THE PHYLOGENY OF THE PAPUAN SUBFAMILY ASTEROPHRYINAE (ANURA: MICROHYLIDAE)

by

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To Cherie

SUMMARY

THE PHYLOGENY OF THE PAPUAN SUBFAMILY ASTEROPHRYINAE (ANURA: MICROHYLIDAE)

The Asterophryinae is a subfamily of terrestrial and fossorial microhylid frogs restricted to the Papuan Sub-Region. It comprises 43 named species and subspecies in seven genera. A second microhylid subfamily, the Sphenophryninae, also occurs in the Papuan Sub-Region, and its relationship to the Asterophryinae is contentious.

In this study I undertake a phylogenetic analysis of the Asterophryinae based on the results of an examination of the myology, osteology and external morphology of members of all of the genera, and also of members of the Sphenophryninae, other microhylid subfamilies and the Ranoidea, which serve as out-groups at different levels of analysis.

The Asterophryinae and Sphenophryninae form a monophyletic group (*sensu* Hennig, 1966) supported by two autapomorphies: (a) direct embryonic development within the egg capsule; and (b) fusion and enlargement of the palatine and prevomer. The monophyly of the Asterophryinae is supported by three autapomorphies: (a) posterior adherence of the tongue and its division into anterior and posterior sections; (b) fusion of elements of the mandible and displacement of the mentomeckelians from the anterior margin of the mandible; and (c) loss of a dorsal element

of the *M. intermandibularis*. The monophyly of the Sphenophryninae is supported by only one character of dubious value: procoely of the vertebral column.

The polarities of characters observed to vary among the asterophryines are assessed and a cladogram is constructed on the basis of shared and derived character states. This cladogram is converted to a proposed classification in the format of the Annotated Linnean Hierarchy of Wiley (1979). A number of taxonomic actions are shown to be necessary:

(1) Resurrection of *Mantophryne* Boulenger 1897 to accommodate three species of *Phrynomantis* with closer affinities to *Asterophrys*, *Hylophorbus* and *Pherohapsis* than to other *Phrynomantis* species.

(2) Transfer of *Xenorhina doriae* to *Phrynomantis*.

(3) Erection of four tribes to accommodate monophyletic groups of genera: Asterophryini (*Asterophrys*, *Hylophorbus*, *Mantophryne* and *Pherohapsis*); Barygenyini (*Barygenys*); Phrynomantini (*Phrynomantis*); and Xenorhinini (*Xenobatrachus* and *Xenorhina*).

(4) Redefinition of all genera in the light of newly described taxonomic characters.

A number of morphological characters described for the first time in the course of this study appear to have potential for use in wider phylogenetic studies of the microhylids.

Though a biogeographical synthesis is considered premature, a number of hypotheses are brought forward to

explain aspects of the patterns of distribution of the Asterophryinae.

DECLARATION

This thesis contains no material accepted for the award of any other degree or diploma in this or any other university.

To the best of my knowledge this thesis contains no material previously published or written by another person, except when due reference is made in the text.

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