EVOLUTION OF INSECT MATING SYSTEMS pdf

1: The evolution of insect mating systems.

The Evolution of Insect Mating Systems is suitable for both graduate students and researchers interested in insect mating systems or behaviour from an evolutionary, genetical, physiological, or ecological perspective.

Insects display a staggering diversity of mating and social behaviours. Studying these systems provides insights into a wide range of evolutionary and behavioural questions, such as the evolution of sex, sexual selection, sexual conflict, and parental care. This edited volume provides an authoritative update of the landmark book in the field, The Evolution of Insect Mating Systems Thornhill and Alcock, , which had such a huge impact in shaping adaptationist approaches to the study of animal behaviour and influencing the study of the evolution of reproductive behaviour far beyond the taxonomic remit of insects. This accessible new volume brings the empirical and conceptual scope of the original book fully up to date, incorporating the wealth of new knowledge and research of the last 30 years. It explores the evolution of complex forms of sex determination in insects, and the role of sexual selection in shaping the evolution of mating systems. Selection arising via male contest competition and female choice both before and after copulation are discussed, as are the roles of parasites and pathogens in mediating the strength of sexual selection, and the role that parental care plays in successful reproduction. The Evolution of Insect Mating Systems is suitable for both graduate students and researchers interested in insect mating systems or behaviour from an evolutionary, genetical, physiological, or ecological perspective. Due to its interdisciplinary and concept-driven approach, it will also be of relevance and use to a broad audience of evolutionary biologists. Princeton University Press Format Available: Presenting a unified conceptual and statistical framework for understanding the evolution of reproductive strategies, this text uses the concept of the opportunity for sexual selection, illustrating how and why sexual selection is one of the strongest and fastest of all evolutionary strategies. Columbia University Press Format Available: The study of flies has figured prominently in major advances in the fields of molecular evolution, physiology, genetics, phylogenetics, and ecology over the last century. This volume, with contributions from top scientists and scholars in the field, brings together diverse aspects of research and will be essential reading for entomologists and fly researchers. Sperm Competition and the Evolution of Animal Mating Systems describes the role of sperm competition in selection on a range of attributes from gamete morphology to species mating systems. This book is organized into 19 chapters and begins with the conceptualization of sperm competition as a subset of sexual selection and its implications for the insects. The following chapter describes the relationship between multiple mating and female fitness, with an emphasis on determining the conditions under which selection on females is likely to counteract selection on males for avoiding sperm competition. Other chapters consider the female perspective on sperm competition; the evolutionary causation at the level of the individual male gamete; and the correlation of high paternal investment and sperm precedence in the insects. The remaining chapters are arranged phylogenetically and explore the sperm competition in diverse animal taxa, such as the Drosophila, Lepidoptera, spiders, amphibians, and reptiles. These chapters also cover the evolution of direct versus indirect sperm transfer among the arachnids or the problem for kinship theory presented by multiple mating and sperm competition in the Hymenoptera. This book further discusses the remarkable potential for sperm competition among certain temperate bat species whose females store sperm through winter hibernation and the mixed strategies and male-caused female genital trauma as possible sperm competition adaptations in poeciliid fishes. The concluding chapter examines the predictions concerning testes size and mating systems in the primates and the possible role of sperm competition in human selection. This book is of great value to reproductive biologists and researchers. After volume 33, this book series was replaced by the journal "Evolutionary Biology. This volume is the 33rd in this series, which includes 32 numbered volumes and an unnumbered supplement. Several special volumes have also been published as separate monographs. This volume, like the others in the series, has chapters devoted to a broad spectrum of topics. Indeed, the editors continue to solicit manuscripts on subjects covered by the encompassing rubric of Evolutionary Biology. The chapters are always up-to-date, informative, and stimulating; sometimes infuriating. Just what good scientific literature should be! Particularly

attractive is the free-wheeling spirit of the series: If you want to remain cognizant of contemporary evolutionary advances in general and have time to read only one volume a year outside your own specialty, make it Evolutionary Biology.

EVOLUTION OF INSECT MATING SYSTEMS pdf

2: Mating in Insects | Smithsonian Institution

Insects display a staggering diversity of mating and social behaviours. Studying these systems provides insights into a wide range of evolutionary and behavioural questions, such as the evolution of sex, sexual selection, sexual conflict, and parental care.

