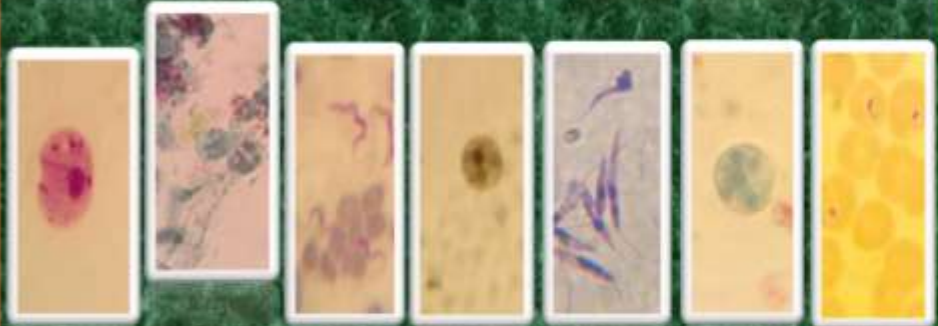
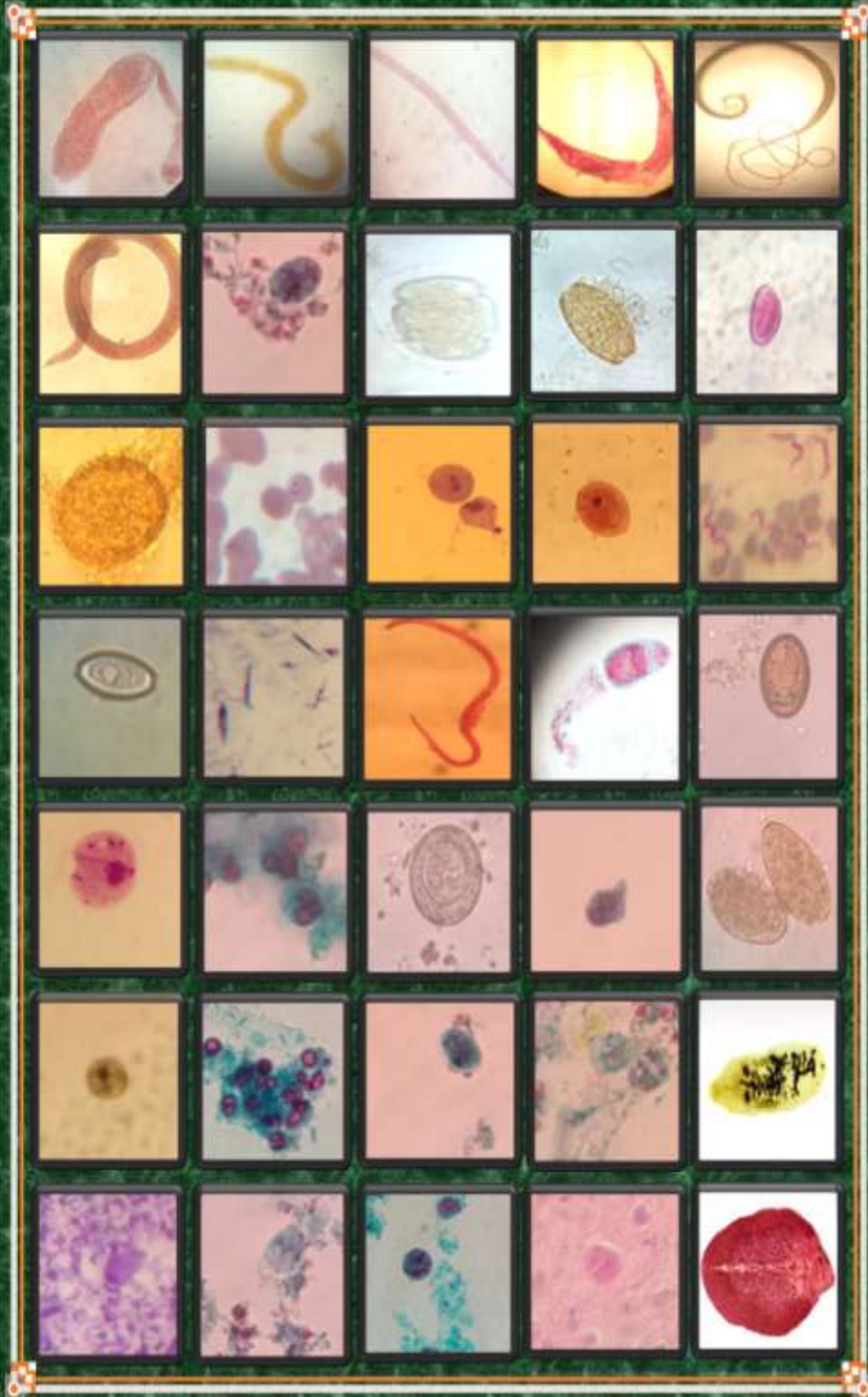


