



## Book Reviews

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## BOOK REVIEW . . .

**George Henry Falkiner Nuttall and the Nuttall Tick Catalogue**, James E. Kierans. United States Department of Agriculture, Agriculture Research Service, Miscellaneous Publication No. 1438, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, USA. 1985. 1785 pp. \$61.00 U.S.

This huge volume will not be of great value to many *Journal of Wildlife Diseases* readers, but will be very useful to systematists in acarology. It represents a complete revision and updating of Nuttall's large tick collection housed in the British Museum. Probably the only larger collections are those of Harry Hoogstraal, soon to be housed at the Smithsonian Institute and the Rocky Mountain Laboratories, Hamilton, Montana. Kierans spent a year studying the col-

lection (3,972 entries) and notes of Nuttall, and has produced a useful, easily usable document. Included is a biography of Nuttall, his tick collection in the original and updated form (presented side-by-side for easy comparison), and four appendices listing type specimens ( $n = 160$ ) of tick species, species of ticks, hosts, and geographic locality.

This is a free volume (limited quantities) to those requesting it from USDA, ARS. It can be purchased from the U.S. Government Printing Office, "but the price is subject to change. Call (202) 783-3238 to verify availability and price."

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## BOOK REVIEW . . .

**Ecology and Genetics of Host-Parasite Interactions**, Linnean Society Symposium Series, Number 11, D. Rollinson and R. M. Anderson (eds.). Academic Press, Inc. (London) Limited, 24128 Oval Road, London NW1 7DX, England (U.S. Edition, Academic Press, Inc., Orlando, Florida 32887, USA). 1985. 266 pp. \$49.50 U.S.

This volume's title indicates an enthusiastic undertaking. It is prefaced as follows: "The fourteen papers in this volume draws together information on the ecology, epidemiology and genetics of a wide variety of host-parasite interactions. . . [and] (t)hey reflect a growing interest in research at the interface between population ecology and population genetics . . ." A number of these papers should be of interest to wildlife disease researchers.

The first chapter by C. R. Kennedy is a treatise on whether or not parasites can constrain the growth of fish populations. It explores field data supporting predictions that there are (1) extensive spatial variations in fish and parasite population interactions, (2) discrete gene pools in both parasite and host populations with little gene flow between sites and (3) many fish parasite populations existing in non-equilibrium conditions where they exert little selective pressure on their hosts. The author argues that the potential of parasites to act as agents of selection upon fish is seldom recognized. However, his conclusions must be qualified since they result from studies on freshwater fish-parasite communities in southwestern England where aquatic systems are very extensively managed and manipulated. Unfortunately, as the author concludes, until similar studies are completed on other natural systems "we may never truly understand the relationships between genetics and ecology in . . . [host] and parasite populations." This is a recurrent theme throughout the volume.

The chapter by M. E. Scott examines the epidemiology of an experimental monogenetic trematode infection in guppies based on an approach developed by M. Greenwood nearly 50 years ago. It is suggested, but not substantiated, that the observed patterns of host response reflected genetic differences. The author supports the contention that parasites should be considered as an important host regulating force and

that temporally dynamic aggregation of the parasite is a major factor in this association. Although the latter is adequately demonstrated, this experimental study presents little evidence in support of host population regulation by a parasite species. An understated aspect of this paper is that the mathematical models failed to mimic the laboratory experiments, emphasizing the problems associated with extrapolating theoretical models to experimental and field studies.

D. Wakelin's chapter entitled "Genetics, immunity and parasite survival" discusses six host-parasite laboratory models in terms of genetic control of the immune response. Although it is often difficult to extrapolate laboratory data to natural populations, this has been done in at least one instance and there are other examples indicating that qualitative differences in host responsiveness are not uncommon. This paper is an important reference for all those interested in the effect of parasites on host populations. On a similar note, the paper by Anne Keymer on the epidemiology of a trichostrongylid nematode in the laboratory mouse provides an informative example of the development of an experimental epidemiological model for hookworm.

The paper entitled "Cyclic and non-cyclic populations of red grouse: a role for parasitism" by P. J. Hudson et al. discusses the effect of parasitism on a wildlife population's productivity and management. The authors address the reasons for cyclic and non-cyclic populations of red grouse in the northern English moors as mediated by the potential dynamical consequences of trichostrongylid infections using a parasite-host system model. Although their study did imply that parasitism played a role in the population fluctuations of grouse numbers, the authors indicate that a range of factors probably influence host population dynamics and their "relative importance can be expected to vary in time and space and it may be naive to involk a simple explanation for all populations."

The study on ecological and evolutionary dynamics of trypanosomiasis in the red spotted newt by D. E. Gill and B. A. Mock provides a much needed example, supported by long term host and parasite population demography data, of the compensatory effect of an infection on

host survival and reproduction. The authors present an alternative to established models for explaining the evolutionary origin of the current apathogenic relationship between trypanosomes and newts. There is an excellent discussion of the natural selection of individuals in the host population infected with apathogenic versus virulent demes of trypanosomes.

The paper by A. Tate explores the current state of knowledge of measures of genetic diversity for defining morphologically similar or identical organisms in relation to the diseases they cause and the hosts they infect. There is an excellent summary discussion on measurement of genetic diversity recommended to all who are unfamiliar with the current technologies. Of particular reference to wildlife diseases, is the following question: "Since the 'same' species of parasitic protozoa [may] infect a range of host species, are the different diseases caused by different parasites and are the parasites causing disease in man different from those in wild and domestic animals?" The author develops a theoretical model based on this question related to human infection, domestic and wild animal reservoirs, and vectors and applies this to actual parasite vector systems including typanosomiasis and malaria.

The last chapter of the book by R. M. May is yet another summary of the prolific theoretical models by this author and his colleagues on the population biology of host-parasite relationships. The emphasis is on the regulation of host populations by micro- and macroparasites, the development of control programs, and concluding sections on the relationships of population genetics and population dynamics. The author summarizes that, although there is theoretical "evidence" that parasites are capable of regulating their host populations, the extent to which

they do so in nature is debatable and there is a definite need for more demographic and epidemiological data to be collected that specifically address these questions.

There are six other papers in this book on experimental epidemiology, population dynamics and genetics of human parasites, bacteria and phages, and plant parasitic nematodes. Although of value to parasitologists and epidemiologists, they are of less interest to wildlife disease researchers.

Reflective of the individual authors, certain chapters are well written, but some papers would have benefited by more extensive editing and proofing. There are several typographical errors in most chapters that detract from the technical quality of the volume. Each chapter provides *Key words* for indexing, but many of these are not listed in the subject index. On a more positive note, the format is consistent for each paper in the volume, including the references. Most figures are well executed and all figures are similar in format throughout the volume.

In general, this volume combines papers on experimental and field data with theoretical models to provide an up-to-date review of present knowledge of, or lack thereof, population ecology and genetics of parasitism in animal and human populations. The authors are recognized authorities in their respective disciplines and the series of papers are reflective of their research activities and interests. It is recommended reading for anyone interested in the population dynamics of infectious diseases and their impact on host populations.

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