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Buchbesprechungen

Wójcik, J. M.; Wolsan, M. (eds.) (1998): **Evolution of Shrews.** Bialowieza: Mammal Research Institute, Polish Academy of Sciences. Hardcover, 458 pp. num. figs. and tabs. US $ 38.–.
ISBN 83-907521-0-7.

The aim of this book is to review recent knowledge on the evolutionary biology of shrews and to point out current problems. This comprehensive multi-authored compilation is presented in altogether 13 chapters, well-ordered, dealing with several aspects, and written by internationally well-known experts in their fields. Following introductory editorial remarks, including brief conclusions of the different themes, the first chapter (Reumer) deals with the classification of these special and species-rich insectivores. Here, in addition to older opinions, a new approach is presented. Accordingly, certain extinct genera with zygomatic arches and further skull characters, formerly ranked as subfamily, are now classified in the family Heterosoricidae, whereas the vast majority of fossil and recent shrews lacking zygomatic arches and attributed with other distinct skull peculiarities is supplemented under the family Soricidae with 5 subfamilies. The numerous genera and species of the subfamily Soricinae are further assigned to 7 tribes. Most of the other authors of this book follow strictly these conclusions. The next chapters deal with the history of shrews documenting the situation in Europe (Rzebik-Kowalska), Asia (Storch, Qiu, Zazhigin), Africa (Butler), and North America (Harris). No fossils were recorded from South America and only a few *Cryptotis*-species are recognized from northern parts of this continent in recent distribution. Thus, late immigration from the north appears probable. According to the fossil documentation Heterosoricidae were obviously distributed from Middle and Late Eocene to Middle and Late Miocene in North America respectively Europe and from Early Oligocene to Late Miocene in Asia, whereas Soricidae were first recognized from Early Oligocene in Europe (with the Soricinae being "older" than Crocidurinae), from Late Oligocene in North America, and from Early Miocene to present in Asia (with the Soricinae and Crocidurinae likewise since Middle Miocene). The history in Africa is poorly documented for only some Soricidae from the Middle Miocene on. This is discussed in connection with the origin of shrews on land masses of the northern hemisphere and the fact that Tertiary Africa and Arabia were separated from Eurasia by the Tethys Sea. A land bridge connecting Arabia with southeastern Asia first emerged during Middle Miocene. Thus, since these eras immigrations of shrews and faunal exchanges between Africa and Eurasia are supposed. A further chapter (Dannelid) deals with dentition, especially that of extant genera but data on extinct forms are included. Both ecological and phylogenetical conclusions are presented very convincingly in detail and in overview as well. Evolutionary and several convergent adaptive trends in Soricidae are focused concerning tooth reductions, tooth modification, and pigmentation. Two subsequent chapters are devoted to the chromosomal configuration in shrews. At first (Zima, Lukáčová, Macholán) a general overview documents present knowledge on 52 species of Crocidurinae with diploid numbers ranging from 22 to 60 and 45 species of Soricinae with a range from 20 to 68. These are commented on in their basic karyotypes and intra- as well as interspecific variations. The unusual heterosomal system known from 8 *Sorex* species is also stressed with males possessing XY_1Y_2, while females have the normal XX. Then, a special chapter (Searle, Wójcik) is centered on the phenomenal chromosomal variability of the Robertsonian type in *Sorex araneus*. This species varies remarkably in diploid number from 20 to 33 at a constant fundamental number of 40. Several karyotypic races are characterized and possible phylogenetic relationships between these are reconstructed with special emphasis on interracial hybrid zones. Two consecutive chapters are devoted to results obtained from molecular methods. Protein variation (Ruedi) is focused at the specific and generic level of some Crocidurinae and Soricinae, and mt DNA diversities (Hausser, Fumagalli, Taberlet) in shrews are discussed as an additive tool for phylogenetic reconstruction among western European species and within karyotypic races of the *S. araneus* group. Physiological characteristics are also presented in a review (Taylor) concerning evolutionary patterns and energetics. Here, the generally higher metabolic rate levels and strict homeothermy of soricines are contrasted with lower rates in crocidurine species and their ability to enter torpor. These generally different adaptations are discussed in connection with

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geopraphical origin, phylogeny, environmental adaptation, reproductive traits, and other biological parameters. The two last chapters are devoted to ethology, e. g., social organisation (RYCHLIK) and mating biology (STOCKLEY, SEARLE) documented as results from observations in the field and in captivity as well. Four social systems are described in extant species in relation to communication, mating systems, rearing of young, predation avoidance, habitat use, etc. The mating systems are documented as different adaptive radiations concerning oestrus, mating behaviour, dispersal and spatial organization. Finally, an appendix (WOLSAN, HUTTERER) offers an updated list and systematics of the known 335 species in 23 genera with their common names, distribution, and brief habitat characterisation. A taxonomic index is also added.

This book certainly deserves close attention not only by specialists but also mammalogists in general. It contains a very large amount of details on the biology of these mammals and many aspects to evaluate and understand phenomena and characteristics. It is also intended to stimulate further research.

D. KRUSKA, Kiel

KLIMA, M. (1999): **Development of the Cetacean Nasal Skull**. In: Advances in Anatomy, Embryology and Cell Biology, Vol. 149. Berlin, Heidelberg, New York: Springer-Verlag. Softcover, 143 pp., 68 illustrations, 1 table. DM 186,– / US$ 119,–. ISBN 3-540-64996-4.

The author of this book on the nasal skull of the Cetacea was able to investigate embryological material from seven species of the Odontoceti (toothed whales) and three species of the Mysticeti (baleen whales). Because of the general rarity of appropriate cetacean material in collections around the world, the reader has to agree with the author's self-confident statement that his "contribution, even though incomplete, is probably the most thorough treatment of the topic for some time to come".

After a section dealing with the prenatal differentiation of the nasal skull, emphasis is paid to changes in position and form of structures in this part of the cranial skeleton, followed by an interspecific comparison of structures in embryonic and adult Cetacea. These sections are illustrated by very informative drawings and micrographs. Relevant structures are marked exclusively by abbreviations, which are listed and explained in a table at the beginning of the book. To appreciate the illustrations properly, the reader has to thumb through page upon page, a rather cumbersome procedure!

In the subsequent section the author deals with the question why the nostrils in whales "lie in the highest point of the cetacean body", but in the fossil ichthyosaurus the "nostrils were situated laterally on the skull, directly in front of the eyes". This difference may be related to the ventro-dorsal movement of the cetacean fluke and the right-left motion of the ichthyosaurous tail.

In a final section KLIMA comments on the systematics within the order Cetacea. His findings do not contradict the modern view that sperm whales have to be classified in a separate subfamily (Physeteroidea) from the other toothed whales, the Delphinoidea, and the baleen whales, Balaenopteroidea. The illustrations for this important section are taken from previous papers (KLIMA 1995 and MILINKOVITCH, 1995). The editors should have marked homologous anatomical structures by clear signatures (Fig. 67) and should have removed redundant abbreviations (Fig. 68).

P. LANGER, Gießen