



## Prevalence of Canine Babesiosis in Jalandhar District, Punjab, India

Kumar Vipan, Kaur Parvinder, Sarangal Charanjeet, Pal Heigo, Bangar Gagandeep, Sharma Hanish and Wadhawan V.M.

Regional Disease Diagnostic Laboratory (North Zone), Jalandhar, 144001, Punjab, INDIA

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### Abstract

*Babesiosis is caused by tick borne protozoal parasite prevalent in the canines Babesia canis and B. gibsoni worldwide. In the current study, a total of 204 canine blood samples with history of fever ( $104^0$  to  $105^0$  F), were collected and examined at Regional Disease Diagnostic Laboratory, Jalandhar (Punjab) during a period of one year (April 2013 to March 2014). Examination of blood smears revealed 8.33% (17/204) of canines were positive for canine babesiosis comprising of B. gibsoni (7.84%) and B. canis (0.49%). The prevalence of the babesiosis was comparatively higher in males than female dogs.*

**Keywords:** Canine, *babesia canis*, *babesia gibsoni*, Jalandhar, Punjab.

### Introduction

*Babesia* species are tick-transmitted apicomplexan parasites which infest on wide range of wild and domestic animal hosts<sup>1</sup>. The identification of species has traditionally been based on the host specificity and on the morphology of the intra-erythrocytic forms (piroplasms). *Babesia canis* (3.0–5.0  $\mu$ m) and *B. gibsoni* (1.5–2.5  $\mu$ m) are recognized as the two species that cause canine babesiosis worldwide and are transmitted by *Dermacentor reticulatus* in Europe, *Rhipicephalus sanguineus* in tropical and subtropical regions and *Haemaphysalis leachi* in South Africa<sup>2</sup>. *B. canis* usually occurs as a single pear-shaped piroplasm or in pairs of merozoites divided by binary fission within the erythrocyte. Cases of canine babesiosis may present with a wide variation and severity of clinical signs. Lethargy is the most common symptom, followed by anorexia, pale mucous membranes, vomiting, amber to brown urine, splenomegaly, jaundice, weight loss, tachycardia and tachypnea.

Canine babesiosis is amongst one of the most widespread canine vector-borne disease (CVBD) causing pathogens because of its close association with the tick *R. sanguineus* and the cosmopolitan distribution of this tick species. Though large surveys on canine babesiosis are scanty, a number of reports suggest that the parasite infects dogs worldwide. In India, a variable prevalence of canine babesiosis has been reported in different studies 0.66% to 8.9% in referral canines in Uttar Pradesh<sup>3</sup>; 21.7% in Assam<sup>4</sup>, 5.4% in Hissar, Haryana<sup>5</sup>, 3.17% and 1.26% and 5.45% and 0.37% of *B. gibsoni* and *B. canis*<sup>7</sup> in Punjab respectively have been reported. Direct microscopic examination is the conventional method for detecting *Babesia* spp. in animal blood samples. This is a conclusive, feasible and low cost diagnostic method<sup>8</sup>. The present study was undertaken to determine the prevalence of canine babesiosis by microscopy in and around Jalandhar, Punjab.

### Material and Methods

204 canines blood samples were received from field and examined at Regional Disease Diagnostic Laboratory, Jalandhar, (Punjab) during the year 2013-14. Blood samples, were collected aseptically from cephalic vein in vials containing anticoagulant (EDTA). To make a thin blood film, a drop of blood was placed on a clean glass slide drawn into a smear, air-dried, fixed in methanol, stained with Giemsa stain<sup>9</sup> and examined under light microscope by using the oil immersion objective (100X).

Table-1

Canine Babesiosis prevalence in and around Jalandhar

Parasite	Number of blood samples examined	Number of infected animals	Prevalence (%)
<i>B. gibsoni</i>	204	16	7.84
<i>B. canis</i>	204	1	0.49
Total	204	17	8.33

Table-2

Age Wise Prevalence of Canine Babesiosis

Age	<i>B. gibsoni</i>	<i>B. canis</i>	Total
<1 year	4	0	4
>1 year	12	1	13
Total	16	1	17

$\chi^2 = .3269$  (Non-significant), p value = .5674

Table-3

Sex wise Prevalence of Canine Babesiosis

Sex	<i>B. gibsoni</i>	<i>B. canis</i>	Total
Male	10	1	11
Female	6	0	6
Total	16	1	17

