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Litoria aplini sp. nov., a New Species of Treefrog (Pelodryadidae) from Papua New Guinea

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Abstract. We describe a new species in the Australopapuan pelodryadid frog genus *Litoria* from upper hill forest (940 m a.s.l.) on the northern slopes of Papua New Guinea's central cordillera. The new species is moderately small (male body length = 31.9–35.1 mm) and slender (head width/body length = 0.29–0.30), with extensive golden-yellow markings ventrally. It is most similar to *Litoria iris*, *L. majikthise*, *L. ollauro*, and *L. verae* but differs from them by a suite of morphological and colour features. The advertisement call is a series of short buzzes and clicks reminiscent of calls produced by both *L. iris* and *L. ollauro*. Phylogenetic analysis of mitochondrial *ND4* nucleotide sequences shows that the new species is closest to *L. iris* and *L. majikthise* but shows a net sequence divergence of 14–15% from both of these taxa. The new species is unusual in being found calling from forest on limestone substrate where free-standing water is rarely encountered.

Introduction

Litoria is a morphologically and ecologically diverse assemblage of pelodryadid frogs confined almost entirely to the Australopapuan region (Tyler, 1999). Although there have been attempts to divide *Litoria* into informal species groups (Tyler & Davies, 1978; King, 1981; Menzies, 2006), and into a number of genera (Duellman *et al*., 2016), relationships among many species remain poorly resolved, limiting the usefulness of proposed generic or species group concepts. One such example is *Litoria iris* and its relatives. *Litoria iris* is a small, brightly coloured, montane treefrog from mainland New Guinea, typically occurring at altitudes above c. 1500 m a.s.l. (Menzies, 2006) although there is a single record from 1000 m a.s.l. (Kraus & Allison, 2006). Adults glue their large, green eggs to vegetation hanging over small pools in a wide range of pristine and degraded habitats (Menzies, 2006). Menzies (1972) and Tyler & Davies (1978) included this species in the "*Litoria nigropunctata* Group" along with *L. nigropunctata* and *L. vocivincens*, two lowland species that differ markedly from *L. iris* in laying small pigmented eggs and in lacking bright colours ventrally (Menzies, 2006). Menzies (1993), in placing greater taxonomic emphasis on known or presumed reproductive strategies, included *L. iris* in an "*L. iris* group" along with six other species, four of them described as new: *L. chloronota*, *L. havina*, *L. majikthise* (as *L. leucova*), *L. mucro*, *L. ollauro*, and *L. pronimia*. Subsequently, Menzies (2006) expanded the "*L. iris* group" to include an additional three species, *L. leucova*, *L. multiplica,* and *L. prora*, creating a morphologically and ecologically heterogeneous assemblage defined by a single character: gluing large pale eggs on leaves above water. However, the reproductive strategies of five of the ten species in Menzies' "*L. iris* group" have not been documented as yet, and the striking morphological and ecological divergences evident among members of the group (see e.g., Menzies, 2006) suggest that it is unlikely to be monophyletic.

Keywords: New Guinea; frog; acoustics; taxonomy; phylogeny; rainforest
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