

**GYALOPION, G. CANUM,
G. QUADRANGULARIS**

REPTILIA: SQUAMATA: SERPENTES: COLUBRIDAE:

Catalogue of American Amphibians and Reptiles.

HARDY, LAURENCE M. 1976. *Gyalopion, G. canum, G. quadrangularis*.

***Gyalopion* Cope
Hook-nosed snakes**

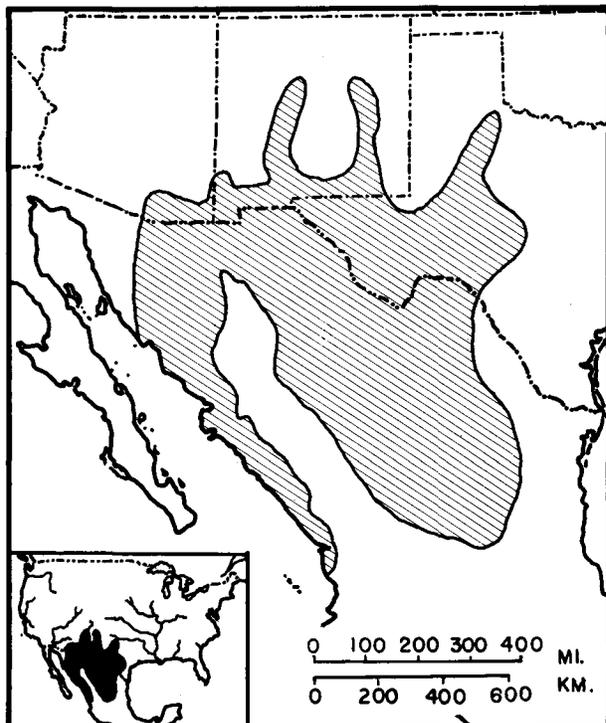
Gyalopion Cope, 1861:243. Type-species, *Gyalopion canum* Cope, 1861, by monotypy.

• CONTENT. Two species are currently recognized: *G. canum* and *G. quadrangularis*.

• DEFINITION. A blotched colubrid genus having rostral separated from frontal, but contacting prefrontals, turned up and sharp edged above; internasals present; single apical pits on smooth dorsal scales arranged in 17 rows; anal plate variable; nasal separated from preocular and fused to first supralabial; origin of musculus retractor penis magnus near terminus of tail (origin of retractor muscle divided by number of subcaudals, 0.81–1.00); width of nasal bone less than three times its length and with posterior edge directed anteriorly from the midline; 10–15 maxillary teeth with posteriormost teeth usually grooved; 12–17 dentary teeth; 7–9 palatine teeth. Both species are oviparous.

Hemipenis single and slightly bulbous; base naked or with tiny spines becoming smaller and more numerous distally, and grading into spinulate calyces on distal one-half of organ; 2 or 3 enlarged basal spines (at least one on each side of sulcus and sometimes each enlarged spine in a group of several smaller spines); apex nude or faintly calyculate; sulcus spermaticus simple, terminating at apex; enlarged spines, decreasing in size distally, bordering smooth edge of sulcus. Hemipenis length *in situ*, in numbers of subcaudals (mean, standard error of mean, range, N): Males of *quadrangularis*, 9.1 ± 0.05 (6–12) 30; males of *canum*, 11.2 ± 0.11 (7–13) 17. Length of retractor muscle, in numbers of subcaudals, in males of *quadrangularis*, 25.0 ± 0.19 (21–29) 43; males of *canum*, 30.7 ± 0.64 (25–34) 18.

Females of *G. quadrangularis* do not possess hemipenes or the associated muscles, whereas females of *G. canum* have small hemipenes and the associated muscles.



MAP 1. Distribution of the genus *Gyalopion*.

Hypapophyses present on anterior 24 vertebrae; premaxillary bone broadly rounded anteriorly with broad truncate lateral flanges, posterior median process sharp pointed; posterior margin of supraoccipital rounded with slightly pointed apex; anterolateral, lateral, and posterior flanges of premaxilla pointed; median process of palatine truncate (*G. canum*) or sharp pointed (*G. quadrangularis*).

• DESCRIPTIONS AND ILLUSTRATIONS. See species accounts.

• DISTRIBUTION. The genus ranges from southern Nayarit, northward through the lowlands of Sinaloa and Sonora, into southeastern Arizona, central New Mexico (as far north as Albuquerque), western Texas, then southward on the Mexican plateau in Chihuahua, Coahuila, Nuevo Leon, San Luis Potosí, Zacatecas, and Durango.

