

PREFACE

The reproduction system of flowering plants (angiosperms) provides an extraordinary advantage, which has led to the massive dominance of this division over any other plant division on the planet. At the centre of angiosperm reproduction is the carpel that protects and nurtures the seeds developing inside until they are ready for dispersal. Different species have developed different strategies for efficient seed dispersal involving both short-range and long-range aims allowing widespread colonization.

While angiosperms represent an evolutionary success story by themselves, fruit and the seed that they produce have been crucial for human civilization and particularly for crop domestication during the Neolithic revolution. Plant research over the last couple of decades has beautifully demonstrated how fruit provide excellent model systems to move crop improvement even further to increase the yield. Such advances are required now more than ever in order to maintain a sustainable production while meeting the increasing demands from an expanding population.

Fruit are, however, not only interesting from an agronomic point of view. Both flowers and fruit are also ideal systems to study cell differentiation processes and tissue-specific development that can answer general questions regarding the development of multicellular organisms. In this book, the aim is to cover the recent impressive advances of research into fruit development and seed dispersal. Moreover, the objective is also to review the history of crop domestication as well as the most novel discoveries in optimizing the development of fruit of significant agricultural importance.

The opening chapter describes the evolution of carpels and fruit among the flowering plants and how this has led to a tremendous biodiversity of forms in different angiosperm lineages. The following chapters describe in detail the genetic, hormonal and molecular knowledge on the different stages of development from the unfertilized flower till the mature fruit including gynoecium development, ovule development, fruit initiation and the post-fertilization fruit development. Chapter 6 reports on exciting new insight to long distance seed dispersal, while Chapter 7 emphasizes the importance of controlling seed dispersal for the establishment of agriculture and human civilization. The eighth chapter provides a compilation of the most recent discoveries in development and ripening of the agricultural important fleshy fruit and finally, Chapter 9 shows how precision technology can be employed to create seedless varieties in certain crop plants.

The topics that are covered in this volume are intended to provide in-depth knowledge of a wide scope of aspects relating to fruit biology. As such, this book contains information that should be of interest to scientists ranging from experimental biologists to agronomists pursuing technology to exploit the knowledge for crop improvement purposes.

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