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Three new species of horned frogs, *Megophrys* (Amphibia: Megophryidae), from northeast India, with a resolution to the identity of *Megophrys boettgeri* populations reported from the region

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Abstract

Northeast India is a well-established region of biological importance but remains poorly understood with regards to the species level identifications of many of its extant amphibians. In this study we examined small sized frogs from the genus *Megophrys* recently collected from remote and suburban forests in the northeast Indian states of Meghalaya and Arunachal Pradesh, from which we have identified three new species. *Megophrys vegrandis* **sp. nov.**, *Megophrys ancræ* **sp. nov.** and *Megophrys oropedion* **sp. nov.** are compared with all known congeners from India and surrounding regions from which they differ based primarily on a combination of morphological characters. *Megophrys boettgeri* is removed, and *Megophrys minor* added to the Indian amphibian checklist, through critical review of all literature pertaining to the former species, and the discovery of an overlooked historical report of the latter species. Two of the new species, *Megophrys ancræ* **sp. nov.** and *Megophrys vegrandis* **sp. nov.** are known from low and mid elevations within two large protected forests in Arunachal Pradesh, both with poorly studied amphibian fauna. Contrastingly, *Megophrys oropedion* **sp. nov.** is currently known only from small forested areas on the upper reaches of the Shillong Plateau. The importance of the Shillong Plateau as an area of known high amphibian endemism is highlighted in the light of the miniscule proportion of its land area afforded government protection, raising concerns about the future conservation of its still poorly known species.

Key words: Amphibian; taxonomy; morphology; chresonymy; Megophryinae; *Megophrys parva*; *baluensis*; *montana*; *Philautus kempii*

Introduction

Within the political boundaries of northeast India lie portions of two of the potentially richest regions of biodiversity in southern Asia, the Indo Burma and Himalayan biodiversity hotspots (Mittermeier *et al.* 2004). This potential diversity is attributed to a combination of its geographic position on the confluence of the Indian, Eurasian and Southeast Asian plates, and the climatic habitat range from the tropical valleys to the boreal mountain peaks (Pawar *et al.* 2007). As experienced in all Asian countries, widespread deforestation and natural habitat destruction resulting from the needs of the expanding human population, has dramatically reduced much of the biologically rich natural environment (Gilbert 2012). Despite being situated in a densely populated area, many forest patches in northeast India, often nearby large cities, have yet to be explored thoroughly by zoologists, and particularly herpetologists, as evident from recent amphibian discoveries from the outskirts of the state capital cities of Guwahati, Assam state and Kohima, Nagaland state (Biju *et al.* 2010; Kamei *et al.* 2012; Mahony *et al.* 2011).

The genus *Megophrys sensu lato* (*s.l.*) Kuhl & Van Hasselt currently consists of about 50 species of primarily secretive hill stream frogs which occur throughout the southern and eastern Himalayas, across China and south to Indonesia (Frost 2013). There is still some considerable debate about the higher systematics of this group. Several proposals of splitting the genus based on arbitrary external morphological characters in combination with basic or