

Book reviews

Books for consideration to review in this section should be posted to the Editor-in-chief.

Rating system

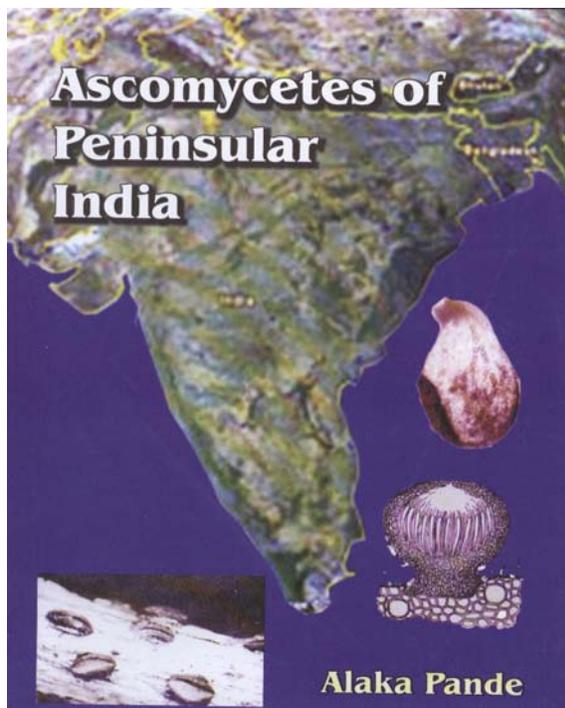
- ★★★★★ Exceptional/brilliant.
- ★★★★ Excellent.
- ★★★ Good.
- ★★ Has merit.
- ★ Not worth reading.

Ascomycetes of Peninsular India

by Alaka Pande

Scientific Publishers (India), 2008

ISBN 978-81-7233-519-9



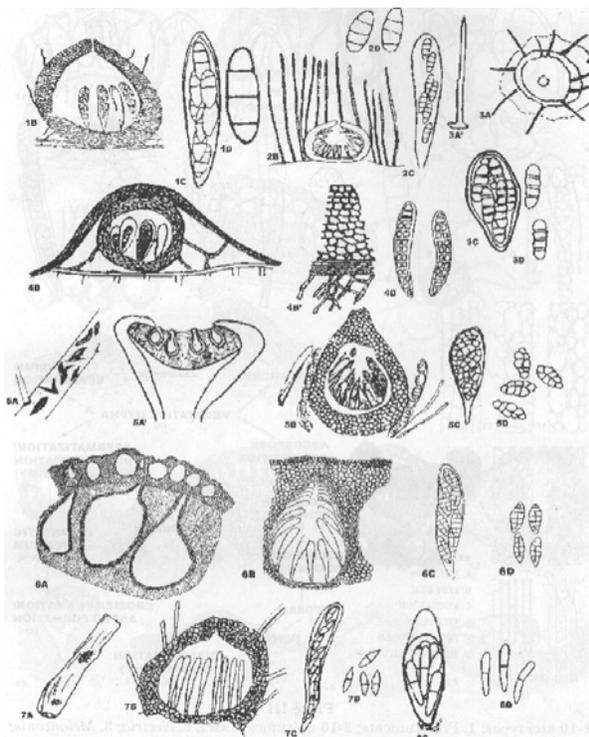
This book is styled on the books by Ellis and Ellis on Fungi on Land Plants and so on. It has an opening chapter where it discusses how and why to study ascomycetes. Details include how to collect, process, preserve and prepare herbarium specimens. Particularly useful is the section on how to examine material where it details important mountants that can be used to

examine ascomycetes and the stains that should be used. This is rarely outlined in books these days, but is very useful to new students; this book has the important ones including formulas.

The major section of the book provides descriptions habit and locations of ascomycetes from the Peninsular India. Not everyone is likely to know what Peninsular India is and southern India might have been better in the title, however the area is detailed in the book. In total 1410 species/subspecies, belonging to 403 in 114 families are detailed. The classification is rather dated but does follow the latest Dictionary of the Fungi (9th edn, 2001), and since entries are well indexed this should not present any problems. Entries include sub class, orders, and families and descriptions are provided for each of these. Where there is more than one order or family keys are provided. Keys to genera in families are also provided. The keys are generally simple and not much data can be gathered through these.

Descriptions of genera are provided and the species descriptions are short to modest. There are 50 plates illustrating over 500 fungal species. The reproduction of the drawings is not very good but necessary details can be resolved. This compilation does not claim to be a complete guide to ascomycetes of Peninsular India as many specimens were not studied or authenticated. It does however provide a base work for others to add on to or alter. There are also numerous new combinations, nom. nov.

and some new species are also described in this book.



The book is also provided with a glossary and species Index, plus an extensive reference list.

A huge amount of work has gone into compiling this book and it should be purchased by all mycologists for its wealth of information.

Rating: ★★ ★

Recommendation: The book should be available in all Universities and colleges where mycology is taught.

