Frequently observed parasites in pet reptiles’ feces in Tehran

Arabkhazaeli, F.1*, Rostami, A.2, Gilvari, A.3, Nabian, S.1, Madani, S.A.4

1Department of Parasitology, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran
2Department of Clinical Sciences, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran
3Graduated from the Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran
4Department of Animal and Poultry Health and Nutrition, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran

Abstract:

BACKGROUND: Many wild-caught reptiles harbor some kind of parasite. Captivity with the negative effect of poor sanitary and husbandry management may lead to clinical disease. With the increasing trend in keeping non-native reptile species in the last decade, a need for the specification of reptile parasites and their hosts has emerged. OBJECTIVES: The study aims to gain data on intestinal parasites of reptiles kept as pets or in small private collections in close contact with people. METHODS: A combination of native and iodine stained direct smears along with flotation concentration were used to investigate parasites in pet reptiles’ feces. All samples were investigated macroscopically and a smear was prepared and stained by modified Ziehl Neelsen for detection of Cryptosporidium. RESULTS: Stool samples from 100 pet or small zoological reptile collections (Lacertilia=36, Serpentes=20, Chelonii=11, Corocodilia=1) were collected. The total occurrence of parasite was 52%. 64.8% of the examined Lacertilia, 35.3% of Serpentes, 45.5% of Chelonii were infected. Eimeria, Isospora, Cryptosporidium, Trichomonas, Balantidium, Strongylid and Oxyurid eggs and amoeba were identified. Cryptosporidium was detected in Lacertilia, Serpentes and Chelonii. In the only sample from a Nile crocodile no parasites were detected. Eimeria was detected in Bearded dragon, Indian python, Albino python and king cobra and Isospora was identified in Bearded dragon and the alien Chelonid species Red-eared slider. Amoeba was identified in Iguana iguana and Horsfield tortoise. CONCLUSIONS: Trichomonads, Balantidium, Cryptosporidium, Isospora, Eimeria, amoebae and nematode eggs were identified in the investigated samples. Cryptosporidium were detected by specific stains in 14 samples. Sauria was the most infected suborder (64.8%) while 32.4% of snakes and 45.5% of chelonians were infected. Parasites are common in pet reptiles but the parasite species, the degree of infestation and hygienic management will determine the ultimate clinical outcome of the existing parasite infections. Hence, examination for endoparasites should be recommended for checking the health status of all captive or newly entering reptiles.

Key words: feces, lacertilia, parasites, reptile, serpentes

Correspondence
Arabkhazaeli, F.
Department of Parasitology, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran
Tel: +98(21) 61117049
Fax: +98(21) 669333222
Email: farab@ut.ac.ir

Received: 23 May 2017
Accepted: 29 July 2017
Introduction

Reptilia with more than 6000 species, which are increasingly being kept as pets in recent years, are host to a diverse range of parasites (Rataj et al. 2011). Many wild-caught reptiles harbor some kind of parasites. Although harboring parasites does not always result in clinical disease, in captivity with the negative effect of poor sanitary and husbandry management the concentration of parasites may increase. Some of the parasites are harmless but others can be dangerous if left untreated (Pappini et al. 2011). Depending on the parasite species and the degree of infestation endoparasites may cause different clinical symptoms (Pasmans et al. 2008). Some of these parasites may not affect the animal but can cause health problems in people (Pasmans et al. 2008).

Although there are many case reports, zoo reptile parasitological description of a single parasite species recovered from reptiles (Fernando et al. 2009; Abdel-Baki et al. 2013; Díaz et al. 2013), there are very few surveys on the prevalence of fecal parasites in pet reptiles worldwide (Pasmans et al. 2008; Pappini et al. 2011; Rataj et al. 2011). Considering the lack of knowledge about the normal microbiota of most reptilian taxa (Pasmans et al. 2008), as well as the increasing trend in keeping non-native reptile species in the last decade, there is evidently a need for the specification of parasites and their hosts. These data will improve the understanding of the ecology of both the parasites and their hosts (Marchang 2015), besides helping veterinarians to perform routine screening and prescribe preventive/therapeutic measures (Pasmans et al. 2008). The present study was thus undertaken to gain data on intestinal parasites of reptiles kept as pets or in small private collections in close contact with people.

