

# **Prevalence of faecal endoparasite ova in falcons in Qatar**

## **Introduction**

Oryx Falcon Veterinary (OFV), Qatar, is a dedicated falcon hospital, in addition to privately-owned birds. Oryx Falcon Veterinary (OFV) is the most prestigious and unique Falcon Hospital in the world. It is one of a handful of hospitals dedicated to falcons in the world. As a government institution, many of the services are heavily subsidized in order to make advanced diagnostics accessible to all falconers. Qatar's long and treasured tradition in falconry is therefore supported by the Hospital. Its location being in the Heart of the Falcon Souq is ideal for encouraging Falconers and the Falcon shops to screen their falcons. As a result, the hospital receives an average daily case load of between 80 – 120 falcons a day (42% Peregrine falcons, 38% Saker falcons, 15% Gyr and Gyr-hybrids, 3% Lanner falcons and 2% Barbary falcons in 2011-12) during the hunting season from September to March. The subsidy on services and treatment is also quite effective in encouraging falconers to screen their birds regularly for endoparasites in faecal samples as a preventive health measure during this stressful period.

## **Our Objectives**

Due to the vast number of falcons seen since the hospital opened, there was a need to study and research one of the problems associated with Falconry the Endoparasite.

A great deal of falcons suffers from endoparasite infestation, and is one of the most common types of diseases to affect falcons. We need more details on the types of Endoparasite affecting the Falcons. Something has to be done.

We will be looking at the main culprits .....Coccidia (figure 1), Capillaria (figure 2 & 5), Serratospiculum (figure 3) and Trematodes (figure 4).

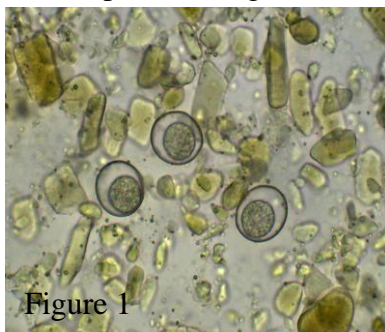


Figure 1



Figure 2



Figure 3

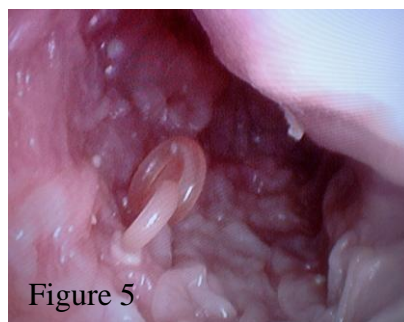


Figure 5

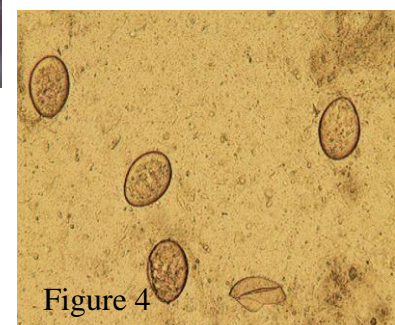


Figure 4

## Methods

During the hunting season from October 2011 to April 2012, 6853 faecal samples from captive falcons were evaluated for endoparasites at OFV. The routine faecal parasite examination was carried out by the direct examination of wet mount preparations of fresh faecal samples under 100X (10X objective) magnification. The results were recorded under 4 broad categories - Coccidia (Caryosporapp), Capillaria, Serratospiculum, and Trematodes / others (consisting mainly of trematodes and few ascarids, acanthocephalans, etc).The categories were based on pathogenecity and treatment considerations. In each sample the parasite abundance was loosely estimated and graded subjectively from 1+ to 4+ (Table1).

