



## A PRELIMINARY SURVEY OF ECTOPARASITES IN NEORA VALLEY NATIONAL PARK, WEST BENGAL

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### ABSTRACT

A preliminary faunistic study was conducted explored the ectoparasites of animals in the Neora Valley National Park (NVNP), West Bengal, India. Many ectoparasites were observed on the bodies of domestic animals that graze on a regular basis in the national park. Major ones found include *Bovicola bovis* (Linnaeus, 1758), *Ixodes granulatus* Supino 1897, and *Dermacentor auratus* Supino 1897, with *B. bovis* perhaps being reported for the first time in NVNP and India. The study also found that domestic animals and humans in NVNP are exposed to different ectoparasite species of medical and veterinary importance.

**Key words:** Ectoparasites, mite, lice, domestic animals, wildlife, zoonotic disease, *Bovicola bovis*, *Dermacentor auratus*, *Ixodes granulatus*, Neora Valley National Park

Ectoparasites are hematophagous arthropods that are diverse and well-adapted groups of parasites. Some ectoparasite species are host-specific, while others can infest a wide variety of hosts (Nelson et al., 1975). Ectoparasites that infest domestic animals include fleas, lice, ticks, and mites (Angyireyiri et al., 2015), which are linked to the transmission of veterinary and public health-related diseases and have a major impact on the ecosystem (Ehlers et al., 2019). Several diseases, including bubonic plague, murine typhus, and tularemia, can be transmitted by them (Pourhossein et al., 2015; Shakya et al., 2019; Farid et al., 2021). Domestic animals that dwell in areas near protected forests and their infestation by ectoparasites are the subject of limited research in India. Due to a lack of information about ectoparasites and disease transmission routes among wild and domestic animals in India, the focus of this study was to document the ectoparasitic arthropods of domestic animals found in and around Neora Valley National Park, West Bengal, in order to provide a preliminary interpretation in the context of possible zoonotic disease risk based on the hosts and vectors present.

### MATERIALS AND METHODS

The study was undertaken as part of the Biodiversity Assessment Programme in Neora Valley National Park

(NVNP hereafter), organised by the Department of Forest (North Division), Government of West Bengal from 2018 to 2021. NVNP is unique and ecologically important as it includes a relatively inaccessible patch of late successional forests with rich diversity, part of a larger and very important Eastern Himalayan landscape. NVNP comprises deciduous and coniferous forests, usually with an understory of bamboo. Cattle biting louse and hard ticks were collected from the bodies of goats and cows grazing regularly inside the national park by hand plucking. One sample of tick was found to stick on the upper arm of a forest guard. Just after collection, the ectoparasites were photographed and they were preserved in 70% alcohol. The description was made following Mathison and Pritt (2014).

### RESULTS AND DISCUSSION

Field survey for ectoparasites in NVNP revealed the following louses and ticks as follows:

#### 1. *Bovicola bovis* (Linnaeus 1758)

It is the common cattle biting louse, or Cosmopolitan Cattle biting louse of class Insecta, order Phthiraptera, and family Trichodectidae, distributed in temperate regions worldwide. Ajith et al. (2019) conducted an



*Bovicola bovis* (Linnaeus, 1758)

*Ixodes granulatus* Supino, 1897

*Dermacentor auratus* Supino, 1897

Fig. 1. Ectoparasites observed in the Neora Valley National Park

experiment in which they used Ivermectin to control chewing lice, *Bovicola (Damalinia) caprae*, in Bengal black goats in Tamil Nadu, India. In NVNP, this louse was found in a huge number on the body hairs of domestic goats (Fig. 1). Report of *Bovicola bovis* (Linnaeus, 1758) is possibly for the first time in NVNP and also in India.

**Diagnostics:** 1.5-2 mm in length; yellowish-white body colour; abdomen with deep brown transverse bands; tarsal claw on each leg; clubbed, filiform and three segmented antennae.

