

Morphological and genetic discordance in two species of Bornean *Leptobrachium* (Amphibia, Anura, Megophryidae)

Abstract

Recent phylogenetic studies of Southeast Asian megophryid *Leptobrachium*, while clarifying (1) distinct specific status of three Philippine populations and (2) high genetic diversities within Bornean *Leptobrachium montanum*, posed two questions, (1) relationships and divergence histories of two Philippine species and Bornean *Leptobrachium gunungense*, and (2) possible discordance between phylogenetically and morphologically defined lineages. In order to solve these questions, and especially reviewing current taxonomy of Bornean species, we estimated the phylogenetic relationships of endemic Bornean species together with their putative relatives from Philippines and Sumatra, using 2451bp sequences of the 12S rRNA, tRNA val, and 16S rRNA of mitochondrial DNA genes. With respect to *Leptobrachium hasseltii* and *Leptobrachium chapaense*, lineages from Borneo, Philippines, and Sumatra formed a monophyletic group with *Leptobrachium lumadorum* from Mindanao as the basal clade, while two other Philippine species from Palawan and Mindoro formed a clade and nested in Bornean lineages. Sister species relationship of the two Philippine species and *L. gunungense* is not supported, rejecting the hypothesis of Philippine origin of *L. gunungense*. Phylogeny does not conform to morphological variation, and the topotypic *L. montanum* and one lineage of *Leptobrachium abbotti* are genetically very close despite their clear difference in ventral color pattern. Furthermore, each of these species forms a paraphyletic group and contains several lineages, each of which is a candidate of good species. These results clearly indicate that current taxonomy of Bornean species based on several morphological characteristics requires complete revision. Detailed studies on adult and larval morphology, as well as acoustic characteristics, are necessary to evaluate the taxonomic status of all lineages recovered.