Cost: \$ 135

Order from: www.scientificpub.com

Aspergillus systematics in the genome era

Edited by R.A. Samson & J. Varga

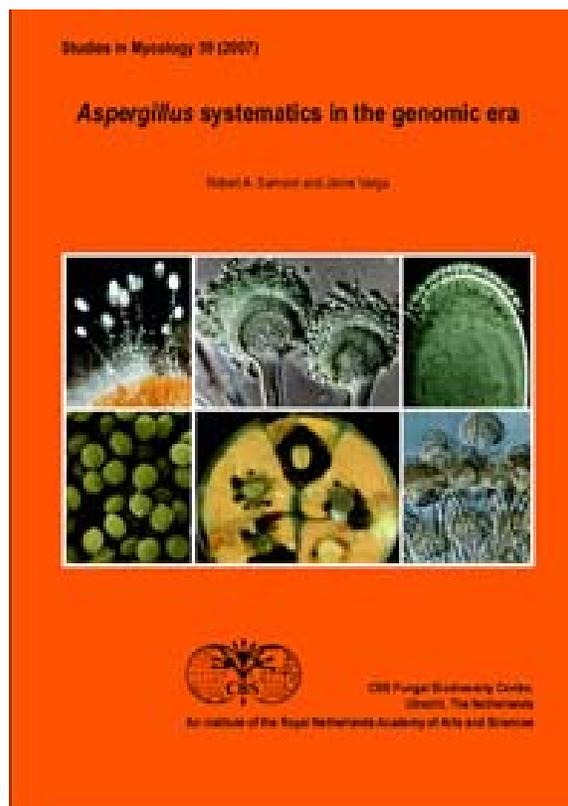
Studies in Mycology 59, 2007

ISBN 978-90-70351-69-4

As one has come to expect in the journal "Studies in Mycology", this is an outstanding compilation of papers on the topic of *Aspergillus* genomics. The 14 Chapters in this issue discuss various aspects of taxonomy and biology of *Aspergillus*, ranging from the current status of species recognition, strain

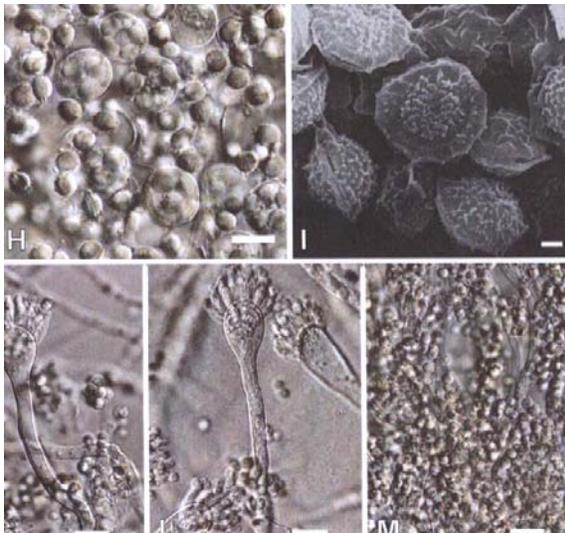
recognition using genomics, secondary metabolites in species recognition, and important mycotoxins. Taxonomy and genomics of various groups of *Aspergillus* are, however, dealt with in most of the chapters.

I tend to discourage my students who come across *Aspergillus* species from working further on these taxa. This is because identification using conventional approaches is very difficult. The question in mind as I read through this was. *Will this issue improve the chances of my students identifying Aspergillus species?* Read on for the answer.



Any book dealing with the taxonomy of *Aspergillus* must be highly prized as it is a very economically important genus of microfungi. Important metabolites and toxins are produced by *Aspergillus* species and many entities might like to patent their products; the taxonomy of the genus is therefore extremely contentious. Any book dealing with and making recommendations that could stabilize the taxonomy of *Aspergillus* and put forward ways to identify species is very important. This book achieves these desirable aim and therefore is a very important text.

The first paper deals with the current status of species recognition and identification in *Aspergillus*. It reviews the history and importance of *Aspergillus* taxonomy and importantly provides a list of new taxa described since 2000. There is an important discussion on the roles of molecular, morphological and physiological characters in species recognition. The genomics approach, especially so called “DNA barcoding” is discussed in more detail. Paper 2 asks the questions what can comparative genomics tell us about *Aspergillus* species concepts. Four cases studies are detailed to provide answers. They conclude that it is unlikely that genomics will solve all taxonomic problems in the group but hope that genomics can provide an arsenal of data that can aid more accurate delineation of species.



Sexual and vegetative compatibility genes are discussed in Chapter 3 and I found this chapter rather hard going. Paper 4 advocates using secondary metabolite profiles, growth profiles and other tools on top of morphological and molecular approaches for species recognition. If all approaches are used a polyphasic classification can be developed for *Aspergillus* species. Paper 5 deals with the clinically important *Aspergillus* species and is significant in that it makes recommendations for clinical species recognition. This is followed by a brief paper (6) on strain typing, while Paper 7 deals with *Aspergillus* diversity in agricultural products. Two rather nice color

micrographs of *Aspergilli* in culture are presented and the polyphasic approach to species identification is subscribed. Paper 8 deals with nomenclatural considerations and is significant in that it makes proposals for describing new taxa in *Aspergillus* and their teleomorphs.

