# Food Exploitation by Social Insects

Ecological, Behavioral, and Theoretical Approaches



Stefan Jarou - Michael Hrncir



# **Social Insects Ecology And Behavioral Biology**

**Tao Wei** 

#### **Social Insects Ecology And Behavioral Biology:**

Social Insects M. V. Brian, 2012-12-06 Here is a guide to the ecology of social insects It is intended for general ecologists and entomologists as well as for undergraduates and those about to start research on social insects even the experienced investigator may find the comparison between different groups of social insects illuminating Most technical terms are translated into common language as far as can be done without loss of accuracy but scientific names are unavoidable Readers will become familiar with the name even though they cannot visualize the animal and could reflect that only a very few of the total species have been studied so far References too are essential and with these it should be possible to travel more deeply into the vast research literature still increasing monthly When I have cited an author in another author s paper this implies that I have not read the original and the second author must take responsi bility for accuracy Many hands and heads have helped to make this book I thank all my colleagues past and present for their enduring though critical support and I thank with special pleasure E M Evesham who fashioned the diagrams Free D J Stradling and P E C Darlington who supplied photographs D Y Brian and R A Weller who were meticulous on the linguistic side and G Frith and R M Jones who collated the references List of plates 1 Fungus combs of Acromyrmex octospinosus and Macrotermes michaelseni 13 2 Mouthparts of larval Myrmica Interindividual 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 Food Exploitation By Social Insects Stefan Jarau, Michael Hrncir, 2009-05-21 Omnipresent in virtually all terrestrial ecosystems and of undisputed ecological and economical importance the study of social insects is an area that continues to attract a vast number of researchers As a consequence a huge amount of information about their biology and ecology has accumulated Distilling this scattered information into a highly The Evolution of Social Behavior in Insects and Arachnids [ae C. Choe, Bernard J. Crespi, 1997 Social insects and arachnids exhibit complex forms of behavior that involve cooperation in building a nest defending against attackers or rearing offspring This book is a comprehensive up to date guide to sociality and its evolution in a wide range of taxa **Insect Evolutionary Ecology** Royal Entomological Society of London. Symposium, 2005 Insects provide excellent model systems for understanding evolutionary ecology They are abundant small and relatively easy to rear and these traits facilitate both field and laboratory experiments This book has been developed from the Royal Entomological Society s 22nd international symposium held in Reading in 2003 Topics include speciation and adaptation life history phenotype plasticity and genetics sexual selection and reproductive biology insect plant interactions insect natural enemy interactions and social insects

**Bee Genetics and Breeding** Thomas E. Rinderer,2013-09-03 Bee Genetics and Breeding provides an overview of the state of knowledge in bee genetics and breeding The book is organized into two parts Part I deals with the scholarly issues of

bee genetics It is intended as a reference source for students of both bees and genetics It could also serve as a text for university courses in bee genetics Topics discussed include the evolution of eusocial insects geographical variability and classification of honey bees and behavioral and biochemical genetics of honey bees Part II deals more specifically with the practical issues of bee breeding The discussions include the quantitative genetics of honey bees ways to define and measure honey bee characteristics so that the best parents for honey bee stock improvement programs can be selected and mating designs This section contains sufficient guidance for bee breeders to initiate or improve breeding programs Apiculturalists generally will find this part especially interesting since the quality of their own bee stock depends on the skills and knowledge of the breeders who produce their queens **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 Social Evolution in Ants Andrew F.G. Bourke, Nigel R. Franks, 1995-11-05 Biologists have long been intrigued material and confounded by the complex issues in the evolution and ecology of the social behaviour of insects The self sacrifice of sterile workers in ant colonies has been particularly difficult for evolutionary biologists to explain This text presents an overview of the current state of scientific knowledge about social evolution in ants and shows how studies on ants have contributed to an understanding of many fundamental topics in behavioural ecology and evolutionary biology Behavioral **Mechanisms in Evolutionary Ecology** Leslie Real,1994-11-30 The first book length exploration of behavioral mechanisms in evolutionary ecology this ambitious volume illuminates long standing questions about cause and effect relations between an animal s behavior and its environment By focusing on biological mechanisms the sum of an animal s cognitive neural developmental and hormonal processes leading researchers demonstrate how the integrated study of animal physiology cognitive processes and social interaction can yield an enriched understanding of behavior With studies of species ranging from insects to primates the contributors examine how various animals identify and use environmental resources and deal with ecological constraints as well as the roles of learning communication and cognitive aspects of social interaction in behavioral evolution Taken together the chapters demonstrate how the study of internal mechanistic foundations of behavior in relation to their ecological and evolutionary contexts and outcomes provides valuable insight into such behaviors as

predation mating and dispersal Behavioral Mechanisms in Evolutionary Ecology shows how a mechanistic approach unites various levels of biological organization to provide a broader understanding of the biological bases of behavioral evolution

