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BOOK REVIEW

LAWRANCE J.F., HASTINGS A.M., DALLWITZ M.J., PAINE T.A. & ZURCHER E.J.: BEETLES OF THE WORLD: A KEY AND INFORMATION SYSTEM FOR FAMILIES AND SUBFAMILIES. CD-ROM, Version 1.0 for MS-Windows, CSIRO Publishing, Melbourne, 1999, ISBN 064306557-1. System requirements: PC IBM with Windows 95, 98, NT or later; SVGA monitor (1024 × 768 and thousands of colours recommended); CD-ROM drive.

This CD-ROM package can be used to identify to family or subfamily levels, occasionally to tribe or even genus, adult beetles from any part of the world. It was generated from the DELTA database (Dallwitz, 1980) using the program Intkey (Dallwitz et al., 1998). In addition to the identification key it includes the following information on all beetle families or lower included groups: 1) images of selected species (more than 2500 jpeg files of habitus drawings, video captures and photographs of living beetles and museum specimens), 2) full descriptions, 3) diagnoses, 4) synonymy, 5) distribution, 6) biology, 7) classification, and 8) references. In addition, there is an interactive glossary of the structures in each of the major regions of a beetle's body, a full glossary of terms and a general bibliography of works on the order Coleoptera.

A total of 945 beetle taxa are described, for each of which is recorded 324 multistate characters with from 1 to 14 states and 6 text characters of additional information. Most of the morpho-

logical characters are figured (nearly 300 jpeg files, each with several drawings or photographs) and briefly explained.

The package includes the Intkey program and information databases, manual (a hard copy as well as the MS-Word file "manual.doc"), and an electronic manual for advanced users ("intkey.doc"). If you do not have MS-Word, the Wordview program is also included on the CD-ROM.

The CD-ROM "Beetles of the World" (BW) can be used in a normal or advanced mode. Most users will probably start in the normal mode. This is very "user friendly" and can be operated by using a few buttons on the toolbar. When one presses the "New identification" button, the "Best characters" and "Taxa remaining" windows appear. The characters are ordered, with the "best" ones at the top of the list, but any of the characters can be used. Clicking on a character or characters results in a window with character states appearing (mostly with images) and the user can click on one or more of the character states. This is a very important and useful feature of BW – when a state is unclear, several character states can be selected. After each selection, the list of taxa remaining changes and the number decreases (all 945 taxa or only 173 families are included at the start of each identification). Most characters are figured and briefly explained. On identifying the group, the user can view images of beetles of the same taxon as well as full and diagnostic descriptions and a brief resume of the family.

Descriptions and images of any taxon or several taxa can be viewed simultaneously, i.e., the identification can be interrupted and then resumed. In addition differences among specified taxa can be summarized at any time.

For experienced users or serious students of beetle morphology and taxonomy, the advanced mode is a more interesting way of using BW not only for the identification of taxa but also as a source of information on the beetles. It includes a lot of interesting data, especially on beetle morphology, character states of particular taxa, differences and similarities among selected taxa, synonymies, etc. The direct Intkey commands can be directly used and searching for taxa or characters is better worked up. Other files of particular taxa or characters can be incorporated in this mode.

The family and subfamily classification used in BW is based mainly on that of Lawrence & Newton (1995); however several changes have been made to accommodate recent developments in the taxonomy of beetles. These changes are specified in the chapter "Classification" in the "Introductory section". (Because of my interest in Cleroidea, I firstly checked the classification of that superfamily: the changes incorporated were published as recently as 1998. However, each specialist needs to check the situation for their beetle group.

I tested the identification program many times. It gave excellent results even when I attempted to identify various untypical and "obscure" species of Cleroidea and successfully identified various untypical species of other families (e.g. Scolytidae, Tenebrionidae) from various parts of the world, although I was not always successful in my first attempt. Probably specialists will know of better (simpler) characters for distinguishing "their" groups, but the included character sets appear to be the best for identification of all beetle families and selected lower taxa. Generally, the advanced mode is more comfortable and faster for identification because the user can switch between "best" and "selected" characters during the identification process. Moreover, selected characters, a feature not included in the normal mode, allows one to use well known (e.g. dorsal surface) characters. This is particularly advantageous if the specimen to be identified cannot be dissected, or can only be viewed from above.

Descriptions of families are good. I found several mistakes or incomplete descriptions for the families I study (e.g. the number of the antennal segments or metatibial spurs in Cleridae) but, generally, the descriptions agree with published data. I have only two other critical remarks: 1) the quality of the beetle images is very variable. Some of the ink and colour drawings

are good but nearly all the photographs are poor, especially those by McClenaghan and Smith, copyright CSIRO, as they are out of focus, lack brightness/contrast correction, etc.; and the drawings copied from the older literature are rather "naive", and 2) many references in "General bibliography" are not alphabetically ordered.

This list of the features of the package is incomplete. It also includes the "Beetle browser" (an interactive glossary of beetle surface morphology), a direct entry to Windows calculator, an explanation of the function of particular buttons, and other useful options, e.g., saving and/or printing of information (e.g. description of taxa). In comparison with previous CD-ROM by the authors on "Beetle larvae of the world" (Lawrence et al., 1993), BW is a more user friendly package. Unlike the graphics of their 1993 CD-ROM (some standard graphic adapters do not work with it) that in BW operates well. The system requirements of BW are standard and the program runs well and fast using Windows NT and 98 in computers with Pentium I and II. I used a monitor resolution of 800 × 600, instead of the recommended 1024 × 768 and found it adequate.

I have used and tested BW in detail over a relatively long time and found it a very easy, informative and powerful tool for the identification of beetle families and other included taxa as well as an interesting source of knowledge on beetle morphology and taxonomy.

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