

Techniques in Pheromone Research

Edited by
H.E. Hummel and T.A. Miller



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Techniques In Pheromone Research

N. Bhushan Mandava



Techniques In Pheromone Research:

Techniques in Pheromone Research Hans E. Hummel, Thomas A. Miller, 2012-12-06 Insects as a group occupy a middle ground in the biosphere between bacteria and viruses at one extreme amphibians and mammals at the other The size and general nature of insects present special problems to the student of entomology For example many commercially available instruments are geared to measure in grams while the forces commonly encountered in studying insects are in the milligram range Therefore techniques developed in the study of insects or in those fields concerned with the control of insect pests are often unique Methods for measuring things are common to all sciences Advances sometimes depend more on how something was done than on what was measured indeed a given field often progresses from one technique to another as new methods are discovered developed and modified Just as often some of these techniques find their way into the classroom when the problems involved have been sufficiently ironed out to permit students to master the manipulations in a few laboratory periods Many specialized techniques are confined to one specific research laboratory Although methods may be considered commonplace where they are used in another context even the simplest procedures may save considerable time It is the purpose of this series 1 to report new developments in methodology 2 to reveal sources of groups who have dealt with and solved particular entomological problems and 3 to describe experiments which may be applicable for use in biology laboratory courses

Insect Pheromone Research R.T. Carde, A.K. Minks, 2012-12-06 This book contains the proceedings of the First International Symposium on Insect Pheromones which was held at Wageningen The Netherlands from March 6 to March 11 1994 Eighty participants from 17 countries attended the symposium which turned out to be a unique forum for the exchange of the latest worldwide findings on insect pheromones an opportunity to discuss and debate unsettled issues and a mechanism to define new directions in pheromone research and foster interdisciplinary collaborations The meeting comprised five sessions representing the breadth of disciplinary interest in pheromones a typical characteristic of this research area In the sessions the following topics were presented 1 control of pheromone production organized by W L Roelofs 2 sensory processing of pheromone signals T L Payne 3 neuroethology of pheromone mediated responses T C Baker 4 use of pheromones in direct control A K Minks and R T Card6 and 5 evolution of pheromone communication c LOfstedt All sessions started with a series of 30 minute lectures after which ample time was reserved for discussion In each session some participants were asked to serve as discussants and to initiate and stimulate discussion and a rapporteur was recruited to make notes of these discussions and to summarize the general trends emerging from the session The general programming of the symposium was in the hands of R T Carde A K Minks and T L Payne

Experimental Techniques in Host-Plant Resistance Akshay Kumar Chakravarthy, Venkatesan Selvanarayanan, 2019-04-24 The earliest land plants evolved around 450 million years ago from aquatic plants devoid of vascular systems The diversification of flowering plants angiosperms during the Cretaceous period is associated with speciation in insects Early insect herbivores were mandibulate but the evolution of

vascular plants led to the co evolution of other forms of herbivory such as leaf feeding sap sucking leaf mining tissue borer gall forming and nectar feeding Plant defense against biotic stress is an adaptive evolution by plants to increase their fitness Plants use a variety of strategies to defend against damage caused by herbivores Plant defense mechanisms are either inbuilt or induced Inbuilt mechanisms are always present within the plant while induced defenses are produced or mobilized to the site where a plant is injured Induced defense mechanisms include morphological physiological changes and production of secondary metabolites Host plant resistance HPR is one of the eco friendly methods of pest management It protects the crop by making it less suitable or tolerant to the pest While books on theoretical aspects of HPR are available an exclusive book on the practical aspects is lacking There is a wide gap between the theory and the experimental procedures required for conducting studies on plant resistance for the post graduate students and young researchers A dire need for a book on practical aspects was strongly felt Initially a practical manual was prepared which eventually evolved into the present book We hope this book provides information on major aspects of screening crop germplasm sampling techniques genetic and biochemical basis of HPR behavioural studies on pheromone and plant volatiles and some of the recent approaches in HPR Further the references provide the scientific articles and books as additional information to readers and workers alike

Gas Chromatography Colin Poole, 2012-07-26 This title provides comprehensive coverage of modern gas chromatography including theory instrumentation columns and applications addressing the needs of advanced students and professional scientists in industry and government laboratories Chapters are written by recognized experts on each topic Each chapter offers a complete picture with respect to its topic so researchers can move straight to the information they need without reading through a lot of background information Individual chapters written by recognized experts The big picture of gas chromatography from theory to methods to selected applications Provides references to other sources in associated areas of study to facilitate research Gives access to core data for practical work comparison of results and decision making

