

FREE READ INTERACTIONS OF INSECT PHEROMONES AND PLANT SEMIOCHEMICALS COPY

THERE IS NOW A CONSIDERABLE LITERATURE ON CHEMICAL ECOLOGY WHICH HAD ITS BEGINNINGS IN THE STUDY OF INSECT PHEROMONES THIS BEGINNING WAS POSSIBLE ONLY BY COMBINING THE DISCIPLINES AND TECHNIQUES OF BIOLOGY AND CHEMISTRY FOR A BIOLOGIST IT IS DIFFICULT TO UNDERSTAND THE TIME FRAMES OF ANALYTICAL AND SYNTHETIC CHEMISTRY A COMPOUND MAY TAKE DAYS TO CHARACTERIZE AND BE AVAILABLE IN MINUTES FROM A BOTTLE ON THE SHELF OR IT MAY TAKE YEARS TO CHARACTERIZE AND SYNTHESIZE CHEMISTS HAVE A SIMILAR FRUSTRATION AFTER AN INTENSE PROGRAMME OF WORK THE INSECT IN QUESTION MAY NOT EMERGE FOR MANY MONTHS STUDY ARE HOWEVER THE REWARDS OF INTEGRATED INTERDISCIPLINARY CONSIDERABLE BECAUSE THEY ALLOW US TO UNDERSTAND MANY FACETS OF INSECT BEHAVIOUR AND CONSEQUENTLY TO CONTROL THAT BEHAVIOUR FOR OUR OWN ENDS IN THIS BOOK WE HAVE SET OUT TO EXPLAIN THE RESULTS OF RESEARCH FROM CHEMICAL AND BIOLOGICAL PERSPECTIVES AND SEE HOW THE KNOWLEDGE GAINED HAS LED TO NOVEL TECHNIQUES THAT CAN BE USED IN INSECT PEST MANAGEMENT AND INSECT CONTROL AN IMPORTANT PART OF UNDERSTANDING INSECT CHEMICAL ECOLOGY INVOLVES THE UNDERSTANDING NOT ONLY OF NEW CONCEPTS BUT OF THE VOCABULARIES USED BY SCIENTISTS SPECIALIZING IN DIFFERENT FIELDS IT WILL BE CLEAR THAT THE THREE SECTIONS OF THIS BOOK HAVE BEEN WRITTEN BY THREE DIFFERENT PEOPLE AN INSECT BEHAVIOURIST AN ORGANIC CHEMIST AND A BIOLOGIST IN INDUSTRY THIS BOOK FOCUSES ON CHEMICALS THAT EFFECT AGGREGATION FOR MATING AND ELICIT SEXUAL BEHAVIOR IN INSECTS MITES AND TICKS MAINLY ON SEX PHEROMONAL OR MATING ACTIVITY THESE PHEROMONES ARE USEFUL TO BOTH AGRICULTURE SCIENCE AND INDUSTRY BECAUSE OF THEIR POTENTIAL AS DETECTION AND CONTROL AGENTS 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 CARDÓ 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 A TECHNICAL REVIEW OF THE USE OF PHEROMONES IN THE CONTROL OF INSECT PESTS IN AGRICULTURE IT EXAMINES THE SCIENTIFIC BACKGROUND AND CHEMICAL MANUFACTURE OF PHEROMONES AND THE ECONOMIC AND COMMERCIAL FACTORS RELEVANT TO THE INTRODUCTION OF THIS NOVEL SYSTEM INSECT SEX PHEROMONES IS A REVISED AND EXPANDED EDITION OF THE BOOK INSECT SEX ATTRACTANTS AND COVERS GREATER DISCOVERIES IN THE FIELD OF SEX PHEROMONES IT IS DISCOVERED THAT MANY SEX PHEROMONES ARE SEXUALLY EXCITATORY RATHER THAN ATTRACTIVE THIS DISCOVERY PROMPTED THE SUBSTITUTION OF THE MORE ACCURATE AND ENCOMPASSING TERM PHEROMONES FOR THE TERM ATTRACTANTS IN THE TITLE OF THIS EDITION COMPOSED OF 13 CHAPTERS THIS BOOK HAS CHAPTERS THAT COVER THE OCCURRENCE IN FEMALE AND PRODUCTION IN MALE OF SEX PHEROMONES IN VARIOUS INSECT SPECIES THE INSECT ORDERS CONSIDERED INCLUDE ACARINA ORTHOPTERA HEMIPTERA HOMOPTERA DIPTERA ISOPTERA NEUROPTERA SIPHONAPTERA COLEOPTERA HYMENOPTERA LEPIDOPTERA TRICHOPTERA AND MECOPTERA THE FOLLOWING CHAPTER DISCUSSES PHEROMONES PRODUCED BY ONE SEX THAT LURE TO ASSEMBLE FOR MATING THIS BOOK GOES ON DISCUSSING THE ANATOMY AND PHYSIOLOGY OF SCENT GLANDS OF MALE AND FEMALE INSECTS THE ATTRACTANT PERCEPTION MECHANISM AND THE BEHAVIORAL AND ELECTROPHYSIOLOGICAL RESPONSES OF INSECTS TO SEX PHEROMONES OTHER CHAPTERS ARE DEVOTED TO THE INFLUENCE OF SEVERAL FACTORS ON THE PRESENCE OF CHEMICAL SEX ATTRACTION OR EXCITATION IN ANY INSECT THE CONCLUDING CHAPTERS DEAL WITH THE COLLECTION ISOLATION IDENTIFICATION SYNTHESIS AND ANALYSIS OF SEX PHEROMONES THIS BOOK WILL GREATLY APPEAL TO RESEARCH AND ECONOMIC ENTOMOLOGISTS INSECT PHYSIOLOGISTS CHEMISTS AND ECOLOGISTS INSECT PHEROMONE BIOCHEMISTRY AND MOLECULAR BIOLOGY SECOND EDITION PROVIDES AN UPDATED AND COMPREHENSIVE REVIEW OF THE BIOCHEMISTRY AND MOLECULAR BIOLOGY OF INSECT PHEROMONE BIOSYNTHESIS AND RECEPTION THE BOOK TIES TOGETHER HISTORICAL INFORMATION WITH RECENT DISCOVERIES PROVIDES THE READER WITH THE CURRENT STATE OF THE FIELD AND SUGGESTS WHERE FUTURE RESEARCH IS HEADED WRITTEN BY INTERNATIONAL EXPERTS MANY OF WHOM PIONEERED STUDIES ON INSECT PHEROMONE PRODUCTION AND RECEPTION THIS RELEASE UPDATES THE 2003 FIRST EDITION WITH AN EMPHASIS ON RECENT ADVANCES IN THE FIELD THIS BOOK WILL BE AN IMPORTANT RESOURCE FOR ENTOMOLOGISTS AND MOLECULAR BIOLOGISTS STUDYING ALL AREAS OF INSECT COMMUNICATION OFFERS A HISTORICAL AND CONTEMPORARY PERSPECTIVE WITH A FOCUS ON ADVANCES OVER THE LAST 15 YEARS DISCUSSES THE MOLECULAR AND REGULATORY MECHANISMS UNDERLYING PHEROMONE PRODUCTION DETECTION AS WELL AS THE EVOLUTION OF THESE PROCESSES ACROSS THE INSECTS LED BY EDITORS WITH BROAD EXPERTISE IN THE METABOLIC PATHWAYS OF PHEROMONE PRODUCTION AND THE BIOCHEMICAL AND GENETIC PROCESSES OF PHEROMONE DETECTION THIS BOOK FOCUSES ON CHEMICALS THAT EFFECT AGGREGATION FOR MATING AND ELICIT SEXUAL BEHAVIOR IN INSECTS MITES AND TICKS MAINLY ON SEX PHEROMONAL OR MATING ACTIVITY THESE PHEROMONES ARE USEFUL TO BOTH AGRICULTURE SCIENCE AND INDUSTRY BECAUSE OF THEIR POTENTIAL AS DETECTION AND CONTROL AGENTS 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 COMMERCIALY 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 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 THIS BOOK PROVIDES A COMPLETE OVERVIEW OF CUTTING EDGE RESEARCH ON INSECT SEX PHEROMONES AND PHEROMONE COMMUNICATION SYSTEMS THE COVERAGE RANGES FROM THE CHEMISTRY BIOSYNTHESIS AND RECEPTION OF SEX PHEROMONES TO THE CONTROL OF ODOR SOURCE SEARCHING BEHAVIOR AND FROM MOLECULES TO THE APPLICATION OF RESEARCH FINDINGS TO ROBOTICS THE BOOK BOTH SUMMARIZES THE PROGRESS OF STUDIES CONDUCTED USING BOMBYX MORI AND SEVERAL GROUPS OF MOTHS AND REVIEWS SEX PHEROMONES OF SOME NON LEPIDOPTERAN INSECT GROUPS OF AGRICULTURAL IMPORTANCE ATTENTION IS DRAWN TO RECENT FINDINGS ON ELABORATE NEURAL INFORMATION PROCESSING IN THE BRAIN IN MALE MOTHS AND TO THE IMPORTANCE OF OLFACTORY RECEPTORS SPECIFICALLY TUNED TO SEX PHEROMONE MOLECULES FEATURING CONTRIBUTIONS FROM LEADING EXPERTS ON THE TOPIC THIS BOOK WILL BE A UNIQUE AND VALUABLE RESOURCE FOR RESEARCHERS AND STUDENTS IN THE FIELDS OF ENTOMOLOGY CHEMICAL ECOLOGY INSECT PHYSIOLOGY AND BIOCHEMISTRY EVOLUTION BIOMIMETICS AND BIOENGINEERING IN ADDITION TO RESEARCHERS GENERAL INSECT LOVERS WILL FIND THE BOOK FASCINATING FOR ITS DESCRIPTIONS OF THE MARVELOUS ABILITIES OF INSECTS AND THE UNDERLYING MECHANISMS INVOLVED SINCE THE IDENTIFICATION OF INSECT PHEROMONES IN THE LATE 1950S ATTENTION HAS OFTEN FOCUSED ON THE USE OF THESE POTENT BEHAVIOR MODIFYING CHEMICALS AS PEST CONTROL AGENTS MUCH OF THIS INTEREST HAS CONCENTRATED ON LEPIDOPTERA PARTICULARLY MOTHS IN ADDRESSING THIS TOPIC IN OTHER INSECT ORDERS THIS MULTI AUTHOR BOOK FILLS THIS CURRENT GAP IN THE LITERATURE IT PRESENTS RESEARCH FROM LEADING AUTHORITIES ON THE MOST IMPORTANT INSECT GROUPS AND DETAILS THE CURRENT PROGRESS OF RESEARCH IN THESE AREAS APPLICATIONS OF THE RESEARCH TO AGRICULTURAL SYSTEMS AROUND THE WORLD AND POSSIBLE MECHANISMS FOR SUSTAINABLE CROP PROTECTION ARE CONSIDERED THIS BOOK IS ESSENTIAL READING FOR STUDENTS AND RESEARCHERS IN ENTOMOLOGY AND CROP PROTECTION THERE IS NOW A CONSIDERABLE LITERATURE ON CHEMICAL ECOLOGY WHICH HAD ITS BEGINNINGS IN THE STUDY OF INSECT PHEROMONES THIS BEGINNING WAS POSSIBLE ONLY BY COMBINING