Paper 9 provides the most significant data in the issue. Important recommendations are made here concerning *Aspergilli* species concepts and these are applicable to many speciose genera. Topics dealt with are 1) which and how many genes are required to delimit species; 2) how to deal with dual nomenclature; 3) standards for describing and storing type cultures and, 4) required databases. These section discussions are followed by 14 important recommendations, many of which should be followed by all mycologists when describing new species in any, but particularly speciose genera.

The polyphasic approach to species recognition is emphasized throughout this issue and the remaining Chapters deal with polyphasic taxonomy in various *Aspergillus* sections; Paper 10, section *Candidi*; Paper 11, section *Clavati*, Paper 12, section *Usti*; Paper 13, black aspergilli; Paper 14, section *Fumigati* and its teleomorph *Neosartorya*.

This book is fantastically illustrated with numerous pages of color plates – the micrographs are wonderful. I recommend that every mycologist and every library associated with a mycologist or plant pathologist should have this book on their shelves.

Returning to the question concerning my student’s chances of identifying *Aspergillus* species – well I guess identification is beyond the average mycologist unless they have plenty of time and funds to carry the experiments needed for the polyphasic approach.

Rating: ★★★★★

Recommendation: Should be available in all libraries having any association with mycology research or students of mycology, biotechnology and plant pathology.

Cost: € 65

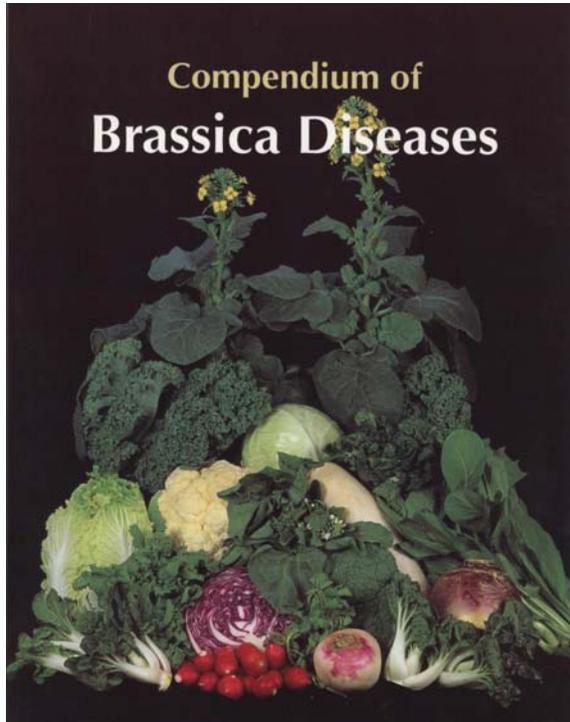
Order from: http://shop.fungalbiodiversitycentre.com/books_and_publications/59.html

Compendium of Brassica Diseases

Edited by S.R. Rimmer, V.I. Shattuck and L. Buchwaldt

APS Press, 2007

ISBN 978-0-89054-344-3

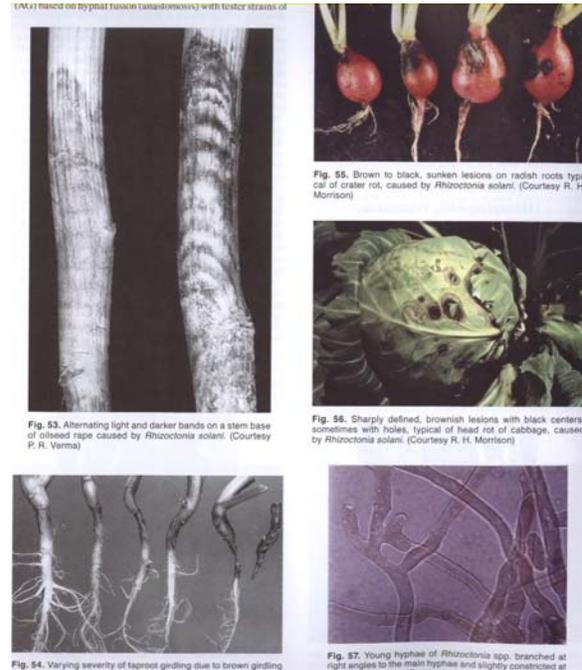


Another excellent Compendium in the series by APS. A must for all plant pathologists, extensionists, farmers and even gardeners. The book claims to be a thorough, authoritative, and practical reference guide for people engaged in diagnosing and managing disease problems in brassica crops. This delightful nicely illustrated colourful guidebook to the diseases of *Brassica* certainly achieves this claim.

