

Catalogue of American Amphibians and Reptiles.

Rossman, D.A. and V. Wallach. 1991. *Virginia*.

**Virginia Baird and Girard
Earth Snakes**

Potamophis Fitzinger, 1843:25. Type-species, *Calamaria striatula* Schlegel, 1837 [= *Coluber striatulus* Linnaeus, 1766], by original designation. Preoccupied by *Potamophis* Cantor, 1836.

Virginia Baird and Girard, 1853:127. Type-species, *Virginia Valeriae* Baird and Girard, 1853, by monotypy.

Haldea Baird and Girard, 1853:122. Type-species, *Coluber striatulus* Linnaeus, 1766, by monotypy.

Conocephalus Duméril, Bibron, and Duméril, 1854:138. Type-species, *Coluber striatulus* Linnaeus, 1766, by monotypy. Preoccupied by *Conocephalus* Thunberg, 1815.

Falconeria Theobald, 1868:44. Type-species, *Falconeria bengalensis* Theobald, 1868 [= *Virginia striatula*], by monotypy.

Amphiardis Cope, 1888:391. Type-species, *Virginia inornata* Garman, 1883 [= *Virginia striatula*], by monotypy.

• **Content.** Two species, *striatula* and *valeriae*, are recognized.

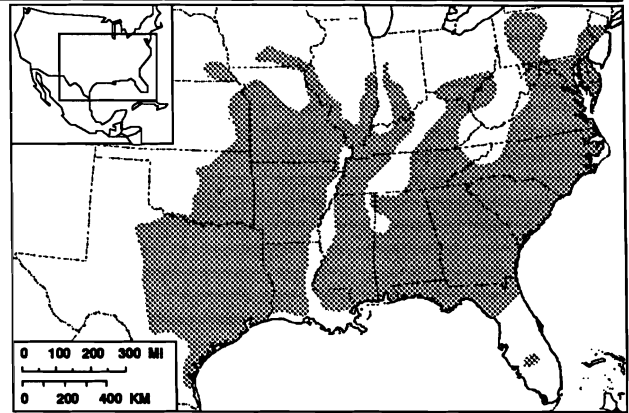
• **Definition.** *Virginia* are very small (maximum total length: 393 mm), slender thamnophiine snakes. The head is scarcely wider than the neck, becoming narrower in the snout region, which is subconical to conical and depressed in profile. The eyes are small, their diameter less than the distance between eye and nostril; the pupil is round. The head scales are somewhat reduced for colubrids, usually with 2 nasals, 1 (*striatula*) or 2 (*valeriae*) internasals, 1 loreal, no preoculars, 1 (*striatula*) or 2 (*valeriae*) postoculars (occasionally 3 in *valeriae*), 1+1 or 1+2 temporals; 5 (*striatula*) or 6 (*valeriae*) supralabials, the 3rd and 4th entering the orbit; 6 infralabials. Ventrals number 109-139 in females, 104-131 in males. Subcaudals are divided and number 20-44 in females, 28-51 in males. The cloacal scute is divided. Dorsal scales are imbricate, strongly keeled (*striatula*) or weakly keeled to smooth (*valeriae*), and slightly notched (*striatula*) or rounded (*valeriae*) posteriorly with no apical pits. The normal scale row formulae are 17-17-17 (*striatula* and *valeriae elegans*), 15-17-17 (*valeriae pulchra*), and 15-15-15 (*valeriae valeriae*). Tail length constitutes about 11-19 % of TL in adult females, 15.5-23.5 % in adult males.

The 16-24 maxillary teeth are moderately slender and slightly recurved, decreasing slightly in size posteriorly. The maxilla is rather high for a thamnophiine (height more than 10 % of length). The dorsal nasal laminae are longer than broad and are in narrow contact with the premaxilla. The combined frontal bones are only a little longer than they are broad. The parietal bone has a poorly defined shield that is broad posteriorly. The quadrate is greatly expanded dorsally, but the supratemporal is reduced (less than 30 % of skull length). The prefrontal is higher than long (*valeriae*) or longer than high (*striatula*), the latter due to an extremely well-developed anterolateral process. The interorbital foramen is large. The basioccipital process is very low and there is no ventral keel on the parasphenoid process.

