



# Genus : Schistosoma

Instructor:

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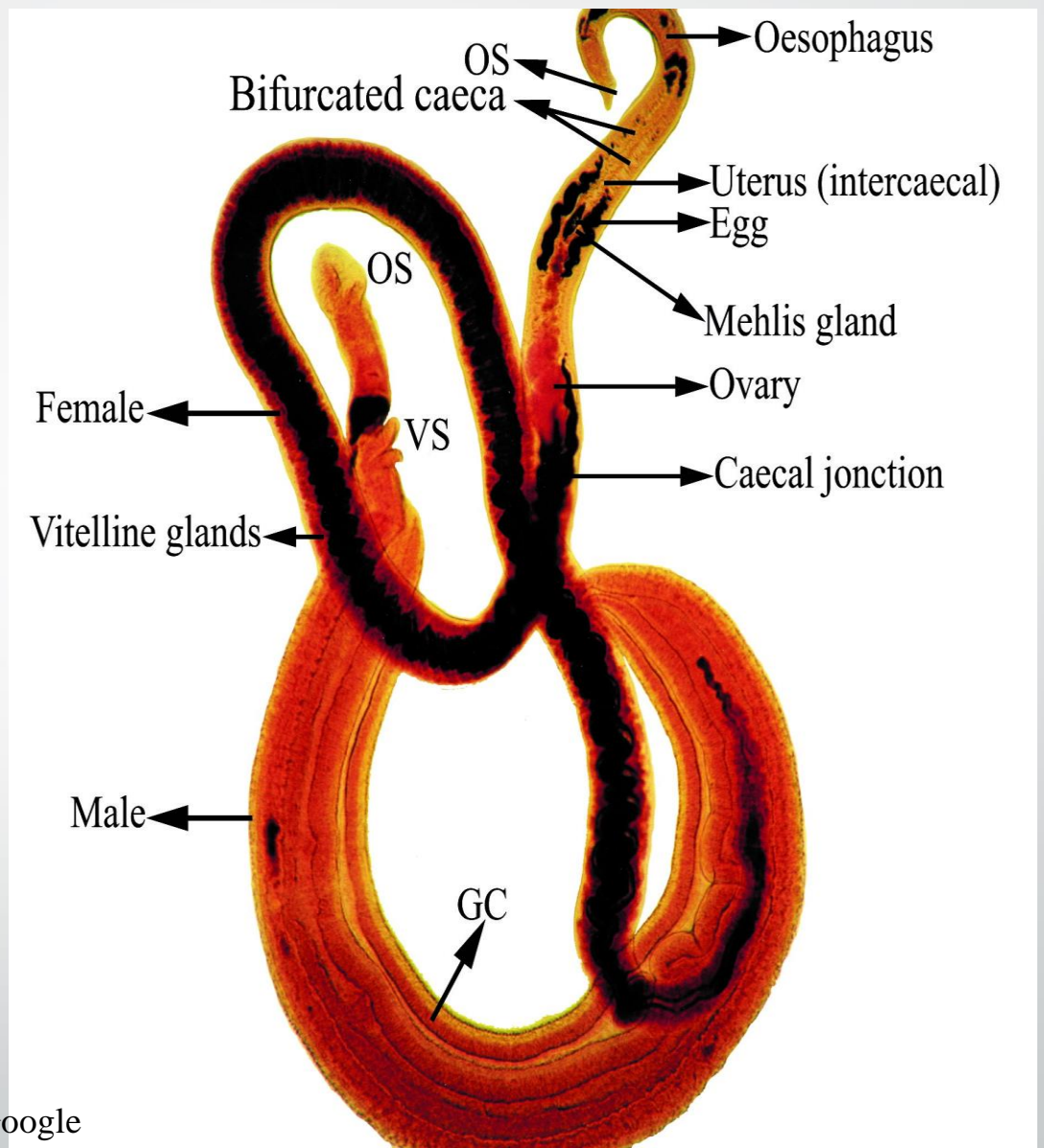
