The Identification Of Fungi An Illustrated Introduction With Keys Glossary And Guide To Literature

This dissertation, "Internal Transcribed Spacer as the DNA Barcode for Pathogenic Fungi" by Mei, Cheung, ??, was obtained from The University of Hong Kong (Pokfulam, Hong Kong) and is being sold pursuant to Creative Commons: Attribution 3.0 Hong Kong License. The content of this dissertation has not been altered in any way. We have altered the formatting in order to facilitate the ease of printing and reading of the dissertation. All rights not granted by the above license are retained by the author. Abstract: Identification of pathogenic fungi isolated from clinical specimens in clinical microbiology laboratories is primarily based on observing fungal phenotypic structures under the microscope and performing biochemical tests for fungal cultures. This conventional method is very time-consuming and labor-dependent. It usually requires several weeks for the fungi to grow sufficiently on culture media, and the identification processes on fungal phenotypic structure rely very much on experienced staff. Therefore, a more accurate and rapid method for pathogenic fungal identification is necessary for clinical laboratories to get abreast of modern development. Gene sequencing and phylogenetic analysis targeting the internal transcribed spacer (ITS) region in the fungal genomes are the most commonly used molecular methods for fungal identification. Because of the optimal inter and intra-species variation property of the ITS region, it can act as the DNA barcode to identify fungi to the species level. In this study, 33 clinical fungal isolates were identified by both phenotypic method and ITS sequencing. The results showed that 23 isolates were successfully identified to thespecies level by both phenotypic and molecular methods. Moreover, five isolates were only identified to the genus level by phenotypic method, but they could be successfully identified to the species level by ITS sequencing. However, five isolates have not been differentiated because there were mismatched results from phenotypic and sequencing methods. It may be due to the limitation of sequencing method on some fungal species. Building up a more comprehensive database or setting up a standard platform to guide the molecular process may help improve the performance of molecular method. To conclude, molecular method is a rapid and reliable way for fungal identification because ITS region acts as the DNA barcode for pathogenic fungi. DOI: 10.5353/th_b5303892 Subjects: Pathogenic fungi - Identification

Since the first edition of Identification of Pathogenic Fungi, there has been incredible progress in the diagnosis, treatment and prevention of fungal diseases: new methods of diagnosis have been introduced, and new antifungal agents have been licensed for use. However, these developments have been offset by the emergence of resistance to several classes of drugs, and an increase in infections caused by fungi with innate resistance to one or more classes. Identification of Pathogenic Fungi, Second Edition, assists in the identification of over 100 of the most significant organisms of medical importance. Each chapter is arranged so that the descriptions for similar organisms may be found on adjacent pages. Differential diagnosis details are given for each organism on the basis of both colonial appearance and microscopic characteristics for the organisms described. In this fully updated second edition, a new chapter on the identification of fungi in histopathological sections and smears has been added, while colour illustrations of cultures and microscopic structures have been included, and high quality, four colour digital images are incorporated throughout.

The previous editions of this book have become well known and well loved by all mycologists working in a diagnostic setting. It is very simple to use, and allows laboratory workers to identify fungal pathogens under the microscope by their morphology and other readily identifiable

features.

This book is designed as a laboratory guide for the food microbiologist, to assist in the isolation and identification of common food-borne fungi. We emphasise the fungi which cause food spoilage, but also devote space to the fungi commonly encountered in foods at harvest, and in the food factory. As far as possible, we have kept the text simple, although the need for clarity in the descriptions has necessitated the use of some specialised mycological terms. The identification keys have been designed for use by microbiologists with little or no prior knowledge of mycology. For identification to genus level, they are based primarily on the cultural and physiological characteristics of fungi grown under a standardised set of conditions. The microscopic features of the various fungi become more important when identifying isolates at the species level. Nearly all of the species treated have been illustrated with colony photographs, together with photomicrographs or line drawings. The photomicrographs were taken using a Zeiss WL microscope fitted with Nomarski interference contrast optics. We are indebted to Mr W. Rushton and Ms L. Burton, who printed the many hundreds of photographs used to make up the figures in this book. We also wish to express out appreciation to Dr D.L. Hawksworth, Dr A.H.S.

