

Preface

We live in an age where we are more dependent upon our understanding of plants than ever before. With the world human population exceeding 6 billion, never has it been more important to be able to feed reliably so many people. Yet, paradoxically, it is an age when interest in plant biology is at an all-time low. The plant biology content of GCSE and A level biology in the UK has become minimal as more and more human biology is added to the curriculum. Funding of plant science research has become minuscule compared to that commanded by the medical sciences. As a consequence, universities employ fewer plant biologists and as a knock-on effect plant biology is scarcely offered as part of a biology degree any longer. Where plant biology is offered, the lecture material can be badly handled and few students are prepared to study it into their final year. But plant biology has to be one of the most interesting subjects in the whole of biology. Plants are central to life and play a crucial role in dictating the diversity of life we currently enjoy on this planet.

To address this problem, what is not needed is another plant physiology textbook. There are many volumes which do the job of teaching plant form and function very well. But what often comes across in these texts is that plants are stale and irrelevant. Somewhere, the interest, appeal and relevance to the real world has been lost in the detail. If you don't think this is true, then look no further than the most amazing enzyme of plants, RUBISCO. Most books dive into the sub-unit arrangement and its

carboxylase/oxygenase properties, but there is nothing to impress the reader that we are discussing the enzyme that supports virtually all of life currently on this planet! RUBISCO is the marvel enzyme of the universe, and yet most students never realize this. Then consider photosystem II, a complex enzyme which splits water to provide an electron donor for a chlorophyll molecule and allows non-cyclical photophosphorylation – but the fact that it generates all of the oxygen we need to breathe and supports the only other known biological autotrophic pathways known in bacteria is lost. So what is, on the face of it, merely a tricky biochemical pathway, suddenly becomes a vital component of our everyday life. Plant biology is amazing in so many ways that this book barely scratches the surface. Having said that, the most interesting and remarkable topics on plant biology have been hand-picked to give students the best chance possible to study plants in all of their glory. The book deliberately steers clear of in-depth discussion of molecular biology and the explosion of knowledge this is providing. This is because much of this knowledge is incomplete and as yet does not give an interesting insight into the mechanisms of plant life. Where molecular mechanisms are discussed, they are always related to the whole plant function, as this is primarily what the text is concerned with – plants.

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July 2007