

Zygaenid Moths of Australia

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ZYGAENID MOTHS OF AUSTRALIA. A revision of the Australian Zygaenidae (Procrinae: Artonini). Monographs on Australian Lepidoptera. Volume 9. i-vii, 248pp. 2005. Gerhard M. Tarmann . CSIRO Publishing, ISBN:9780643067981 - AU \$199.00

The “Zygaenid Moths of Australia. A revision of the Australian Zygaenidae (Procrinae: Artonini)” by Gerhard M. Tarmann is the 9th volume in the *Monographs on Australian Lepidoptera*, a series that has seen several benchmark publications since it was introduced in 1989.

The publication follows a classic format, opening with an abstract, a general introduction to the family and a more specific introduction to the little known Australian fauna, which is considered by the author to comprise only members of the tribe Artonini. This is not surprising considering the limited Australian Zygaenidae to this tribe in the “Checklist of Australian Lepidoptera” (Nielsen et al. 1996). However, since Common (1991) in “Moths of Australia” also included the *Lactura* group in Zygaenidae, this group should at least have been mentioned (it is treated as a separate family in the Checklist and later in the Handbook of Zoology (Kristensen 1998)), more so since “Moths of Australia” is still likely to be the first serious introduction to Australian moths for most students and amateurs. The standard “Materials and Methods” and “Acknowledgements” chapters are followed by a very detailed chapter on zygaenid morphology. This chapter gives an excellent account of the morphology of all zygaenid life stages, useful not only to students of the Australian fauna (for which relevant characters are discussed in particular detail), or even Zygaenidae in general, but for anyone interested in the morphology of lower ditrysian Lepidoptera. The chapter is excellently illustrated and the numerous scanning electron micrographs particularly are highly informative. My only slight criticism here would be that highlights tend to be burned out in some micrographs and could have benefited from contrast adjustment. The genitalia of both sexes are described in great detail, but this section would have been enhanced by generalized illustrations of zygaenid genitalia. The sections on juvenile stages provide another well-illustrated overview of the family.

The next chapter covers various aspects of zygaenid biology and life history, such as larval-host plant relations, pest species, parasitoids, and the family’s intriguing defence biology, again with sufficiently broad focus to be of interest to lepidopterists in general. The

sections on “Zygaenids as indicator species” and “Conservation” are clearly of more general importance since zygaenids are often very environment-specific and changes in distributions and phenology can thus be excellent indicators of environmental changes, even as they happen. The short chapter on phylogeny (based on a morphological/ecological dataset of 13 species and 31 characters) is unfortunately focused only on the Australian genera, with two other Asian Artonini genera and one genus from Procrini included as outgroups. This is particularly unfortunate as the two Asian genera are shown to be deeply embedded within the Australian genera, so the author wisely does not draw any strong evolutionary conclusions based on these results. In the following chapter on the history and origin of the Australian Zygaenidae, the non-monophyly of the Australian genera is followed by the inescapable conclusion that several Artonini faunal exchanges between the Australian and Asia must have taken place.

The bulk of the work is, as might be expected, dedicated to the taxonomy of Australian species, with keys to genera and species. All known genera and species are redescribed, and a total of four genera, 21 species, and two subspecies described as new. The author also illustrates, but does not formally describe, “taxa recognised as possible distinct species” for which he felt insufficient material precluded formal description. It is debatable whether new species should be described based on single (or very few) specimens, and while there can be good arguments for doing so (e.g. when species are of particular systematic, biological or conservation importance, where a formal name is required for the species to “exist” for scientific or management purposes), the approach followed here is probably commendable in the given situation and may inspire future workers to collect and study these as yet unnamed species. If the need arises (e.g. for conservation purposes), the species can then be quickly named based on the information made available by Tarmann in this work. This chapter is elaborately illustrated with stunning colour paintings (by Dr. F. Gregor) of each species in 6.5–10x life size, and also by photographs of habitats, specimens, eggs and larvae, and genitalia. With respect to the latter, one could argue that ink drawings highlighting important characters would be more user-friendly. But the photographs are consistent and allow for quick comparisons between species. It is perhaps also debatable whether 6–10x paintings of whole animals are more useful for Lepidoptera identification than much lesser

magnifications or life-size illustrations (paintings or photos). However, there is little discussion of the great utility of the large scale paintings here; as pointed out by the author in the abstract, characters that distinguish one zygaenid species from another are often minute differences in wing or body colours that are easily missed (or very hard to illustrate) in smaller illustrations. Plates 36–40 (part of the genus *Hestiochora*) and 51–55 (*Homophylotis* and *Pseudoamuria*) are excellent examples of this. Australian zygaenids are not a group that can be confidently identified through binoculars.

There is little doubt that Gerhard Tarmann has written a valuable contribution to the knowledge of Australian Lepidoptera. But what makes the publication

stand out as more than “just” a comprehensive, detailed and beautiful illustrated regional revision of a hitherto poorly known group of insects is the wealth of information on Zygaenidae as a whole and the geographical and biological contexts in which it is presented. The book should be a must for anyone with an interest in the systematics, morphology and evolution of not only Zygaenidae, but lower Lepidoptera in general.

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