PRIMATE PARASITE ECOLOGY pdf

1: Community Disease Ecology | Field Projects International

Written for academic researchers, this book addresses these issues and provides up-to-date information on the methods of study, natural history and ecology/theory of the exciting field of primate parasite ecology.

Quick Info Program dates: June 3 â€" July 30, Minimum stay required: Anne Stone from Arizona State University. These researchers have extensive experience handling wildlife, and have conducted a wildlife capture-and-release program at this site for 9 years as of They also have experience in laboratory screening for parasite DNA. The data analyses are presented here by Gideon, and are an offshoot of his doctoral thesis. Project Background Parasitism can be defined as any relationship in which one organism consumes the resources of another organism without providing anything in return. Actually, the question of whether parasites are good or bad is no longer very relevant. It is purported that parasitism is the most common life strategy on the planet, and moreover that parasites play central roles in regulating plant and animal populations, communities, and even entire ecosystems. Spokes are to a wheel, what parasites are to predator-prey dynamics, nutrient cycles, speciation, extinction, social behavior, and much more. Parasitism occurs in as many ways as parasites themselves are diverse. Studying parasites informs us about how the natural world functions at a fundamental level. Why monkey parasites in particular? One of the oldest reasons for studying monkeys is because through them we are driven to understand ourselves. Monkeys are close evolutionary relatives of humans, and we learn about the evolution of humans by identifying similarities and differences that we share with other primates. Some of the most interesting comparisons pertain to the parasites that we host in common and those we do not. More and more we are seeing that parasites defy species boundaries, particularly among primates. Are parasites adapting to new host environments at greater rates than ever before? Alternatively, perhaps increased parasite sharing is driven by human-caused disturbances to stable ecological relationships that previously obstructed parasite exchange. Either way, monitoring the parasites of natural primate populations is of importance to all parties involved. Beyond our vain curiosities and concerns, primates provide a good model for the study of parasiteâ€"host relationships and parasiteâ€"parasite relationships. For example, regardless of the host-parasite system you choose, the parasite is unlikely to be distributed evenly across host individuals. In other words, all individuals in a population do not share an equal burden of parasites. This inequality can frequently be driven in human populations by host age, sex, socioeconomic status, diet or family size. In this research project, we are interested in determining what factors explain uneven distributions of parasites under the most natural environmental conditions. In other words, who is most parasitized and why? At an even finer level, we can think of the host as one environment within which many different parasites interact. Just like all living organisms, parasites sometimes struggle to survive, compete for resources, and work together for mutual benefit. In a similar fashion, the loss of top predators in North America such as wolves and large cats has resulted in overpopulation of large herbivores, like deer, which now require coordinated management programs. Exploring these relationships will help us understand why the removal of some parasites may not be in the best interest of a host. Sex, Stress and Self-Defense There is a great deal of interest today in how complex organisms allocate resources e. For example, how much energy should an animal devote toward searching for food as opposed to courting a mate? We are interested in these life history trade-offs, but we are also curious about the mechanisms that mediate them. One commonly cited trade-off occurs between immune function and reproductive investment. For example, male ungulates that experience increases in testosterone levels grow larger horns and become more territorial. Also, animals that experience chronic stress tend to have higher cortisol levels and depressed immune systems. Thus, we wonder to what extent steroid hormones regulate these life history trade-offs? If they do, does this differ between sexes, given the differing hormone profiles of males and females. We can explore these potential relationships by collecting data on levels of parasitism, hormone concentrations, immune status, and sexual signaling in wild primates, as we do at Los Amigos on the wild populations of callitrichid primates.

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2: Sagan Friant, PhD

MA Huffman and CA Chapman, editors. Primate Parasite Ecology: The dynamics and study of host-parasite relationships. Cambridge University Press. pp. pp. ISBN No one can doubt that disease played a major role in human history and still continues to impact human health.

