

CONTAMINATION OF SOIL WITH PARASITE EGGS IN MADRICH, YAP ISLANDS, FEDERATED STATES OF MICRONESIA

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Abstract

Soil samples were collected from shady ground of dwelling areas in Madrich. Detection of parasite eggs from soil samples were carried out. Three species of helminth eggs, *Ascaris lumbricoides*, *Trichuris trichiura* and *Txocara canis* were detected. Among the 10 soil samples examined, *A. lumbricoides* eggs were detected in 4 samples, and *T. trichiura* eggs were in one sample. *Txocara canis* eggs were also detected in 6 samples. *A. lumbricoides* and *T. canis* eggs contained infective larvae.

Keywords: intestinal parasite, *Toxocara canis*, soil, Yap Islands, Federated States of Micronesia

Introduction

Parasitism is usually considered as a common condition in rural populations in developing countries. Although the mortality rate by intestinal helminth infections is low, these infections are recognized as a serious public problem because of the high prevalence. In our previous survey, of 111 persons examined, 12 (10%) were infected with one or two species of intestinal parasite in Yap Islands. The prevalence of intestinal parasites was relatively high in Rull (26.2%) (NODA et al. 2001). Eggs of *Ascaris lumbricoides* and *Trichuris trichiura* are discharged into natural environments, and develop to embryonated egg stage under appropriate climate conditions. Embryonated eggs are ingested by humans with dust or food. The source of parasite egg contamination to environments is untreated human feces. This study was conducted to recover parasite eggs from soil samples collected in Madrich, Yap Islands.

Materials and Methods

Soil samples were collected from shady ground of dwelling areas in Madrich. Detection of parasite eggs from soil samples was carried out according to the method reported by UGA and KATAOKA (1995). Collected samples were dried overnight in the shade and sifted through a 150- μ m mesh sieve. Approximately 2 gm of the powdery sand obtained was placed in a test tube and suspended in approximately 8 ml of 0.05% Tween 20 solution. After centrifugation of the test tube at 80 g for 10 minutes, the supernatant was removed and sucrose solution with a specific gravity of 1.200 was added to fill the tube 1 cm from the top. The tube was then filled to the top with the sucrose solution so that only a small bubble was formed when a cover glass was placed on the tube. After a final centrifugation of the tube at 25 g for 5 minutes, the cover glass was removed from the tube, placed on a slide glass, and examined under a microscope. The same test tube was then treated repeatedly using three final steps to recover more eggs.

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Results and Discussion

Three species of helminth eggs, *Ascaris lumbricoides*, *Trichuris trichiura* and *Toxocara canis* were detected (Table 1 and Fig. 1). Among the 10 soil samples examined, *A. lumbricoides* eggs were detected in 4 samples, and *T. trichiura* eggs were in one sample. *Toxocara canis* eggs were also detected in 6 samples. *A. lumbricoides* and *T. canis* eggs contained infective larvae (Fig. 1a, c). *T. canis* is a parasite that occurs commonly in dogs. Eggs of non-human ascarids such as *T. canis* are capable of undergoing a limited development in the human host. Their parasitological importance to humans involves the occasional symptomatic diseases that result from a condition known as larva migrans. Visceral larva migrans affects primary children. There is hepatomegaly, persistent hypereosinophilia, bronchial asthma and fever.

The results indicate that the surveyed area was contaminated with parasite eggs which were the source of new infection to villagers. Measures to prevent environmental contamination will be concerned with the safe disposal of human and animal excreta and the prevention of food contamination by fecal material. Education of the public in personal hygiene will be necessary. Health education should be based on what the people need to know and what they can do for themselves.

Table 1. Number of parasite eggs recovered from soil samples

Sample No.	Species		
	<i>Ascaris lumbricoides</i>	<i>Trichuris trichiura</i>	<i>Toxocara canis</i>
1	0	0	0
2	2	0	1
3	0	0	0
4	0	0	0
5	1	0	5
6	0	0	0
7	0	0	1
8	1	0	6
9	1	2	26
10	0	0	22

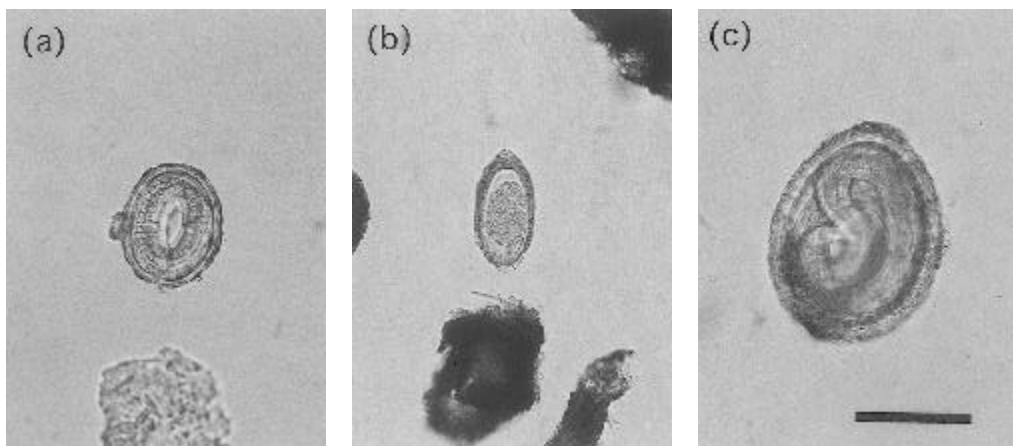


Fig. 1. Recovered parasite eggs; (a) *Ascaris lumbricoides* (b) *Trichuris trichiura*. (c) *Toxocara canis* (Bar=50µm).

References

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