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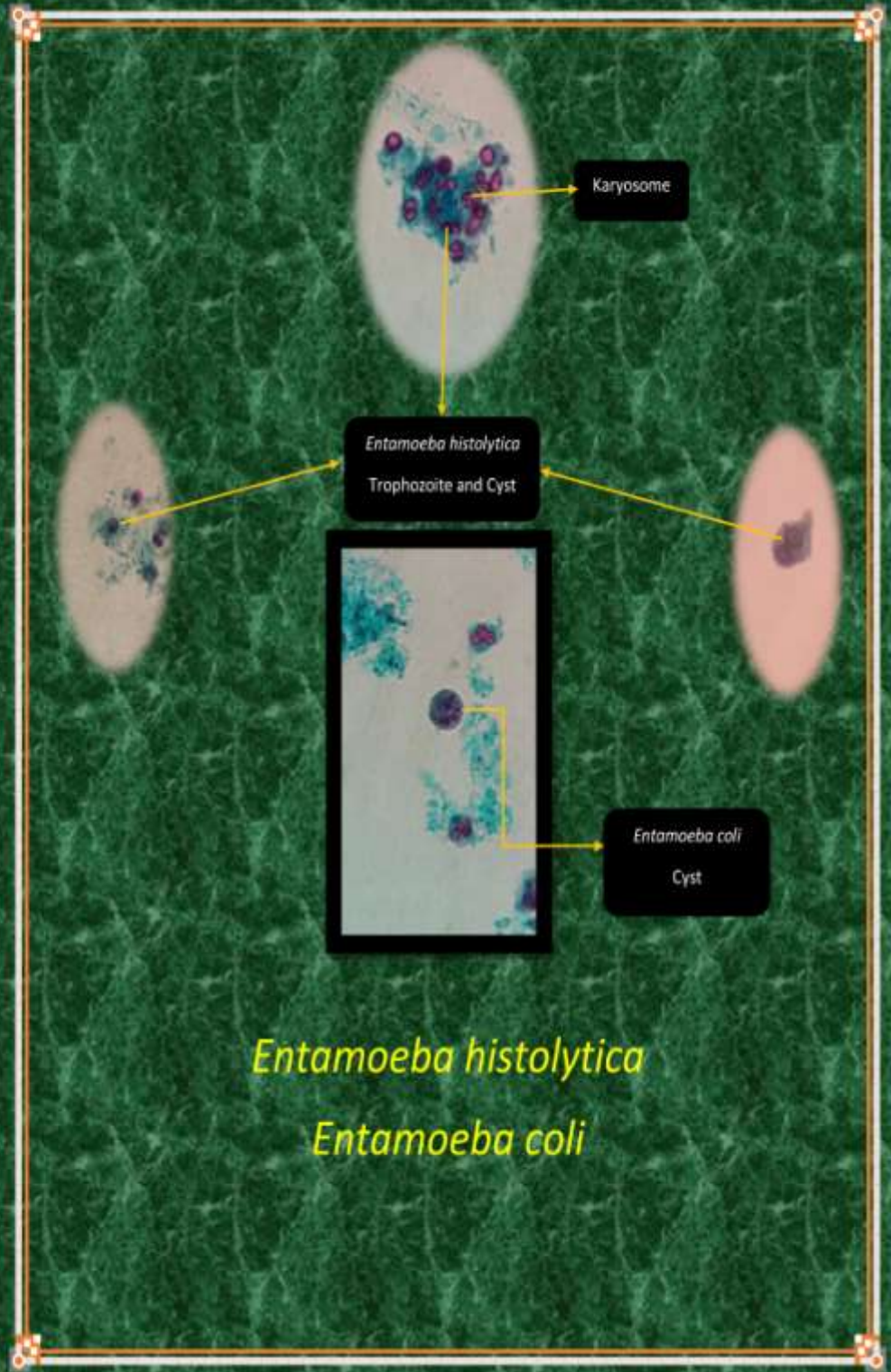
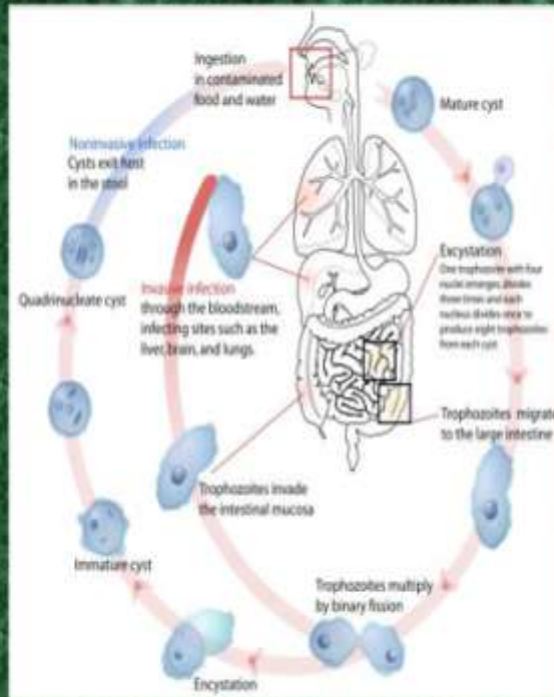
Entamoeba histolytica is an anaerobic parasitic protozoan, part of the genus *Entamoeba*. Predominantly infecting humans and other primates, *E. histolytica* is estimated to infect about 50 million people worldwide.