THE DISCIPLINES AND TECHNIQUES OF BIOLOGY AND CHEMISTRY FOR A BIOLOGIST IT IS DIFFICULT TO UNDERSTAND THE TIME FRAMES OF ANALYTICAL AND SYNTHETIC CHEMISTRY A COMPOUND MAY TAKE DAYS TO CHARACTERIZE AND BE AVAILABLE IN MINUTES FROM A BOTTLE ON THE SHELF OR IT MAY TAKE YEARS TO CHARACTERIZE AND SYNTHESIZE CHEMISTS HAVE A SIMILAR FRUSTRATION AFTER AN INTENSE PROGRAMME OF WORK THE INSECT IN QUESTION MAY NOT EMERGE FOR MANY MONTHS STUDY ARE HOWEVER THE REWARDS OF INTEGRATED INTERDISCIPLINARY CONSIDERABLE BECAUSE THEY ALLOW US TO UNDERSTAND MANY FACETS OF INSECT BEHAVIOUR AND CONSEQUENTLY TO CONTROL THAT BEHAVIOUR FOR OUR OWN ENDS IN THIS BOOK WE HAVE SET OUT TO EXPLAIN THE RESULTS OF RESEARCH FROM CHEMICAL AND BIOLOGICAL PERSPECTIVES AND SEE HOW THE KNOWLEDGE GAINED HAS LED TO NOVEL TECHNIQUES THAT CAN BE USED IN INSECT PEST MANAGEMENT AND INSECT CONTROL AN IMPORTANT PART OF UNDERSTANDING INSECT CHEMICAL ECOLOGY INVOLVES THE UNDERSTANDING NOT ONLY OF NEW CONCEPTS BUT OF THE VOCABULARIES USED BY SCIENTISTS SPECIALIZING IN DIFFERENT FIELDS IT WILL BE CLEAR THAT THE THREE SECTIONS OF THIS BOOK HAVE BEEN WRITTEN BY THREE DIFFERENT PEOPLE AN INSECT BEHAVIOURIST AN ORGANIC CHEMIST AND A BIOLOGIST IN INDUSTRY CONTROL OF INSECT BEHAVIOR BY NATURAL PRODUCTS PRESENTS PAPERS ON NEW BIOCHEMICAL APPROACHES TO PEST CONTROL THE BOOK PRESENTS ARTICLES ON PHEROMONE RESEARCH WITH STORED PRODUCT COLEOPTERA SOME GENERAL CONSIDERATIONS OF INSECTS RESPONSES TO THE CHEMICALS IN FOOD PLANTS AND PHEROMONES OF THE HONEY BEE THE TEXT ALSO INCLUDES PAPERS ON SEVERAL SUBSTANCES RESPONSIBLE FOR THE FEEDING BEHAVIOR AND GROWTH OF THE SILKWORM LARVA THE SENSORY RESPONSES OF PHYTOPHAGUS LEPIDOPTERA TO CHEMICAL AND TACTILE STIMULI AND THE USE OF VOLATILE ORGANIC SULFUR COMPOUNDS AS INSECT ATTRACTANTS WITH SPECIAL REFERENCE TO HOST SELECTION INSECT ANTI FEEDANTS IN PLANTS A HOUSE FLY ATTRACTANT IN THE MUSHROOM AND STUDIES ON SEX PHEROMONES OF THE STORED GRAIN MOTHS ARE ALSO CONSIDERED THE BOOK ALSO DEMONSTRATES ARTICLES ON THE ELECTROPHYSIOLOGICAL INVESTIGATION OF INSECT OLFACTION AND HOST ATTRACTANTS FOR THE RICE WEEVIL AND THE CHEESE MITE ENTOMOLOGISTS BIOLOGISTS CHEMISTS AND PEOPLE INVOLVED IN THE RESEARCH OF PEST CONTROL WILL FIND THE BOOK INVALUABLE PRESENTING AN AUTHORITATIVE OVERVIEW OF CURRENT FINDINGS ON PHEROMONE APPLICATIONS THIS REFERENCE REVIEWS THE PRINCIPLES INVOLVED IN EMPLOYING THESE COMPOUNDS THEIR CHEMISTRY AND DELIVERY SYSTEMS FOR EFFICIENT USE IN ADDITION IT PROVIDES CASE STUDIES OF CURRENT AND POTENTIAL PRACTICAL APPLICATIONS BRINGING TOGETHER FOR THE FIRST TIME PROMINENT RESEARCHERS IN SOCIAL INSECT PHEROMONE COMMUNICATION INCLUDING NESTMATE RECOGNITION THIS BOOK LOOKS AT ANTS WASPS BEES AND TERMITES HIGHLIGHTING AREAS OF CONVERGENCE AND DIVERGENCE AMONG THESE GROUPS AND IDENTIFYING AREAS THAT NEED FURTHER INVESTIGATION PRESENTING BROAD SYNTHETIC OVERVIEWS AS WELL AS SPECIES SPECIFIC STUDIES THE VOLUME WILL BE USEFUL TO NATURAL SCIENTISTS ECOLOGISTS AND THOSE INTERESTED IN PEST MANAGEMENT AS WELL AS TO ANYONE INTERESTED IN THE FASCINATING CHEMICALLY MEDIATED BEHAVIORAL INTERACTIONS OF SOCIAL INSECTS CHEMICALS CONTROLLING INSECT BEHAVIOR CONSISTS OF PAPERS ORIGINALLY PRESENTED AT THE SYMPOSIUM ON CHEMICALS CONTROLLING INSECT BEHAVIOR AT THE 157TH NATIONAL MEETING OF THE AMERICAN CHEMICAL SOCIETY IN MINNEAPOLIS MINNESOTA ON APRIL 16 1969 ORGANIZED INTO SEVEN CHAPTERS THIS BOOK PRESENTS INFORMATION ON INSECT PHEROMONES INSECT DEFENSE MECHANISMS AND OTHER INSECT ATTRACTANTS AND REPELLENT IT SPECIFICALLY DESCRIBES THE SEX PHEROMONES OF THE LEPIDOPTERA THE ATTRACTANT PHEROMONES OF COLEOPTERA AND THE BOLL WEEVIL SEX ATTRACTANT THE CHEMICAL BASIS OF INSECT SOCIALITY AND ARTHROPOD DEFENSIVE SECRETIONS ARE ALSO EXPLAINED LASTLY THE PRACTICE IN PROGRAMS WITHIN THE USDA RELATING TO INSECT ATTRACTANTS AND REPELLENTS IS DISCUSSED THIS BOOK WILL SERVE AS GROUNDWORK FOR EVEN GREATER AND MORE RAPID PROGRESS IN THIS FIELD OF INTEREST IT WILL BE USEFUL TO CHEMISTS BIOCHEMISTS BIOLOGISTS ENTOMOLOGISTS AND OTHERS WORKING TO CONTROL INSECT PESTS THIS BOOK DOCUMENTS THE LATEST ACCOMPLISHMENTS AND TECHNOLOGY RELATING TO PHEROMONE USE IT CONTAINS LISTING OF PHEROMONES WHICH PROVIDES AN UP TO DATE BACKGROUND OF MATERIAL TO HELP BRING BOTH THE ADVANCED AND THE NEW WORKER ABREAST OF THE RAPIDLY GROWING PHEROMONE FIELD 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 EVOLUTION GAVE RISE TO A PROMINENT INSECT DIVERSITY AT EVERY LEVEL OF ECOLOGICAL NICHE SINCE THEN HORDES OF INSECTS HAVE THREATENED HUMAN AND CATTLE HEALTH AS WELL AS MOST OF ALL GREEN LANDS AND AGRICULTURAL CROPS NOW THE INSECT PROBLEM EXPANDS FROM MANY MUTANT FORMS OF YELLOW FEVER MOSQUITOES TO HIGHLY RESISTANT LARVAE OF MOST ALL VARIOUS PHYTOPHAGEOUS SPECIES THE TREMENDOUS EXPANSION OF INSECTS IS DUE NOT ONLY TO AN INCREASING RESISTANCE CAPACITY TO INSECTICIDES BUT ALSO TO A STRONG CAPACITY FOR ADAPTING TO DIFFERENT CLIMATE AND ENVIRONMENTAL CHANGES INCLUDING GLOBAL WARMING OBVIOUSLY INSECTS DISPLAY A NUMBER OF RUDIMENTARY SYSTEMS TO BUILD AN EXTREMELY EFFICIENT ORGANISM TO SURVIVE IN A CHANGING WORLD IN MANY SPECIES ONE PHEROMONE MOLECULE IS ENOUGH TO TRIGGER MATING BEHAVIOR THEREFORE INSECTS HAVE BECOME CRUCIAL MODELS NOT ONLY FOR EVOLUTIONARY STUDIES BUT ALSO FOR UNDERSTANDING SPECIFIC MECHANISMS UNDERLYING SENSORY BASED BEHAVIORS MOST OF INSECT SPECIES SUCH AS ANTS BEETLES COCKROACHES LOCUSTS MOTHS AND MOSQUITOES LARGELY RELY ON OLFACTORY CUES TO EXPLORE THE ENVIRONMENT AND FIND CON SPECIFICS OR FOOD SOURCES A CONGLOMERATE OF RENOWNED INTERNATIONAL SCIENTIFIC EXPERTS IS GATHERED TO EXPOSE THE INSECT PROBLEM ON THE VARIOUS CONTINENTS OF THE PLANET AND PROPOSE AN ALTERNATIVE TO THE USE OF TOXIC INSECTICIDES SEX PHEROMONES SPECIFIC CHEMICAL SIGNALS NECESSARY FOR REPRODUCTION AND PHEROMONE DETECTION IN INSECTS ARE DESCRIBED WITH FULL DETAILS OF THE OLFACTORY MECHANISMS IN THE ANTENNAE AND HIGHER CENTERS IN THE BRAIN THUS NEW SYNTHETIC PHEROMONES AND OR PLANT ODORS WITH SPECIFIC MOLECULAR TARGET SITES IN THE INSECT OLFACTORY SYSTEM ARE PROPOSED FOR SUSTAINABLE DEVELOPMENT IN AGRICULTURAL AND ENTOMOLOGICAL INDUSTRIES DISRUPTING INSECT PHEROMONE CHANNELS AND PLANT ODOR DETECTION MECHANISMS IS SOLEMNLY ENVISIONED AS A UNIQUE WAY TO CONTROL INVASIVE INSECT PEST SPECIES WHILE PRESERVING HUMAN AND ENVIRONMENT SAFETY THIS BOOK ENABLES THE STUDENTS RESEARCHERS AND TEACHERS OF CROP PROTECTION FACULTY TO UNDERSTAND AND PRACTICE THE PHEROMONES OF THE FAUNA THAT HAVE BEEN DESIGNATED BY SCIENTISTS THIS COMPENDIUM OF INFORMATION INCLUDES THE FOLLOWING TOPICS AMONGST OTHERS A TIMELINE DETAILING THE HISTORY OF THE PHEROMONES INFORMATION ON THE MENTORS OF PHEROMONE RESEARCH TYPES OF SIGNALLING IN VARIOUS GROUPS OF FAUNA MODES OF COMMUNICATION AMONG FAUNA AND INSECTS ALARM SIGNALS ATTRACTANTS RECOGNITION SIGNALS INDIRECT GUIDING KINESIS ORTHOKINESIS KLINOKINESIS ETC TYPES OF COMMUNICATION AMONG CONSPECIFICS MODES OF COMMUNICATION THE BROAD CATEGORIES OF THE PHEROMONES PHEROMONES IN FICTION MEDIA FRANCHISES LITERATURE ETC COURTING BEHAVIOUR OF FAUNA MATING CATEGORIES AND MATING BEHAVIOUR AND MUCH MORE THE

