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Revision of the genus *Leopoldamys* (Rodentia, Muridae) as inferred from morphological and molecular data, with a special emphasis on the species composition in continental Indochina

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Abstract

A revision of the genus *Leopoldamys* is presented, and both the species composition and distribution in Indochina and Sundaic regions is reinvestigated. The phylogeny of the genus is recovered based on Cyt *b*, COI, and IRBP gene analyses. Five basal and 16 secondary monophyletic phylogenetic lineages were identified. A taxonomic reassessment of the continental and Sundaic populations is performed based on morphological verification of the genetically defined clades. Six clades were recovered in the phylogenetic analyses and correspond to morphologically defined species: *L. revertens* (distributed in lowlands of eastern and central Indochina), *L. herberti* (western and central Indochina, northward to northern Vietnam), *L. edwardsi* (China and northern Vietnam, northward of 21°N), *L. milleti* (endemic of Dalat Plateau, southern Vietnam), *L. sabanus* (Borneo), and *L. vociferans* (lowlands of the Malacca Peninsula, northward to southwestern Thailand). The absence of proper *L. sabanus* in continental Indochina is revealed. The substitute name for the species known from the majority of Indochina under the name of *L. sabanus* should be *L. revertens*. The name *L. neilli*, which has been ascribed to populations from Thailand and Vietnam, is a junior synonym of *L. herberti*. Two related but rather divergent clades are found in Sumatra and the Malacca Peninsula. Based on their considerable genetic distances, these forms should be regarded as separate species from the *L. sabanus* type-bearing populations of Borneo, or as the members of *L. sabanus* polytypic superspecies. The substitute name for the lineage-bearing taxon from Malacca should be *L. vociferans*. The continental populations of *Leopoldamys* can be distinguished from each other by external and cranial characters and may be subdivided into four species. Two of these species (*L. revertens* and *L. milleti*) are well distinguished by external and cranial morphology, whereas the other two species (*L. herberti* and *L. edwardsi*) may be treated as sibling species that are difficult to distinguish based on morphological characters.

Key words: giant tree rats, Southeast Asia, Vietnam, phylogeography, molecular phylogeny, taxonomy, morphology

Introduction

The genus *Leopoldamys* Ellerman is a member of *Dacnomys* division of the tribe Rattini. According to Musser & Carleton (2005), the division includes four Indo-Sundaic genera, *Dacnomys* Thomas, *Niviventer* J. T. Marshall, Jr., *Leopoldamys*, and *Chiromyscus* Thomas, the Sri Lankan endemic *Srilankamys* Musser and the Philippine genus *Anonymomys* Musser, with the *Niviventer* and *Leopoldamys* genera as the most varied and taxonomically complicated in the division. The *Dacnomys* division composition was recently subjected to a taxonomic revision based on molecular data, and it was conclusively demonstrated that *Saxatilomys* Musser is also a member of *Dacnomys* division (Balakirev *et al.* 2011, 2012). It was also found that *Srilankamys* should be excluded and be placed instead in the *Rattus* division (Buzan *et al*. 2011). Combined analyses of mitochondrial and nuclear gene sequences placed the *Dacnomys* division as the sister lineage to the *Rattus* division (Lecompte *et al*. 2008). Both of these groups are included in the large phylogenetic clade of Murinae in Southern Asia, which was demonstrated to

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