

Susceptibility of tropical mountain forests to biological invasions from the temperate and subtropical zone, exemplified by *Zonitoides* (Gastropoda: Gastrodontidae)

Abstract

Colonisation by, and spread of, animal species from the temperate zone are rather uncommon observations in the tropics. The study provides the first reports of two snail species of the genus *Zonitoides* in Sabah, Borneo, namely *Z. arboreus* (Say, 1819) and *Z. nitidus* (O.F. Müller, 1774). The identification was aided using partial sequences of 28S rDNA, and the barcoding sequence of COI. So far, the two *Zonitoides* species were found in locations where the natural forest cover had been disturbed, and only in the montane forest at elevations between 1500 and 2000 m a.s.l.. Niche modeling suggests that both taxa could be widely distributed in the mountains of tropical South America and Africa. *Z. arboreus* finds suitable climates in many places in SE Asia and especially at many conservation areas in Borneo. In contrast, *Z. nitidus* finds only marginal climatic conditions in the same area, and introductions of *Z. nitidus* probably will remain spatially restricted. This prediction, however, needs to be monitored because the latter species can display molluscivory. Our results additionally point to the possibility of *Z. arboreus* being a species complex that, given its potential economic impact, urgently needs a taxonomic revision.