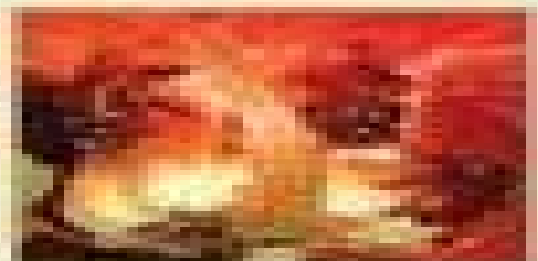
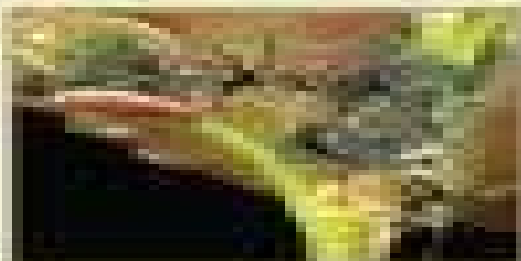
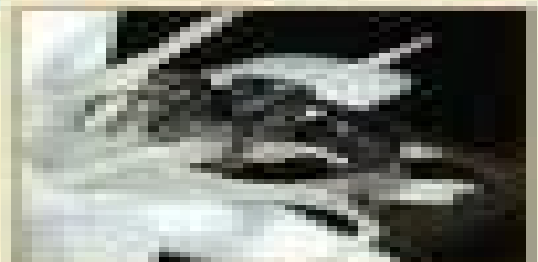
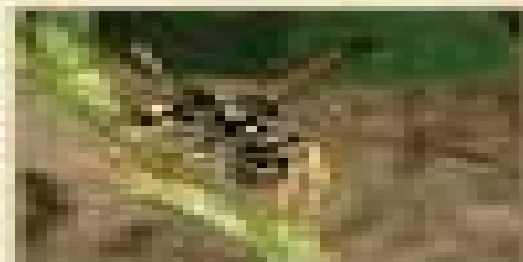
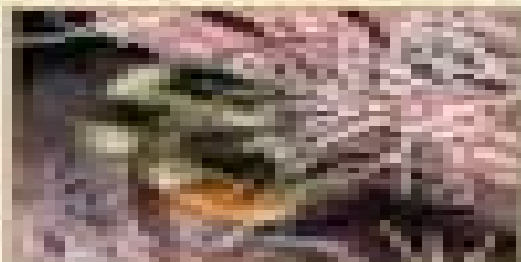
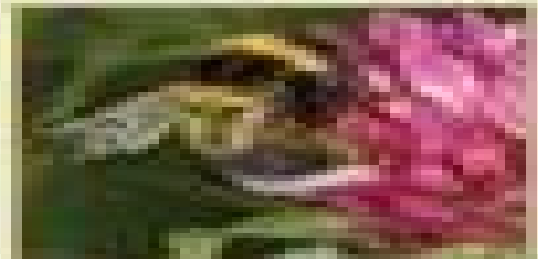
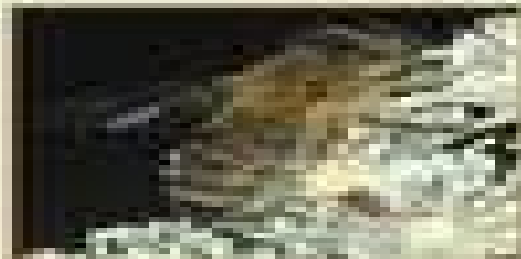


# Food Exploitation by Social Insects

Ecological, Behavioral, and  
Theoretical Approaches



Edited by  
**Stefan Janssen • Michael Henrich**



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# Social Insects Ecology And Behavioral Biology

**M. V. Brian**



## **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 responsibility 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* *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 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 **The Evolution of Social Behavior in Insects and Arachnids** Jae 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 **Insect Ecology** Peter W. Price, Robert F. Denno, Micky D. Eubanks, Deborah L. Finke, Ian Kaplan, 2011-08-18 Combining breadth of coverage with detail this logical and cohesive introduction to insect ecology couples concepts with a broad range

of examples and practical applications It explores cutting edge topics in the field drawing on and highlighting the links between theory and the latest empirical studies The sections are structured around a series of key topics including behavioral ecology species interactions population ecology food webs communities and ecosystems and broad patterns in nature Chapters progress logically from the small scale to the large from individual species through to species interactions populations and communities Application sections at the end of each chapter outline the practicality of ecological concepts and show how ecological information and concepts can be useful in agriculture horticulture and forestry Each chapter ends with a summary providing a brief recap followed by a set of questions and discussion topics designed to encourage independent and creative thinking

**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

*Social Evolution in Ants* Andrew F.G. Bourke, Nigel R. Franks, 1995-11-05 Biologists have long been intrigued 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