BOOK CONTAINS THE 12 DIFFERENT TYPES OF CLASSIFICATIONS WHICH ARE THE WORLD STANDARD CLASSIFICATION IN ADDITION FOR THE BENEFIT OF RESEARCHERS AND FIELD WORKERS THE VARIOUS TYPES OF DISPENSERS USED IN TRAPS ARE MENTIONED THE BOOK ALSO DISCUSSES THE POSSIBILITIES OF PHEROMONES AS ANTISEPTIC CHEMICALS AND PHEROMONOTHERAPY AMONGST VARIOUS OTHER FACTS OUR OBJECTIVE IN COMPILING A SERIES OF CHAPTERS ON THE CHEMICAL ECOLOGY OF INSECTS HAS BEEN TO DELINEATE THE MAJOR CONCEPTS OF THIS DISCIPLINE THE FINE LINE BETWEEN PRESENTING A FEW TOPICS IN GREAT DETAIL OR MANY TOPICS IN VENEER HAS BEEN CAREFULLY DRAWN SUCH THAT THE BOOK CONTAINS SUFFICIENT DIVERSITY TO COVER THE FIELD AND A FEW TOPICS IN SOME DEPTH AFTER THE READER HAS PENETRATED THE CRUST OF WHAT HAS BEEN LEARNED ABOUT CHEMICAL ECOLOGY OF INSECTS THE DEFICIENCIES IN OUR UNDERSTANDING OF THIS FIELD SHOULD BECOME EVIDENT THESE DEFICIENCIES TO WHICH NO CHAPTER TOPIC IS IMMUNE INDICATE THE YOUTHFUL STATE OF CHEMICAL ECOLOGY AND THE NEED FOR FURTHER INVESTIGATIONS ESPECIALLY THOSE WITH POTENTIAL FOR INTEGRATING ELEMENTS THAT ARE PRESENTLY ISOLATED FROM EACH OTHER AT THE OUTSET OF THIS VOLUME IT BECOMES EVIDENT THAT ALTHOUGH WE ARE BEGINNING TO DECIPHER HOW RECEPTOR CELLS WORK VIRTUALLY NOTHING IS KNOWN OF HOW SENSORY INFORMATION IS CODED TO BECOME RELEVANT TO THE INSECT AND TO CONTROL THE BEHAVIOR OF THE INSECT THIS PROBLEM IS EXACERBATED BY THE STATE OF OUR KNOWLEDGE OF HOW CHEMICALS ARE DISTRIBUTED IN NATURE ESPECIALLY IN COMPLEX HABITATS AND FINALLY WE HAVE BEEN UNABLE TO UNDERSTAND THE SIGNIFICANCE OF ORIENTATION PATHWAYS OF INSECTS IN PART BECAUSE OF THE TWO PREVIOUS PROBLEMS ORIENTATION SEEMS TO DEPEND ON PATTERNS OF DISTRIBUTION OF CHEMICALS THE CODING OF THESE PATTERNS BY THE CENTRAL NERVOUS SYSTEM AND THE GENERATION OF MOTOR OUTPUT BASED ON THE RESULTING MOTOR COMMANDS SUBSTANTIAL PROGRESS HAS BEEN MADE DURING THE PAST THREE DECADES IN THE DEVELOPMENT OF A VARIETY OF CHEMICAL MEANS TO CONTROL INSECT PESTS A LARGE NUMBER OF HIGHLY EFFECTIVE INSECTICIDES HAVE BEEN DEVELOPED AND MANY OF THEM HAVE CONTRIBUTED TO A GREAT EXTENT TO INCREASING AGRICULTURAL PRODUCTIVITY AND ERADICATING DISEASES TRANSMITTED BY VECTORS HOWEVER CONTAMINATION OF OUR ENVIRONMENT CAUSED BY VARIOUS PESTICIDES HAS BECOME A SERIOUS PROBLEM AND VARIOUS ATTEMPTS HAVE BEEN MADE TO DEVELOP NEWER METHODS OF CONTROLLING INSECT PESTS ONE OF THE APPROACHES IS TO DEVELOP NEWER INSECTICIDES WHICH CAUSE LESS CONTAMINATION OF THE ENVIRONMENT WITHOUT LOSING THEIR INSECTICIDAL POTENCIES ANOTHER APPROACH AMONG OTHER THINGS IS TO UTILIZE PHEROMONES TO CONTROL CERTAIN SPECIES OF INSECTS NO MATTER WHAT APPROACH ONE MAY CHOOSE IT IS IMPERATIVE TO UNDERSTAND THE MECHANISM OF ACTION OF PESTICIDES FOR EFFICIENT DEVELOPMENT AND UTILIZATION OF THESE CHEMICALS ONE IMPORTANT FEATURE COMMON TO MOST INSECTICIDES AND PHEROMONES IS THEIR INTERACTION WITH THE NERVOUS SYSTEM WHICH IS THE MAIN TARGET SITE THUS THE MECHANISMS OF ACTION OF THESE CHEMICALS ON THE NERVOUS SYSTEM REPRESENT ONE OF THE MOST CRITICAL ASPECTS IN PESTICIDE TOXICOLOGY IN COMPARISON TO THE CHEMICAL AND BIOCHEMICAL STUDIES DEALING WITH THE METABOLISM OF VARIOUS PESTICIDES THE STUDY OF NEUROTOXICOLOGY HAS LAGGED BEHIND TO A CONSIDERABLE EXTENT FOR VARIOUS REASONS TECHNICAL COMPLICATIONS INVOLVED IN NEUROTOXICOLOGICAL EXPERIMENTS APPEAR TO BE ONE OF THE CONTRIBUTING FACTORS COMMON AMONG MOTHS IS A MATE FINDING SYSTEM IN WHICH FEMALES EMIT A PHEROMONE THAT INDUCES MALES TO FLY UPWIND ALONG THE PHEROMONE PLUME SINCE THE CHEMICAL PHEROMONE OF THE DOMESTICATED SILK MOTH WAS IDENTIFIED IN 1959 A STEADY INCREASE IN THE NUMBER OF MOTH SPECIES WHOSE PHEROMONE ATTRACTANTS HAVE BEEN IDENTIFIED NOW RESULTS IN A RICH BASE FOR REVIEW AND SYNTHESIS PHEROMONE COMMUNICATION IN MOTHS SUMMARIZES MOTH PHEROMONE BIOLOGY COVERING THE CHEMICAL STRUCTURES USED BY THE VARIOUS LINEAGES SIGNAL PRODUCTION AND PERCEPTION THE GENETIC CONTROL OF MOTH PHEROMONE TRAITS INTERACTIONS OF PHEROMONES WITH HOST PLANT VOLATILES PHEROMONE DISPERSAL AND ORIENTATION MALE PHEROMONES AND COURTSHIP AND THE EVOLUTIONARY FORCES THAT HAVE LIKELY SHAPED PHEROMONE SIGNALS AND THEIR ROLE IN SEXUAL SELECTION ALSO INCLUDED ARE CHAPTERS ON PRACTICAL APPLICATIONS IN THE CONTROL AND MONITORING OF PEST SPECIES AS WELL AS CASE STUDIES THAT ADDRESS PHEROMONE SYSTEMS IN A NUMBER OF SPECIES AND GROUPS OF CLOSELY ALLIED SPECIES PHEROMONE COMMUNICATION IN MOTHS IS AN INVALUABLE RESOURCE FOR ENTOMOLOGISTS CHEMICAL ECOLOGISTS PEST MANAGEMENT SCIENTISTS AND PROFESSIONALS WHO STUDY PHEROMONE COMMUNICATION AND PEST MANAGEMENT THE PRESENT BOOK A REPRINT OF THE SUCCESSFUL INSECTS SPECIAL ISSUE FROM INSECT PHEROMONES TO MATING DISRUPTION THEORY AND PRACTICE INCLUDES LABORATORY AND FIELD STUDIES DEALING WITH INSECT PHEROMONES AS WELL AS ON MATING DISRUPTION EFFICACY AGAINST INSECT SPECIES OF ECONOMIC IMPORTANCE WITH SPECIAL REFERENCE TO THE DEVELOPMENT AND OPTIMIZATION OF MATING DISRUPTION APPROACHES THEIR MECHANISMS OF ACTION AND POSSIBLE NON TARGET EFFECTS EVOLUTION GAVE RISE TO A PROMINENT INSECT DIVERSITY AT EVERY LEVEL OF ECOLOGICAL NICHE SINCE THEN Hordes of insects have threatened human and cattle health as well as most of all green lands and agricultural crops now the insect problem expands from many mutant forms of yellow dengue fever mosquitoes to highly resistant larvae of most all various phytophagous species the tremendous expansion of insects is due not only to an increasing resistance capacity to insecticides but also to a strong capacity for adapting to different climate and environmental changes including global warming obviously insects display a number of rudimentary systems to build an extremely efficient organism to survive in a changing world in many species one pheromone molecule is enough to trigger mating behavior therefore insects have become crucial models not only for evolutionary studies but also for understanding specific mechanisms underlying sensory based behaviors most of insect species such as ants beetles cockroaches locusts moths and mosquitoes largely rely on olfactory cues to explore the environment and find conspecifics or food sources a conglomerate of renowned international scientific experts is gathered to expose the insect problem on the various continents of the planet and propose an alternative to the use of toxic insecticides sex pheromones specific chemical signals necessary for reproduction and pheromone detection in insects are described with full details of the olfactory mechanisms in the antennae and higher centers in the brain thus new synthetic pheromones and or plant odors with specific molecular target sites in the insect olfactory system are proposed for sustainable development in agricultural and entomological industries disrupting insect pheromone channels and plant odor detection mechanisms is solemnly envisioned as a unique way to control invasive insect pest species while preserving human and environment safety a pheromone is a chemical signal that triggers a natural response in another member of the same species there are alarm pheromones food trail pheromones sex pheromones and many others that affect behaviour or physiology their use among insects has been particularly well documented in addition some vertebrates and plants communicate by using pheromones this book examines trail pheromones and sex pheromones in termites and their potential use in pest management and insect repellents also discussed is splendipherin the aquatic male sex pheromone of the tree frog as well as the study of human pheromones perhaps the best expression of our intent in organizing this gathering is found in the definition of the word colloquy and its derivations a gathering allowing familiar and informal conversation among colleagues with similar interests was our objective our motives were of course complex our main intent was not however to add to the list of books competing for the time of the scientific community at large however while informality was our objective a lasting document exists in the form of this publication of the presentations forming the skeleton on which we built less formal but meatier communications we hope you can reconstruct on these bones a perception of the state of the art in the subject at hand the members of this assemblage are specialists in one or more subdisciplines their formal communications are found in texts and journals appropriate to their broader disciplines often their friends alone are privy to their less formal thoughts intuitions hopes and especially fears and failures we hoped by organizing this colloquium to develop familiar and informal conversation among those most interested and active in applying semiochemicals in pest control that community like others also shared by Gainesville entomologists has little or no formal organization or means for assemblage we proposed on this and future occasions to offer the opportunity to this and similar groups to gather though we do not presume too much to lead but rather to facilitate conversation this text explores biocommunication in insects including the role of chemical signals in insect plant interactions the application of pheromones neuroethological approaches and the evolution of communication using the example of the queen honey bee pheromones with contributions by numerous experts