Fields[edit] The study of these diverse organisms means that the subject is often broken up into simpler, more focused units, which use common techniques, even if they are not studying the same organisms or diseases. Much research in parasitology falls somewhere between two or more of these definitions. In general, the study of prokaryotes falls under the field of bacteriology rather than parasitology. Human parasites The Italian Francesco Redi , considered to be the father of modern parasitology, was the first to recognize and correctly describe details of many important parasites. Cox noted that "Humans are hosts to nearly species of parasitic worms and over 70 species of protozoa, some derived from our primate ancestors and some acquired from the animals we have domesticated or come in contact with during our relatively short history on Earth". A parasite is an organism that live on or within another organism called the host. These include organisms such as: The four species infective to humans are P. Leishmania donovani, the unicellular organism which causes leishmaniasis Entamoeba and Giardia , which cause intestinal infections dysentery and diarrhoea Ectoparasites such as ticks , scabies and lice Medical parasitology can involve drug development, epidemiological studies and study of zoonoses. Veterinary parasitology The study of parasites that cause economic losses in agriculture or aquaculture operations, or which infect companion animals. Examples of species studied are: Lucilia sericata , a blowfly , which lays eggs on the skins of farm animals. The maggots hatch and burrow into the flesh, distressing the animal and causing economic loss to the farmer Otodectes cynotis, the cat ear mite , responsible for Canker. Gyrodactylus salaris, a monogenean parasite of salmon , which can wipe out populations which are not resistant. Structural parasitology This is the study of structures of proteins from parasites. Determination of parasitic protein structures may help to better understand how these proteins function differently from homologous proteins in humans. In addition, protein structures may inform the process of drug discovery. Quantitative[edit] Parasites exhibit an aggregated distribution among host individuals, thus the majority of parasites live in the minority of hosts. This feature forces parasitologists to use advanced biostatistical methodologies. In fisheries biology , for example, parasite communities can be used to distinguish distinct populations of the same fish species co-inhabiting a region. Additionally, parasites possess a variety of specialized traits and life-history strategies that enable them to colonize hosts. Understanding these aspects of parasite ecology, of interest in their own right, can illuminate parasite-avoidance strategies employed by hosts. Conservation biology of parasites[edit] Main article: Conservation biology of parasites Conservation biology is concerned with the protection and preservation of vulnerable species, including parasites. A large proportion of parasite species are threatened by extinction, partly due to efforts to eradicate parasites which infect humans or domestic animals, or damage human economy, but also caused by the decline or fragmentation of host populations and the extinction of host species. Taxonomy and phylogenetics[edit] The huge diversity between parasitic organisms creates a challenge for biologists who wish to describe and catalogue them. Recent developments in using DNA to identify separate species and to investigate the relationship between groups at various taxonomic scales has been enormously useful to parasitologists, as many parasites are highly degenerate , disguising relationships between species. History[edit] Cyst and imago of Giardia lamblia , the protozoan parasite that causes giardiasis. The species was first observed by Antonie van Leeuwenhoek in This was the first protozoan parasite of humans that he recorded, and the first to be seen under a microscope. His earlier book Osservazioni intorno agli animali viventi che si trovano negli animali viventi Observations on Living Animals found in Living Animals described and illustrated over parasites including the human roundworm. James Paget discovered the intestinal nematode Trichinella spiralis in humans in James McConnell described the human liver fluke in A physician at the French naval hospital at Toulon, Louis Alexis Normand, in researching the ailments of French soldiers returning from what is now Vietnam, discovered the only known helminth that,

without treatment, is capable of indefinitely reproducing within a host and causes the disease strongyloidiasis. Manson further predicted that the malaria parasite, Plasmodium , had a mosquito vector, and persuaded Ronald Ross to investigate. Ross confirmed that the prediction was correct in â€" Ross was controversially awarded the Nobel prize for his work, while Grassi was not.

PRIMATE PARASITE ECOLOGY pdf

3: Parasitology - Wikipedia

Book review of "Primate Parasite Ecology: The dynamics and study of host-parasite relationships" by Michael A. Huffman and Colin A. Chapman (Eds.) No one can doubt that disease played a major role in human history and still continues to impact human health. Also, many human diseases, such as HIV.