• FOSSIL RECORD. None.

• PERTINENT LITERATURE. Generic monographs and literature summaries are by Smith and Taylor (1941) and Hardy (1975a). See species accounts for other important references.

• KEY TO SPECIES.

Anal plate entire; six supralabials; six infralabials; generally black dorsal blotches on a red to reddish-brown background *G. quadrangularis*.
Anal plate divided; seven supralabials; seven infralabials; generally dark brown dorsal blotches on a paler brown to tan background *G. canum*.

• REMARKS. Leviton and Banta (1961) described the species *Gyalopion atavus* from three specimens collected in Zacatecas. These specimens belong to *Conopsis nasus* (Hardy, 1975a) and, therefore, the name *G. atavus* Leviton and Banta is a junior subjective synonym of *Conopsis nasus* Günther.

• ETYMOLOGY. The name *Gyalopion* is derived from the Greek, *gylon*, meaning a hollow or a hollow vessel; the gender is neuter. This is possibly in reference to the up-turned rostral with its distinct concave dorsal surface, to which Cope referred in the original description.

COMMENT

The species herein included in the genus *Gyalopion* have frequently been placed in the genus *Ficimia* (e.g., Fouquette and Rossman, 1963; Taylor, 1936; Minton, 1959). There has been much confusion concerning the validity and content of the genera *Gyalopion* and *Ficimia*. In their revisions of both genera, Smith and Taylor (1941) separated *Gyalopion* from *Ficimia*; *Gyalopion* was considered to be more primitive because it has internasals (absent in *Ficimia*), a loreal (absent), and separation of the rostral from the frontal (in contact in *Ficimia*). Apparently the highly modified rostral and the strikingly similar general appearance of all of the species of *Gyalopion* and *Ficimia* caused many workers to frequently refer *canum* and *quadrangularis* to *Ficimia*, always without explanation. The loreal is no longer considered to be a valid generic characteristic (Hardy and McDiarmid, 1969) although other characteristics are presented in Hardy (1975a, b, c) that confirm the separation of the genera.

***Gyalopion canum* Cope
Western Hook-nosed snake**

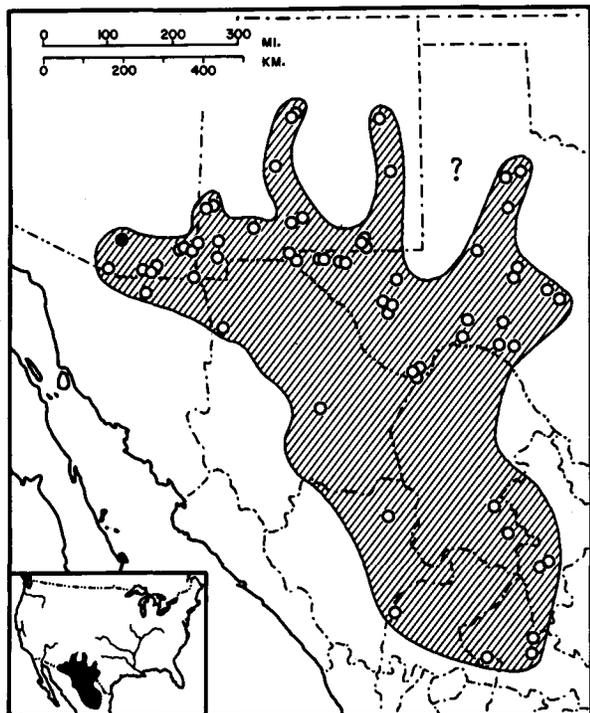
Gyalopion canum Cope, 1861:241, 243 (footnote). Type-locality, "near Ft. Buchanan, Arizona" [about 4 miles south of Tucson, Pima County]. Holotype, U. S. Natl. Mus. 5284 (formerly USNM 4675), male, collected by B. J. D. Irwin; date of collection unknown (examined by author).

Ficimia cana: Garman, 1883:82.

Gyalopion canus: Leviton and Banta, 1961:2.

• CONTENT. The species is monotypic.