Materials and Methods

Between April 2013 and September 2014, fresh fecal samples from 100 captive reptiles not showing any clinical signs, representing 28 species were collected. These included 11 Saurian species (n=54), 12 Ophidia (n=34), four Chelonian species (n=11) and a single sample from crocodilian suborder (Table 1). The samples were investigated immediately after arriving in the laboratory or preserved in SAF and refrigerated for subsequent examination. A combination of native and iodine stained direct smears together with flotation saturated salt solution (CNF) was performed on each sample (Pasmans et al. 2008; Wolf et al. 2014). Nematode infestations according to egg morphology were characterized as strongylid, strongyloides and oxyurid (Fig. 1). Besides all samples were investigated macroscopically and by modified Ziehl-Neelsen (MZN) staining for detection of gross parasites and Cryptosporidium, respectively. Detected oocysts were sporulated in 2.5% potassium dichromate for genus identification.

Results

Overall, 52 fecal samples were infested with protozoas and nematodes. Single protozoan and helminthic infestations were detected in 10 and 23 of the samples, respectively. Dual/multiple protozoan infection and concurrent infection of protozoans and helminths were observed in six and 13 samples, respectively. Trichomonads,
Balantidium, Cryptosporidium, Isospora, Eimeria and amoebae were the identified protozoas (Fig. 2) (Table 2). All three types of nematode eggs were identified in the infested samples. Fecal wet smear revealed 34 animals harboring parasites while floatation augmented it to 36. Amoeba and Cryptosporidium were detected by specific stains in seven and 14 samples, respectively. In a blue tongue skink MZN staining revealed acid-fast organisms larger than Cryptosporidium oocysts (13-17×10-13 μm) resembling Cyclospora sp (Fig 3).

32.4% of snakes were infested and use of floatation method did not significantly increase the detection rate (p=0.09, χ²= 2.8).
Three of those samples were infected with *Cryptosporidium* sp. oocysts. No amoeba was identified in Ophidia. King cobra was the most infested species. In a sample from Coluber nummifer mite eggs originating from a prey were detected.

45.5% of chelonians were infected, among which Testudo horsfieldii had the most diverse range of fecal parasites. *Cryptosporidium* sp. and amoeba were identified in Testudo horsfieldii (Table 2). *Balantidium*, Strongylid and oxyurid eggs were the identified parasites in investigated chelonians.

**Discussion**

In the present study, 54 Saurians, 34 Ophidias, 11 Chelonians and a crocodile were investigated coprologically for fecal parasites. The most frequent detected fecal...
parasite was oxyurid egg (12%). In lizards pinworm eggs were the most frequent parasite showing two morphologically distinct eggs as reported by Rataj et al (2011). One morphotype with dark pitted egg wall identified as *Pharyngodon* sp. was detected in leopard gecko, *Lacerta media* and bearded dragon while the other unidentified species of pinworm egg was more elongate and translucent, mostly found in Iguanas (Fig. 4a, b). Oxyurid eggs are rarely detected in snakes (Okulewicz et al. 2014). Rataj et al. (2011) reported oxurid eggs from a *Platyceps karelini*. In this study pinworm eggs were detected in a *Levantine viper* (Fig. 4c). Although most pseudoparasitic pinworms from snakes are *Syphacia* (Souza et al. 2014), the eggs detected in the present study morphologically resembled lizard’s pinworms (Pharyngodonidae) (Wright 2009). The actual identification of these eggs requires isolation of the adult worm or further molecular investigations. Reptiles with oxyurid infections are generally asymptomatic. Pathologic changes are rare, but heavy infections might be one of the causes of anorexia in tortoises coming out of hibernation (Mitchell 2007) and a positive correlation has been reported between oxyurid and salmonella infection in Cheloniids (Dipinetto et al., 2012). Strongylid eggs as the second most prevalent detected parasite were mostly seen in lizards while others reported it as the most prevalent parasite in Ophidia (Pasmans et al. 2008; Rataj et al. 2011).

