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**Entomopathogenic Nematodes**-Khuong B. Nguyen 2007-01-01 The volume deals with morphology, taxonomy and systematics of entomopathogenic nematodes (EPN) in the families Steinernematidae and Heterorhabditidae and bacteria associated with these nematodes. In the first part, history, taxonomic status, family and genus definitions of EPN are mentioned. In the second part, all useful aspects of morphology and methodology of EPN are mentioned with illustrations and SEM photographs and instructions on how to make the measurements, and how to use them in taxonomic work. A polyphyletic key with SEM photographs and illustrations is provided. In the third part, full descriptions of all species are presented with latest information about each species. In the fourth part, molecular and phylogenetic methods for working with EPN are presented, including the latest information and instructions on how to use molecular data in taxonomic work. In the last part, bacteria associated with this group of nematodes are discussed in the context of the latest information about methodology, biology and taxon.

**Advances in Taxonomy and Phylogeny of Entomopathogenic Nematodes of the Steinernematidae and Heterorhabditidae**-David J. Hunt 2016-10-17 Advances in Taxonomy and Phylogeny of Entomopathogenic Nematodes of the Steinernematidae and Heterorhabditidae provides an account of the valid Steinernema and Heterorhabditis species proposed since 2007. A taxonomic overview, tabular key to species, and their phylogeny and phylogeography are provided.

**Entomopathogenic Nematodes: Systematics, Phylogeny and Bacterial Symbionts**-Khuong Nguyen 2007-09-30 The volume deals with history, morphology, taxonomy, and systematics of entomopathogenic nematodes (EPN) in the families Steinernematidae and Heterorhabditidae, molecular methods and bacteria associated with these nematodes.

**Biocontrol Agents**-Mahfouz M M Abd-Elgawad 2017-07-12 This book describes entomopathogenic and slug parasitic nematodes as potential biocontrol agents in crop insect and slug pest management. Addressing research on these two nematodes from tropical, subtropical and temperate countries, it covers the new techniques and major developments regarding mass production, formulation, application, commercialization and safety measures. Plans for future strategies to make these beneficial nematodes cost-effective and expand their use by including them in integrated pest management programmes in different agro-ecosystems are also discussed. Biocontrol Agents: Entomopathogenic and Slug Parasitic Nematodes provides a comprehensive review of the topic and is an essential resource for researchers, industry practitioners and advanced students in the fields of biological control and integrated pest management.

**Entomopathogenic Nematology**-Randy Gaugler 2002-01-31 Nematodes that are parasites of insects are no longer a laboratory curiosity. They have been begun as accepted environmentally benign alternatives to the use of chemical insecticides, for the control of insect pests. Nematode worms are now applied as biological control agents against insectpests of numerous horticultural and agricultural crops. This book provides a comprehensive review of entomopathogenic nematology. It begins by reviewing fundamental biology and setting a taxonomic foundation for nematodes and their bacterial symbionts. Several chapters are devoted to functional processes involved in parasitism and to nematode ecology. Later chapters describe technological advances and control methodologies.

**Techniques for Work with Plant and Soil Nematodes**-Roland N. Perry 2020-11-26 Plant-parasitic and free-living nematodes are increasingly important in relation to food security, quarantine measures, ecology (including pollution studies), and research on host-parasite interactions. Being mostly microscopic, nematodes are challenging organisms for research. Techniques for Work with Plant and Soil Nematodes introduces the basic techniques for laboratory and field work with plant-parasitic and free-living soil-dwelling nematodes. Written by an international team of experts, this book is extensively illustrated, and addresses both fundamental traditional techniques and new methodologies. The book covers areas that have become more widespread over recent years, such as techniques used in diagnostic laboratories, including computerized methods to count and identify nematodes. Information on physiological assays, electron microscopy techniques and basic information on current molecular methodologies and their various applications is also included.