Methods for the Study of Pest Diabrotica J.L. Krysan, Thomas A. Miller, 2012-12-06 Insects as a group occupy a middle ground in the biosphere between bacteria at one extreme amphibians and mammals at the other and viruses of insects present special problems to the The size and general nature study of entomology For example many commercially available instruments are geared to measure in grams while the forces commonly encountered in studying insects are in the milligram range Therefore techniques developed in the study of insects or in those fields concerned with the control of insect pests are often unique Methods for measuring things are common to all sciences Advances sometimes depend more on how something was done than on what was measured indeed a given field often progresses from one technique to another as new methods are discovered developed and modified Just of these techniques find their way into the classroom when as often some the problems involved have been sufficiently ironed out to permit students to master the manipulations in a few laboratory periods Many specialized techniques are confined to one specific research laboratory Although methods may be

considered commonplace where they are used in another context even the simplest procedures may save considerable time It is the purpose of this series 1 to report new developments in methodology 2 to reveal sources of groups who have dealt with and solved particular entomological problems and 3 to describe experiments which may be applicable for use in biology laboratory courses

Pheromones and Animal Behavior Tristram D. Wyatt, 2014-01-23 Pheromones and other kinds of chemical communication underlie the behavior of all animals Building on the strengths of the first edition widely recognized as the leading text in the subject this is a comprehensive overview of how pheromones work Extensively revised and expanded to cover advances made over the last ten years the book offers a thorough exploration of the evolutionary and behavioral contexts of chemical communication along with a detailed introduction to the molecular and neural basis of signal perception through olfaction At a time of ever increasing specialization Wyatt offers a unique synthesis integrating examples across the animal kingdom A final chapter critically considers human pheromones and the importance of olfaction to human biology Its breadth of coverage and readability make the book an unrivaled resource for students and researchers in a range of fields from chemistry genetics genomics molecular biology and neuroscience to ecology evolution and behavior

Handbook of Natural Pesticides N. Bhushan Mandava, 2018-12-07 This handbook series includes several naturally occurring chemicals that exhibit biological activity These chemicals are derived from plants insects and several microorganisms Volume I of this series covers the theory and practice of the strategies for pest control and methods for detection Moreover it presents extensive tables that provide the information you need to select the most appropriate bioassay for a particular plant growth regulator or hormone In addition to the chapters on bioassays Volume I provides a solid introduction to the theory and practice of natural pesticide use including in depth discussions of integrated management systems for weed and pest control the state of the art use of computers in pest management and allelochemicals as natural protection Guidelines on toxicological testing and EPA regulation of natural pesticides are also detailed

Ant Pheromone Networks Sophie Carter, 2025-03-04 Ant Pheromone Networks explores the fascinating world of chemical communication in ant colonies revealing how these social insects use pheromones to coordinate complex behaviors without central control The book uncovers how ants achieve coordinated foraging defense and social organization through these chemical signals highlighting the colony as a superorganism Readers will discover that ant colonies function as decentralized self organizing systems where pheromone trails serve as the primary mechanism for collective actions The book examines the chemical diversity of ant pheromones how ants detect and interpret these signals and the collective behaviors that emerge By integrating chemical ecology behavioral biology and network science it offers a holistic understanding of ant pheromone networks Beginning with an introduction to pheromone communication the book progresses through foraging defense and social organization culminating in broader implications for collective intelligence and decentralized control systems in fields like swarm robotics

Pheromone Biochemistry Glenn D. Prestwich, Gary J. Blomquist, 2014-06-28 Pheromone

Biochemistry covers chapters on Lepidoptera ticks flies beetles and even vertebrate olfactory biochemistry The book discusses pheromone production and its regulation in female insects as well as reception perception and degradation of pheromones by male insects The text then describes the pheromone biosynthesis and its regulation and the reception and catabolism of pheromones Researchers in the areas of chemistry biochemistry entomology neurobiology molecular biology enzymology morphology behavior and ecology will find the book useful

Chromatography and Isolation of Insect Hormones and Pheromones A.R. McCaffery, I.D. Wilson, 2012-12-06 The connection between the study of insects their development behaviour and biochemistry and chromatography is perhaps not immediately obvious However this connection exists and it is of fundamental importance to our understanding of many areas of insect physiology Insects range in size from small to minute and consequently the amounts of hormones or pheromones they produce are equally minute Ultimately any attempt at understanding the processes which control development social behaviour or the biochemistry of insects requires some means of isolating the tiny quantities of the hormones and pheromones responsible in sufficient quantity and purity for identification The ability to devise novel techniques to separate these materials from frequently complex biological mixtures including precursors and metabolites and to devise detection systems for them is vital Methods for the quantification of these substances at different stages in the life cycle or in response to environmental change or stress are then essential Chromatography both as a means for isolation and as a method for quantitative analysis has been an essential tool in these studies This volume represents the outcome of a joint international symposium organized by the Chromatographic and Royal Entomological Societies at the University of Reading between the 21st and 23rd March 1989 aimed specifically at discussing the chromatography and isolation of insect hormones pheromones and related substances The papers presented at that meeting and collected together here covered many aspects of the subject including the chromatography of juvenile hormones ecdysteroids peptides pheromones and semio chemicals

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