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Insects are the most interesting and diverse group of organisms on earth, many of which are useful as pollinators of crops and wild plants while others are useful as natural enemies keeping pestiferous insects in check. It is important to conserve these insects for our survival and for this the diversity of insect species inhabiting the different ecosystems of our country must be known. The cornerstone to studies of any kind of organismal diversity is their taxonomic identity. Even after over two and half centuries of studies, so little is known of the insect wealth of our country. It has contributions from taxonomists who have been studying Indian insects for long, this book offers up to date information on many important groups of Indian insects seeking to fill the lacuna of a long felt need for a comprehensive work on the taxonomy of Indian insects. Salient features: Provides an up-to-date taxonomy of major insect groups of India Presents identification keys with illustrations of several important groups of Indian insects Gives a new insight into why insects are so abundant Addresses fundamental questions in mechanoreception and cross kingdom interactions using insects as model systems Indian Insects: Diversity and Science is a festschrift to Professor C. A. Viraktamath, an insect taxonomist par excellence. It has been designed to cater to the needs of academicians, researchers and students who wish to identify insects collected from local environments and will be an invaluable aid for those working in the areas of systematics, ecology, behaviour, diversity and the conservation of insects.

This is the seventh volume of a ten-volume series on The Natural History of the Crustacea. Chapters in this volume synthesize our current understanding of early crustacean development from the egg through the embryonic and larval phase. The first part of this book focuses on the elemental aspects of crustacean embryonic development. The second part of the book provides an account of the larval phase of crustaceans and describes processes that influence the development from hatching to an adult-like juvenile. The third and final part of the book explores ecological interactions during the planktonic phase and how crustacean larvae manage to find food, navigate the dynamic water column, and avoid predators in a medium that offers few refuges.

Decapods are a culmination of nearly 600 million years of Crustacean evolution, during which time they have radiated into a variety of superfamilies, families, genera and species which occupy a variety of niches from fresh mountain streams to the abysses of the oceans. This book will fill a gap in the current literature on southern African decapods. Since Barnard published his Descriptive Catalogue of South African Decapod Crustacea in 1950, there have been numerous additions and name changes. This publication updates the taxonomy, and includes ecological and fisheries information. In addition, Kensley's (1981) distributional checklist for the region has been updated and includes large numbers of new species and records for the region, bringing the total number of decapod to over 1000 species. Although not exhaustive, 262 species are featured, some of which are beautiful, some have commercial or artisanal value, both for consumption and the aquarium, and some have important ecological functions, while others are rare or interesting. For each species there is a photograph, synonymies, common names, a description, ecological information and name derivation (etymology). All the decapod families found in South Africa are described, some new, along with chapters on decapod research history in southern Africa, commercial and artisanal food value of decapods, biodiversity and future research direction. The book is arranged systematically, as taxonomy is based on phylogeny, starting with the earliest forms and progressing to the most derived and advanced forms, and will serve to stimulate interest and future research into southern Africa's rich decapod biodiversity, especially at a time when biodiversity itself is threatened by global warming, coral bleaching and habitat loss. It will appeal to people interested in Decapoda, including academics, scholars, students, fishermen, aquarists, aquaculturists, recreational snorkel and SCUBA divers, as well as those interested in conservation, biodiversity, management and governance.

Mammals of Africa (MoA) is a series of six volumes which describes, in detail, every currently recognized species of African land mammal. This is the first time that such extensive coverage has ever been attempted, and the volumes incorporate the very latest information and detailed discussion of the morphology, distribution, biology and evolution (including reference to fossil and molecular data) of Africa's mammals. With more than 1,160 species and 16-18 orders, Africa has the greatest diversity and abundance of mammals in the world. The reasons for this and the mechanisms behind their evolution are given special attention in the series. Each volume follows the same format, with detailed profiles of every species and higher taxa. The series includes hundreds of colour illustrations and pencil drawings by Jonathan Kingdon highlighting the morphology and behaviour of the species concerned, as well as line drawings of skulls and jaws by Jonathan Kingdon and Meredith Happold. Every species also includes a detailed distribution map. Edited by Jonathan Kingdon, David Happold, Tom Butynski, Mike Hoffmann, Meredith Happold and Jan Kalina, and written by more than 350 authors, all experts in their fields, Mammals of Africa is as comprehensive a compendium of current knowledge as is possible. Extensive references alert readers to more detailed information. Volume V, edited by Jonathan Kingdon and Michael Hoffmann, comprises 83 species of carnivores, and includes jackals, wolves, dogs, foxes, weasels, polecats, striped weasels, Zorilla, otters, Ratel, fur seals, monk seals, Palm Civet, cats, genets, linsangs, African Civet, hyaenas, Aardwolf and mongooses. The volume is completed with profiles of four pangolins, four zebras and two rhinoceroses.