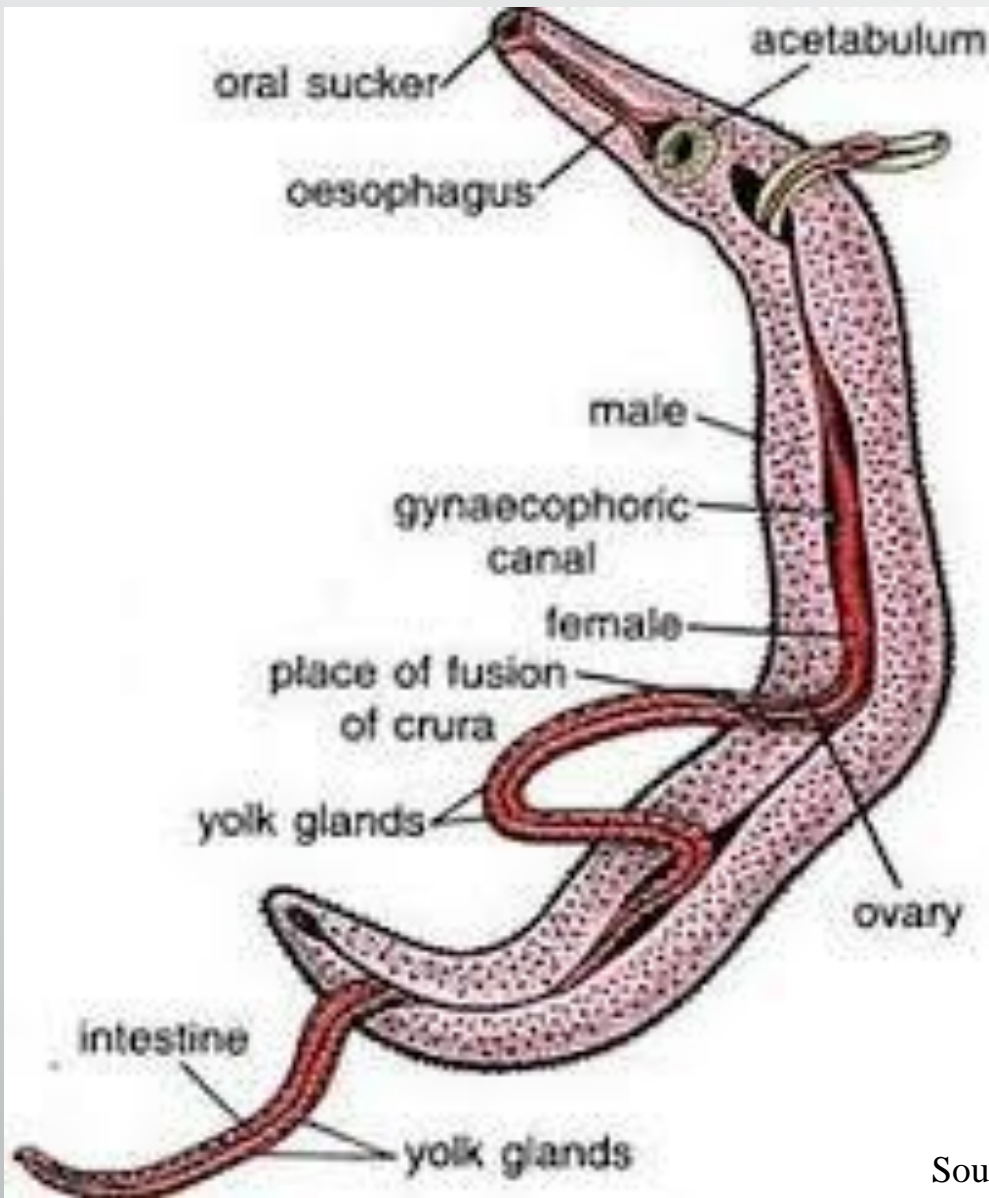
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# Schistosoma : Morphology

