第二版前言

植物科学向来是生物学中的一个基础领域。在过去20年中，随着大量新信息的涌现使该学科的重点发生根本的变化。这些新信息多数源自分子生物学技术，使人们对植物各种生命过程的理解更加深入，使植物生物学在各个方面都得以进一步的阐明。基因组分析和基因转移的成功开创了植物生物技术操作的可能性，这在几十年前是不可想象的。随着对生物多样性认识的深化，生态学理论得到进一步发展，对植物与植物间、其他生物间以及植物与其他生物间的相互关系有了新的启示。植物育种工作者、生态学家以及许多其他领域的人们都已真正地意识到正不断减少的植物资源的经济和艺术价值。

本书涵盖了现代植物生物学的所有领域。在撰写此书时，我们始终铭记在心的是：面对一系列高级课程的大学生需要一部可接受的课本，使之能洞悉植物科学的全貌；它的深度与广度应适合植物生物学专业的一年级和二年级大学生，专门化知识有待于通过高级课程去学习。本书还旨在为分子生物学家和生物技术学家提供一条可行的途径，使他们对所工作的对象有一个初步的了解，为深入认识提供基础背景。它既可帮助大学生们学习，也使其他领域的专家得以了解植物科学。本书和所有精要速览系列图书一样，在每个部分前列出要点，作为复习速览，帮助读者在读完每一部分后再加以记忆，如在考试前。我们将名词术语在能够理解的前提下削减到最低限度，尽可能减少采用老的生物学知识，以求本书能适用于期刊工作者、环保工作者以及那些关心植物生物学重要事件或对其有真正兴趣的人们。

本书第二版在保持第一版的格式和风格的基础上，对全书的一些结构做了调整，并从头至尾对内容进行了更新。本版的主要变化是增加了B部分——认识植物。该部分是为了向读者介绍现代植物科学中的主要技术，已取得研究进展的基础。因此，我们必须要一个“技术”部分，使读者能够回顾和追溯，我们认为很有必要对这个部分有一个深刻地理解。在本书的其他部分，对章节顺序做了调整，将介绍分类大纲、与水的关系、代谢等部分提前，将在第一版中分开的花和种子部分归并到一起，使得能更好地将结构、功能和生理学联系起来。分子技术在第一版中占了较大的篇幅，此版中更多。由于分子技术已渗透到整个植物科学中，在新版中纳入了分子技术和其他的进展，使得有些部分改动较大，有些部分重点也作了更改。我们的指导原则仍然是让大学生了解植物科学中的最新研究进展，学习更多的知识，而不仅是对该多样化和快速发展学科的一时兴趣。

致　谢

我们首先要感谢我们的家人在整个写作过程中给予的大力支持，Margaret Evans帮助完成了图解部分，我们的同事和助手给予了建议、指出相关工作的问题、做出评论，全面支持我们的著作工作，有时甚至是无意识的。还要感谢Taylor & Francis出版集团的诸位编辑，尤其是Liz Owe，给予的鼓励、支持和提出的很多宝贵意见。我们还要感谢我们在Aberdeen和Aberystwyth的就读时代，那些引导我们进入植物生物学领域的人以及多年来我们在Oxford Brookes教过的学生们，他们对本书的选材有着重要的作用，没有他们的参与，我们不可能以简明易懂的方式来表述植物科学的基本纲要。

PREFACE TO SECOND EDITION

Plant science has always been a fundamental area of biology, but the emphasis in the subject has changed radically in the last two decades with a plethora of new information, much of it deriving from techniques of molecular biology. This has deepened our understanding of plant processes and has illuminated almost all aspects of plant biology. The ability to analyze genomes and to transfer genes has opened possibilities for plant biotechnology and genetic manipulation undreamed of in earlier decades. There have been advances in ecological knowledge that, with increased awareness of the richness of biodiversity, have shed new light on the relationships between plants, other organisms and their interdependence. Plant breeders, ecologists and many people outside plant biology have become acutely conscious of the aesthetic and economic value of the resources, so often dwindling, of the plant kingdom.

In this book we have covered all these aspects of modern plant biology. We have written it keeping in mind an undergraduate faced with a range of advanced courses, needing an affordable text that gives insight into the whole range of plant science. Its scope and depth are suitable for a first and second year undergraduate student of plant biology; specialism will need an advanced text. We have aimed it also at molecular biologists and biotechnologists needing an accessible route to understanding the basis of the systems on which they work. It is intended to provide the fundamental background required for true understanding. It should aid undergraduates in their learning and give insight for specialists into areas of plant science not their own. As in all Instant Notes books we have provided 'Key Notes' at the start of each section. These are intended solely as revision notes, e.g. before an exam, to prompt a reader's memory after reading the section fully. We have kept technical and jargon terms to a minimum needed for understanding and any such term is defined at first mention. We have assumed minimal previous knowledge of biology and hope that the book will prove useful to journalists, environmentalists and those with a genuine interest in the key issues of plant biology as they seek to be informed about the issues that they deal with.

For the second edition of this book we have made a number of structural changes and have updated the text throughout while keeping to the format and style of the first edition. A major change for this edition is adding Section B, Understanding Plants. This is designed to introduce readers to the major techniques in modern plant science and indicate the basis on which advances are being made. As such it is, inevitably, a 'technical' section but we hope one that the reader can refer back to. We feel it is needed to foster a critical understanding of the subject. In the rest of the book we have changed the order of the sections, introducing an outline classification and water relations and metabolism earlier and putting together the topics on flowering and seeds that had been separated in the first edition. This has allowed us to integrate structure, function and physiology more closely. Molecular techniques loomed large in the first edition and loom larger now. We have incorporated these and other advances throughout this new edition as they permeate all of plant science. The result is that some parts have been substantially rewritten and the emphasis has changed in many places. Our guiding principle remained the needs of an undergraduate wanting to understand all the latest advances in plant science, while remaining accessible to any with more than a passing interest in this diverse and rapidly moving subject.

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