Garrett County (ANSP 18389 or 18393, summer 1912), and was the first record from the Allegheny Plateau. Since Dunn's monograph, only a few brief references have been published concerning this species in Maryland, and these have mostly been confined to locality records. Fowler (1940) reported the species from four localities in the Blue Ridge Physiographic Province (three in Frederick County, one in Washington County) that were in his private collection (now CM). McCauley & East (1940) collected the species at four sites in Garrett County (USNM), although they specifically mentioned only two. Fowler (1944) reported the first records for the Valley and Ridge Physiographic Province (Allegany County; also now in CM). Keller (1945) added another record for Allegany County (USNM), although the data he published are at variance with the catalogue data. Cooper (1960, 1965), in his distributional matrix, noted the presence of the species in the four western counties of Maryland (Allegany, Frederick, Garrett, and Washington); however, he indicated that the species occurs in the Western Division of the Piedmont. I can find no evidence for this. Brandon (1966) monographed the genus and listed 16 specimens from Maryland from six collections. [One specimen he listed, USNM 101983 [*Desmognathus fuscus* (Green, 1818)], should have been listed as USNM 101984.] Harris (1969, 1975), aside from Dunn (1926), was the first to map individual localities in the state. Harris (1969, 1975) followed Cooper (1960, 1965) in stating that the western edge of the Piedmont was within the spring salamander's range, but mapped no unambiguous localities in this province. Franz & Slifer (1971) reported larvae from Hogmaw Cave (formerly Rohrersville Cave—see Davies, 1950; Franz 1967) and Jugtown Cave in Washington County (no specimens or dates), and Platania (1976) reported what he assumed were the first specimens from the interior of the Valley and Ridge, although Fowler (1944) was the first to do so (Miller, 1982). Platania also noted that "Roarsville" (Rohrersville), Washington County, was the only known site for *Gyrinophilus* in the Great Valley of Maryland, but did not state a source. Apparently this was based on a personal communication from L. Richard Franz and is the same site as Franz & Slifer's (1971) Hogmaw Cave report. Stranko et al. (2010) stated: "Northern spring salamanders … usually occur in and along small streams under rocks and other substrates (Harris 1975)." Although this is undoubtedly true, Harris did not make this statement. However, Harris (1975) did assert: "Eggs are deposited under stones in springs and streams and in Maryland have been reported during early September." Lee (1973) showed a graph with a breeding date of 1 September. These authors provided no support for their claims and I can find none. A careless conversion, and there are many in Stranko et al., stated: "Mature ova are light yellow, about 3.5 to 4.0 mm (1.4–1.6 in.) in diameter …" This should have read: 0.14–0.16 inch. Also, no one was credited for ova color and size; this can be found in Bishop (1941) and was repeated by Petranka (1998), both of which were listed in Stranko et al. Miller (2016) rejected a highly improbable locality for *Gyrinophilus* in Howard

County, as well as two other incredible localities for *Scaphopod holbrookii* (Harlan, 1835) and *Glyptemys insculpta* (Le Conte, 1830) and questioned another for *Cemophora coccinea* (Blumenbach, 1788) that requires confirmation. These were all proffered by the same person.