- They live inside visceral blood vessels , So commonly known as **blood flukes**.
- Adult worms have elongated tubular bodies.
- Adult schistosomes are diecious, and the sexes have different morphologies.
- The adult worms are bilaterally symmetrical .
- They have oral and ventral suckers for attachment and stabilization.
- Male worms are 6-2.2 centimeters in length and rather thick.
- They possess a structure known as a **gynecophoral canal** running the length of the body in which the 1.2-2.6 centimeter-long female remains during much of the life cycle .
- The thinner female separates from her mate to migrate to the venules bordering the intestine or bladder in order to deposit eggs .

These eggs are responsible for the clinical manifestations of schistosomiasis.



Source: Google

# Schistosoma : Parts of the body



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*Schistosoma nasale*

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# Schistosoma : Life cycle

- Schistosome life cycle occurs in 2 hosts, snails and mammals.

- Mammal hosts release worm eggs into the external environment through feces or urine. In fresh water, these eggs form miracidia, which hatch and infect snails.

- In the snail, this begins with the development of miracidia into a sporocyst. Sporocysts further multiply and grow into cercariae.

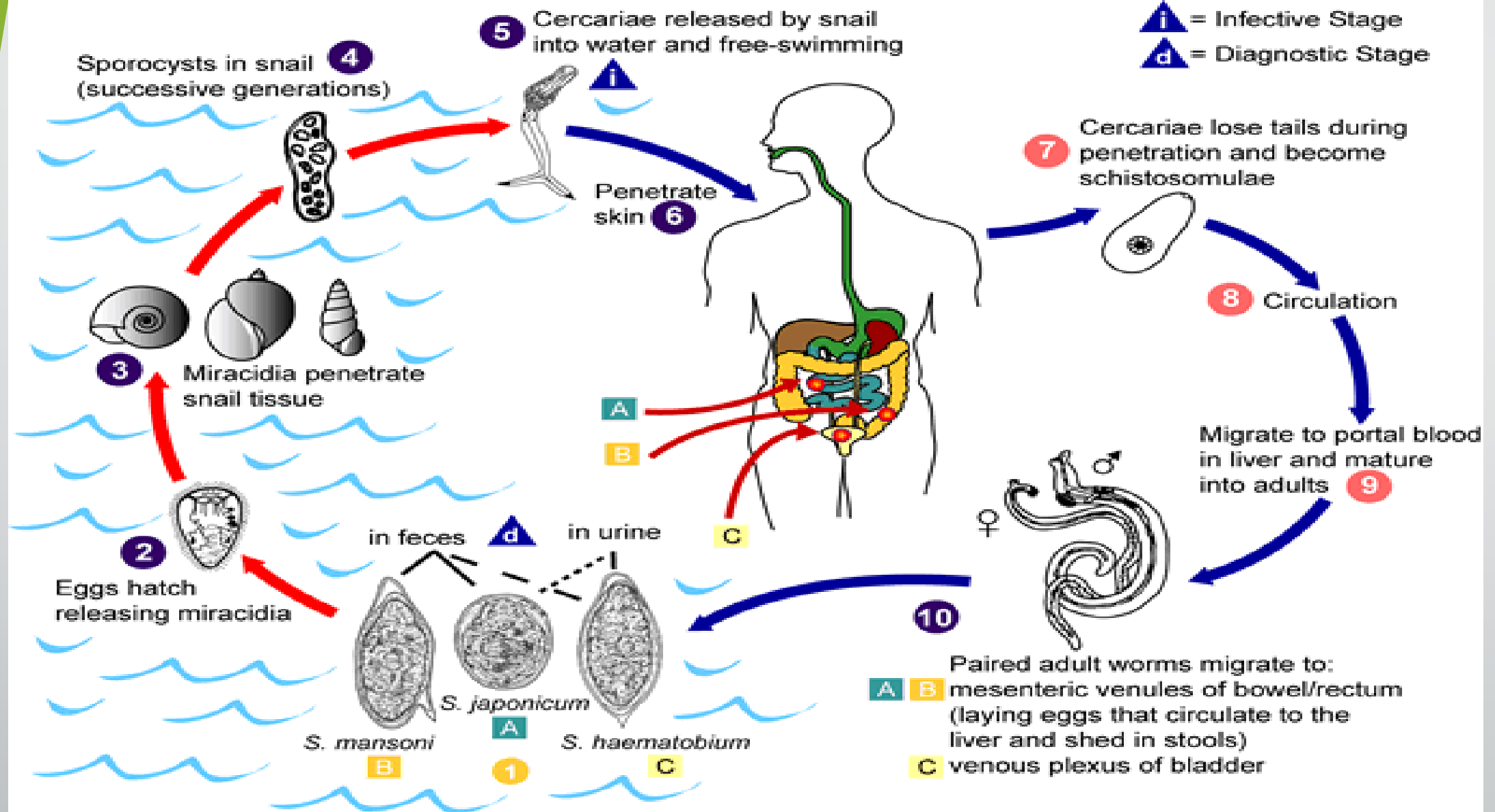
- In the mammalian hosts, parasites grow to become mature, mate, and produce eggs.

- In mammalian hosts cercariae enter skin and shed their forked tail, forming **schistosomula**.

- The schistosomula migrate throughout the body's tissues through blood circulation.

