

Parasitic Flatworms in Humans

“The *Trematodes* (sometimes called *flukes*) are a group of parasites. There are three subgroups within this subgroup, but two of them have relatively minor effects on the world - one is a parasite mostly on the skin and gills of fish; the other found mostly inside mollusks such as snails. The third group, the *Digenea* include a number of serious parasites of humans and other large animals.

The *Cestodes*, or *tapeworms*, are also parasites. In their adult forms, these worms attach with a specialized "head" to the lining of their hosts intestines and begin to lengthen by adding *proglottids* segments whose entire purpose is sexual reproduction. Tapeworms in large animals can get quite long, with the segments farther back being progressively older. Reproduction occurs between mature proglottids, which then fill with eggs and either drop off to be passed or break apart, so the eggs will be passed. As adults, tapeworms tend to be very host-specific: they can only live in one or a few species of hosts – and often cause hardly any ill effects to the host. Many species can control how many individual tapeworms are present in a host, somehow preventing new ones from attaching when a few are already there. In their larval forms, however, tapeworms may be much more dangerous to the host”

TREMATODES OR FLUKES

“There are many types of trematodes, or flukes, that cause human disease. They include *Schistosomes*, which infect perhaps a quarter-billion people, with well over twice that at risk for the disease. There are three different species of schistosomes, can be found around world. Snails are the intermediate hosts for schistosomes – each fluke species has particular snails that they must infect in order to complete their life cycles. After reproducing in the snails, the larvae swim about seeking skin to burrow through. Once under a humans skin, the larvae migrate eventually through the blood to the linings of either the intestine or the bladder (depending upon the species of fluke). In the linings, they reproduce sexually and the females lay eggs. If all goes well for the worm, the eggs pass into the space of the intestine or bladder and are passed into a water body where they can hatch and the early larvae can infect more snails. In many cases, though, the eggs don't make it out, and circulate in the body. Sometimes the eggs have spines (for tearing through the linings), which make them very damaging as they circulate; sometimes the body, in an attempt to fight the invaders, just makes matters worse.

“In North America, a *schistosome* of water birds can invade humans by mistake and cause an irritation and rash called swimmers itch. These worms, evolved to live in birds, cannot survive long in mammals like us, though.

The Chinese liver fluke is common in eastern Asia. It's life cycle starts, like schistosomes, with a snail, but the emerging larvae attach to fish (or to crustaceans which are then eaten by fish), and it is through the eating of uncooked Asian freshwater fish that it passes to humans. The

adult flukes live in the liver, eating the tissues; their eggs travel down the bile duct to the intestines and out.

CESTODES / TAPEWORMS

As mentioned above, adult tapeworms in the intestine rarely cause serious health problems. It is when humans become the intermediate hosts that real problems can happen.

The beef and pork tapeworms, genus *Taenia*, rarely use humans as definitive hosts. If eggs are picked up, from eating poorly-cooked infected meat or from contaminated vegetation (watercress is a common source), the larvae bore out of the digestive system and use the blood to get to various places in the body. Asexual reproduction produces a larva that resembles a cyst, which can damage surrounding tissues.

A similar type of infection can be caused by larvae of a tapeworm of carnivorous mammals, including dogs and cats. Eggs picked up from the environment and accidentally swallowed produce larvae that grow in humans as hydatids, sometimes called bladder worms. These may become quite large if the structures around them allow it. The hydatids can both press on neighboring organs and cause trouble, or cause allergic reactions to the worm fluid inside them.”

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