The active (trophozoite) stage exists only in the host and in fresh loose feces; cysts survive outside the host in water, in soils, and on foods, especially under moist conditions on the latter.

When cysts are swallowed they cause infections by excysting (releasing the trophozoite stage) in the digestive tract.

Infection can be asymptomatic or can lead to amoebic dysentery or amoebic liver abscess. Symptoms can include fulminating dysentery, bloody diarrhea, weight loss, fatigue, abdominal pain, and amoeboma. It can be diagnosed by stool samples, but it is important to note that certain other species are impossible to distinguish by microscopy alone. Trophozoites may be seen in a fresh fecal smear and cysts in an ordinary stool sample. ELISA or RIA can also be used.

Entamoeba coli is a non-pathogenic species of *Entamoeba* that frequently exists as a commensal parasite in the human gastrointestinal tract. (Wikipedia).



Entamoeba histolytica
Entamoeba coli

Dicrocoelium dendriticum

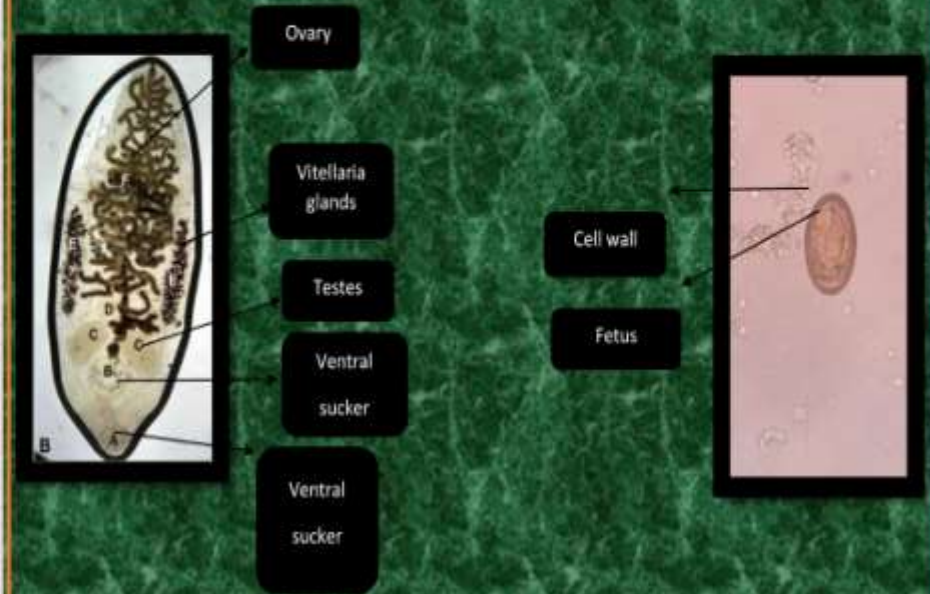
along with *Dicrocoelium hospes* are part of a group of trematodes that can infect the bile ducts of humans. Because the bodies of these parasites are long and narrow, infections are generally confined to the more distal parts of the bile ducts. As a result, most *Dicrocoelium dendriticum* infections of the biliary tree produce only mild symptoms. These symptoms can include biliary colic and general digestive disturbances, including bloating and diarrhea. However, in heavier infections, bile ducts and the biliary epithelium may become enlarged in addition to the generation of fibrous tissue surrounding the ducts, and as a result, causing an enlarged liver (hepatomegaly) or inflammation of the liver (cirrhosis). In one unique case, an infection with *Dicrocoelium dendriticum* was associated with a skin rash urticaria.

Due to the highly specific nature of this parasite's life cycle, human infections are generally rare. Ruminants such as cows and sheep are usually the definitive host, but other herbivorous mammals and humans can also serve as definitive hosts through ingestion of infected ants. One definitive case involved a man who ingested bottled water contaminated by infected ants. Traditionally, diagnosis for dicrocoeliasis infection involves the identification of *Dicrocoelium dendriticum* eggs in the faeces of a human or other animal. However, in humans, eggs in the stool may be a result of ingesting raw infected animal liver and may not in fact indicate dicrocoeliasis. Therefore, examining bile or duodenal fluid for eggs is a more accurate diagnostic technique in combination with a liver-free diet.

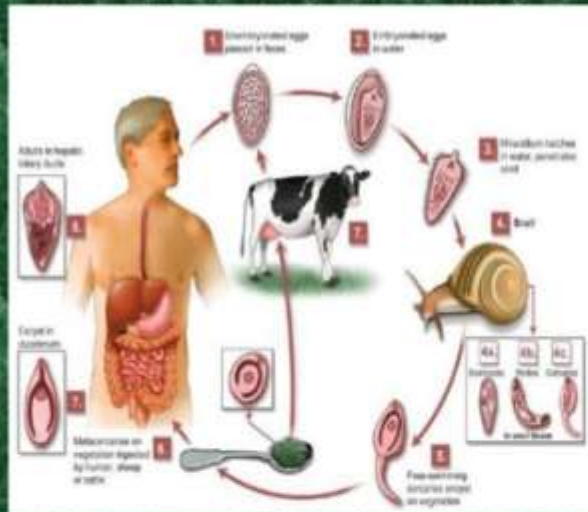
In animals, diagnosis has traditionally involved stool examination or post-mortem examination of the liver. Recently, an ELISA using a *Dicrocoelium dendriticum* antigen was able to identify cases of dicrocoeliasis in sheep in Italy 28 days earlier than traditional methods. (Wikipedia)