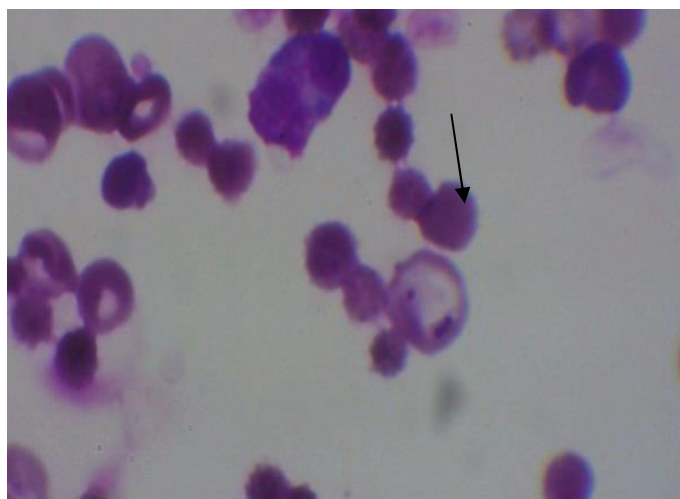
$\chi^2 = .5795$  (Non-significant), p value = .4464

## Results and Discussion

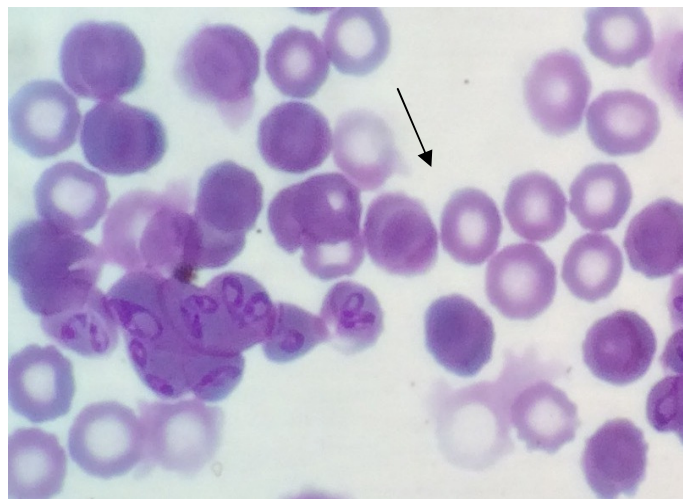
Blood smears examination revealed that 8.33% (17/204) of canines were positive for canine babesiosis (table-1). Eljadar<sup>6</sup>, Singh *et al.*<sup>10</sup>, Singh *et al.*<sup>7</sup> reported the comparable prevalence of canine babesiosis from the same region of Punjab. The substantial improvement in the management practices involved in canine keeping was the reason for lower prevalence of babesiosis in dogs. This has decreased the exposure probability of canines to the vector tick thus leading to a decrease in the cases of canine babesiosis in the region. Further, a much higher prevalence of *B. gibsoni* (7.84%) was recorded as compared to *B. canis* infection (0.49%) from the region and the results are in harmony with previous reports Eljadar<sup>6</sup>; Singh *et al.*<sup>11</sup>. Although it is known that infection with either of these pathogens can result in severe and fatal disease, it may remain clinically undetectable in chronically infected dogs due to very low and often intermittent parasitaemia. Infection is diagnosed only after such animals are immuno-compromised by unrelated disease or following splenectomy<sup>12</sup>.

Sundar *et al.*<sup>13</sup> conducted a study in Chennai and reported that the prevalence *B. gibsoni* was 0.1% in client-owned dogs using bloods smear evaluation. Other studies report 8.9% and 221.7% of dogs in Uttar Pradesh<sup>3</sup> and Assam<sup>4</sup>, respectively, infected with Babesia, but the species of piroplasm infecting these dogs was not reported.

The pathogenicity of Babesia is believed to vary in different regions of India and the world. This is likely due to host factors and/or differences in the species of tick parasites present. With reference to the age of the host, the results of the current study indicated a comparable prevalence of *B. gibsoni* in all age groups but, *B. canis* was recorded only from the dogs above 1 year of age (table-2). The results are similar to earlier reports<sup>7</sup>. The prevalence of the babesiosis was comparatively higher in males (6.47%) than female dogs (3.52%) which may be due to a smaller sample size collected during one year period (table-3).



*B.gibsoni*



*B.canis*

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