



## **Helminth burden among school going children of southern Bengal, India: A survey report**

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### **Abstract**

Soil Transmitted Helminths (STHs) are often neglected in developing nations like India although they have immense public health importance. It is thought to be one of the major barriers for countries development. The study was conducted to generate an idea about the presence of common helminths infection among the school going children (10-15 years). The gangetic plains of West Bengal characterised by humid climate with ample rainfall and moist soil texture was chosen as our study site. Stool samples were collected from the children and helminth burden was estimated using a WHO guided KatoKatz protocol. About 16% of 1192 enrolled children were found to be positive for any STHs infection. Along with high percentage of *Ascaris*, other major helminths like *Schistosoma*, *Trichuris*, etc were also found. The overall rate of infection and egg load per gram was found to be mild to low in context to the demography of the study region but presence of *Schistosoma* made a greater public health concern.

**Keywords:** Helminths, Children, Soil.

### **Introduction**

Soil Transmitted Helminth (STH) infections have a high public health importance especially in developing countries like India. The global diseases burden caused by the common STHs like *Ascaris*, *Trichuris*, Hookworm etc. estimates about 39 million disability-adjusted life years (DALY) (5). Socio-economic structures and other behavioural as well as environmental factors are always a part of the health system that directly or indirectly controls the infestation of STH and other pathogens. Similarly the STH infection can also become a key determinant of countries health status by controlling the workforce (3). Various control strategies and advancement in epidemiological understanding was unable to change the STH burden in the developing nation. One of the major reasons was lack of long term program thus making it impossible to eradicate (4). STHs are considered as one of the health markers (3) for understanding the health and hygiene status of a particular region. This study was conducted to generate an idea about the rate of helminth infection in the gangetic basin of West Bengal. Stool samples were collected from the school going (senior secondary) children through a systemic sampling technique and examined for STHs. The infection rate was found to be mild to low as expected due to the demographic location and climatic condition of the study region, thus suggesting a possibility of better health and hygiene practice in the particular area.

### **Text**

The study was approved by the institutional ethical committee of ‘National Institute of Cholera and Enteric Diseases’, Kolkata, India under Indian Council of Medical Research, Government of India. Literate parents and legal guardians of eligible school children were given an information sheet, whereas illiterate were informed in lay terms by trained volunteers. Written consents were obtained from all participants. The participation was completely voluntary thus allowing the children to withdraw from the study without any obligations.

The study sites were chosen as per their demographic status and were subdivided into 4 major categories: Mangrove regions (Sunderbans i.e. South 24 Parganas district), Laterite soil Community (Bankura and Birbhum district), flood prone areas (Midnapore and Bardhaman district) and urban slum population near metro city (Kolkata). The aim of our study was to assess the burden of STH among the school children of this region. To achieve this goal the 14 study sites were selected within 8 districts and the GPS co-ordinates were recorded for future investigation. The whole selection procedure was performed as per the WHO guidelines (1). Children within 10-15 years of age were randomly selected from those schools with total target population of 1200 subjects. The selected child was provided a plastic stool container with a unique identity number and was invited to return with fresh morning stool on the following day. Upon collection the samples were transferred to the laboratory within 24 Hrs. in an ice cool chamber and were processed the same day as follows.

Two 33.33 mg KatoKatz slides were prepared for each sample and were allowed to clear for at least 30 minutes before microscopic examination (1). The number of helminth eggs for each species was counted separately in case of positive slides. All the negative slides and 10% positive slides were rechecked by senior parasitologist for quality control. The data obtained were preserved in MS EXCEL format. The parasite species specific data and further analysis were restricted to the subjects who have provided the stool sample. Frequency of total as well as each helminth infection was calculated for both district and site level. For each STH positive individual the arithmetic mean egg count was calculated

from Katokatz smears and was classified into light, moderate or heavy intensities as per World Health Organization (WHO) guidelines (ref).

Stool samples were collected from 1192 school going children from southern part of West Bengal. Among the five different Helminths diagnosed i.e. *Ascaris*, *Trichuris trichiura*, *Schistosoma* sp., *H.nana* and *Taenia* sp. 16.36% of study population were infected by any of these Soil Transmitted Helminth parasites. *Ascaris* showed highest prevalence rate but presence of *Schistosoma* in stool created a major public health concern for the study region (Fig 1). As per the soil texture the Mangrove region showed highest prevalence of helminthes (26%) whereas other rural areas showed much lower worm prevalence.