**Utilization of Phylogetic Systematics, Molecular Evolution, and Comparative Transcriptomics to Address Aspects of Nematode and Bacterial Evolution**-Scott M. Peat 2010 Both insect parasitic/entomopathogenic nematodes and plant parasitic nematodes are of great economic importance. Insect parasitic/entomopathogenic nematodes provide an environmentally safe and effective method to control numerous insect pests worldwide. Alternatively, plant parasitic nematodes cause billions of dollars in crop loss worldwide. Because of these impacts, it is important to understand how these nematodes evolve, and, in the case of entomopathogenic nematodes, how their bacterial symbionts evolve. This dissertation contains six chapters. Chapter one is a review of DNA markers and their use in the phylogetic systematics of entomopathogenetic and insect-parasitic nematodes as well as a review of phylogenetic, co-phylogenetic and population genetic methodologies. Chapter two characterizes positive destabilizing selection on the luxA gene of bioluminescent bacteria. Our data suggests that bacterial ecology and environmental osmolarity are likely driving the evolution of the luxA gene in bioluminescent bacteria. Chapter 3 examines relationships among bacteria within the genus Photorhabdus. Our analyses produced the most robust phylogenetic hypothesis to date for the genus Photorhabdus. Additionally, we show that glnA is particularly useful in resolving specific and intra-specific relationships poorly resolved in other studies. We conclude that P. asymbiotica is the sister group to P. luminescens and that the new strains HIT and JUN should be given a new group designation within P. asymbiotica. Chapter 4 characterizes the morphology of the head and feeding apparatus of fungivorous and insect infective female morphs of the nematode Deladenus siricidicola using scanning electron microscopy. Results showed dramatic differences in head, face, and stylet morphology between the two D. siricidicola female
morphps that were not detected in previous studies using only light microscopy. Chapter five utilizes comparative transcriptomics to identify putative plant and insect parasitism genes in the nematode Deladenus siricidcola. Results from this study provide the first transcriptomic characterization for the nematode Deladenus siricidcola and for an insect parasitic member of the nematode infrorder Tylenchomorpha. Additionally, numerous plant parasitism gene homologues were discovered in both D. siricidcola libraries suggesting that this nematode has co-opted these plant parasitism genes for other functions. Chapter six utilizes a phylogenomic approach to estimate the phylogeny of the nematode infrarorder Tylenchomorpha.

Next Generation Systematics-Peter D. Olson 2016-06-16 Cheaper and plentiful genome sequence data is transforming biology, and will surely transform systematics. This volume explores how.

Insect Pathogens-S. Patricia Stock 2009 This book attempts to bring together a broad array of molecular techniques and approaches currently used in insect pathology. It is divided into four parts: (i) identification and diagnostics; (ii) evolutionary relationships and genetics; (iii) host-pathogen interactions; and (iv) genomics and genetic engineering. Sixteen chapters have been written by leading researchers in the field which provide comprehensive and up-to-date information on each part.

Nematode Pathogenesis of Insects and Other Pests-Raquel Campos-Herrera 2015-08-11 Achieving a sustainable agriculture requires integrating advances in multiple disciplines, covering both fundamental and applied research in a common objective: enhancing crop health for better productions. This first volume of the Series “Sustainability in plant and crop protection” presents a comprehensive and multi-disciplinary compendium about the recent achievements in the use of entomopathogenic nematodes (EPNs) as biological control in a global scale. The volume is organized in a first section discussing the last discoveries on the biology and ecology of the EPN, a second section covering the advances on the EPN productions and release, and a third section with multiple case-studies in which the concepts and ideas on the two previous sections are integrated and discussed. An essential tool for researchers and professionals working to advance in the sustainable use of our resources.

Entomopathogenic Nematodes in Biological Control-Randy Gaugler 2018-01-18 The editors of this book, who are world renown for their creativity with entomopathogenic nematodes, have assembled the foremost authorities from four continents to contribute on basic and applied concepts. The authors have taken advantage of this opportunity to express their views to a wide scientific audience. They have combined their international experience so that the latest developments in this fascinating and rapidly expanding field are present in comprehensive manner with diverse topics ranging from biological control theory to organismal and molecular biology.