• DEFINITION AND DIAGNOSIS. Smooth dorsal scales in 17 rows (without reduction) with single apical pits and no anal ridges; internasals present and not in mutual contact medially; nasal entire above and divided below naris, fused to first supralabial, the posterior section not in contact with single



MAP 2. Distribution of *Gyalopion canum*; solid symbol marks type-locality, open symbols indicate other localities.

preocular; two postoculars; temporals usually 1 + 2, but variable; seven supralabials, with 3rd and 4th entering orbit and 2nd and 3rd contacting prefrontal; seven infralabials, with first three in contact with anterior chin shields; mental not contacting anterior chin shields; rostral turned up in front, sharp edged, and contacting prefrontals; loreal present or absent; anal divided. Approximate means (and ranges) of selected characteristics are: ventrals of 24 females, 134.5 (122–140), of 46 males, 130.5 (128–138); subcaudals of 22 females, 30.3 (25–36), of 46 males, 32.9 (26–37); tail length/total length ($\times 100$) of 17 females, 14.4 (12.0–17.9), of 45 males, 15.4 (13.2–17.3); numbers of body blotches of 24 females, 37.9 (29–52); of 45 males, 36.7 (25–48); caudal blotches of 23 females, 9.8 (8–12), of 44 males, 11.4 (8–15); snout-vent length of 46 males, 215 mm (116–292), of 19 females 227 (151–315); tail length of 45 males, 40 (19–58), of 18 females, 38 (23–50).

Ground color usually pale brown with darker brown dorsal blotches; brown bar crossing snout between eyes, equally placed on prefrontals and frontal, and usually including posterior tip of rostral; another brown bar (sometimes broken medially) originating just posterior to supralabials and extending forward, including anterior one-half of parietals and posterior tip of frontal; brown subocular spot usually present; nape spot larger, but similar in color to other dorsal spots; dorsal blotches with distinct, but very irregular edges; anterior edges of dorsal blotches consisting of small angles and undulations tending to correspond to edges of individual scales; posterior edges of dorsal blotches usually with larger undulations shaped like inverted *U*'s, sometimes paired on each blotch; dorsal blotches decreasing in length from 4–10 scales anteriorly to 1½–3 scales posteriorly, becoming narrower ventrally, extending to scale rows one or two, sometimes reaching ventrals; sometimes a break in a dorsal blotch at scale row four or five results in a series of lateral blotches; a series of small spots on tips of ventrals or on scale rows one and two alternating with dorsal blotches; dorsal ground color pale brown including small brown flecks more concentrated laterally than middorsally; venter immaculate white or cream-white; all blotches with dark brown or black edges and with pale brown centers composed of brown flecks.

Hemipenis single with simple sulcus spermaticus. Maxillary teeth increasing gradually in size from anterior to posterior, with faint lateral grooves on posterior teeth.

Gyalopion canum differs from *G. quadrangularis* by having a divided anal plate (entire in *G. quadrangularis*), pale-

centered and dark-edged dorsal blotches (never pale-centered in *G. quadrangularis*), and fewer gulars (15–35, \bar{x} = 25; 30–52, \bar{x} = 42 in *G. canum*).

• DESCRIPTIONS. Size, scutellation, dentition, osteology, coloration, and hemipenis are described in a generic revision by Hardy (1975a). In addition to the original description (Cope, 1861) a supplementary description, possibly, but not definitely, from the holotype, was published by Garman (1883). A possible second specimen was described by Günther (1893) and Boulenger (1894) gave the first data that was definitely not based on the holotype. Ruthven (1907) reported the third specimen known to him and extended the distribution into New Mexico. Van Denburgh (1922) summarized the morphology, pattern, and distribution based on five specimens available to him.

Certain aspects of behavior have been described by Taylor (1931), Kauffeld (1948), Woodin (1953), Duellman (1955), Tanner and Robison (1960), Chrapliwy and Ward (1963) and Student (1964). Habitat is described in Taylor (1931), Kauffeld (1948), Woodin (1953), Duellman (1955), Minton (1959), Tanner and Robison (1960), Webb (1960), Chrapliwy and Ward (1963), Ferguson (1965), and Hardy (1975a).

Feeding habits are described in Kauffeld (1948), Webb (1960), Licht and Gelbach (1961), and Chrapliwy and Ward (1963).

• ILLUSTRATIONS. Whole body and sectional closeup photographs of the holotype and of a live specimen (photo by Isabelle Hunt Conant) are in Hardy (1975a). Other photographs of specimens are in Duellman (1955), and Smith and Taylor (1941).

• DISTRIBUTION. *Gyalopion canum* occurs in northern Sonora and southeastern Arizona, New Mexico (north to Sandoval County in the Rio Grande valley), western Texas, Chihuahua, southward to Coahuila, Nuevo Leon, San Luis Potosí, Durango, and Zacatecas.