INSECT PHEROMONES AND THEIR USE IN PEST MANAGEMENT

2013-12-01

THERE IS NOW A CONSIDERABLE LITERATURE ON CHEMICAL ECOLOGY WHICH HAD ITS BEGINNINGS IN THE STUDY OF INSECT PHEROMONES THIS BEGINNING WAS POSSIBLE ONLY BY COMBINING THE DISCIPLINES AND TECHNIQUES OF BIOLOGY AND CHEMISTRY FOR A BIOLOGIST IT IS DIFFICULT TO UNDERSTAND THE TIME FRAMES OF ANALYTICAL AND SYNTHETIC CHEMISTRY A COMPOUND MAY TAKE DAYS TO CHARACTERIZE AND BE AVAILABLE IN MINUTES FROM A BOTTLE ON THE SHELF OR IT MAY TAKE YEARS TO CHARACTERIZE AND SYNTHESIZE CHEMISTS HAVE A SIMILAR FRUSTRATION AFTER AN INTENSE PROGRAMME OF WORK THE INSECT IN QUESTION MAY NOT EMERGE FOR MANY MONTHS STUDY ARE HOWEVER THE REWARDS OF INTEGRATED INTERDISCIPLINARY CONSIDERABLE BECAUSE THEY ALLOW US TO UNDERSTAND MANY FACETS OF INSECT BEHAVIOUR AND CONSEQUENTLY TO CONTROL THAT BEHAVIOUR FOR OUR OWN ENDS IN THIS BOOK WE HAVE SET OUT TO EXPLAIN THE RESULTS OF RESEARCH FROM CHEMICAL AND BIOLOGICAL PERSPECTIVES AND SEE HOW THE KNOWLEDGE GAINED HAS LED TO NOVEL TECHNIQUES THAT CAN BE USED IN INSECT PEST MANAGEMENT AND INSECT CONTROL AN IMPORTANT PART OF UNDERSTANDING INSECT CHEMICAL ECOLOGY INVOLVES THE UNDERSTANDING NOT ONLY OF NEW CONCEPTS BUT OF THE VOCABULARIES USED BY SCIENTISTS SPECIALIZING IN DIFFERENT FIELDS IT WILL BE CLEAR THAT THE THREE SECTIONS OF THIS BOOK HAVE BEEN WRITTEN BY THREE DIFFERENT PEOPLE AN INSECT BEHAVIOURIST AN ORGANIC CHEMIST AND A BIOLOGIST IN INDUSTRY

HANDBOOK OF INSECT PHEROMONES AND SEX ATTRACTANTS

2019-08-22

THIS BOOK FOCUSES ON CHEMICALS THAT EFFECT AGGREGATION FOR MATING AND ELICIT SEXUAL BEHAVIOR IN INSECTS MITES AND TICKS MAINLY ON SEX PHEROMONAL OR MATING ACTIVITY THESE PHEROMONES ARE USEFUL TO BOTH AGRICULTURE SCIENCE AND INDUSTRY BECAUSE OF THEIR POTENTIAL AS DETECTION AND CONTROL AGENTS

INSECT PHEROMONE RESEARCH

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 CARDÓ 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

INSECT PHEROMONES IN PLANT PROTECTION

1989-05-05

A TECHNICAL REVIEW OF THE USE OF PHEROMONES IN THE CONTROL OF INSECT PESTS IN AGRICULTURE IT EXAMINES THE SCIENTIFIC BACKGROUND AND CHEMICAL MANUFACTURE OF PHEROMONES AND THE ECONOMIC AND COMMERCIAL FACTORS RELEVANT TO THE INTRODUCTION OF THIS NOVEL SYSTEM