Taxonomy, Phylogeny and Gnotobiological Studies of Entomopathogenic Nematode Bacterium Complexes- 1999

Field Manual of Techniques in Invertebrate Pathology-Lawrence A. Lacey 2013-06-29 The 38 chapters of this Field Manual provide the tools required for planning experiments with entomopathogens and their implementation in the field. Basic tools include chapters on the theory and practice of microbial control agents, statistical design of experiments, equipment and application strategies. The major pathogen groups are covered in individual chapters (virus, bacteria, protozoa, fungi, nematodes). Subsequent chapters deal with the impact of naturally occurring and introduced exotic pathogens and inauditive application of microbial control agents. The largest section of the Manual is composed of 21 chapters on the application and evaluation of entomopathogens in a wide range of agricultural, forest, domestic and aquatic habitats. Mites and slugs broaden the scope of the book. Supplementary techniques and media for follow-up laboratory studies are described. Three final chapters cover the evaluation of Bt transgenic plants, resistance to insect pathogens and strategies to manage it, and guidelines for evaluating the effects of MCA on nontarget organisms. Readership: Researchers, graduate students, practitioners of integrated pest management, regulators, those doing environmental impact studies. The book is a stand-alone reference, but is also complementary to the laboratory-oriented Manual of Techniques in Insect Pathology and similar comprehensive texts.

Pratylenchus (Nematoda: Pratylenchidae): Diagnosis, Biology, Pathogenicity and Management-Pablo Castillo 2007-10-30 Root-lesion nematodes of the genus Pratylenchus are recognized worldwide as one of the major constraints of crop primary economic importance including vegetables, and many small and fruit trees. Pratylenchus spp. rank third behind root-knot and cyst nematodes as the nematodes of greatest economic impact.

The Evolutionary History of Nematodes-George O. Poinar Jr. 2011-03-05 This book establishes a solid base in palaeonematology with descriptions of 66 new fossil species and accounts of all previous fossil and subfossil nematodes from sedimentary deposits, coprolites, amber and mummies.

Nematology in South Africa: A View from the 21st Century-Hendrikia Foure 2017-02-28 This unique book contains not only a comprehensive up-to-date summary of the achievements made in all areas of Nematology in South Africa over more than half a century, but it also combines this rather technical part with an insidors narrative of how Nematology started and developed. It also demonstrates how the South African community of nematologists gradually adapted to major changes in agriculture. These were due to a major political shift followed by socio-economic changes and this in an often challenging natural environment. At the same time this book is conceived as a useful source for young scientists to provide them with practical knowledge and critical insight in the field of Nematology. The information given is based primarily on research conducted by nematologists in South Africa. Most of this research was aimed at finding workable solutions for nematological problems confronted by both large-scale commercial producers and smallholding farmers. During a period when funding for scientific research is becoming increasingly scarce, the future demand and quest for practical solutions by applied research will only increase.

Dorylaimida-Mohammad Shamim Jairajpuri 1992-01-01 The Dorylaimida represent a large and very important group of soil and freshwater inhabiting nematodes of great agricultural importance. Both in appearance and mode of life they represent a wide diversity and as a consequence the number of species and higher taxa that have been described hitherto is the highest within Nematoda. The identification of species, genera, families, etc. of Dorylaimida is very difficult and at times causes problems for the specialist too. The large number of species on the one hand and often the meagre descriptions on the other make even well-known taxonomists to look at Dorylaimida with great hesitation and desperation. M. Shamim Jairajpuri and Wasim Ahmad have undertaken a great task in summarizing, evaluating and systematizing all the knowledge that has been published so far.