This study used molecular techniques to examine the diversity of fungal species inhabiting leaf and stem litter of the freshwater emergent macrophyte, Typha angustifolia, during decomposition. Because morphological identification of fungal species is frequently inaccurate and underestimates the number of fungal species present, molecular techniques involving rRNA genes such as ITS regions (internal transcribed spacer regions) are used to better determine specific fungal species within a sample. In this study, samples of decaying leaf and stems litter of Typha angustifolia were obtained from Independence Lake, Michigan over the span of a year. DNA from litter samples obtained from the months of October (early), March (intermediate), and August (late) decomposition stages were extracted using MoBio PowerSoil© DNA Isolation Kit, followed by polymerase chain reaction (PCR) amplification of the fungal ITS region using ITS3 and ITS4 primers. The presence of PCR products were checked by agarose gel electrophoresis and then subjected to denaturing gradient gel electrophoresis (DGGE) to identify all varying DNA fragments (i.e., fungal operational taxonomic units, OTUs) that were amplified. A total of 34 and 63 operational taxonomic units (OTUs) were observed in Typha leaf and stem litter, respectively. NMDS statistical analysis using Jaccard index statistics revealed a significant (p> 0.001) shift in fungal communities associated with decaying Typha leaf litter, indicating that there is a succession in certain fungi during the stages of decomposition. In contrast, no observable successional pattern was observed in fungal communities associated with decaying Typha stems (p

Fusaria, which are found throughout the world, are among the most important causes of economic loss in crop yield and quality. Major food and fiber crops of the world are seriously affected by this group of fungi, making quick and certain identification of these organisms vital. This book, the first of its kind, supplies this sorely needed information by providing a practical pictorial guide for identifying Fusarium species. Based on the Snyder-Hansen taxonomic revision of the genus, it details the morphological criteria for identifying the species and the methods for growing Fusarium cultures under standardized optimum conditions. The heart of this large-format volume consists of extremely high quality photographs--including plates in full color--of the distinct spore morphology of each species, together with some of their major variations. The book is designed to help workers readily recognize similarities within species as well as the

differences between species, and to compare Fusarium unknowns directly with the illustrations, to aid in rapid identification.

The definitive guide for identifying fungi from clinical specimens Medically Important Fungi will expand your knowledge and support your work by: Providing detailed descriptions of the major mycoses as viewed in patients' specimens by direct microscopic examination of stained slides Offering a logical step-by-step process for identification of cultured organisms, utilizing detailed descriptions, images, pointers on organisms' similarities and distinctions, and selected references for further information Covering nearly 150 of the fungi most commonly encountered in the clinical mycology laboratory Presenting details on each organism's pathogenicity, growth characteristics, relevant biochemical reactions, and microscopic morphology, illustrated with photomicrographs, Dr. Larone's unique and elegant drawings, and color photos of colony morphology and various test results Explaining the current changes in fungal taxonomy and nomenclature that are due to information acquired through molecular taxonomic studies of evolutionary fungal relationships Providing basic information on molecular diagnostic methods, e.g., PCR amplification, nucleic acid sequencing, MALDI-TOF mass spectrometry, and other commercial platforms Including an extensive section of easy-to-follow lab protocols, a comprehensive list of media and stain procedures, guidance on collection and preparation of patient specimens, and an illustrated glossary With Larone's Medically Important Fungi: A Guide to Identification, both novices and experienced professionals in clinical microbiology laboratories can continue to confidently identify commonly encountered fungi.