**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      *Biomat 2006 - International Symposium On Mathematical And Computational Biology* Rubem P Mondaini, Rui Dilao, 2007-05-23 This useful volume contains the contributions from the keynote speakers of the BIOMAT 2006 symposium as well as selected contributions in the areas of mathematical biology biological physics biophysics and bioinformatics It contains new results contributions and comprehensive reviews to the mathematical modeling of infectious diseases such as HIV tuberculosis and hepatitis B Mathematical models for physiological disorders including tumors aneurysms and metabolic diseases are discussed and analyzed This book also contains original contributions to de novo protein structure prediction and multi objective optimization techniques applied to protein tertiary structure prediction DNA evolutionary issues stem cell biology dynamics of biologic membranes reaction diffusion mechanisms population dynamics and bioeconomics are covered and discussed throughout this book      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      **Insect Ecology** Mr. Rohit

Manglik, 2024-07-10 EduGorilla Publication is a trusted name in the education sector committed to empowering learners with high quality study materials and resources Specializing in competitive exams and academic support EduGorilla provides comprehensive and well structured content tailored to meet the needs of students across various streams and levels

*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 evolution

**Self-Organization in Biological Systems** Scott Camazine, Jean-Louis Deneubourg, Nigel R. Franks, James Sneyd, Guy Theraulaz, Eric Bonabeau, 2020-05-05 The synchronized flashing of fireflies at night The spiraling patterns of an aggregating slime mold The anastomosing network of army ant trails The coordinated movements of a school of fish Researchers are finding in such patterns phenomena that have fascinated naturalists for centuries a fertile new approach to understanding biological systems the study of self organization This book a primer on self organization in biological systems for students and other enthusiasts introduces readers to the basic concepts and tools for studying self organization and then examines numerous examples of self organization in the natural world Self organization refers to diverse pattern formation processes in the physical and biological world from sand grains assembling into rippled dunes to cells combining to create highly structured tissues to individual insects working to create sophisticated societies What these diverse systems hold in common is the proximate means by which they acquire order and structure In self organizing systems pattern at the global level emerges solely from interactions among lower level components Remarkably even very complex structures result from the iteration of surprisingly simple behaviors performed by individuals relying on only local information This striking conclusion suggests important lines of inquiry To what degree is environmental rather than individual complexity responsible for group complexity To what extent have widely differing organisms adopted similar convergent strategies of pattern formation How specifically has natural selection determined the rules governing interactions within biological systems Broad in scope thorough yet accessible this book is a self contained introduction to self organization and complexity in biology a field of study at the forefront of life sciences research

The Social Biology of Wasps Kenneth G. Ross, Robert W. Matthews, 2018-08-06 In this edited collection 17 internationally known authorities bring together the results of recent research on the natural history ecology behavior morphology and genetics of wasps as they pertain to the evolution of social behavior The first part of the book opens with a review of the classification of the family Vespidae along with a revision of the subfamily Polistinae Seven subsequent chapters deal with the natural history and social biology of each of the major taxa of social and presocial vespids The second part of the book offers chapters on reproductive competition worker polyethism evolution of nest architecture of queen number and queen control and of exocrine glands population genetics the nutritional basis of social evolution and the nest as the locus of social life The final chapter is a comparative discussion of social behavior in the Sphecidae the only family of wasps besides the Vespidae in which well developed social behavior is known Providing a

wealth of information about the biology of wasps this comprehensive up to date volume will be an essential reference for entomologists evolutionary biologists behavioral ecologists ethologists and zoologists Contributors James M Carpenter David P Cowan Holly A Downing Raghavendra Gadagkar Albert Greene James H Hunt Robert L Jeanne Makoto Matsuura Robert W Matthews Hudson K Reeve Peter Frank Roseler Kenneth G Ross J Philip Spradbery Christopher K Starr Stefano Turillazzi John W Wenzel Mary Jane West Eberhard

The 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

**The Ants** Bert Hölldobler, Edward O. Wilson, 1990 This landmark work is a thoroughgoing survey of one of the largest and most diverse groups of animals on the planet H lldobler and Wilson review in exhaustive detail virtually all topics in the anatomy physiology social organization ecology and natural history of the ants

**Insect Behavior** Alex Córdoba-Aguilar, Daniel González-Tokman, Isaac González-Santoyo, 2018-07-19 Insects 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 each topic

Selforganization Sidney W. Fox,1986      Design Principles for the Immune System and Other Distributed Autonomous Systems Lee A. Segel,Irun R. 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



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  5. In chapter 4, this book will scrutinize the relevance of Social Insects Ecology And Behavioral Biology in specific contexts. This chapter will explore how Social Insects Ecology And Behavioral Biology is applied in specialized fields, such as education, business, and technology.
  6. In chapter 5, this book will draw a conclusion about Social Insects Ecology And Behavioral Biology. The final chapter will summarize the key points that have been discussed throughout the book.
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