

## Short Paper

## Gastrointestinal parasites of ostrich (*Struthio camelus domesticus*) raised in Iran

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### Summary

Introduction of ostrich (*Struthio camelus domesticus*), a new exotic host species to a new ecosystem like Iran, necessitates the study of its infectious diseases including parasitic infestations. For a period of one year, from 2002–03, faecal samples of 254 ostriches on 5 farms located at different parts of Iran, including Garmsar, Semnan province (n = 85); Nashtaroud, Mazandaran province (n = 29); Saveh, Central province (n = 47); Eshtehard, Ghazvin province (n = 8) and around Tehran, Tehran province (n = 85) were examined for gastrointestinal parasites. Our findings revealed the presence of *Libostrongylus douglasii* in 55% of the examined birds in Nashtaroud and 25% of birds of Eshtehard farms. In the latter farm, 12.5% in the ostriches harboured *Heterakis dispar* in their alimentary canals. Oocyst of *Eimeria* sp. was found in ostrich on farm of Garmsar. All these parasites are reported for the first time from ostriches in Iran.

**Key words:** Ostrich, Gastrointestinal parasites, Iran

### Introduction

Ostrich (*Struthio camelus domesticus*), an exotic bird, was introduced to ecosystem of Iran by mid-1998.

According to data collected from the Veterinary Organization, currently, 2301 ostriches are bred on 19 farms in 12 provinces of Iran (Fig. 1). It seems that parasitic infestations are not uncommon in ostrich all over the world (Dingle, 1996; Huchzermeyer, 1998). Some of these infestations may lead to the death of infested animals (Nel, 1980).

This survey was designed to study the gastrointestinal parasites of ostriches in Iran.

### Materials and Methods

In a period of one year, from 2002–03, for the difficulty in direct collection of faeces from the rectum of the bird, 220 faecal samples free from soil debris, were

collected after defecation by the bird under the supervision. Sex, age, geographic origin



**Fig. 1:** Distribution of ostrich farms in Iran. (1: Golestan, 2: Mazandaran, 3: Ghazvin, 4: Semnan, 5: Tehran, 6: Ghom, 7: Markazi, 8: Hamedan, 9: Esfahan, 10: East-Azerbaijan, 11: Kerman and 12: Hormozgan)

and identification number of each examined ostrich was recorded. Faecal samples were examined for the presence of helminth ova and oocyst of *Eimeria*, using Clayton lane centrifuge and saturated salt solution. To identify the genus of strongyle eggs presented in the faeces of infected birds, faecal cultures were kept at 25°C for seven days to obtain larvae at the third stage. Baermann apparatus was used to remove the larvae from the cultures.

## Results

Out of five farms, *Libostrongylus douglasii* ova was seen in 55% of the ostriches in Nashtaroud and and 25% of birds in Eshtehard farms. The mean number of eggs per gram of faeces was 197.11 (range: 31–750). The identification of *L. douglasii* to the species was carried out according to the dimensions of eggs; length of 55-67 µm, width of 32.4-43.2 µm and the characteristics of the third stage trichostrongyle-like larvae which had a knob on the point of the tail (Fig. 2) (Soulsby, 1982).

## Discussion

*L. douglasii* is one of the most pathogenic helminthes of the ostrich and heavy infestation may lead to death of the infested birds, especially chickens. According to Nel (1980), 4% of the ostrich chicks on South African ostrich farms died of *L. douglasii*, *Codiostomum struthionis* and *Houttuynia struthionis* infestations. Twenty two percent of ostriches on 59 Gippsland farms and 36% of 11 North farm of eastern Victoria were found to be infested with *L. douglasii* based on examination of 450 faecal samples and positive cultures (Batton *et al.*, 1993).

*L. douglasii* inhabits the proventriculus (hence, the name stomach worm) and can causes sever pathologic changes in this organ. Heavy infestation may lead to a high mortality rate, especially in young ostrich chicks (Dingle, 1996).

Two other species of *Libostrongylus* namely *L. magnus* and *L. dentatus* can be identified from *L. douglasii* through the

characteristics of eggs (Table 1) as well as adult worms.

**Fig. 2: The posterior end of *L. douglasii*. Note the knob at the end of larvae**

**Table 1: Comparison of dimensions of eggs of different species of *Libostrongylus***

Dimension (µm)	<i>L. douglasii</i>	<i>L. magnus</i>	<i>L. dentatus</i>
Length	59-74	80-92	52-62
Width	34-44	40-44	31-39

Pathogenicity of the two latter species needs further investigation (Huchzermeyer, 1998). It seems likely that *L. douglasii*-infested ostriches inbred in Iran, are introduced to our ecosystem through imported birds. *L. douglasii* is a very host-specific parasite and is reported only from ostrich. Its larvae can survive in different conditions from the dry and hot climate of Africa to the very cold winters of Sweden (Jansson and Christensson, 2002). Therefore, it is no surprise that it could adapt itself to different climatic conditions of Iran. In one ostrich, from farm of Eshtehard (13.5%) ascarid-like eggs was observed. According to the egg dimension (51.3 µm), it was identified as *Heterakis dispar*. Although, an unidentified species of *Heterakis* is reported from ostrich (Huchzermeyer, 1998), to the best of our knowledge, *H. dispar* is not reported yet

from ostrich. The infection of ostrich with this parasite could take place under local conditions, because it has been reported from 1.9% of native ducks of Iran (Eslami and Firouz-Azar, 1984). Although no pathogenicity can be attributed to this nematode, its role in the transmission of *Histomonas meleagridis* must be taken into consideration.

A few oocyst of *Eimeria*, not enough for sporulation, was seen in faecal examination of some ostriches. *Isospora struthionis* is reported on zoo ostriches of Russia (Huchzermeyer, 1998).

Ostrich as an ecosystem could be infested with its own specific parasites as well as the external and internal parasites of other bird, some parasites of ruminants and raccoons. Therefore, more comprehensive studies are needed to elucidate different aspects of parasitic infestations of this animal and their impacts on the infested birds.

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