• FOSSIL RECORD. None.

• PERTINENT LITERATURE. Since the original description only a few accounts of individual specimens appeared before the first generic revision (Smith and Taylor, 1941). Reports of individual specimens have continued to dominate the literature with about two-thirds of the literature appearing after 1960. Hardy (1975a) presented a generic revision and compared the genus to other similar genera (1975c).

• ETYMOLOGY. The specific epithet *canum* is Latin for hoary, gray, or whitish-gray color; probably in reference to the general coloration of some individuals (especially preserved) of this species.

Gyalopion quadrangularis (Günther) Desert Hook-nosed snake

Ficimia quadrangularis Günther, 1893:99, pl. 35, fig. A. Type-locality, "Presidio, near Mazatlan, Sinaloa." Holotype, British Museum (Natural History) 83.4.5.36/1946.1.1.75, female, collected by H. R. Forrer; date of collection unknown (not examined by author).

Ficimia desertorum Taylor, 1936:51. Type-locality, "about 12 kilometers northwest of Guaymas, Sonora." Holotype, Univ. Illinois Mus. Nat. Hist. 25065, male, collected by Edward H. Taylor, 6 July 1934 (examined by author).

Gyalopion quadrangularis: Smith and Taylor, 1941:359.

Gyalopion desertorum: Smith and Taylor, 1941:359.

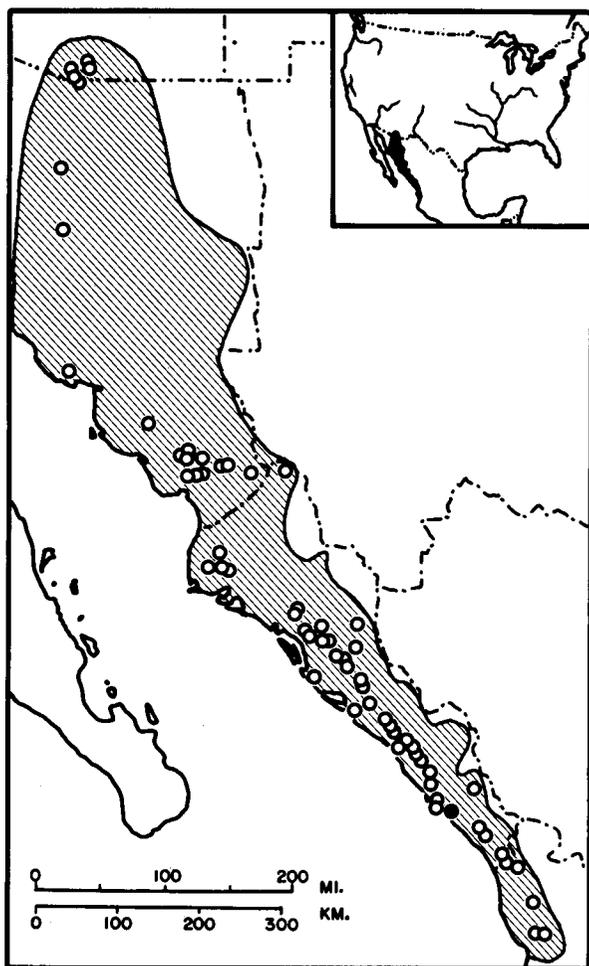
Gyalopion quadrangularis quadrangularis: Dixon and Fugler, 1959:164.

Gyalopion quadrangularis desertorum: Dixon and Fugler, 1959:164.

Ficimia quadrangularis desertorum: Woodin, 1962:52.

• CONTENT. The species is monotypic.

• DEFINITION. Smooth dorsal scales in 18-18-17-17-17 rows with single apical pits and no anal ridges; internasals present and not in mutual median contact; nasal entire above and divided below naris, fused with first supralabial and separated from single preocular; two postoculars; 1 + 2 temporals; 6 supralabials, with 3rd and 4th entering orbit and 2nd and 3rd contacting prefrontal; 6 infralabials, with first three in contact with anterior chin shields; rostral turned up in front, sharp



MAP 3. Distribution of *Gyalopion quadrangularis*; solid symbol marks type-locality, open symbols indicate other localities.

edged, contacting prefrontals and separated from frontal; loreal present or absent; anal entire. Means (and ranges) of selected characteristics are: ventrals of 25 females, 130.4 (122–140), of 76 males, 123.9 (116–132); subcaudals of 24 females, 24.3 (20–28), of 75 males, 27.0 (22–32); tail length/total length ($\times 100$) of 23 females, 12.2 (10.0–13.7), of 72 males, 13.9 (11.7–16.0); numbers of body blotches of 25 females, 28.8 (21–40), of 76 males, 25.7 (16–41); caudal blotches of 26 females, 5.7 (4–9), of 77 males, 5.9 (3–10), snout-vent length of 76 males, 212 mm (87–304), of 25 females, 202 (127–280); tail length of 73 males, 34 (14–50), of 23 females, 28 (21–42).