Trichomonads were identified in iguanas and a snake (3%) and *Balantidium* was recovered from a Russian tortoise and an iguana (2%). Our efforts in culturing the trichomonads in diamond’s medium at 37 °C and at room temperature were unsuccessful. Ciliates and flagellates are commonly found in herbivorous lizards and also in turtles and snakes (Papini et al. 2011; Rataj et al. 2011). Endoparasites are an important cause of disease in captive reptiles. Some of the
intestinal parasites are considered normal residents of the gut flora but with predisposing factors they may lead to gastrointestinal diseases. The parasite species, the degree of infestation and conditions in captivity such as overcrowding or hygienic management will determine the ultimate clinical outcome of the existing parasite infections. Consequently, examination for endoparasites has been recommended for checking the health status of all captive reptiles (Pasmans et al. 2008). Furthermore, precise morphologic and taxonomic description of reptile parasite species regarding reptile species, the lifecycle and their health impact are not widely identified or described. Performing more detailed research on these aspects will certainly improve the understanding of the ecology of both the parasites and their hosts and may contribute to improving the safety and welfare of these animal species.

Acknowledgments

The authors would like to thank Dr. Naqa Tamimi and Mr. Mohammad Bagher Ahoo for their valuable help. This study was financially supported by University of Tehran under grant number 75080029/6/3.

References


Dipineto, L., Capasso, M., Maurelli, M.P., Russo, T.P., Pepe, P., Capone, G., Fioretti, A., Crin-


بررسی آلوگی های انگلی مفروضی در خزندگان در اساطیر شهر تهران

فاصله عرب خزانلی، امیر رستمی، علیرضا گیلویی، صدیقه تیبان

1. خزندگان انگلی، دانشگاه تهران، تهران، ایران
2. خزندگان انگلی، دانشگاه تهران، تهران، ایران
3. دانشگاه تهران، دانشگاه تهران، تهران، ایران
4. خزندگان انگلی، دانشگاه تهران، تهران، ایران

چکیده
زمینه مطالعه: خزندگان به ویژه انواعی که از حیات ویژه مصرف می‌شوند ممکن است آلوگه به انواع آن‌گاه باشد در شرایط

اسارت به دلیل وجود استرس‌های مانند تراکم بالا و عدم تغذیه صحیح، حیوان ضعیف شده و علاطم بیلی در حیوان ظاهر می‌گردد.

هدف: با توجه به افزایش تولید به نکه‌داری خزندگان به عنوان حیوان خانگی و با توجه به محدودیت مطالعات در زمینه انگل‌های موجود در خزندگان ایران و دنیا، با نظر به این که اطلاعات در این زمینه در کشور غلیبه‌ها محدود به گزارشات موردی می‌باشد، در این مطالعه، تلاش شد تا شیوع انگل‌های بالینی و روش‌های ازدیک به جامعه انسانی هستند.

منابع آنالوگ خون‌های موجود در مجموعه‌های خصوصی، مجموعه‌های زیست‌پزشکی و خزندگان خانگی مورد استان تهران مورد بررسی و شناسایی قرار گرفته و روش گزارش‌کردن روش‌های مورد بررسی قرار گرفته.

نتیجه‌گیری مطالعه: آلوگی انگلی در خزندگان در اساطیر شیوع بالایی داشته و در صورت بررسی علامات بالینی باید با مداخلات درمانی همراه باشد. در مراحل به علاوه به ویژه به علاوه به مرحله به علاوه به ویژه به مرحله به علاوه به ویژه به علاوه به ویژه به ویژه به ویژه به ویژه به ویژه به ویژه به ویژه به ویژه به ویژه به ویژه به ویژه به ویژه به ویژه به ویژه به ویژه به...