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SHORT COMMUNICATION

Eimeria Species (Apicomplexa: *Eimeriidae*) from Anatolian Ground Squirrels *(Spermophilus xanthoprymnus)* in Turkey

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Summary

This study was conducted to determine the *Eimeria* species of Anatolian ground squirrels *(Spermophilus xanthoprymnus). Eimeria* spp. oocysts were found in all (100%) of seven fecal samples examined by zinc sulphate flotation method. *Eimeria morainensis, E. callospermophili,* and *E. lateralis* were detected in Anatolian ground squirrels in Turkey for the first time.

Keywords: *Anatolian ground squirrel, Eimeria, Spermophilus xanthoprymnus, Turkey*

Türkiye'de Anadolu Yer Sincaplarında *(Spermophilus xanthoprymnus)* Bulunan *Eimeria* (Apicomplexa: Eimeriidae) Türleri

Özet

Bu çalışma Anadolu yer sincaplarında *(Spermophilus xanthoprymnus)* bulunan *Eimeria* türlerini belirlemek amacıyla yapılmıştır. Çinko sülfat yüzdürme yöntemiyle incelenen yedi dışkı numunesinin tamamında (%100) *Eimeria* spp. oosistleri bulunmuştur. Anadolu yer sincaplarında *E. morainensis, E. callospermophili* ve *E. lateralis* türleri Türkiye'de ilk kez tespit edilmiştir.

Anahtar sözcükler: *Anadolu yer sincabı, Eimeria, Spermophilus xanthoprymnus, Türkiye*

INTRODUCTION

Eimeria genus contains a large number of species infecting vertebrate animals of all classes [1]. These species were reported from different kinds of rodents including ground squirrels [2-6]. Seventeen named and two unnamed *Eimeria* species were reported from 18 species of ground squirrels *(Spermophilus spp.)* [7]. Information on *Eimerian* parasites of squirrels is very limited in Turkey [8-10]. The aim of this study was to determine the *Eimeria* species of Anatolian ground squirrels and contribute to Turkish parasite fauna.

MATERIAL and METHODS

This study was performed on Anatolian ground squirrels from Niğde (n=2) and Aksaray (n=5) cities of Central Anatolian region of Turkey. Seven Anatolian ground squirrels were captured between May and August 2005. All animals were brought alive to the laboratory and put in different cages. Fecal samples obtained from each cage ground were put into a solution of 2% (w/v) aqueous potassium dichromate ($K_2Cr_2O_7$) and were allowed to sporulate. Oocysts were concentrated by zinc sulphate flotation. At least 20 sporulated oocysts from each sample were measured by oil immersion lenses on a compound microscope (Nikon AFX DX, Japan) with bright field. All measurements were done as µm. Oocyst identification was done according to Seville et al.[3].

RESULTS

Fecal samples from seven Anatolian ground squirrels were examined and all of animals were found as positive

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for the presence of *Eimeria* spp. (100%). Three species were identified from Anatolian ground squirrels including *E. morainensis, E. callospermophili* and *E. lateralis.*

Oocysts of *E. morainensis* are subspheroid, have two layered wall, wall thickness was 1 µm, outher layer and inner wall was smooth, there was no micropyle and oocyst residium. Size of oocyst was 19.5 x 17.7 (18-21 x 16-20) µm. Sporocysts were ellipsoid, there was a prominent stidea body and a characteristic sporocyst residium. Size of sporocyst was 9.5 x 6.7 (6-11 x 5-8) µm *(Fig. 1a).*

Oocysts of *E. lateralis* were ovoid, have two layered wall, outher layer texture was rough, inner wall was smooth, wall thickness was 2 µm. There was a polar granule. There was no micropyle and oocyst residium. Size of oocyst was 33.8 x 29.2 (32-35 x 27-30) µm. Sporocysts were ovoid. There was a prominent stidea body and a sporocyst residium. Size of sporocyst was 16.2 x 11 (14-17 x 11) µm *(Fig. 1b).*

Oocysts of *E. callospermophili* were subspheroid, have two layered wall, wall thickness was 1 µm, outher layer and inner wall was smooth, there was no micropyle. Oocyst residium and polar granule were present. Size of oocyst was 20.9 x 19.2 (18-25 x 17-23) µm. Sporocysts were subspheroid, there was a stidea body and sporocyst residium. Size of sporocyst was 9.1 x 7.6 (7-11 x 6-9) µm *(Fig. 1c).*

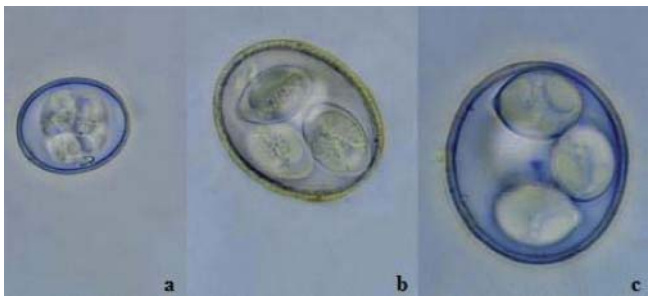

Fig 1. Sporulated oocysts of *Eimeria morainensis* **(a),** *Eimeria lateralis* **(b)** and *Eimeria callospermophili* **(c)**

Şekil 1. *Eimeria morainensis* **(a),** *Eimeria lateralis* **(b)** ve E*imeria callospermophili* **(c)**'nin sporlanmış ookistleri

DISCUSSION

Eimeria morainensis, E. callospermophili and *E. lateralis* were reported from Richardson's ground squirrels *(S. richardsonii),* Arctic ground squirrels *(S. parryii),* Townsend's ground squirrels *(S. townsendii),* black *(Cynomys ludovicianus)* and white-tailed prairie dogs *(C. leucurus)* [3-5,11]. *Eimeria morainensis* and *E. callospermophili* were also reported from Wyoming ground squirrels *(S. elegans elegans)* [6]. These Eimeria species were reported from Alaska, Russia, Wyoming, Idaho and Alberta [3-5,11].

There is only one study about the *Eimerian* parasites of Anatolian ground squirrels in Turkey [10]. Çiçek et al.[10] studied on 105 Anatolian ground squirrels for determining the types and prevalence of Eimeria species. They recovered *E. callospermophili* (prevalence 25.7%), *E. morainensis* (2.8%) *E. pseudospermophili* (1.9%) and *E. lateralis* (0.9%). They reported that Anatolian ground squirrel is a new host for *E. pseudospermophili.*

In this paper we reported *Eimeria morainensis, E. callospermophili* and *E. lateralis,* from a new host, Anatolian ground squirrel *(Spermophilus xanhoprymnus)* for the first time in Turkey. We concluded that more extended studies about *Eimeria* species are required to determine the new species and prevalence rates in these animals.

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