Smith (2018) was the most recent author to publish on *Gyrinophilus* in Maryland, but his publication overlooked virtually all the literature concerning the species. Of the references listed above, he cited only Harris (1975) and Platania (1976) on distribution, with a heavy reliance on Petranka (1998) whom he referenced six times. Smith mentioned and MARA mapped two records from the "Walkersville watershed," Frederick County, and another "from a spring along the Fall Line in Howard County." Both are the only localities known from the Piedmont. As noted above, the Howard County site was discarded by Miller (2016), which appeared in MARA's references but was not cited by Smith. It is located 64 km southeast of the nearest Blue Ridge locality. The Walkersville locality was based on a misidentified larval *Pseudotriton ruber* (Sonnini de Manoncourt & Latreille, 1801) (Lynn M. Davidson, personal communication, 2026). Despite MARA's efforts, Smith stated that "this species remained elusive throughout large portions of the Ridge and Valley, particularly in Washington County and western Allegany County." If MARA had shown an interest in systematic collections they would have learned that two localities exist for the Valley and Ridge in Washington County, as mapped and cited herein. Smith also noted MARA's inability to reconfirm localities mapped by Harris (1975) for the Allegheny Front, Allegany County, and the Great Valley in southeastern Washington County. I was not able to either. This was due to Harris's extensive use of personal communications throughout his survey. Several minor errors appeared in Smith. He stated that Harris (1975) mapped two localities in Garrett County when in fact he mapped three. He also credited Dodd's "gunsight" metaphor concerning the spring salamander's canthus rostralis to Dodd (2003) when Dodd (2004) would have been correct. Smith repeated himself on the subjects of habitat and the means of locating *Gyrinophilus*.

Misstatements abound in the literature concerning the spring salamander's habitat requirements, abundance, and difficulty in collecting. Pope & Noble (1921) stated that *Gyrinophilus* was "one of the rarest salamanders of Pennsylvania," but Cope (1889), whom they did not cite, listed four localities and 44 specimens for the state, far more than he had for any other state. Wright & Haber (1922) wrote: "In the latter state [Pennsylvania] it is quite common, e.g., Professor Ralph J. Gilmore ... captured with little difficulty a hundred or more adults from one reservation near his home city." Wright & Haber did not state where this was, but an internet search revealed that Gilmore was affiliated with Lehigh University, Bethlehem, Northampton County. This area is on the edge of the range of *Gyrinophilus* in Pennsylvania (McCoy, 1982), and probably near where Gilmore collected. Continuing, just 12 years after Pope & Noble's assertion, Netting (1933) stated: "this species occurs throughout the state [Pennsylvania], having been recorded from 50 counties." Netting had 43 counties of record for *Pseudotriton ruber*, 44 counties for *Eurycea bislineata* (Green, 1818), and 45 counties for *Eurycea longicauda* (Green, 1818). At the least, I think all field workers would agree that *E. bislineata* is far more likely to be encountered than *Gyrinophilus*. Also commenting on Pope & Noble (1921), Bishop (1941) stated: "from my own experience in that state [Pennsylvania], I would regard it as abundant in many localities."

In New York, Reed & Wright (1909) considered *Gyrinophilus* "Common" in the Cayuga River basin, which lies in six counties in the central part of the state. Wright & Haber (1922) noted two localities at Ithaca [Tompkins County], New York, "that may be said to abound in them." In Albany County, Bishop (1923) stated that *Gyrinophilus* was common, being exceeded only by *Desmognathus fuscus* and *Eurycea bislineata*: "Dozens of specimens, both larvae and adults, have

