SMITH, PHILIP W. 1963. *Plethodon cinereus*, p. 5. *In* W. J. Riemer (ed.), Catalogue of American Amphibians and Reptiles. American Society of Ichthyologists and Herpetologists, Bethesda, Maryland.

Plethodon cinereus (Green)
Red-backed and lead-backed salamander

Salamandra erythronota Rafinesque, 1818. See *P. c. cinereus.*

Salamandra cinerea Green, 1818 (Sept.):356-357. Type-locality: "Newjersey." Revised to "near Princeton?" by Fowler, 1906:57; to "vicinity of Princeton" by Schmidt, 1953:33. Lectotype, Acad. Nat. Sci. Philadelphia 1232, designated by Highton, 1962:286; syntypes include ANSP 1232-34, 1237 (see Fowler, 1906:57 and Highton, 1962:286), all collected by Jacob Green, date unknown.

Plethodon cinereus: Tschudi, 1838:92. Description of genus and selection by first reviser of *S. cinerea* as having priority over *S. erythronota*. Highton (1961:221-222), has applied to International Commission to place name *cinereus* on Official List.

Salamandra puncticulata Valenciennes *in* Duméril, Bibron, & Duméril, 1854:87. Not available.

• CONTENT. Three rather poorly differentiated subspecies——*cinereus*, *serratus*, and *polycentratus*—— are recognized, the last two representing disjunct populations assumed to be subspecies because of their similarity to the nominate race. See Highton (1962) for the most recent monographic treatment.

• DEFINITION. This *Plethodon* is small, usually less than 110 mm in total length, and has 18-23 trunk vertebrae and 17-22 visible costal grooves. The breeding male has a shelflike mental gland at the apex of the lower jaw rami, enlarged premaxillary teeth, and hedonic glands on the ventral surface of the tail and body. The venter is usually mottled with approximately equal amounts of dark and light pigment and lacks red pigment; the dorsum is typically dark gray or black with a wide, red, middorsal, approximately straight-edged stripe, or is uniformly dark gray or black without a middorsal stripe but with brassy, red, or white flecks, or the dorsum is entirely red (see Thurow, 1961, for a discussion of the erythristic variant).

• DESCRIPTIONS. Eggs, nesting habits, and development are described by numerous authors, whose observations are summarized and cited in Dunn (1926) and Bishop (1941, 1943). Adults have been described in detail by Dunn, Bishop, Thurow (1956, 1957), and Highton (1962).

• ILLUSTRATIONS. See Conant (1958:pl. 32) for color photographs of red-backed and lead-backed adult color phases, and Bishop (1941:figs. 39c, 40c-f) for eggs and immature stages.

• DISTRIBUTION. This species occurs in the northeastern United States and southeastern Canada. The Missouri, Arkansas-Oklahoma, and Georgia populations appear to be disjunct. Note on the map the outlier records in southeastern North Carolina, northeastern Oklahoma, western Minnesota, and at the southern tip of James Bay, Ontario.

Both the adult and juvenile live within rotten logs and stumps, under objects on the ground, and in forest-floor litter in relatively cool and mesic coniferous and hardwood forests of eastern North America.

• FOSSIL RECORD. None.

• PERTINENT LITERATURE. For information on the life history and natural history of the species, see literature cited by Dunn, Bishop, and Highton; for ecology, see literature cited by Heatwole (1962); for genetics of color patterns, see Highton (1959); for geographic and individual variation, see Dunn, Thurow, and Highton references, plus Grobman (1944), and Highton & Grobman (1956); for nomenclatural history, see Dunn and Highton references, and Reed (1960). For the biogeographic significance of species, see Grobman references and Smith (1957).

• REMARKS. The breeding site is in the normal habitat (see DISTRIBUTION). The egg cluster is often suspended from the roof of a cavity within a log or stump. It may also be under a rock or in the leaf litter. The larval period is spent within the egg capsule. At hatching or soon thereafter, the young is a miniature replica of the adult, except for certain proportional and pattern differences. The food consists primarily of small arthropods.

Reed (1960) and Goodwin (1960) found that *S. erythronota* Rafinesque, 1818, has priority over *S. cinerea* Green, 1818, and *S. erythronota* Green, 1818. Highton (1961) has appealed to the International Commission on Zoological Nomenclature to conserve *cinerea* and suppress *erythronota* and has suggested that zoologists continue to use *P. cinereus* as the valid name for the species, pending a decision by the Commission.