The authors have declared that no competing interests exist. Conceived and designed the experiments: Received Apr 4; Accepted Oct 5. This article has been cited by other articles in PMC. Abstract Hangingflies are unique for the male providing a nuptial gift to the female during mating and taking a face-to-face hanging copulation with the female. Their male genitalia are peculiar for an extremely elongated penisfilum, a pair of well-developed epandrial lobes 9th tergum , and a pair of degenerated gonostyli. However, the co-evolution of their face-to-face copulation behavior and the male genitalia has rarely been studied hitherto. In this paper the mating behavior of the hangingfly Bittacus planus Cheng, was observed under laboratory conditions, and the morphology of the male and female external genitalia was investigated using light and scanning electron microscopy. The male provides an insect prey as a nuptial gift to the female in courtship and mating process, and commits a face-to-face copulation. The aedeagal complex has an extremely elongated penisfilum, corresponding to the elongated spermathecal duct of the female. The well-developed epandrial lobes serve as claspers to grasp the female subgenital plate during copulation, replacing the function of gonostyli, which are greatly reduced in Bittacidae. The modified proctiger assists the penisfilum to stretch and to enter into the female spermathecal duct. The possible reasons why this species might mate face-to-face are briefly discussed. Introduction In most animal species with internal fertilization, male genitalia are among the most diverse, complex, and rapidly evolving morphological structures [1] â€” [3]. Because of the extraordinary diversity in form and function, genital structures are often used to determine species status of insects and to estimate the evolutionary relationships among insects, including hangingflies [4] â€” [8]. However, how the genitalia of insects arrived at their current configuration and the driving force of genital evolution are poorly understood. Previous studies highlight three main hypotheses to explain the evolutionary processes responsible for genital evolution: The lock-and-key hypothesis proposes that female genital structures are complex mechanical locks, into which only males of the same species can fit [10]. Although this hypothesis sounds elegant to explain why genitalia are often species-specific in form, the supposed female locks rarely exist [10] â€” [13]. The pleiotropy hypothesis states that genital evolution is an indirect result of evolution of genetically correlated characters through accumulated pleiotropic effects of genes that code for both genital and general morphology [14]. Again, this hypothesis is not currently well supported [9] , [15]. This hypothesis proposes that males and females are engaged in co-evolutionary arms races over control of copulation and insemination and includes three main mechanisms [9]: The sperm competition assumes that male genitalia may be reflected in differences in ability to displace or dislocate sperm from previous males within the female reproductive tract or to induce nonreceptivity in females [9] , [16]. The cryptic female choice states that male genitalia may differ in their ability to stimulate multiply-mated females to selectively use sperm from males with superior stimulatory capabilities of genital morphology over that of others to fertilize their eggs [1] , [17]. Sexual conflict occurs when the evolutionary interests of the two sexes are at odds [18] â€” [23] , and may generate co-evolution between the two sexes in the rapid specialization and modification of certain traits, particularly structures involved in mating [21]. Many behavioral adaptations are involved in mediating sexual selection and sexual conflict. The provision of a nuptial gift prior to and during mating is an interesting strategy employed by male hangingflies Mecoptera: Bittacidae in their pursuit of a mate [24] , [25]. The Bittacidae are commonly called hangingflies because the adults are unable to stand on a surface but hang on the edges of leaves or twigs of plants by their prehensile forelegs [26]. During courtship and copulation, the male usually provides an insect prey as a nuptial gift to the female [27] , and mate with the female in a face-to-face hanging position, with their forelegs suspended from a twig or leaf [28]. The sexual behavior of Bittacidae has been well studied in the North American Hylobittacus apicalis, Bittacus strigosus, B. However, these studies are generally concentrated on behavioral observations only except Mickoleit and Mickoleit , who describe both

