Infection with *Crenosoma striatum* lungworm in Long-eared Hedgehog (*Hemiechinus auritus*) in Kerman province southeast of Iran

İran′ın Güneydoğusunda Uzun Kulaklı Kirpi (*Hemiechinus auritus*)'de *Crenosoma striatum* Akciğer Kurdu ile Enfeksiyon

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ABSTRACT

Hedgehogs are distributed in different areas of Iran. Unfortunately, clinical and parasitological studies on parasites of hedgehogs are very few. *Crenosoma striatum* is a common lungworm in hedgehogs. *C. striatum* infection can cause weight loss, dry cough, bronchitis with ulcerous reactions based on secondary bacterial infections, pulmonary damage, thickening of the tracheal wall, and pulmonary emphysema up to cardiovascular failure. In this survey, six dead hedgehogs (*Hemiechinus auritus*) were investigated for lungworm infection. All the six hedgehogs had *C. striatum* infection in their lungs. *(Turkiye Parazitol Derg 2014; 38: 255-7)*

Keywords: *Crenosoma striatum*, parasite, hedgehog, Iran

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ÖZET

Kirpiler İran'ın farklı alanlarına dağılmıştır. Ne yazık ki, kirpilerin parazitleri hakkında klinik ve parazitolojik çalışmalar çok azdır. *Crenosoma striatum* kirpilerde sık görülen bir akciğer kurdudur. *C. striatum* enfeksiyonu kilo kaybı, kuru öksürük, sekonder bakteriyel enfeksiyonlara bağlı ülseroz reaksiyonlarla birlikte bronşit, akciğer hasarı, trakea duvar kalınlaşması, akciğer amfizemi ve kardiyovasküler yetmezliğe neden olabilir. Bu araştırmada, altı ölü kirpi (*Hemiechinus auritus*) akciğer kurdu enfeksiyonu yönünden incelendi. Altı kirpinin de akciğerleri *Crenosoma striatum* ile enfekte idi. *(Turkiye Parazitol Derg 2014; 38: 255-7)*

Anahtar Sözcükler: *Crenosoma striatum*, parazit, kirpi, İran

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INTRODUCTION

Hedgehogs are distributed in different area of Iran. They are found both in the wild and, to a lesser extent, as pet animals. Unfortunately, clinical and ecological studies on parasites of hedgehogs are very few. Two types of parasitic worms, *C. striatum* and *Capillaria aerophila*, are as causative agents for lungworm infection in hedgehogs. C. *striatum* belongs to the order Strongylida, family Crenosomatidae, and genus Crenosoma (1). The hedgehog lungworm *C. striatum* Zeder, 1800, is specific to the hedgehog and is the most important parasite found in the lung (2, 3). These parasites can be found on their own, although mixed infections are also common. *Crenosoma* adults and larvae are found in the trachea, bronchi, and alveolar ducts, while *Capillaria* adults are found in the bronchi.

Infection with *C. striatum* can cause weight loss, nasal discharge, increased respiratory effort, cough, and weight, and in severe cases, the disease can cause death. So far, there have

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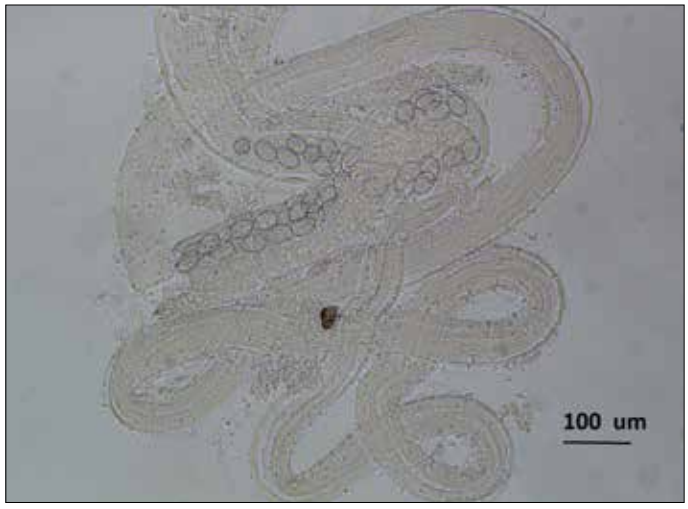

