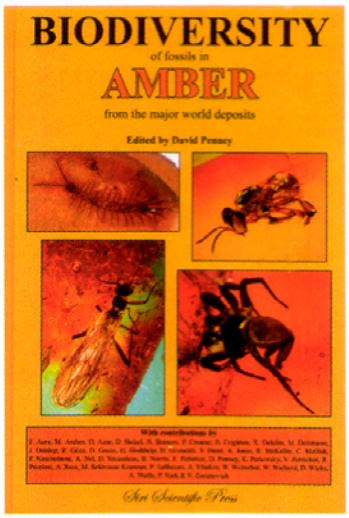

Biodiversity of fossils in amber from the major world deposits

Edited by David Penney

304 pages, 157 colour tables of photos and drawings, 24 16.5 cm. Hard-cover.

Siri Scientific Press, 2010; in English.

ISBN 978-0-9558636-4-6

Obtainable from Siri Scientific Press <siri.press@live.co.uk>; cost £85 plus postage. Further details online at: <http://siriscientificpress.co.uk>.

The international entomological community can welcome a new book devoted to global diversity of terrestrial amber arthropod fossils (Insecta, Arachnida, Myriapoda and Crustacea). The compiled volume presents a comprehensive synopsis of the following thirteen major fossiliferous amber deposits: Dominican, Mexican, Germany (Bitterfeld), Australian, Baltic, Ukrainian, French (Tertiary and Cretaceous), Canadian, American (New Jersey), Burmese, Spanish and Lebanese ambers. This book is a unique edition, because much of the amber-related information that was previously scattered in a great number of academic journals and rarely available to laymen or interested amateurs has been gathered in a single volume for the first time. The book is fully referenced and richly illustrated by 157 colour figure plates of 451 individual photos, schemes or maps. It is safe to assume that the audience of this book is potentially very broad and will include not only palaeontologists and entomologists, but also students and all amber enthusiasts.

The book is a collection of 15 papers, with each one starting as a new chapter from a new page and having dedicated figure numbers and reference lists (of which surprisingly there is very little overlap between chapters). Thirty seven authors, who are leading world experts on the relevant deposits, from ten countries contributed to this volume. Although the book does not contain a separate list of all authors with their contact details, these are available at the beginning of each chapter. Unfortunately, there are no chapters on the Russian, Chinese and Japanese amber deposits. As mentioned in the Foreword by the editor, contributions from these countries were invited but no submissions were received.

The introductory chapter of the book is devoted to methodological aspects, such as, tissue and DNA preservation, methods of separating amber from copal and fakes, various preparation methods, photo-microscopy and imaging techniques, and the curation of amber collections. The reader will certainly be impressed, as I was, by the research potential of the application of high resolution X-ray computed tomography or the phase contrast X-ray synchrotron imaging to the study of amber inclusions, even from completely opaque amber pieces. Both methods are non-destructive and generate 3D reconstructions of the inclusion that otherwise maybe impossible to view using traditional techniques (impressive examples of such reconstructions are given on pp. 15-17 (e.g., the spider *Cenotextricella simoni*) and p. 77 (the scolytid beetle from Cape York amber). For some kinds of the amber (e.g, from the Charentese deposit) X-ray synchrotron imaging seems to be the main current method of study (pp. 198-199). The generated 3D images can even be used for making plastic models of the studied creatures, exemplified in the book by the model of the psychodid fly *Trychomyia lengleti* (p. 17, Fig. 8).

Each of the following chapters is devoted to one of the aforementioned amber deposits and is written in a semi-standardized format: an introduction, information on the geological setting, methods of amber collection, palaeohabitat, the resin producing tree, age, physical and chemical properties, diversity of inclusions and finally a checklist of the fossils described (as an appendix to almost all chapters). Taxonomic checklists vary in detail: some of them (e.g., those for the New Jersey, Burmese or Lebanese amber

deposits) are provided with complete species lists, whereas others (Baltic, Rovno, Canadian, Spanish deposits) list families only. It is a bit unfortunate that in the latter case no references to the main sources from which species lists can be obtained were given, and thus the reader is to seek them through the main text and reference lists of particular chapters. Although the Baltic amber checklist is limited to families, it contains exact counts of genera and species described from each order. The chapter devoted to the Austarlian Cape York amber has no checklist at all, though in the text (p. 69) it is said that at least 25 families of terrestrial arthropods have been recorded. However, as noted, this is a newly discovered deposit and only one fossil species has been formally described.

In most deposits, the highest palaeodiversity relates to the Diptera, followed by the Hymenoptera. Yet, sometimes the Coleoptera (in Burmese amber, p. 211) or even Araneae (in Baltic amber, p. 100) can be the second richest group. A notable disadvantage of the reviewed volume, to my mind, is the absence of a general chapter summarizing the existing data on amber palaeodiversity and/or presenting a general overview of the current state of knowledge of the amber Arthropods from various deposits. Based on the figures extracted from the reviewed book, here I have produced a comparative table giving an indication of the comparative arthropod palaeodiversity of the 13 amber deposits.

	Amber deposit	Age	Orders	Families	Species
1	Dominican	Early-Middle Miocene (15-20 mya)	35	296	1,000+
2	Mexican	Early-Middle Miocene (15-20 mya)	23	195	120
3	German (Bitterfeld)	Late Oligocene (23.8-25.3 mya)	28	160	?
4	Australian Cape York	Late Miocene (12 mya)	11	25	133
5	Baltic	Late Oligocene-Middle Eocene (44-49 mya)	44	539	3,068
6	Ukrainian (Rovno)	Late Eocene (44-49 mya)	32	296	~2,000
7	French (Oise)	Early Eocene (53 mya)	14	64	~300
8	Canadian	Late Cretaceous (78-79 mya)	23	130	132
9	American (New Jersey)	Late Cretaceous (90-94 mya)	15	61	~250
10	French (Charentese)	Early Cretaceous (c. 100 mya)	28	85	~1,500
11	Burmese	Middle Cretaceous (100-106 mya)	36	216	228
12	Spanish	Early Cretaceous (120 mya)	22	82	57
13	Lebanese	Early Cretaceous (125-130 mya)	19	127	164

Obviously, the comparative figures given in the table actually reflect the current state of knowledge of each deposit rather than its real diversity. The best studied are the Baltic and Dominican amber deposits; the most promising of the recently discovered deposits, in terms of its potential palaeodiversity, is the Rovno one in Ukraine. The oldest amber deposits presented in the book are those from France (Charentese), Myanmar, Spain and Lebanon. While reading this book, I got the feeling that there is great potential for any active entomologist, myself included, to become involved in the study of amber arthropod taxonomy and diversity.

Overall, the volume makes a very good impression with regard to its comprehensiveness and clarity, and I wish to congratulate the authors and editor for such fine work. For this impressive book constitutes a reliable source of information on the palaeodiversity of amber arthropods, it will beyond doubts become a reference handbook for all amber students and general entomologists. It is a must-have for all entomological libraries. I recommend this book to both amateur and professional entomologists alike.

Dmitri V. Logunov
Curator of Arthropods
The Manchester Museum