

## Research Note

### New data on helminths of stone marten, *Martes foina* (Carnivora, Mustelidae), in Italy

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#### Summary

Ten helminth species are reported in stone marten (*Martes foina*) in the southern Italy (Calabrian region). Five of them, namely the nematodes *Personema plica*, *Eucoleus aerophilus*, *Aonchotheca putorii*, *Crenosoma petrowi* and *Sobolevingylus petrowi* represent new geographical records in the Italian Peninsula. Most of these species including the remaining cestode *Taenia martis* and nematode *Molineus patens* have been found in stone marten in other Palearctic regions; *Oochoristica* sp. is reported in this carnivore for the first time. The trematode *Brachylaima* sp. and the cestode *Mesocestoides* sp. was not identified by the scarcity of material. A trophic status and biogeography of stone marten in Italy is here discussed.

Key Words: *Martes foina*; helminths; Italy

#### Introduction

The stone marten *Martes foina* (Erxleben, 1777), was relatively often studied parasitologically in Europe, and at least 30 helminth species have been reported from this mustellid carnivore so far (Libois and Waechter, 1991). However, scarce studies were made in the region of Italy (Poglayen *et al.*, 1996; Millán and Ferroglio, 2001). A recent survey of small mammal helminths in Calabria (Southern Italy) included a dissection of one specimen of stone marten killed accidentally by vehicle. The present paper reports the surprisingly rich helminth fauna of this individual. Moreover, a geographical distribution of helminths detected and the trophic status of *M. foina* in Italy is discussed.

#### Material and Methods

Helminths were isolated from lungs (L); trachea (T), sto-

mach (S), small intestine (SI) and urinary bladder (UB) of 1 specimen of stone marten *Martes foina* killed accidentally near Cosenza (Calabria, Italy) in December 2001. Helminths obtained were processed following usual helminthological methods. Trematodes and cestodes were stained in Semichon acetocarmine, dehydrated and mounted in Canada balsam. Nematodes were extemporary mounted in Amann lactophenol.

#### Results

A single stone marten was parasitized by 10 helminth species. Following information includes the helminth group, scientific name of the species, family, localization within the host body, and data on the intensity of infection (number of specimens).

Trematoda: *Brachylaima* sp. (Brachylaimidae) (SI) (10); Cestoda: *Taenia martis* (Zeder, 1803) (Taeniidae) (SI) (2), *Mesocestoides* sp. (Mesocestoididae) (SI) (16), *Oochoristica* sp. (Anoplocephalidae) (SI) (3 juvenile tapeworms); Nematoda: *Personema plica* (Rudolphi, 1819) (Trichuridae) (UB) (3), *Eucoleus aerophilus* (Creplin, 1839) (Trichuridae) (T) (7), *Aonchotheca putorii* (Rudolphi, 1819) (Trichuridae) (S) (12); *Molineus patens* (Dujardin, 1845) (Molineidae) (SI) (23), *Crenosoma petrowi* Morozov, 1939 (Crenosomatidae) (LT) (12), *Sobolevingylus petrowi* Romanov, 1952 (Angistrongylidae) (L) (32).

Helminths of the genera *Brachylaima* and *Mesocestoides* were not identified at the specific level because the reliable identification need a detailed morphological study of more than 2 or 3 fully worms such as our case. In the case of *Oochoristica* sp., species identification was not possible due to small number and immature worms obtained.

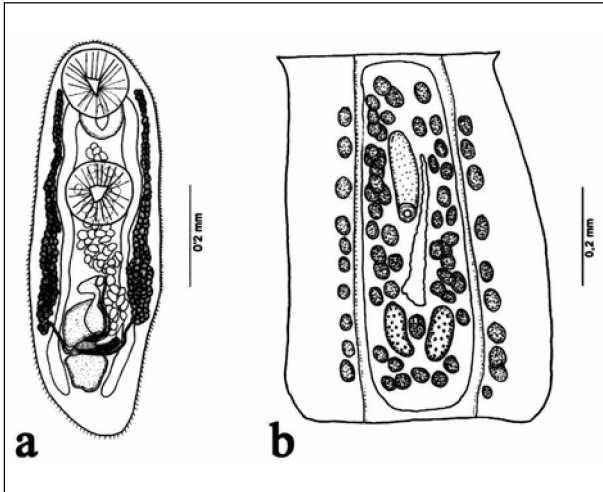


Fig. 1. A – *Brachylaima* sp. (pregravid worm); B – Hermaphroditic proglotid of *Mesocestoides* sp.

