OCCURRENCE AND PREVALENCE OF *YERSINIA* SPP IN FREE-RANGING RED DEER (*CERVUS ELAPHUS*) IN NORWAY

A. Aschfalk[1], N. Kemper[2], J.M. Arnemo[3], V. Veiberg[4], O. Rosef[5], H. Neubauer[6]

[1]Federal Research Institute for Animal Health, Institute of Epidemiology, Wusterhausen, Germany; [2]Christian-Albrechts-University, Institute of Animal Breeding and Husbandry, Kiel, Germany; [3]The Norwegian School of Veterinary Science, Department of Food Safety and Infection Biology, Section for Arctic Veterinary Medicine, Tromsø, Norway; [4]Centre of Ecological and Evolutionary Synthesis, Department of Biology, University of Oslo, Norway; [5]Telemark University College, Bø, Norway; [6]Federal Research Institute for Animal Health, Institute of Bacterial Infections and Zoonoses, Jena, Germany

Introduction

Enteric bacteria belonging to the family *Yersinia* occur worldwide in domestic livestock, wild animals and the natural environment. Several *Yersinia* species are of severe animal and public health importance e.g. *Yersinia enterocolitica* and *Y. pseudotuberculosis* being the causative agents of yersiniosis in humans and animals or *Y. pestis* of plague in man. However, knowledge of occurrence of these pathogens in game animals used for human consumption and the impact on human health is not sufficient.

Materials and methods

As a contribution to the evaluation of the occurrence and prevalence of *Yersinia* spp in wild animals in Norway, faecal samples from clinically healthy red deer [170 immobilized animals (both genders, calves and adult deer) from different sites in Southern Norway, fig. 1] were examined by bacteriological means. Isolates were further identified by biochemical tests (API 20E) and PCR was performed to detect the genes encoding 16S rRNA, *yad*A and V-antigen.

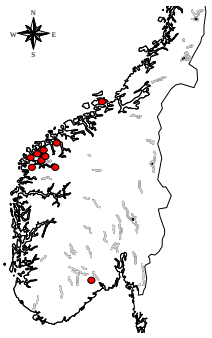

Fig. 1: Map of Southern Norway showing sampling sites

Fig. 2: Red deer with radio collar

Results

Yersinia spp were detected in faeces samples from 10 (5,9 %) red deer: *Y. enterocolitica* *n* = 8 (serovar O:5/1A, *n* = 3; O:6/1A, *n* = 2; O:8/1A, *n* = 3); *Y. molaretti* (*n* = 1), *Y. pseudotuberculosis* (*n* = 1, adult female; positive for genes encoding for *yad*A, and V-antigen).

Discussion

In this study, all *Yersinia enterocolitica* (biogroup 1A) and *Y. molaretti* are considered apathogen saprophytic strains. The finding of *Y. pseudotuberculosis* in red deer is of particular importance as this pathogen is considered to cause one of the most important infectious diseases in red deer and was in sporadic cases associated to disease in man. Even though *Y. pseudotuberculosis* was isolated in Scandinavian countries among others from further feral animals, such as rodents, foxes and birds, this finding is surprising, as this is obviously the first report in red deer in Norway. In previous studies in reindeer (*Rangifer t. tarandus*; *n* = 2.243; Kemper *et al*., 2006) and moose (*Alces alces*; *n* = 72; Kemper *et al*., 2004) in Fennoscandia, this agent was not isolated (tab. 1), or apathogen *Yersinia* strains only were detected.

Most information on morbidity and lethality in red deer caused by *Y. pseudotuberculosis* is based on disease in animals subjected to adverse hygienic conditions. Especially crowding around feeding sites together with cold and humid weather conditions are considered favouring factors (fig. 2).

There are several reports on wild and free-ranging animals being a reservoir for enteric pathogens that may cause severe and fatal diseases in animals and eventually in man. However, information on their impact on public health or on livestock production is mostly missing and further efforts have to be made in the future to clarify these gaps.

This study is part of a more extensive study on the occurrence of enteric zoonotic pathogens in Nordic free-ranging deer (tab. 1).

Tab.: 1: Occurrence and prevalence of important enteric bacteria in red deer, moose and reindeer in Norway and Finland

Deer species / enteric pathogen	*Campylobacter* spp	*Enterococcus* spp	*Escherichia coli*	*Yersinia* spp
Red deer (*n* = 170)	-	160 (94,1 %)	166 (97,6 %)	10 (5,9 %)
Moose (*n* = 72)	-	71 (98,6 %)	49 (68,1 %)	-
Reindeer (*n* = 2.243)	1 (0,04 %)	2.084 (92,9 %)	2.123 (94,7 %)	108 (4,8 %)

References

Kemper, N., Aschfalk, A., Arnemo, J.M., Höller, C., 2004. Prevalence of enteropathogenic bacteria and *Cryptosporidium* species in moose (*Alces alces*) in Norway. The Veterinary Record, 154, 827-828.

Kemper, N., Aschfalk, A., Höller, C., 2006. *Campylobacter* spp., *Enterococcus* spp., *Escherichia coli*, *Salmonella* spp., *Yersinia* spp. and *Cryptosporidium* oocysts in semi-domesticated reindeer (*Rangifer tarandus tarandus*) in Northern Finland and Norway. Acta Veterinaria Scandinavica, 48, 7.