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Ectoparasites and endoparasites from Indian Vulture (Gyps Indicus) - Case report

[1]Yadav SK, [2]Nath C and [3]Siddiki AZ
[1]Department of Medicine and surgery, [2]Department of microbiology and veterinary public health
[3]Department of Pathology and Parasitology
Chittagong Veterinary & Animal Sciences University (CVASU), Bangladesh

Corresponding author: shirfraaz@gmail.com

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ABSTRACT

The report was aimed to record ectoparasites and endoparasites from Indian vulture (*Gyps indicus*). The careful physical examination resulted in a very collection of several ticks. Three dimensional (3D) microscopy was accustomed to capture high-quality images of the tick towards its identification. Further confirmation of the tick taxonomy was achieved with the assistance of an internet tick research site (www.tickspotters.org). The nymphal stage of Lone star tick (*Amblyomma americanum*) was confirmed during the study. For endoparasites, a fecal sample was collected to spot eggs and larvae through the direct smear method. Coproscopy revealed a variety of Ascarid eggs and eggs of the Strongyle group and blood smear made for blood protozoa. Ectoparasite the nymphal stage of Lone star tick (*Amblyomma americanum*) and endoparasite Ascarid eggs and eggs of the Strongyle group found in direct smear but no protozoa found in a blood smear.

Keywords: Amblyomma, Ascarid Ectoparasite, Endoparasite, Indian Vulture.

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Introduction

Birds constitute a very important element of virtually every ecosystem and wild birds are available throughout the globe. Among wild birds vultures are the most important and highest-flying raptors. These large birds don't explore for food, but will very occasionally attack wounded and dying animals (Khursheed *et al*., 2014). An outsized number of untamed birds are thought to be to blame for the spread of emerging infectious diseases worldwide. Parasitic infestation is one {in all (one amongst) one in every of} the foremost critical among these problems both for the high occurrence and provoking serious infections and even death in a large proportion of the bird populations found in intensely parasitized regions (Mullen and Durden 2009; Troughton and Levin, 2007). The bulk of ectoparasites in birds are related to the skin and feathers while some species infect subcutaneous sites (Mites, flies).

A variety of hems spend a part of their life on the host and a few are only related to a number for brief periods at a time (Marietto-Gonçalves *et al*., 2009). External parasites generally bite and irritate birds but may cause blood loss and transmit diseases. Mites, lice, and ticks are all external parasites. Ectoparasites found on birds are usually characterized by common morphological patterns like segmented bodies, jointed appendages, achitinous exoskeleton. Ticks are obligate ectoparasites of various birds. They need to be considered to transmit parasitic, viral, and bacterial diseases in birds. Additionally, they cause heavy morbidity by sucking blood and causing irritation to the birds which adversely affects the economical production of birds. The tick was considered a nuisance because it doesn't transmit the etiological agent of zoonosis, but newer studies have shown that this species can transmit various other pathogens to humans and other animals, like people who cause rickettsiosis, ehrlichiosis, theileriosis, and tularemia. Endoparasites mostly found in prey birds like roundworms (nematodes), protozoans, spiny-headed worms (Acanthocephala), flukes (digenetic trematodes), tapeworms (cestodes), and tongue worms (pentastomida). Nematodes are considered to be

the foremost pathogenic endoparasites and should have a substantial economic impact on birds. With the above scenario, the current study was geared toward identifying several endoparasites and ectoparasites that were collected from an Indian vulture captured unexpectedly.

Case History and observations

An Indian vulture (*Gyps indicus*) was found within the jungle of the Chittagong region in emaciated condition body weight 6 kg. The captured vulture was admitted for treatment when an additional physical and clinical examination was performed. A fecal sample was collected for coproscopy, Blood from wing vein, and ectoparasite was collected manually from the vulture.

Examination of fecal sample

Several forms of qualitative and quantitative techniques are available to analyses the fecal samples. The direct smear, floatation, sedimentation method, and also the McMaster technique are the foremost common methods to detect and quantify the number of eggs, ova, or cyst in fecal samples. The direct smear method of fecal examination was performed and several other smears were prepared for an immediate smear. Parasitic eggs were identified by morphological features.

Direct smear

This is the foremost common and easiest way to detect the presence of helminth eggs. A tiny low amount of fresh fecal sample was taken within the glass slide. Few drops of the physiological isotonic solution were placed on the glass slide. At least three smears were prepared for a sample. A coverslip was placed on the transparent liquid and examined systematically under lower magnification with the assistance of a lightweight microscope and eggs were identified on the basis of their morphological features as described by (Khan, 2013).