The dynamics and study of host-parasite relationships. Received Oct 15; Accepted Oct Abstract Book review of "Primate Parasite Ecology: The dynamics and study of host-parasite relationships" by Michael A. Huffman and Colin A. Book review No one can doubt that disease played a major role in human history and still continues to impact human health. Also, many human diseases, such as HIV, Ebola and malaria, have been acquired from our close primate relatives. The potential transmission of infectious agents from monkeys and apes to humans is why the study of primate parasites is so significant. The present work, which is divided into several Parts, consists of 25 chapters authored by one or more of 62 contributors. Part 1 deals with methods used in studying primate parasite interactions. It begins with a chapter on collecting and diagnosing primate parasites. This is followed with a chapter on extracting and identifying minute nematodes, mostly pin worms, recovered from fecal samples. The next chapter discusses the use of molecular methods for comparing populations of stomach worms Oesophagostomum. This is followed by a discussion on the use of endocrinological analyses to interpret social relationships, anthropogenic disturbances and nutrition of primates. Part 1 ends with a chapter on the use of agent-based modeling to investigate the role played by infectious diseases of primates. Part 2 covers the natural history and host interactions of primate parasites. The first chapter discusses the behavior of gasterointestinal parasites in relation to host finding and parasite migrations. This is followed by a chapter on the evolution of adaptation and species jumping in primate malaria. Since there are over 30 species of primate Plasmodium malaria and at least 5 infect humans, this is an important topic. Whether the association of P. This scenario is strengthened by the discovery of a fossil Plasmodium from the Dominican Republic showing that Plasmodium malaria was in the New World million years ago. The next chapter discusses disease avoidance in gorillas and chimpanzees in relation to social organization. The amount of Ficus-fruit consumption by the apes is correlated with Ebola outbreaks since the bat reservoir hosts contaminate figs while feeding. This is followed by a review of primate-parasitic zoonoses and anthropozoonoses, including protozoa, nematodes, bot flies myiasis , fleas, ticks, leeches and trematodes. Included is American trypanosomiasis or Chagas disease, caused by Trypanosoma cruzi. Reservoir hosts include rodents, but also probably bats since a member of the latter group carried a Trypanosoma very similar to T. Curiously, the authors omitted reports of simian infections by Leishmania, an important human disease in both the New and Old Worlds. The following chapter discusses the use of primate sucking lice Pediculus, Pthrius and Pedicinus as markers of primate evolutionary history. Pinworms, Pneumocystis fungae, Plasmodium malaria and simian foamy virus are other agents that could be used as markers for non-human primate evolution. The following chapter discusses cryptic species reproductively isolated but morphological indistinguishable of lice on primates. The human body louse and head louse are considered cryptic species and various methods by which they can be distinguished, including molecular, are discussed. The next chapter discusses the prevalence of Clostridium perfringens in the intestine of non-human primates. This bacterium is ubiquitous and a normal component in the guts of many vertebrates. Different rates of infestation occur between wild and captive monkeys and apes. The next chapter discusses the use of molecular sequence analyses to determine differences in numbers of Clostridium, Lactobacillus and Bifidobacterium in wild and captive chimpanzees. This is followed by a chapter on habitat disturbance and seasonal fluctuations of lemur parasites Sifakas in Madagascar. Tapeworm and nematode populations were higher in Sifakas Propithecus edwardsi in disturbed rather than in undisturbed forests. The following chapter questions if climatic differences might influence self-medicative behavior the folding and swallowing of whole rough, bristly leaves in gorillas. Apparently this behavior stimulates peristalsis that serves to cleanse the gut of helminths. The following chapter deals with possible dangers when humans are exposed to simians with novel retroviruses. Apparently a much broader range of simian retroviruses than realized are capable of causing

primary zoonotic infections in humans and the authors conclude that transmission is probably occurring continuously. This is followed by a chapter on gasterointestinal parasites infecting Alouatta howler monkeys. Whether these infections are natural or were acquired from humans or domestic animals is discussed. The following chapter deals with a possible correlation between social dominance and the distribution of five nematodes in a subspecies of the Japanese macaque, Macaca fuscata yakai. The observed aggregated distribution pattern was considered to result from the highly social nature of the monkeys. Possible differences in the parasite load in wild-feeding and crop raiding baboons were investigated in the next chapter. Significant differences were found regarding some of the parasites. Whether parasites can be a selective force on primate group size is discussed in the following chapter. This hypothesis was tested with red colobus monkeys Procolobus rufomitratus in Uganda. Results showed no difference in numbers of protozoa and nematodes between large and small monkey troops. The next chapter discussed whether the diet of mountain gorillas in Uganda influenced their nematode and tapeworm parasites. No correlation between parasite load and protein intake was noted, but ingestion of tannin decreased pinworm Probstmayria sp. This Part ends with a discussion on host-parasite dynamics and future areas of study in primate-parasite ecology. This book contains a wealth of information and provides a solid base for future studies of primate-parasite interactions. A higher classification of the primates, down to the species level with those members discussed in the book, would have been a helpful addition. Competing interests The author declares that he has no competing interests.

