

Parasitological monitoring of mammals endoparasites in an Italian faunistic park: effect of two prophylactic treatments with ivermectin on nematodes infections

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Background

Parasite infections in zoo mammals are generally asymptomatic; however, these infections could also determine serious diseases, and some species are also zoonotic [1]. The control of nematodes in captive animals is strongly recommended: among antiparasitic drugs, ivermectin, a macrocyclic lactone, is largely used to control circulation of both nematodes in animals kept in zoos and wildlife parks [2].

Aim of the study

This study aimed to evaluate the spread of nematode infestations in two groups of mammals regularly treated with ivermectin for the control of parasites housed in a faunistic park sited in northern Italy.

Materials and Methods

The study included 10 Families (Bovidae, Camelidae, Elephantidae, Rhinocerotidae, Giraffidae, Hippoptamidae, Equidae, Cavidae, Macropodidae, Tapiridae) treated twice/year (in March and November), daily for 30 days, with ad libitum administration of in-feed formulation of ivermectin (1.7 kg/ton). Besides, 3 Families of carnivores (Felidae, Hyaenidae) and 2 of primates' species (Cebidae, Hylobatidae, Lemuridae) treated once a month, from March to November, with oral or subcutaneous administrations of ivermectin (200 µg/kg b.w.) were sampled. For both groups, a "late spring-early summer" and an "autumn" sampling were performed. Overall, 52 (46 pooled and six individual) and 32 (28 pooled and four individual) fecal samples from 153 herbivorous mammals and 28 carnivores and primates' species were collected, respectively. FLOTAC® dual technique was performed using the flotation solutions FS2 (NaCl; s.g.=1200) and FS7 (ZnSO₄; s.g.=1350) [3].

Results and Discussion

Out of the overall 84 fecal samples, 23 tested positive for at least one parasitic taxon (27.4%), with higher prevalence in the "autumn" (14/42, 33.3%) than in "late spring/early summer" sampling (9/42, 21.4%). Parasite infections were only evidenced in animals belonging to the first group of 10 Families (21/52, 40.4%). Nematode eggs (EPG=Min-Max) of *Nematodirus* spp. (9/52, 17.3%) were observed in Bovidae (4-26), Camelidae (4-8) and Giraffidae (5-64), *Capillaria* spp. (8/52, 15.4%) in Bovidae (5-46), Cavidae (44-142) and Giraffidae (1), *Trichuris* spp. (8/52, 15.4%) in Bovidae (8), Camelidae (110-578), Cavidae (44-142) and Giraffidae (6-50), Strongylida (2/52, 3.8%) in Bovidae (2) and Camelidae (2), and *Parascaris* spp. (3/52, 5.8%) in Equidae (587). Low OPG of coccidian oocysts of *Eimeria* spp. were also detected in Bovidae, Camelidae and Cavidae (7/52, 13.5%). These results indicate the efficacy of the prophylaxis for genera such as Strongylida, frequently found in herbivores, but it may indicate a lower effectiveness of the adopted prophylaxis in controlling genera such as *Nematodirus* spp., *Capillaria* spp. and *Trichuris* spp., probably due to biological characteristic of the cycle and drug dosage. None of the samples from carnivores and primates were positive to any endoparasite (0/32, 0%), indicating the effectiveness of the adopted monthly prophylactic treatment. Parasitological monitoring of mammals housed in faunistic parks could both provide information on the efficacy of prophylactic treatments, and indications to limit parasite circulation.

References

- [1] Panayotova-Pencheva et al. 2013, Zoologische Garten, 82:60-71.
- [2] Panayotova-Pencheva et al. 2016, Zoologische Garten, 85:280-308.
- [3] Cringoli et al. 2010, Nature Protocols, 5:503-515.