The dorsum is brown, reddish brown, or gray, patternless (*striatula*) or occasionally with a faint, light vertebral stripe and scattered, small dark flecks (*valeriae*). An obscure light band across the back of the head often occurs in *striatula*. Ventral coloration is some shade of cream, yellow, white, gray, or pink. The top and sides of the head are similar to the dorsal ground color; the labials, chin, and throat are colored like the venter.

The everted hemipenis is single with the distal end distinctly bilobed (*striatula*) or slightly bilobed (*valeriae*). The sulcus spermaticus is simple and terminates apically in a nude area between the lobes. The remainder of the organ is spinose, the spines being larger proximally. Two enlarged hooks (2-3 times longer in *valeriae* than in *striatula*) lie at the base of the organ opposite the proximal portion of the sulcus. Small spines lie proximal to the hooks.

• **Descriptions.** Scutellation and color pattern in one or both species has been described by Baird and Girard (1853), Garman (1883), Wright and Bishop (1915), Blanchard (1923), Smith (1950), Edgren and Ward (1952), Richmond (1954), Smith and List (1955),



Map. The range of *Virginia*.

Wright and Wright (1957), Cooper (1958), Smith (1961), Pisani and Collins (1971), Minton (1972), Christiansen (1973), Mount (1975), Mitchell (1976), Blem and Blem (1985), and Ernst and Barbour (1989). Myers (1963) reported ontogenetic color variation in *valeriae*; Palmer and Braswell (1976) recorded an albino *striatula*. Vertebral morphology has been described by Holman (1962, 1963) and Brummer (1980), the hyoid apparatus by Langebartel (1968), the cranial musculature by Varkey (1979), the relative size and position of the visceral organs by Rossman et al. (1982), the relative dimensions of the maxilla and maxillary teeth by Rossman and Myer (1990), and the hemipenis by Clark (1964b). The karyotype has been described by Hardy (1971), scale structure and free margins by Jackson and Reno (1975), cutaneous touch corpuscles by Jackson (1977), and microdermatoglyphic scale patterns by Blaney (1977) and Price (1981, 1982). Curtis (1949) reported maximum length for *striatula*, Laposha and Powell (1982) for *valeriae*. Fitch (1981) described sexual dimorphism in size.

• **Illustrations.** Color photographs were provided by Barbour (1971), Behler and King (1979), Linzey (1979), Martof et al. (1980), Ashton and Ashton (1981), Linzey and Clifford (1981), Jackson (1983), Tennant (1984, 1985), Green and Pauley (1987), Johnson (1987), and Ernst and Barbour (1989). Color plates appeared in Conant (1958, 1975), Smith and Brodie (1982), and Dundee and Rossman (1989). Black-and-white photographs were presented by Haltom (1931), Ditmars (1936, 1939), Conant (1938, 1951), Schmidt and Davis (1941), McCauley (1945), Carr and Goin (1955), Parmalee (1955), Wright and Wright (1957), Cooper (1958), Smith (1961), Anderson (1965), Huheey and Stupka (1967), Cochran and Goin (1970), Minton (1972), Collins (1974, 1982), Mount (1975), and Ernst and Barbour (1989). Line drawings of the head appeared in Garman (1883), Cope (1900), Blanchard (1923, 1925), Haltom (1931), Pope (1937), Schmidt and Davis (1941), Collins (1982), Smith and Brodie (1982), and Tennant (1985). The hemipenis has been illustrated by Cope (1895, 1900), Clark (1964b), and Dowling and Duellman (1978); the latter authors also figured a maxilla and trunk vertebra.

• **Distribution.** The genus ranges from northern New Jersey and western Pennsylvania southward to northern Florida, thence westward to central Texas and northward to southeastern Iowa and the Ohio Valley. Apparently isolated populations exist in peninsular Florida and in Nebraska. It is absent from the broad alluvial plain of the Middle and Lower Mississippi Valley, and, apparently, from much of the Interior Low Plateaus in Kentucky and Tennessee.

