

Morphometric Study of the Palm Weevils, *Rhynchophorus vulneratus* and *R. ferrugineus* (Coleoptera: Curculionidae) in View of Insular and Mainland Populations of Malaysia

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ABSTRACT

A morphometric analysis was conducted on *Rhynchophorus vulneratus* and *R. ferrugineus* (Coleoptera: Curculionidae) from insular and mainland populations. Twenty-three morphological characters were measured and the data were analysed using independent *t*-test, principal component analysis (PCA) and discrimination function analysis (DFA). Using independent *t*-test, all characters were found to be significant at $p < 0.05$, except distance between eyes (ED), mesotarsus length (F2Ta) and metatarsus length (F3Ta). In PCA, cumulative variations of 80.7% were recorded from the first two principal components, resulting from high loadings in elytra length (EL), elytra width (EW) and pronotum length (PL). For DFA, a single function explained a canonical correlation of 0.952 with 100.0% of variation and the Wilk's Lambda statistics (0.094) was strongly supported with $p < 0.0001$. The highest character loadings were the total length (TL), elytra width (EW) and pronotum length (PL), which were useful as diagnostic characters for separating

both *Rhynchophorus* species. Therefore, this study suggests that *R. vulneratus* and *R. ferrugineus* are morphologically distinct species. This finding proves that the insular population of *R. vulneratus* fits the generality of the 'island rule' as being larger compared to the mainland counterparts of *R. ferrugineus*.

Keywords: Morphometrics, mainland, insular population, *Rhynchophorus*, weevils

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