

## Catalogue of American Amphibians and Reptiles.

DUELLMAN, WILLIAM E. 1968. *Smilisca*.*Smilisca* Cope  
Smiliscas*Smilisca* Cope, 1865: 194. Type-species *Smilisca daulinia* Cope, 1865 [= *Hyla baudinii* Duméril and Bibron, 1841] by monotypy.

- CONTENT. Six species are recognized: *S. baudinii*, *S. cyanosticta*, *S. phaeota*, *S. puma*, *S. sila*, and *S. sordida*.

• DEFINITION. The frogs in this genus are medium to large sized (45 to 90 mm snout-vent) and have broad, well-ossified skulls consisting of a minimum amount of cartilage and/or secondarily ossified cartilage. There is no dermal co-ossification. The sphenethmoid is large, and the quadratojugals and an internal septum are present. The *M. depressor mandibulae* consists of two parts; one arises from the dorsal fascia and the other from the posterior arm of the squamosal. The mandibular branch of the trigeminal nerve passes between two branches of the *M. adductor mandibulae*. The males have paired subgular vocal sacs. The pupil is horizontally elliptical. Dermal appendages are lacking. Tadpoles have 2/3 tooth rows, one or two rows of labial papillae, and generalized body form or moderately pisciform. The haploid chromosome number is 12 (2N = 24).

Frogs of the genus *Smilisca* can be distinguished from most members of the genus *Hyla* by the presence of paired subgular vocal sacs that expand ventrolaterally when inflated. Barely distensible paired subgular sacs are present in *Hyla pseudopuma*, and vocal sacs like those in *Smilisca* are present in *Pternohyla* and *Tripurion petasatus*. Members of those genera have the skin of the head co-ossified with the underlying cranial elements. Frogs of the genus *Phrynohyas* have paired lateral vocal sacs behind the angles of the jaws and thick, glandular skin.

• DESCRIPTIONS. The most important descriptions at the generic level are given by Taylor (1952), Starrett (1960), and Duellman and Trueb (1966).

• ILLUSTRATIONS. Adults, tadpoles, hands, feet, skulls, and breeding calls of all species are illustrated by Duellman and Trueb (1966).

• DISTRIBUTION. The genus ranges throughout most of the lowlands of México and Central America, in some places to elevations of nearly 2000 meters. *Smilisca* is found southward from southern Sonora and the Río Grande Embayment of Texas to northern South America, where the genus is known from the Caribbean coastal regions and the valleys of the Río Cauca and Río Magdalena in Colombia and from the Pacific slopes of Colombia and northern Ecuador.

• FOSSIL RECORD. None.

• PERTINENT LITERATURE. Important references are cited in this and the accounts of the species. Duellman and Trueb (1966) monographed the genus and summarized the previous literature.

• KEY TO SPECIES (adults only; Catalogue page numbers given in parentheses after specific names).

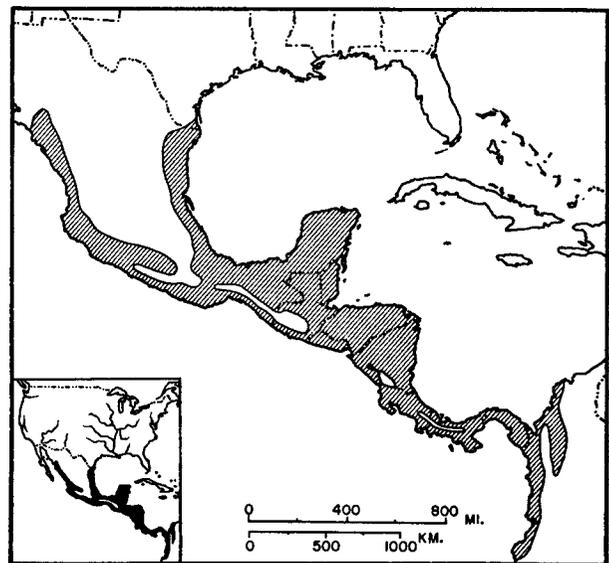
1. Large frogs (males to 76 mm, females to 90 mm) having broad flat heads and a dark brown or black postorbital mark encompassing tympanum ..... 2  
— Small frogs (males to 45 mm, females to 64 mm) having narrow heads and lacking a dark brown or black postorbital mark encompassing tympanum ..... 4
2. Lips barred; flanks cream with bold brown or black mottling in groin; posterior surfaces of thighs brown with cream flecks ..... *S. baudinii* (59)  
— Lips not barred; narrow white labial stripe present; flanks not cream with bold brown or black mottling in groin; posterior surfaces of thighs variable ..... 3
3. Flanks and anterior and posterior surfaces of thighs dark brown with large pale blue spots on flanks and small blue spots on thighs ..... *S. cyanosticta* (60)  
— Flanks cream with fine black venation; posterior surfaces of thighs pale brown with or without darker

- flecks or small cream spots ..... *S. phaeota* (61)
4. Fingers with only vestige of web; diameter of tympanum two-thirds that of eye; dorsum pale tan with pair of broad brown stripes ..... *S. puma* (62)  
— Fingers about one-half webbed; diameter of tympanum about one-half that of eye; dorsum variously marked with spots or blotches ..... 5
  5. Snout short, truncate; vocal sacs in breeding males dark gray or brown; blue spots on flanks and posterior surfaces of thighs ..... *S. sila* (63)  
— Snout long, sloping, rounded; vocal sacs in breeding males white; cream, pale tan, or blue flecks on flanks and posterior surfaces of thighs ..... *S. sordida* (64)