The book is divided into 3 parts: Introduction, infectious diseases and noninfectious diseases. The introduction deals with the relationships and taxonomy of *Brassica* species. Showing my ignorance - I certainly didn't know that radish and turnips belonged to *Brassica* group. The major section is on infectious diseases. The first parts deals with diseases caused by the fungi; the lovely leaf spots are beautifully illustrated (only mycologists can say this) and each section provides symptoms, casual organisms the disease cycle and management. Of course the book also deals

with diseases caused by bacteria, mollicutes, viruses and nematodes.

The final section deals with noninfectious diseases. I was surprised to find that certain symptoms are caused by air pollution or other environmental effects. Nutritional deficiencies can also effect *Brassica* and this are nicely shown.



As usual the books are provided with a good glossary of terms and an excellent Index

Rating: ★★★★★

Recommendation: For all libraries where plant pathology and extension are taught. Should be available on all mycologists' bookshelves. *Brassica* farmers and general gardeners would also find this valuable.

Cost: \$49

Order from: www.shopapspress.org

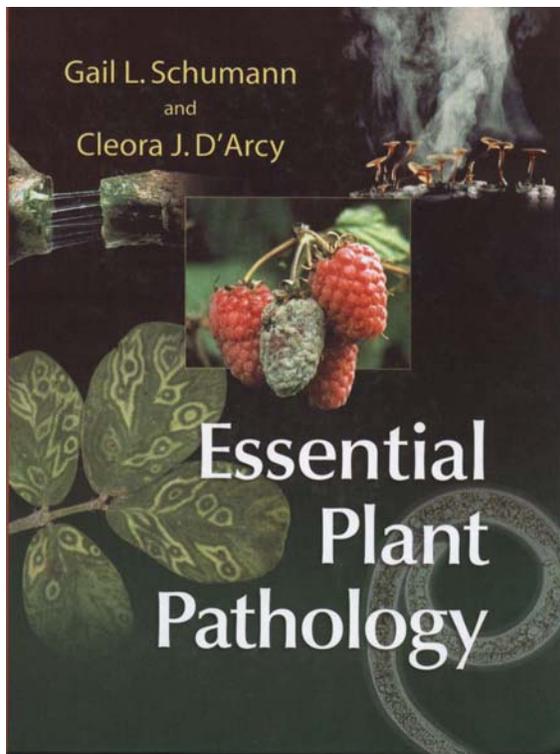
Essential Plant Pathology

G.L. Schumann & C.J. D'Arcy

APS Press, 2006

ISBN 978-089054-342-9

What a fantastic book! If you are a student of plant pathology this is what you need and if you are a lecturer and you get the CDs Mycology Volumes 1 & 2 from APS press



you have 99% of the material you will need to prepare a comprehensive animated course in Plant Pathology. So why is this book so good. Its the way its laid out! The pages of each chapter are arranged in two columns. The inner column is text, and summaries in bold type are provided after each section. These are available so you can decide if you need to read the text. The outer column contains images, illustrations, content summary boxes, and disease classics. The disease classics are summaries of important diseases usually studied in introductory plant pathology courses. The book also provides case studies, short interesting snippets under “Did you know”, and good illustrative diagrams.

A CD is also provided with the book and here one can find the illustrated glossary, plant disease lessons, exercises and words to know. The disease plant lessons are particularly good providing detailed information, images and diagrams on various important diseases. I used these as a filler to finish off a mornings lectures (30 minutes) at a workshop on plant pathogens and it went down well. The book also provides internet research and links and these are well thought out and useful.

Fungi are composed of living filaments called hyphae, which form a mycelium. The cells of hyphae have nuclei, mitochondria, and other organelles. The cell walls contain chitin.

In many fungi, the cells of the hyphae have cross-walls, called septa. A septum is a divider, such as the septum that separates the nose into two nostrils. Hyphae with cross-walls are said to be **septate** (Figure 2.4A). In some fungi, however, the hyphae are **nonseptate** (aseptate or coenocytic) (Figure 2.4B) and contain multiple nuclei. Other fungi have a variable number of nuclei between septa, and still others have a pair of nuclei between septa. The structure of a fungal septum varies, depending on the fungal group. In some fungi, cellular material, including nuclei, can pass through a pore in the septum. Thus, it is not always possible to identify a single “cell” of a fungus. It also is not possible to see fungal nuclei without special stains. (Novices often confuse oil droplets in the cytoplasm with nuclei when hyphae are viewed with a microscope.)

For diagnostic purposes, the presence or absence of septa in the hyphae is an important feature that helps determine to which of the major fungal groups an organism belongs (see the table on this page). In some fungi, a hump-shaped structure, a **clamp connection** (Figure 2.5), is present on some septa; this characteristic identifies these fungi as members of one specific group, the basidiomycetes.

Fungi reproduce by means of **spores** (Figure 2.6). In early studies of fungi, the spores were called seeds, by analogy with the seeds of plants. Spores are important for the survival and dispersal of fungi. Most hyphae are fragile and cannot withstand environmental extremes, particularly desiccation (drying out).

