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Infestation of Nematodes in Phlebotomus Argentipes Annandale and Brunetti (Diptera: Psycodidae), Bihar, India

D.S. Dinesh[1]

[1] Rajendra Memorial Research Institute of Medical Sciences

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Abstract

Visceral Leishmaniasis (VL) is a major health problem in Bihar, India. The disease is caused by a protozoan parasite Leishmania donovani and transmitted by the established vector Phlebotomus argentipes (Diptera: Psychodidae) in India. P. argentipes transmits viral and bacterial pathogens. Nematodes were isolated from the body of P. argentpes for the first time in India. Its role as pathogen is yet to be established.

Index terms— visceral leishmaniasis, phlebotomus argentipes, nematodes.

1 Introduction

isceral Leishmaniasis (VL) is a vector borne parasitic disease caused by a protozoan parasite leishmania donovani and transmitted by the established vector Phlebotomus argentipes Annandale and Brunneti (Diptera : psychodidae) in Bihar, India. P. argentipes also transmits virus and bacteria to the human beings. The transmission of Nematodes is not known so far. The Nematodes or roundworms (Phylum: Nematoda) are the most diverse pseudocoelomates. There are more than 28,000 species of Nematodes (Hugot et al. 2001), of which over 16,000 are parasitic.Sand flies are the main vector of Leishmaniasis. Out of 700 hundred worldwide popu-lations of sand flies, approximately 70 are respo-nsible for transmission of disease to human (Lane 2009). However, these are carrying some entomopathogens like viruses, bacteria, protozoa, fungi, nematods and mites. Phlebotomine sandflies spend most of their lives in dark habitat with stable temperature and high humidity. Their developmental stages from eggs to pupae are passed in crevices, tree buttresses, caves rodent burrows with organic debries like leaf litter and dungs **??**Killick-Kendrik 1979, 1987). Even adult also prefer the dark and humid diurnal resting sites. These circumstances might be conducive to the development of entomopathogens in sandflies.

It is difficult to find out immature stages of sandflies in nature (Killick-Kendrick 1987), hence, natural pathogens in immature stages in sand flies have not been reported so far. Most of the pathogens were identified from adult sand flies while doing the research Authors ? ? ?: Rajendra Memorial Research Institute of Medical Sciences (Indian Council of Medical Research), Agamkuan, Patna-800007, India. e-mail: drdsdinesh@yahoo.com work on leishmaniasis **??**ewis 1977, 1980). This study reveals the presence of nematodes inside the body of P. argentipes in nature.

2 II.

3 Material and Methods

Sandflies were collected early in the morning from indoor habitats of dwellings using aspirator and flash light as well as CDC (Centre for Disease Control) light trap. The dissection of gravid females was made in normal saline under dissecting binocular microscopes (Zeiss) and observation was made in high magnification.

4 III.

5 Results

In the present study 25% P. argentipes were found infested with Nematodes in Bihar, India out of 100 dissected wild populations for the first time collected from villages of Muzaffarpur districts (Figure **??**.

IV.

6 Discussion

Particular work on pathogens of phlebotomines has been conducted by (Killick-Kendrick et al. 1989; Warburg 1991). Many pathogens were found transmitting the diseases. The transmission of phlebovirus, family Bunyaviridae was found infecting mammals (Tesh 1988). The bacterial pathogen like Bartonella bacilliformis, the causative agent of human diseases in some Andean regions of Peru, Ecuador and Colombia is transmitted by Lutzomyia spp. as a group of protozoan kinetoplastids apart from leishmania spp species of Endotrypanum and Trypanosomes are also transmitted by sandflies to vertebrates other than man (Killick-Kendrick 1979; Shaw 1981). In New World Plasmodium spp. the causative agent of reptilian malaria are transmitted by sandflies (Ayala1977; Klein et al. 1988). Entomophtoralean fungi may constitute important pathogens of adult sand flies L. pia in Colombia (Warbug 1991). Saprophytic fungi are found in adult sand flies (Warburg1991) which may influence the development of Leishmania infections (Schlein et al. 1985). Mites (Acarina) collected from sandflies comprise 21 species reported to affecting some 39 species of sand flies hosts. In India mites were found from the body surface of P. argentipes and in laboratory predating the larvae (unpublished).

Nematodes were reported from different countries in sandflies. Encapsulated third stage spirurid nematodes (rodent infecting Mastophorus muris) have been reported in P. arisasi **??**Killick Kendrick et al. 1976). Sand fly parasitic nematode i.e tetradonematid was found in P. papatasi and P. sergenti in Afganistan. In adults the nematode interfered with blood feeding by female sandflies (Killick Kendrick et al. 1989). Tylenchid nematodes have been recorded in L. sangunaria, L. vespertilionis and L. panamensis **??**Mc Conell and Correa 1964) and L. shanoni (Warburg 1991). Eggs, free juveniles and gravid females were recorded in P. papatasi and P. sergenti in Syria by R. Killick-Kendrick was previously in Bagdad (Alder and Theodor 1929). Gregarines(Ascogregarina saraviae) and nematodes (Tylenchida and Spiruda) were recorded in Lutzomyia spp. (Warburg et al. 1991). Infestation of a nematode parasite was observed in the natural population of P. papatasi in Pondicherry, India. Of the 877 males and 959 females sandflies examined for the natural infection, 11 females were found infested with nematodes (0.59%). The presence of a stylet at the opening of the dorsal oesophageal duct suggests that the parasite belongs to the super family Tylenchoidea (Srinivasan et al. 1992). It requires detail studies on sand flies to find out any role of P. argentipes in transmission of helminthes diseases in human in India.

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Figure 1:

.1 Acknowledgements

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