



## Nematode parasites of invertebrates from Manipur, North East India (Diagnosis, keys and illustration)

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## Abstract

The present report is based on findings of occasional survey work conducted from the region spanning over six years for the presence of insect parasitic nematodes under the superfamily Thelastomatoidea (Nematoda: Oxyurida), parasitic in invertebrate hosts. Out of five families recognized under the superfamily, the present report discusses the findings of four families from Manipur and its adjoining areas as well. For the first time, out of 15 taxa described in the text, seven species are described from the region, eight species reported. The findings of the study will help in understanding of the biodiversity status of insect parasitic nematodes of the region. Diagnosis of the genus, key to species and illustration with line diagrams and photomicrographs are provided in the manuscript.

**Key words:** Insect, Nematode, Oxyurida, Thelastomatoidea, Manipur, India

## Introduction

Manipur state is known as one of the seven sisters of the Northeastern States of India covering an area of 22356km<sup>2</sup> ([http://en.wikipedia.org/wiki/Manipur#cite\\_note-www.e-pao.net-2](http://en.wikipedia.org/wiki/Manipur#cite_note-www.e-pao.net-2)). The present study is based on samples collected during occasional survey work from 1998 – 2003. This report represents the first consolidated account of the nematodes of invertebrates (particularly insects) from Manipur, but including other areas of North-East India as well. Major contributors from other Indian regions are Basir (1956), Rao (1958), and Fotedar (1964). Among them, Basir's contributions were significant, including a monograph and several papers related to thelastomatid nematodes.

Nematodes are one of the most abundant, dynamic, diverse, ecologically and biologically significant groups of organisms on Earth (Bongers and Ferris 1999). They may be free-living in marine and freshwater habitats, soil-inhabiting and parasites, feed on all kinds of higher and lower plants or live as parasites in all Metazoa. As with most animals, nematode populations are regulated by the availability of food reserves (bottom up processes) and by parasitism, competition and predation from other organisms in soil (top down processes).

Nematodes of the order Oxyurida parasitize both invertebrate and vertebrate hosts. The order Oxyurida consists of two superfamilies. Those parasitizing vertebrate hosts belong to the superfamily Oxyuroidea and those nematodes parasitizing invertebrate hosts belong to the superfamily Thelastomatoidea. The superfamily Thelastomatoidea (Nematoda: Oxyurida) consists of nematodes parasitic only in invertebrates. The superfamily consists of five families out of which findings from four families are reported in the present manuscript with particular reference to Manipur, North East India. This will provide information on the parasitic fauna of insect parasitic nematodes of Manipur. As of now, there has never been a thorough report on this particular superfamily from the region. The present information will provide an impetus for understanding the biodiversity of the region. India is one among the twelve mega-diversity country in the world. The country embraces more than 91,307 animal species i.e., over 7.35% of world's known species (<http://www.zsi.gov.in>). India has a long history of *in situ* conservation of biodiversity through protected area networks of 88 National Parks and 490 Wildlife Sanctuaries. The present manuscript brings diverse and new information which will make a major contribution to the subject. Adamson and Van Waerebeke (1992 a,b,c) divided the superfamily Thelastomatoidea into five families: Thelastomatidae, Protrelloididae, Travassosinematidae, Pseudonymidae and Hystrignathidae. Nematodes representing the four families except Hystrignathidae are reported in the present study. The entire report is based on published papers as cited wherever necessary.

## Material and methods

The parasitic nematodes were collected from insect hosts, namely *Periplaneta americana* Linn, *Gryllotalpa africana* Beauvois, and *Hydrophilus triangularis* Say. Detailed explanations of these methods can be found in the original manuscripts cited herein. Specimens can be obtained or borrowed on loan from Dr. S. M. Haris, Assistant Curator, Museum of the Department of Zoology, Aligarh Muslim University, Aligarh-202002, U.P., India (email:shahharis03@gmail.com) by mentioning the name of the species followed by slide number.