

First Report on Heavy *Uncinaria (Dochmoides) sp. (Nematoda: Ancylostomatidae)* Infection in Brown Bear (*Ursus arctos*) Cub, in Van Province, Eastern Anatolian Region of Turkey

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Abstract

On April 2014, 6 months old male Brown bear cub that found in the Saray district of Van province was brought into Directorship of Wild Animal Protection of University of Yüzüncü Yıl. Despite all the intervention, bear cub, very poor condition in clinically, dead after two days. In postmortem pathological and parasitological examination were detected severe hemorrhagic enteritis and many hookworms with white colour and approximately 1 cm diameter in surface of the small intestine. In stereo microscopic examinations, it was concluded that this worms are *Uncinaria* spp. This case report represents the first time *Uncinaria* spp. have been reported in Brown bear in Turkey.

Keywords: *Uncinaria*, Brown bear cub, Turkey

Türkiye'nin Doğu Anadolu Bölgesi Van İlinde Bir Boz Ayı Yavrusunda Şiddetli *Uncinaria (Dochmoides) sp. (Nematoda: Ancylostomatidae)* Enfeksiyonu İle İlgili İlk Bildiri

Özet

Nisan 2014'te 6 aylık erkek boz ayı yavrusu Van'ın Saray ilçesinde bulunarak Yüzüncü Yıl Üniversitesi Yaban Hayvanlarını Koruma Müdürlüğüne getirildi. Klinik olarak çok kötü durumdaki ayı yavrusu tüm müdahalelere rağmen 2 gün sonra öldü. Postmortem patolojik ve parazitolojik incelemelerde yavru ayının ince bağırsakları yüzeyine tutunmuş olarak çok sayıda beyaz renkli ve yaklaşık 1 cm uzunluğunda kancalı kurtlar ve şiddetli hemorajik enterit saptandı. Mikroskopla yapılan incelemeler sonucunda nematodların *Uncinaria* spp. olduğu sonucuna varıldı. Türkiye'de boz aylarda *Uncinaria* spp. enfeksiyonu ilk defa bu olgu sunumuyla bildirilmiştir.

Anahtar sözcükler: *Uncinaria*, Boz ayı yavrusu, Türkiye

INTRODUCTION

The Brown bear (*Ursus arctos*) is the national animal for a number of states in North America, Europe and Asia. The Brown bear is the largest carnivore living in Turkey. Its present distribution is mainly confined to the intact natural habitats of the Black Sea and Eastern Anatolian regions^[1]. Brown bears are omnivorous and opportunistic, feeding on fruit, roots, insects, mammals and carcasses^[2].

Many intestinal parasites including protozoa, tapeworms, cestodes and nematodes are found in bears. *Ascaris* and *Baylisascaris* are common ascaridoid nematodes in bears.

Members of *Baylisascaris* are common in bear and have been reported all species except *Tremarctos ornatus*. The hookworms detected in bears are *Ancylostoma* and *Uncinaria* species. Four species of hookworm in *Ancylostoma* (*Ancylostoma brasiliens*, *A. ceylanicum*, *A. malayanum* and *A. caninum*) were reported from captive sloth bears in India^[3,4]. Four species of *Uncinaria* (*U. yukonenensis*, *U. rauschi*, *U. stenocephala* and *U. ursi*) have been reported from bears^[4-6].

Hookworm infections in bears like in any other gastrointestinal parasite it is likely that the most severe effects may be seen in newborn cubs and impaired absorptions from the intestines and can cause severe clinical signs. In



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infected animals, there are bloody faeces, anorexia and weight loss. In juveniles, severe infection may result in poor body condition and can be fatal [2,7].

Uncinaria spp. is a common parasite of carnivores. Adult form of *Uncinaria* spp. live in the intestine and feed on blood, which can lead mucosal damage, serious clinical signs that may occur with *Uncinaria* spp. including haemorrhagic diarrhoea, anemia and weight loss due to malabsorption [8].