courtship and copulation behavior in B. The male genitalia in Bittacidae are unique in Mecoptera by an extremely elongated penisfilum, a pair of well-developed epandrial lobes 9th tergum , and a pair of greatly degenerated gonostyli [44] , [45]. This raises two currently unanswered questions: In this study we explore the co-evolutionary knowledge of the face-to-face copulation and the functional morphology of male genitalia in the hangingfly Bittacus planus Cheng, through observations of courtship and copulation behavior under laboratory conditions and via morphological observations using light and scanning electron microscopy. Materials and Methods Ethics Statement No specific permits were required for the described field studies: Live flies blow flies, house flies and fruit flies , crane flies, moths and other flying insects captured from fields were supplied as food items. Each hangingfly was supplied three to four prey items per day. Twigs of plants were placed in the cage to simulate the shaded micro-environment for the hangingflies. The cage was cleaned regularly usually at 8: Each phase of the mating behavior and its duration were recorded. The surface area of the nuptial prey was measured as follows: Light and Scanning Electron Microscopy Fifty adults 30 males and 20 females were used for morphological studies. Before dehydration in a graded ethanol series, they were ultrasonically cleaned for 30 s. Then the materials were dried in a critical-point drier with liquid CO2, coated with gold in a sputter coater, and examined in a Hitachi SN scanning electron microscope Hitachi, Tokyo, Japan at 15 kV. Results Courtship and Copulation Behavior Provided that the food supply is sufficient, the courtship and copulation of B. The sequence of courtship and copulation behaviors began when the male caught a prey item or stole one from another male. The mating process was divided into four phases: The surface area of 16 mm2 or more for the prey items were generally accepted by the females, e. If the prey was large enough and palatable, he retained it and initiated searching behavior. During this searching phase, the male made a short flight to search for any females in the vicinity and sought suitable twigs or leaves of plants to hang on Fig.

EVOLUTION OF INSECT MATING SYSTEMS pdf

3: The Evolution Of Mating Systems In Insects And Arachnids | Download eBook PDF/EPUB

"[The Evolution of Insect Mating Systems] brings to a vertebrate-biased literature a well-documented and persuasive demonstration of the importance of insects for generation and testing of theory organizes an immense and diverse literature on insect reproductive behavior into a logical framework that will allow more efficient and effective exploration of both insect behavior and sexual selection theory.

Choe and Bernard J. For scientists it represents an opportunity to study the evolutionary constraints and pathways that have lead to, and maintain, sociality in animals. Nearly everything that has been published recently on sociality in arthropods has been on social insects or as part of a taxon text, i. Furthermore the recently published " Cooperation in Animals " by Lee Alan Dugatkin looked almost exclusively at vertebrates, taking only a brief look at the eusocial Hymenoptera. This book then fills a much needed empty space in the literature. The various chapters reach across the whole spectrum of the insect and arachnid world providing a rich diversity of topics that is both enlightening and a pleasure to read. The authors in a number of chapters have had the courage to step outside the stereotype centrepiece images of sociality and its origins and to present controversial and challenging ideas. It is not important, whether or not for instance ou accept the validity of the hypothesis that maternal activity in the hemiptera is an evolutionarily early, and difficult to sustain practice that has been mostly abandoned in favour of other methods of egg protection. What is important is that these ideas are coherently expressed in a book making them accessible to a far larger audience than the would encounter in a paper. With chapters on a great range of groups, see below this work is both a fascinating read for anyone interested in arthropod ecology but also an excellent first resource for students and researchers all around the world. Both the authors and the editors are to be congratulated on the production on this wonderful book. Contains the following chapters: Are behavioural classifications blinders to natural variation? Life beneath silk walls: Post-ovulation parental investment and parental care in cockroaches; 4. The spectrum of eusociality in termites; 5. Maternal care in the Hemiptera: Evolution of parental care in the giant water bugs Heteroptera: The evolution of sociality in aphids: Ecology and evolution of social behaviour among Australian gall thrips; 9. Interactions among males, females and offspring in bark and ambrosia beetles: Biparental care and social evolution in burying beetles: Subsocial behavior in Scarabaeiinae; Evolution of social behavior in Passalidae Coleoptera ; The evolution of social behaviour in the Augochlorine bees Hymenoptera: Halicitidae based on a phylogenetic analysis of the data; Demography and sociality in halictine bees Hymenoptera: Behavioural environments of sweat bees Halictinae and variability in social organization; Intrinsic and extrinsic factors associated with social evolution in allodapine bees; Cooperative breeding in wasps and vertebrates: Social conflict and cooperation among founding queens in ants Hymenoptera: Social evolution in the lepidoptera: Sociality and kin selection in Acari; Causes and consequences of cooperation and permanent-sociality in spiders Letitia Aviles; Evolution and explanation of social systems; Index.

