

Examination of fingernail contents of Students at The Inpres Yoka Public Elementary School in Jayapura City, Papua

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ABSTRACT

One environmental disease that is a public health concern is worm infection. Soil-transmitted helminths (STH) are a type of worm infection caused by various types of intestinal worms that spread through the soil. The purpose of this study was to determine the presence or absence of intestinal worm eggs in nail clippings from public elementary school students in Jayapura City. This study is descriptive in nature with a laboratory test approach. This study was conducted at the Microbiology Laboratory, Faculty of Health Sciences, Jayapura University of Science and Technology, from March 1, 2025, to June 1, 2025. The population in this study was all students attending public elementary schools in Jayapura City. The samples used in this study were nail clippings from elementary school students, which were examined using the flotation method on samples emulsified in a saturated NaCl solution, followed by microscopic identification. The results showed that of the 32 samples (100%) examined, 6 samples (18.75%) were positive for intestinal worm eggs, including 3 samples (9.37%) of *Ascaris lumbricoides* eggs (fertile) and *Ascaris lumbricoides* eggs (unfertile) in 3 samples (9.37%), and negative results without intestinal nematode eggs in 26 samples (81.25%).

INTRODUCTION

Worm infections are one of the diseases caused by environmental factors and are a problem for public health. Worm infections caused by several types of intestinal worms transmitted through soil are called Soil Transmitted Helminths (STH). Factors that influence worm infestation include climatic conditions, low socioeconomic status and education, poor environmental sanitation, and personal hygiene. Based on data from the World Health Organization (WHO), it is known that the incidence of worm infections in the world is still high, with 1 billion people infected with *Ascaris Lumbricoides*, 795 million people infected with *Trichuris trichiura*, and 740 million people infected with Hookworm (Indonesian Ministry of Health, 2007; WHO, 2017). According to the Indonesian Ministry of Health (2013), soil-transmitted helminth infections (STH) most commonly affect children aged 6-12 years, or those attending elementary school, with a total of 189 million children infected. Based on the results of a survey of elementary school children in 175 districts/cities in 2013, the prevalence of worm infections in Indonesia reached 85.9%, with a national average of 28.12%. The types of worm parasites identified in the survey were *Ascaris lumbricoides* (60%), *Trichuris trichiura* (16%), hookworm (7%), and other types of worms (17%).

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Environmental sanitation conditions are closely related to worm infections in elementary school children. This is because inadequate environmental sanitation can be a source of worm transmission to the human body (Martila et al., 2015).

STH infections affect children more because their activities are often related to soil. Soil contamination is the main cause of worm egg transmission from soil to humans through hands or nails that contain worm eggs, which then enter the mouth along with food (Chadijah et al, 2014).

Worm Infections in Jayapura City According to data from the Papua Provincial Health Office (2011), there were 528.8 cases of worm infections per 1,000 residents, while the Jayapura City Health Office reported 2.48 cases per 1,000 residents in 2011. According to data from the Abe Pantai Community Health Center, the prevalence of intestinal worms in 2012 was 3.21 per 1,000 residents. The prevalence at the Hedam Community Health Center, Waena Community Health Center, and Kotaraja Community Health Center in 2012 was 1.94 per 1,000 population, 1.25 per 1,000 population, and 0.94 per 1,000 population, respectively (Martila et al., 2015).

SD Negeri Inpres Yoka Pantai is one of the public elementary schools located in the Heram District, Jayapura City, Papua. SD Negeri Inpres Yoka Pantai was established on November 10, 1973, with Establishment Decree Number 71 KPTS BUP JP 1973 under the Ministry of Education and Culture. In terms of learning activities, the school has 207 students, consisting of 110 male students and 97 female students, and is guided by 12 teachers who are professionals in their fields (Ministry of Education and Culture, 2025). Based on this background, the author is interested in taking the research title “Examination of fingernail contents of Students at The Inpres Yoka Public Elementary School in Jayapura City”

MATERIALS/METHOD

This study is descriptive in nature with a laboratory test approach to identify intestinal worm eggs in the fingernail clippings of students at Yoka Elementary School in Jayapura City. The research samples consisted of fingernail clippings from students attending Yoka Elementary School in Jayapura City, with a total of 32 samples. The samples used in this study were elementary school students' fingernail clippings, which were examined using the flotation method on samples emulsified in a saturated NaCl solution, followed by microscopic identification, tabulation, and discussion with supporting theories.

