Social insects - Types, Examples with Social life, Importance, Advantages



Social Insects

Henry Hermani

Social Insects:

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includes a discussion on insects and other arthropods The following chapters focus on various types of bee including bumble bees honey bees and stingless bees Chapter 2 focuses on the behavior and ecology of bumble bees whereas Chapters 3 and 4 discuss in detail the different biological aspects of honey and stingless bees respectively Topics include the evolution of sociality colony caste differentiation and distribution of these species Students and researchers interested in the study of Debugging the Link Between Social Theory and Social Insects Diane M. bees will find this book very valuable Rodgers. 2008-11-15 During the nineteenth and early twentieth centuries natural and social scientists began comparing certain insects to human social organization Entomologists theorized that social insects such as ants bees wasps and termites organize themselves into highly specialized hierarchical divisions of labor Using a distinctly human vocabulary that reflected the dominant social structure of the time they described insects as gueens workers and soldiers and categorized their behaviors with words like marriage slavery farming and factories At the same time sociologists working to develop a model for human organization compared people to insects relying on the same premise that humans arrange themselves hierarchically In Debugging the Link between Social Theory and Social Insects Diane M Rodgers explains how these co constructed theories reinforced one another thereby naturalizing Western conceptions of race class and gender as they gained prominence in popular culture and the scientific world Using a critical science studies perspective not previously applied to research on social insect symbolism Rodgers attempts to debug this theoretical co construction She provides sufficient background information to accommodate readers unfamiliar with entomology including in depth explanations of the terms used in the research and discussion of social insects particularly the insect sociality scale. The entire premise of sociality for insects depends on a dominant understanding of high low civilization standards particularly the tenets of a specialized division of labor and hierarchy comparisons that appear to be informed by nineteenth century colonial thought Placing these theories in a historical and cross cultural context Rodgers explains why hierarchical ideas gained prominence despite the existence of opposing theories in the literature and how they resulted in an inhibiting vocabulary that relies more heavily on metaphors than on description Such analysis is necessary Rodgers argues because it sheds light both on newly proposed scientific models and on future changes in human social structures Contemporary scientists have begun to challenge the traditional understanding of insect social organization and to propose new interdisciplinary models that combine ideas about social insect and human organizational structure with computer technologies Without a thorough understanding of how the old models came about residual language and embedded assumptions may remain and continue to reinforce hierarchical social constructions This intriguing interdisciplinary book makes an important contribution to the history and future of science and sociology **Social Insects and the Environment** International Union for the Study of Social Insects. Congress, 1990 <u>Information Processing in Social Insects</u> Claire Detrain, Jean L. Deneubourg, Jacques M. Pasteels, 2012-12-06 Claire Detrain Jean Louis Deneubourg and Jacques Pasteels Studies on insects have been pioneering in

major fields of modern biology In the 1970 s research on pheromonal communication in insects gave birth to the discipline of chemical ecology and provided a scientific frame to extend this approach to other animal groups In the 1980 s the theory of kin selection which was initially formulated by Hamilton to explain the rise of eusociality in insects exploded into a field of research on its own and found applications in the under standing of community structures including vertebrate ones In the same manner recent studies which decipher the collective behaviour of insect societies might be now setting the stage for the elucidation of information processing in animals Classically problem solving is assumed to rely on the knowledge of a central unit which must take decisions and collect all pertinent information However an alternative method is extensively used in nature problems can be collectively solved through the behaviour of individuals which interact with each other and with the environment The management of information which is a major issue of animal behaviour is interesting to study in a social life context as it raises additional questions about conflict cooperation trade oft's Insect societies have proven particularly open to experimental analysis one can easily assemble or disassemble them and place them in controllable situations in the laboratory Advances in Genomics and Epigenomics of Social Insects Greg J. Hunt, Juergen R. Gadau, 2017-01-27 Social insects are among the most successful and ecologically important animals on earth The lifestyle of these insects has fascinated humans since prehistoric times These species evolved a caste of workers that in most cases have no progeny Some social insects have worker sub castes that are morphologically specialized for discrete tasks The organization of the social insect colony has been compared to the metazoan body Males in the order Hymenoptera bees ants and wasps are haploid a situation which results in higher relatedness between female siblings Sociality evolved many times within the Hymenoptera perhaps spurred in part by increased relatedness that increases inclusive fitness benefits to workers cooperating to raise their sisters and brothers rather than reproducing themselves But epigenetic processes may also have contributed to the evolution of sociality The Hymenoptera provide opportunities for comparative study of species ranging from solitary to highly social A more ancient clade of social insects the termites infraorder Isoptera provide an opportunity to study alternative mechanisms of caste determination and lifestyles that are aided by an array of endosymbionts This research topic explores the use of genome sequence data and genomic techniques to help us explore how sociality evolved in insects how epigenetic processes enable phenotypic plasticity and the mechanisms behind whether a female will become a queen or Caste and Ecology in the Social Insects George F. Oster, Edward O. Wilson, 2020-03-31 In this pathbreaking and a worker far reaching work George Oster and Edward Wilson provide the first fully developed theory of caste evolution among the social insects Furthermore in studying the effects of natural selection in generally increasing the insects ergonomic efficiency they go beyond the concentration of previous researchers on the physiological mechanisms of the insects and turn our attention instead to the scale and efficiency of the insects division of labor Recognizing that the efficiency of the insect colony is based on a complex fitting of the division of labor to many simultaneous needs including those imposed by the distribution