## • KEY TO TADPOLES.

1. Pond tadpoles; tail about half again as long as body; mouth anteroventral ..... 2  
— Stream tadpoles; tail about twice as long as body; mouth ventral ..... 5
2. Labial papillae in two rows ..... 3  
— Labial papillae in one row ..... 4
3. First upper tooth row strongly arched medially; third lower tooth row much shorter than other rows; dorsal fin deepest at about two-thirds length of tail; tail cream with gray reticulations ..... *S. puma* (62)  
— First upper tooth row not arched medially; third lower tooth row nearly as long as others; dorsal fin deepest at about one-third length of tail; tail tan with brown flecks and blotches ..... *S. baudinii* (59)
4. Dorsal fin extending onto body ..... *S. phaeota* (61)  
— Dorsal fin not extending onto body ..... *S. cyanosticta* (60)
5. Mouth completely bordered by two rows of papillae; inner margin of upper beak not forming continuous arch with lateral processes; red or reddish brown markings on tail ..... *S. sordida* (64)  
— Median part of upper lip bare; rest of mouth bordered by one row of papillae; inner margin of upper beak forming continuous arch with lateral processes; dark brown markings on tail ..... *S. sila* (63)

• REMARKS. Although Cope (1865) proposed the generic name *Smilisca* for *Hyla baudinii* Duméril and Bibron, the combination *Smilisca baudinii* was seldom used, until Smith and Taylor (1948) formally resurrected the generic name, which they still applied only to *baudinii*. Starrett (1960) redefined *Smilisca* to include *Hyla baudinii* Duméril and Bibron, *Hyla gabbii* Cope, *Hyla wellmanorum* Taylor, and *Hyla phaeota* Cope (and by implication *Hyla phaeota cyanosticta*). Duellman and Trueb (1966) monographed the genus and changed the composition somewhat by describing one new species (*S. sila*) and raising *cyanosticta* to a specific



MAP. The composite ranges of the six species of *Smilisca* are shaded.

level. Furthermore, they showed that *Hyla gabbii* is a synonym of *S. sordida* (Peters) and *Hyla wellmanorum* is a synonym of *S. puma* (Cope).

The vernacular group name *smilisca* is proposed so that this genus has a name different from the genus *Hyla*, the members of which are usually called treefrogs.

• **ETYMOLOGY.** The generic name *Smilisca* is derived from the Greek *smile*, meaning knife, and the Greek *iskos*, a diminutive suffix, and means literally "little knife" in reference to the sharp pointed frontoparietal processes of *S. baudinii* used as a diagnostic character of the genus by Cope.

#### COMMENT

The definition of genera in the Hylidae is difficult due to an inadequate knowledge of internal characters of the vast assemblage of species. Few genera can be defined on the basis of one character. Pyburn (1966) argued that *Smilisca* could not be separated from *Hyla* on the basis of differences in the jaw musculature, postorbital processes, or shape of the squamosal. His conclusions were based on the examination of two species of *Smilisca* and one of *Hyla*. Furthermore, he was under the erroneous impression that a considerable amount of variation was present in the frog that he called *Hyla phaeota cyanosticta*. Pyburn was unaware that *cyanosticta* and *phaeota* are distinct species, as demonstrated by Duellman and Trueb (1966). The condition of the jaw musculature used by Starrett (1960) to define *Smilisca* is constant within the genus, but the same condition occurs in some species of *Hyla* and in *Pternohyla*. Distinct bony postorbital processes are present on the frontoparietals in only *baudinii* and *phaeota*.

The genus *Smilisca* can be defined on a combination of characters (see foregoing definition); six closely related species comprise the genus. If these species were placed in *Hyla* their relationships to one another and to other hylids would be obscured.

Blair (1959) summarized the mating calls of the species of *Hyla* in the United States. He included *baudinii* in *Hyla* and placed *baudinii* in the *versicolor* group (including *arenicolor*, *baudinii*, *femorialis*, *phaeocrypta* [= *avivoca*], and *versicolor*). The inclusion of *baudinii* in the *versicolor* group was based on the structural resemblances of the calls of *femorialis*, *arenicolor*, and *baudinii* and the artificially produced viable hybrids between *baudinii* and *versicolor*. Similarity in call structure in otherwise morphologically divergent and widely allopatric species is a weak index to relationships. Blair (1960) used the same criteria to include *Hyla staufferi*

(a member of the predominantly South American *Hyla rubra* group) in the *Hyla eximia* group of western North America.

Artificially produced hybrids of *baudinii* and *versicolor* were reported by Pyburn and Kennedy (1960). This kind of evidence is used by some workers as an indication of relationships, but this is meaningful only when analyzed quantitatively in comparison with many crosses utilizing many species. Blair's suggestions concerning the relationships of *baudinii* are based on one trait and the evidence of one inconclusive experiment. Duellman and Trueb (1966) based their phylogenetic conclusions on internal and external morphology, tadpoles, eggs, mating calls, and behavior.

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