Most fungi produce at least two kinds of spores: sexual and asexual. Sexual spores are produced in the same sexual cycle that occurs in all eukaryotic organisms. The key events in the sexual cycle (Figure 2.7) are

- **plasmogamy**: fusion of cells, bringing two sexually compatible haploid nuclei together in one cell
- **karyogamy**: nuclear fusion, forming a diploid nucleus
- **meiosis**: formation of four genetically recombined haploid nuclei from a single diploid nucleus

The purpose of sex in fungi is the same as in other organisms: to provide genetic diversity for the continued ability of the species to adapt to changing conditions. This adaptability has enabled some fungi to overcome plant resistance genes selected by plant breeders to protect plants from infection, and it has enabled some fungi to become resistant to certain fungicides.

Fungal group	Hyphal characteristics
ascomycetes	septate hyphae
basidiomycetes	septate hyphae; some but not all species have clamp connections
zygomycetes	nonseptate (coenocytic, aseptate) hyphae

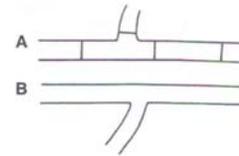


Figure 2.4. Septate (A) and nonseptate hyphae (B). Note the cross-walls in the septate hypha.



Figure 2.5. Hypha with a septum and a clamp connection (arrow).



Figure 2.6. Fungal spores of various shapes.

When I first opened the package containing this book, I thought “oh no, not another plant pathology book”! What a surprise I got when I started to use it. This must be one of the most user friendly books on the market and a great deal of work and experience has gone into producing it. I certainly plan to adopt this as the course title for my course in plant pathology at Mae Fah Luang University.

Contents: What is wrong with my plant; causes of plant diseases (Chapters on fungi, bacteria, nematodes, viruses, parasitic flowering plants, abiotic factors); types of plant diseases, plant interactions with pathogens, and plant disease epidemics.

Rating: ★★★★★

Recommendation: All colleges and libraries where agriculture and plant pathology is taught should have this. Anyone teaching plant pathology should get this and consider adopting it as their course text book.

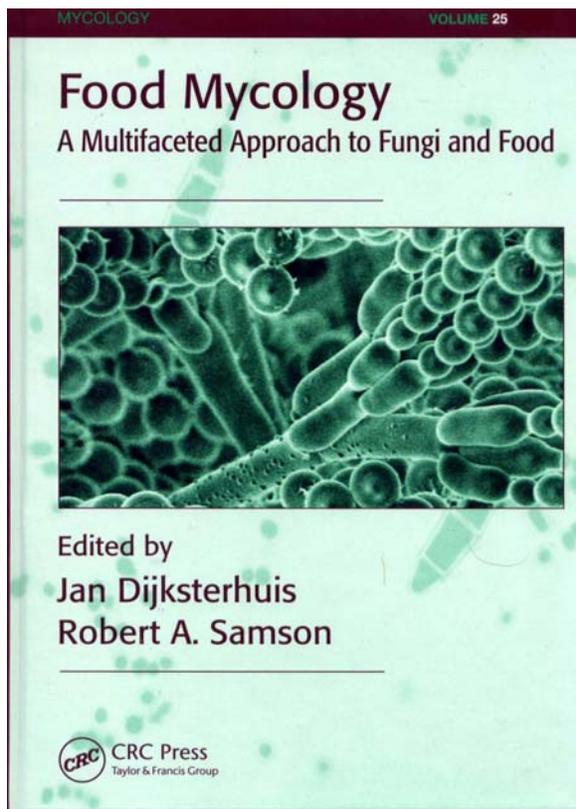
Cost: \$79.95

Order from: www.shopapspress.org

Food Mycology. A Multifaceted Approach to Fungi and Food

Edited by J. Dijksterhuis and R.A. Samson
2007, CRC PRESS MYCOLOGY SERIES 25,
ISBN-13: 978-0-8493-9818-6

This book comprises 19 multi-authored chapters dealing with various aspects of food mycology, mainly focusing on food spoilage and mycotoxins, food and beverage production and fungi as food. The first Part deals with fungi and crops in the field. The first two Chapters address post harvest disease. Chapter 1 addresses aspects of host and fungus including recognition, penetration, and the roles of enzymes released by fungi. The Chapter ends with possible new approaches for the control of post harvest disease.



In Chapter 2 a new technique called laser-based photo acoustic spectroscopy is described. The technique monitors ethylene to follow fungus-host interactions in real time.