been taken during the past year (1922) at the Indian Ladder and in the swamps bordering the foot of the Helderberg escarpment near Voorheesville, N. Y." Referring to Cattaraugus County, Bishop (1927) stated: "The Purple Salamander has been regarded as one of the rarer species but in suitable situations in the Allegany State Park it is very common." He added: "Here the streams flow across *open hillside meadows*[emphasis added] but because the requirements of the species are met—cold water, shelter and food—the *absence of forest* [emphasis added] has not caused them to disappear." Leffingwell (1926), commenting on a site 1.6 km E McLean, Tompkins County, wrote: "These salamanders were found regularly at Gyrinophilus Springs [a made-up term] ..." Hassler (1932), in a rarely cited and oddly uninfluential article, demonstrated that most of what appears in the recent literature concerning the habitat and abundance of *Gyrinophilus* is not necessarily true. At unspecified localities in or near Olean, Cattaraugus County, New York, he stated (p. 305): "Three of the five species were most common and very plentiful in some of the springs. These were the large purple salamander, *Gyrinophilus porphyriticus* ..." On p. 307 he wrote: "Nearly 200 purple salamanders from four different springs were so marked ..." On p. 308, commenting on the importance of nighttime work, he stated: "purple salamanders were never thought to be particularly abundant in any given water course, but repeated nightly visits and careful investigations of certain springs served to change our ideas considerably. One hundred and forty-four of these large salamanders were caught, tagged, and returned to one particular spring, and nearly fifty more were observed there, but not tagged." Most extraordinary, however, was a photograph in the Hassler article that showed one habitat of *Gyrinophilus* where "More than 200 purple salamanders were obtained from this spring during May and June." The spring was situated on a gentle slope and was surrounded by extensive, low coarse vegetation. This is in stark contrast to the pristine, heavily wooded springhead habitats that dominate the literature (e.g., Petranka, 1998). Bishop (1941) added: "They are not confined to wooded areas for many occur in open springs and streams of barren hillside meadows." He also noted several instances of the species being "found in fairly dry situations." Pope (1915) and Dunn (1926) also noted atypical habitat. The former author, referring to Manchester [Kennebec County], Maine, stated: "A week later I visited the place where they [*Gyrinophilus*] were found, a cold spring rising in a barrel *in an open field* [emphasis added] and emptying into a stone drain." Dunn: "I have taken thirteen adults and larvae in Nelson County, Va. These were either near springs in *quite broad, open, valleys* [emphasis added] or in streams in narrow, dark, ravines." Bishop (1941) noted that *Gyrinophilus* sometimes outnumbered *Desmognathus fuscus*.

Gibbs et al. (2007) were the most recent authors to comment on *Gyrinophilus* in New York. Of the eight publications pertaining to New York listed in the previous paragraph, they did not cite seven of them. Inexplicably, Bishop (1941) was cited only twice and this concerned reproduction. On habitat and abundance Gibbs et al. claimed: "The salamanders seem particularly averse to disturbed environments and are rare in streams within logged or polluted areas ..." Later in their account they stated: "Because spring salamanders are difficult to locate, our knowledge of their current distribution and densities is somewhat limited. Spring salamanders are quite common in many creeks in central New York but are only rarely found in many streams in the Adirondack Mountains and do not appear to occur east of the Hudson south of Rensselaer County ..." Again, Gibbs et al. did not cite Bishop (1941) on habitat or distribution, and Klemens (1993), whom Gibbs et al. cited elsewhere, documented a locality (AMNH 121823, 28 October 1984) in Columbia County, which is adjacent to and south of Rensselaer County. Gibbs et al. also overlooked Weber (1928) concerning the Adirondacks: "The Purple Salamander finds an ideal habitat in the cold mountain brooks of the region, and is common."

Another instance of extraordinary abundance of *Gyrinophilus* was recorded by King (1939), who found "at least 200 salamanders of this species [*G. danielsi danielsi* (Blatchley, 1901)] crawling about on the road [Newfound Gap Road (US Route 441)]" at night on 20 April 1937. He added: "The presence of so many of these comparatively uncommon animals made the observation all the more interesting." Unlike Hassler's (1932) reports, King's experience was noted by Huheey & Stupka (1967) and Dodd (2004). Dodd (2004) was the most recent author to comment on abundance in a noteworthy manner. He stated: "During surveys from 1998 to 2001, USGS field crews saw a large number of Spring Salamanders within the park [Great Smoky Mountains National Park]. All of the animals seen conformed to the description of *G. p. danielsi* [Blatchley, 1901], regardless of whether they were in Tennessee or North Carolina." Unfortunately Dodd did not provide any details.