of resources and enemies around the nest Professors Oster and Wilson are able to construct a series of mathematical models to characterize the agents of natural selection that promote particular caste systems The social insects play a key role in the subject of sociobiology because their social organization is so rigid and can be related to genetic evolution Because of this important consideration the authors work has consequences not only for entomology but also for general evolutionary theory

Genomics, Physiology and Behaviour of Social Insects, 2015-03-26 Physiology Behavior Genomics of Social Insects provides comprehensive information on the social insect groups described including new and unique reviews on emerging model social organisms. The book interdisciplinary approach integrates behavior genomics and physiology providing readers with great insights into the present state of a rapidly expanding area of research. It also discusses areas where new research tools will bring hope to longstanding problems Provides the latest research on the genomics behavior and physiology of social insects. Presents diverse and authoritative syntheses on the relationship between genomics physiology and the fascinating behavior of social insects. Takes an in depth look of the current state of social insect research and its future path

Parasites in Social Insects Paul Schmid-Hempel,2019-12-31 This book analyzes for the first time how parasites shape the biology of social insects the ants wasps bees and termites Paul Schmid Hempel provides an overview of the existing knowledge of parasites in social insects Current ideas are evaluated using a broad database and the role of parasites for the evolution and maintenance of the social organization and biology of insects is carefully scrutinized In addition the author develops new insights especially in his examination of the intricate relationships between parasites and their social hosts through the rigorous use of evolutionary and ecological concepts Schmid Hempel identifies gaps in our knowledge about parasites in social insects and uses models to develop new questions for future research In addition issues that are usually considered separately such as division of labor genetics immunology and epidemiology are placed in a common framework to analyze two of the most successful adaptations of life parasitism and sociality This work will appeal not only to practitioners in the fields of behavioral ecology and sociobiology but also to others interested in host parasite relationships or in social organisms such as apiculturists struggling to overcome the problems arising from mite infestations of honeybee colonies

The Biology of Social Insects Michael D. Breed, Charles D. Michener, Howard E. Evans, 2019-06-25 In this book internationally known experts provide a comprehensive view of current knowledge of social insect biology including much previously unpublished information Particular emphasis is given to the relationships between social insects and humans sections are devoted to economically important social insects pollination foraging and the role of insects in ecosystems and agroecosystems. The authors also discuss communication behavior and caste within insect colonies A special section focuses on the neurobiology of social insects A series of papers considers the presocial insects which live in family groups but without caste differences. Also well represented are the fields of sociobiology and the origins and evolution of social behavior. The book will be valuable to agricultural scientists as well as to entomologists sociobiologists ecologists ethologists and natural

