

Catalogue of American Amphibians and Reptiles.

WILLIAMS, KENNETH L. 1985. *Cemophora, C. coccinea*.

Cemophora Cope
Scarlet Snake

Amphycephalus Kuhl and van Hasselt, 1822:101 (Smith, 1968, in a complicated discussion, pointed out that this name as cited was not a *nomen nudum*, as treated by most authors, but could be tied to the type of *Coluber coccineus* Blumenbach, and thus becomes a senior synonym of *Cemophora*; fortunately the International Commission on Zoological Nomenclature in Opinion 963 (1971) suppressed this name).

Cemophora Cope, 1860:244. Type species, *Coluber coccineus* Blumenbach, by monotypy.

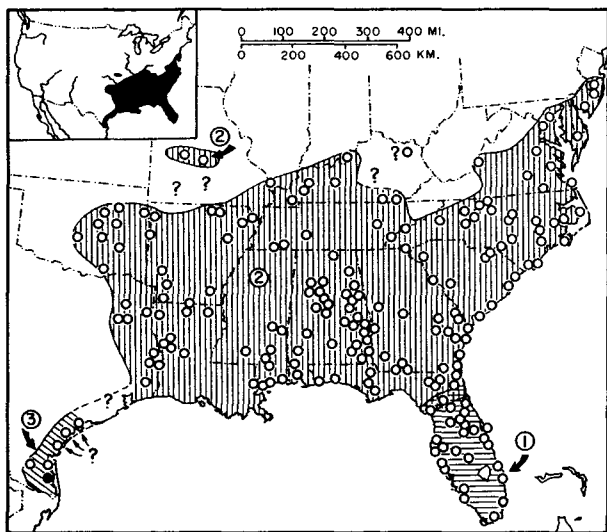
Stasiotes Jan, 1862:75. Type species, *Coluber coccineus* Blumenbach, by monotypy.

● CONTENT. A single polytypic species, *Cemophora coccinea*, is recognized.

● DEFINITION AND DIAGNOSIS. *Cemophora* is a small to medium-sized snake with a maximum known length of 823 mm. The rostral is enlarged and projects beyond the lower jaw. Supralabials are usually 6-7. Infralabials are usually 7, occasionally 8 or 9. The last two maxillary teeth are distinctly enlarged and saber-like. Dorsal scales are smooth with two apical pits, usually in 19 rows throughout. Ventrals range from 149 to 195. Subcaudals are in two rows, 31-50 in number. The anal plate is entire. The dorsal pattern consists of red saddles (12-28 on body) bordered by black, between which are white or pale yellow interspaces. The venter is immaculate cream. The black band on the head varies in position from the middle of the frontal to the middle of the parietals; the rest of the head is red. The hemipenis is bilobed with a single sulcus spermaticus extending onto the lateral lobe. The proximal area is naked. Distally a spinose area grades into a calyculate area that extends to the apex of the organ. Micro-ornamentation of the calyces is papillate. The area between the lobes is naked. No apical differentiation is present.

Cemophora may be distinguished from other colubrid genera in the Western Hemisphere by the following combination of characteristics: hemipenial shape and ornamentation, color pattern, enlarged rostral, scales in 19 rows at midbody; two apical pits, anal plate entire; and last two maxillary teeth distinctly enlarged and saber-like.

● DESCRIPTIONS, ILLUSTRATIONS, DISTRIBUTION. See species account.



MAP. Solid circle indicates the type-locality of *Cemophora coccinea lineri*; other type-localities are too indefinite to plot. Hollow circles indicate other locality records. Question marks indicate uncertain localities and range boundary. Overlapping shading patterns indicate a zone of intergradation.

● PERTINENT LITERATURE. Dunn (1928), primarily using hemipenial characteristics, placed *Cemophora* in the Colubrinae and indicated closest relationship to a group containing *Lampropeltis*, *Rhinocheilus*, *Stilosoma*, *Sonora*, and *Tantilla*. Williams and Wilson (1967) compared *Cemophora* to five related genera (*Lampropeltis*, *Rhinocheilus*, *Arizona*, *Pituophis*, and *Stilosoma*). Dowling and Duellman (1978) assigned *Cemophora*, *Lampropeltis*, *Rhinocheilus*, and *Stilosoma* to the Colubrine tribe Lamproleptiini. Aufenberg (1963) and Holman (1964) indicated that the fossil genus *Pseudozemophora* is closely related to *Cemophora* and *Lampropeltis triangulum*. Meylan (1982) suggested that *Cemophora* diverged from some earlier form of *Lampropeltis* rather than *L. triangulum*, as suggested by Williams and Wilson (1967).

● ETYMOLOGY. *Cemophora* is derived from the Greek words *ceмос* (meaning muzzle) and *phoros* (meaning bearing) and alludes to the pronounced rostral scale. The gender is feminine.