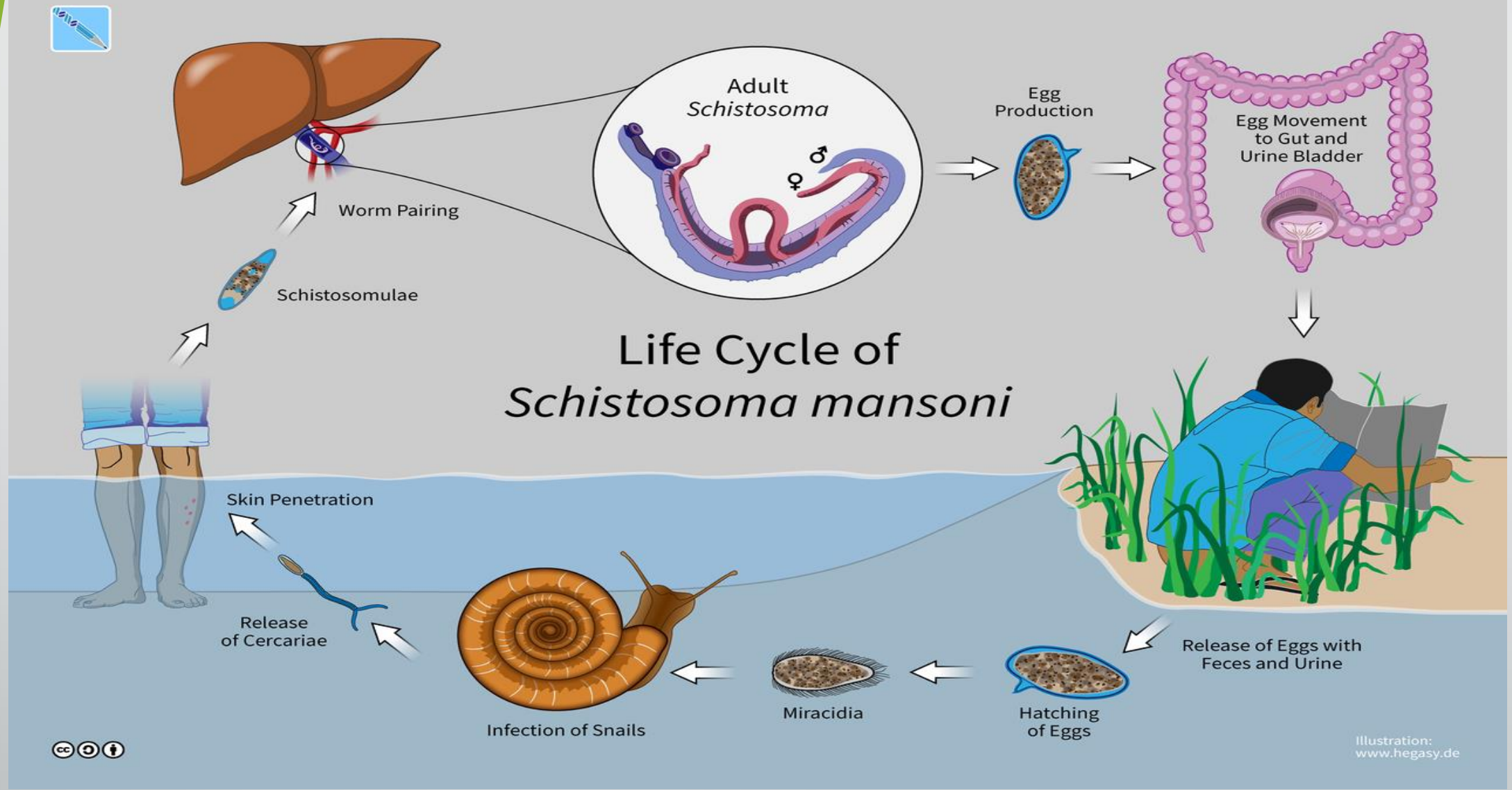
Schistosomula further grow into schistosomes and then adult worms.