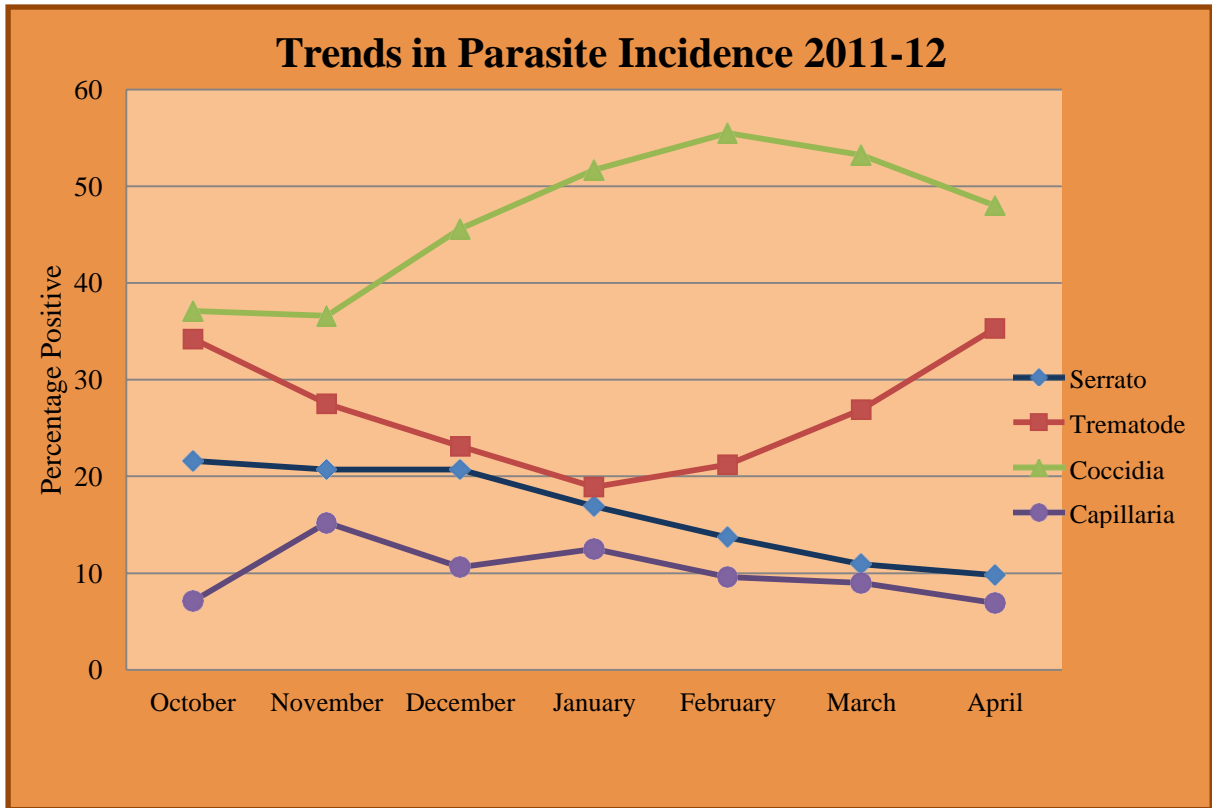
Grade	Microscopic Finding (10X) Objective)
1+	1-5 ova detected in the smear
2+	6-15 ova detected in the smear
3+	16-25 ova detected in the smear
4+	More than 25 ova in the smear

*Table 1 Explanation of grades used for estimating parasite ova abundance in direct smears at OFV (Note: Only the area under the cover slip is examined)*

