

O. Kudrna, A. Harpke, K. Lux, J. Pennerstorfer, O. Schweiger, J. Settele, and M. Wiemers 2011. Distribution Atlas of Butterflies in Europe. – Gesellschaft für Schmetterlingsschutz, Halle, Germany. ISBN 978-3-938249-70-3. Price: 65,- € plus shipping costs*.

This book represents the second, completely re-written, revised and much improved edition of O. Kudrna's very well-known "Distribution Atlas of European Butterflies" from 2002.

The Preface (Chapter 1) is followed by an introductory part (Chapter 2) which details the complex procedure of transforming data submitted, or made available in many different formats, into a computer-friendly format. There is also a list of all contributors.

The most important part of the main text of this Atlas, however, is devoted to the clarification of procedures followed while producing the checklist of European butterfly species (Chapter 3). Whereas nomenclature (i.e., which name is to be used to designate any given taxon) is exactly codified by the International Code of Zoological Nomenclature, taxonomy (i.e., which taxa should be recognised as distinct) is indeed a highly subjective branch of science.

The limits of genera are fixed by their monophyly, which in some cases is only supposed. The authors decided to use very broad genera, often encompassing a number of sub-lineages, which other authors may subjectively decide to keep separate. Some outstanding problems, particularly arising with some lycaenid genera, are briefly discussed on pp. 26–27, and on pp. 33–39.

The limits of species are even more problematic. The subspecies concept, as endearing as it can be to some taxonomists, has no biological basis and to repeat the well-known joke, in zoological lists "if you have three names, you are either a butterfly or a bird". The use of the subspecies rank can be viewed as a measure of our ignorance and should be limited to cases of very imperfectly known faunas. No "subspecies" have been recognised in this Atlas, and very correctly so.

Clearly the authors had to make decisions of what could and what could not be mapped, and have decided to stick to a somewhat "Linnean" vision of the species, at least for the moment. Modern DNA studies keep demonstrating that a number of once apparently well-established species are in fact dual taxa, the ranges of which are often insufficiently known to be represented on maps (e.g., *Leptidea sinapis*/*L. reali*/*L. juvernica*, or *Melitaea phoebe*/*M. telona*, etc.). The same criterion has also been applied to some "morphospecies", even in cases where they are known to differ in their genitalic, or other structural features. A checklist of species recognised for the purposes of this Atlas is given on pp. 27–33 and 39–43. The most important synonyms, and other unrecognised species, are listed on pp. 43–45.

Species distributions (Chapter 4) are individually depicted in 441 maps of excellent quality, where their occurrence is shown for each of the 4121 quadrats 0.5° (latitude) \times 1° (longitude) which collectively compose the European (excluding the Russian and the Icelandic) part of their range. Butterflies occurring in the Gibraltar area are not mapped because data were unavailable at the time when maps were assembled, but are listed on p. 45 of the Atlas. Supposedly extinct "populations" are shown as red (before 1950) or yellow (1951–1980) dots. The level of accuracy of the latter is occasionally disputable. A short discussion of the zoogeography and conservation status of each species is appended under each map, together with some additional comments on the species' taxonomy, where appropriate. Maps are arranged alphabetically by genus and species names, which will sometimes require the reader to refer to the index.

Chapter 5 contains a short analysis of results obtained in the recording phase. Of course, the geographical distribution of the butterfly fauna is better known in some European countries than in others. The type and level of information, as it was known to the authors, is alphabetically listed on a country by country basis. It is rather a pity that the authors were in some cases unable to retrieve some important sources of information, for example from Italy, where the distribution atlas of butterflies (and many other animal groups) has already reached its second edition. The chapter continues with a discussion of the zoogeography of European butterfly species, which includes two interesting "coincidence maps" (Figs 7, 8) showing European hotspots of butterfly diversity. The following paragraph, dealing with conservation, summarises what is currently known on this extremely important issue regarding the European area.

To summarise, apart from some small glitches which could not be avoided in a book having such a broad scope, the authors of the "Distribution Atlas of Butterflies in Europe" should be thanked for their efforts and congratulated over their results. This book should be included in the library of every serious lepidopterist, irrespectively of whether amateur or professional.

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* The order can be placed online at <http://www.european-butterflies.ufz.de/index.php?de=22179>.

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