Source: Google

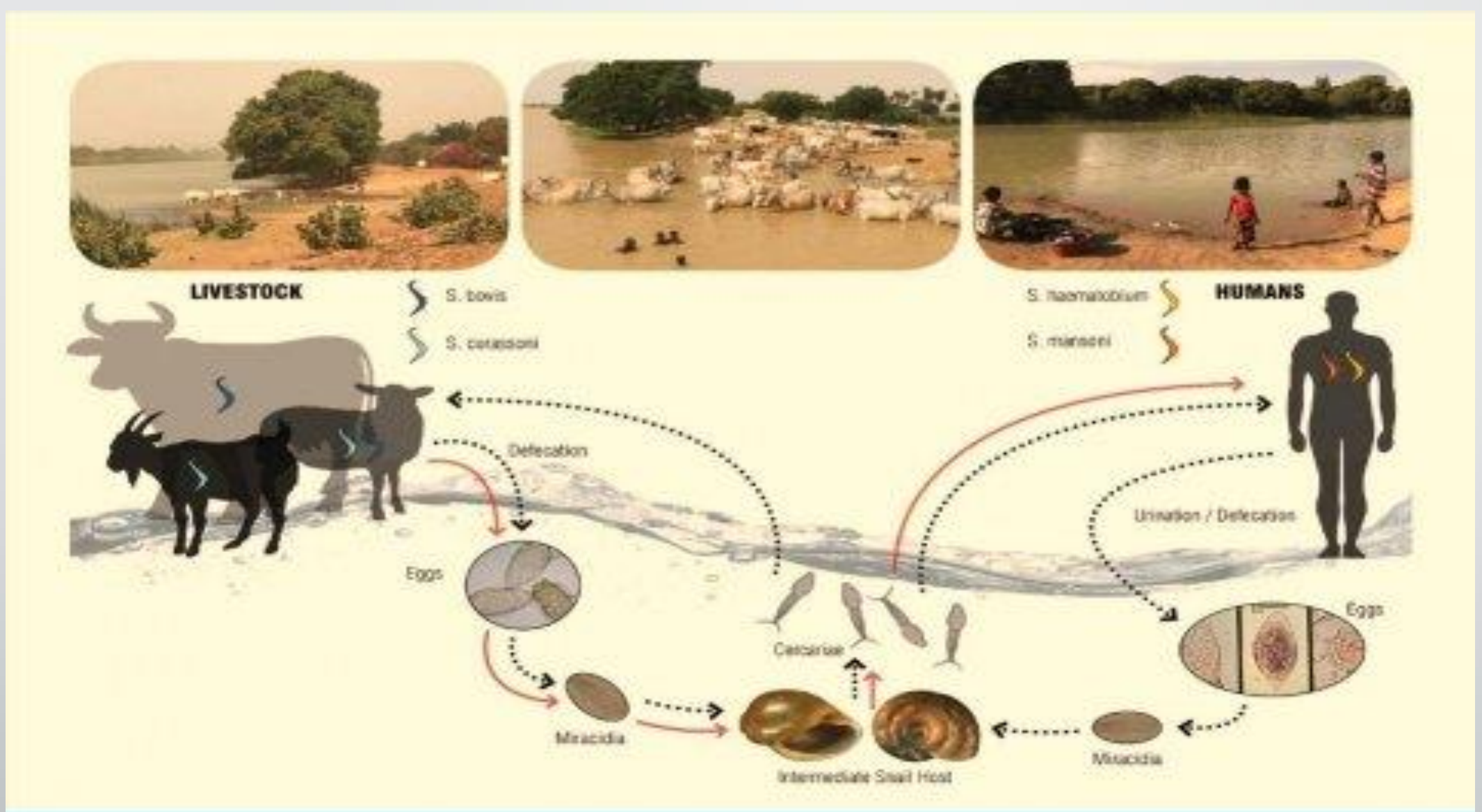
# Schistosoma : Life cycle



Source: Google

# Schistosoma : life cycle

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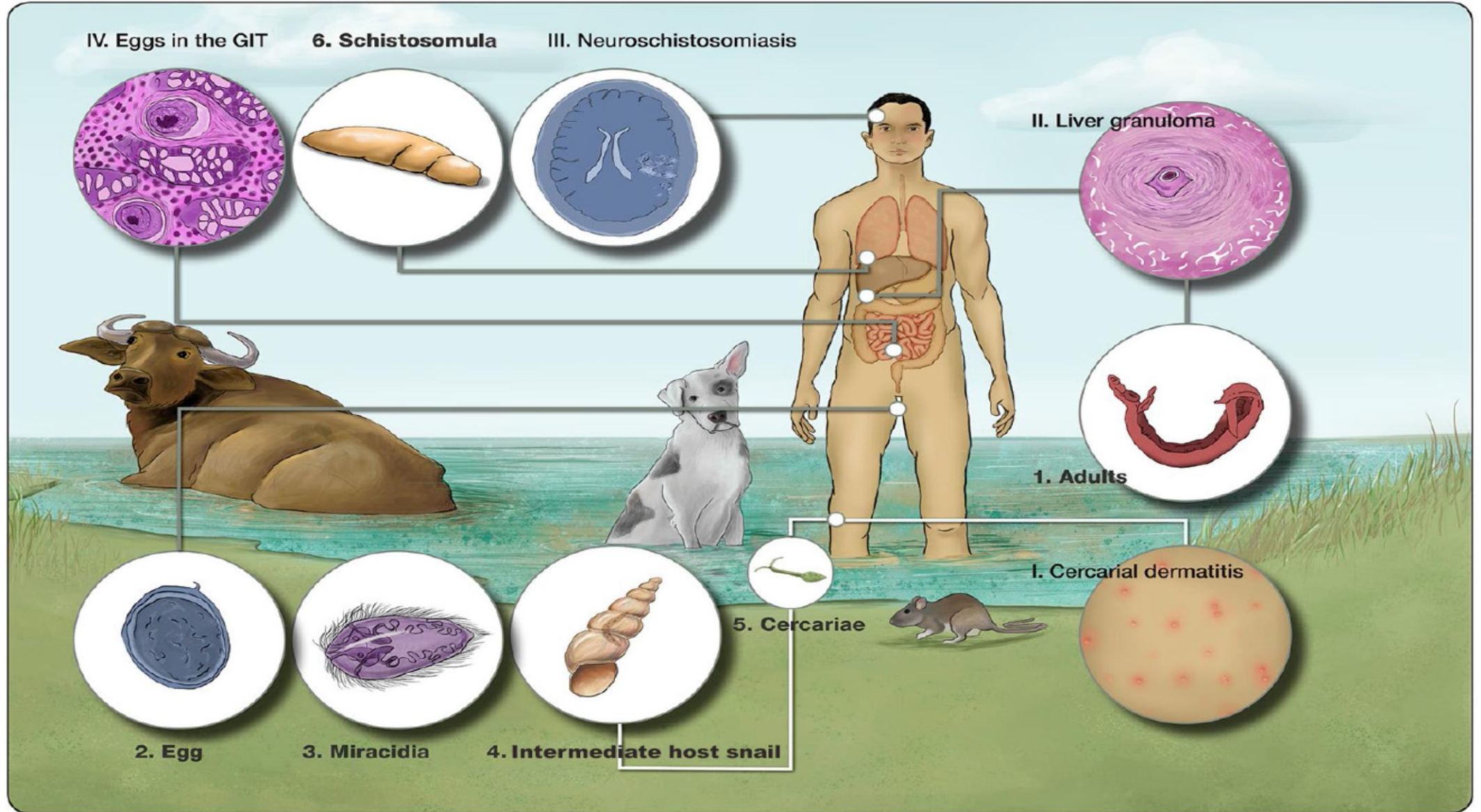


