



Intestinal Parasites: Biology, Transmission, Infection, and Effects on Human Health

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DESCRIPTION

Intestinal parasites are organisms that live within the digestive tract of humans or other hosts and obtain nutrients or other biological benefits from their surroundings. They include several groups of organisms, with helminths and intestinal protozoa being among the most important causes of human infection. These parasites occur in many parts of the world and are particularly common in areas where access to safe drinking water, sanitation, waste management, and healthcare services is limited. However, intestinal parasitic infections can also occur in developed regions through contaminated food, travel, contact with infected individuals, and exposure to contaminated recreational or natural water.

Intestinal parasites differ widely in their structure, life cycle, method of transmission, and effects on the host. Helminths are multicellular organisms that include roundworms, tapeworms, and flukes. Protozoa are microscopic single-celled organisms capable of multiplying within the host or passing through different developmental stages. Some parasites complete their entire life cycle within one host, whereas others require more than one host or an environmental stage for transmission. Knowledge of these life cycles is important for diagnosis, treatment, and prevention.

Roundworms are among the commonly recognized intestinal helminths. Species such as *Ascaris lumbricoides* can infect humans after ingestion of microscopic eggs present in contaminated soil, food, or water. Following ingestion, larvae hatch and pass through particular stages of development before mature worms establish themselves in the intestine. Adult worms produce eggs that leave the body through feces. When sanitation is inadequate, these eggs can contaminate the surrounding environment and contribute to further transmission.

Hookworms represent another important group of intestinal worms. Their larvae can develop in soil contaminated with human feces and may enter the body through the skin, especially

when people walk barefoot on contaminated ground. After entering the circulation, the larvae can migrate through tissues before reaching the intestine, where adult worms attach to the intestinal lining and consume blood or tissue fluids. Heavy infections can contribute to blood loss and iron deficiency, particularly in children and individuals with inadequate nutritional intake.

Pinworm infection is common in children and is caused by *Enterobius vermicularis*. Adult female worms move toward the area around the anus, usually during the night, and deposit eggs on nearby skin. Scratching the affected area can transfer eggs to the fingers and beneath the fingernails. The eggs may then reach food, household surfaces, clothing, or another person's hands. This creates a cycle of repeated infection within families, schools, and childcare environments.

Tapeworms have a different body structure from roundworms. They consist of a series of segments and attach to the intestinal lining using specialized structures. Human infection can occur through consumption of inadequately cooked meat or other foods containing larval stages. Different tapeworm species have different life cycles and sources of infection. Some are associated with beef or pork, while others may be acquired from fish or contaminated environments.

Intestinal protozoa include organisms such as *Giardia duodenalis* and *Entamoeba histolytica*. *Giardia* can be transmitted through contaminated water, food, or direct contact with infected individuals. It attaches to the small intestinal lining and can interfere with normal digestion and absorption. Infection may cause diarrhea, abdominal discomfort, excessive gas, nausea, and weight loss. Some infected individuals have few or no symptoms but may still contribute to transmission. Infection occurs primarily through ingestion of microscopic forms of the parasite from contaminated food or water. Proper sanitation and personal hygiene are therefore important measures for reducing transmission. Early diagnosis and appropriate treatment can help reduce symptoms and prevent further spread of infection.

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Received: 20-Jan-2026, Manuscript No. JBP-26-32374; **Editor assigned:** 22-Jan-2026, Pre QC No. JBP-25-32374 (PQ); **Reviewed:** 05-Feb-2026, QC No JBP-26-32374; **Revised:** 12-Feb-2026, Manuscript No. JBP-26-32374 (R); **Published:** 19-Feb-2026, DOI: 10.35248/2155-9597.26.17.591

Citation: Everden M (2026). Intestinal Parasites: Biology, Transmission, Infection, and Effects on Human Health. J Bacteriol Parasitol. 17:591.

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CONCLUSION

The symptoms caused by intestinal parasites vary according to the organism, number of parasites, location of infection, duration of infection, and condition of the host. *Entamoeba histolytica* can infect the large intestine and may cause intestinal inflammation and diarrhea. In more serious cases, the organism

can invade intestinal tissues and produce ulcers. Some individuals may remain asymptomatic, while others develop abdominal pain, diarrhea, constipation, nausea, reduced appetite, fatigue, or weight loss. Heavy worm infections can contribute to nutritional deficiencies and impaired physical development. Children may be particularly affected because repeated infections can occur during periods of rapid growth.