INSECT SEX PHEROMONES

2012-12-02

INSECT SEX PHEROMONES IS A REVISED AND EXPANDED EDITION OF THE BOOK INSECT SEX ATTRACTANTS AND COVERS GREATER DISCOVERIES IN THE FIELD OF SEX PHEROMONES IT IS DISCOVERED THAT MANY SEX PHEROMONES ARE SEXUALLY EXCITATORY RATHER THAN ATTRACTIVE THIS DISCOVERY PROMPTED THE SUBSTITUTION OF THE MORE ACCURATE AND ENCOMPASSING TERM PHEROMONES FOR THE TERM ATTRACTANTS IN THE TITLE OF THIS EDITION COMPOSED OF 13 CHAPTERS THIS BOOK HAS CHAPTERS THAT COVER THE OCCURRENCE IN FEMALE AND PRODUCTION IN MALE OF SEX PHEROMONES IN VARIOUS INSECT SPECIES THE INSECT ORDERS CONSIDERED INCLUDE ACARINA ORTHOPTERA HEMIPTERA HOMOPTERA DIPTERA ISOPTERA NEUROPTERA SIPHONAPTERA COLEOPTERA HYMENOPTERA LEPIDOPTERA TRICHOPTERA AND MECOPTERA THE FOLLOWING CHAPTER DISCUSSES PHEROMONES PRODUCED BY ONE SEX THAT LURE TO ASSEMBLE FOR MATING THIS BOOK GOES ON DISCUSSING THE ANATOMY AND PHYSIOLOGY OF SCENT GLANDS OF MALE AND FEMALE INSECTS THE ATTRACTANT PERCEPTION MECHANISM AND THE BEHAVIORAL AND ELECTROPHYSIOLOGICAL RESPONSES OF INSECTS TO SEX PHEROMONES OTHER CHAPTERS ARE DEVOTED TO THE INFLUENCE OF SEVERAL FACTORS ON THE PRESENCE OF CHEMICAL SEX ATTRACTION OR EXCITATION IN ANY INSECT THE CONCLUDING CHAPTERS DEAL WITH THE COLLECTION ISOLATION IDENTIFICATION SYNTHESIS AND ANALYSIS OF SEX PHEROMONES THIS BOOK WILL GREATLY APPEAL TO RESEARCH AND ECONOMIC ENTOMOLOGISTS INSECT PHYSIOLOGISTS CHEMISTS AND ECOLOGISTS

INSECT PHEROMONE BIOCHEMISTRY AND MOLECULAR BIOLOGY

2020-09-18

INSECT PHEROMONE BIOCHEMISTRY AND MOLECULAR BIOLOGY SECOND EDITION PROVIDES AN UPDATED AND COMPREHENSIVE REVIEW OF THE BIOCHEMISTRY AND MOLECULAR BIOLOGY OF INSECT PHEROMONE BIOSYNTHESIS AND RECEPTION THE BOOK TIES TOGETHER HISTORICAL INFORMATION WITH RECENT DISCOVERIES PROVIDES THE READER WITH THE CURRENT STATE OF THE FIELD AND SUGGESTS WHERE FUTURE RESEARCH IS HEADED WRITTEN BY INTERNATIONAL EXPERTS MANY OF WHOM PIONEERED STUDIES ON INSECT PHEROMONE PRODUCTION AND RECEPTION THIS RELEASE UPDATES THE 2003 FIRST EDITION WITH AN EMPHASIS ON RECENT ADVANCES IN THE FIELD THIS BOOK WILL BE AN IMPORTANT RESOURCE FOR ENTOMOLOGISTS AND MOLECULAR BIOLOGISTS STUDYING ALL AREAS OF INSECT COMMUNICATION OFFERS A HISTORICAL AND CONTEMPORARY

PERSPECTIVE WITH A FOCUS ON ADVANCES OVER THE LAST 15 YEARS DISCUSSES THE MOLECULAR AND REGULATORY MECHANISMS UNDERLYING PHEROMONE PRODUCTION DETECTION AS WELL AS THE EVOLUTION OF THESE PROCESSES ACROSS THE INSECTS LED BY EDITORS WITH BROAD EXPERTISE IN THE METABOLIC PATHWAYS OF PHEROMONE PRODUCTION AND THE BIOCHEMICAL AND GENETIC PROCESSES OF PHEROMONE DETECTION

HANDBOOK OF INSECT PHEROMONES AND SEX ATTRACTANTS

2019

THIS BOOK FOCUSES ON CHEMICALS THAT EFFECT AGGREGATION FOR MATING AND ELICIT SEXUAL BEHAVIOR IN INSECTS MITES AND TICKS MAINLY ON SEX PHEROMONAL OR MATING ACTIVITY THESE PHEROMONES ARE USEFUL TO BOTH AGRICULTURE SCIENCE AND INDUSTRY BECAUSE OF THEIR POTENTIAL AS DETECTION AND CONTROL AGENTS

TECHNIQUES IN PHEROMONE RESEARCH

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

CHROMATOGRAPHY AND ISOLATION OF INSECT HORMONES AND PHEROMONES

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

INSECT SEX PHEROMONE RESEARCH AND BEYOND

2020-03-19

THIS BOOK PROVIDES A COMPLETE OVERVIEW OF CUTTING EDGE RESEARCH ON INSECT SEX PHEROMONES AND PHEROMONE COMMUNICATION SYSTEMS THE COVERAGE RANGES FROM THE CHEMISTRY BIOSYNTHESIS AND RECEPTION OF SEX PHEROMONES TO THE CONTROL OF ODOR SOURCE SEARCHING BEHAVIOR AND FROM MOLECULES TO THE APPLICATION OF RESEARCH FINDINGS TO ROBOTICS THE BOOK BOTH SUMMARIZES THE PROGRESS OF STUDIES CONDUCTED USING BOMBYX MORI AND SEVERAL GROUPS OF MOTHS AND REVIEWS SEX PHEROMONES OF SOME NON LEPIDOPTERAN INSECT GROUPS OF AGRICULTURAL IMPORTANCE ATTENTION IS DRAWN TO RECENT FINDINGS ON ELABORATE NEURAL INFORMATION PROCESSING IN THE BRAIN IN MALE MOTHS AND TO THE IMPORTANCE OF OLFACTORY RECEPTORS SPECIFICALLY TUNED TO SEX PHEROMONE MOLECULES FEATURING CONTRIBUTIONS FROM LEADING EXPERTS ON THE TOPIC THIS BOOK WILL BE A UNIQUE AND VALUABLE RESOURCE FOR RESEARCHERS AND STUDENTS IN THE FIELDS OF ENTOMOLOGY CHEMICAL ECOLOGY INSECT PHYSIOLOGY AND BIOCHEMISTRY EVOLUTION BIOMIMETICS AND BIOENGINEERING IN ADDITION TO RESEARCHERS GENERAL INSECT LOVERS WILL FIND THE BOOK FASCINATING FOR ITS DESCRIPTIONS OF THE MARVELOUS ABILITIES OF INSECTS AND THE UNDERLYING MECHANISMS INVOLVED

PHEROMONES OF NON-LEPIDOPTERAN INSECTS ASSOCIATED WITH AGRICULTURAL PLANTS

1999

SINCE THE IDENTIFICATION OF INSECT PHEROMONES IN THE LATE 1950S ATTENTION HAS OFTEN FOCUSED ON THE USE OF THESE POTENT BEHAVIOR MODIFYING CHEMICALS AS PEST CONTROL AGENTS MUCH OF THIS INTEREST HAS CONCENTRATED ON LEPIDOPTERA PARTICULARLY MOTHS IN ADDRESSING THIS TOPIC IN OTHER INSECT ORDERS THIS MULTI AUTHOR BOOK FILLS THIS CURRENT GAP IN THE LITERATURE IT PRESENTS RESEARCH FROM LEADING AUTHORITIES ON THE MOST IMPORTANT INSECT GROUPS AND DETAILS THE CURRENT PROGRESS OF RESEARCH IN THESE AREAS APPLICATIONS OF THE RESEARCH TO AGRICULTURAL SYSTEMS AROUND THE WORLD AND POSSIBLE MECHANISMS FOR SUSTAINABLE CROP PROTECTION ARE CONSIDERED THIS BOOK IS ESSENTIAL READING FOR STUDENTS AND RESEARCHERS IN ENTOMOLOGY AND CROP PROTECTION

INSECT PHEROMONES AND THEIR USE IN PEST MANAGEMENT

2012-03-01

THERE IS NOW A CONSIDERABLE LITERATURE ON CHEMICAL ECOLOGY WHICH HAD ITS BEGINNINGS IN THE STUDY OF INSECT PHEROMONES THIS BEGINNING WAS POSSIBLE ONLY BY COMBINING THE DISCIPLINES AND TECHNIQUES OF BIOLOGY AND CHEMISTRY FOR A BIOLOGIST IT IS DIFFICULT TO UNDERSTAND THE TIME FRAMES OF ANALYTICAL AND SYNTHETIC CHEMISTRY A COMPOUND MAY TAKE DAYS TO CHARACTERIZE AND BE AVAILABLE IN MINUTES FROM A BOTTLE ON THE SHELF OR IT MAY TAKE YEARS TO CHARACTERIZE AND SYNTHESIZE CHEMISTS HAVE A SIMILAR FRUSTRATION AFTER AN INTENSE PROGRAMME OF WORK THE INSECT IN QUESTION MAY NOT EMERGE FOR MANY MONTHS STUDY ARE HOWEVER THE REWARDS OF INTEGRATED INTERDISCIPLINARY CONSIDERABLE BECAUSE THEY ALLOW US TO UNDERSTAND MANY FACETS OF INSECT BEHAVIOUR AND CONSEQUENTLY TO CONTROL THAT BEHAVIOUR FOR OUR OWN ENDS IN THIS BOOK WE HAVE SET OUT TO EXPLAIN THE RESULTS OF RESEARCH FROM CHEMICAL AND BIOLOGICAL PERSPECTIVES AND SEE HOW THE KNOWLEDGE GAINED HAS LED TO NOVEL TECHNIQUES THAT CAN BE USED IN INSECT PEST MANAGEMENT AND INSECT CONTROL AN IMPORTANT PART OF UNDERSTANDING INSECT CHEMICAL ECOLOGY INVOLVES THE UNDERSTANDING NOT ONLY OF NEW CONCEPTS BUT OF THE VOCABULARIES USED BY SCIENTISTS SPECIALIZING IN DIFFERENT FIELDS IT WILL BE CLEAR THAT THE THREE SECTIONS OF THIS BOOK HAVE BEEN WRITTEN BY THREE DIFFERENT PEOPLE AN INSECT BEHAVIOURIST AN ORGANIC CHEMIST AND A BIOLOGIST IN INDUSTRY