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# Schistosoma : Zoonotic life cycle

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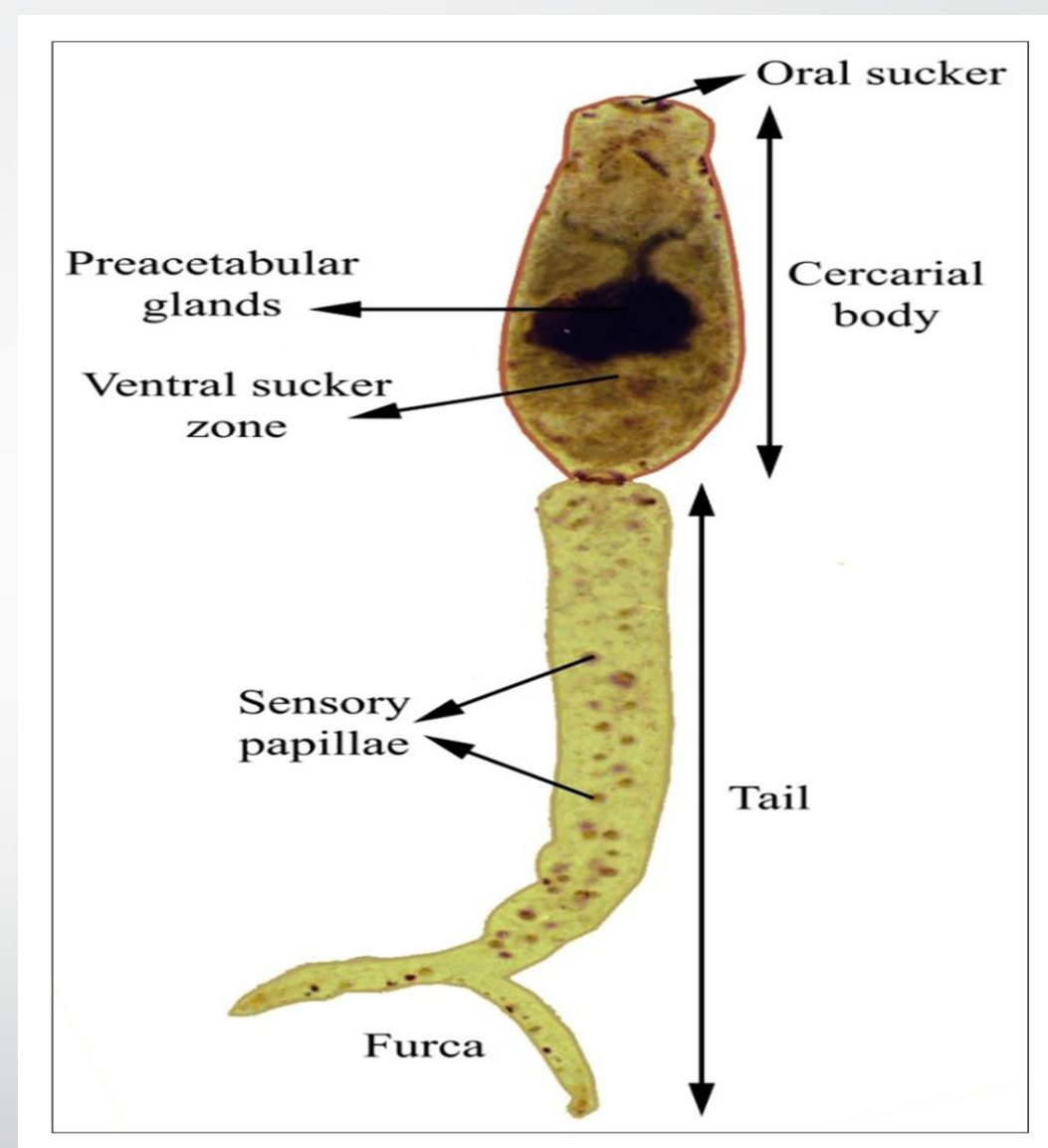