Cemophora coccinea Cope
Scarlet snake

Coluber coccineus Blumenbach, 1788:11. Type-locality, "Florida."

Type apparently nonexistent.

Elaps coccineus: Merrem, 1820:145.

Heterodon coccineus: Schlegel, 1837:141.

Rhinostoma coccineus: Holbrook, 1842:125, pl. 30.

Simotes coccineus: Duméril, Bibron and Duméril, 1854:637.

Cemophora coccineus: Cope, 1860:244.

Stasiotes coccineus: Jan, 1862:75.

Cemophora doliaata: Smith, 1952:26.

● CONTENT. Three subspecies are recognized: *coccinea*, *copei*, and *lineri*.

● DEFINITION. Same as for genus.

● DESCRIPTIONS. Williams and Wilson (1967) described variation in detail. Mount (1975) presented descriptive data on Alabama specimens. Haines (1967) presented general comments on skull modification. Williams and Wilson (1967) briefly described the skull osteology and gave tooth counts. Underwood (1967, 1970) described the "rod type" in the retina indicating a relationship to *Lampropeltis*. Saiff (1975) described the epiglottal structure. Cope (1894a, 1894b) and Underwood (1967) presented information on the lungs. Hardaway and Williams (1976) described the costal structures. Dowling (1959) commented on the absence of the ocular shield or "brille" in *Cemophora* and other burrowing snakes. Skocylas (1978) included brief comments on *Cemophora* in his account of the reptilian digestive tract. Meylan (1982) presented data on vertebrae.

● ILLUSTRATIONS. Black and white photographs are in Haltom (1931), Ditmars (1936, 1945), McCauley (1945), Pope (1946), Schmidt and Inger (1957), Wright and Wright (1957), Smith (1961), Anderson (1965), Williams, Brown and Wilson (1966), Williams and Wilson (1967), Huheey and Stupka (1967), Minton (1972), Mount (1975) and Smith (1977). Color illustrations or photographs are included in Kelly (1936), Carr (1963), Keiser (1971), Conant (1975), Oulahan (1976), Gow (1978, erroneously listed as *Lampropeltis zonata*), Behler and King (1979), Simon (1979), Martof et al. (1980), Ashton and Ashton (1981), Linzey and Clifford (1981), Smith and Brodie (1982), and Tennant (1984). Williams and Wilson (1967) illustrated the head pattern, maxilla, and hemipenis. Cope (1900) illustrated the *in situ* hemipenis. Line drawings of the head are in Jan and Sordelli (1865), Duméril, Bibron and Mocquard (1883), Cope (1900), Haltom (1931), Schmidt and Davis (1941), Linzey (1979), and belly pattern in Ashton and Ashton (1981). The cochlear duct is illustrated by Miller (1968).

● DISTRIBUTION. The range of the scarlet snake extends along the Atlantic coast from New Jersey southward to the southern tip of Florida, westward including all the Gulf coast states at least as far as Jim Hogg County, Texas; the range extends northward to include eastern Texas, eastern Oklahoma, Arkansas, Tennessee, and Kentucky, as well as southern Indiana, southern Illinois, and central and southwestern Missouri. The distribution has been determined using the information in Williams and Wilson (1967) and updated from the following sources: Alabama (Mount, 1975), Arkansas (Byrd and Hanebrink, 1976), Florida (Duellman and Schwartz, 1958, who discounted records for the Florida Keys; Ashton and Ashton, 1981),

Georgia (Wharton and Howard, 1971; Ringler, 1977; Laerm et al., 1980), Louisiana (Hardy, 1979; Williams, unpublished records), Missouri (Nickerson, 1967; Johnson and Watkins, 1979), Oklahoma (Webb, 1970; Ball, 1975, 1979; Lardie, 1979), South Carolina (Ringler, 1977; Gibbons and Coker, 1978; Gibbons and Harrison, 1981), Texas (Raun, 1974; Lewis and Dixon, 1976; Seifert, 1980; Tennant, 1984), Tennessee (Huheey and Stupka, 1967; Norton and Harvey, 1975), and Virginia (Witt, 1964; Hoffman, 1977). Comments on specific habitats occupied by *Cemophora* within its range are found in Minton and Bechtel (1958), Williams and Wilson (1967), Wharton and Howard (1971), Landry (1973), Raun (1974), Mount (1975) and Martof et al. (1980).

● **FOSSIL RECORD.** *Cemophora coccinea* has been reported from the early Pleistocene by Meylan (1982) and the middle or late Pleistocene by Auffenberg (1963).