The second part deals with fungal spores. Chapter 3 deals with spore formation and germination in different fungi; Chapters 4 & 5 deal with the behavior of fungal spores and

their germination, while Chapter 6 looks at heat resistant. Mycotoxins are dealt with in Chapters 7 & 8 and ask the question “why do fungi produce mycotoxins?” (7) with details of the mycotoxins (8). The use of fungi as cell factories to produce useful metabolites such as β -lactams and organic acids (9) and enzymes (10) are dealt with in the next two chapters. There are 6 chapters on food spoilage: with examples (11), fungal colonization (12), molecular detections and monitoring (13), fungal volatiles (14), vineyard infections, and spoilage of cheese and fermented sausages (16). The last 3 chapters look at fungi as food: Chapter 17 providing a summary of different fungal food products which they consider as “neatly-spoiled food”; Chapter 18 deals with mycoprotein and its ability to replace meat. The safety of these products is also discussed. The last chapter deals with wild and cultivated mushrooms.



The book is well laid out and easy to sort through and each chapter is illustrated with fairly good photographs. A useful colour section can also be found in the centre. Each chapter is well referenced however the latest references are mostly before 2006. Every University library should have this book which should be essential reading for students studying Food Science. The book is pleasing as

it only deals with mycological aspects of food science. In this respect it is very useful for preparing teaching courses and could also be assigned as one of the course text books for food microbiology.

Rating: ★★★★★

Recommendation: should be available in all college and university libraries where courses in food (e.g. food science, cooking) are on offer.

Cost: £94

Order from: www.crcpress.co.uk

Mycology Volume 1 and Mycology Volume 2 J. Webster

I first bought this back in 1993 on one of those very large DVDs. The images then were brilliant but trying to find a large disk DVD player in a conventional well-equipped lecture theatre was impossible. So it was a great surprise to me when I receive this to review as a modern style DVD to use on an ordinary PC.



The set includes line diagrams of fungal structures and life cycles, still photographs and some brilliant films of fungal actions and still photography. Whether you are teaching plant pathology or basic mycology these DVDs are an indispensable addition to your teaching armory. Remember how difficult it is to teach the life cycle (haploid/diploid) of ascomycetes. Well it is all here. A flow diagram of the ascomycete life cycle, click on this – you get lovely images of each process – particularly nuclear fusion, meiosis and mitosis before ascospore formation in the developing ascus. It

all becomes clear. Bitunicate asci and ‘jack in the box’ discharge happens before your eyes, while ejection of ascospores in some pyrenomyces is beautifully filmed. The growing hyphae, swimming zoospores are all included and there are fantastic shots of growth of fruiting bodies in *Phallus*, puffing in discomycetes. I really do feel that this is a must for any serious teacher.

The DVD is interactive through a menu system. I’ve used this in teaching; it is a little slow to upload film sequences (seconds), however if well planned it can improve lectures considerably. Each sequence has a commentary and this can be useful if the voice is tiring. However sequences should be shown more than once and perhaps the second time the lecturer should narrate and point things out. Frustratingly, I could not find a way to stop a film to view a particular frame but that might be my lack of computer skills. One also has to jump between PowerPoint and DVD presentations, unless you have the technical skills to use the barcode scanner operational system.

I should point out that these are PC products and do not work on a MAC and don’t hope that you can copy this from your friends as it is rightly and justifiably protected.

Rating: ★★★★★

Recommendation: This should be available in all university libraries and colleges where science is taught and even in schools. Lecturers of mycology and plant pathology and even general biology should purchase this to make their lectures animated.

Cost: \$259

Order from: www.shopapspress.org

The Fusarium Laboratory Manual

Edited by J.F. Leslie, B.A. Summerell & S.

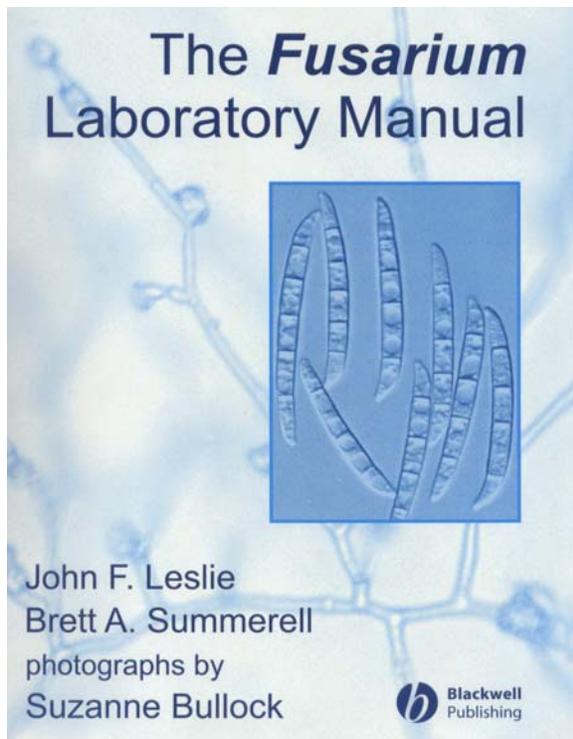
Bullock, 2006

Blackwell Publishing Asia

ISBN-13: 978-0-8138-1919-8

As the title suggests, this book is designed as a laboratory manual with guides to techniques and this claim is fulfilled with numerous species descriptions. Apart from an introduction, there are six chapters dealing with

techniques and methods, four chapters focusing on taxonomy and identification of *Fusarium* and two chapters with species descriptions. By using the table of contents and index, all terms and topics could be easily found.