Mononchida-Wasim Ahmad 2010 A unique treatise on the morphology and taxonomy of the order Mononchida. The mononchs represent a group of predatory nematodes that are natural enemies of other soil micro-organisms including plant-parasitic nematodes. The book includes detailed morphology of mononchs with emphasis on characters of taxonomic importance. Detailed diagnoses of the ordinal and familial groups and all the genera known to date are provided. A brief description of type species of each genus is followed by a complete list of all the valid species and their synonyms and an up-to-date key to species. The book is heavily illustrated with line drawings, microphotographs and SEM photographs of type or representative species. A complete bibliography until 2007 and an index are included.
Freshwater Nematodes - Eyuala Abebe 2006 This book contains 22 chapters on various aspects of freshwater nematode ecology and taxonomy. Subjects covered include the techniques for processing freshwater nematodes, the composition and distribution of free-living freshwater nematodes, their abundance, biomass, and diversity. The production of freshwater nematodes, their feeding ecology, patterns in size structure of freshwater nematode communities, different nematode habitats, and computation and application of nematode community indices. It provides descriptions with figures of each taxon at the genus level and above to currently valid genera. For every genus, a complete list of species, with an emphasis on biogeography, is given for primarily freshwater taxa and a list of only those species reported from freshwater bodies is given for the genera that are considered primarily non-freshwater. This book is intended to provide a useful reference to students, beginners and established researchers in the field of freshwater nematology, benthologists, invertebrate biologists, limnologists, ecologists, microbiologists, and soil biologists.

Integrated Pest Management (IPM) - Harsimran Gill 2016-08-31 This book is an update on environmentally sound pest management practice under the umbrella of integrated pest management (IPM). It consists of seven contributions from different authors providing information on pest management approaches as chemical alternatives. The book chapter details about historical review of IPM concepts, strategies, and some experiences in applications of IPM in Latin America; pest control in organic agricultural systems; and the use of entomopathogenic and molluscaparasitic nematodes, insect pheromones, semiochemicals, detersants, and soaps as a part of IPM scheme. The goal of this book is to provide the most up-to-date review on information available around chemical alternatives in IPM. Therefore, this book will equip academia and industry with adequate basic concepts and applications of IPM as eco-friendly pest management option.

Entomopathogenic Nematodes and Their Symbiotic Bacteria - S. Sivaramakrishnan 2021-06-08 This book provides basic information and different protocols associated with the Entomopathogenic nematodes (EPNs) and their symbiotic bacteria. Entomopathogenic nematodes (EPNs) of the genera Steinernema and Heterorhabditis and their associated bacterial symbionts Xenorhabdus and Photorhabdus aid nematode infectious juveniles (J1s) in infecting and killing their insect hosts, creating a unique tripartite complex of host-vector-symbiont interactions. Due to this insect killing capability, EPNs are used as biological control agents of economically important insect pests. They are also a model system to study host-parasite interactions. It provides a systematic approach to various nematode procedures, including pathogenicity, reproduction, foraging behaviour. It gives a brief outline on historical aspects, nematode-bacterium complex, biology and chemical ecology of EPNs. It concisely describes host insect rearing, nematode sampling and storage, isolation techniques, counting, handling and staining of nematodes, characterization including morphological, molecular, and ecological studies, mass production, variance bioassay, field application and efficacy. The book also includes methods and techniques for their associated symbiotic bacterial. This book serves as a laboratory manual and assists the readers to undertake advanced research in different aspects related to nematodes. It is useful for researchers in the fields of nematology, microbiology, bacteriology, and entomology.

Nematode Interactions - M. Wajid Khan 2012-12-06 Nematode interactions are important biological phenomena and of great significance in agriculture. It is a fascinating subject which is multidisciplinary by nature, and concerns any scientist involved with plant health. There have been marked advances in our knowledge of various aspects of the subject in the last two decades. This study area has the subject of several reviews, but there was no exclusive text on the subject. This has stressed the need to document the information, developing a unifying theme which treated nematode interactions in a holistic manner. This book is about the interaction of plant-parasitic nematodes with other plant pathogens or root symbionts. It covers the nature of their associations, their impact on the host and on sequential interactive effects on the involved organisms. Since nematodes are at the centre of the theme, the responsibility of understanding of other plant pathogens dealt with in this book is largely delegated to the reader. I have limited the book content to interactions with biotic pathogens and root symbionts only, for various reasons. The book embarks 16 chapters, and attempts to present balanced information on various aspects of nematode interactions with other plant pathogens and root symbionts. Some chapters describe general aspects of the subject. Interactions of nematodes with specific groups of organisms are addressed in the remaining chapters.