The remainder of this article is devoted to the numerous misinformed or confusing statements that have appeared in the literature and were not considered above. According to Beachy (2005), Bruce (1972, 1978) made claims of rarity or had difficulty collecting the species, but his field work indicated just the opposite. In the 1972 paper he collected 20 transformed and 190 larval specimens in the Piedmont of South Carolina, 1965–1971. Three sites were worked in the mountains of North Carolina. One yielded 161 metamorphs and ca. 450 larvae, 1962–1971. A second produced 118 metamorphs and ca. 200 larvae, mostly 1969–1971, and a third site, "In limited field work" resulted in the collection of 26 metamorphs and 15 larvae. In the 1978 paper, but working a different mountain range in North Carolina (the Cowees) from those listed in 1972, Bruce collected 81 metamorphs and 613 larvae, 1973–1975 from one subdivision, and 92 metamorphs and 471 larvae from the other, 1966–1976. Burton & Likens (1975): "*Gyrinophilus porphyriticus* are secretive and relatively rare, and are difficult to capture during daylight hours." It is not clear whether this was a general statement or applied solely to their study site. However, they estimated that 225 adults and 225 larvae occurred in a 120-meter stretch of stream, indicating the species was anything but rare. Green & Pauley (1987): "Spring salamanders are agile, elusive, and difficult to capture." Camp et al. (2025) made no comment along these lines. In the same vein, Hulse et al. (2001) claimed: "This is an exceedingly difficult species to capture." This may have been one or more of these authors' experience with the species along or in deeper water (see Engelhardt, 1919), but it is belied by their map, that of McCoy (1982), and numerous other collectors. Brandon (1989) wrote: "Throughout the range, spring salamanders have been found only in cool, clear waters free of predaceous fishes." Markowsky (1992, 1999) claimed: "Spring salamanders are uncommon and seldom encountered by people." Beachy (1996): "*G. porphyriticus* are difficult to collect in large numbers (and exceptionally difficult to collect in the Cowee Mountains ..." (not the case; see Bruce, 1978 above) and in 2005: "Spring salamanders are well known for being difficult to find. ... Current densities seem in line with historical densities. This means that in most of their range, spring salamanders have *always* [emphasis added] been difficult to obtain." Collections of one hundred or more were noted above. Petranka (1998) stated: "*G. porphyriticus* reaches its highest densities in protected watersheds with hardwood forests." On balance this may be true, but the highest density that has been reported was from a habitat (see Hassler, 1932 above) where, according to authority, the species should not even occur. Although I am not aware of any recent reports of high densities of spring salamanders occupying atypical habitats, there is no reason to believe they no longer exist. Camp & Cash (2008): "This species appears to be nowhere abundant." Niemiller (2011): "Spring Salamanders are difficult to find because of their secretive nature and tendency to inhabit subterranean haunts, but they are by no means uncommon." Green et al. (2013): "Spring Salamanders are notoriously difficult to find ..."

Their map alone indicated just the opposite. And finally Pfingsten (2013): "Throughout their range, Spring Salamanders are found *only* [emphasis added] in cool, clear waters free of predacious fishes. The common habitats are in and around springs, seepages, and spring-fed headwater streams in heavily wooded areas ..." Aside from Bishop (1941, 1943), Pfingsten is the only author I have found who cited Hassler. However, it is clear that he did not consult this article; otherwise the statement just quoted would not have been made.

Figure 1 maps the documented distribution of *Gyrinophilus porphyriticus* in Maryland.

