



A Guide to the Beetles of Australia

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Every American schoolchild knows that many unusual animals and plants inhabit the continent "Down Under". Since my boyhood, I dreamed of collecting beetles in Australia and was lucky enough to do so for a month in 1972, in company of Dr. Howard E. Hinton. We attended the International Congress of Entomology and spent much of August driving from Canberra to Queensland. Unfortunately, this was the driest time of the year and beetle collecting was the worst I've ever experienced.

It was just as well that I did not have the new guide to Australian beetles, or I would have been even more disappointed. This beautifully illustrated guide (mostly with magnificent color photographs) would create an enthusiast of even a non-entomologist. Obviously it was many years in research and final production, and the results are a just reward. In "American Beetles" (Arnett et al. 2001, 2002) we have a great set of technical books, but the colored photographs set the Australian guide apart. Such an undertaking would be well advised for the American fauna.

The authors are both well qualified for this daunting task. George Hangay has studied the Australian beetle fauna for 40 years, retiring as Chief Preparator at the Australian Museum, curating additional collections in New South Wales, and has written several books and articles. Paul Zborowski is an entomologist, but foremost a photographer, based in the wet tropics of Queensland. He has published several insect reference works, including the "Field Guide to Insects of Australia". He operates a specialist image bank at www.close-up-photolibrary.com.

Their synergy results in masterful collaboration. Anyone who knows the magnitude of the beetle fauna of a continent, would shy away from such an undertaking. With 91 families and over 20,000 species described, it seems too much to squeeze into a single "guide". Obviously many choices had to be made to limit treatment of each family. The specialist will object to the lack of keys (not the amateur), but the more than 400 striking photos make up for this. The "gestalt" or appearance is a much faster and easier way to recognize most families.

The book is arranged in 9 chapters: Preface, Acknowledgements, Introduction, What Makes a beetle?, Anatomy, Reproduction and Development, Food and Survival, Higher Taxonomy, and Family Descriptions. There is a 6-page glossary and separate indices to common and scientific names. There is an "Endnotes" section which contains some specific references noted in the text, but there is no Bibliography or Literature section.

I'm sure the authors had to sacrifice these for space requirements. It would now be helpful to have a new book on Australian beetle literature!

Aside from omissions mentioned above, there is little else to criticize in this guide; very few typos and only a few mistakes were noted. Lamentably there are no tips or techniques on how the marvelous photos were made. It was noted in the Preface that most specimens were photographed live in their natural habitats and afterwards set free. Because there were no voucher specimens, many of the photos have only generic identifications. Too few insects can be identified to species from photos. The figures are not numbered, making reference to specific ones more difficult. Space restrictions presumably caused omission of describers' names.

I especially noted the following spectacular photos: the frontispiece of a jewel beetle, *Castiarina luteipennis* Gory; p. 159, the rare (1.5mm) Discolomatidae; p. 145 a showy melyrid, *Dicranolaius* Champion; p. 30, 78, the king stag beetle, *Phalacrognathus muelleri* MacLeay; p. 106, a remarkable rhipicerid (*Rhipicera* Latreille) with expanded antennal flabellum; and many glorious examples of the famous jewel beetles (Buprestidae) and Christmas beetles (Scarabaeidae, Rutelinae). Many aquatic beetles are shown under water, including the remarkable dytiscid (p. 32) feeding on a water scorpion. A photo (p. 144) of the rare Phycosecidae (3.5mm) is credited to R. De Keyser. Scale lines are not used, but measurements are provided.

The classification is based on a slightly updated version of Lawrence and Newton (1995). The number of species in Australia is staggering: the approximately 20,000 described species include 6,500 weevils, 2,600 scarabs (*sensu lato*), and 2,250 leaf beetles. They estimate that over 10,000 species await description, and many more await discovery with extensive field work. Even though the Australian government recently arrested some beetle collectors who had improper documentation, there is great need for encouragement of collecting. The authors recognize this by stating, "Every coleopterist, amateur or professional, contributes something to science. Even the seemingly most unimportant observations can add to the knowledge of our biodiversity and the world we live in".

Most coleopterists will recognize few familiar beetles species. Nearly everything "Down Under" is different, unusual, and exciting. Not only are colors spectacular, but other morphological characters are often strange as well. There are unique biologies and behaviors also, and some of them

are here noted. There is a jewel beetle (p. 112), *As-traeus fraterculus* van de Poll (Buprestidae), which snaps open its elytra to catapult away. There is a member of the family Brachypsectridae that remains undescribed, because it is known from only larvae. Rove beetles of the genus *Paederus* Fabricius, commonly called “whiplash beetles” are well known for causing dermatitis and blistering. However, the authors state that the toxin, known as pederin, may also have some therapeutic effects and can be harnessed to heal chronic lesions in humans and cure cancerous growths.

When I was in Australia, great fanfare was made of the unusual introduction from South Africa of *Onthophagus gazella* (Fabricius) and its successful biological control of dung. I even obtained a CSIRO promotional film entitled “Dung Down Under”. Curiously, this species is not mentioned or illustrated in the book, although it has been introduced into many other countries and is now possibly the most widespread dung beetle in the World! Since that introduction, 45 species of dung beetles have been introduced into Australia from Asia, Europe, and Africa; over half are now established. Two of these (*Euoniticellus intermedium* Reiche and *Onitis alexis* Klug) are illustrated.

Other biological control projects involving beetles also have been successful in Australia. Nine species of Histeridae (mainly from Java and Africa) have been introduced for various fly and weevil larvae (p. 66). One of the greatest success stories involves a tiny (2mm) weevil, *Cyrtobagous salviniae* Calder and Sands, which mines the leaves of a Brazilian aquatic plant, *Salvinia molesta* D. S. Mitchell, which was choking open water surfaces. It also attacks *Salvinia* in Florida. The authors report (p. 218) that, “. . . 800 hectares of *Salvinia* mat, weighing tens of thousands of

tonnes was almost totally destroyed by the quickly multiplying weevils within a year”.

A book review cannot detail the tremendous biodiversity of Australian beetles, but there are some interesting differences from the North American fauna. Some families are well represented (Hydraenidae, 55 species in 8 genera; Psephenidae, 579 species in 163 genera; Curculionidae, 6,500 species), while others are poorly represented (Silphidae, 3 species in 2 genera; Dascillidae, 2 species in 1 genus).

A book that will be useful to both amateurs and professionals, be they entomologists, coleopterists, ecologists, conservationists, or general lovers of the great natural beauty and biodiversity of beetles in the land “Down Under”.

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