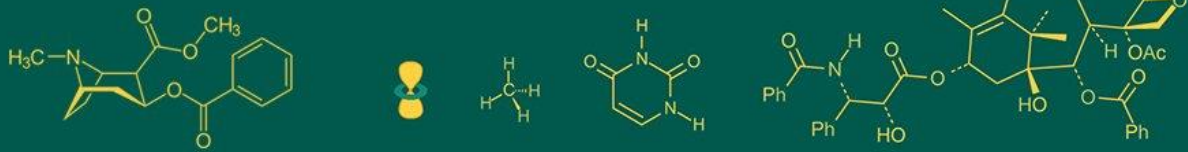


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Ecto and Endoparasitic occurrence in a wild hog deer (*Axis porcinus*) from Kaziranga National Park, Assam

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Abstract

Wild animals usually suffer from a wide range of infectious agents of which parasites are an important concern for causing diseases in these animals. A study on the occurrence of Ecto and endo parasites was undertaken on a hog deer (*Axis porcinus*) from Kaziranga National Park, Assam that had died due to certain complications. Samples were collected during post mortem of the animal and sent to the Department of Veterinary Parasitology, College of Veterinary Science, Khanapara, Guwahati for identification. After performing detailed examination, the parasites were identified as *Lipoptena cervi* (Deer ked) and ticks, *Haemaphysalis bispinosa* amongst the ectoparasites and *Carmyerius gregarius* and *Gastrothylax crumenifer* amongst the endoparasites. A total of 7 nos. *L. cervi* were recovered which were wingless, yellowish brown in colour, 3-5 mm in length with three pairs of legs and having strong claws. A total of 7 nos. of *H. bispinosa* ticks were recovered from the ears of the deer which had no eyes, rectangular basis capituli, with the presence of a medium projection at the base of third palpal segment, presence of festoons, anal groove posterior to anus and ovoid spiracles. Adult flukes recovered from the rumen and reticulum and were confirmed to be *C. gregarius* and *G. crumenifer*. Both the parasites were cylindrical. *C. gregarius* (11.5-15 mm x 2.6-4.2 mm) had anteriorly blunt pointed end with truncated posterior end while *G. crumenifer* (14-18 mm x 4-5.5 mm) was curved ventrally and banana shaped. The parasites were identified by following the keys of Sen and Fletcher (1969) and Soulsby (1982).

Keywords: Hog deer, *Lipoptena cervi*, *Haemaphysalis bispinosa*, *Carmyerius gregarius*, *Gastrothylax crumenifer*, Assam

Introduction

Hog deer (*Axis porcinus*) is a small, endangered deer is found in Northern India, Pakistan and Southeast Asia (nathab.com) [7]. They feed on tender shoots and grasses in addition to flowers and fallen fruit. They can survive on riverine grasslands, floodplains and forests. These deer are preyed upon by leopards, tigers, Indian wild dogs, and at times Burmese pythons. Hog deer has the highest population among deer species in Kaziranga, accounting for over 40,000 population (indietimes.com) [6]. At present, the North East India has become the major stronghold of this animal species with largest subpopulation found in the Kaziranga National Park and different riverine reserve forests of Assam (Biswas 2004) [1]. Death of hog deer due to reasons other than natural one and poaching may be spontaneous parasitic and infectious microbial pathogens in their natural habitat (Sarmah *et al.* 2019) [8]. A wide range of infectious agents including parasites can be regarded as important cause for diseases in these animals. The present communication focuses on occurrence and identification of ecto-and endo-parasites from a wild hog deer from Kaziranga National Park, Assam.

Materials and Methods

The samples that were carefully collected during post mortem of the animal in 70% alcohol, sent to the Department of Veterinary Parasitology, CVSc, Khanapara for identification. The ectoparasites (ticks and flies) brought to the laboratory were then cleared in lactophenol and few specimens were boiled in 10% KOH and dehydrated in ascending grades of alcohol. They were then cleared in clove oil and mounted in DPX (Bowman 1999) [2]. Endoparasites (flukes) were put in specimen tubes containing 70% alcohol.

They were also cleared and processed following standard procedure (Cable 1963) [3]. Identification of the specimens was performed by following the keys of Sen and Fletcher, 1969 [10] and Soulsby, 1982 [11].

Results and Discussion

The parasites on detailed examination were identified as *Lipoptena cervi* (Deer ked) and ticks, *Haemaphysalis bispinosa* amongst the ectoparasites and *Carmynerius gregarius* and *Gastrothylax crumenifer* amongst the endoparasites. The fly *Lipoptena cervi* also known as the 'Deer Ked' (Family: Hippoboscidae; Genus: *Lipoptena*) is leathery, yellowish brown in colour (Fig. 1) They were wingless, 2-5 mm in length with three pairs of legs and strong claws (Fig. 2). On external examination of the body of the hog deer, certain ectoparasites were seen clinging to the hair. The insects were dorsoventrally flattened. The males were smaller than females. The females measured 5.0 to 5.5 mm in length and 2.3 mm in breadth in the broadest abdominal region while the males measured 2 to 4 mm in length and 1.5 mm in breadth. The head was sunken into the thorax and contained widely separated Semi Circular eyes, protrusible curved proboscis and short antennae. The thorax had knob like halters. The legs were long, stout with dark claws. In two specimens, the abdomen was distended with blood sucked from the host. The haematophagous deer keds have been reported to attack, cattle, sheep, goats and even dogs and humans visiting forests or living in the periphery of the forests (Sarmah *et al.* 2019) [8]. Infestation caused development of skin wounds influencing myiasis and long lasting dermatitis (Sarmah *et al.* 2019) [8]. The occurrence of these flies from this region has been earlier reported by workers like Sarmah *et al.*, 2019 [8]; Choudhury *et al.*, 2005 [4]. They could record similar features as ours.

