

## Book Review

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*Essential Fungal Genetics*. D. MOORE AND L. N. FRAZER. Springer. 2002. 357 pages. ISBN 0 387 95367 1. Price £56.00 (hardcover).

In writing this book the authors have engaged in a daunting task since, from the title, the reader might be tempted to make an immediate comparison with the classic 'Fungal Genetics' by Fincham, Day and Radford. In truth, the two books are quite different both in style, content and intent, but the authors should be congratulated on writing a book in which a comparison can be contemplated and from which they emerge with credit.

The authors attempt a succinct review of the genetics of the fungal kingdom and address an imbalance in which animal and plant genetics receive the majority of attention. There are 10 chapters, each starts with a 'revision concepts' section which lays out the bones of the topic to be dealt with in that chapter. Roughly speaking about half the book deals with classical genetics and the contribution that fungi have made towards understanding basic genetic phenomenon. The remaining chapters deal with molecular developments and their application in mapping, analysis of populations and molecular phylogenies, and morphogenesis and differentiation. The fungal species that are used to illustrate these topics are not confined to the model organisms. Clearly, yeast, *Neurospora* and *Aspergillus* figure prominently but other species, especially basidiomycetes, are used to re-inforce the authors assertion that: 'no matter how much we learn about *Saccharomyces cerevisiae*, it is not the end of the story [and] ... it is not adequately representative of filamentous fungi'. Overall the book lays the foundations of some genetic principles that students traditionally find difficult, but leads on into areas which are at the forefront of current research activity in fungi.

Undergraduate students will derive much benefit from this book. The clear explanation of genetic concepts and basic molecular biology ensures this. There

are worked examples of the analysis of genetic data to illustrate these ideas. By choosing examples that are firmly embedded in fungi they will also derive an appreciation of diversity amongst fungi. The authors have deliberately decided to increase readability by omitting detailed references within the text. Instead, at the conclusion of each chapter, a variety of references, some reviews, some original articles and some of historical importance, are supplied together with key websites. The book cannot be used to track down original sources easily, although cited reviews will, if pursued, lead to this information, but there is no denying that the book is very readable.

There is much to intrigue postgraduate students too. For example, the systematic chapter contains a valuable section on horizontal gene transfer which is potentially very important in fungi where hyphal fusion, recognition of self and nuclear exchange play such a prominent part in fungal life cycles. The clustering of genes involved in secondary metabolism might constitute an intriguing example of a 'selfish cluster' of genes depending upon horizontal transfer for their survival. In the same chapter, an account of fungal evolution in cultures of *Fusarium* grown in continuous flow fermenters to produce Quorn™, told of the discovery, new to me at least, that there are bursts of mutation producing unwanted colonial mutants. These bursts occur approximately every 30 generations and have also been demonstrated in cultures of *Aspergillus niger* and *A. nidulans*. As the authors observe, bursts of mutation within a fungus that has been growing in a constant environment requires an explanation but none is yet available.

This book is highly recommended. It is both readable and informative. Scientists at all stages of their careers will derive great benefit from this survey of fungal genetics. Yes, as an update to the library shelf currently occupied by 'Fungal Genetics' and 'Mycogenetics' it is much to be welcomed.

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