Progesterone Congeners—Advances in Research and Application: 2012 Edition is a ScholarlyBrief™ that delivers timely, authoritative, comprehensive, and specialized information about Progesterone Congeners in a concise format. The editors have built Progesterone Congeners—Advances in Research and Application: 2012 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Progesterone Congeners in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Progesterone Congeners—Advances in Research and Application: 2012 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Volume 31 of Oceanography and Marine Biology: An Annual Review provides a carefully selected set of authoritative reviews of important topics in the broad field of marine science. The interest shown in oceanographical and marine biological work calls for a

publication summarizing the results. For nearly 30 years *Oceanography and Marine Biology: An Annual Review* has provided reading for students, lecturers and researchers. Physical, chemical and biological aspects of marine science are each dealt with by leading experts actively engaged in their own fields, and the series aims to be consistently at the cutting edge of marine research, and is also relevant to studies of global environmental change. This book provides up-to-date information and informed critical reviews in the broad interdisciplinary field of marine science.

Date palm, *Phoenix dactylifera* L. (Arecaceae), is an important palm species cultivated in the arid regions of the world since pre-historic times and traditionally associated with the life and culture of the people in the Middle-East and North Africa which are the pre-dominant date palm growing regions worldwide. The Food and Agriculture Organization of the UN estimates that there are over 100 million date palms with an annual production of over 7.5 million tonnes. A recent report on the arthropod fauna of date palm, enlists 112 species of insects and mites associated with date palm worldwide including 22 species attacking stored dates. Enhanced monoculture of date palm in several date palm growing countries coupled with climate change, unrestrained use of chemical insecticides and extensive international trade is likely to impact the pest complex and the related natural enemies in the date agro-ecosystems. In view of the importance of date palm as an emerging crop of the future and the need to develop and deploy ecologically sound and socially acceptable IPM techniques, this book aims to comprehensively address issues related to the biology and sustainable management of major insect and mite pests of date palm by assessing the current IPM strategies available, besides addressing emerging challenges and future research priorities. The issues pertaining to the role of semiochemicals in date palm IPM involving new strategies revolving around "attract and kill" and "push-pull" technologies, phytoplasmas and their insect vectors with implications for date palm, innovative methods for managing storage pests of dates and knowledge gaps in devising sustainable strategies for the management of red palm weevil, *Rhynchophorus ferrugineus* (Olivier) are also addressed.

This termite Volume 2 comprises 13 chapters in an attempt to bring all available information on sustainable and eco-friendly termite management. The previous Volume considered the biology, social behaviour and economic importance of these insects. Chapters in this book dealing with damage and specific management of fungus-growing termites provide a review on most recent methodologies used for management. Termite damage crops from sowing till harvest. As it is difficult to detect damages in field, usually it is too late when the symptoms are noticed. A separate chapter on issues related to Indian agriculture and the contemporary practices being followed by majority of the Indian farmers is quite informative. Similarly, a case study for termites infesting Malaysian forests constitutes an important contribution. Various issues related to integrated and eco-friendly termite management in tropical conditions have been addressed comprehensively. Potential role of microbes has also been discussed in detail in other chapters. The information contained under these chapters should help termite management in a way that natural resources can be used and maintained for the generations to come. Similarly, the chapter on physical barriers contributes a wealth of information that can be useful all over the world where termite is a problem. Emphasis has been laid on reviewing contribution of synthetic chemical insecticides in termite management. A separate chapter dealing with standard norms in wood protection constitute a significant step in this direction. A further chapter throws light on the potential of biotechnology as a tool in management.