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# Schistosoma : Zoonotic life cycle



Source: Google



# Schistosoma : Furcocercus cercaria

# Schistosoma : Pathogenesis

- Schistosomiasis often divided into three phases: migratory, acute and chronic.
- The **migratory phase** occurs when cercariae penetrate and migrate through the skin. This is often asymptomatic and may cause transient dermatitis ('**Swimmers itch**') and pneumonitis.
- The **acute phase** ( called **Katayama fever**) is characterized by allergic responses resulting in pyrexia, fatigue, aches, lymphadenopathy, gastrointestinal discomfort and eosinophilia.
- The **chronic phase** occurs in response to the deposition of fluke eggs in tissues and the host reactions that develop against them.
- Not all the eggs laid by female worms successfully penetrate the gut or bladder walls, many are swept away in the circulation and become trapped in organs where they capsulated .
- The encapsulated eggs die and eventually calcify. The resultant effects on host organs and tissues are intestinal polyposis, abdominal pain, diarrhoea, glumerulonephritis, pulmonary arteritis, cardiovascular problems including heart failure, and periportal (**Symmer's clay pipe-stem**) fibrosis.
- Cerebral granulomas have been associated with epileptic convulsions, while spinal cord granulomas may cause transverse myelitis.
- Infections by *S. haematobium* often cause haematuria (blood in urine) and progressive disruption of the bladder wall may lead to carcinoma.





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## Schistosoma : Cercarial dermatitis

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## Schistosoma : Cercarial dermatitis

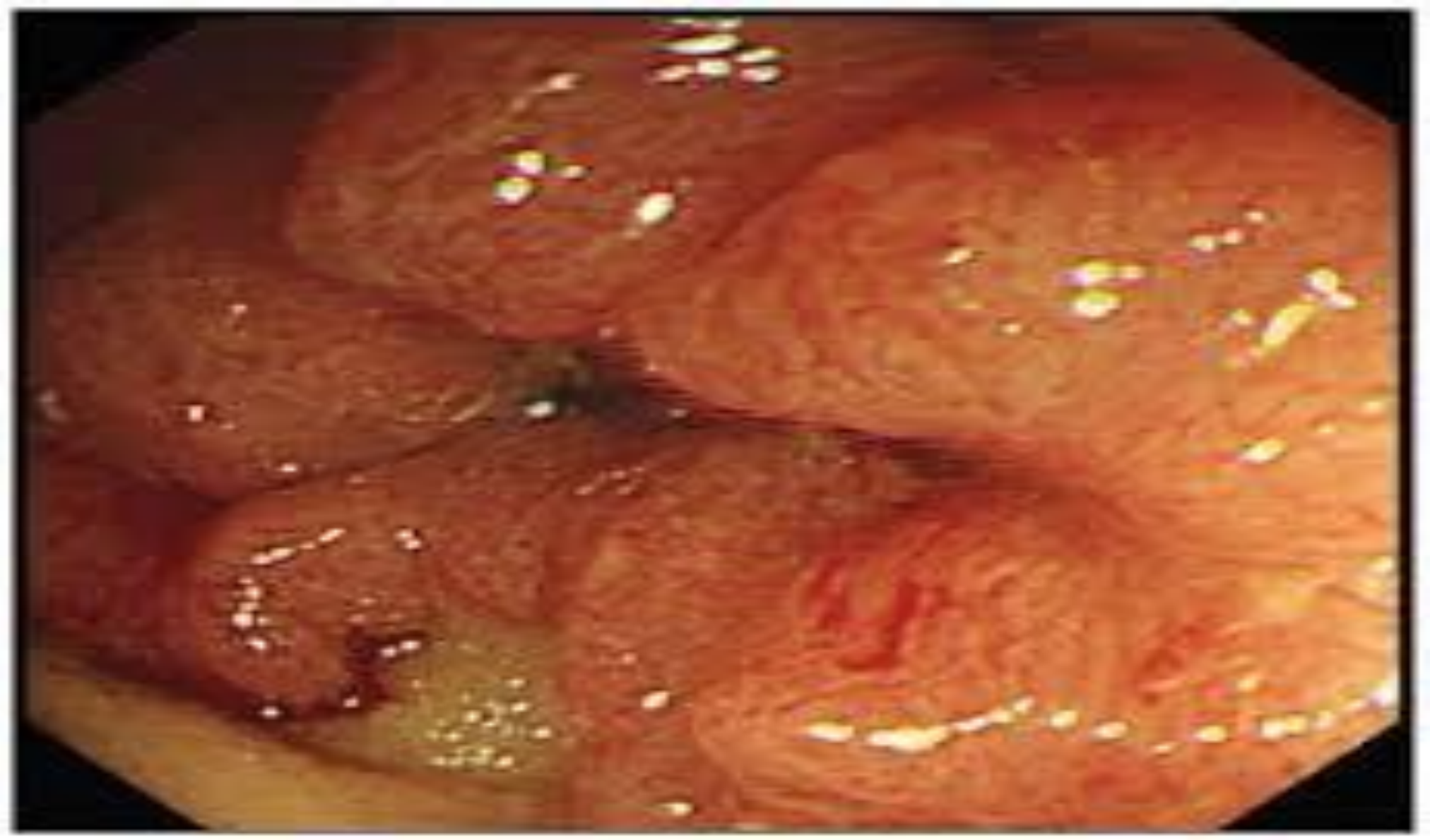
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# Nasal granuloma