EVOLUTION OF INSECT MATING SYSTEMS pdf

4: Co-Evolution of the Mating Position and Male Genitalia in Insects: A Case Study of a Hangingfly

The Evolution of Insect Mating Systems by Thornhill and Alcock was one of the key texts that helped define modern behavioural ecology. Published in , it has had a huge impact in shaping 'adaptationist' approaches to the study of animal behaviour, ending up far more than the sum of its parts, and influencing the study of the evolution of reproductive behaviour far beyond the taxonomic.

Studying these systems provides insights into a wide range of evolutionary and behavioural questions, such as the evolution of sex, sexual selection, sexual conflict, and parental care. This edited volume provides an authoritative update of the landmark book in the field, The Evolution of Insect Mating Systems Thornhill and Alcock, , which had such a huge impact in shaping adaptationist approaches to the study of animal behaviour and influencing the study of the evolution of reproductive behaviour far beyond the taxonomic remit of insects. This accessible new volume brings the empirical and conceptual scope of the original book fully up to date, incorporating the wealth of new knowledge and research of the last 30 years. It explores the evolution of complex forms of sex determination in insects, and the role of sexual selection in shaping the evolution of mating systems. Selection arising via male contest competition and female choice both before and after copulation are discussed, as are the roles of parasites and pathogens in mediating the strength of sexual selection, and the role that parental care plays in successful reproduction. The Evolution of Insect Mating Systems is suitable for both graduate students and researchers interested in insect mating systems or behaviour from an evolutionary, genetical, physiological, or ecological perspective. Due to its interdisciplinary and concept-driven approach, it will also be of relevance and use to a broad audience of evolutionary biologists. Modes of reproduction, Benjamin B. Sexual selection theory, David Shuker 3. The genetics of insect mating systems, Michael G. Ritchie and Roger K. Reproductive physiology and behaviour, Patricia J. Reproductive contests and the evolution of extreme weaponry, Douglas J. Alternative phenotypes within mating systems, Bruno A. Tomkins and Leigh W. Mate choice, John Hunt and Scott K. The evolution of polyandry, Rhonda R Snook Sperm competition, Leigh W. Cryptic female choice, Goran Arnqvist Parental care, Per T. Parasites and pathogens in sexual selection, Marlene Zuk and Nina Wedell Sexual selection in social insects, Boris Baer His research focuses on the evolution of reproductive behaviour in insects. This work brings together functional and mechanistic studies at the genetic and whole organism level to test evolutionary theory. David has worked on various aspects of reproductive behaviour and ecology in a number of different insect species, including extensive work on sex allocation and the causes and consequences of sexual conflict over reproductive decisions. David has published more than 50 papers and articles. He has also recently co-edited a special issue of Philosophical Transactions of the Royal Society B, and is a member of the editorial boards of the Journal of Evolutionary Biology, Biology Letters and Ecology and Evolution. His research uses both vertebrates and invertebrates to test the predictions and assumptions of theoretical models of sexual selection and life history evolution. Collectively, these research programs seek to determine the direction and strength of selection acting on male and female reproductive strategies, and on the morphological and life history traits that contribute to fitness, from the whole organism to its gametes. Leigh has published more than papers and articles, authored a book on insect sperm competition, and co-edited a volume on dung beetle ecology and evolution. He has had extensive editorial experience with many journals including Proceedings of the Royal Society B, Behavioural Ecology and Sociobiology, and Advances in the Study of Behavior, as well as time as the editor-in-chief of Animal Behaviour.

EVOLUTION OF INSECT MATING SYSTEMS pdf

5: Evolution of Insect Mating Systems - Oxford Scholarship

BOOK REVIEW doi/evo The evolution of insect mating systems, thirty years after Russell Bonduriansky1,2 1Evolution and Ecology Research Centre and School of Biological, Earth and Environmental Sciences, University of New.