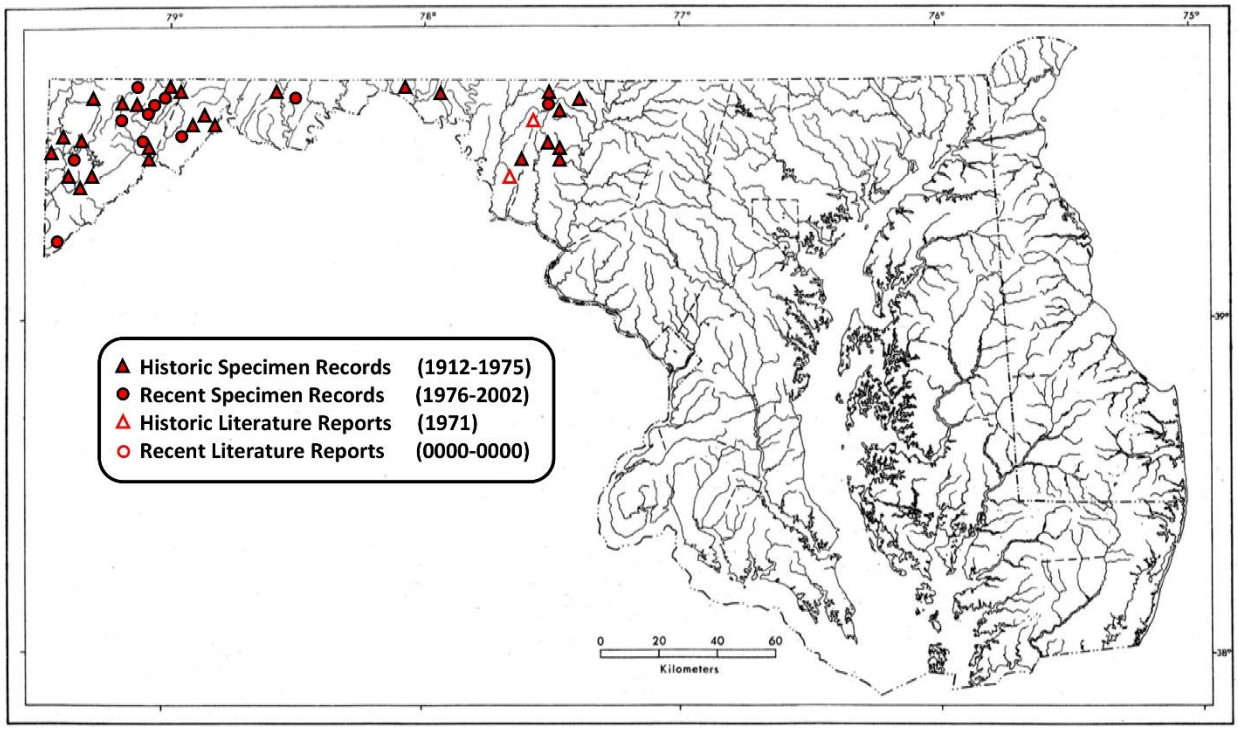


Figure 1. Map of Maryland, Delaware and the District of Columbia showing locality records and reports for the spring salamander, *Gyrinophilus porphyriticus*, in Maryland.

ACKNOWLEDGEMENTS

I thank Neftali Camacho (LACM), Lynn M. Davidson (DNR), David A. Dickey (AMNH) and Addison H. Wynn (USNM) for their assistance. I especially thank Stephen L. Barten and Michael A. Dloogatch (Chicago Herpetological Society) for their work on the map.

REFERENCES

Beachy, C. K. 1996. Reduced courtship success between parapatric populations of the plethodontid salamander *Gyrinophilus porphyriticus*. Copeia 1996(1): 199–203.

Beachy, C. K. 2005. *Gyrinophilus porphyriticus* (Green, 1827), spring salamander. Pp. 776–778 In M. Lannoo (ed.), Amphibian Declines: The Conservation Status of United States Species. University of California Press, Berkeley & Los Angeles, CA.

Bishop, S. C. 1923. Notes on the herpetology of Albany County, New York. Copeia 1923(118): 64–68.