Social Evolution in Ants Andrew F.G. Bourke, Nigel R. Franks, 2019-12-31 Biologists since Darwin have been intrigued and confounded by the complex issues involved in the evolution and ecology of the social behavior of insects The self sacrifice of sterile workers in ant colonies has been particularly difficult for evolutionary biologists to explain In this important new book Andrew Bourke and Nigel Franks not only present a detailed overview of the current state of scientific knowledge about social evolution in ants but also show how studies on ants have contributed to an understanding of many fundamental topics in behavioral ecology and evolutionary biology One of the substantial contributions of Social Evolution in Ants is its clear explanation of kin selection theory and sex ratio theory and their applications to social evolution in insects Working to dispel lingering skepticism about the validity of kin selection and more broadly of selfish gene theory Bourke and Franks show how these ideas underpin the evolution of both cooperation and conflict within ant societies In addition using simple algebra they provide detailed explanations of key mathematical models Finally the authors discuss two relatively little known topics in ant social biology life history strategy and mating systems This comprehensive up to date and well referenced work will appeal to all researchers in social insect biology and to scholars and students in the fields of entomology behavioral ecology and Insect Behavior Alex Córdoba-Aguilar, Daniel González-Tokman, Isaac González-Santoyo, 2018-07-19 Insects evolution display a staggering diversity of behaviors Studying these systems provides insights into a wide range of ecological evolutionary and behavioral questions including the genetics of behavior phenotypic plasticity chemical communication and the evolution of life history traits This accessible text offers a new approach that provides the reader with the necessary theoretical and conceptual foundations at different hierarchical levels to understand insect behavior The book is divided into three main sections mechanisms ecological and evolutionary consequences and applied issues The final section places the preceding chapters within a framework of current threats to human survival climate change disease and food security before providing suggestions and insights as to how we can utilize an understanding of insect behavior to control and or ameliorate them Each chapter provides a concise authoritative review of the conceptual theoretical and methodological foundations of Design Principles for the Immune System and Other Distributed Autonomous Systems Lee A. Segel, Irun R. each topic Cohen, 2001-06-14 Design Principles for the Immune System and Other Distributed Autonomous Systems is the first book to examine the inner workings of such a variety of distributed autonomous systems from insect colonies to high level computer programs to the immune system It offers insight into the fascinating world of these systems that emerge from the interactions of seemingly autonomous components and brings us up to date on the state of research in these areas Using the immune system and certain aspects of its functions as a primary model this book examines many of the most interesting and troubling questions posed by complex systems How do systems choose the right set of agents to perform appropriate actions