CONTROL OF INSECT BEHAVIOR BY NATURAL PRODUCTS

2013-10-22

CONTROL OF INSECT BEHAVIOR BY NATURAL PRODUCTS PRESENTS PAPERS ON NEW BIOCHEMICAL APPROACHES TO PEST CONTROL THE BOOK PRESENTS ARTICLES ON PHEROMONE RESEARCH WITH STORED PRODUCT COLEOPTERA SOME GENERAL CONSIDERATIONS OF INSECTS RESPONSES TO THE CHEMICALS IN FOOD PLANTS AND PHEROMONES OF THE HONEY BEE THE TEXT ALSO INCLUDES PAPERS ON SEVERAL SUBSTANCES RESPONSIBLE FOR THE FEEDING BEHAVIOR AND GROWTH OF THE SILKWORM LARVA THE SENSORY RESPONSES OF PHYTOPHAGUS LEPIDOPTERA TO CHEMICAL AND TACTILE STIMULI AND THE USE OF VOLATILE ORGANIC SULFUR COMPOUNDS AS INSECT ATTRACTANTS WITH SPECIAL REFERENCE TO HOST SELECTION INSECT ANTI FEEDANTS IN PLANTS A HOUSE FLY ATTRACTANT IN THE MUSHROOM AND STUDIES ON SEX PHEROMONES OF THE STORED GRAIN MOTHS ARE ALSO CONSIDERED THE BOOK ALSO DEMONSTRATES ARTICLES ON THE ELECTROPHYSIOLOGICAL INVESTIGATION OF INSECT OLFACTION AND HOST ATTRACTANTS FOR THE RICE WEEVIL AND THE CHEESE MITE ENTOMOLOGISTS BIOLOGISTS CHEMISTS AND PEOPLE INVOLVED IN THE RESEARCH OF PEST CONTROL WILL FIND THE BOOK INVALUABLE

BEHAVIOR-MODIFYING CHEMICALS FOR INSECT MANAGEMENT

1990-03-12

PRESENTING AN AUTHORITATIVE OVERVIEW OF CURRENT FINDINGS ON PHEROMONE APPLICATIONS THIS REFERENCE REVIEWS THE PRINCIPLES INVOLVED IN EMPLOYING THESE COMPOUNDS THEIR CHEMISTRY AND DELIVERY SYSTEMS FOR EFFICIENT USE IN ADDITION IT PROVIDES CASE STUDIES OF CURRENT AND POTENTIAL PRACTICAL APPLICATI

INSECT PHEROMONES AND THEIR USE IN PEST MANAGEMENT

1998

BRINGING TOGETHER FOR THE FIRST TIME PROMINENT RESEARCHERS IN SOCIAL INSECT PHEROMONE COMMUNICATION INCLUDING NESTMATE RECOGNITION THIS BOOK LOOKS AT ANTS WASPS BEES AND TERMITES HIGHLIGHTING AREAS OF CONVERGENCE AND DIVERGENCE AMONG THESE GROUPS AND IDENTIFYING AREAS THAT NEED FURTHER INVESTIGATION PRESENTING BROAD SYNTHETIC OVERVIEWS AS WELL AS SPECIES SPECIFIC STUDIES THE VOLUME WILL BE USEFUL TO NATURAL SCIENTISTS ECOLOGISTS AND THOSE INTERESTED IN PEST MANAGEMENT AS WELL AS TO ANYONE INTERESTED IN THE FASCINATING CHEMICALLY MEDIATED BEHAVIORAL INTERACTIONS OF SOCIAL INSECTS

PHEROMONE COMMUNICATION IN SOCIAL INSECTS

2019-06-18

CHEMICALS CONTROLLING INSECT BEHAVIOR CONSISTS OF PAPERS ORIGINALLY PRESENTED AT THE SYMPOSIUM ON CHEMICALS CONTROLLING INSECT BEHAVIOR AT THE 157TH NATIONAL MEETING OF THE AMERICAN CHEMICAL SOCIETY IN MINNEAPOLIS MINNESOTA ON APRIL 16 1969 ORGANIZED INTO SEVEN CHAPTERS THIS BOOK PRESENTS INFORMATION ON INSECT PHEROMONES INSECT DEFENSE MECHANISMS AND OTHER INSECT ATTRACTANTS AND REPELLENT IT SPECIFICALLY DESCRIBES THE SEX PHEROMONES OF THE LEPIDOPTERA THE ATTRACTANT PHEROMONES OF COLEOPTERA AND THE BOLL WEEVIL SEX ATTRACTANT THE CHEMICAL BASIS OF INSECT SOCIALITY AND ARTHROPOD DEFENSIVE SECRETIONS ARE ALSO EXPLAINED LASTLY THE PRACTICE IN PROGRAMS WITHIN THE USDA RELATING TOINSECT ATTRACTANTS AND REPELLENTS IS DISCUSSED THIS BOOK WILL SERVE AS GROUNDWORK FOR EVEN GREATER AND MORE RAPID PROGRESS IN THIS FIELD OF INTEREST IT WILL BE USEFUL TO CHEMISTS BIOCHEMISTS BIOLOGISTS ENTOMOLOGISTS AND OTHERS WORKING TO CONTROL INSECT PESTS

INSECT PHEROMONE TECHNOLOGY

1982

THIS BOOK DOCUMENTS THE LATEST ACCOMPLISHMENTS AND TECHNOLOGY RELATING TO PHEROMONE USE IT CONTAINS LISTING OF PHEROMONES WHICH PROVIDES AN UP TO DATE BACKGROUND OF MATERIAL TO HELP BRING BOTH THE ADVANCED AND THE NEW WORKER ABOARD OF THE RAPIDLY GROWING PHEROMONE FIELD

CHIRAL SYNTHESIS OF INSECT PHEROMONES [MICROFORM]

1985

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

CHEMICALS CONTROLLING INSECT BEHAVIOR

2012-12-02

EVOLUTION GAVE RISE TO A PROMINENT INSECT DIVERSITY AT EVERY LEVEL OF ECOLOGICAL NICHE SINCE THEN HORDES OF INSECTS HAVE THREATENED HUMAN AND CATTLE HEALTH AS WELL AS MOST OF ALL GREEN LANDS AND AGRICULTURAL CROPS NOW THE INSECT PROBLEM EXPANDS FROM MANY MUTANT FORMS OF YELLOW DENGUE FEVER MOSQUITOES TO HIGHLY RESISTANT LARVAE OF MOST ALL VARIOUS PHYTOPHAGEOUS SPECIES THE TREMENDOUS EXPANSION OF INSECTS IS DUE NOT ONLY TO AN INCREASING RESISTANCE CAPACITY TO INSECTICIDES BUT ALSO TO A STRONG CAPACITY FOR ADAPTING TO DIFFERENT CLIMATE AND ENVIRONMENTAL CHANGES INCLUDING GLOBAL WARMING OBVIOUSLY INSECTS DISPLAY A NUMBER OF RUDIMENTARY SYSTEMS TO BUILD AN EXTREMELY EFFICIENT ORGANISM TO SURVIVE IN A CHANGING WORLD IN MANY SPECIES ONE PHEROMONE MOLECULE IS ENOUGH TO TRIGGER MATING BEHAVIOR THEREFORE INSECTS HAVE BECOME CRUCIAL MODELS NOT ONLY FOR EVOLUTIONARY STUDIES BUT ALSO FOR UNDERSTANDING SPECIFIC MECHANISMS UNDERLYING SENSORY BASED BEHAVIORS MOST OF INSECT SPECIES SUCH AS ANTS BEETLES COCKROACHES LOCUSTS MOTHS AND MOSQUITOES LARGELY RELY ON OLFACTORY CUES TO EXPLORE THE ENVIRONMENT AND FIND CON SPECIFICS OR FOOD SOURCES A CONGLOMERATE OF RENOWNED INTERNATIONAL SCIENTIFIC EXPERTS IS GATHERED TO EXPOSE THE INSECT PROBLEM ON THE VARIOUS CONTINENTS OF THE PLANET AND PROPOSE AN ALTERNATIVE TO THE USE OF TOXIC INSECTICIDES SEX PHEROMONES SPECIFIC CHEMICAL SIGNALS NECESSARY FOR REPRODUCTION AND PHEROMONE DETECTION IN INSECTS ARE DESCRIBED WITH FULL DETAILS OF THE OLFACTORY MECHANISMS IN THE ANTENNAE AND HIGHER CENTERS IN THE BRAIN THUS NEW SYNTHETIC PHEROMONES AND OR PLANT ODORS WITH SPECIFIC MOLECULAR TARGET SITES IN THE INSECT OLFACTORY SYSTEM ARE PROPOSED FOR SUSTAINABLE DEVELOPMENT IN AGRICULTURAL AND ENTOMOLOGICAL INDUSTRIES DISRUPTING INSECT PHEROMONE CHANNELS AND PLANT ODOR DETECTION MECHANISMS IS SOLEMNLY ENVISIONED AS A UNIQUE WAY TO CONTROL INVASIVE INSECT PEST SPECIES WHILE PRESERVING HUMAN AND ENVIRONMENT SAFETY