● **PERTINENT LITERATURE.** The most complete work on the genus is that of Williams and Wilson (1967). They summarized the literature through 1966, studied variation in morphological features, and reviewed nomenclatorial history. Christman (1980) analyzed geographic variation of Florida specimens, pointing out some variational patterns previously unrecognized. Palmer and Tregembo (1970) presented data on distribution, habitat, activity, feeding behavior, and eggs in North Carolina. Fitch (1970) and Turner (1977) suggested that scarlet snakes may produce more than one clutch of eggs annually. Dickson (1948) and Minton and Bechtel (1958) presented information on the unusual feeding method of *Cemophora*. Brown (1979) reported an additional note on feeding, as well as a record of *Bufo terrestris* feeding on *Cemophora*. Nelson and Gibbons (1972) and Campbell and Christman (1982) presented important information on ecology, abundance, and seasonal activity. Brandner (1981) and Trauth (1982) published on reproduction and appearance of juveniles. Hermann (1983) reported an amelanistic partial albino specimen and a maximum egg clutch (9) for the species. Woolcott (1959) and Braswell and Palmer (1984) reported on clutches of eggs (5 and 7, respectively), size, incubation time, and size of newly hatched juveniles. Grant (1973) gave information on how to feed captive scarlet snakes. Carpenter and Ferguson (1977) summarized what little is known about the behavior of this species. Willard (1977) presented data on constriction methods used.

● **ETYMOLOGY.** The name *coccinea* is derived from the Latin *coccin* and means "scarlet or crimson," alluding to the color of the dorsal saddles. The name *copei* is a patronym honoring Edward Drinker Cope, the describer of the genus and famous naturalist. The name *lineri* is a patronym and honors Ernest A. Liner, who helped collect the type.

1. *Cemophora coccinea coccinea* (Blumenbach)

Coluber coccineus Blumenbach, 1788:11. See species account.

Elaps coccineus: Merrem, 1820:145 (part).

Heterodon coccineus: Schlegel, 1837:141 (part).

Rhinostoma coccineus: Holbrook, 1842:125, pl. 30 (part).

Simotes coccineus: Duméril, Bibron and Duméril, 1854:637.

Rhinostoma coccinea: Baird, 1859:pl. 33, fig. 89.

Cemophora coccinea: Cope, 1860:244 (part).

Stasiotes coccineus: Jan, 1862:75 (by inference, part).

Cemophora doliata coccinea: Mittleman, 1952:25.

Cemophora doliata: Smith, 1952:26 (part).

Cemophora coccinea coccinea Williams, Brown and Wilson, 1966: 85 (part).

● **DEFINITION.** The first black body blotch does not touch the parietal and is usually separated by 2 scale lengths. Body blotches are closed laterally. The number of body blotches ranges from 12 to 22 (mean, 17.6). Ventrals are usually less than 185 (range 158–185; mean, 174). Supralabials are usually 7.

2. *Cemophora coccinea copei* Jan

Coluber coccineus: Daudin, 1803:43 (part).

Coluber dumfriensis: Sowerby, 1804:5, pl. 3 (Schmidt, 1954: 305, indicated this name was a synonym of *Cemophora coccinea*; considered a *nomen nudum* by Williams and Wilson, 1967:113.)

Elaps coccineus: Merrem, 1820:145 (part).

Heterodon coccineus: Schlegel, 1837:102 (part).

Rhinostoma coccineus: Holbrook, 1842:125 (part).

Rhinostoma coccinea: Baird, 1859:pl. 33, fig. 89.

Simotes coccineus: Duméril, Bibron and Duméril, 1854:637 (part).

Cemophora coccinea: Cope, 1860:244 (part).

Stasiotes coccineus: Jan, 1862:75 (by inference, part).

Cemophora copei Jan 1863:231. Type-locality, "Etats-Unis, Tennessee." Holotype, Muséum d'Histoire naturelle de Genève 524.74, collected by H. de Saussure (?), no date given. (fide Mahnert, 1976) (not examined by author).

Cemophora coccinea var. *copei*: Garman, 1884:78.

Cemophora doliata doliata: Mittleman, 1952:25.

Cemophora doliata: Smith, 1952:26 (part).

● **DEFINITION.** The first black body blotch usually touches the parietal (or joins with black head band) or is separated by one or fewer scale lengths. Body blotches are closed laterally. The number of body blotches ranges from 13 to 28 (mean, 18.6). Ventrals are usually fewer than 185 (range 150–180; mean, 165.3). Supralabials are usually 6.

3. *Cemophora coccinea lineri* Williams, Brown, and Wilson

Cemophora coccinea: Auffenberg, 1948:212.

Cemophora coccinea lineri Williams, Brown and Wilson, 1966: 85. Type-locality, "34.5 miles south Riviera, Kennedy County, Texas." Holotype, Amer. Mus. Natur. Hist. 75307, collected by E. A. Liner and R. Whitten, on 29 June 1963 (examined by author).

● **DEFINITION.** The first body blotch does not touch the parietal and is separated by 2 or more scale lengths. Body blotches are open laterally. The number of body blotches are 14–17 (mean, 16). Ventrals are 185–195 (mean, 189.3). Supralabials are 7.

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