Figure 1. The view of female adult *C. striatum*

Figure 2. The view of body of adult *C. striatum*

been reports of hedgehogs being infected with this parasite from Italy (4), Britain (5), and Turkey (6). Getting information about parasites of Long-eared Hedgehog can be effective for increasing our knowledge. We report the occurrence of the *C. striatum* infection in the lung of hedgehogs in Kerman province southeast of Iran.

CASE REPORT

The study was conducted in Kerman province southeast of Iran. Kerman is located at 30°17′13″N and 57°04′09″E southeast of Iran. The mean elevation of the city is about 1755 m above sea level. Kerman city has a hot and arid climate, and the average annual rainfall is 135 mm. Because it is located close to the Kavir-e lut, Kerman has hot summers.

A total of 6 dead hedgehogs (4 females, 2 males) that were hit by cars (road casualties) were collected and brought to parasitology laboratory of School of Veterinary Medicine, Shahid Bahonar University of Kerman for post-mortem inspection.

The lungs were removed, and the worms removed from lungs and washed by shaking in 0.9% saline, and a number of worms were cleared in lactophenol on a standard microscope slide for identification, and the rest of them stored in 5% formalin.

The morphology of the nematodes was examined by light microscope. The parasite was identified to species level according to Skrjabin (1).

The morphology of the nematodes was examined by light microscope. The cuticle forms annular and encircling folds were seen. Moreover, posterior edge of fold extends over anterior edge of following fold. Furthermore, vulva in female were bound by two cuticular plates. The male worm was not seen in studied cases. Based on these morphologic characteristics, the parasite was identified as *C. striatum*. All the six hedgehogs had *C. striatum* in their lungs. In addition, there was a large number of nematodes in the affected lungs. Figures 1 and 2 show a view of a *C. striatum* nematode from a Long-eared Hedgehog.

DISCUSSION

There is very limited published data on the presence of helminthic parasites in hedgehogs in Iran (7). The helminthes reported by Mowlavi et al. (7) were as follows: *Gongylonema* sp., *Spirocerca lupi*, *Rictularia* sp., *Physaloptera* sp., and *Mathevotaenia* sp. This study represents the occurrence of *C. striatum* in the region southeast of Iran. In Europe, epidemiological studies on the parasitic species of hedgehogs have been conducted in Italy (4), Britain (8, 9), and Turkey (6).

In most of these studies, the dominant species was *C. striatum*. Hedgehogs eat almost any animal substance, including meat, bones, and maggots as well as vegetation, arthropods, slugs, and snails (10). As a result of these dietary habits, it seems likely that they are frequently exposed to infective stages of the heteroxen parasites, which were ultimately found to be the most prevalent species hosted by hedgehogs. On the other hand, age-related differences have been found in lungworm infections in hedgehogs, where higher infection rates were observed with increasing age, but we were unable to analyze the impact of age on the helminthes parasite burden in this study. Infection with *C. striatum* varies based on the severity parasite infection in the lungs and whether or not there is any secondary bacterial infection present that can range from no disease to snuffles, nasal discharge, increased respiratory effort, dry cough, weight loss, reduced appetite, reduced activity, open mouth breathing, bronchitis with ulcerous reactions based on secondary bacterial infections, pulmonary damage. In severe cases, death due to *C. striatum* can occur in excessive numbers (11).

CONCLUSION

In conclusion, parasitic reports of hedgehogs can serve as biological indicators showing dispersal following introduction into a novel area. The study underlined the necessity of further investigation about the parasitological study of hedgehogs in Iran.

Findings of this study are worth mentioning from the perspective of ecology of *C. striatum*. From other perspectives, it can be effective for increasing our knowledge in the field of parasites of Long-eared Hedgehog. Such studies will form an important part of ongoing investigations into the possible role of parasites and other diseases in population decline.

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