Bishop, S. C. 1927. The amphibians and reptiles of Allegany State Park. New York State Museum Handbook 3: 3–141.
Bishop, S. C. 1941. The Salamanders of New York. New York State Museum Bulletin 324: 1–365.
Bishop, S. C. 1943. Handbook of Salamanders: The Salamanders of the United States, of Canada, and of Lower California. Comstock Publishing Co., Ithaca, NY. 555 pp.
Brandon, R. A. 1966. Systematics of the salamander genus *Gyrinophilus*. Illinois Biological Monographs 35: 1–86.
Brandon, R. A. 1967. *Gyrinophilus porphyriticus*. Catalogue of American Amphibians and Reptiles 33: 1–3.
Brandon, R. A. 1989. *Gyrinophilus porphyriticus* (Green), Spring Salamander. Pp. 213–222 in R. A. Pfingsten & F. L. Downs (eds.), Salamanders of Ohio. Bulletin of the Ohio Biological Survey 7(2): 1–315.
Bruce, R. C. 1972. Variation in the life cycle of the salamander *Gyrinophilus porphyriticus*. Herpetologica 28(3): 230–245.
Bruce, R. C. 1978. Life-history patterns of the salamander *Gyrinophilus porphyriticus* in the Cowee Mountains, North Carolina. Herpetologica 34(1): 53–64.
Burton, T. M., & G. E. Likens 1975. Salamander populations and biomass in the Hubbard Brook Experimental Forest, New Hampshire. Copeia 1975(3): 541–546.
Camp, C. D., & W. B. Cash. 2008. Spring salamander, *Gyrinophilus porphyriticus*. Pp. 205–207 In J. B. Jensen, C. D. Camp, W. Gibbons, & M. J. Elliott (eds.), Amphibians and Reptiles of Georgia. University of Georgia Press, Athens, GA.
Camp, C. D., M. S. Osbourn, & B. Lindley. 2025. Spring Salamander, *Gyrinophilus porphyriticus* (Green 1827). Pp. 125–127 In T. K. Pauley, C. D. Camp, M. B. Watson, N. E. Karraker & Z. J. Loughman (eds.), Amphibians and Reptiles of West Virginia. Quarrier Press, Charleston, WV.
Cooper, J. E. 1960. Distributional survey V: Maryland and the District of Columbia. Bulletin of the Philadelphia Herpetological Society 8(3): 18–24.
Cooper, J. E. 1965. Distributional survey: Maryland and the District of Columbia. Bulletin of the Maryland Herpetological Society 1(1): 3–14. [Reprinted from Bulletin of the Philadelphia Herpetological Society 8(3): 18–24, 1960. Revised by H. S. Harris, Jr.]
Cope, E. D. 1889. The Batrachia of North America. United States National Museum Bulletin 34: 1–525.
Cunningham, H. R., & N. H. Nazdrowicz (eds.). 2018. The Maryland Amphibian and Reptile Atlas. Johns Hopkins University Press, Baltimore, MD. 283 pp.
Davies, W. E. 1950. The caves of Maryland. Department of Geology, Mines and Water Resources Bulletin 7: 1–70.
Dodd, C. K., Jr. 2003. Monitoring amphibians in Great Smoky Mountains National Park. U.S. Department of the Interior, U.S. Geological Survey, Circular 1258: 1–117.
Dodd, C. K., Jr. 2004. The Amphibians of Great Smoky Mountains National Park. University of Tennessee Press, Knoxville, TN. 283 pp.
Dunn, E. R. 1926. The Salamanders of the Family Plethodontidae. Smith College, Northampton, MA. 441 pp.
Engelhardt, G. P. 1919. The habitat of *Gyrinophilus porphyriticus*. Copeia 1919(69): 20–21.
Fowler, J. A. 1940. Records of the purple salamander in Maryland. Copeia 1940(2): 60.

Fowler, J. A. 1944. A collection of salamanders from Allegany County, Maryland. Maryland: A Journal of Natural History 14(4): 90–92.

Franz, R. 1967. Annotated check list of cave-associated reptiles and amphibians of Maryland. Bulletin of the Maryland Herpetological Society 3(3): 51–53.

Franz, R., & D. Slifer. 1971. Caves of Maryland. Maryland Geological Survey, Educational Series 3: 1–120.