This is the ninth volume of ten in the *The Natural History of the Crustacea Series*. The chapters in this volume synthesize the diverse topics in fisheries and aquaculture. In the first part of the book, chapters explore worldwide crustacean fisheries. This section comes to a conclusion with two chapters on harvested crustaceans that are usually not within the focus of the mainstream fisheries research, possibly because they are caught by local fishing communities in small-scale operations and sold locally as subsistence activity. In the second part of the book, the authors explore the variety of cultured crustacean species, like shrimps, prawns, lobsters, and crabs. Chapters in the third part of the volume focus on important challenges and opportunities, including diseases and parasitism, the use of crustacean as bioindicators, and their role in biotechnology.

Tilapia Culture, Second Edition, covers the vital issues of farmed tilapia in the world, including their biology, environmental requirements, semi-intensive culture, intensive culture systems, nutrition and feeding, reproduction, seed production and larval rearing, stress and disease, harvesting, economics, trade, marketing, the role of tilapia culture in rural development and poverty eradication, and technological innovations in, and the environmental impacts of, tilapia culture. In addition, the book highlights and presents the experiences of leading countries in tilapia culture, thus making it ideal for tilapia farmers and researchers who seek the most relevant research and information. The new second edition not only brings the most updated information within each chapter, but also delivers new content on tilapia transfers, introductions and their impacts, the use of probiotics and other additives in tilapia culture, tilapia trade, including marketing, and sustainability approaches and practices, such as management practices, ecosystem approaches to tilapia culture, and value chain analyses of tilapia farming. Presents the biology of tilapia, including taxonomy, body shapes, geographical distribution, introductions and transfers, gut morphology, and feeding habits. Covers semi-intensive tilapia culture in earthen ponds, tanks, raceways, cages, recirculating systems, and aquaponics. Provides the latest information on brood stock management, production of monosex tilapia, seed production, and larval rearing under different culture systems. Highlights the most common infectious and non-infectious diseases affecting farmed tilapia, with a full description of disease symptoms and treatment measures. Provides an in-depth exploration of tilapia economics, trade and marketing.

From the Foreword Umberto Quattrocchi has brought us some amazing and useful works through the various dictionaries that he has compiled. This time it is for two very important plant families the palms and the cycads that are synthesized here in these two volumes. Each entry is fascinating not just for the botany and full nomenclature of the plant species but for all the associated uses, folklore and interactions with other organisms. ... These entries are fascinating glimpses of natural history. ... Botanists, conservationists, ethnobotanists, anthropologists, geographers, bird watchers, naturalists, historians and those of many other disciplines will find these volumes a most valuable and useful resource. It is the sort of book that will be in frequent use in my library. ----- Professor Sir Ghilleen Prance FRS, VMH, Former Director, Royal Botanic Gardens, Kew. Following the same format as Umberto Quattrocchi's highly praised and well-used previous works, *The CRC World Dictionary of Palms: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology* brings together the vast and scattered literature on palms and cycads to provide better access to information on these economically important plants. Each genus and species has a detailed morphological description and includes a list of synonyms and vernacular names in many languages. Bibliographies accompany each entry which are comprehensive, up-to-date and multi-lingual. The detailed information for every entry on habitats, economic uses, historical and biographical data, botanical exploration, and linguistics will be useful for any library involved with botany,

herbal medicine, pharmacognosy, medicinal and natural product chemistry, ecology, ethnobotany, systematics, general plant science, agriculture or horticulture. Umberto Quattrocchi is the author of the bestselling CRC World Dictionary of Plant Names, winner of the prestigious Hanbury Botanical Garden Award. His most recent multi-volume work, CRC World Dictionary of Medicinal and Poisonous Plants, received strong praise as being "... an unparalleled starting place—a tool of first resort for any thoughtful researcher. Quattrocchi and CRC have delivered a dictionary like no other, a learned finger pointing in the right direction." —John de la Parra, Northeastern University, Boston, Massachusetts, USA, from *Economic Botany*, Vol. 68, 2014

The present book has been designed to bind prime knowledge of climate change-induced impacts on various aspects of our environment and its biological diversity. The book also contains updated information, methods and tools for the monitoring and conservation of impacted biological diversity.