• **Fossil Record.** Pleistocene (Rancholabrean) records from Texas (Holman, 1963) and Virginia (Guilday, 1962), and Pleistocene (Irvingtonian) records from Florida (Meylan, 1982) have been reported.

• **Pertinent Literature.** Dietary information has been reported by Surface (1906), Hurter (1911), Strecker (1927), Davenport (1943), Clark (1949), Smith (1950), Hamilton and Pollack (1956), Wright and Wright (1957), Clark (1964a), Minton (1972), Clark and Fleet (1976), Brown (1979), Ashton and Ashton (1981), Cervone (1983), and Tennant (1984, 1985). Reproductive data have been presented by Hay (1892), Ditmars (1907), Strecker (1908, 1927), Wright and Bishop (1915), Force (1930), McCauley (1945), Conant (1951), Sinclair (1951),

Swanson (1952), Guidry (1953), Richmond (1954), Martof (1955), Wright and Wright (1957), Carpenter (1958), Cooper (1958), Sabbath and Worthington (1959), Groves (1961), Smith (1961), Walker (1963), Bothner and Moore (1964), Clark (1964a), Anderson (1965), Fitch (1970), Pisani (1971), Minton (1972), Collins (1974), Clark and Fleet (1976), Mitchell (1976), Behler and King (1979), Cervone (1983), Tennant (1984, 1985), and Blem and Blem (1985). Ecological information appeared in Hurter (1911), Allen (1932), Carr (1940), Neill (1948), Grizzell (1949), Smith (1950), Cook (1954), Richmond (1954), Liner (1955), Fitch (1956), Wright and Wright (1957), Rossman (1960), White (1960), Smith (1961), Clark (1964a), Pisani and Collins (1971), Minton (1972), Clark and Fleet (1976), Behler and King (1979), Cervone (1983), Green and Pauley (1987), and Dundee and Rossman (1989). Stickel and Cope (1947) reported on home range movement. Various anti-predator behaviors were described by Keeler (1959), Kirk (1969), Minton (1972), Thomas and Hendricks (1976), Yeatman (1983), and Ernst and Barbour (1989). Gehlbach et al. (1971) tested scent-trailing abilities.

• Key to Species.

Five supralabials, 1 internasal, dorsal scales strongly keeled *striatula*
Six supralabials, 2 internasals, dorsal scales smooth or weakly keeled *valeriae*

• **Remarks.** Although Goode (1883) reported that, according to Baird's memory, the descriptions of both *Virginia* and *Haldea* were written by Girard alone, Article 50 of the 1985 version of the International Code of Zoological Nomenclature stated that such divided authorship of a joint work must be clear from the publication itself in order to affect attribution. Baird and Girard (1853) contains no such internal evidence. Zillig (1958) pointed out that although *Haldea* would have page priority over *Virginia*, the latter name can continue to be used because Garman (1883) was acting in the role of first reviser when he combined the two species in a single genus and chose the name *Virginia* for it. Varkey (1979) found that *Virginia* shares more cranial myology character states with *Storeria* than with any other thamnophiine genus. Rossman (1981) reported that *Virginia* shares a number of cranial osteology features with *Adelophis* and *Tropidoclonion*. Lawson (1985) noted that his molecular data indicated a sister-group relationship between *V. valeriae* and *Tropidoclonion lineatum* (rather than *V. striatula*), but that such a relationship is contraindicated by a cladistic analysis he performed on Varkey's myological data, which revealed a synapomorphy defining a clade composed of *V. striatula* and *T. lineatum* (but not *V. valeriae*). Lawson suggested that this taxonomic conundrum could be resolved either by resurrecting the genus *Haldea* (for *V. striatula*) or by expanding the genus *Virginia* to incorporate *T. lineatum*.

• **Etymology.** The genus *Virginia* is named for the state of Virginia. It is feminine in gender.

• **Comment.** We are indebted to George Pisani for providing us with his unpublished data on the genus *Virginia*, and to Hobart M. Smith for sage advice on points of nomenclature.

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