Insects entomology Table of contents 1. Modes of reproduction ; 2. Sexual selection theory ; 3. Mating systems ; 4. The genetics of insect mating systems ; 5. Reproductive physiology and behaviour ; 6. Reproductive contests and the evolution of extreme weaponry ; 7. Alternative phenotypes within mating systems ; 8. Mate choice ; 9. The evolution of polyandry ; Sperm competition ; Cryptic female choice ; Parental care ; Parasites and pathogens in sexual selection ; Sexual selection in social insects ; The evolution of insect mating systems show more Review quote This book will become a standard reference work on the subject for many years to come. It is suitable for both graduate students and researchers interested in insect mating systems or behaviour His research focuses on the evolution of reproductive behaviour in insects. This work brings together functional and mechanistic studies at the genetic and whole organism level to test evolutionary theory. David has worked on various aspects of reproductive behaviour and ecology in a number of different insect species, including extensive work on sex allocation and the causes and consequences of sexual conflict over reproductive decisions. David has published more than 50 papers and articles. He has also recently co-edited a special issue of Philosophical Transactions of the Royal Society B, and is a member of the editorial boards of the Journal of Evolutionary Biology, Biology Letters and Ecology and Evolution. His research uses both vertebrates and invertebrates to test the predictions and assumptions of theoretical models of sexual selection and life history evolution. Collectively, these research programs seek to determine the direction and strength of selection acting on male and female reproductive strategies, and on the morphological and life history traits that contribute to fitness, from the whole organism to its gametes. Leigh has published more than papers and articles, authored a book on insect sperm competition, and co-edited a volume on dung beetle ecology and evolution. He has had extensive editorial experience with many journals including Proceedings of the Royal Society B, Behavioural Ecology and Sociobiology, and Advances in the Study of Behavior, as well as time as the editor-in-chief of Animal Behaviour.

6: The Evolution of Insect Mating Systems : David Shuker :

The Evolution of Insect Mating Systems has 4 ratings and 0 reviews. Here is the first comprehensive analysis of insect reproductive behavior to employ a.

7: The Evolution of Insect Mating Systems by Shuker, D.m.; Simmons, L.w. (eds)

The authors draw together an enormous body of literature to illustrate their central thesis: the great diversity of insect mating systems can be understood in view of the differences between the sexes in their resource investment per gamete and the differences among species in their ecological niches.

8: Gordon's Cambridge University Press Review Page

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9: The Evolution of Insect Mating Systems by Randy Thornhill

The topics dealt with include evolutionary hypotheses, modes of reproduction, sexual selection theory, timing of mate location, motivation to copulate, competition, defence of mating sites, protection of females during copulation, sperm competition, selective mate choice by females, and male and female mating systems.

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UltraThin Classic Bible (NKJV)-Burgundy (Holman UltraThin Classic Bibles) Noble, A. Fable of freedom: The green isle of the great deep. The gift of a lowly thorn The bride in black and white Inside out, or, An interior view of the New-York State Prison Uncovering the truth: a year long investigation Historians I Have Known Saxon course 2 solutions manual Bmw e92 2011 manual A handbook for engaged couples The Maritime Roots of ONeills Radicalism Robert A. Richter Harvard business review march 2017 A primer of ignorance Bits and Pieces of My Soul Data Structures, Algorithms, And Applications In C++ The Lords day and the Westminster confession Rowland S. Ward Women, seduction, and betrayal in biblical narrative Turbines, generators and auxiliaries The Sylphs of the Season with Other Poems A-level Psychology Refutation of the Misstatements and Calumnies contained in Mr. Lockharts Life of Sir Walter Scott, Bart. Inherited Environmentally Induced Retinal Degenerations The basic essentials of camping Sybil and the soft red rock Dara Anastasia Moskowitz Japanese drama and culture in the 1960s Arranged by Nelson Riddle Decoding the ancient novel Apple Valley year Making online news More Little Mouse Deer Tales Marcel Broodthaers: This is a Pipe Is home care for you? Issues in selecting, collecting, reporting, using performance measures. Lonely Planet New York City Encounter Renunciation and liberation by grace Nostalgia and the power of Amish witness. Imperialism, race, and resistance Asthma Management Electronic musical instruments Where others wavered