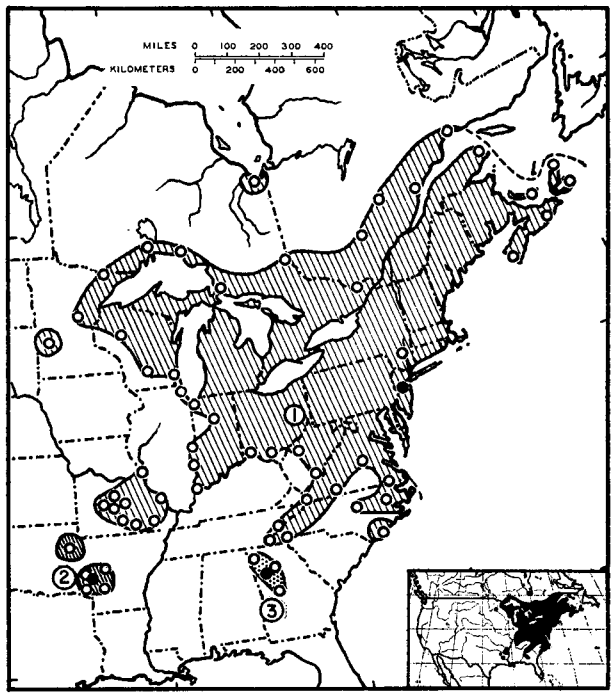
• ETYMOLOGY. The name *cinereus*, taken directly from Latin, means "ash-colored" and refers to the dorsal color of the lead-backed phase. The name *serratus*, also taken directly from Latin, means "sawed" or "having the edges snagged" and refers to the evenly notched margins of the middorsal red stripe. The name *polycentratus* is of Greek origin (from *polys* "many" and *kentron* "point of a circle") and refers to the relatively numerous vertebrae.

1. *Plethodon cinereus cinereus* (Green)
Red-backed and lead-backed salamander

Salamandra erythronota Rafinesque, 1818 (March):25-26. Type-locality, "state of New York, on the Highlands, etc." Revised to "Hudson Highlands of New York" by Highton, 1962:285. Types not known to exist.

Salamandra erythronota [?Rafinesque] Green, 1818 (Sept.):356. Type-locality, "Newjersey." Revised to "near Princeton?" by Fowler, 1906:57. Syntypes presumably include Acad. Nat. Sci. Philadelphia 1227, 1230-1, 1235-6, (see Fowler, 1906:57, and Highton, 1962:286) collected by Jacob Green, date unknown.

S.[alamandra] erythronota: Harlan, 1827:329. Redescription and indication of doubt about author of name; both Rafinesque and Green cited.



MAP. Solid circles mark type-localities. Hollow circles are other selected localities. After Goode Base Map 202; © University of Chicago 1937.

Sauropsis erythronotus (Rafinesque) Fitzinger, 1843: 33. Transfer of *S. erythronota* to *Sauropsis*.
Ambystoma erythronotum (Green) Gray, 1850:37-38. Transfer of *Salamandra erythronota* to *Ambystoma*; synonymizing of *Salamandra cinerea* Green; consistent misspelling of *Sauropsis* as *Saurophis*.
P.[lethodon] erythronota (Green) Baird, 1850:285. Recognition of *Salamandra erythronota* as distinct from *S. cinerea*; notation that Green credited *erythronota* to Rafinesque; error in indicating gender.
Plethodon erythronotus (Green) Storer, 1852:138. Correction of gender; crediting of authorship of name combination to Baird.
Plethodon erythronotum (Green) Duméril, Bibron, & Duméril, 1854:86. Preference for *Salamandra erythronota* over *S. cinerea*; crediting of authorship of the latter name combination to Tschudi; error in indicating gender.
Spelerpes erythronota (?author) Kennicott, 1869. Quotation from Kennicott's field notes in his obituary (Anonymous, 1869:144) in which *S. erythronota* is assigned to *Spelerpes*.
Plethodon erythronotus erythronotus (Green) Cope, 1869:100.
Plethodon cinereus erythronotus (Green) Yarrow, 1882: 154. Recognition of *Salamandra cinerea* and *S. erythronota* Green as varieties of *Plethodon cinereus*.
Plethodon erythronotus (Rafinesque) Reed, 1960:207-213. See also Goodwin, 1960:35-36. Independent discoveries that *Salamandra erythronota* Rafinesque predates *Salamandra erythronota* Green and *Salamandra cinerea* Green.
Salamandra cinerea Green, 1818. See *P. cinereus*.
Plethodon cinereus (Green) Tschudi, 1838. See *P. cinereus*.
Plethodon erythronotus cinereus: Cope, 1869:100. Recognition of *Salamandra erythronota* and *S. cinerea* as varieties of *P. erythronotus*.
Plethodon cinereus cinereus: Yarrow, 1882:153. Crediting of authorship of name combination to Cope. Grobman (1944:300) describes this subspecies as currently recognized.
Sal.[amandra] agilis Sager, 1839:322-323. Type-locality presumably Detroit, Michigan. Syntypes, U.S. Natl. Mus. 3770 (15 specimens) collected by A. Sager, date unknown.
Plethodon huldae Grobman, 1949:136. Type-locality, "Hawksbill Mountain . . . approximately 3500 feet in Madison County, Virginia." Holotype, U.S. Natl. Mus. 127955, collected by Hulda and Arnold Grobman, 5 September 1947.