The sterile insect technique (SIT) is an environment-friendly method of pest control that integrates well into area-wide integrated pest management (AW-IPM) programmes. This book takes a generic, thematic, comprehensive, and global approach in describing the principles and practice of the SIT. The strengths and weaknesses, and successes and failures, of the SIT are evaluated openly and fairly from a scientific perspective. The SIT is applicable to some major pests of plant-, animal-, and human-health importance, and criteria are provided to guide in the selection of pests appropriate for the SIT. In the second edition, all aspects of the SIT have been updated and the content considerably expanded. A great variety of subjects is covered, from the history of the SIT to improved prospects for its future application. The major chapters discuss the principles and technical components of applying sterile insects. The four main strategic options in using the SIT — suppression, containment, prevention, and eradication — with examples of each option are described in detail. Other chapters deal with supportive technologies, economic, environmental, and management considerations, and the socio-economic impact of AW-IPM programmes that integrate the SIT. In addition, this second edition includes six new chapters covering the latest developments in the technology: managing pathogens in insect mass-rearing, using symbionts and modern molecular technologies in support of the SIT, applying post-factory nutritional, hormonal, and semiochemical treatments, applying the SIT to eradicate outbreaks of invasive pests, and using the SIT against mosquito vectors of disease. This book will be useful reading for students in animal-, human-, and plant-health courses. The in-depth reviews of all aspects of the SIT and its integration into AW-IPM programmes, complete with extensive lists of scientific references, will be of great value to researchers, teachers, animal-, human-, and plant-health practitioners, and policy makers.

This fifth volume of *The Crustacea* contains chapters on: ? Devoting a chapter to Pentastomida ? Class Eupentastomida ? Orders Bochusacea, Mictacea, and Spelaeogriphacea ? Order Amphipoda ? Order Tanaidacea

The search for new strategies of pest control with safer molecules is currently of great importance and interest. Microbe-mediated biological crop protection is an attractive and promising technology with no concern for a negative impact on the environment and biodiversity. Microbial hydrolytic enzymes such as proteases, chitinases, lipases, etc. are attractive for this purpose. They present toxic properties and act synergistically to control pest attacks. Also, some metabolites, that microorganisms produce for their survival or defense, can be explored and exploited for plant protection. The focus of this Volume is on the potential of microbial hydrolytic enzymes and their metabolites in agroecosystem functioning.

Subsequent chapters review topics such as microbial hydrolytic enzymes as powerful management tools, chitinases in IPM of agro-horticultural crops, metabolites as pesticides and the importance of the metabolites of entomopathogenic fungi, metabolites and virulence factors. Other topic as include: microbial-based nanoparticles, recombinant DNA technologies to improve the efficacy of microbial insecticides, the effects of entomopathogens on insect predators and parasitoids, and the management of major vegetable insect pests. This Volume provides detailed accounts on the safe use of microbial products for sustainable management of insect pests. Its aim is to build solid foundations for the students, teachers, and researchers interested in eco-friendly management of important insect crop pests.

Covering all aspects of practical plant nematology in subtropical and tropical agriculture, the third edition of this definitive global reference work is fully revised and in full colour throughout. It covers the presence, distribution, symptomology and management of all economically important plant parasitic nematodes damaging the world's major food and cash crops. This includes: rice, cereals, solanum and sweet potatoes (and other root and tuber crops), food legumes, vegetables, peanut, citrus, fruit tree crops, coconut and other palms, coffee, cocoa, tea, bananas, sugarcane, tobacco, pineapple, cotton, other tropical fibres, spices and medicinal plants. New content for this edition includes: A chapter on nematode soil biodiversity and soil health; Reflections on the future impact of nematodes and nematology on food security; The importance of climate change, emerging threats, and new management technologies for large and small subsistence growers; Significant revisions to the IPM chapter and chapters on vegetables, citrus, legumes, tuber crops, cotton, peanut and banana where major advances in nematode management have occurred. This book is highly illustrated, with up-to-date practical guidance on methods of extraction, processing and diagnosing of different plant and soil nematodes and on integrated pest management. It remains an invaluable resource for those studying and working in the area of crop protection.