CASE HISTORY

On April 2014, 6 months old male bear cub that found in the Saray district of Van province in wooded area by shepherds was brought into Directorship of Wild Animal Protection of University of Yüzüncü Yıl (Fig. 1). In bear cub, despite all the interventions that can be kept alive for 2 days, hypothermia, bloody diarrhea, apathy and anorexia were clinically present.

In pathological examination severe ulcerative hemorrhagic enteritis was detected. In postmortem macroscopic parasitological examination numerous worms with white color about 1 cm in length in surface of small intestine



Fig 1. Brown bear cub in poor condition clinically
Şekil 1. Klinik olarak kötü durumdaki boz ayı yavrusu



Fig 2. Many hookworms and severe hemorrhagic enteritis in small intestine of bear cub
Şekil 2. Yavru ayının ince barsaklarında çok sayıda kançalıkurt ve şiddetli hemorajik enterit

was detected (Fig. 2). A large number of hookworm eggs were seen in microscopic faecal examination (Fig. 3).

Measurements of some morphological properties of worms that was found in small intestine of bear cub: The length of males was 7.4-8.2 mm and the diameter was 0.340-0.387 mm. Oesophagus was club-shaped, 0.784-0.820 mm long and 0.178-0.196 mm thick (Fig. 4). Both spicules were slender, long, equal in length as 0.813-0.889 mm. The bursa comprised two big lateral lobes and a single small dorsal lobe (Fig. 5). Buccal capsule was keyhole shaped, has cutting plate (Fig. 4). Buccal capsule was 0.179-0.191 mm long and 0.128-0.134 mm wide.

The length of females was 8.4-9.6 mm and the diameter was 0.348-0.439 mm. The distance of anus from the back-end was 0.205-0.212 mm. Female's tail was short and tapered and has a pointed terminal end (Fig. 6).

DISCUSSION

Uncinaria species are small nematodes, classified in the order of Strongylata, family *Ancylostomatidae*, and infect



Fig 3. *Uncinaria* spp. egg containing larvae
Şekil 3. Embriyonlu *Uncinaria* spp. yumurtası



Fig 4. Buccal cavity and oesophagus
Şekil 4. Ağız boşluğu ve yemek borusu



Fig 5. Bursa copulatrix and spicules
Şekil 5. Bursa copulatrix ve spiküller



Fig 6. Posterior end of the female
Şekil 6. Dişinin arka ucu

many animal species including bear in various parts of the world [9]. The northern carnivore hookworm (*Uncinaria stenocephala*) was found in Brown bears from the vicinity of the Caspian Sea [4]. In North America, a new species of hookworm, *Uncinaria* (=Dochmoides) *yukonensis*, was described from specimens collected from wild black bear in Yukon Territory, Canada [6]. A new species of hookworm, *U. rauschi*, was described by Olsen in both black and brown bears in Alaska [10]. *Uncinaria* species, originally described as *Dochmius ursi* were collected from polar bear [4]. *Dochmius* was considered a synonyms of *Uncinaria* in later years [11].

Bursa copulatrix and spicules of male *Uncinaria* and posterior end of female *Uncinaria* are similar to *Ancylostoma*, but *Uncinaria* species in the bear cub that was detected

in this study are smaller than *Ancylostoma* species in length.

Uncinaria species that was found in bear cub were very similar to *Uncinaria rauschi* in terms of size and many morphological characteristics. The length of the males of *Uncinaria rauschi* is 7.4-9.1 mm and the diameter is 0.243-0.297 mm. Oesophagus was club-shaped 0.763-0.856 mm long and 0.167-0.191 mm thick through bulb. Spicules were slender and 0.819-0.954 mm long. The length of the females was 7.2-10.5 mm and the width was 0.275-0.381 mm at the level of vulva [10]. But because of not having the possibility for molecular diagnosis, we also approved to name as *Uncinaria* spp. the worm that we detected in bear cub.

The importance of *Uncinaria* species in terms of public health is not known exactly, but human infections with *Uncinaria* species were reported [12]. Thus, people who handle bears should use of disposable gloves during clean up of bear faecal material.

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