## Discussion

Although the stone marten (*M. foina*) occurs frequently throughout the Italy, only two studies on their helminth parasites have been published so far (Poglayen *et al.*, 1996; Millán and Ferroglio, 2001) reporting 10 endoparasitic helminths. A single trematode reported was not identified; 3 cestode species included *Insinurotaenia* sp. (Anoplocephalidae), *Taenia hydatigena* (Taeniidae) and *T. martis* (Taeniidae); most frequently were found nematodes, namely *Capillaria* sp. (Trichuridae), *Uncinaria* sp. (Ancylostomidae), *Angiostrongylus* sp. (Angiostrongylidae), *Molineus patens* (Molineidae), *Toxocara cati* (Ascarididae) and *Diffilaria immitis* (Ondrocercidae).

The present study revealed five helminth species that have not been reported in Italian Peninsula so far and represent new geographical records. They are *P. plica*, *E. aerophilus*, *A. putorii*, *C. petrowi* and *S. petrowi*. Moreover, trematodes of the genus *Brachylaima* were reported from the stone martens only once time in Spain by Sospedra (2000). The present finding of the lung nematode *S. petrowi* in the south of Italy enlarges its geographical distribution that has been restricted to the Eastern Europe and Iberian Peninsula (Sospedra, 2000).

Anaplocephalid tapeworm *Oochoristica* sp. is reported here for the first time from the stone marten in Europe. Other cestodes of the family Anoplocephalidae, reported so far in European mustelids, have been *Insinurotaenia* spp. parasitizing badger *Meles meles* and *Mustela nivalis* from Russia and Italy (Schmidt, 1986; Poglayen *et al.*, 1996), and *Atriotaenia incisa* (Railliet, 1889) frequently found in *M. meles* throughout the Europe (Torres *et al.*, 2001). Recently, the genus *Atriotaenia* has been transferred to the genus *Oochoristica* (Beveridge, 1994), however, the systematic status of the species *Atriotaenia* (*Oochoristica*?) *incisa* is still uncertain and need further clarification; it comprises two distinct “major” and “minor” morpholo-

gical forms (Baer, 1927). The presently studied tapeworms resemble the “major” form of the species, however, the species identification was not possible due to scarcity of material and a lack of mature individuals.

A specification of possible intermediate hosts of mentioned helminths enabled assessing of trophic practices of the definitive host, the stone marten. Thus, the trematode *Brachylaima* spp. use terrestrial gastropods as first and second intermediate hosts (Pojmanska, 1972). Life cycles of tapeworms *T. martis* and *Mesocestoides* sp. involve small mammals and alternatively amphibians or reptilians, in case of the later parasite (Loos-Frank, 1991). Intermediate hosts of the tapeworm *Oochoristica* sp. and the heteroexous nematode species found, are various insects, earthworms and/or terrestrial snails (Wardle and McLeod, 1952; Anderson, 2000). The broad spectrum of the organisms serving as compounds of stone marten food evidences that this mammal is a trophic generalist.

It can be stated that the spectrum of helminth species reported in stone marten in Italy so far generally corresponds with this of Palaearctic mustelids (*Martes* spp., *Mustela* spp., *Gulo gulo* and *M. meles*). Although no zoonotic parasites have been found in the present study in *M. foina*, an occurrence of *Trichinella* spp. and *Toxocara* spp. can likely be supposed in this carnivore. Actually, *Toxocara cati* has previously been reported in *M. foina* in Italy (Poglayen *et al.*, 1996). Generally, nearly every helminths found in stone marten showed a weak host specificity and were found in different carnivore families. Therefore, analysis of helminth fauna can hardly contribute to biogeographic analyses of European mustelids. The only exception should be the lung nematode *S. petrowi* that is specific to Mustelidae. Thus, data on the geographical distribution of this parasite could help, together with genetic analyses of its host, to an elucidation of the ways of colonisation of stone marten in south of Italy.

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