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BRIEF COMMUNICATION

# Epidemiological Characteristics of Strongyloidiasis in Inhabitants of Indigenous Communities in Borneo Island, Malaysia

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**Abstract:** Epidemiological study on strongyloidiasis in humans is currently lacking in Malaysia. Thus, a cross-sectional study was carried out to determine the prevalence of *Strongyloides stercoralis* infection among the inhabitants of long-house indigenous communities in Sarawak. A single stool and blood sample were collected from each participant and subjected to microscopy, serological and molecular techniques. Five species of intestinal parasites were identified by stool microscopy. None of the stool samples were positive for *S. stercoralis*. However, 11% of 236 serum samples were seropositive for strongyloidiasis. Further confirmation using molecular technique on stool samples of the seropositive individuals successfully amplified 5 samples, suggesting current active infections. The prevalence was significantly higher in adult males and tended to increase with age. *S. stercoralis* should no longer be neglected in any intestinal parasitic survey. Combination of more than 1 diagnostic technique is necessary to increase the likelihood of estimating the 'true' prevalence of *S. stercoralis*.

Key words: *Strongyloides stercoralis*, soil-transmitted helminth (STH), ELISA, PCR, Malaysia

The threadworm, *Strongyloides stercoralis* is a soil-transmitted helminth (STH) causing the disease strongyloidiasis. It is one of the most overlooked and neglected nematode infections, although an estimated 30-100 million people are infected worldwide [1-3]. It is endemic worldwide especially in the tropical and temperate zones as well as resource poor countries with inadequate environmental and sanitary conditions along with poor hygiene. Despite its high prevalence, the 'true' epidemiological data on the geographic distribution and global burden are largely lacking and scarce [3]. Its prevalence is often underestimated compared to other STHs species [1-3]. In Malaysia, there are only a few data on epidemiological studies of *S. stercoralis* are which available. Moreover, most of the previous studies were carried out mainly among rural communities in Peninsular Malaysia with prevalence rate ranging from 1.2% to 1.7% [4-6]. As for Thailand in particular, the epidemiology of *S. stercoralis* has been studied in some detail with prevalence ranging between 2.3% and 28.9% [7,8] and other countries, including Cambodia (10.3-21%) [9,10], China (11.7%) [11], and Japan (5-10%) [12].

The difficult diagnosis and irregular excretion of larvae lead to an underreporting of its prevalence rates [13]. To date, there is no universally agreed gold standard for diagnosing *S. stercoralis* infection [3]. An important underlying reason is that one of the most widely used diagnostic techniques in parasitic epidemiological studies is simple microscopy examination which often fails to detect *S. stercoralis*, mainly due to its low sensitivity [14]. Concentration techniques [15] and larval cultivation [16] are more sensitive diagnostic tools which, however, are laborious, time consuming to perform, and not suitable to be used in large-scale epidemiological studies.

Alternatively, several serological approaches have also been developed to diagnose strongyloidiasis. In comparison to microscopy, serological method is sensitive but still suffers from high variables in specificity depending on the antigen and protocol used. Cross reactions with other STHs have also been reported with serological technique particularly in endemic areas where co-infection is common [7]. DNA-based methods

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