with appropriate intensities at appropriate times How in the immune system ant colonies and metabolic networks does the diffusion and binding of a large variety of chemicals to their receptors permit coordination of system action What advantages drive the various systems to complexity and by what mechanisms do the systems cope with the tendency toward unwieldiness and randomness of large complex systems Sociobiology of Communication Patrizia d'Ettorre, David P. Hughes, 2008-08-21 Communication is essential for all forms of social interaction from parental care to mate choice and cooperation This is evident for human societies but less obvious for bacterial biofilms ant colonies or flocks of birds The major disciplines of communication research have tried to identify common core principles but syntheses have been few because historical barriers have limited interaction between different research fields Sociobiology of Communication is a timely and novel synthesis It bridges many of the gaps between proximate and ultimate levels of analysis between empirical model systems and between biology and the humanities The book offers the complementary approaches of a distinguished group of authors spanning a large diversity of research programs addressing for example the genetic basis of bacterial communication dishonest communication in insect societies sexual selection and network communication among colonial vertebrates Other chapters explore the role of communication in genomic conflict and self organisation and how linguistics psychology and philosophy may ultimately contribute to a biological understanding of human mate choice and the evolution of human societies This highly interdisciplinary book highlights key examples of modern research to explore the genetic neurobiological physiological chemical and behavioural basis of social communication It identifies where consensus on the general principles is emerging and where the major future challenges are to be found The book is therefore suitable for both for graduate students and professionals in evolutionary biology and behavioural ecology seeking novel inspiration and for a wider academic audience including social and medical scientists who would like to explore what evolutionary approaches can offer to their fields Encyclopedia of Animal Behavior, 2019-01-21 Encyclopedia of Animal Behavior Second Edition Four Volume Set the latest update since the 2010 release builds upon the solid foundation established in the first edition Updated sections include Host parasite interactions Vertebrate social behavior and the introduction of overview essays that boost the book's comprehensive detail The structure for the work is modified to accommodate a better grouping of subjects Some chapters have been reshuffled with section headings combined or modified Represents a one stop resource for scientifically reliable information on animal behavior Provides comparative approaches including the perspective of evolutionary biologists physiologists endocrinologists neuroscientists and psychologists Includes multimedia features in the online version that offer accessible tools to readers looking to deepen their understanding **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 I 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

Nourishment and Evolution in Insect Societies James H. Hunt, Christine A. Nalepa, 1994 Host Manipulation by Parasites David P. Hughes, Jacques Brodeur, Frédéric Thomas, 2012-06-07 Parasites that manipulate the behaviour of their hosts represent striking examples of adaptation by natural selection This text provides an authoritative review of host manipulation by parasites that assesses developments in the field and lays out a framework for future research Future Role of Dwarf Honey Bees in Natural and Agricultural Systems DP Abrol, 2020-07-08 The future role of dwarf honeybees in natural and agricultural systems provides multidisciplinary perspective about the different facets of dwarf honeybees The role of dwarf honeybee Apis florea assumes utmost importance in the context of pollinator decline throughout the world threatening stability of ecosystems and global food security Apis florea is a low land species of south Asia extending more to the west than other Asiatic Apis species It is an important pollinator of crops in hot and dry agricultural plains The book is first of its kind which deals in details on varied aspects of Apis florea biology management conservation strategies for protecting biodiversity and enhancing crop productivity. The book aims to promote a large diverse sustainable and dependable bee pollinator workforce that can meet the challenge for optimizing food production well into the 21st century Features Apis florea provides source of livelihood in mountainous areas and marginal farmers This book will for the first time present the beekeeping from the perspective of agricultural production and biodiversity conservation An excellent source of advanced study material for academics researchers and students and programme planners Excellent pollinator of tropical and subtropical crops fruits vegetables etc less prone to diseases and enemies Covering the latest information on various aspects of Apis florea biology this book brings the latest advances together in a single volume for researchers and advanced level students This book will be useful to pollination biologists honeybee biologists in entomology departments students teachers scientists of agriculture animal behaviour botany conservation biology ecology entomology environmental biology forestry genetics plant breeding horticulture toxicology zoology seed growers and seed agencies and shall serve as reference book for students teachers researchers extension functionaries and policy planners **Pesticides** 

**Documentation Bulletin**, 1969 Insect Potpourri Adams, 1992-01-01 This book gives a popularized account of entomology and working in entomology in the USA The 7 chapters by various authors cover useful insects such as bees insects that help control pests insects as medicine and as food insects and public health including mosquitoes the diseases they carry and their control an account of the work of medical entomologists in the armed forces of the USA memories of working on the development of early insect repellents on control of screwworm and the role of dipteran larvae in forensic

entomology forest pests and their control in particular the gypsy moth Lymantria dispar domestic insects and their control work on termites Isoptera and other pests of timber an account of the problems of imported fireants Solenopsis spp and Africanized honey bees and cockroaches in an urban environment agricultural pests including the development stages of control chemicals a discussion on the public and scientific attitudes to insecticides and their alternatives a description of bollworms the boll weevil Anthronomus grandis and pests of fruits and corn maize a history of insecticides insects as plant pathogen vectors and the role of biotechnology in insect control The final chapter contains unusual facts about insects and other arthropods The text is interspersed with cartoons by Gary Larson and the appendices provide information on the American registry of Professional Entomologists of the Entomological Society of America on the Society itself and on the American Mosquito Control Association

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