

THE FAMILIES
AND GENERA
OF VASCULAR PLANTS

Edited by K. Kubitzki



The Families and Genera of Vascular Plants

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I *Pteridophytes and Gymnosperms*

Volume Editors:

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With 216 Figures

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Preface

The study of organismic diversity has witnessed an unprecedented upswing in the last two decades. The empirical basis of botanical systematics has been broadened far beyond the realm of macromorphological traits on which systematists have based their decisions for more than 200 years. Electron microscopy and phytochemistry have become standard tools, rendering evidence from micromorphology and micromolecules accessible to systematic research. The analysis of truly biological phenomena, like the interaction between various groups of organisms, or the strategy of reproduction, has been added to the already existing fields of floral and dispersal biology. The study of macromolecules permits genealogical reconstructions with the greatest precision. Considerable progress has also been made in the methodology for reconstructing phylogeny. All this is in consonance with the strong intellectual stimulus that the study of phylogeny seems to exert on taxonomists. It is small wonder then that a large proportion of the taxonomists' activities is absorbed by the attempt to reconstruct phylogeny at all hierarchical levels.

While botanists from Linnaeus to Bentham & Hooker and Engler & Prantl have synthesized the botanical knowledge of their time, such a synthesis has not been attempted more recently in spite of, or possibly rather because of, the rising flood and rapid diversification of botanical knowledge. Yet such a synthesis, by many considered as the foremost goal of systematic biology, would serve the needs of all those who are working in the fields of pure and applied biology, and are interested in and depend on taxonomic information.

Because of this situation, the idea to produce a modern, comprehensive treatise of vascular plant taxonomy at the generic level was proposed during a symposium held at the University of Hamburg in 1976. Several colleagues, among them V. H. Heywood, F. Stafleu, and the late R. Dahlgren, took part in shaping the outline of the work. At later stages, D. M. Bates, K. U. Kramer, P. S. Green, P. Goldblatt, and S. Shetler offered invaluable assistance in various matters. Rolf Dahlgren (1932–1987), Professor of Botany at the University in Copenhagen, had an especially important share in developing the ideas leading to the present work. He also devoted much of his time during his last years to the preparation of the volume that is to deal with the monocotyledons. Without his enthusiasm and ardour, work on this book would never have started. With deep gratitude the present volume is dedicated to his memory.

It has been our intention to bring together in this work information from all disciplines important to modern taxonomy. At the same time, a complete inventory of genera is attempted, including means for their identification. Practical usefulness is considered to be of prime importance; therefore the keys are designed as tools for identification rather than for expressing phylogenetic relationships. For the same reason useful generic revisions, where they exist, are cited. Only a limited number of genera of all vascular plants are treated in the present volume, and therefore rather complete generic descriptions were permissible. It must be noted, however, that in the following volumes the descriptions can only be diagnostic, due to the sheer number of angiosperm genera.

In striking departure from accepted custom it has been decided to arrange the families alphabetically within each major plant group. The rationale for doing so is our awareness of the weak basis of phylogenetic reconstruction in vascular plants (and especially angiosperms). In spite of the great progress that is being made in this field, the systematic position of many families is still unknown or uncertain. The delimitation of major subgroupings of the angiosperms is still unsatisfactory, and even their basic separation in dicotyledons and monocotyledons has been challenged! In establishing phylogenetic schemes the taxonomist very often is faced with problematic choices and has to opt for one of several equally tenable alternatives, or even for an ill-founded solution. The sequence of families adopted in most systems of classification too often veils our ignorance, and it seems scientifically more honest to us to point explicitly to competing hypotheses or to gaps in our knowledge. Thus we try to avoid an undesired authoritative

influence that might adversely influence the further development of plant taxonomy. An alphabetic arrangement of families, however, does not mean that consideration of relationships of families and orders is ignored. On the contrary, the different views on the classification and phylogeny of the major groups are evaluated in special sections, and each family treatment includes a paragraph discussing its affinities with other families.

Unfortunately, it is an inherent weakness of multiauthor works that a single missing contribution can delay the completion of the whole. Thus, it took much longer than originally anticipated to complete this volume. I therefore have to apologize for the delay in publication of those contributions that had been submitted by the original target date. For many groups no suitable collaborator could be found. In these cases the treatments were prepared by the editors, with apologies for what may seem presumption; however, necessity for completeness dictated such a procedure.

Generous support for the preparation of this and the subsequent volume was received from the Volkswagenstiftung through the Joachim Jungius-Gesellschaft der Wissenschaften in Hamburg, for which I am particularly grateful. Special thanks go to the volume editors for their meticulous work and to the authors, who generously provided their expert knowledge of the taxa dealt with. I am also deeply indebted to Dr. E. Götz for taking care of the illustrations and especially for providing numerous fresh illustrations of conifers, and to all those who very generously assisted with the photographic illustrations.

Finally, I wish to extend my indebtedness to the Springer-Verlag for the very careful editing and fine production of this volume and to Dr. K. F. Springer for the personal interest he took in this work.

Hamburg, Summer 1990

K. KUBITZKI

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