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An excerpt from the Author's PREFACE: THE author of this book makes no claim to the discovery of the facts presented. The material has all been drawn from monographs written by men who have made specialties of the different divisions of fungi. A list of works consulted is given at the close of this book. The plates are reproductions of photographs made by Mr. J. A. Anderson. They are as true to nature as it is possible to make them with the best methods of reproduction now known, and by them alone an acquaintance with many species may be acquired. Many of the cuts have been redrawn by the author from various reliable sources, and many have been drawn directly from nature. With a few exceptions, the line

drawings of sections were made from the specimens photographed. It has been the aim of the author to write a book simple enough to serve as a ource of knowledge for the many who, though busy with other pursuits, yet take an interest in science and wish to obtain information about the fungi, either for the sake of using them as food, or for the pleasure which an acquaintance with their habits and home life may give. A great effort has been made not to sacrifice accuracy in this attempt. The number of species of the fungi is so great that to describe them all would necessitate a book of huge dimensions, so that it has seemed best simply to give a general idea of the characteristics upon which the larger groups, the classes, orders, and genera, are based, by describing some of the species in each. Seven genera of the Spore-sac Fungi are illustrated with ten species, and thirty-five genera of the Basidiomycetes with seventy-three species, making a total of eighty-three species represented by photographs. In addition a number of species are given in rough pen drawings, with sufficient accuracy for identification, and many species have been described without illustration. An effort has been made to describe the species in terms intelligible to the average reader without constant reference to an unabridged dictionary, and, whenever possible, the terms have been illustrated by line cuts. Although the technical names necessarily used are a serious hindrance to the popularization of the study of fungi, it has seemed best, in most cases, to give only the Latin form of the names of species, since, by so doing, there will be less danger of confusing harmless species with those which are harmful; and, also, if their Latin names are adhered to, one will find it much simpler to consult the scattered literature on this subject, as this nomenclature is used by all naturalists of whatever nationality. That the pronunciation of names may be rendered as simple as possible, each vowel has been marked long or short. These vowel-marks are not necessarily indicative of the true syllabic quantity, but are rather diacritical points denoting the popular pronunciation by the English system. Each word has been divided into syllables according to the accepted rules, and an accent has been placed on the syllables to be accented.

Helps lab workers and medical technology students identify fungal pathogens under the microscope by their morphology and other features. Bandw illustrations and photomicrographs illustrate guides to interpretation of clinical specimens and identification of fungi in culture, with descriptions of filamentous bacteria, yeasts, thermally dimorphic fungi, and thermally monomorphic molds. A section on laboratory technique details lab procedures, staining methods, and media preparation. Includes an illustrated glossary. The latest edition adds new organisms, lab procedures, and staining methods.

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This practical book provides an updated resource for the identification of bacteria found in animals inhabiting the aquatic environment, illustrated with colour photos. It contains expanded biochemical identification tables to include newly identified pathogenic and saprophytic bacteria, molecular identification tests now available for a greater number of aquatic bacterial pathogens, more information on the

pathogenesis and virulence of each organism and new coverage of traditional and molecular identification of fungal pathogens and quality assurance standards for laboratories.

The Kingdom fungi encompass a massive diversity of taxa with wide-ranging ecologies, life cycles, and morphologies ranging from unicellular aquatic chytrids to large mushrooms. Before molecular methods came in existence, taxonomists considered this Kingdom to be a member of the plant kingdom due to certain life styles like immobility and growth habitats. Molecular markers (also known as DNA markers), facilitated a better alternative method over traditional morphological methods, employed for the identification, characterization, and to understand the evolution of fungi. The morphological methods used for identification are mainly dependent on spore color or microscopic features whereas molecular markers are based on DNA polymorphism in the genomic organization. Phylogenetic studies reported in last decade, based on molecular markers, have reshaped the classification system of Kingdom fungi, which divided into one subkingdom, seven phyla, and ten subphyla. Recent advances in molecular mycology have opened the way for researchers to identify and characterize novel fungal species from unique environments. Mycology is concerned with the systematic study of fungi, including their genetic and biochemical properties, their use to humans as a source of medicine and food, as well as their dangers, such as poisoning and infections. In the 21st century with the development of DNA sequencing technologies and phylogenetic analysis based on molecular markers, new insights into fungal taxonomy were provided. This book contains a thorough discussion of molecular characterization and detection of different groups of fungi by using PCR-based markers and provides a comprehensive view of the applications and uses of different molecular markers in molecular mycology. It also addresses the recent molecular markers employed to solve the problems of identification and discusses current approaches used in molecular characterization and detection of fungi.

