# Quantitative estimation of helminth parasites in *Cervus elephus hanglus* (Kashmir red deer)

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## Abstract

The present pilot study was aimed to quantify the gastrointestinal nematode infections in *Cervus elephus hanglus* (Kashmir red deer) for which a total of 8 samples were collected and examined by Stoll's and Mac-masters technique. The examination revealed that all the samples were found positive for *Strongyle* type of eggs with EPG ranging from 50-350 and means EPG to be 175. Further detailed study is required to quantify the helminth infections for developing the deworming schedule against helminth parasites of hangul species. The gastrointestinal nematode fauna of hangul are similar to other ruminants; therefore, the access of other ruminants to the national park should be checked to prevent future outbreaks of parasitic infections in hangul population.

**Key Words**: Helminths; Parasites; Quantitaive estimation; *Cervus elephus hanglus*

# Introduction

The state animal of Jammu and Kashmir *Cervus elephus hanglus* (Kashmir red deer) is the only survivor of red deer group in Indian subcontinent. It is considered as least concern under IUCN red deer list of threatened species but is placed under schedule I of both Indian wildlife protection act 1972 and Jammu and Kashmir wild life protection act 1978. It is considered among top 15 conservation priority species by government of India (MoEF, 2011) As per the latest Hangul population estimation censes 2021 conducted by the department of wildlife protection, the population of hangul is 261, compared to 237 in 2019. At present the only viable population of red deer is restricted to Dachigam national park and its adjoining protected areas (Ahmad *et al*., 2009). The Park is situated 21km northeast of Srinagar approximately between 34° 5` and 34° 12`N and 74° 54` and 75° 9` E, 141 sq Km in area (Bhat and Fazli, 2015)

Parasitic infections are common in nature. The chances of parasitic infections in wild animals are high which are kept in captivity or in those that live in limited spaces due to overcrowding and are usually asymptomatic during low intensity of infections (Lone et al., 2014). Red deer is susceptible to gastrointestinal (GI) parasites of livestock. Helminth infections can reduce fertility, capacity and during heavy infections it can result in significant increase in mortality and morbidity of wild animals. Anthropogenic changes can result in altered transmission rates, host range and virulence (Patz et al., 2000). Data on patterns of parasitic infections in wild deer populations provide an index of population health and to begin to assess and manage disease risks. Many studies have been conducted to adjudge the gastrointestinal parasites of ruminants, but the GI parasites of hangul is poorly understood and few studies are on record (Lone et al., 2016; Nazia et al., 2021) and no study has been carried out to quantify gastrointestinal helminthes infections. Therefore, the present pilot study was aimed to quantify the GI parasites of Hangul, the Kashmiri stag so as to develop package of practices for their effective control and to conserve the rare germplasm of Kashmiri stage from extinction.

# Materials and methods

A total of eight samples were collected immediately after defecation at Dachigam while observing the animals continuously for long hours at national park. The samples were transported to Parasitology laboratory of F.V.Sc. and A.H in 30ml wide mouthed screw capped bottles and were first examined macroscopically for the presence of any adult parasite. For microscopic examinations, samples were subjected to simple flotation and sedimentation technique to detect the presence of any helminth eggs. The positive samples were subjected to quantification by Stolls and Mac-Masters technique in order to record the intensity of gastrointestinal nematode infection in terms of eggs per gram (EPG) of faeces.

# Results

The animals apparently looked healthy with good feed and water intake. However, the collected faeces were having loose consistency as compared to the normal. Out of eight samples, all were found to be positive for *Strongyle* type of eggs with EPG ranging from 50-350 and mean EPG of 175 (Table 1; Fig 1)

# Discussion

Studies on helminth parasites of hangul were carried out in dachigam national park of Kashmir valley based on faecal examination. A total of 8 faecal samples were examined and all were found to be positive for *Strongyle* type of eggs. The mean EPG of the samples was found to be 175 which indicate that proper control measures should be undertaken at an earliest; otherwise, the problem of parasitic infections in Hangul will flare up. Besides this, the infection of parasitic helminthes might be due to lack of adoption of proper managemental practices in the park. Grazing of small ruminants together on small plots of land throughout the year may facilitate contamination of grazing grounds (Lone et al., 2014). Many parasites have been identified from the faeces of Hangul *viz*., *Dictyocaulus viviparous*, *Haemonchus contortus*, *Trichostrongylus axei*, *T. colubriformis*, *Bunostomun trigonocephalum*, *Chabertia ovina*, *Nematodirus spathiger*, *Trichuris ovis* from Hangul (Nashiruddullah et al., 2005, 2007; Lone et al., 2016; Nazia et al., 2021. Global climatic alterations leading to increase in temperature can be one of the possible factors behind their occurrence in this temperate climatic zone. This pilot study provides baseline data regarding quantification of helminth parasitic infection in wild hangul, a first step toward an index of population health and disease risk assessment for conservation and management plans of threatened hangul populations. The helminth fauna of hangul are similar to other ruminants therefore; their access to the national park

| **Table 1:** EPG of faecal samples | |
|---|---|
| **Sample No.** | **EPG** |
| 1 | 150 |
| 2 | 250 |
| 3 | 100 |
| 4 | 100 |
| 5 | 100 |
| 6 | 50 |
| 7 | 300 |
| 8 | 350 |
| **Mean EPG** | **175** |

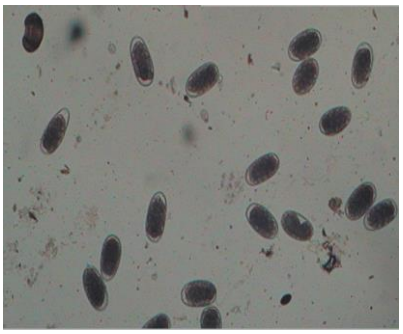

**Fig 1**: Strongyle eggs

should be checked to prevent pasture contamination and outbreaks of parasitic infections in hangul population. Further study is required to provide true picture of parasitic infections in hangul species.

## Conclusion

The present study revealed that the hangul deer can be infected by various helminthes. Therefore, effective preventive and control measures should be adopted to prevent the damage caused by these parasites which in turn can help to preserve the endangered species. The sample size in the present study was small due to difficulty in collection of faecal samples from the national park.

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