

Preface

Angiosperms are the most diversified plant group in the world, being represented by *ca* 300,000 species in about 400 families. Like all of Life, including ourselves, they have had their own history and undergone many evolutionary stages before they arrive at their current forms. The origin of Angiosperms (flowering plants) has been the subject of much dispute because this is a key event in the history of life and has a far-reaching influence on our understanding of relationships among seed plants as a whole as well as within the angiosperms. Despite all efforts and investigations on pre-Cretaceous fossil plants, most of palaeobotanists accepted angiosperms only from the Cretaceous and younger strata. This not only contradicts the results of molecular analyses but also makes angiosperms as if out of nowhere.

I have been working on Mesozoic fossil plants in the past two decades, during which time I have studied a number of fossil plants. Some of these fossil plants have been published as Jurassic angiosperms, and, unsurprisingly, many questions and doubts have been raised about them. These questions need to be addressed seriously and journal papers do not provide sufficient space to compare and relate these early angiosperms. In this book, these pioneer angiosperms are documented in detail, sometimes with new specimens not studied before. Also, I propose a criterion to identify angiosperms that could be adopted in palaeobotany. My aim is to improve clarity and objectivity of judgment about what constitutes an angiosperm before studying. The evolution of angiosperms is evaluated in the background of seed plants or even in whole land plants. The general patterns of plant evolution are elaborated.

In Chap. 1, a brief introductory overview of angiosperms is given. In Chap. 2, some of the already suggested ancestors of angiosperms are noted. Chapter 3 discusses the various features scientists have used to define angiosperms, and an index character for fossil angiosperms is selected. Chapter 4 gives a brief summary of the geological and biological backgrounds of fossil plants to be elaborated upon in later chapters. Chapters 5 through 7 document in detail several angiosperms or possible angiosperms found in the Early Cretaceous and Jurassic of northeast China and south Germany, and these chapters form the core of the book. For those

interested in fossil evidence, these chapters may be your favorite. Chapter 8, based on current knowledge, raises a new hypothesis on flower formation and discusses possible origin and evolutionary history of angiosperms and land plants. For those interested in general evolution patterns of plants, especially reproductive organs, this may be your favorite chapter. Chapter 9 summarizes the results as a whole and provides suggestions for future study in related fields.

There are 671 pictures and drawings in 166 figures. These pictures represent the fossil plants in a way more direct and objective than words; the latter more or less reflects my personal inclination in interpretation as well as wording. In total, 642 references are cited. The readers can refer to these references for further information.

It is expected that this book, like many others, will have certain controversial aspects. The publishing of this book can only serve as a starting rather than a concluding point for works on these fossils as well as the origin of angiosperms. Everything in this book, including criteria, definitions, interpretations, and conclusions, is open to discussion. Readers are always welcome to interpret the data in this book from their own perspectives. I hope the readers can feel free to send me their opinions. I believe the future study of early angiosperms will benefit from such feedback and interaction.

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