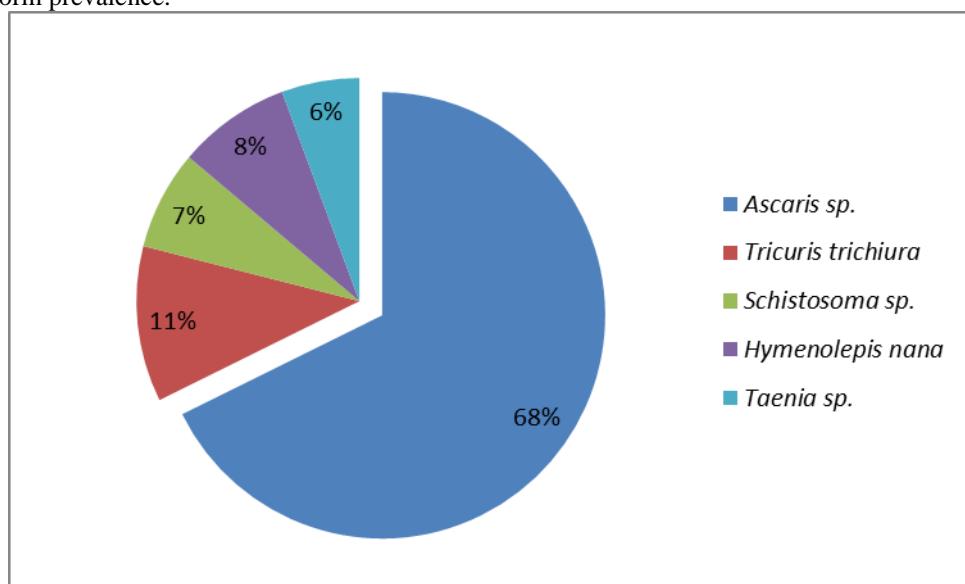


Figure 1: Percentages of each helminth out of 195 positive cases.

Prevalence of *Ascaris* sp., *Trichuris trichiura*, *Schistosoma* sp., and *Taenia* sp. were higher in female than in male but in case of *H. nana* more males were affected than females, but still, gender didn't show to be a significant risk factor (Fig 3).

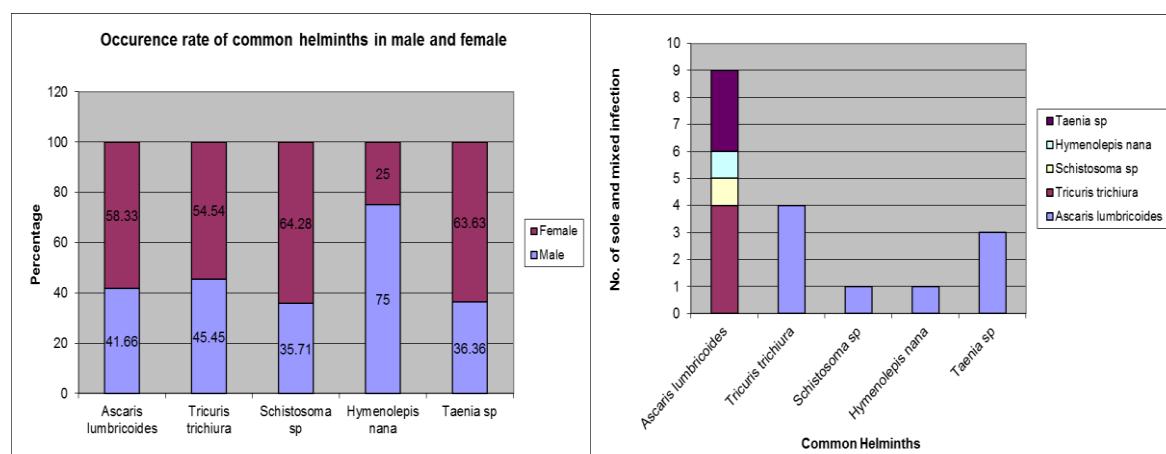


Figure 3: Sex distribution of common helminths found in the study region and evidence of co-infection among them.

## Conclusion

Overall the study provided an idea regarding the helminth infection in the school going children of southern part of Bengal, India. High prevalence rate of *Ascaris* in the population can create an adverse effect on the child health as well as its cognitive capacity (2) and in turn reduces the work force of the population. Moreover identification of *Schistosoma* sp. in the population generates the need of high level public health awareness and requirement of mass deworming program.

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