

Preliminary Note on *Dirofilaria immitis* Infection of Pet Dogs in the North Bank Plain Zone of Assam, India

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ABSTRACT

Dirofilaria immitis is a mosquito borne filarid nematode parasite which inhabits the pulmonary artery and right ventricle of hosts like dog, cat and other similar wild animals in temperate, tropical and subtropical

countries. The severity of the disease depends upon the intensity of parasite load and the degree of cardiopulmonary involvement which may even lead to congestive heart failure. In India, the North Eastern region is a known endemic for *D. immitis*. In the state of Assam, prevalence study conducted earlier in different types of dogs was mainly from the lower Brahmaputra valley zone. The present communication reports the *D. immitis* infection in pet dogs from the Lakhimpur district, under the North bank plain zone of Assam. 5 out of 9 test samples were found positive for microfilariae of *D. immitis* in all the three tests performed viz., Giemsa staining of the blood smear, wet blood film and standard Knott's technique.

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INTRODUCTION

Dirofilaria immitis is a filarid nematode parasite that inhabits the pulmonary artery and right ventricle (Bhattacharjee and Sarmah 2014, Vatne 2015) of dog, cat and other similar wild animals in temperate, tropical and subtropical countries. The parasite is transmitted through different mosquito species under genera *Culex*, *Aedes*, *Anopheles*, *Ochlerotatus* and *Mansonia* (Capelli *et al.* 2013, Mirahmadi *et al.* 2017, Adebayo *et al.* 2020). Dogs affected by *D. immitis* infection exhibit weakness/lethargy, exercise intolerance, anorexia, coughing, dyspnoea, weight loss, hemoptysis, hemoglobinuria and symptoms of congestive heart failure depending upon the intensity of parasite load and the degree of cardiopulmonary involvement (Kramer 2009, Cardoso *et al.* 2012). Typical pathology includes right ventricle enlargement, enlargement of main, lobar and peripheral pulmonary arteries and perivascular parenchymal lesions (Song *et al.* 2003). Caval syndrome, a serious life threatening complication of chronic heartworm disease occurs due to retrograde migration of adult worms to the right atrium and vena cava resulting to embolism and partial obstruction of blood flow. Zoonotic importance of this parasite has also been recognized in the recent past (Saritas *et al.* 2005, Montoya-Alonso *et al.* 2010) in some countries including report of human pulmonary dirofilariosis in India (Badhe and Sane 1989). In India, the North Eastern region is a known endemic for *D. immitis* (Borthakur *et al.* 2015). The parasite was frequently reported in street dogs, pet dogs and dogs working in defence and police organizations (Bhattacharjee and Sarmah 2013, Bhattacharjee *et al.* 2014, Borthakur *et al.* 2015). In the state of Assam, prevalence study conducted earlier in different types of dogs was mainly from the lower Brahmaputra valley zone (Bhattacharjee and Sarmah 2013, Borthakur *et al.* 2015). The present communication reports the *D. immitis* infection in pet dogs from the Lakhimpur district, under the North bank plain zone of Assam.

MATERIALS AND METHODS

Blood samples collected in EDTA from a total of 9 (nine) certified breed pet dogs from Lakhimpur District attending the Veterinary Clinical Complex of Lakhimpur College of Veterinary Science, Assam Agricultural University, Joyhing, North Lakhimpur were sent to the Parasitology department for detection of *D. immitis*. These 9 animals were suspected for heartworm disease in a two year period on the basis of clinical findings such as rough body coat, depression, lethargy, anorexia, coughing and exercise intolerance.

RESULTS AND DISCUSSION

Blood samples examined by Giemsa staining of the blood smear, wet blood film and standard Knott's technique (Soulsby 1982) revealed 5 out of 9 samples positive to microfilariae of *D. immitis* in all the three tests (Fig. 1 Giemsa stained blood smear and Fig. 2 Knott's technique). This confirmed the endemicity of *D. immitis* in dogs from Lakhimpur District also which remained uncovered in the earlier study conducted by Bhattacharjee (2011). However, the rate of infection in the present study showed to be higher than that was observed earlier (Bhattacharjee and Sarmah 2013, Borthakur *et al.* 2015). This might be due to examination of blood from symptomatically suspected dogs and growing awareness of the pet owners to bring sick dogs to the hospital for diagnosis and treatment of various illnesses. Borthakur *et al.* (2015) reported serodiagnostic commercial ELISA kit having highest sensitivity to detect *D. immitis* in dogs

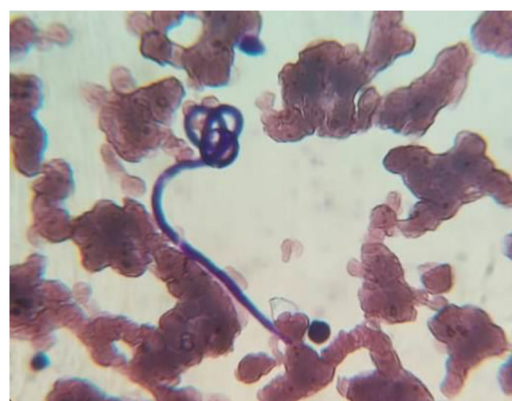


Fig. 1. Microfilariae in Giemsa stained blood smear (100 x).



Fig. 2. Microfilariae in Knott's technique (40 x).

followed by PCR and Knott's technique. Traditional tests using thin blood smear and wet blood film were found less sensitive. However, in the present study, all the three conventional tests could equally detect the microfilaraemia which might be due to long standing infections resulting appearance of large numbers of microfilariae in the blood.

Lakhimpur, one of the district under the North bank plain zone of Assam situated at the eastern corner of the state adjacent to Arunachal Pradesh. The district is located between 27.2253° N longitude and 94.1053° E latitude. The study site is situated at 101 m above the sea level and receives annual rainfall of 2837.97 mm. The annual average maximum and minimum temperature ranges from 28.6 °C to 18.5 °C respectively. The average relative humidity of the region ranges from 69 % in morning to 95 % in the afternoon, which are congenial for the growth and propagation of many parasites including *D. immitis* (Deka *et al.* 1995).

Conclusively, present detection of *D. immitis* adds the district in the previously reported list of districts

of Assam endemic for the parasite.

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