

AUTHOR'S PREFACE

Sometime in the early 1980s I was asked by the late Charles Russell Metcalfe to prepare a compendium on orchid anatomy along the lines of the already published plant families in *Anatomy of the Monocotyledons*. Metcalfe, whom I admired, was Keeper of the Jodrell Laboratory at the Royal Botanic Gardens, Kew, and a prominent plant anatomist. He was aware that many innovations had taken place during the 50 or more years that had elapsed since a comprehensive account of orchid anatomy had appeared. Technology had advanced appreciably and newly evolved ways of understanding systematics had been applied to unravelling and answering botanical questions. Thus, the intent of this work is to provide an up-to-date analysis of the vegetative anatomy of the orchid family (Orchidaceae), to suggest any taxonomic implications of the application of anatomy to questions of systematics, and to present the results in a systematic format providing a tool for systematists, students, and others to whom orchid anatomy and systematics are relevant.

Heretofore, the only comprehensive body of work on orchid anatomy had been summarized by Hans Solereder and Fritz Jürgen Meyer in their seminal compilation of 1930 as part of the series *Systematische Anatomie der Monokotyledonen*. Solereder was Professor of Botany at the University of Erlangen, Germany, and Meyer held a similar position at the Technical Institute in Braunschweig, also in Germany. Solereder began the work and devoted more than 10 years to it. Besides compilations and interpretations of existing literature and his original observations, noted in the text by an exclamation point, '(!)', Solereder illustrated salient features. Following Solereder's death in 1920, Meyer assumed editorship, revising, updating, and completing Solereder's work. The original product was published in German, translated into English by A. Herzberg, and edited by B. Golek as part of the Israel Program for Scientific Translation. The English version was published in Jerusalem in 1969.

Descriptions in Solereder and Meyer's anatomical treatise were organ-based, however, making application of their work cumbersome for systematic studies. There were no indices for taxa nor coordinated lists of literature references; the bibliography was condensed into paragraph form and the entries were listed chronologically rather than alphabetically by author. I have expanded the earlier efforts of Solereder and Meyer and presented results in a systematic format: by incorporating taxonomic categories, listing literature and authors' names alphabetically and chronologically, providing an evaluation for each taxon described, and adding results from botanical literature and research since 1930. At the end of the introductory portion for each taxon described, I have added selected names of the chief ornamental species represented in the taxon and listed species of putative medicinal value extracted from the compilations of Lawler (1984), Gutiérrez (2010), and Singh and Duggal (2009).

It may be of interest that, prior to my study, an earlier unpublished work on the anatomy of orchids had been attempted by Edward S. Ayensu while he was associated with the Smithsonian Institution. His efforts lapsed owing to his feeling that he should put his energies into something else and to the lack of collaborators who, almost correctly, considered the anatomy to be an endless task. There are estimated to be more than 26,000 species in the orchid family! I must confess that during my writing, at times, I was reminded of the Herculean endeavours of James A. H. Murray, compiler and editor of the great *Oxford English Dictionary*, who spent 50 years on it! My own research began in 1983 while I was Professor and Chairman of the Department of Botany at the University of Florida, Gainesville, and continued in Florida after my 2002 retirement, studying at The Kampong, Coral Gables, and at Florida International University, Miami and North Miami.

I have chosen to follow the format developed by Metcalfe in the Monocotyledon series he initiated, including his anatomy of Gramineae in 1960 and, subsequently, anatomy of Cyperaceae in 1971. The monocot series has continued, with the latest publication in 2002 being Volume IX on Acoraceae and Araceae by Richard C. Keating.

To provide a framework for this publication I have adopted the classification utilized in *Genera Orchidacearum* (Pridgeon *et al.* 1999–2014). It is a fortunate circumstance that my work proceeds almost simultaneously with the last volumes of *Genera Orchidacearum*. Resources for my work are my original

published research papers as well as publications of other botanists for groups unrepresented in my studies.

I consider it an honour and pleasure to have been chosen to undertake this wholly enjoyable task. My goals are for this treatise to enrich the body of information available on orchid anatomy, to serve as a lodestone for future studies on this, arguably, the largest of flowering plant families, to provide a source of taxonomic detritus to be picked over by systematists, and to unfold the rich fabric of orchid structure as it applies to the biology of orchid life. My hope is to reach into the distant future with information we need to sustain that which we know and to promote that which is waiting to be known about the most seductive plants in the world.

W.L.S.