



## The world according to amber

**Wolfgang Weitschat and Wilfried Wichard. 2002. *Atlas of Plants and Animals in Baltic Amber*. Verlag Dr. Friedrich Pfeil. München, Germany. 256 pages (hardcover). EUR 75.00, USD 98.00.**

This is the first English edition of the "Atlas der Pflanzen und Tiere im Baltischen Bernstein" published twice in 1998 and 2001 in German by the same publisher. The present volume concentrates on Baltic amber, and presents a comprehensive and up-to-date account of knowledge, including the results of twenty years of studies since the last review of Baltic amber by Larsson (1978). From among the many kinds of fossil resins known (about 100 deposits throughout the world), the authors have left aside the poorly fossilized resins usually originating in historical times and referred to as copals, as well as pre-Tertiary ambers, including a number of Cretaceous fossiliferous ambers from different localities (Jordan, Taimyr Peninsula, New Jersey, France, Pyrenees) discovered in the last few years. These extremely interesting Cretaceous amber inclusions from the time of first appearance of the "modern" flora and fauna await detailed scientific study.

After nearly 150 years of intense research in this field, the last few decades have witnessed a kind of "Amber Renaissance", bringing great progress in the taxonomy, taphonomy, and ethology of amber fauna and flora. Frustratingly, some of the fundamental issues concerning amber are still the subject of controversy; for example, the identity of the resin-producers is still a mystery. The theory that the resin producer was a pine tree, called *Pinus succinifera* for a long time, or a some other pine relatives, has been undermined by the results of infrared spectroscopy which have shown striking similarities between Baltic amber and copal produced by present-day araucarian and cedar trees. Another problem still open to debate is the exact age and site of origin of Baltic amber, prior to its rapid transportation to the depositional basin and sometimes its re-working several times, mainly during the Miocene and Pleistocene.

The new book encompasses two main parts: Chapter 1, about 17% of the total, is an Introduction, Chapter 2, over 70% of the total, concerns the plants and animals recorded in Baltic amber. Twenty-two pages of references and nine pages of taxonomic index complete the book.

Chapter 1 gives a popular review of amber topics beginning with basic information and terminology, and ranging through geographic and stratigraphic distribution of amber deposits to the various problems raised by the organic inclusions that are the key subject of the volume. The nature of these inclusions, fossilization processes, preservation potential of organs and tissues at different microscopic levels (e.g., successful isolation of a DNA sequence from Dominican amber 25 million years old), treatment of specimens, and last but not least, the taphonomic issues concerning the fossil-

ization potential of animals and plants, and the resulting bias in composition of amber assemblages, are all discussed in the last third of the Introduction. In the case of animal inclusions, size, habitat and behaviour (e.g., active flight to light or colour traps) are important selective agents. The predominance of insects, comprising 85% of the animal part of the systematic chapter, may partly reflect their tendency to be selectively fossilized, and be partly an indicator of the high frequency of insects in palaeobiocenosis of the amber forest which may have been similar to the forests of today (80% of Recent species are insects). Non-insect arthropods, mainly Arachnida, take up about 12% of the animal section, with just 3% being left for gastropods, worms and vertebrates. A comparatively short section of 11 pages describes plant inclusions.

Chapter 2 discusses the characteristics of each taxonomic group, usually at family level, and includes their unique discriminative features plus some of the main characters of the habitats in which they live. This popular approach to taxonomical description is informative and accessible even for the general reader. Most of systematic section is devoted to ecological problems including those of the habitat and behaviour of the amber fauna, and their bearing on the reconstruction of the biocenosis and environmental conditions of the amber forest. Each section includes a concise history of research on the groups of animals discovered in amber, and a formal list of taxa. An index of scientific names (pp. 247–256) is effective in helping the reader to navigate through the jungle of taxonomic terms used in the book.

Most of the families present in Baltic amber are extant and therefore the fauna is virtually modern in its composition. Usually, however, the animals differ from living forms at the species level, although some Eocene bristletails (Machilidae), some ants (Formicidae, order Hymenoptera) and some flies (Diptera) are so similar that they might readily be considered conspecific with extant species in spite of the 40 million years age difference. With over 70 families recorded from Baltic amber, Coleoptera are the most diverse group. Diptera occupy second place in diversity (60 families recorded) while constituting the most frequent inclusions (70% of the total number).

The book is superbly illustrated by 92 full coloured plates. Application of modern techniques, including colour and close-up photography, has allowed demonstration of the extremely detailed preservation of body shape and surface structures in these trapped creatures. Particularly impressive are pictures of minute structures such as insect eyes, mouth apparatuses and genital organs (see, for example, Plates 76 and 86).

The volume is a precious source of current knowledge on Baltic amber for both palaeontologists and zoologists, as well as for those interested in amber from scientific and popular viewpoints.

Magdalena Borsuk-Białynicka [borsuk.b@twarda.pan.pl], Instytut Paleobiologii PAN, ul. Twarda 51/55, PL-00-818 Warszawa, Poland.