Acta Theriologica 35 (1 – 2): 170 – 171, 1990.

BOOK REVIEWS

Dispersal – towards the final synthesis

Dispersal in rodents: a resident fitness hypothesis. Paul K. Anderson. American Society of Mammalogists. Special publication No. 9 . 1989; 139 pp.; index ISBN: 0-935868-40-2.

Dispersal in rodents is a population phenomenon which attracted the attention of many students of mammals. This resulted in the accumulation of an enormous amount of observations and a massive literature. While the role of dispersal in population regulation is well understood, the evolution of this behaviour and the ultimate and proximate factors causing animals to leave their natal habitat remain unclear. Thus, the dispersal phenomena still await a synthesis and the development of a cohesive theory.

This book is a very good attempt at such a synthesis . First, the author points out that contemporary thinking about the evolution of dispersal is based on the "too-facile assumption that because animals emigrate, there must have been direct selection for emigratory tendency" or in other words, that the evolution of dispersal is founded on benefits to emigrants. Anderson calls this assumption "the Emigrant Fitness Hypothesis" (EFH). Then, he proposes an alternative hypothesis based on the assumption that "selection has generated dispersal phenomena in the first instance through advantage to residents; the responses of non-residents are secondary". This is named "the Resident Fitness Hypothesis" (RFH).

The book consists of six chapters. In Chapter I the terminology of dispersal is reviewed. In the dispersal literature the usage of many terms is vague and varying. Here the basic terms are precisely defined and their meaning clarified. For example, the author proposes to refer to the animals leaving the natal site as "emigrants", and not as "dispersers" – the usage widespread in the literature. He also believes that the term "dispersal" should imply emigration followed by immigration or in other words "effective dispersal". Many authors describe minor shifts of home sites or home ranges as dispersal. According to Anderson, range shift can be qualified as dispersal only if it causes the change in the individual social environment (a new set of social contacts and potential mates).

Chapter II deals with the EFH. Possible gains in fitness to emigrants, postulated by different authors, are critically reviewed. The analysis of possible gains in fitness includes: better survival of emigrants, avoidance of competition, increased opportunity of breeding, establishment in better habitats, avoidance of population crashes, avoidance of inbreeding depression and advantage through heterotic mating. The outcome of the analysis is that emigrants are unlikely to gain fitness or even that emigration is maladaptive for emigrants, most of which find their way into emigration sinks. Therefore, the author rejects the EFH.

In Chapters III & IV the RFH is presented and tested against observations found in the literature. A short and precise definition of this hypothesis has not been given in the book, and, thereofore, I may only try to recount the main points of reasoning presented by the author. The main concepts of the RFH are that rodents are fundamentally philopatric and sedentary, that interests of parents (residents) and offspring come into conflict and that dispersal of offspring is controlled by behaviour of resident adults. Residents can drive out offspring and benefit by reduced competition, either by their absence or possible success elsewhere or both. Residents also can suppress maturation of offspring and thereby reduce competition, but parents with a high residual reproductive value will benefit, in most cases, by forcing their offspring to emigrate. Options open to offspring are limited. They emigrate, when given no other choice, but if tolerated they can avoid competition by delayed maturation. Possible behaviour of parents and response of offspring require consideration of inclusive fitness. Predictions of the RFH, postulated by Anderson, include: high site tenacity, and high tendency to philopatry in rodents, kin recognition and cohesiveness among kin, different behaviour of resident males and females toward offspring, and different response of male and female offspring. Testing of these predictions against the available literature led the author to the conclusion that "although there are many gaps in our information, there is considerable support for the RFH".

In Chapter V new predictions are proposed and possible tests of these predictions are suggested. They are aimed at direct discriminination between the two hypotheses: the EFH and the RFH. The last chapter

(VI) is a brief concluding statement emphasizing behavioral, demographic and genetic implications of the Resident Fitness Hypothesis.

The book is excellent and should be read by all population ecologists. It is very well-written, it provides a critical review of up-to-date literature on dispersal and social interactions in rodent population: it stimulates our thinking about the evolution of dipersal behaviour: it is an important contribution to the theory of population biology.

In my opinion, however, the two hypotheses: EFH and RFH, are not mutually exclusive. Anderson rightly stated that "dispersal can best be understood in a broad context that includes both, classic selection and kin selection". Benefits to residents (parents and siblings of dispersers) do not exclude benefits to dispersers, emigrating under a certain set of seasonal, spatial and social conditions. In fact, they result in gains in fitness to lineages with dispersing offspring.

Joanna GLIWICZ, Warsaw Agricultural University, Department of Wildlife Management, Rakowiecka 26/30, 02–528 Warsaw, Poland

Acta Theriologica 35 (1–2): 171 – 172, 1990.

Field guide for European mammals

Observing British and European mammals. Ch. Bouchardy and F. Moutou. British Museum. Natural History, London, 1989; 240 pp.; index ISBN: 0-565-01095-6.

The popular series of zoological field guides has been recently enriched with a new item, compiled by two well-known French theriologists Ch. Bouchardy and F. Moutou. Its English version has been prepared by Jain Bishop. Curator of Mammals at the British Museum (Natural History).

The book is 240 pages long, contains 89 colour photographs (of very good quality) and 33 black and white figures. It consists of two basic parts, "Introduction" and "Taxonomic catalog", and terminates in indexes of species names (in Latin and English), "Further readings" and "Check list of species". The authors concentrate their attention on terrestrial mammals of western Europe and possibilities of visually recognized them in the field. The "Introduction" falls into 7 chapters. The first one tersely, but also in a way intelligible for amateurs, characterizes 6 mammal orders discussed in detail in the guide. The second chapter contains general information on the ecology of this animal class. While stressing difficulties of observing mammals, the authors answer in the third chapter the question of how, where, when and which species may be observed and how one should prepare him or herself for direct observations, taking photographs or shooting films of these animals. The fourth chapter concerns the methods of catching small mammals with traps for monitoring their biological peculiarities in vivarial conditions. The fifth, and longest, chapter deals with the identification of mammals in the field, employing their droppings, footprints, food remains, nests, burrowing activity, voices and carcasses. The sixt chapter advises the reader how to take notes and how to secure paw prints in a practical way. The seventh, and last, chapter briefly discusses the problems of mammal preservation and displays the role of amateurs in theriological studies.

In the taxonomic part, the authors present 120 species, 80 of which are supplied with fairly detailed descritpions. Each species has a descritpion of its occurrence area, external, biological and ecological characteristics, field identification trails and conditions of monitoring. The description is supplemented with