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A NEW GENUS OF SURINAM TOADS (PIPIDÆ)

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The Surinam toad, *Pipa pipa* (Linné), has been known for over two centuries. The unusual mode of parental care exhibited by this frog has given the species a very distinctive position among the Amphibia. Many Surinam toads have been collected but it was only in very recent times that it was recognized that these toads were not all alike. In rapid succession there have appeared the descriptions of *Pipa snethlageæ* Mueller, *Pipa parva* Ruthven and Gaige, *Pipa aspera* Mueller, and *Pipa pernigra* Barbour. The species of *Pipa* may be divided into two categories according to general body form. *Pipa pipa*, *P. snethlageæ*, and *P. pernigra* are greatly flattened creatures with flaps at the angles of the jaws. I cannot distinguish the latter species from young specimens of *P. pipa* before me. The second group includes *P. parva* and *P. aspera*. Neither of these species are greatly flattened and neither possess dermal appendages on the head. During the summer of 1924 a series of specimens of *P. aspera* was collected near the Tropical Research Station at Kartabo, British Guiana. Through the kindness of Mr. William Beebe and Dr. Alfred Emerson, they have been loaned to me for examination. Three of the specimens have been presented to the American Museum by Mr. Beebe. Four of the adult specimens in the series are females with well-advanced larvæ in the capsules of their backs. Some of the young have already escaped and have been preserved. An examination of this fine species of young and adult material has revealed the fact that *Pipa aspera* can no longer be maintained in the genus *Pipa* for it possesses maxillary teeth. A new generic name may be erected for it.

PROTOPIPA, new genus

TYPE.—*P. aspera* Mueller.

DIAGNOSIS.—Habitus of *Hymenochirus*, no dermal flaps at the angles of the mouth, no dermal filament at the premaxillary symphysis as in *Pipa*; neither head nor body greatly flattened; snout rounded, not angular; skin rough, tubercular. Similar to *Pipa* in other external characters, but differing remarkably in possessing maxillary teeth throughout life.

REMARKS.—It is highly probable that *Pipa parva* will be found referable to the above genus for it is very closely allied to *P. aspera*. *Protopipa* is immediately ancestral to *Pipa*, and holds the same relation to that genus that *Telmatobius* does to *Batrachophrynus*. *Protopipa* differs from *Pipa pipa* in having a smaller number of proportionately larger eggs. In this it agrees with *P. snethlageæ*. The eggs are distributed in a narrow belt, from two to four eggs wide, along the median longitudinal axis of the back. As they develop the encapsulated larvæ extend greatly the pouches in which they lie. The integument of the back is raised and appears slightly lumpy from the larvæ which, in growing, extend their sacs until the laterally placed larvæ lie not below but to the outer side of the outer row of sac openings. Further, the opercula which close the sacs are not smooth as in *Pipa* but raised into a ridge, giving further evidence that these covers are merely the somewhat altered capsules of the eggs around which the vasculated integument has spread. These differences, however, are matters of detail. The life histories of *Protopipa* and *Pipa* are essentially alike and differ radically from those of all other frogs.

Protopipa AND THE PHYLOGENY OF THE SALIENTIA

The discovery of *Protopipa* adds one more link to a long series of evidence that families of Salientia founded on the presence or absence of maxillary teeth are artificial assemblages. In an earlier paper (Noble, 1922) I have listed the several pairs of genera which are obviously more closely related to one another than either is to any other genus of frogs, and yet the one member of each pair possesses and the other lacks maxillary teeth. The breeding habits of *Pipa* and *Protopipa* are unique among frogs; the star-like appendages on the digits are found in no other forms. It is obvious that *Pipa* and *Protopipa* are more closely related to one another than either is to any other pipid. Nevertheless, one possesses and the other lacks maxillary teeth. In my classification (Noble, 1922) I found it necessary to abandon the presence or absence of teeth as a character of primary importance. All genera with toothless maxillaries have evolved directly or indirectly from toothed forms. Families based on the absence of teeth are polyphyletic groups. More recently I have had the occasion to discuss the evolution of the Pelobatidæ (Noble, 1924) in more detail, and have confirmed and extended the conclusions reached. The immediate toothed ancestors of some toothless genera such as *Bufo* are probably extinct, but the progenitors of many others are known or will be made known as herpetological exploration continues.

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