Dicrocoelium dendriticum



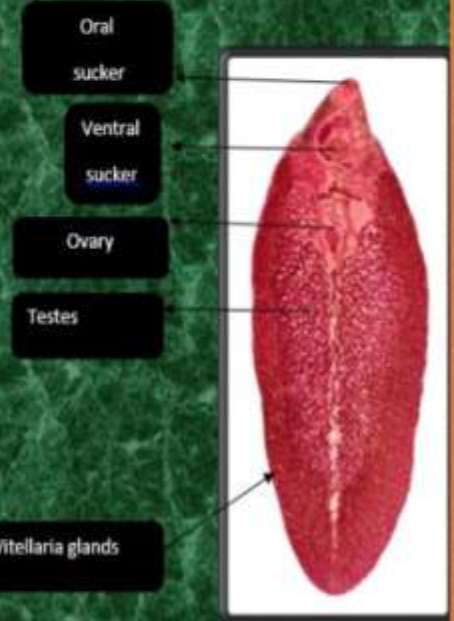
Fasciola hepatica, also known as the **common liver fluke** or **sheep liver fluke**, is a parasitic flatworm (a type of helminth) of the class Trematoda, phylum Platyhelminthes that infects the livers of various mammals, including humans. The disease caused by the fluke is called fascioliasis (also known as fasciolosis), which is a type of helminthiasis and has been classified as a neglected tropical disease. *F. hepatica* is distributed worldwide, and causes great economic losses in sheep and cattle. It has been known as an important parasite of sheep and cattle for hundreds of years. Because of its size and economic importance, it has been the subject of many scientific investigations and may be the best-known of any trematode species. Specific diagnosis depends on finding eggs in the stool. A false record can result when the patient has eaten infected liver and egg passes through the feces. Daily examination during a liver-free diet will unmask the false diagnosis. (Wikipedia)