PHEROMONES

1974

THIS BOOK ENABLES THE STUDENTS RESEARCHERS AND TEACHERS OF CROP PROTECTION FACULTY TO UNDERSTAND AND PRACTICE THE PHEROMONES OF THE FAUNA THAT HAVE BEEN DESIGNATED BY SCIENTISTS THIS COMPENDIUM OF INFORMATION INCLUDES THE FOLLOWING TOPICS AMONGST OTHERS A TIMELINE DETAILING THE HISTORY OF THE PHEROMONES INFORMATION ON THE MENTORS OF PHEROMONE RESEARCH TYPES OF SIGNALLING IN VARIOUS GROUPS OF FAUNA MODES OF COMMUNICATION AMONG FAUNA AND INSECTS ALARM SIGNALS ATTRACTANTS RECOGNITION SIGNALS INDIRECT GUIDING KINESIS ORTHOKINESIS KLINOKINESIS ETC TYPES OF COMMUNICATION AMONG CONSPECIFICS MODES OF COMMUNICATION THE BROAD CATEGORIES OF THE PHEROMONES PHEROMONES IN FICTION MEDIA FRANCHISES LITERATURE ETC COURTING BEHAVIOUR OF FAUNA MATING CATEGORIES AND MATING BEHAVIOUR AND MUCH MORE THE BOOK CONTAINS THE 12 DIFFERENT TYPES OF CLASSIFICATIONS WHICH ARE THE WORLD STANDARD CLASSIFICATION IN ADDITION FOR THE BENEFIT OF RESEARCHERS AND FIELD WORKERS THE VARIOUS TYPES OF DISPENSERS USED IN TRAPS ARE MENTIONED THE BOOK ALSO DISCUSSES THE POSSIBILITIES OF PHEROMONES AS ANTISEPTIC CHEMICALS AND PHEROMONOTHERAPY AMONGST VARIOUS OTHER FACTS

INSECT SUPPRESSION WITH CONTROLLED RELEASE PHEROMONE SYSTEMS

2019-07-23

OUR OBJECTIVE IN COMPILING A SERIES OF CHAPTERS ON THE CHEMICAL ECOLOGY OF INSECTS HAS BEEN TO DELINEATE THE MAJOR CONCEPTS OF THIS DISCIPLINE THE FINE LINE BETWEEN PRESENTING A FEW TOPICS IN GREAT DETAIL OR MANY TOPICS IN VENEER HAS BEEN CAREFULLY DRAWN SUCH THAT THE BOOK CONTAINS SUFFICIENT DIVERSITY TO COVER THE FIELD AND A FEW TOPICS IN SOME DEPTH AFTER THE READER HAS PENETRATED THE CRUST OF WHAT HAS BEEN LEARNED ABOUT CHEMICAL ECOLOGY OF INSECTS THE DEFICIENCIES IN OUR UNDERSTANDING OF THIS FIELD SHOULD BECOME EVIDENT THESE DEFICIENCIES TO WHICH NO CHAPTER TOPIC IS IMMUNE INDICATE THE YOUTHFUL STATE OF CHEMICAL ECOLOGY AND THE NEED FOR FURTHER INVESTIGATIONS ESPECIALLY THOSE WITH POTENTIAL FOR INTEGRATING ELEMENTS THAT ARE PRESENTLY ISOLATED FROM EACH OTHER AT THE OUTSET OF THIS VOLUME IT BECOMES EVIDENT THAT ALTHOUGH WE ARE BEGINNING TO DECIPHER HOW RECEPTOR CELLS WORK VIRTUALLY NOTHING IS KNOWN OF HOW SENSORY INFORMATION IS CODED TO BECOME RELEVANT TO THE INSECT AND TO CONTROL THE BEHAVIOR OF THE INSECT THIS PROBLEM IS EXACERBATED BY THE STATE OF OUR KNOWLEDGE OF HOW CHEMICALS ARE DISTRIBUTED IN NATURE ESPECIALLY IN COMPLEX HABITATS AND FINALLY WE HAVE BEEN UNABLE TO UNDERSTAND THE SIGNIFICANCE OF ORIENTATION PATHWAYS OF INSECTS IN PART BECAUSE OF THE TWO PREVIOUS PROBLEMS ORIENTATION SEEMS TO DEPEND ON PATTERNS OF DISTRIBUTION OF CHEMICALS THE CODING OF THESE PATTERNS BY THE CENTRAL NERVOUS SYSTEM AND THE GENERATION OF MOTOR OUTPUT BASED ON THE RESULTING MOTOR COMMANDS

MOLECULAR MECHANISMS OF INSECT CHEMICAL COMMUNICATION

2002

SUBSTANTIAL PROGRESS HAS BEEN MADE DURING THE PAST THREE DECADES IN THE DEVELOPMENT OF A VARIETY OF CHEMICAL MEANS TO CONTROL INSECT PESTS A LARGE NUMBER OF HIGHLY EFFECTIVE INSECTICIDES HAVE BEEN DEVELOPED AND MANY OF THEM HAVE CONTRIBUTED TO A GREAT EXTENT TO INCREASING AGRICULTURAL PRODUCTIVITY AND ERADICATING DISEASES TRANSMITTED BY VECTORS HOWEVER CONTAMINATION OF OUR ENVIRONMENT CAUSED BY VARIOUS PESTICIDES HAS BECOME A SERIOUS PROBLEM AND VARIOUS ATTEMPTS HAVE BEEN MADE TO DEVELOP NEWER METHODS OF CONTROLLING INSECT PESTS ONE OF THE APPROACHES IS TO DEVELOP NEWER INSECTICIDES WHICH CAUSE LESS CONTAMINATION OF THE ENVIRONMENT WITHOUT LOSING THEIR INSECTICIDAL POTENCIES ANOTHER APPROACH AMONG OTHER THINGS IS TO UTILIZE PHEROMONES TO CONTROL CERTAIN SPECIES OF INSECTS NO MATTER WHAT APPROACH ONE MAY CHOOSE IT IS IMPERATIVE TO UNDERSTAND THE MECHANISM OF ACTION OF PESTICIDES FOR EFFICIENT DEVELOPMENT AND UTILIZATION OF THESE CHEMICALS ONE IMPORTANT FEATURE COMMON TO MOST INSECTICIDES AND PHEROMONES IS THEIR INTER ACTION WITH THE NERVOUS SYSTEM WHICH IS THE MAIN TARGET SITE THUS THE MECHANISMS OF ACTION OF THESE CHEMICALS ON THE NERVOUS SYSTEM REPRESENT ONE OF THE MOST CRITICAL ASPECTS IN PESTICIDE TOXICOLOGY IN COMPARISON TO THE CHEMICAL AND BIOCHEMICAL STUDIES DEALING WITH THE METABOLISM OF VARIOUS PESTICIDES THE STUDY OF NEUROTOXICOLOGY HAS LAGGED BEHIND TO A CONSIDERABLE EXTENT FOR VARIOUS REASONS TECHNICAL COMPLICATIONS INVOLVED IN NEUROTO CO LOGICAL EXPERIMENTS APPEAR TO BE ONE OF THE CONTRIBUTING FACTORS

PHEROMONE BIOCHEMISTRY

2014-06-28

COMMON AMONG MOTHS IS A MATE FINDING SYSTEM IN WHICH FEMALES EMIT A PHEROMONE THAT INDUCES MALES TO FLY UPWIND ALONG THE PHEROMONE PLUME SINCE THE CHEMICAL PHEROMONE OF THE DOMESTICATED SILK MOTH WAS IDENTIFIED IN 1959 A STEADY INCREASE IN THE NUMBER OF MOTH SPECIES WHOSE PHEROMONE ATTRACTANTS HAVE BEEN IDENTIFIED NOW RESULTS IN A RICH BASE FOR REVIEW AND SYNTHESIS PHEROMONE COMMUNICATION IN MOTHS SUMMARIZES MOTH PHEROMONE BIOLOGY COVERING THE CHEMICAL STRUCTURES USED BY THE VARIOUS LINEAGES SIGNAL PRODUCTION AND PERCEPTION THE GENETIC CONTROL OF MOTH PHEROMONE TRAITS INTERACTIONS OF PHEROMONES WITH HOST PLANT VOLATILES PHEROMONE DISPERSAL AND ORIENTATION MALE PHEROMONES AND COURTSHIP AND THE EVOLUTIONARY FORCES THAT HAVE LIKELY SHAPED PHEROMONE SIGNALS AND THEIR ROLE IN SEXUAL SELECTION ALSO INCLUDED ARE CHAPTERS ON PRACTICAL APPLICATIONS IN THE CONTROL AND MONITORING OF PEST SPECIES AS WELL AS CASE STUDIES THAT ADDRESS PHEROMONE SYSTEMS IN A NUMBER OF SPECIES AND GROUPS OF CLOSELY ALLIED SPECIES PHEROMONE COMMUNICATION IN MOTHS IS AN INVALUABLE RESOURCE FOR ENTOMOLOGISTS CHEMICAL ECOLOGISTS PEST MANAGEMENT SCIENTISTS AND PROFESSIONALS WHO STUDY PHEROMONE COMMUNICATION AND PEST MANAGEMENT

OLFACTORY CONCEPTS OF INSECT CONTROL - ALTERNATIVE TO INSECTICIDES

2019-05-16

THE PRESENT BOOK A REPRINT OF THE SUCCESSFUL INSECTS SPECIAL ISSUE FROM INSECT PHEROMONES TO MATING DISRUPTION THEORY AND PRACTICE INCLUDES LABORATORY AND FIELD STUDIES DEALING WITH INSECT PHEROMONES AS WELL AS ON MATING DISRUPTION EFFICACY AGAINST INSECT SPECIES OF ECONOMIC IMPORTANCE WITH SPECIAL REFERENCE TO THE DEVELOPMENT AND OPTIMIZATION OF MATING DISRUPTION APPROACHES THEIR MECHANISMS OF ACTION AND POSSIBLE NON TARGET EFFECTS