Two types of color patterns exist in a geographic cline. One pattern consists of black dorsal blotches on a ground color of red or red-orange scales with or without black tips. Lateral black interblotches may be present or absent (Hardy, 1975a, fig. 1). The other pattern is similar except that the dorsal blotches extend laterally as black-edged, pale-centered scales to or near the ventrals (Hardy, 1975a, fig. 2). This gives the appearance of black transverse bands that are wider and complete dorsally, broken laterally, and narrower ventrally. The first two dorsal blotches of both pattern types are larger and extend farther ventrally than other blotches; the anterior-most blotch (band) is usually connected with a dorsal head blotch that is shaped somewhat like a truncated triangle with the apex posterior and the corners of the base extending over both eyes (Hardy, 1975a, figs. 1A, C, D, and 2A, C, F). The snout color is that of the ground color or slightly darker. The venter is immaculate white. The dorsal spots (when present) vary in shape from circular to rectangular and in size from 1 to 6 scales in length, giving a very pale to almost black appearance.

The hemipenis is single and slightly bulbous with 2 or 3 enlarged basal spines and a gradual transition from a naked

base through a spinose region, spinulate calyces, non-spinulate calyces, and a nude apex. The sulcus spermaticus is simple. Maxillary teeth gradually increase in size from anterior to posterior and are grooved posteriorly. Grooves are sometimes present on all maxillary teeth.

For diagnostic characteristics see the species account for *G. canum*.

• **DESCRIPTIONS.** Following the original description the next description was of a new species, *Ficimia desertorum*, by Taylor (1936). Smith and Taylor (1941) placed both *F. desertorum* and *F. quadrangularis* in the genus *Gyalopion*. Only the holotypes of these two species were known until Bogert and Oliver (1945) reported 6 specimens of *F. desertorum* from southern Sonora and northern Sinaloa, and Duellman (1957) reported two specimens of *G. quadrangularis* from Sinaloa. Descriptions of individual specimens are in Zweifel and Norris (1955), Duellman (1957), Campbell and Simmons (1962), and Fouquette and Rossman (1963). The first attempts at describing geographic variation were by Bogert and Oliver (1945), Dixon and Fugler (1959), who proposed two subspecies, Fugler and Dixon (1961), Campbell and Simmons (1962), and Greer (1965). Hardy and McDiarmid (1969) proposed that the species is monotypic. Thorough descriptions of scutellation and brief descriptions of dentition, osteology, coloration, and hemipenis are in Hardy (1975a).

Descriptions of habitat are in Zweifel and Norris (1955), Hardy and McDiarmid (1969), and Hardy (1975a). Bogert and Oliver (1945) recorded spiders in the diet. No other observations on the behavior have been published. "Cloacal pops," such as produced by *G. canum*, have never been recorded for this species.

• **ILLUSTRATIONS.** Besides the drawing with the original description there are drawings of the head in Smith and Taylor (1941) and photographs (whole body and sectional close-up) in Hardy (1975a).

• **DISTRIBUTION.** *Gyalopion quadrangularis* occurs in the lower Sonoran desert of southern Arizona and Sonora, the tropical thorn woodland, tropical semiarid forest, tropical dry forest, and subtropical dry forest of Sinaloa, and the tropical dry forest of Nayarit; usually found below 1200 m elevation.

• **FOSSIL RECORD.** None.

• **PERTINENT LITERATURE.** The history of the name *desertorum* can be traced, from its original description, in Taylor (1936), Dixon and Fugler (1959), Fugler and Dixon (1961), Campbell and Simmons (1962), Greer (1965), and Hardy and McDiarmid (1969). Systematic revisions are in Smith and Taylor (1941) and Hardy (1975a).

• **ETYMOLOGY.** The epithet *quadrangularis* is derived from Latin (*quadr*, four; *angul*, an angle, corner) in allusion to the shape of the dark dorsal blotches.

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