H. bispinosa (7 in no.) ticks had no eyes, rectangular basis capituli, presence of a medium projection at the base of third palpal segment, presence of festoons, anal groove posterior to anus and ovoid spiracles. They measured 3 to 4 mm in length and 1-2 mm in breadth in the abdominal region. The occurrence of these ticks from hog deer from this region has been earlier reported by previous workers (Sarmah *et al.*, 2019) [8]. Several tick species including *H. bispinosa* were reported earlier from other wild animals of the North East India (Sarmah *et al.*, 2019) [8]. There are reports of occurrence of ticks like *Amblyomma*, *Haemaphysalis*, *Dermacentor*, *Rhipicephalus*, *Hyalomma* and *Ixodes* ticks in the state of Assam (Ghosh *et al.*, 2007) [5].

Adult flukes recovered from the rumen and reticulum and sent to us were confirmed to be *C. gregarius* and *G. crumenifer*. Both the parasites were cylindrical. *C. gregarius* (11.5-15 mm x 2.6-4.2 mm) had anteriorly blunt pointed end with truncated posterior end while *G. crumenifer* (14-18 mm x 4-5.5 mm) was curved ventrally and banana shaped. In *G. crumenifer*, anterior end was attenuated and posterior end was truncated with slight constrictions at pre-acetabular region. The ventral surface was flat and the dorsal surface convex. The oesophagus was about 1 mm in length. The acetabulum was terminal. The intestinal caeca were long, wavy and ending at a point in front of testes. The vitellaria were post oesophageal. The cuticle of *C. gregarius* was papillated. Ventral pouch was present, triangular with vertex diverted ventrally. The acetabulum was terminal. The intestinal caeca were wavy, terminating a little behind anterior border of the testes. The excretory pore was at the

level of the anterior border of the acetabulum. Vitellaria was mainly lateral. Not much reports of occurrence of amphistomes are there from this region. However, occurrence of *Fasciola*, *Paramphistomum*, strongyles, *Strongyloides* and *Trichuris* worms during coprological examination of free-living herbivores including hog deer reported from Kaziranga National Park, Assam (Sarmah *et al.*, 2019) [8].

Since the hog deer is currently listed as Endangered in the IUCN Red List of Threatened Species, so these kind of reports of occurrence of parasitic infections should be regarded as utmost priority for conservation of the animals.

Acknowledgement

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Conflict of Interest

The authors declare no conflict of interest.



Fig 1: *L. cervi*

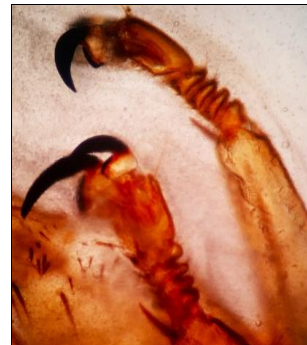


Fig 2: *L. cervi* claws

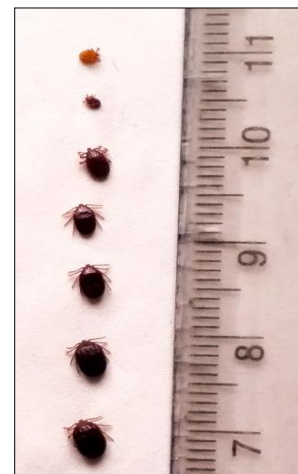


Fig 3: *Haemaphysalis bispinosa* gross samples

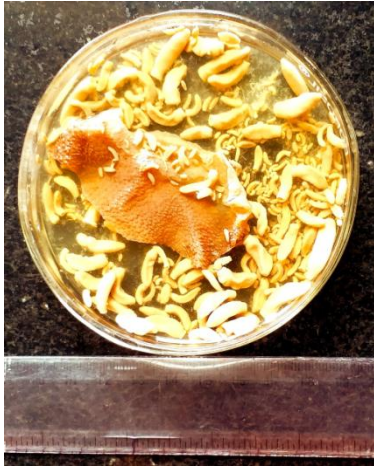


Fig 4: Paramphistomes gross samples



Fig 5: *Gastrothylax crumenifer*

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Conclusion

The examination of parasites infesting hog deer revealed the presence of *Lipoptena cervi* (Deer ked), *Haemaphysalis bispinosa* ticks, *Caromyerius gregarius*, and *Gastrothylax crumenifer* flukes. These parasites pose significant risks, causing skin wounds, myiasis, and dermatitis, especially in endangered species like hog deer. Past studies corroborate our findings, highlighting the prevalence of these parasites in similar regions and wildlife. Given the conservation status of hog deer as Endangered, monitoring and addressing parasitic infections must be a top priority to safeguard their population and overall well-being in the ecosystem.

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