Taxonomy, phylogeny and gnotobiological studies of entomopathogenic nematode bacterium complexes - proceedings of the workshop held at Horticulture Research International, Wellesbourne, Warwick, United Kingdom on 22 and 23 April 1998 - Noël Boemare 1999

Bionomics and Identification of the Genus Rotylenchus (Nematoda: Hoplolaimidae) - Pablo Castillo 2005

This book presents information on various aspects of the importance of Rotylenchus spp. in agricultural crops, their distribution, biology, pathogenicity to vegetables, fruit and forest trees, ecology, and different management strategies, including chemical control, crop rotation, and biological control. Diagnosis, descriptions, morphometric and cluster analyses, as well as comprehensive tabular and dichotomous keys are also included.

Nematodes for Biological Control of Insects - George O. Poinar 2018-05-04 This book discusses nematodes for biological of insects. The book includes the following chapters: classification of nematode, key to entomogenous nematodes, nematode groups, microorganisms associated with entomogenous nematodes, immunity to entomogenous nematodes, natural enemies of entomogenous nematodes, environmental impact of entomogenous nematodes, and future prospects.

Biocontrol of Lepidopteran Pests - K. Sowjanya Sree 2015-02-17 This book describes the various applications of entomopathogenic soil microorganisms in the management and control of the devastating lepidopteran pest. An introduction describes the insecticidal properties of viruses, bacteria, fungi, nematodes and their metabolites, as well as their applications in the context of crop improvement. Subsequent chapters focus on topics such as insecticidal proteins; the role of nucleopolyhedrovirus; BT toxins and their receptors; control of lepidopterans using entomopathogenic fungi; management of cotton defoliators; and sustainable use of entomopathogenic nematodes and their bacterial symbionts. An overview of culture collections of entomopathogenic microorganisms rounds out the volume.

Nematode-Trapping Fungi - Ke-Qin Zhang 2014-04-22 These chapters provide up-to-date information on nematophagous fungi, particularly those of the Orbiulaceae in Ascomycota, whose asexual state produces nematode-trapping devices. The authors consider fungal-nematode interactions, fossil fungi, the biodiversity, ecology and geographical distribution of nematode-trapping fungi, and their potential use in biocontrol of nematodes, all in detail. Nematode-trapping fungi with adhesive or mechanical hyphal traps are the main focus of this book, which begins with an overview of the same and then covers the key themes of nematode-trapping fungi, including their taxonomy, phylogeny and evolution. Subsequent chapters expand upon the methods and techniques used to study these fascinating fungi. Keys for genera of Arthrobotrys, Drexchlerella and Dactylylina, which include all reported species of predatory orbiulacean fungi are presented and numerous species from these genera are morphologically described and illustrated. The ecology of nematode-trapping fungi is expertly presented: their occurrence and habitats, their geographical and seasonal distribution and the effects of soil conditions and nematode density on their distribution all feature amongst the relevant themes. Further chapters examine the use of nematode-trapping fungi in biological control and the authors consider nematicidal activities in detail, exploring the many compounds from fungi that feature in nematicidal activities and of course useful paths for further study on this topic. This is a highly informative and carefully presented book, providing scientific insights for scholars with an interest in fungi and in biological control of nematodes.

Perspectives in Sustainable Nematode Management Through Pochonia chlamydospora Applications for Root and Rhizosphere Health - Rosa H. Manzanilla-López 2017-10-07 This volume presents our current knowledge and novel research areas on Pochonia chlamydospora, a cosmopolitan fungus occurring in soils as a
saprophyte yet capable of colonizing the rhizosphere of crops as an endophyte and behaving as a parasite of eggs of plant-parasitic nematodes. The book is divided into six sections containing 18 chapters, starting with a historical background chapter, followed by 16 chapters, each contributed by experts, concerning those key aspects necessary to work with this biocontrol agent in a multidisciplinary treatise. Topics covered include systematics, biology, nematode-fungus interactions, nematode management strategies, secondary metabolites, and other methods including more novel research areas such as molecular, -omics, plant growth enhancement and endophytic abilities of P. chlamydosporia. The final chapter deals with the future perspectives of P. chlamydosporia research.

