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INTRODUCTION

The family Hylidae, as currently recognized, is composed of about 34 genera and more than 400 species. Most genera (30) and about 350 species live in the American tropics. *Hyla* and 10 other genera inhabit Central America; four of those 10 genera (*Gastrotheca, Hemiphractus, Phrynohyas,* and *Phyllomedusa*) are widely distributed in South America. The other six genera are either restricted to Central America or have their greatest differentiation there. *Plectrohyla* and *Ptychohyla* inhabit streams in the highlands of southern Mexico and northern Central America; *Diaglena* and *Triprion* are casque-headed inhabitants of arid regions in México and northern Central America. *Anotheca* is a tree-hole breeder in cloud forests in Middle America. The genus *Smilisca* is the most widespread geographically and diverse ecologically of the Central American genera.

The definition of genera in the family Hylidae is difficult owing to the vast array of species, most of which are poorly known as regards their osteology, colors in life, and modes of life history. The genera *Diaglena, Triprion, Tetraprion, Osteocephalus, Trachycephalus, Aparasphenodon, Corythomantis, Hemiphractus, Pternohyla,* and *Anotheca* have been recognized as distinct from one another and from the genus *Hyla* on the basis of various modifications of dermal bones of the cranium. *Phyllomedusa* is recognized on the basis of a vertical pupil and opposable thumb; *Plectrohyla* is characterized by the presence of a bony prepollex and the absence of a quadratojugal. *Gastrotheca* is distinguished from other hylids by the presence of a pouch in the back of females. A pair of lateral vocal sacs behind the angles of the jaws and the well-developed dermal glands were used by Duellman (1956) to distinguish *Phrynohyas* from *Hyla.* He (1963a) cited the ventrolateral glands in breeding males as diagnostic of *Ptychohyla.* Some species groups within the vaguely defined genus *Hyla* have equally distinctive characters. The *Hyla septentrionalis* group is characterized by a casque-head, not much different from that in the genus *Osteocephalus* (Trueb, MS). Males in the *Hyla maxima* group have a protruding bony prepollex like that characteristically found in *Plectrohyla.*

Ontogenetic development, osteology, breeding call, behavior, and ecology are important in the recognition of species. By utilizing

the combination of many morphological and biological factors, the genus *Smilisca* can be defined reasonably well as a natural, phyletic assemblage of species. Because the wealth of data pertaining to the morphology and biology of *Smilisca* is lacking for most other tree frogs in Middle America it is not possible at present to compare *Smilisca* with related groups in more than a general way.

Smilisca is an excellent example of an Autochthonous Middle American genus. As defined by Stuart (1950) the Autochthonous Middle American fauna originated from "hanging relicts" left in Central America by the ancestral fauna that moved into South America and differentiated there at a time when South America was isolated from North and Middle America. The genus *Smilisca*, as we define it, consists of six species, all of which occur in Central America. One species ranges northward to southern Texas, and one extends southward on the Pacific lowlands of South America to Ecuador. We consider the genus *Smilisca* to be composed of rather generalized hylids. Consequently, an understanding of the systematics and zoogeography of the genus can be expected to be of aid in studying more specialized members of the family.

Acknowledgments

Examination of many of the specimens used in our study was possible only because of the cooperation of the curators of many systematic collections. For lending specimens or providing working space in their respective institutions we are grateful to Doris M. Cochran, Alice G. C. Grandison, Jean Guibe, Robert F. Inger, Günther Peters, Gerald Raun, William J. Riemer, Jay M. Savage, Hobart M. Smith, Wilmer W. Tanner, Charles F. Walker, Ernest E. Williams, and Richard G. Zweifel.

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We especially thank Charles J. Cole for contributing the information on the chromosomes, and Robert R. Patterson for preparing osteological specimens. We thank M. J. Fouquette, Jr., who read the section on breeding calls and offered constructive criticism.

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Materials and Methods

In our study we examined 4151 preserved frogs, 93 skeletal preparations, 88 lots of tadpoles and young, and six lots of eggs. We have collected specimens in the field of all of the species. Observations on behavior and life history were begun by the senior author in México in 1956 and completed by us in Central America in 1964 and 1965.

Osteological data were obtained from dried skeletons and cleared and stained specimens of all species, plus serial sections of the skull of *Smilisca baudini*. Developmental stages to which tadpoles are assigned are in accordance with the table of development published by Gosner (1960). Breeding calls were recorded in the field on tape using Magnemite and Uher portable tape recorders. Audiospectrographs were made by means of a Vibralyzer (Kay Electric Company). External morphological features were measured in the manner described by Duellman (1956). In the accounts of the species we have attempted to give a complete synonymy. At the end of each species account the localities from which specimens were examined are listed alphabetically within each state, province, or department, which in turn are listed alphabetically within each country. The countries are arranged from north to south. Abbreviations for museum specimens are listed below:

AMNH—American Museum of Natural History
BMNH—British Museum (Natural History)
BYU—Brigham Young University
CNHM—Chicago Natural History Museum
KU—University of Kansas Museum of Natural History
MCZ—Museum of Comparative Zoology
MNHN—Museu National d'Histoire Naturelle, Paris
UF—University of Florida Collections
UIMNH—University of Illinois Museum of Natural History
UMMZ—University of Michigan Museum of Zoology
USC—University of Southern California
USNM—United States National Museum
TNHC—Texas Natural History Collection, University of Texas
ZMB—Zoologisches Museum Berlin