Catalogue of American Amphibians and Reptiles.

PLATT, DWIGHT R. 1983. *Heterodon.*

Heterodon Latreille
Hognose snakes

Heterodon Latreille (*in* Sonnini and Latreille), 1801:32. Type-species, *Heterodon platirhinos* Latreille, 1801 (=*Heterodon platyrhinos* Schlegel, 1837), by monotypy.

• CONTENT. Three living species, *H. nasicus*, *H. platyrhinos* and *H. simus*, and two fossil species, *H. brevis* and *H. plionasicus*, are recognized.

• DEFINITION. Hognose snakes are medium-sized stout-bodied snakes with short tails (adult total length, 360–850 mm; maximum, 1155 mm; tail length 12–18% of total length). Differences from typical colubrid head scutellation include: a prominent rostral scale with a projecting anterior transverse edge slightly or sharply upturned, a flat anteroventral face and a median dorsal longitudinal keel; one (0–2) azygous scale and 0–27 accessory azygous scales between the pair of internasals and sometimes between the prefrontal pair, the prefrontals and frontal and/or the rostral and internasals or anterior nasals; complete ring of oculars, supralabials excluded from orbit; temporals usually 3–4 + 4–5; and postgenials reduced and separated by small scales. The dorsal body scales are keeled and bifossate, usually in 23–25 rows at midbody and 19–21 rows anterior to the vent. Ventrals number 109–156 and paired subcaudals 25–57, with significant sexual dimorphism in both counts. Anal scale is divided. Dorsal color pattern is usually blotched with little ontogenetic change.

Maxillary dentition is diacranterian, with two enlarged ungrooved teeth posterior to a diastema; maxilla rotates to erect posterior teeth. The eye is moderately-sized with a round pupil. The hemipenis is bilobed with a bifurcate sulcus spermaticus; papillose calyces cover distal lobes and the basal part is spinous. A diverticulum of the small left lung extends to the throat. The adrenal gland is enlarged. The vertebrae are wider than long with flat neural arches; the posterior vertebrae lack hypapophyses.

Stereotyped defensive behavior includes expanding and flattening the neck and anterior body, hissing and mock strikes and/or hiding the head under body coils; these behaviors are often followed by letisimulation.

• DESCRIPTIONS. Generic descriptions are available in Boulenger (1894), Cope (1900), Brown (1901), Van Denburgh (1922) and Wright and Wright (1957). Cope (1900) and Platt (1969) described the hemipenis. Holman (1962) and Auffenberg (1963) described vertebrae. Kapus (1964), Weaver (1965), Taub (1967), Underwood (1967), Gibson (1972) and Kroll (1976) described cranial osteology, dentition, myology and/or head glands. Parsons (1970) described nasal anatomy and Underwood (1970) described the histology of the retina.

• ILLUSTRATIONS. Illustrations of three living species are in Wright and Wright (1957) and Conant (1975).

• DISTRIBUTION. Hognose snakes are found in eastern North America west to the Rocky Mountains (to 1830 m altitude in Colorado). They occur north into southern Canada in the western part of the range, to northern Minnesota, Wisconsin and Michigan and into the peninsula of southern Ontario in the central part and to extreme southern New Hampshire in New England. On the south the range extends to the Gulf coast and into northern and eastern Mexico to central Tamaulipas, northern San Luis Potosí and Zacatecas. Typical habitat is characterized by moderately open vegetative cover and sandy or loose soils. In parts of the geographic range, hognose snakes are rare or absent except in the most favorable habitat (Platt, 1969; Conant, 1975).

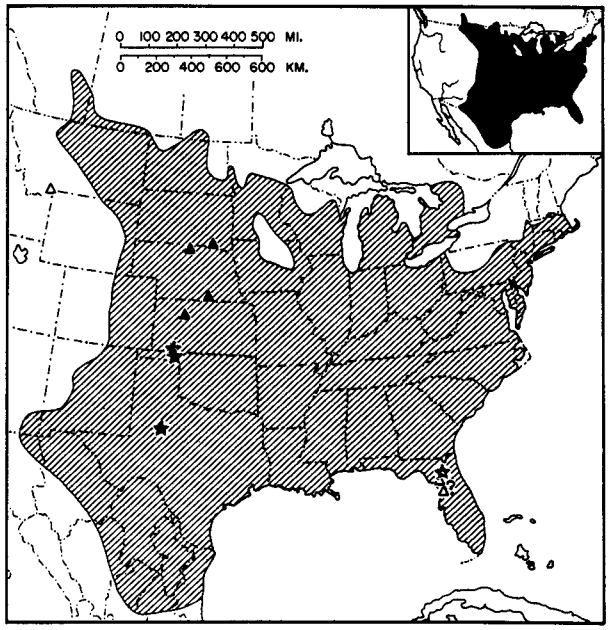
• FOSSIL RECORD. *Heterodon brevis* was described from the Middle Pliocene of Florida (Auffenberg, 1963). *Heterodon plionasicus* has been reported from the Pliocene of Kansas, Oklahoma and Texas (Peters, 1953; Brattstrom, 1967; Rogers, 1976). Fossils of *Heterodon* sp. have been reported from the Pleistocene of Arkansas, Kansas and Texas (Dowling, 1958; Holman, 1962, 1972). See the species accounts for the fossil records of living species of *Heterodon*. All fossil sites are within the present geographic range of the genus.