PRIMATE PARASITE ECOLOGY pdf

4: Primate Parasite Ecology | Colin A Chapman - www.enganchecubano.com

Title Primate parasite ecology: the dynamics and study of host-parasite relationships / edited by Michael A. Huffman, Colin A. Chapman. Format.

Huffman and Colin A. Monkeys and apes often share parasites with humans, for example the HIV viruses which evolved from related viruses of chimpanzees and sooty mangabeys, and so understand- ing the ecology of infectious diseases in non-human primates is of paramount importance. Furthermore, there is accumulating evidence that environmental change may promote contact between humans and non-human primates and increase the possibility of sharing infectious disease. He is currently an editor for the American Journal of Primatology. His research on hostâ€"parasite relationships and primate self-medication has involved multi-disciplinary interna- tional collaborations on species around the world, spanning over 15 countries. He has been an associate scientist with the Wildlife Conservation Society since and for the last 18 years has conducted research in the Kibale National Park, Uganda. Foley, University of Cambridge Nina G. An Evolutionary Perspective Tessa M. Pollard 0 6 55 Spider Monkeys: Subject to statutory exception and to the provisions of relevant collective licensing agreements, no reproduction of any part may take place without the written permission of Cambridge University Press. Includes bibliographical references and index. ISBN hardback 1. Communicable Diseases â€" transmission. QX 45 P] QL Chapman Frontmatter More information Contents List of contributors page ix Preface xv Part I Methods to study primateâ€"parasite interactions 1 1 Collection methods and diagnostic procedures for primate parasitology 3 Ellis C. Polderman 4 The application of endocrine measures in primate parasite ecology 63 Michael P. Muehlenbein 5 Using agent-based models to investigate primate disease ecology 83 Charles L. Chapman Frontmatter More information vi Contents Part II The natural history of primateâ€"parasite interactions 6 What does a parasite see when it looks at a chimpanzee? Sukhdeo and Suzanne C. Sukhdeo 7 Primate malarias: Ayala 8 Disease avoidance and the evolution of primate social connectivity: Ebola, bats, gorillas, and chimpanzees Peter D. Wolfe and William M. Switzer 18 Overview of parasites infecting howler monkeys, Alouatta sp. Vitazkova 19 Primate parasite ecology: MacIntosh, and Michael A. Huffman 20 Crop raiding: A test with red colobus Colin A. Rothman, and Stacey A. Hodder 22 How does diet quality affect the parasite ecology of mountain gorillas? Pell, and Dwight D. Chapman Frontmatter More information viii Contents 23 Hostâ€"parasite dynamics: Hodder, and Jessica M. Ryan, Raja Sengupta, and Tony L. Goldberg 25 Useful diagnostic references and images of protozoans, helminths, and nematodes commonly found in wild primates Hideo Hasegawa, Colin A. Chapman, and Michael A. Chapman Frontmatter More information Contributors julie m. Chapman Frontmatter More information Contributors xi alexander d. Diagonal , ES, Barcelona, Spain jessica m. Thomas, US Virgin Islands peter d. The effects of parasitism can be serious or even deadly, warranting that all precautionary measures be taken. However, for some like ourselves who have had the experience more than once, it can lead to an interest to understanding the nature of hostâ€"parasite relationships and the effect parasites can have on the host. For both of us, the study of primate parasite ecology is truly infectious, and it is our wish that this enthusiasm is transmitted to you the reader! Given that monkeys and apes often share parasites with humans, understanding the ecology of infectious diseases in non-human primates is of paramount importance. This is well illustrated by the HIV viruses, the causative agents of human AIDS, which evolved recently from related viruses of chimpanzees Pan troglodytes and sooty mangabeys Lophocebus atys and the outbreaks of Ebola virus, which trace their origins to zoonotic transmissions from local apes. A consideration of how environmental change may promote contact between humans and non-human primates and increase the possibility of sharing infectious disease detrimental to humans or non-human primates is now critical to both conservation and human health planning. The study of disease adds a new and important dimension to primatology, as most previous research has focused on predation and resource competition, with almost no research on infectious disease as an ecological force. Chapman Frontmatter More information xvi Preface researchers including the veterinary sciences, conservation, zoonotic diseases, zoology, and evolutionary biology. In general, the chapters fall into three broad categories: They cover hostâ€"parasite,

pathogen inter- actions of both internal and external parasites. Authors address the dynamic nature of hostâ€”parasite relationships and look at such aspects as host behavioral counter-measures in response to infection, inter- and intra-species difference in parasite prevalence as a consequence of climatic and environmental varia- tion, habitat fragmentation, and seasonality. This book would not have come to fruition had it not been for the enthusi- asm and efforts of all the authors and colleagues who offered their time and assistance in preparing and reviewing the manuscripts. To all of you we give our hearty appreciation.