SYNTHETIC CHEMISTRY OF INSECT PHEROMONES AND JUVENILE HORMONES

1979

EVOLUTION GAVE RISE TO A PROMINENT INSECT DIVERSITY AT EVERY LEVEL OF ECOLOGICAL NICHE SINCE THEN HORDES OF INSECTS HAVE THREATENED HUMAN AND CATTLE HEALTH AS WELL AS MOST OF ALL GREEN LANDS AND AGRICULTURAL CROPS NOW THE INSECT PROBLEM EXPANDS FROM MANY MUTANT FORMS OF YELLOW DENGUE FEVER MOSQUITOES TO HIGHLY RESISTANT LARVAE OF MOST ALL VARIOUS PHYTOPHAGEOUS SPECIES THE TREMENDOUS EXPANSION OF INSECTS IS DUE NOT ONLY TO AN INCREASING RESISTANCE CAPACITY TO INSECTICIDES BUT ALSO TO A STRONG CAPACITY FOR ADAPTING TO DIFFERENT CLIMATE AND ENVIRONMENTAL CHANGES INCLUDING GLOBAL WARMING OBVIOUSLY INSECTS DISPLAY A NUMBER OF RUDIMENTARY SYSTEMS TO BUILD AN EXTREMELY EFFICIENT ORGANISM TO SURVIVE IN A CHANGING WORLD IN MANY SPECIES ONE PHEROMONE MOLECULE IS ENOUGH TO TRIGGER MATING BEHAVIOR THEREFORE INSECTS HAVE BECOME CRUCIAL MODELS NOT ONLY FOR EVOLUTIONARY STUDIES BUT ALSO FOR UNDERSTANDING SPECIFIC MECHANISMS UNDERLYING SENSORY BASED BEHAVIORS MOST OF INSECT SPECIES SUCH AS ANTS BEETLES COCKROACHES LOCUSTS MOTHS AND MOSQUITOES LARGELY RELY ON OLFACTORY CUES TO EXPLORE THE ENVIRONMENT AND FIND CON SPECIFICS OR FOOD SOURCES A CONGLOMERATE OF RENOWNED INTERNATIONAL SCIENTIFIC EXPERTS IS GATHERED TO EXPOSE THE INSECT PROBLEM ON THE VARIOUS CONTINENTS OF THE PLANET AND PROPOSE AN ALTERNATIVE TO THE USE OF TOXIC INSECTICIDES SEX PHEROMONES SPECIFIC CHEMICAL SIGNALS NECESSARY FOR REPRODUCTION AND PHEROMONE DETECTION IN INSECTS ARE DESCRIBED WITH FULL DETAILS OF THE OLFACTORY MECHANISMS IN THE ANTENNAE AND HIGHER CENTERS IN THE BRAIN THUS NEW SYNTHETIC PHEROMONES AND OR PLANT ODORS WITH SPECIFIC MOLECULAR TARGET SITES IN THE INSECT OLFACTORY SYSTEM ARE PROPOSED FOR SUSTAINABLE DEVELOPMENT IN AGRICULTURAL AND ENTOMOLOGICAL INDUSTRIES DISRUPTING INSECT PHEROMONE CHANNELS AND PLANT ODOR DETECTION MECHANISMS IS SOLEMNLY ENVISIONED AS A UNIQUE WAY TO CONTROL INVASIVE INSECT PEST SPECIES WHILE PRESERVING HUMAN AND ENVIRONMENT SAFETY

CHROMATOGRAPHY AND ISOLATION OF INSECT HORMONES AND PHEROMONES

1990

A PHEROMONE IS A CHEMICAL SIGNAL THAT TRIGGERS A NATURAL RESPONSE IN ANOTHER MEMBER OF THE SAME SPECIES THERE ARE ALARM PHEROMONES FOOD TRAIL PHEROMONES SEX PHEROMONES AND MANY OTHERS THAT AFFECT BEHAVIOUR OR PHYSIOLOGY THEIR USE AMONG INSECTS HAS BEEN PARTICULARLY WELL DOCUMENTED IN ADDITION SOME VERTEBRATES AND PLANTS COMMUNICATE BY USING PHEROMONES THIS BOOK EXAMINES TRAIL PHEROMONES AND SEX PHEROMONES IN TERMITES AND THEIR POTENTIAL USE IN PEST MANAGEMENT AND INSECT REPELLENTS ALSO DISCUSSED IS SPLENDIPHERIN THE AQUATIC MALE SEX PHEROMONE OF THE TREE FROG AS WELL AS THE STUDY OF HUMAN PHEROMONES

PHEROMONES: CURRENT RESEARCH

1974

PERHAPS THE BEST EXPRESSION OF OUR INTENT IN ORGANIZING THIS GATHERING IS FOUND IN THE DEFINITION OF THE WORD COLLOQUY AND ITS DERIVATIONS A GATHERING ALLOWING FAMILIAR AND INFORMAL CONVERSATION AMONG COLLEAGUES WITH SIMILAR INTERESTS WAS OUR OBJECTIVE OUR MOTIVES WERE OF COURSE COMPLEX OUR MAIN INTENT WAS NOT HOWEVER TO ADD TO THE LIST OF BOOKS COMPETING FOR THE TIME OF THE SCIENTIFIC COMMUNITY AT LARGE HOWEVER WHILE INFORMALITY WAS OUR OBJECTIVE A LASTING DOCUMENT EXISTS IN THE FORM OF THIS PUBLICATION OF THE PRESENTATIONS FORMING THE SKELETON ON WHICH WE BUILT LESS FORMAL BUT MEATIER COMMUNICATIONS WE HOPE YOU CAN RECONSTRUCT ON THESE BONES A PERCEPTION OF THE STATE OF THE ART IN THE SUBJECT AT HAND THE MEMBERS OF THIS ASSEMBLAGE ARE SPECIALISTS IN ONE OR MORE SUBDISCIPLINES THEIR FORMAL COMMUNICATIONS ARE FOUND IN TEXTS AND JOURNALS APPROPRIATE TO THEIR BROADER DISCIPLINES OFTEN THEIR FRIENDS ALONE ARE PRIVY TO THEIR LESS FORMAL THOUGHTS INTUITIONS HOPES AND ESPECIALLY FEARS AND FAILURES WE HOPED BY ORGANIZING THIS COLLOQUIUM TO DEVELOP FAMILIAR AND INFORMAL CONVERSATION AMONG THOSE MOST INTERESTED AND ACTIVE IN APPLYING SEMIOCHEMICALS IN PEST CONTROL THAT COMMUNITY LIKE OTHERS ALSO SHARED BY GAINESVILLE ENTOMOLOGISTS HAS LITTLE OR NO FORMAL ORGANIZATION OR MEANS FOR ASSEMBLAGE WE PROPOSED ON THIS AND FUTURE OCCASIONS TO OFFER THE OPPORTUNITY TO THIS AND SIMILAR GROUPS TO GATHER THOUGH WE DO NOT PRESUME TOO MUCH TO LEAD BUT RATHER TO FACILITATE CONVERSATION

PHEROMONES

2018-06-14

THIS TEXT EXPLORES BIOCOMMUNICATION IN INSECTS INCLUDING THE ROLE OF CHEMICAL SIGNALS IN INSECT PLANT INTERACTIONS THE APPLICATION OF PHEROMONES NEUROETHOLOGICAL APPROACHES AND THE EVOLUTION OF COMMUNICATION USING THE EXAMPLE OF THE QUEEN HONEY BEE PHEROMONES

CHEMICAL ECOLOGY OF INSECTS

2013-11-27

WITH CONTRIBUTIONS BY NUMEROUS EXPERTS

NEUROTOXICOLOGY OF INSECTICIDES AND PHEROMONES

2012-12-06

INSECT PHEROMONE TECHNOLOGY

1982-01-01

INSECT SEX PHEROMONES

1992

PHEROMONES AND DEFENSIVE SECRETIONS IN SOCIAL INSECTS

1975

PHEROMONE COMMUNICATION IN MOTHS

2016-10-25

FROM INSECT PHEROMONES TO MATING DISRUPTION

2022-02-11

OLFACTORY CONCEPTS OF INSECT CONTROL - ALTERNATIVE TO INSECTICIDES

2019-05-16

PHEROMONES

2010

MANAGEMENT OF INSECT PESTS WITH SEMIOCHEMICALS

2012-12-06

BIOCOMMUNICATION IN INSECTS

1998

THE CHEMISTRY OF PHEROMONES AND OTHER SEMIOCHEMICALS II

2005-01-07

- [VISTAS SUPERSITE ANSWERS \(2023\)](#)
- [USE OF SOLAR TRACKING SYSTEM FOR EXTRACTING SOLAR ENERGY .PDF](#)
- [BY JIM COLLINS MORTEN T HANSEN GREAT BY CHOICE UNCERTAINTY CHAOS AND LUCK WHY SOME THRIVE DESPITE THEM ALL \(READ ONLY\)](#)
- [CLAMORI AL VENTO LARTE LA VITA I MIRACOLI LA CULTURA \(PDF\)](#)
- [CANON EOS KISS X3 GUIDE BOOK COPY](#)
- [MATHS STUDY GUIDE CAPS GRADE 8 .PDF](#)
- [HOLDING MAN TOMMY MURPHY \[PDF\]](#)
- [SHAPES SHAPES SHAPES .PDF](#)
- [ONE WAY COPY](#)
- [FINE DINING SERVICE GUIDELINES \(READ ONLY\)](#)
- [SIEMENS S7 PLC TRAINING MANUAL \(READ ONLY\)](#)
- [COMMON CORE PACING GUIDE 4TH GRADE \(PDF\)](#)
- [LIVRE MATHS SECONDE EXERCICES CORRIGES FULL PDF](#)
- [CALCULUS FOR BIOLOGY AND MEDICINE 2011 CLAUDIA NEUHAUSER \[PDF\]](#)
- [MIEVEAL CIVILIZATION 400 1500 JACQUES LE GOFF \(DOWNLOAD ONLY\)](#)
- [SAMPLE PROFESSIONAL DEVELOPMENT GOALS FOR TEACHERS PDF \(READ ONLY\)](#)
- [ANSWERS KEY TO GEOSCIENCE LABORATORY 5TH EDITION \[PDF\]](#)
- [FULL VERSION 1968 EVENTS PDF WORKSHEETS \[PDF\]](#)
- [PAPER CONFERENCE 2014 \(2023\)](#)
- [THE CHILD THAT BOOKS BUILT A LIFE IN READING FRANCIS SPUFFORD \(2023\)](#)