RESULTS AND DISCUSSION

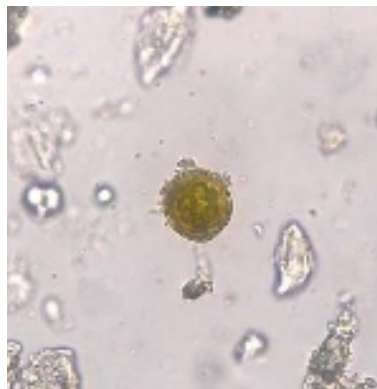
Table 1 Result of Examination on fingernail contents of Students at The Inpres Yoka Public Elementary School in Jayapura City

No	Types of Examinations	Number of Samples	Examination Results		Types of Worms
			Negative (percentage)	Positive (percentage)	
1.	Microscopic Examination	32	26 (81,25%)	6 (18,75%)	3 Ascaris lumbricoides (fertil) 3 sample
					3 Ascaris lumbricoides (infertil) 3 sample

Based on Table 1, it shows that out of 32 samples (100%) examined, 6 samples (18.75%) tested positive for intestinal nematode eggs in the nail clippings of students at SDN Inpres Yoka Kota Jayapura, including 3 samples (9.37%) of *Ascaris lumbricoides* (infertile)

worm eggs and *Ascaris lumbricoides* (fertile) eggs in 3 samples (9.37%), while 26 samples (81.25%) tested negative.

In the research results, it shows that *Ascaris lumbricoides* nematode eggs are the dominant species obtained from nail samples of students at SDN Inpres Yoka Elementary School in Jayapura City. Among them are fertilized *Ascaris lumbricoides* eggs and unfertilized *Ascaris lumbricoides* eggs. *Ascaris lumbricoides* worms have two types of eggs, namely fertilized eggs (picture 1) and unfertilized eggs (picture 2). Fertilized eggs are oval-shaped, measuring 45-70 x 35-50 microns, consisting of a colorless outer shell. The outer layer of the shell is covered by a layer of albumin with a serrated surface (mamillation) and a brown color, which is due to the absorption of bile pigments. Meanwhile, the inner part of the shell has a thin but very strong vitelline membrane, which allows *Ascaris lumbricoides* worm eggs to survive for up to one year in the soil. Fertilized eggs have an ovum without segments, while at both poles there are air chambers that appear bright and crescent-shaped (Soedarto, 2019).



Picture 1. Fertilized Eggs



Picture 2. Unfertilized Eggs

The research results obtained on the identification of intestinal nematode eggs in the nail clippings of students at SD Negeri Inpres Yoka Kota Jayapura are in accordance with Widoyono (2011), where the factors that influence worm infestation are environmental hygiene, personal hygiene, clean water supply, cleanliness of the floor of the house, use of healthy toilets, and food hygiene. Personal hygiene is important for prevention, such as keeping nails short, washing hands thoroughly before eating, and wearing footwear to protect the skin from soil contaminated with worms. This shows a lack of implementation of clean and healthy living behaviors (PHBS), such as awareness of washing hands before eating, after defecating, not wearing footwear when playing outside, and nail hygiene. Parasites can cause a decline in health, nutrition, intelligence, and productivity. Parasites in children cause permanent malnutrition, which in the future will have short-term effects according to age (stunting), lack of nutrient absorption, anemia, and growth disorders in children, so it is important to monitor parasites in children (Sutanto, 2013).

Nail hygiene can cause worm infections because long, dirty nails harbor bacteria that spread disease and cause infections, including worms. Nails should be cut short and kept clean using nail clippers or sharp scissors. If there is dry skin around the nails, apply lotion or mineral oil, and soak the nails if they are thick and rough. Worm eggs often get stuck under dirty nails. This condition often occurs in children who play in the dirt and in adults who work in gardens or rice fields. Symptoms that often appear in this infection are damage to the nails, including thickening and separation from the nail bed or onycholysis, cracking,

unevenness and loss of shine, as well as discoloration of the nail plate to white, yellow, brown, or even black (Setianingsih et al., 2015).

CONCLUSIONS

The main conclusion of this study is that hygiene among children at SDN Yoka is not yet optimal. Among other things, these children have long and dirty nails, and rarely wash their hands before and after activities at school. The discovery of six positive samples of *Ascaris lumbricoides* eggs indicates that the school needs to pay special attention to educating students more frequently about maintaining personal hygiene, especially nail hygiene. In addition, the results of this study were reported to the school and the nearest community health center, so that they can be taken into consideration in the future for the examination and treatment of intestinal worms in children at SDN Yoka Elementary School in Jayapura City.

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