PRIMATE PARASITE ECOLOGY pdf

5: Infectious Diseases in Primates - Charles Nunn; Sonia Altizer - Oxford University Press

From focusing almost exclusively on parasites as a measure of host fitness, research on primate parasitology has expanded to explore the diverse relationships between parasites and their hosts within the context of disease ecology.

Understanding these patterns and processes under natural conditions can help determine potential impacts of habitat alteration on primate populations, which is a constant concern in conservation of endangered species. One of my main interests is to determine host traits that contribute to heterogeneity in infection phenotypes across individuals. I am currently focusing on the importance of social structure in mediating both exposure and susceptibility to parasitic nematode infection, working with the populations of Japanese macaques on Koshima and Yakushima Islands, under naturalistic and field-experimental conditions. By disrupting the natural course of infection via anthelmintic treatment of target individuals, I hope to uncover mechanisms of reinfection and potential fitness benefits of parasite removal. Since Japanese macaques are isolated from other nonhuman primates, within-species effects clearly dominate parasite transmission dynamics, at least for parasites with direct modes of transmission. In tropical areas, however, multiple related primate species typically live sympatrically, allowing for potential cross-infection by parasites. This means that not only specific host individuals but also specific host species may play a disproportionate role in the transmission dynamics of certain disease-causing or otherwise parasitic organisms, i. If host community assemblages can affect the transmission rates of generalist shared parasites, then the potential exists for other species to influence infection dynamics of focal species, such as primates and other wildlife of conservation concern, or humans, leading to indirect effects on their population viabilities. We aim to address such issues in a project aimed at: Fractal Complexity in Animal Behaviour Perhaps because of the difficulties inherent in determining costs associated with parasite infection and other ecological challenges, I have also been investigating the utility of fractal analysis in health monitoring studies of wild animal behaviour. I am currently using various fractal methods, including detrended fluctuation analysis DFA and various other Hurst exponent estimators, as well as other tools that measure fractal dimension, to examine complexity in behavioural sequences - which are subtly more stereotypical with stress and disease. My previous research suggested a possible link between parasitic infection and complexity loss in Japanese macaques, and I am currently applying these fractal tools to other study systems, including further work with Japanese macaques and other primates in collaboration with the University of Veterinary and Pharmaceutical Sciences Brno, as well as penguins in collaboration with the IPHC-DEPE, CNRS-University of Strasbourg. In the latter case, using the novel merger of temporal fractal analysis applied to data collected via bio-logging i. We aim to use fractal tools to investigate through a comparative approach behavioral complexity in relation to both individual and environmental quality, and particularly with reference to issues surrounding climate change in the Antarctic region. My dissertation, which was supervised by Dr. Michael Huffman, was entitled "Gastrointestinal helminth parasitism among Japanese macaques: To date, I have studied primates in one capacity or another in Central America, Africa, and Asia, but my current focus is on Asian primates and their gastrointestinal parasites. Appl Anim Behav Sci. A Behie et al. Cryptic Strongyloides in a Bornean slow loris. R Soc Open Sci 4: Lessons from studies of diffusion. Am J Primatol Physics of Life Reviews. Marine Ecology Progress Series Behavioral Ecology and Sociobiology International Journal of Primatology Journal of the Royal Society Interface 8: Cambridge University Press, pp. American Journal of Primatology The diversity and distribution of parasitic protozoa in primates of the lower Kinabatangan Flood Plain Cecile Sarabian , section of Social Systems Evolution. The Origins of Hygiene: Infection-risk Avoidance in Papionini and Hominidae.

6: Gideon Erkenswick â€“ Wildlife Research, Parasite Ecology, Science Education

study, parasite and primate ecology only recently began to explore their commonalities, especially because of the close relationship between non-human primates and humans, and the increasing.

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7: Macroecology of Infectious Disease â€“ A NSF Research Coordination Network

Monkeys and apes often share parasites with humans, so understanding the ecology of infectious diseases in non-human primates is of paramount importance.

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