Gibbs, J. P., A. R. Breisch, P. K. Ducey, G. Johnson, J. L. Behler, & R. C. Bothner. 2007. The Amphibians and Reptiles of New York State. Oxford University Press, New York, NY. 422 pp.

Green, D. M., L. A. Weir, G. S. Casper, & M. J. Lannoo. 2013. North American Amphibians: Distribution and Diversity. University of California Press, Berkeley & Los Angeles, CA. 340 pp.

Green, N. B., & T. K. Pauley. 1987. Amphibians and Reptiles in West Virginia. University of Pittsburgh Press, Pittsburgh, PA. 241 pp.

Harris, H. S., Jr. 1969. Distributional survey: Maryland and the District of Columbia. Bulletin of the Maryland Herpetological Society 5(4): 97–161.

Harris, H. S., Jr. 1975. Distributional survey (Amphibia/Reptilia): Maryland and the District of Columbia. Bulletin of the Maryland Herpetological Society 11(3): 73–167

Hassler, W. G. 1932. Salamanders and water hygiene. Natural History 32(3): 303–310.

Huheey, J. E., & A. Stupka. 1967. Amphibians and Reptiles of Great Smoky Mountains National Park. University of Tennessee Press, Knoxville, TN. 98 pp.

Hulse, A. C., C. J. McCoy, & E. Censky. 2001. Amphibians and Reptiles of Pennsylvania and the Northeast. Comstock Publishing Associates, Ithaca, NY. 419 pp.

Keller, W. F. 1945. Notes on Maryland salamanders. Copeia 1945(4): 233.

King, W. 1939. A survey of the herpetology of Great Smoky Mountains National Park. American Midland Naturalist 21(3): 531–582.

Klemens, M. W. 1993. Amphibians and Reptiles of Connecticut and Adjacent Regions. State Geological and Natural History Survey of Connecticut Bulletin 112: 1–318.

Lee, D. S. 1973. Seasonal breeding distributions for selected Maryland and Delaware amphibians. Bulletin of the Maryland Herpetological Society 9(4): 101–104.

Leffingwell, D. J. 1926. Vertebrates. Pp. 71–82 In A Preliminary Biological Survey of the Lloyd–Cornell Reservation. Bulletin of the Lloyd Library of Botany, Pharmacy & Materia Medica 27(5): 1–247.

Markowsky, J. K. 1992. Spring salamander, *Gyrinophilus porphyriticus*. Pp. 39–41 In M. L. Hunter, Jr. J. Albright & J. Arbuckle (eds.), The Amphibians and Reptiles of Maine. Maine Agricultural Experiment Station Bulletin 838.

Markowsky, J. K. 1999. Spring salamander, *Gyrinophilus porphyriticus*. Pp. 59–61 In M. L. Hunter, Jr., A. J. K. Calhoun & M. McCollough (eds.), Maine Amphibians and Reptiles. University of Maine Press, Orono, ME.

McCauley, R. H., Jr., & C. S. East. 1940. Amphibians and reptiles from Garrett County, Maryland. Copeia 1940(2): 120–123.

McCoy, C. J. 1982. Amphibians and reptiles in Pennsylvania: checklist, bibliography, and atlas of distribution. Carnegie Museum of Natural History Special Publication 6: 1–91.

Miller, R. W. 1982. Distributional records for Maryland herpetofauna, II. Bulletin of the Maryland Herpetological Society 18(3): 161–164.

Miller, R. W. 2016. Notes on the distribution of *Cemophora coccinea* in Maryland. Bulletin of the Chicago Herpetological Society 51(8): 132–138.

Netting, M. G. 1933. The amphibians of Pennsylvania. Proceedings of the Pennsylvania Academy of Science 33: 100–110.

Niemiller, M. L. 2011. Spring Salamander, *Gyrinophilus porphyriticus*. Pp. 178–181 In M. L. Niemiller and R. G. Reynolds (eds.), The Amphibians of Tennessee. University of Tennessee Press, Knoxville, TN.