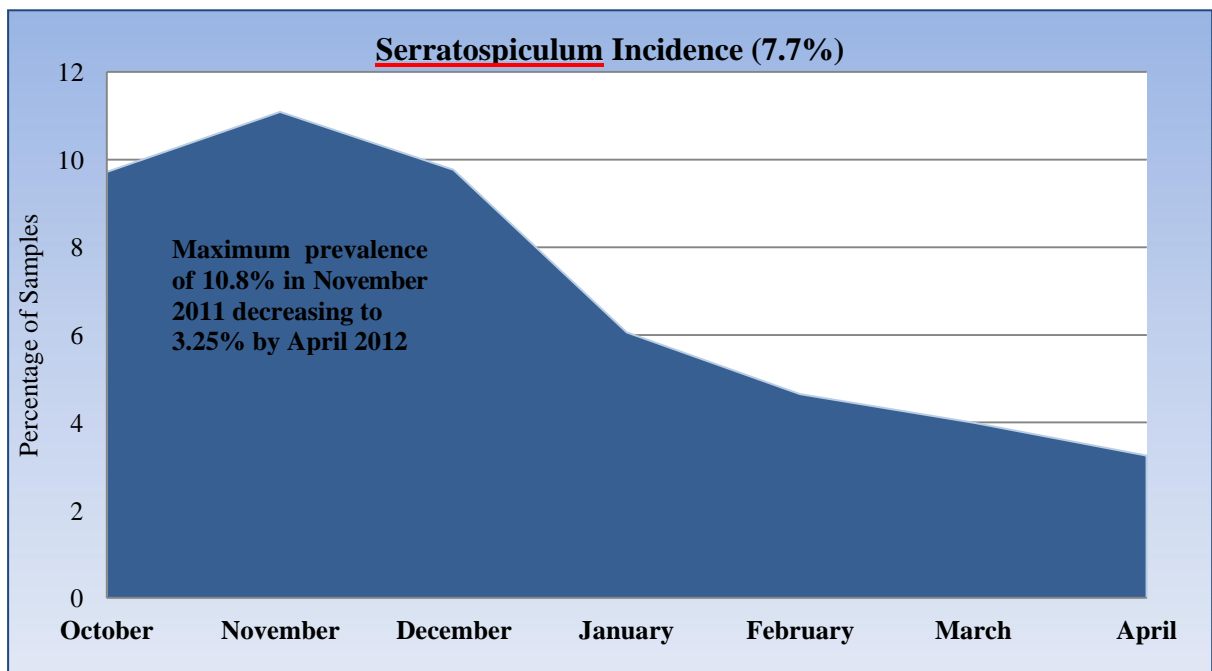
Any repeat samples from one bird on a particular day was recorded as one sample, but the same bird returning another day for a faecal check was recorded as a new case. For the purpose of this study, all faecal samples showing gross abnormalities, including worms, in the absence of parasite ova were considered negative.

## Results

Retrospective analysis of the faecal records revealed that 35.7% (2449/6853) of the samples examined were positive for one or more endoparasite ova. A monthly break-up showed that the prevalence of endoparasites was highest in the month of November, at 40.9%, and lowest in January, at 31.5%. When the relative prevalence of the different categories of parasites recorded at OFV was analysed. Coccidiosis was by far the most common endoparasite infestation, with oocysts of Caryospora spp. detected in 53.6% of the positive cases. Prevalence of Coccidiosis during the study period was 19.2%. This was followed by Trematodes / others detected in 29.5%, Serratospiculum in 21.6%, and Capillaria in 13.2% of the positive cases. 519 of the 2449 cases (21.2%) concurrently tested positive for two or more types of endoparasite. Serratospiculiasis had a prevalence of 7.7% (529/6853 samples). A deeper scrutiny of the Serratospiculum species positive cases revealed a definitive trend over the months examined, with a maximum of 10.8% (129/1188) in the month of November, declining progressively over the next few months to 3.25% (100/307) by April 2012 (graph 2). Records were available for 187 out of 457 samples that were positive for Serratospiculiasis. Of these, 13 were repeat samples from the same bird, therefore 174 record files were analysed. Within the Serratospiculum positive group were predominantly Peregrine falcons (51%), followed by Saker falcons (40%), Lanner falcons (5%), Gyr and Gyr-hybrids (3%), and Barbary falcons (1%). During the examination period, only 14 birds were recorded as having a heavy infestation of Serratospiculum spp. (4+), of which 57% (8/15) were Saker falcons.



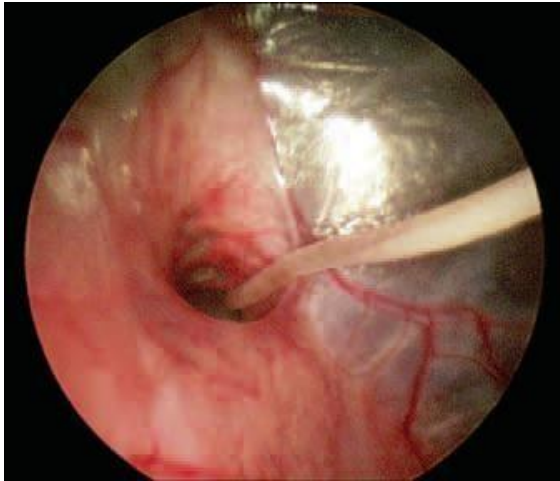
Graph 1: Showing the sample trend between the different endoparasite investigated throughout October 2011 to April 2012