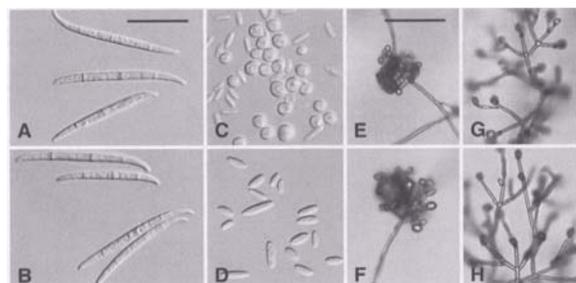
Chapters on techniques and methods comprised detailed information of media including formulas and preparation, culture techniques for growing and maintaining *Fusarium* species, vegetative compatibility and fertility concepts and nucleic acids analyses. Guidelines, techniques and methods for the laboratory work focus on *Fusarium*, however the detail knowledge could be applied when working with other fungi.

It was lovely to read the detailed techniques and methods included in this book, for instance authors discuss sampling strategies and point out how important this using the static point of view. In addition, general information and methods needed to deal with commonly encountered cultural problems are also carefully described. For example how to prevent and solve mite contamination problems which is very common and destructive in culture collections. There are several recommendations and suggested conditions and protocols such as culture conditions that would

lead to the expression of the commonly observed morphological characters, materials and protocols that can be used to recover pure cultures, to recover auxotrophic mutants, to preserve the cultures for long-term storage and to prepare dried cultures to meet the standards of the International Code for Botanical Nomenclature.

This book introduces concepts of vegetative compatibility and fertility. A summary of the history and genetic basis for vegetative compatibility traits both in *Fusarium* and in other fungal species, and general strategies for determining if *Fusarium* strains are vegetatively compatible are provided. Moreover, protocols for recovering and identifying nit mutants, identifying some potential trouble spots in the VCG identification process, and strategies for screening a population for the presence of previously identified VCG or overall VCG diversity are provided.

The fertility concepts Chapter includes the basics of sexual cross-fertility which is understood well in *Fusarium* species as well as some knowledge about other ascomycete fungal species. Protocols that can be used to make sexual crosses under laboratory conditions for some of the commonly studied *Fusarium* spp. are provided along with a list of available standard strains for making crosses for routine diagnostics.



The next Chapter describes nucleic acid analyses which are important; the authors provide a number of protocols such as DNA isolation and purification, AFLP amplification, and mating-type allele identification specifically for *Fusarium* as well as generally for other fungi.

In addition to the very detailed chapters of laboratory techniques and methods, chapters

on taxonomy and identification of *Fusarium* include a brief history of *Fusarium* taxonomy, species concepts, and the teleomorph and further ideas leading to practical approaches to identification.

A brief history of *Fusarium* taxonomy is provided based on the gradual development and progress of taxonomic system of *Fusarium* and different opinion of species concepts by mycologists. Considerable discussion on the status of *Fusarium* taxonomy and species concept based on knowledge of morphology, biology and phylogeny is provided with updated information. The teleomorph of *Fusarium* is mentioned with the summary of the development of sexual structures, knowledge about unusual features of ascus development and ascospore maturation, and information on links between *Fusarium* anamorphs and their teleomorphs in *Gibberella*, *Albonectria* and *Haematonectria*. The authors suggest that neotypification is needed to stabilize nomenclature for many species of *Fusarium*. This is not only very helpful for *Fusarium*, but also very effective for other difficult genera such as *Colletotrichum*.

As *Fusarium* species cause an enormous number of diseases on a wide range of hosts, a practical approach to identifying species of *Fusarium*, with special consideration given to those that cause plant diseases in this book will undoubtedly allow sufficient identification of most cultures for routine work in a plant disease diagnostic laboratory.

Chapters of species descriptions cover explanation of morphological characters as well as fully illustrated descriptions of 70 species arranging alphabetically from *F. acuminatum* to *F. verticillioides* with information on their sexual stage, taxonomy, pathology, ecology, genetics and molecular biology.

Criteria to be considered for species descriptions are provided as a good identification guide with pictures of critical features such as macroconidia, microconidia and chlamydospores. Very accurate observation of these important morphological criteria is recommended and even an example table of culture identification checklist is supplied for

species diagnosis. This very useful identification guide is perfectly followed by almost all the recognized species descriptions i.e. 70 out of less than 80 recognized and accepted species. Each species description is nicely illustrated, keys of the morphological characters, information on sexual stages, taxonomy, pathology, ecology, genetic and molecular biology are included in this helpful handbook which would aid beginners to reach a quick identification. Most of all, painstaking citations of very recent publication in this book provide a great deal of information for further reading.

Taking into account all informative aspects and practical instructions which have been integrated in this text, the *Fusarium* Laboratory Manual would indeed assist as a guidebook for hand-on workshops as well as a guide for those who are looking for a reference, description of a common species, or a technique especially suited with such an important genus *Fusarium*.