Tick collection

Visual examination in which the ectoparasites were collected from host birds by controlling the legs and beak recommended (Khursheed *et al*., 2014).

Tick identification

The ticks were preserved with 70% formalin and viewed by a lightweight microscope. Further measurement and morphological analyses were aided by a 3D microscopy (Entovision®, USA) to watch the tick. Additionally, confirmation of tick species was achieved by sending pictures to the worldwide resource of tick researchers named Tick Spotters (www.tickspotters.org) who are voluntary contributors and help to spot ticks round the globe. Tick Spotters is an organizational site that helps to spot tick after submitting the photograph and relevant information recommended (Apanaskevich and Apanaskevich, 2016).

Blood smear

Blood samples were collected from wing vein in an anticoagulant tube containing ethylenediamine-tetra acetic acid then One drop blood sample was taken then thin blood smears prepared. The smears were fixed in methanol for 5 min and stained with Giemsa solution for 45 min and examined under the immersion objective recommended (Reed *et al*., 2003). The sample was observed no blood protozoa (Fig.1).

Morphology of tick

Detailed morphological investigation done for identification of collected sample of Lone star tick (*Amblyomma americanum*).

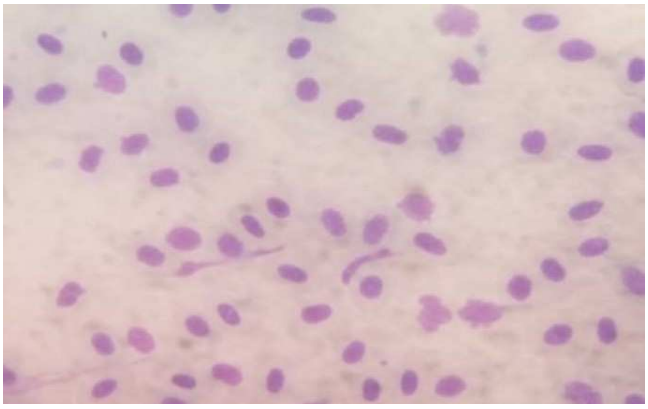

Fig. 1: Blood smear (100X)

Findings and Discussion

Vultures were grabbed which was fallen down in emaciated condition. Ectoparasite (tick) and a fecal sample were collected for endoparasite (*Amblyomma americanum*). Within the fecal sample, Strongyle type eggs and Ascarid type eggs were (Fig. 2) found by the direct smear method but Blood smear no blood protozoa found. Parasitic findings were possibly the results of the feeding habits of Indian vulture (*Gyps indicus*).

Detailed morphological investigation revealed that the collected sample was Lone star tick (*Amblyomma americanum*) under the Ixodidae family. The recorded tick was at the nymphal stage of the lone star tick. The length of the nymph was recorded as 1.71mm, width 1.53mm, and has six legs (Fig. 3) recommended (Hossain *et al*., 2011).

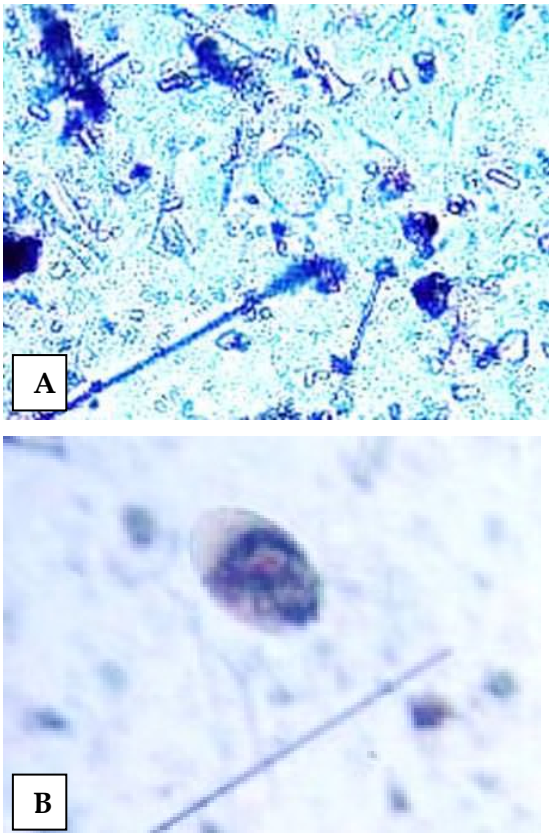

Fig. 2: Parasitic eggs of Indian vulture (*Gyps indicus*); A) Ascarid type egg B) Strongyle type egg

The result of gel electrophoresis was presented with samples having molecular weight of 475bp. This product size has already been reported for *Simulium* species by Hassan *et al*., (2015). The Indian vulture (*Gyps indicus*) could be a critical species per the IUCN red list since 2002 because the population is very declined. Ascarid type Toxocara eggs are originated from stray dogs, cats, and wild feline and canine animals (Mallory *et al*., 2010). Strongyle type eggs are more frequent in sheep fecal samples (Lars, 2019).