In addition to the complex taxonomic and nomenclatural history outlined above, the following misspellings, lapsi, and orthographically incorrect citations may be found in the voluminous literature treating the species: *Salamandra cinera, Salamandra erithronota, Amblystoma erythronotum, Plethodon cinerus, Plethodon cinereous, Plethodon cinereum, Plethodon erythronotus cinerea, Plethodon erythronotus erythronota,* and *Plethodon cinereus erythronota.* For purposes of synonymy these variant spellings are superfluous; moreover, they have no status according to the International Code of Zoological Nomenclature (1961: art. 33[b]).

• DEFINITION. The middorsal red stripe, when present, is usually straight-edged. Trunk vertebrae number 19-22 (modal number 20; 19 or 21 in some areas), costal grooves 18-21 (modal number 19; 18 or 20 in some areas). (Modal numbers are for the entire range but are subject to geographic variation.) The middorsal stripe at midbody averages half the body width. Tail length of the adult averages considerably more than snout-vent length. Costal grooves between toes of adpressed limbs number 7-9 in adults. Secondary sexual characters, particularly the hedonic glands on the underside of the tail, are well developed in breeding males. Red pigment normally is restricted to the middorsal stripe in the red-backed phase.

2. *Plethodon cinereus serratus* Grobman
Ouachita red-backed salamander

Plethodon cinereus serratus Grobman, 1944:306. Type-locality, "Rich Mountain, Polk County, Arkansas, at an altitude of 2500 feet." Holotype, female, Chicago Nat. Hist. Mus. 39464, collected by Karl P. Schmidt and C. M. Barber, 23 March 1938.

• DEFINITION. A red middorsal stripe is usually present; its borders have definite serrations coinciding with the costal grooves. Red pigment is mixed with dark pigment along the sides but not on the venter. Secondary sexual characters are poorly developed. Usually 18 or 19 costal grooves are present, and 7 or 8 costal folds remain between the toes of adpressed limbs in adults. Tail length in the adult barely exceeds snout-vent length.

3. *Plethodon cinereus polycentratus* Highton & Grobman
Georgia red-backed salamander

Plethodon cinereus polycentratus Highton & Grobman, 1956:185-187. Type-locality, "2 miles northeast of Palmetto, Fulton County, Georgia." Holotype, male, Univ. Florida 8376, collected by Albert and Richard Highton, 2 February 1954.

• DEFINITION. Trunk vertebrae number 21-23, costal grooves, 20-22. Red pigment is present on the sides and on the belly between the front limbs in both the red-backed and lead-backed color phases.

COMMENT

The disjunct population on the Salem Plateau of eastern Missouri, which is not accorded subspecific rank, differs from trans-Mississippi River *Plethodon cinereus* in that the red middorsal stripe, invariably present, averages somewhat narrower; it differs from the Ouachita Mountain subspecies (*serratus*) most obviously by its straight-edged dorsal stripe and minor proportional characters; it differs from the Georgia Piedmont subspecies (*polycentratus*) by its lower costal groove count and details of coloration. However, in the eastern United States most of the characters are subject to considerable discordant variation in the continuous range of *P. c. cinereus*, and it is possible to find local populations of *P. c. cinereus* almost inseparable from *P. c. polycentratus* and occasional specimens almost inseparable from *P. c. serratus*.

Thurow (1957) and Highton (1962) have suggested that parts of the Salem Plateau of Missouri may be occupied by both *P. c. cinereus* and a superficially similar relict population of *P. dorsalis dorsalis* × *angusticlavius*, but all known specimens from the area, in my judgment, are referable to *P. cinereus*.

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