



Canine Hepatozoonosis

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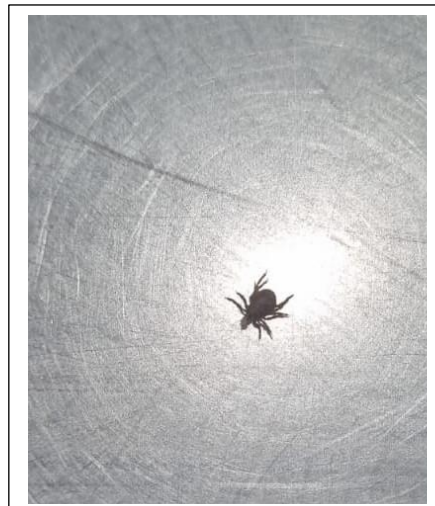
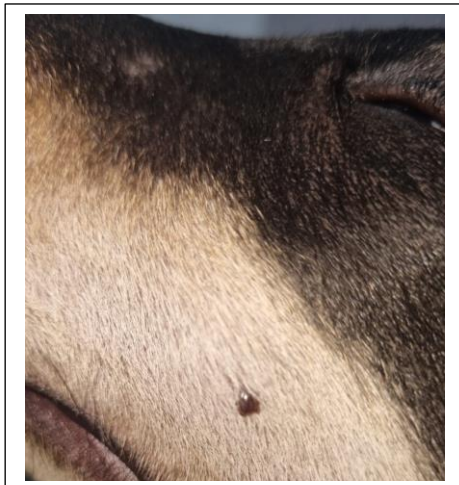
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The apicomplexan genus *Hepatozoon* (suborder Adeleorina, family Hepatozoidae) contains over 300 species that infect a broad variety of vertebrates, from amphibians to mammals. All *Hepatozoon* species follow the same life cycle: gametogony and sporogony in the definitive host (a blood sucking invertebrate) and schizogony followed by gamete production in the intermediate host (a vertebrate). The definitive host of *Hepatozoon canis* is the brown dog tick *Rhipicephalus sanguineus*, whereas dogs and wild canids serve as intermediate hosts. *H. canis* infection in dogs is widespread. Its distribution range resemble to that of the vector tick: Africa, South Europe, South America, and Asia, which includes the Middle East, Pacific and Indian Ocean islands. Hepatozoonosis manifests as an enzootic illness with varying prevalence.

In dogs, the primary route of infection is through the ingestion of a tick harbouring mature oocysts, but additional routes have been recorded. *H. canis*, like other coccidia such as *Toxoplasma gondii* and *Neospora caninum*, exhibits vertical transmission from mother to offspring. Parenteral injection of tissues or blood from infected dogs did not result in infections, whereas tick tissue emulsion injection was effective. Transovarial transmission has not been detected.





Hepatozoonosis is classified into three forms: subclinical, acute, and chronic infection. Various clinical signs include anaemia, emaciation, intermittent fever, cachexia, depression, muscle hyperaesthesia, purulent conjunctivitis, and rhinitis. Bloody diarrhoea, anorexia, paraparesis, and paralysis was less common. The gross pathological symptoms are icteric mucous membrane, splenomegaly, hepatology, congestion in lungs and gastrointestinal tract, lymphadenopathy, and pale kidneys. Schizonts are seen histologically in the skeletal and cardiac muscles, lymph nodes, spleen, liver, and kidneys. Schizonts are classified into two types: microschizonts, which include micromerozoites, and macroschizonts, which contain macromerozoites.

There was no link discovered between *H. canis* infection in dogs and their gender or age. This parasite affects animals of all ages, from neonates to adults. Rural dogs are more likely to become sick than urban dogs, due to closer interaction with tick vectors. The majority of *H. canis* infections occur during hot seasons, when the vector is more active. However, diseases were also recorded throughout the cold months, most likely as a result of persistent infections.

Clinical symptoms such as normocytic normochromic anaemia, thrombocytopaenia, hyperglobulinaemia, hypoalbuminaemia, elevated creatine kinase, and alkaline phosphatase enzymes are used to make the diagnosis. The microscopic detection of *H. canis* in blood smears involves staining gamonts with the Romanovski-Giemsa stain. Gamonts are oval-shaped and measure 8-12/3-6 μm . They are found in neutrophils' cytoplasm and seldom in monocytes. Schizonts of *H. canis* were found in histological or touch impression preparations from lymph nodes, spleen, and bone marrow. Schizonts are circular or oval, with a diameter of around 30 μm . They contain 2 or 4 macromerozoites or more than 20 micromerozoites. Histologically, microschizonts resembles "wheel-spoke" shape. *H. canis* infection could also be identified in the tick vector. Microscopy revealed large oocysts in Romanovski-Giemsa-stained preparations of the hemocoel, salivary glands, and other internal organs. Many oval sporocysts can be found within the oocysts. In addition to microscopy, serodiagnostic techniques such as the indirect immunofluorescent antibody test (IFAT) and ELISA are also employed to make diagnoses. PCR for *H. canis* in blood has been shown to be a sensitive diagnostic technique.





The principal drugs used presently in the treatment of canine *H. canis* infection is Imidocarb dipropionate at 5-6 mg/kg, subcutaneously or intramuscularly at 14-day intervals until gamonts disappear from the blood. Typically, one or two injections are adequate; but, in severe infections, an 8-week or longer treatment may be required. To treat probable coinfections carried by the tick vector, Imidocarb dipropionate is frequently coupled with Doxycycline at a daily oral dose of 10 mg/kg for 21 days. The prognosis for animals with high parasitaemia rates is guarded.

The prevention of Hepatozoonosis is based on effective tick control on dogs and in the surrounding environment. This is accomplished by the use of various acaricides with the aim to kill the ticks. Also, frequent cleaning and combing of animals will keep them from eating a tick. Infected dogs should be treated before mating to reduce the risk of congenital transmission. Dogs from endemic areas should not be fed raw meat due to the risk of *H. canis* infection spreading through contaminated tissues.

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