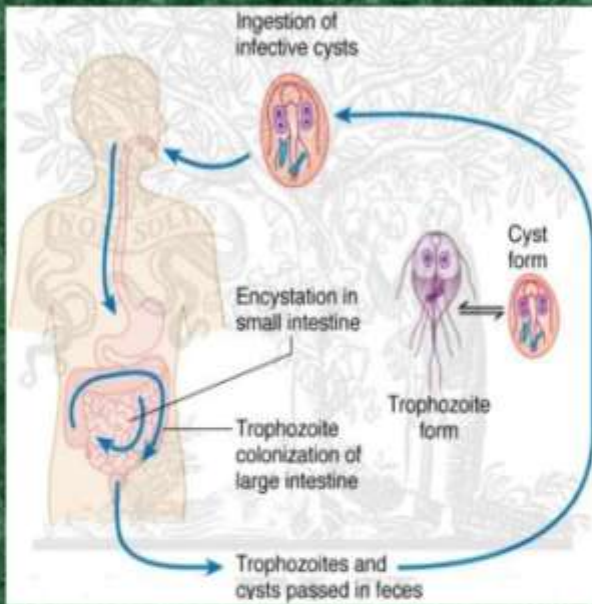
Fasciola hepatica



Operculum

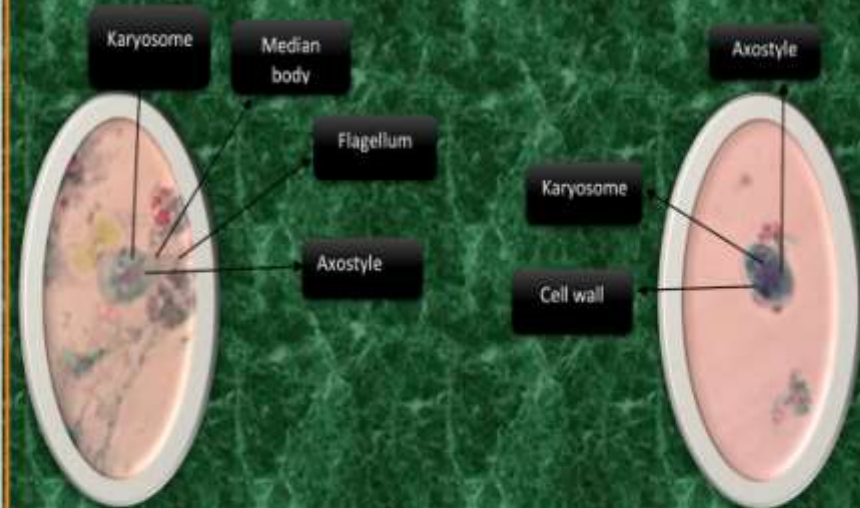


Giardia lamblia is a flagellated protozoan parasite that colonizes and reproduces in the small intestine, causing giardiasis. The parasite attaches to the epithelium by a ventral adhesive disc, and reproduces via binary fission. Giardiasis does not spread via the bloodstream, nor does it spread to other parts of the gastrointestinal tract, but remains confined to the lumen of the small intestine. *Giardia* trophozoites absorb their nutrients from the lumen of the small intestine, and are anaerobes. If the organism is split and stained, its characteristic pattern resembles the familiar "smiley face" symbol. Chief pathways of human infection include ingestion of untreated sewage, a phenomenon particularly common in many developing countries; contamination of natural waters also occurs in watersheds where intensive grazing occurs.

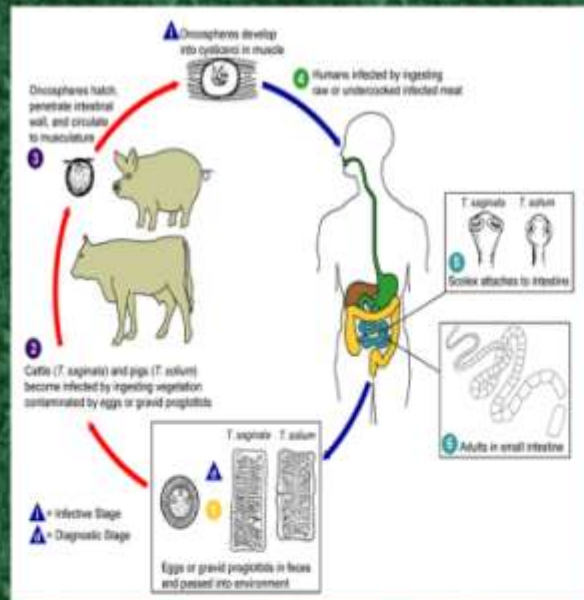


Giardia infection can occur through ingestion of dormant microbial cysts in contaminated water, food, or by the faecal-oral route. The cyst can survive for weeks to months in cold water. (Wikipedia)

Giardia lamblia



Hymenolepis nana is a cosmopolitan species though most common in temperate zones, and is one of the most common cestodes (a type of intestinal worm or helminth) infecting humans, especially children. As its name implies (Greek: nanos – dwarf), it is a small species, seldom exceeding 40 mm long and 1 mm wide. The scolex bears a retractable rostellum armed with a single circle of 20 to 30 hooks. The scolex also has four suckers, or a tetrad. The neck is long and slender, and the segments are wider than long. Genital pores are unilateral, and each mature segment contains three testes. After apolysis gravid segments disintegrate, releasing eggs, which measure 30 µm to 47 µm in diameter. The oncosphere is covered with a thin, hyaline, outer membrane and an inner, thick membrane with polar thickenings that bear several filaments. The heavy embryophores that give taeniid eggs their characteristic striated appearance are lacking in this and the other families of tapeworms infecting humans. Rostellum remains invaginated in the apex of the organ. Rostellar hooklets are shaped like tuning fork. Neck is long and slender, the region of growth. Strobila starts with short, narrow proglottids, followed with mature ones. (Wikipedia)



Hymenolepis nana

