REVISION OF THE HIGHER CATEGORIES OF STIGMADERINI
(COLEOPTERA : BUPRESTIDAE)

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SUMMARY

The tribe Stigmoderini (Coleoptera: Buprestidae), comprising about 640 described species, occurs in Australia, New Guinea and South America, suggesting a Gondwanan origin of the tribe. At present, 480 of these are placed in the genus Stigmodera with 3 subgenera: Stigmodera (s. s.), Themognatha, and Castiarina, which represents about half the Australian buprestid fauna. The remaining species of the tribe are placed in Hypostigmodera, Calodema, Metaxymerpha, Conopomera, Dactylorhodies and Hyperanthia. The inclusion of Curis and Julodimorpha in the tribe by Théry (1929) is contentious.

In this study, the karyology, internal anatomy, and external morphology of the higher taxa of Stigmoderini were investigated. Chromosome counts were obtained for 30 species of Stigmodera, and karyotypes of 15 species are presented. Thirty-three species have a diploid complement of 22 chromosomes, two species have 2n = 20. All Stigmodera species studied have an X0 sex-determining mechanism. Male Curis and Julodimorpha have diploid complements of 14 and 39 respectively.

The most useful morphological characters are those associated with the female reproductive system. The highly derived ovipositor of Stigmoderini possessing a dorsal valve, particle sac, medial styles and spatulate setae, was compared with that of 64 other buprestid species representing 47 genera in 21 tribes, and was found to be unique, providing strong evidence that the tribe is monophyletic. Curis and Julodimorpha which lack this type of ovipositor are excluded from the tribe.
The higher categories are delineated by suites of characters and monophyly is established for some, but not all taxa. Relationships between the higher taxa of the tribe are investigated. Synapomorphic characters which suggest conflicting relationships are examined critically and the probability of homoplasy assessed. A cladogram is constructed which best fits the available evidence.

The female accessory gland, a structure not recorded previously in any buprestid, is accorded high weight and supports the monophyly of Themognatha - Calodema - Metaxymerpha. This necessitates removing Themognatha from Stigmodes and elevating it to generic status. Arguments are also presented to support the elevation of Castiarina to generic status, and to transfer to it the species variegata Blackburn, which at present is placed in the monotypic genus Hypostigmodes. No evidence was found to suggest that the Australian and South American components of the fauna represent different lineages, indeed the data suggest that Conognatha is more closely related to the Australian fauna than it is to the other South American genera of the tribe.

This thesis contributes to the knowledge of Stigmodes by adding data on aspects previously neglected, such as female genitilia, and by providing an overview of the tribe not attempted by earlier workers. Furthermore, it uses investigative approaches and methods of analysis that may have broader application to the field of coleopteran systematics.