Nematodes as Biocontrol Agents-Parwinder S. Grewal 2008 This book aims to document and illustrate the major developments in the use of nematodes for biological control of insects and slugs. It has three major sections covering entomopathogenic nematodes, entomophilic nematodes, and slug-parasitic nematodes. Each of these sections discusses biology, commercial production, formulation and quality control, application technology, strategy and safety. Separate chapters are devoted to the application of nematodes in different cropping systems, and the efficacy of nematodes against specific pests. Potential of predatory nematodes to control plant-parasitic nematodes and mycophasic nematodes to control fungal pathogens is also reviewed. This book was first published as a hardback in 2005. Now new in paperback.

Parasite Diversity and Diversification-Serge Morand 2015-02-26 By joining phylogenetics and evolutionary ecology, this book explores the patterns of parasite diversity while revealing diversification processes.

Bioassays of Entomopathogenic Microbes and Nematodes-Amos Navon 2000-01-01 This volume provides background theory and practical protocols for bioassays of bacteria, viruses, fungi and nematodes that can be used as biological control agents against insect pests of agricultural and medical importance.

Handbook of Soil Sciences (Two Volume Set)-Pan Ming Huang 2018-10-03 An evolving, living organic/inorganic covering, soil is in dynamic equilibrium with the atmosphere above, the biosphere within, and the geology below. It acts as an anchor for roots, a purveyor of water and nutrients, a residence for a vast community of microorganisms and animals, a sanitizer of the environment, and a source of raw materials for co production so new technologies can compete in the open market. It is also an excellent resource for those researching beneficial arthropod mass production and technologies for other uses, including for study and application in biotechnology and biomedical research. Focuses on techniques for mass production of beneficial organisms and methods of evaluation and quality assessment Organizes and presents the most advanced and current knowledge on methods to mass produce beneficial organisms in response to the increased global demand for alternatives to chemical pesticides for biological control producers Includes a team of highly respected editors and authors with broad expertise in these areas

Parasitic Nematodes-Malcolm W. Kennedy 2013 Covering a wide range of rapidly-developing fields of research into parasitic nematodes, this comprehensive volume discusses the genetics, biochemistry and immunology of nematode parasites of humans as well as domestic animals and plants. This fully-updated edition also covers new advances including horizontal gene transfer, immune expulsion mechanisms, genetics of susceptibility in humans, nematode protein structures, role of bacterial symbionts, intrinsic immune response, host immune system modulation, modulation of allergic and autoimmune diseases and the use of parasitic nematodes or their products as therapeutics.

Bark Beetles-Fernando E. Vega 2014-12-29 Bark Beetles: Biology and Ecology of Native and Invasive Species provides a thorough discussion of these economically important pests of coniferous and broadleaf trees and their importance in agriculture. It is the first book in the market solely dedicated to this important group of insects, and contains 15 chapters on natural history and ecology, morphology and phylogenetics, evolution and diversity, population dynamics, resistance, symbiotic associations, natural enemies, climate change, management strategies, economics, and politics, with some chapters exclusively devoted to some of the most economically important bark beetle genera, including Dendroctonus, Ips, Tomicus, Hypothenemus, and Scolytus. This text is ideal for entomology and forestry courses, and is aimed at scientists, faculty members, forest managers, practitioners of biological control of insect pests, mycologists interested in bark beetle-fungal associations, and students in the disciplines of entomology, ecology, and forestry. Provides the only synthesis of the literature on bark beetles Features chapters exclusively devoted to some of the most economically important bark beetle genera, such as Dendroctonus, Ips, Tomicus, Hypothenemus, and Scolytus Includes copious color illustrations and photographs that further enhance the content

Pristionchus pacificus-Ralf J. Sommer 2015-03-27 This book focuses on Pristionchus pacificus and the progress of developing this nematode as model to combine evolutionary biology with mechanistic approaches in comparative biology. Integrating developmental, ecology and population genetics can foster the understanding of biological diversity and novelty.

Health and Disease in Free-Ranging and Captive Wildlife-Robert James Ossiboff 2021-02-24