



## Taxonomic re-assessment of the Australian and New Guinean green-eyed treefrogs *Litoria eucnemis*, *L. genimaculata* and *L. serrata* (Anura: Hylidae)

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### Abstract

The green-eyed treefrogs (*Litoria eucnemis* species-group) are found throughout New Guinea and some of its offshore islands, and in two geographically separated regions in north-eastern Queensland, Australia. We examine the genetic relationships among populations of the complex from across its range and find that populations fall into two major lineages: 1) specimens referable to *L. genimaculata* from New Guinea and its offshore islands, and *L. exophthalmia*, and 2) samples referable to *L. eucnemis* from New Guinea and northern Cape York, Australia, and two lineages from the Wet Tropics of north-eastern Australia that are currently assigned to *L. genimaculata*. Based on our molecular genetic analyses, morphological assessment of new collections and re-examination of type material, we retain *L. eucnemis* as currently recognised for northern Cape York populations but resurrect the name *L. serrata* for the Wet Tropics populations. The degree of reproductive isolation between the two Wet Tropics lineages is being studied currently and so at this point we refer both to *L. serrata*. The degree of genetic variation observed in *L. genimaculata* across New Guinea locations and possible parapatry with *L. exophthalmia* suggest the presence of additional undescribed species. Re-examination of type material and collection of new specimens, allow us to reassess the status of several other names currently synonymised with *L. eucnemis* and *L. genimaculata*. Our observations support the present synonymy of *Hyla rhacophorus* with *L. eucnemis* and we remove *Nyctimystes loveridgei* from the synonymy of *L. genimaculata* and place it in the synonymy of *L. eucnemis*.

**Key words:** Allozyme electrophoresis, advertisement call, Anura, Australia, Hylidae, Indonesia, *Litoria*, mitochondrial DNA, New Guinea, taxonomy

### Introduction

The two species of green-eyed treefrogs of the *Litoria eucnemis* species-group (Tyler and Davies 1978), *L. genimaculata* (Horst, 1883) and *L. eucnemis* (Lönnberg, 1900), are distinguished from each other primarily on the basis of calls, that of *L. genimaculata* consisting of a series of soft ‘ticks’ and that of *L. eucnemis* of short growls. As currently recognised, both species are distributed in New Guinea and north-eastern Australia (Richards *et al.* 1993). The taxonomic history of this species-group has included grouping the Australian and New Guinean populations as a single species, either *L. eucnemis* or *L. genimaculata*, or separating the Australian populations as a single species *L. serrata* (Andersson, 1916) (references in Richards *et al.* 1993). The current taxonomic arrangement provides a fourth alternative, with both species widely distributed in New Guinea but with localised distributions in north-eastern Australia, *L. eucnemis* being restricted to northern