**Material examined:** 12 ♀♀, Mouchuki to Bhotaykharka, NVNP, 19.x.2019; 14 ♀♀, Thamkharka, NVNP, 18.iii.2020.

**Host:** Assam Hill Goat (Female)

**Site of collection:** On the way to Bhotaykharka from Mouchuki and near Koblong Village in Thamkharka, NVNP (27°05'51.9" N, 88°41'26.5" E).

## 2. *Ixodes granulatus* Supino 1897

Known colloquially as "hard tick". It is the most common tick on rodents. It is very common in Malaysia and its distribution extends from South East Asia to eastern India. It is a vector of public health importance and also a vector of the Langat Virus, and is involved in the cycle of Tick Typhus and Q fever in the Climax forest of Peninsular Malaysia (Madinah et al., 2011).

In NVNP, this louse was found in a moderate number on the body hairs of domestic cows. The available literature does not show any reports of tick species, including the present from NVNP, West Bengal.

**Diagnostics:** Body length 5-7 mm.; prominent head;

light brown body colour, small oval shield chocolate brown and inornate; visible lateral spiracles.

**Material examined:** 2 ♀, Mouchuki, NVNP, 18.x.2019.

**Host:** Siri cow (Female)

**Site of collection:** On the body of a cow during grazing in the forest near Mouchuki, NVNP (27°01'36" N, 88°47'10.5" E).

## 3. *Dermacentor auratus* Supino 1897

Ticks of the genus *Dermacentor* are all potential vectors of diseases, although little work has been done on this. At least four possible human diseases are transmitted by *D. auratus*, none of which has been fully investigated (Petney, 1953). Ajithkumar et al. (2012) reported *D. auratus* from Wayanad, Kerala, India. *D. auratus* carries many reckettsiae and viruses, including the Kyasanur Forest Disease (KFD) virus, which causes a fatal zoonotic viral disease reported from Karnataka, India (Ajithkumar et al., 2012). It is also found on the bodies of captive elephants (Islam et al., 2019).

**Diagnostics:** Body shape is flat and pear-shaped; body length is 4 mm; colour is creamy white with deep brown thick dorsal marking anteriorly and posteriorly; legs have 4 pairs of small claws; scutum is highly ornate; eyes are prominent.

**Material examined:** 1 ♀, Thamkharka, NVNP, 17.iii.2020.

**Host:** Collected on human body (One tick was found on the upper arm of a forest guard during a field survey).

**Site of collection:** Forest in Thamkharka, NVNP (27°05'51.9" N, 88°41'26.5" E).

Three ectoparasites *Bovicola bovis*, *Ixodes granulatus*, and *Dermacentor auratus* were documented in NVNP. Both the louse *B. bovis* and the tick *I. granulatus* were collected on the bodies of domesticated herbivores that regularly enter the national park for grazing, have medical and veterinary importance (Fig. 1). Survey conducted in four wildlife reserves in Peninsular Malaysia capturing small mammals revealed 14 ectoparasites from five host species, including three species of ticks (Ixodidae). Ticks pose a threat to humans and animals alike, and are arthropods of medical and veterinary importance next to mosquitoes (CheLah et al., 2016). Sanyal and De (2001) indicated the occurrence of both *Ixodes granulatus* Supino on the black rat *Epimys rufescens* and *Dermacentor auratus* Supino on the bodies of deer and humans in West Bengal. Debbarma et al. (2017) observed that ticks like *Rhipicephalus (Boophilus)* sp., *Hyalomma* sp., and *Haemaphysalis* sp., are prevalent in West Bengal. Though *I. granulatus* harbours some pathogens, a little work has been done on its medical significance (Petney, 1953). The present study revealed that domestic animals and humans in NVNP are exposed to different ectoparasite species, and that number may be higher. Therefore, future studies are needed to examine the occurrence of ectoparasites among domestic animals as well as wildlife in NVNP of the Eastern Himalaya.

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