

EFFECT OF INTERMEDIATE HOST 'SNAIL' ON PARASITIC POPULATION

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Abstract

Snails are invertebrate animals, belonging to the Phylum Mollusca. This group of organisms possesses a unique feature, known as "shell" which is a major characteristic of the group. The snail inhabits a wide range of habitats because they are found not only in freshwater environment but also in other ecological niches. Some snails are medically important because they transmit disease-causing trematodes in humans and other animals. Most of the diseases caused by snail-borne trematodes are prevalent in the tropic and sub-tropic regions of the world, and the medical and economic burden of these diseases are often neglected which is why they are called neglected tropical diseases. The distribution of the diseases caused by snail-borne trematodes especially schistosomiasis is focal. Hence, the parasites distribution is strongly dependent on the intermediate snail hosts distribution. Snails have four roles in the life cycles of the parasites they host: as an intermediate host infected by the first-stage larvae, as the only intermediate host infected by miracidia, as the first intermediate host that ingests the parasite eggs are ingested, and as the first intermediate host penetrated by miracidia with or without the second intermediate host being an aquatic animal. Snail-borne parasitic diseases target many organs, such as the lungs, liver, biliary tract, intestines, brain and kidneys, leading to overactive immune responses, cancers, organ failure, infertility and even death. Developing countries in Africa, Asia and Latin America have the highest incidences of these diseases, while some endemic parasites have developed into worldwide epidemics through the global spread of snails. Physical, chemical and biological methods have been introduced to control the host snail populations to prevent disease. Any animal, plant, or protest that spends a portion or all of its life intimately associated with another organism of a different species is considered to be a symbiont or host-parasite relationship. A parasite relationship in which, one member of the association benefits while the other is harmed (Ahmodjian and Paracer, 2000). Parasitism may be regarded as an ecological association between species in which, one parasite lives on or in the body of the other, the host. The parasite may spend the majority of its life in association with one or more host species, or alternatively it may spend only short periods, adopting a free living mode for its developmental cycle.

Larval stages of parasites completed in association with definitive host (final host) and intermediate host. Definitive host (final host) is the organism in which a parasite passes its adults and sexual existence. Intermediate host is the organism in which a parasite passes its larval or non-sexual existence.

Larval helminth in fish hosts are transmitted to their definitive hosts (larger predatory fish, birds or marine mammals) by predation, clearly the best fish species to use as intermediate hosts would be small bodied enough to serve as prey and they should not be top predators (they would have to be near the bottom or middle of the food chain, not at the very top) (George Nascimento, 1987; Marcogliese, 2002).

Freshwater crustacean such as a copepod is the first intermediate host of adult cestode.

Insect larvae, copepods and tubificid worms have often been accused as the first intermediate host of parasitic nematodes and molluscs as the first intermediate host of trematode.

Trematode that parasitize livestock are hermaphrodites (except the schistosomes) but they have the ability to reproduce asexually and multiply in aquatic or amphibious snails, which they require as intermediate hosts in order to complete their life cycles. Most flukes are very discriminating in their choice of snail as intermediate host and geographic distribution of trematode species dependent to the distribution of suitable species of snails.

Parasites occupy the same position in a functional food web as predators, and thus can exact similar impacts on their hosts as

predators on pray. Digenea trematodes are a widespread group of parasitic flatworms that use snails almost exclusively as first intermediate hosts (Schmidt and Roberts, 1996). Trematodes have a complex life cycle involving several host species, with a

a [gill](#) and an operculum, aquatic gastropod molluscs in the family Viviparidae.

Snail habitat includes all types of fresh water bodies ranging from small temporary ponds and streams to large lakes and rivers. They live on water plants, mud that is rich in decaying organic matter. They are most common in waters where water plants are abundant and in water moderately polluted with organic matter such as faeces and urine, as it often the case near human habitations.

Azygia Sp. complete their life cycle in association with intermediate host snail



Bellamya bengalensis

present study area, there are high population of *Azygia* trematode, because of availability of intermediate host snail *Bellamya bengalensis* in which different larval stages (meracidia, sporocyst & redia) of *Azygia* sp. develop and then remaining larval stages (cercaria, metacercaria) develop in the definitive host *Channa gachua*. So in the study area, Sina Kolegoan Dam has favourable conditions for the development of trematode parasites or completion of their life cycle. Both the host are available in the same ecosystem that becomes easy to grow and continue the life cycles of *Azygia* sp.

vertebrate usually serving as the definitive host.

In the present study, in Sina kolegoan Dam snail *Bellamya bengalensis* (Lamarck, 1822) observed for larval trematode, *Azygia* sp. Snail *Bellamya bengalensis* (Lamarck, 1822), *Bellamya* is a genus of freshwater snails with

Bellamya bengalensis (Lamarck, 1822). (Ubgade, S.R.1980).

The life cycle of *Azygia* Sp., the eggs, which were fully embryonated when laid, hatched after ingestion by snail. The meracidia penetrates the intestine and become sporocysts in the connective tissue wall. Two generation of rediae were produced. Mother Rediae give rise to daughter rediae at first, and then cercariae, whereas the daughter rediae produced only cercariae. Cercariae emerged from snail after infection, the flukes matured when cercariae were fed to fish (Fig. No.1)

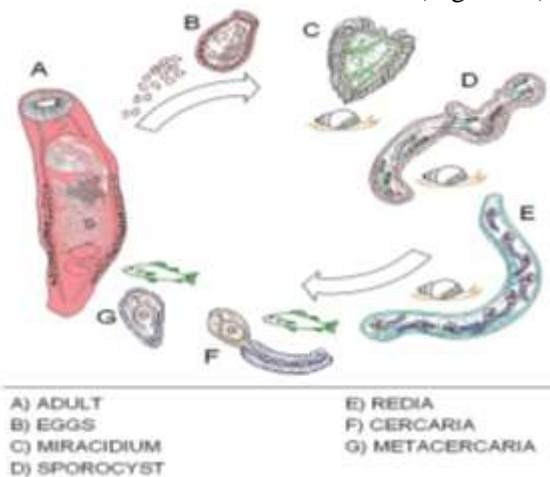


Fig.1 Life cycle of *Azygia* Sp.

To prevent this infection water quality closely monitor and other management tools put in place to prevent their spread to the fish farm around vicinity and beyond, as to reduce low fish productivity and marketable value of fish, also by killing the larval stages of intermediate hosts, prevent the parasitic infection.

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