Rating: ★★★★★

Recommendation: Should be available in all libraries having any association with mycology research or students of mycology, biotechnology and plant pathology.

Cost: US \$129.99

Order from: <http://as.wiley.com/>

Reviewed by

Po Po Than

Email: pphan11@gmail.com

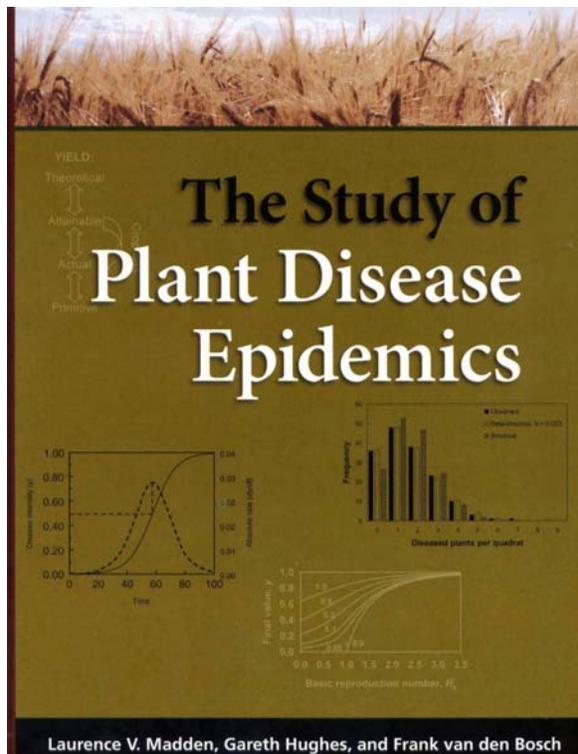
The Study of Plant Disease Epidemics

L.V. Madden, G. Hughes & F. van den Bosch, 2007, APS PRESS, ISBN 978-0-89054-354-2

This book is about refining the understanding of plant disease populations in the field through studying their temporal and spatial dynamics. The authors acknowledge that the book comprises numerous compilations of statistical and mathematical techniques but they argue that these approaches are essential for the study of plant disease epidemics. They conclude that plant pathologists would have trouble evaluating the vast but

significant epidemiological literature and that this book provides a vessel to summarize the available information.

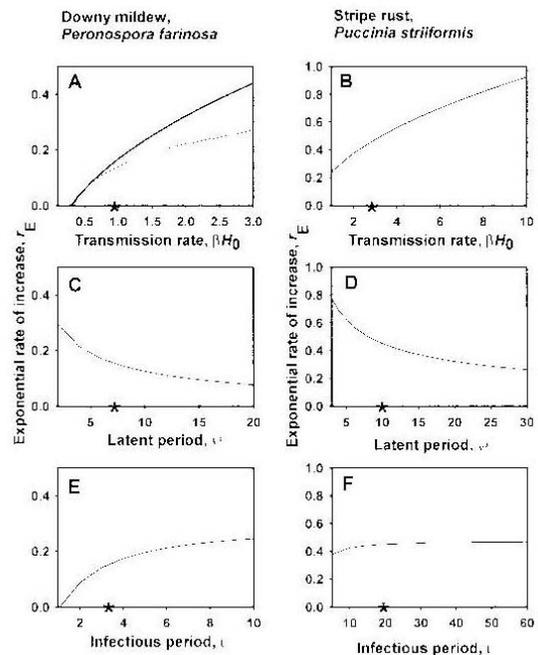
The book comprises 12 Chapters, the first an introduction, providing an overview of plant disease epidemics, epidemiology, and a history



of the subject. Chapter 2 discusses the concept and methods available to measure plant diseases. Chapter 3 introduces the reader to modeling in epidemiology. This is expanded on in Chapters 4-6 which deal with various aspects of temporal analysis and Chapters 7-9 which look at aspects of spatial analysis. Chapter 10 deals with the practical aspects of disease sampling, Chapter 11 in decision making for plant disease management and Chapter 12 deals with epidemics and the affect on crop yields. Overall the book provides a substantial amount of information and succeeds in its claim that the book “provides the needed exposition of” plant disease epidemiology.

The book is nicely laid out with a large print font so that it is easy on the eye, especially for aging scientists. It is well written and

readable, quite pleasing considering the complexity of the subject. The graphs and tables are good quality and formulas are spaced nicely in the text. The headers are well thought out, so it is easy for the reader to find the relevant part of the text. The book is also provided with a very thorough literature list and an adequate index. The book might have been improved by some photographs, however I guess the authors did not see these as relevant.



Rating: ★★★★★

Recommendation: should be available in all college, university, research laboratories and institutional libraries where there are courses and research in plant pathology.

Cost: \$89

Order from: www.shopapspress.org

All others reviewed by

Kevin D. Hyde

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Tasud, Chiang Rai 57100, Thailand