historians Endocrinologists and neurobiologists will also find important new material American Social Insects Charles Duncan Michener, Mary H. Michener, 1951 Preface This book concerns the lives of those insects that live in colonies and whose activities center about the gueen tended by her six footed subjects Included also are the various insects that are parasites and associates of our principal subjects the bees ants wasps and termites as well as those that shed light on the origin and evolution of the colonial habits of these insects We do not intend that this book should be considered a contribution to science we hope rather that it will be an introduction to the behavior of social insects that will prove interesting to many and perhaps stimulate a few to learn more about these faxcinating creatures Any of the groups of social insects would provide a worthwhile lifetime project for anyone wishing to enjoy an interesting study and at the same time make a valuable contribution to knowledge It is scarcely necessary to point out that such a study might also serve a practical purpose for many social insects are of great importance to man we need mention only the pollination and nectar gathering of bees the dissemination of pestiferous insects by ants and the destruction of property by termites We wish to thank the many persons who have provided us with photographic illustrations Their names are mentioned elsewhere but the time and trouble required for each photograph can scarcely be acknowledged We wish also to mention those who stimulated us to write this book the late Clyde Fisher and Dr Mon A Cazier Mary H Michener Charles D Minchener Lawrence Kansas Behavioral Variability In Social Insects Robert L. Jeanne, 2019-04-09 This book represents empirical studies of some aspect of the phenomenon of variability in social insect behavior It illustrates the range of ways colony members can differ from one another and interprets the variability in terms of the external environment social context or individual experience

Orientation and Communication in Arthropods Miriam Lehrer, 2013-03-07 The present volume deals with the most fascinating aspects of sensory performance studied in insects crustaceans and spiders Arthropods inhabit practically every conceivable ecological niche and are perfectly adapted to cope with the constraints of their natural habitats. They move on the ground in water and in the air They use visual olfactory acoustical vibratory and tactile cues for orientation to recognize and pinpoint their target their home place a feeding site a prey or a potential mate. Many arthropods use celestial skylight and terrestrial magnetic compass cues for orientation and some of them were shown to develop through experience oriented behaviours based on a variety of innate hard wired orientation mechanisms. In many cases aspects of behaviour that are involved in orientation cannot be separated from inter and intraspecific communication. The book brings to the fore the role of communication not only in social and sexual behaviours but also in the context of oriented locomotion. Top internationally renowned scientists have contributed to this volume and have succeeded in presenting a book full of highlights which will be of great interest to workers in this field of research With contributions by F G Barth D von Helverson K E Kaissling W Kirchner M Walker M Weissburg R Campan T Collett J Zeil K Kirschfeld R Wehner M Srinivasan M Lehrer R Gadagkar

Organization of Insect Societies Jürgen Gadau, Jennifer Fewell, 2009-02-28 In this landmark volume an international

group of scientists has synthesized their collective expertise and insight into a newly unified vision of insect societies and what they can reveal about how sociality has arisen as an evolutionary strategy J rgen Gadau and Jennifer Fewell have assembled leading researchers from the fields of molecular biology evolutionary genetics neurophysiology behavioral ecology and evolutionary theory to reexamine the question of sociality in insects Recent advances in social complexity theory and the sequencing of the honeybee genome ensure that this book will be valued by anyone working on sociality in insects At the same time the theoretical ideas presented will be of broad ranging significance to those interested in social evolution and complex systems

The Social Insects Owain Westmacott Richards, 1961

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Table of Contents Social Insects

- 1. Understanding the eBook Social Insects
 - The Rise of Digital Reading Social Insects
 - Advantages of eBooks Over Traditional Books
- 2. Identifying Social Insects
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
- 3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Social Insects
 - User-Friendly Interface
- 4. Exploring eBook Recommendations from Social Insects
 - Personalized Recommendations
 - Social Insects User Reviews and Ratings
 - Social Insects and Bestseller Lists
- 5. Accessing Social Insects Free and Paid eBooks
 - Social Insects Public Domain eBooks
 - Social Insects eBook Subscription Services
 - Social Insects Budget-Friendly Options

- 6. Navigating Social Insects eBook Formats
 - o ePub, PDF, MOBI, and More
 - Social Insects Compatibility with Devices
 - Social Insects Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Social Insects
 - Highlighting and Note-Taking Social Insects
 - Interactive Elements Social Insects
- 8. Staying Engaged with Social Insects
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Social Insects
- 9. Balancing eBooks and Physical Books Social Insects
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Social Insects
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Social Insects
 - Setting Reading Goals Social Insects
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Social Insects
 - Fact-Checking eBook Content of Social Insects
 - Distinguishing Credible Sources
- 13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
- 14. Embracing eBook Trends
 - Integration of Multimedia Elements

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