Petranka, J. W. 1998. Salamanders of the United States and Canada. Smithsonian Institution Press, Washington, DC. 587 pp.

Pfingsten, R. A. 2013. Northern Spring Salamander, *Gyrinophilus porphyriticus porphyriticus* (Green 1827)/Kentucky Spring Salamander, *Gyrinophilus porphyriticus duryi* (Weller 1930). Pp. 299–311 In R. A. Pfingsten, J. G. Davis, T. O. Matson, G. J. Lipps, Jr., D. Wynn & B. J. Armitage (eds.), Amphibians of Ohio. Ohio Biological Survey Bulletin 17(1).

Platania, S. 1976. A comment on the distribution of *Gyrinophilus porphyriticus* in western Maryland. Bulletin of the Maryland Herpetological Society 12(3): 101.

Pope, P. H. 1915. Some new records for *Gyrinophilus porphyriticus* (Green). Copeia 1915(19): 14–15.

Pope, P. H., & G. K. Noble. 1921. Purple salamander. Copeia 1921(100): 79–80.

Powell, R., R. Conant, & J. T. Collins. 2016. Peterson Field Guide to Reptiles and Amphibians of Eastern and Central North America. Fourth edition. Houghton Mifflin Harcourt, Boston, MA. 494 pp.

Reed, H. D., & A. H. Wright. 1909. The vertebrates of the Cayuga Lake Basin, N. Y. Proceedings of the American Philosophical Society 48(193): 370–459.

Smith, D. R. 2018. Spring Salamander, *Gyrinophilus porphyriticus*. Pp. 78–79 In H. R. Cunningham and N. H. Nazdrowicz (eds.), The Maryland Amphibian and Reptile Atlas. Johns Hopkins University Press, Baltimore, MD.

Stranko, S., S. Smith, L. Erb, & D. Limpert. 2010. A key to the amphibians and reptiles of Maryland. MarylandHerpKey_Strankoetal2010.pdf. (Accessed 23 September 2026).

Weber, J. A. 1928. Herpetological observations in the Adirondack Mountains, New York. Copeia 1928(169): 106–112.

Wright, A. H., & J. M. Haber. 1922. The carnivorous habits of the purple salamander. Copeia 1922(105): 31–32.

Appendix. Specimens cited.

Specimens examined

Allegany County: NHSM 3321-3322, 3324; NHSM/HSH 349, 351; TSU 43, 115, 567-569, 1225, 1233-1234, 1320-1324, 1338, 1910; UF 41001.
Frederick County: NHSM 1748, 1906, 3326-3328, 4477; NHSM/HSH 99, 160.
Garrett County: ANSP 18389; NHSM 1698-1703, 1743, 2750-2751, 3305-3306, 3320, 4748; NHSM/HSH 423; TSU 1452-1456, 1481, 1950, 4366, 5729, 5896-5897, 7193-7195, 7227, 7656-7657, 8074, 8083, 9087-9089; UF 41002.
Washington County: LACM 124434; TSU 9188. Washington Monument State Park (RSS S65, 7 May 1953; RSS S156, no date) (NHSM uncatalogued).

Specimens unexamined

Allegany County: CM 138929-138931, 138932-138934, 138954; LACM 124427-124430; USNM 141317, 265675-265676, 518514-518516.
Frederick County: CM 138924, 138925, 138926, 138949-138950; FMNH 48941; LACM 124431; USNM 383368.
Garrett County: ANSP 18393; BYU 22961; CAS 223841; CM 4759, 138935-138942, 138943-138948, 138951, 138952-138953, 138956-138963, 138964-138966, 143025; LACM 124432-124433; OSUM 2901; OUVC 3918; UIMNH 50133-50134, 51536-51537; UMMZ 89855; USNM 101967, 101984, 511097-511098.
Washington County: CM 138927-138928, 138955.