Graph 2: Showing the trend of Serratospiculum incidence throughout October 2011 to April 2012

## Discussion

Endoparasites, a common finding in free-living raptors, assume a greater clinical significance in captive birds, especially under compromised management conditions, concurrent disease and stress (Forbes, 2008). At a falcon hospital in Saudi Arabia, endoparasitism was a major contributor to morbidity in captive falcons, with a prevalence of 32.9% (Naldo and Samour, 2004). Of the common endoparasites in raptors, nematodes are the most common, potentially pathogenic, group (or phylum) of endoparasites, with the notable exception of protozoa. In fact, a number of different studies in the Middle East have established Serratospiculiasis as the most widespread parasitic disease of captive falcons (Al-Tamimi, 1987; Samour and Silvanose, 2000; Samour and Naldo, 2001). With the percentage of endoparasite positive samples at 35.7%, the findings of this study corroborate those of previous ones on the prevalence of endoparasites in captive falcons. The maximum prevalence recorded (40.9% in November) coincided with the peak hunting season period in Qatar, most likely a result of the extreme demands placed on the birds by the rigours of hunting. In contrast to published literature, the most common endoparasite encountered in this study was *Coccidia* or the *Caryospora* species, not Serratospiculiasis. The pattern of monthly prevalence of *Coccidia* mirrored that of total endoparasite prevalence with increasing prevalence rising to 21.6% by December before decreasing again to 15.9% by April. This study also recorded the lowest prevalence (7.7%) of Serratospiculiasis to date. The fact that data from only one part of the year has been analysed might account for this, although a seasonal variation in prevalence of Serratospiculiasis has not been reported so far. Alternatively, the detection method used in this study was examination of a direct smear, a less sensitive technique than faecal flotation for the detection of parasite ova. Despite these limitations, these results appear to follow an interesting trend apparent in recent publications on the prevalence of Serratospiculiasis in captive falcons. A review of published literature on the subject, especially in the Middle East, published between 1984 and 2001 reveals a prevalence ranging from 35-70% (Greenwood et al., 1984; Al-Tamimi, 1987; Samour and Silvanose, 2000; Samour and Naldo, 2001), whereas studies published in the last decade report much lower prevalences of 8.7% (Tarello, 2006) and 18.9% (Al-Tamimi et al., 2009), in Kuwait and Saudi Arabia, respectively. The probable reasons underlying this apparent decline in the prevalence of Serratospiculum species include the increasing use of captive-bred falcons in falconry and, more likely, especially in Qatar, the widespread and unregulated use of anti-parasitic drugs like ivermectin by falconers and falcon traders. Although Peregrine falcons accounted for most of the Serratospiculum positive cases in our study, in contrast to Saker falcons reported elsewhere (Al-Tamimi, 1987; Samour and Naldo, 2001; Forbes, 2008), caution must be exercised before drawing any conclusions from this data since records with species information were not available for all the faecal samples examined in this study. The results may well be a reflection of the relative numbers of these species received at the hospital. In conclusion, the results of this study, albeit preliminary, have yielded some interesting findings that highlight areas for further research. Narrower categories for recording results of faecal examination have been introduced at OFV, especially since the Trematodes / others group was found in 29.5% of positive cases. In addition, there appeared to be a close association between incidence of Trematodes and Serratospiculiasis (approaching 40% in some months) that needs further investigation. Further, given the volume of samples examined at the hospital, analysis of year-round data and comparison of season and out-of-season data, as well as the sensitivity of faecal examination methods over time studies at OFV will definitely augment the existing body of knowledge on the subject.



*Figure 5: Endoscopic view of a larva of Serratospiculum species in the air sac and*



*Figure 6: Endoscopic view of the same larva (in fig . 2 ) from the trachea.*



*Figure 7: Endoscopic picture of Serratospiculum ova in the airsac of a Gyr-Peregrine hybrid falcon. Inset: Cytological examination of a swab from the area showing ova of Serratospiculum species with numerous erythrocytes in the background (10x Objective)*



## References

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