This dissertation, "ITS Sequencing for Identification of Pathogenic Fungi and Discovery of a Novel Fungal Species" by Wood-hay, Ian, Ling, ???, was obtained from The University of Hong Kong (Pokfulam, Hong Kong) and is being sold pursuant to Creative Commons: Attribution 3.0 Hong Kong License. The content of this dissertation has not been altered in any way. We have altered the formatting in order to facilitate the ease of printing and reading of the dissertation. All rights not granted by the above license are retained by the author. Abstract: ?Eleven fungal strains were received from the clinical microbiology laboratory collection of Queen Mary Hospital and Pamela Youde Nethersole Eastern Hospital in Hong Kong from 2010-2011. The collection comprised of ten ascomycetes and one zygomycete. They were identified down to the genus level based on the morphological criteria. Internal transcribed spacer (ITS), beta-tubulin, actin and 28S gene sequencing were used for genotypic characterization. The ITS sequences of four of the strains demonstrate DOI: 10.5353/th_b5071316 Subjects: Pathogenic fungi - Identification

Mycotoxigenic Fungi and Mycotoxins" is a manual designed to aid the guidelines and techniques applied in mycological laboratory and in the other allied fields. This handbook is based on research conducted by many renowned scientists on fungi and related mycotoxins, and the practical approach to the isolation and identification of toxigenic strains of fungi as well as their related fungal toxins, called as Mycotoxins, commonly met on stored food and other materials. Students hopefully will find the information on important fungi particularly related to storage and field conditions and secondary metabolites produced during the growth of fungi on food and other substrates. Reports of many eserachers, scientists, and books from all over globe indicate direct relation between the incidence of mycotoxigenic fungi, extent of mycotoxin contamination and their prevalence revealed their relation to some of the human ailments. Most of the mycotoxins mainly aflatoxins, ochratoxins A and fumonisins are posing serious health hazards in Asian countries. In the context of Indian climatic conditions,

need of assessing and preparation of a comprehensive account related to consumption of contaminated food and feed is essential in order to highlight the problems and their health hazards due to mycotoxins. Present attempt is made to provide recent developments in the subject so that researchers interested may get clear understanding of the problems. This Handbook deals with general aspects of mycological techniques, mycotoxins covering detailed information of mycotoxigenic fungi and their identification.

Diseases caused by fungi have become a significant medical problem and are increasing at an alarming rate. The number of fungal species reported to cause disease is greater than ever some of these species had previously been considered harmless. The increase in the number of patients that are not immuno-competent, along with greater awareness and appreciation of opportunistic fungal infections, have highlighted the importance of accurate identification of fungi. This full-color handbook makes it possible to identify medically important fungi with ease and confidence. Whether the specimen is a common or unusual fungi, the authors take the mystery and difficulty out of identification. A greatly expanded, completely revised and updated edition based upon the highly acclaimed first edition (Identifying Filamentous Fungi). Now including more fungi, including yeasts, new tables, more color photographs, an expanded glossary, more descriptions. Includes two keys: a unique color-coded key you match the colors to those on colony surface, and a comprehensive dichotomous key. Additionally, accurate color photographs of each colony are provided along with precise photomicrographs and drawings to guide your own microscopic observations. The format of the book is designed to facilitate accurate, easier identification. The author provide careful explanations of fungal identification techniques, stains, and media; useful for experienced laboratory personnel and scientists but also invaluable for those learning medical mycology. No other book has such extensive color photography and these unique identification keys.

