

REVIEW

R. DESALLE, G. GIRIBET & W. WHEELER (eds.): **Molecular Systematics and Evolution: Theory and Practice**. Birkhäuser Verlag, Basel, 2002. ISBN 3-7643-6544-7. Price: CHF 158; EUR 104.

This book is the complement of the also recently published practitioner's manual 'Techniques in Molecular Systematics and Evolution' (see Book Notices, p. 346) and focuses on present progress in molecular systematics. It is divided into three major parts. The first section examines the utility of molecular information in systematics through empirical examples ranging from population, species and genus to order level. The reader is subsequently exposed to problems relevant to the understanding of hierarchical relationships around geographical races and species boundaries and shortcomings of analytical methods applied at the level of bird, mammal and insect orders such as limited taxon sampling and rapid radiations. The second section looks at problems occurring when using molecular data. First, current pitfalls associated with multiple sequence alignments are discussed, such as the high degree of subjectivity of manual alignments. Then the process of tree construction is explained by chapters on parallel computing, statistical aspects of maximum parsimony, maximum likelihood and distance methods. Finally, the role of molecular characters in constructing trees at and around the species level is examined, also in combination with classical morphological and new developmental data to make statements about the origin of evolutionary novelties. The final section is dedicated to recently developed computer-based tools to examine gene family evolution, and includes explanations on how products of various large genome databases can be correlated to evolutionary processes such as functional change. Empirical examples include the evolutionary history of repeated motifs in spider silks that are correlated with their mechanical attributes and horizontal transfer in microbial evolution.

The editors themselves already acknowledge the decidedly cladistic approach and the fact that a large number of authors are associated with the American Museum of Natural History. The editors also state that the book is primarily written to serve as a broad and updated information source regarding new approaches in systematics. Most of the chapters are indeed clearly written, easy to read and nicely illustrated. However, to completely meet with this goal, some empirical examples of studies on fungi, algae and plants and increasingly used modern techniques such as supertrees, parametric bootstrapping, Bayesian analyses and molecular dating should have been included, too.

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