The *Handbook of Research on Food Processing and Preservation Technologies* covers a vast abundance of information on various design, development, and applications of novel and innovative strategies for food processing and preservation. The roles and applications of minimal processing techniques (such as ozone treatment, vacuum drying, osmotic dehydration, dense phase carbon dioxide treatment, pulsed electric field, and high-pressure assisted freezing) are discussed, along with a wide range of applications. The handbook also explores some exciting computer-aided techniques emerging in the food processing sector, such as robotics, radio frequency identification (RFID), three-dimensional food printing, artificial intelligence, etc. Some emphasis has also been given on nondestructive quality evaluation techniques (such as image processing, terahertz spectroscopy imaging technique, near infrared, Fourier

transform infrared spectroscopy technique, etc.) for food quality and safety evaluation. The significant roles of food properties in the design of specific foods and edible films have been elucidated as well. Volume 5: Emerging Techniques for Food Processing, Quality, and Safety Assurance discusses various emerging techniques for food preservation, formulation, and nondestructive quality evaluation techniques. Each chapter covers major aspects pertaining to principles, design, and applications of various food processing methods, such as low temperature-based-ultrasonic drying of foods, hypobaric processing of foods, viability of high-pressure technology, application of pulsed electric fields in food preservation, green nanotechnology for food processing and preservation, advanced methods of encapsulation, basics and methods of food authentication, imaging techniques for quality inspection of spices and nuts, FTIR coupled with chemometrics for food quality and safety, and the use of robotic engineering for quality and safety. Other volumes in the 5-volume set include: Volume 1: Nonthermal and Innovative Food Processing Methods Volume 2: Nonthermal Food Preservation and Novel Processing Strategies Volume 3: Computer-Aided Food Processing and Quality Evaluation Techniques Volume 4: Design and Development of Specific Foods, Packaging Systems, and Food Safety Together with the other volumes in the set, the Handbook of Research on Food Processing and Preservation Technologies will be a valuable resource for researchers, scientists, students, growers, traders, processors, industries, and others.

This landmark scientific reference for scientists, researchers, and students of marine biology tackles the monumental task of taking a complete biodiversity inventory of the Gulf of Mexico with full biotic and biogeographic information. Presenting a comprehensive summary of knowledge of Gulf biota through 2004, the book includes seventy-seven chapters, which list more than fifteen thousand species in thirty-eight phyla or divisions and were written by 138 authors from seventy-one institutions in fourteen countries. This first volume of Gulf of Mexico Origin, Waters, and Biota, a multivolumed set edited by John W. Tunnell Jr., Darryl L. Felder, and Sylvia A. Earle, provides information on each species' habitat, biology, and geographic range, along with full references and a narrative introduction to the group, which opens each chapter.

More than twenty years ago, the Food and Agriculture Organization of the United Nations contributed to the growing recognition of the role of pollination in agricultural production, with the publication of "The Pollination of Cultivated Plants in the Tropics". Since that time, the appreciation of pollinators has grown, alongside the realization that we stand to lose them. But our knowledge and understanding of crop pollination, pollinator biology, and best management practices has also expanded over this time. This volume is the first of two "compendiums for practitioners", sharing expert knowledge on all dimensions of crop pollination in both temperate and tropical zones. The focus in this first volume is on applied crop and system-specific pollination.

For many years the Keys have provided a working tool to those within the field and laboratory needing to know "what is this worm?" They have also helped to establish a classification, using associations of characters, that gives real insight into nematode relationships across the group and their lines of evolution. This supplementary volume is designed to complement the original CIH Keys, now reprinted as one volume, with the additional convenience of reordering into superfamily. The supplement includes revised and redescribed taxa and draws attention to new taxa, to generic level, published by many authors after the original Keys were complete. It also identifies the current position of some of the older genera not included in the original Keys.

