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**EPIDEMIOLOGICAL SURVEYS OF *Blastocystis* SPP. ISOLATES FROM THE  
PROTO-MALAY AND NEGRITO TRIBES IN PENINSULAR MALAYSIA**

**By**

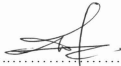
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## DECLARATION

I hereby declare that this thesis is my original work and has not been submitted previously or currently for any other degree at UiTM or any other institutions.

JULY 2015



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## ABSTRACT

*Blastocystis* spp. is an enteric protozoan which is most commonly isolated organism in parasitological surveys. The distribution of the *Blastocystis* spp. appeared to be global as the infection typically in developing, tropical and subtropical countries. Nevertheless, the transmission of this parasite to human beings is still controversial and varied among reports from different geographic regions. Therefore, the present study was conducted to evaluate the prevalence and risk factors that might be associated with *Blastocystis* spp. infection. A series of cross-sectional study were carried out among 289 individuals from the Proto-Malay (150) and the Negrito (139) tribes and took place in selected villages in Negeri Sembilan and Perak, Peninsular Malaysia. The socio-demographic data for each individual was provided by using pre-tested questionnaire. The fecal samples were subjected to microscopic examination using Wheatley's trichrome stain and formalin-ether sedimentation techniques. The laboratory diagnosed with the *Blastocystis* spp. indicated the prevalence was greater in Negritos as compared to Proto-Malays (21.6% vs.13.3%). Moreover, this findings showed decrease in increasing age as the distribution of the infection was highest in individuals less than 15 years old (19.8%) as compared to their counterparts. Higher prevalence was reported in females compared to males in the ratio of 1.2:1. The univariate and multivariate analyses showed that the risk of being infected by *Blastocystis* spp. among the Proto-Malay tribe was associated with drinking of untreated water (OR = 6.25; 95% CI = 1.52, 25.70;  $p = 0.019$ ) and human-to-human transmission (OR = 21.48; 95% CI = 6.70, 68.82;  $p < 0.001$ ). Similar findings was found in the Negrito tribe where drinking of untreated water (OR = 2.79; 95% CI = 1.10, 7.03;  $p = 0.026$ ) and human-to-human transmission (OR = 6.19, 95% CI = 2.55, 14.98;  $p < 0.001$ ) were also found to be significant risk factors of blastocystosis. This was consistent with the results for the overall population. Substantially, *Blastocystis* spp. infection is a major public health concern among Orang Asli population in Malaysia. Further studies involved the molecular approaches are essential to identify the subtype of *Blastocystis* spp. that responsible for this infection. The current study discovered that the blastocystosis was communicable through waterborne and anthroponoses among two tribes. Thus, the intervention of government in supplying clean water and health screening were urgently needed in averting the spread of this peculiar parasite.

## CHAPTER 1 INTRODUCTION

*Blastocystis* spp. is one of the most common intestinal protozoa that infect the human. It is a unicellular parasite that most commonly found in fresh fecal sample in man (Yaicharoen *et al.*, 2005). Initially, *Blastocystis* spp. was classified as the cyst of flagellate, vegetable, yeast and fungus. However, subsequent reclassification into protist was done based on many protistan features, where it was found to be resistant to antifungal drugs and failed to grow on fungal media. The *Blastocystis* spp. also was sensitive to anti-protozoal drugs metronidazole and emetine (Zierdt *et al.*, 1988; Tan *et al.*, 2008). *Blastocystis* spp. is not monophyletic with the fungi, yeast sarcodines or sporozoans and yet it should be placed among the stramenopiles based on an earlier analysis of the SSU rDNA genes (Johnson *et al.*, 1989). However, different studies later involving EF-1 $\alpha$  suggested that *Blastocystis* spp. has diverged before the stramenopiles. This suggests that it is a close relative of *Entamoeba* spp. (Ho *et al.*, 2000).

Generally, *Blastocystis* spp. is the most commonly isolated organism in parasitological surveys found in the fecal specimens of patients (Baldo *et al.*, 2004). The dramatic increase of this parasite may be restrained with the knowledge of the mode of transmission, pathogenesis and distribution. The distribution of *Blastocystis* spp. infection is worldwide and has been found to be more widespread in several developing countries (Aguilar *et al.*, 2007; Stensvold *et al.*, 2009b) compared to the develop countries. The prevalence is high in developing countries which include Brazil (40.9%) (Aguilar *et al.*, 2007) and Cuba (38.5%) (Escobedo *et al.*, 2007) while it is low in countries such as Japan (0.5 to 1%) (Hirata *et al.*, 2007) and Singapore (3.3%) (Wong *et al.*, 2008).