It is concluded that each one of the eggs of the parasite is originated from animals where the vulture is fed. Larval, nymphal, and adults all stages of ticks suck blood in vulture often from a special host. Individuals remain attached to hosts for as long as two days (Özmen, 2009). Most ticks are ambush parasites found in litter and soil that attach to passing hosts. There are two varieties of ticks found in Avian. Those are soft ticks (Argasidae — Argas and Ornithodoros) and few hard ticks (*Ixodidae* — *Ixodes*) sleep in nests and burrows. Ticks transmit spirochetosis in birds and zoonotic disease and act as a vector for various anemia causing diseases. Some species of ticks produce toxin in their saliva that incites paralysis. The present research found nymphal stage of Lone star tick (*Amblyomma americanum)* from an Indian vulture (*Gyps indicus*). Wild turkey populations are a standard host and should contribute to tick expansion by providing additional hosts for immature stages (Kostelić *et al*., 2005). Lone star ticks are manily three-host ticks but feeding on different hosts during the larval, nymphal, and adult stages. The ticks have unique piercing-sucking mouthparts with chelicerae that pierce through the skin of the host. Attachment is facilitated by the tubular hypostome and a secreted cement- or latex-like compound that attaches ("glues") the tick to the host until feeding is complete (Adams *et al*., 2003). The nymph of lone star tick which parameter was 1.71mm long, 1.53 mm broad and have 6 legs. Nymphs can survive up to six to eight months without feeding on a number. Once a number is found they feed for 3 to eight days, drop off the host, and molt into the adult stage within a 5 to six week period (Yadav *et al*., 2015). As ticks are mobile, they breech their host range easily. The lone star tick is extremely aggressive and non-specific when seeking hosts (Guglielmone and Nava, 2017).

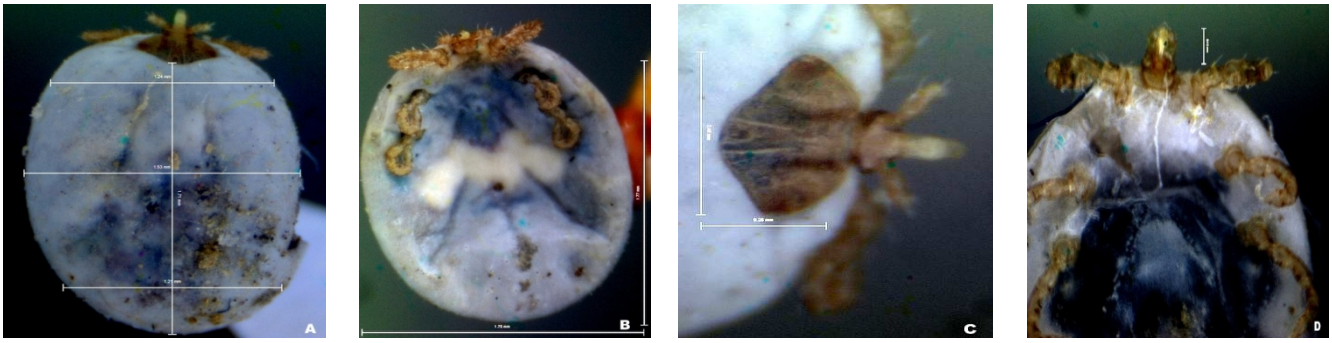

Fig. 3: Morphology of Lone star tick (*Amblyomma americanum*);A) Dorsal view, B) Ventral view, C) Mouthparts, D) Legs

The lone star tick is found in multiples host like as humans, domesticated animals (mostly cattle, dogs, horses, goats), ground-dwelling birds (e.g., quail and wild turkeys), and little (e.g. squirrels, opossums, hares) and massive (primarily deer and coyotes) wild mammals (Kostelić *et al*., 2005). With the exception of untamed turkeys, adult lone star ticks infrequently take advantage of birds (Kostelić *et al*., 2005). Tick-borne diseases are common occurrences in both the medical and veterinary sectors (Goddard and Varela, 2009). Lone star ticks don't transmit zoonotic disease but they transmit some nesting germs. Within the present study, blood protozoa could be noticed however, some researcher mentioned blood protozoa carry by tick (Lee *et al*., 2014).

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