Fungi enjoy great popularity in pharmaceutical, agricultural, and biotechnological applications. Recent advances in the decipherment of whole fungal genomes promise an acceleration of these trends. This timely book links scientists from different parts of the world who are interested in the molecular identification of fungi combined with the exploration of the fungal biodiversity in different ecosystems. It provides a compendium for scientists who rely on a rapid and reliable detection of fungal specimens in environmental as well as clinical resources in order to ensure the benefit of industrial and clinical applications. Chapters focus on the opportunities and limits of the molecular marker-mediated identification of fungi. Various methods, procedures and strategies are outlined. Furthermore, the book offers an update of the current progress in the development of fungal molecular techniques, and draws attention to potential and associated problems, as well as integrating theory and practice.

General references. Literature by genus.

This manual covers all groups of fungi and fungus-like organisms and includes over 500 diagrams and line drawings. Descriptions of major groups (phylogenetic and artificial), simplified keys to family, and an illustrated glossary enable placement of common fungi into the appropriate taxonomic category. Text and glossary are coordinated to introduce fundamentals of mycological terminology. Over 30 pages of references are provided for literature on identification of cultures and specimens, and references are also given for contemporary phylogenetic research on each major taxonomic

group. Publisher.

 Abstract: In clinical microbiology laboratories, the conventional method for identification of pathogenic fungi is based on fungal culture and observation of fungal phenotypic characters. However, it is time-consuming, subjective and unreliable due to the long incubation period and variations in fungal colony morphology. Thus, there is a need for a rapid, objective and accurate identification of pathogenic fungal isolates. ITS regions are most commonly used targets for molecular identification of fungal pathogens because of the optimal inter- and intra-species variations and large copies in fungal genome. In this study, twenty-two clinical fungal isolates were identified using the phenotypic method and ITS sequencing. The results showed that there were only thirteen isolates identified to species level by phenotypic method, while others were only differentiated in genus level. Due to the poor differentiation based on the conventional phenotypic approach, misidentification of fungal pathogens occasionally occurred. However, ITS sequencing successfully achieved accurate species-level identification of all fungal isolates. The results were demonstrated in phylogenetic trees with high bootstrap support. In conclusion, ITS sequencing is a rapid and reliable for the identification of pathogenic fungal isolates. DOI: 10.5353/th_b5091411 Subjects: Pathogenic fungi - Identification Although there are many texts that provide quality information for the identification of fungi, researchers and technologists rarely have time to read the text. Most are rushed for time and seek morphological information that helps guide them to the identification of fungi. The Atlas of Clinically Important Fungi provides readers with an alphabetical list of fungi as well as listing the division of fungi by both sporulation and morphology. The characteristic traits for a particular fungus are displayed through a series of images, with the fungi appearing as they did in the author's lab on the day(s) that testing was performed. For this reason, numerous (6-20) color photographs are included so that technologists will have sufficient reference photos for identifying the various morphologies of a single organism. Organism photographs begin with the macroscopic colony views followed by the microscopic views. Also included for some microorganisms, are clinical pathology photographs demonstrating how the organism appears in human tissues. A collection of literature citations are also provided to enable further reading. This user-friendly fungi atlas provides a resource for those seeking information in the field of medical mycology, specifically with regards to identifying an organism using the parameters of culture morphology.

The Identification of FungiAn Illustrated Introduction with Keys, Glossary, and Guide to LiteratureAmer Phytopathological Society Mycotic diseases are gaining importance because of the increase in opportunistic fungal infections in patients whose immune systems are compromised. The identification of fungi isolated from clinical material has posed a variety of problems to many laboratories because of lack of expertise and experience, especially in the identification of recently emerged rare fungi that had not been previously reported. A Guide to the Study of Basic Medical Mycology offers an overview of the basic characteristics of fungi frequently isolated from clinical specimens. This comprehensive guide, developed by authors Kee Peng Ng, Tuck Soon Soo-Hoo, and Shiang Ling Na from the Department of Medical Microbiology, University Malaya Medical Centre, Malaysia, details the macro- and microscopic features of each fungus through graphics and illustrations. Including specimens not often found in all teaching modules, A Guide to the Study of Basic Medical Mycology serves to help medical students identify and learn to deal with clinically important fungi and fungal pathogens.

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