

BOOK REVIEW

**Biology, ecology and management of the red fox**

Atti I Simposio Italiano sui Carnivori. Biologia, ecologia e gestione della Volpe. C. Prigioni, ed. *Hystrix*, (n.s.) 3: 1 – 256. Publication of Rome Theriological Association, Rome, 1991. ISSN 0394-1914.

Proceedings of the I Italian Symposium on Carnivores – Biology, ecology and management of the red fox – are printed in the third volume of Italian theriological journal – “*Hystrix*”.

The review articles and original papers are divided, following the course of the Symposium, into three groups. In the first, the largest one, 14 papers on fox ecology and ethology are published, the second group devoted to the problem: “The fox as vector of zoonoses” – contains 8 papers, and the third one: “Census methods and management” – 7 publications. Generally, the Italian authors distinctly predominate; only four papers are written by foreign authors and presented in English. Papers by Italian authors contain summaries in English.

Many papers analyse food habits and diet of foxes. Beside the methodical and review article (C. Prigioni), readers may find here the information about nutritive value of particular food items (C. Cavani), as well as data on fox food composition in different regions of Italy. These papers confirm the generalistic feeding strategy of red foxes. In Italy, beside mammals and birds, such food items as fruit, insects, garbage and carrion are of significant importance in the diet of this predator (M. Pandolfi *et al.*, I. Fais *et al.*, P. Boldreghini and M. Pandolfi).

Several other interesting papers give data on fox reproduction and on selecting den location by the species in Italy (C. Prigioni, A. Meriggi and P. Rosa). Reported mean litter size (2.7 indiv.) is rather low in comparison with other geographical regions. It is also worthwhile to notice that the period in which young foxes in Italy are born (January – May), is unusually long.

Three papers concern spatial organization and use of home range by foxes. Italian researchers (S. Lovari *et al.*) point out to the relationship between home range and food abundance. These authors, on the basis of their own data and literature, support the hypothesis according to which home range size varies with the food availability and climatic factors. The British scientists (C. P. Doncaster and D. W. Macdonald) report on social organization of foxes under urban condition of Oxford. Urban fox live in groups; each group defends its territory but borders of group range are continually shifted. Number of adult foxes in groups and the size of territories may depend on habitat patchiness and between-group competition for food resources. French researchers (M. Artois and M. Aubert) also point out to the variability of fox spacial activity but, contrary to other studies, they observe relatively solitary behaviour of predators. The same authors analyse changes in mobility of foxes infected with rabies and population structure in the rabies infected areas. Their paper is an interesting attempt of new approach to the rabies problem.

Rabies among carnivores is also considered in the paper of Swiss author – I. A. Wandeler and by Italian ones. In these papers statistics related to the disease are presented (G. Garletti *et al.*), and efficiency of prophylactic measures, eg. use of oral fox immunization is discussed (A. Civardi). Three papers refer to ecto- and endoparasites.

Among papers devoted to fox census methods the most important is an article by Spanish-Chilean team (J. F. Beltran *et al.*) in which the different methods used in fox studies are compared. This paper should be read by every scientist interested in methodology of ecological research on predatory mammals. There is, however, one mistake in the article: first censuses on predator densities by night counting with spotlight has been carried out much earlier than the authors suggest. The densities of foxes in Italy, revealed either by counting of dens (L. Nieder *et al.*, C. Prigioni *et al.*) or by spotlight census (M. Pandolfi *et al.*) are rather high in comparison with those in central and northern Europe.

Several articles refer to fox management in Italy (R. Santolini *et al.*, F. Cassola).

In conclusion, it must be said that the Proceedings of the I Italian Symposium present a large spectrum of research on fox biology, ecology and management, and show strong involvement of Italian scientists in the studies of this important predator.