Two fossil genera, *Paleoheterodon* and *Dryinoides*, from the Miocene-Pliocene are probably related to *Heterodon* (Meylan, 1982).

• PERTINENT LITERATURE. Edgren (1952, 1955) revised the taxonomy of the genus *Heterodon* and reviewed the literature on its natural history. Platt (1969) reviewed the morphology, distribution and natural history of *H. platyrhinos* and *H. nasicus*. Recent papers not included in these reviews are: Kroll (1976) on the feeding mechanism; Spaur and Smith (1971) on adrenal size; Grogan (1974), Kroll (1976) and McKinstry (1978) on the toxicity of salivary secretions; and McDonald (1974), Sexton (1979), Durham (1980) and Nichols (1982) on behavior. Weaver (1965), Brattstrom (1967), Platt (1969) and Meylan (1982) discussed the evolutionary relations of the species in the genus.

• REMARKS. Weaver (1965) suggested on the basis of myological and osteological evidence that *Heterodon* may have evolved from a "xenodontine proto-viper" that also gave rise to *Xenodon* and to the solenoglyphs. Underwood (1967), George and Dessauer (1970), Baker et al. (1972), Minton and Salanitro (1972), Kroll (1976) and Minton (1978) presented serological, karyological, osteological and/or myological evidence that supports the distinctness of *Heterodon* from most other colubrids and/or a relationship to the solenoglyphs. Edmund (1969) included a schematic diagram of the development of viperid dentition from that in *Heterodon* and other opisthodonts. Underwood (1967) and Gasc (1981) questioned some of the myological evidence with which Weaver supported a viperid relationship.

Smith (1964) proposed use of the subfamily name Heterodontinae for "*Heterodon, Xenodon, Lystrophis* and perhaps a few other genera of colubrid snakes" but later withdrew his proposal in favor of the name Xenodontinae, a name that had been used by Cope (1893) for a much larger group of genera (Rossman and Wilson, 1965). Underwood (1967) endorsed Smith's restricted subfamily Xenodontinae and placed it in the family Dipsadidae. However Dowling and Duellman (1978) and Jenner (1982) placed *Heterodon* in a larger subfamily Xenodontinae (approximately 90 genera) of the family Colubridae and included *Heterodon* in a tribe Alsophiini separate from the tribe in which they placed *Xenodon* and *Lystrophis*.



MAP. Shaded area indicates composite range of three living species. Solid stars mark Pliocene sites for *H. plionasicus*; open star marks Pliocene site for *H. brevis*. Solid triangles mark Miocene and Pliocene sites for *Paleoheterodon tiheni*; open triangles mark Miocene and Pleistocene sites for *Dryinoides* (fossils from site with question mark are only tentatively assigned to this genus).

• KEY TO THE LIVING SPECIES.

1. Single (0–2) azygous plate, prefrontals in contact; rostral only slightly upturned; usually 25 scale rows at midbody ---------- *H. platyrhinos* (282)
   Accessory scales around the azygous (3–28 scales in the azygous mass) usually separating the two prefrontals; rostral sharply upturned; usually 23–25 scale rows at midbody ---------- 2
2. Ventral surface black with yellow patches, more uniformly dark under the tail; usually 23 scale rows at midbody; rostral as broad as space between eyes ---------- *H. nasicus*
   Ventral surface pale, clouded or punctate, similar under tail; usually 25 scale rows at midbody; rostral narrower than space between eyes ---------- *H. simus*

• ETYMOLOGY. *Heterodon* is derived from the Greek words "*heteros*" (meaning different or other) and "*odous*" (meaning a tooth), probably a reference to the enlarged posterior maxillary teeth. The gender is masculine.

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