The reduction of agricultural losses, especially among smallholder farmers, should be an essential component of food security strategies in developing countries. Loss reduction strategies should be informed by evidence on optimal loss levels, or the point below which loss reduction efforts become economically unviable, characterized by reduction costs greater than benefits. Information on minimum losses can help provide a benchmark for farm management, formulation of policies, and investment decisions. This study connects information on minimum losses with farming practices or production technologies, to help in assessing the effectiveness of loss reduction practices and of the underlying policies and incentives that promote them. While most empirical research and data collection activities on losses tend to focus on average losses, this paper provides evidence on minimum losses levels for several commodities and regions of the world.

They migrated not only with the language they spoke and their DNAs but also with their cows, bulls and buffaloes. With them went their dogs, chicken and goats. They carried with them the seeds of barley and rice and wheat. And the mice and shrews followed them. They spread the pottery and the figurines, the art and culture of India to Iran, Iraq, Syria, Turkey, Jordan and Israel and further west. This is the story of out-of-India migration of the farmers between 8000 BCE to 1500 BCE from Mehrgarh and the later Harappa Civilization located in the Indus-Sarasvati Valley of Northwest India, from Vindhya region, and the Ganga Valley in Central India and from the Brahmaputra Valley of Assam. Based on archaeological records of not only India, but also China, Iran, Iraq, Syria, Turkey and Levant, and the genetic studies of man, animals and plants, both modern and ancient. A book for everyone interested in authentic evidence-based prehistory of India and her contributions to Asia, Europe and Africa during the Neolithic, Copper Age and Bronze Age. Appropriate citations and detailed bibliography, as well as a subject index, have been provided. The book lays to rest the speculative type of prehistory of India and the Aryan Invasion hypothesis.

Mason's World Dictionary of Livestock Breeds, Types and Varieties, now in its sixth edition, has a long history as a reliable and authoritative source of key livestock breed information. Intended as a list of livestock names and synonyms for breeds, groups, types and varieties worldwide, the dictionary aims to include all names found in the literature, 'defining' each breed or type with a brief indication of identifying characteristics, uses and source of origin.

The book illustrates the use of putative microbial agents which provide good protection to the plant from biotic pathogens attack. An up to date knowledge on plant-microbiome interaction strategies in terms of improved sustainability has been discussed. Information from experts across the globe on the application of microbes for providing amicable solution in

sustainable agriculture has been gathered. In addition, information related to microbes mediated resistance levels leading to enhanced plant health has been well presented. The chapters have emphasised the use of Plant Growth Promoting Rhizobacteria (PGPR) and other potential biocontrol agents/antagonists in the management of plant diseases which provide extensive information to the readers. Literature on microbial root colonization, plant growth promotions, and also on the protection of plants from attack of various soil borne pathogens have been presented in a coherent way.

Information on the application of potential strain of the bio-control fungi, endophytes, actinomycetes strengthening the plants ability which rescue the plant from pathogens attack leading to improved plant health has also been underpinned. The World Catalogue of the Dermestidae (Coleoptera) contains all the taxa described until February 28, 2014.

Hawkmoths are large charismatic insects with highly variable and colourful larvae. Some species are specialised in their habitat preferences, but others are widespread and often encountered in gardens. However, little is known about most species, and associating the adults with their larvae has previously been difficult or impossible. Hawkmoths of Australia allows identification of all of the Australian hawkmoths for the first time and treats species found on mainland Australia, Tasmania and all offshore islands within Australian limits. It presents previously undescribed life histories of nearly all species and provides a comprehensive account of hawkmoth biology, including new parasitoids and their hawkmoth hosts. Detailed drawings and photographs show the external and internal morphology of adults and immatures, and eggs, larval instars and pupa. Keys are provided for last instar larvae and pupae of the 71 species that the authors have reared. The book is concluded by a glossary, appendices to parasitoids and larval foodplants, an extensive reference list with bibliographical notes and a comprehensive index. The wealth of new information in this book makes it an essential reference for anyone interested in these moths. Hawkmoths of Australia is Volume 13 of the Monographs on Australian Lepidoptera Series.

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