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# Intestinal schistosomiasis

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# Epistaxis

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# Cercarial dermatitis

- This is a pathological condition caused by the infestation of the skin by cercariae (larvae) of nonhuman schistosomes, whose usual hosts are birds and small mammals.
- The condition is also called as Clam-digger's dermatitis, Schistosome dermatitis, Sedge pool itch, Swimmer's itch because mainly occurs in swimmers and those with occupations that include water exposure.
- Cercarial dermatitis is acquired by skin exposure to fresh and salt water. The cercariae penetrate intact human skin within a few minutes. The time from exposure to onset of symptoms varies from a few minutes to a maximum of 24 hours after exposure.
- A prickling sensation after exposure to infested water may be seen. Later on a cutaneous lesions begin as a pruritic macular erythematous eruption that progresses to a papular, papulovesicular, and urticarial eruption. The eruption typically covers skin surfaces that are exposed to water. These eruption peaks in 1–3 days and lasts 1–3 weeks.
- The Cercarial dermatitis is self-limited and diagnosis based on characteristic clinical findings. Oral antihistamines and topical steroids reduce the symptoms.

# Nasal schistosomiasis

- Nasal schistosomiasis or snoring disease is caused by *Schistosoma nasale*, which resides in nasal veins of cattle, buffaloes and also in sheep, goat, and horses .
- It was first reported in 1933 by Dr. M. Anant Narayanan Rao at Madras Veterinary College, Tamil Nadu.
- The freshwater snail *Indoplanorbis exustus* acts as intermediate host .
- This blood fluke adversely affect health and production of cattle .
- The pathology of infection and clinical signs are less severe in buffalo than in cattle. Affected cattle shows rhinitis, profuse mucopurulent nasal discharge manifested clinically by sneezing, dyspnoea and snoring.
- Chronic infections show proliferation of nasal epithelium as granuloma and small abscesses containing eggs. Buffaloes are not much affected by the disease and show only pin-head sized eruptions and congestion of nasal mucosa.
- Snoring disease was reported from Tamil Nadu, Karnataka, Andhra Pradesh, West Bengal, Assam, Bihar, Orissa and Maharashtra

# Visceral schistosomiasis

- Visceral schistosomiasis or Snail fever or Bilharzia or Neglected tropical disease is a disease caused by schistosomes.
- Symptoms include abdominal pain, diarrhea, bloody stool, or blood in the urine because its mainly infect urinary tract or intestines .
- A Long time exposure may caused liver damage, kidney failure, infertility, or bladder cancer and in children, it may cause poor growth and learning difficulty.
- The disease is spread by contact with fresh water contaminated with the parasites, released from infected freshwater snails.
- The disease is especially common among children and farmers, fishermen, and people using unclean water.
- Diagnosis is based on finding of eggs in a person's urine or stool.
- Prevention mainly require improved sanitation,use of clean water and reducing the number of snails.
- For treatment praziquantel may be given once a year to the entire group, recommended by the World Health Organization .

# Schistosoma : Diagnosis

- Faecal examination for detection of fluke eggs in faecal or urine samples, by sedimentation/flotation or filtration techniques.
- Microscopy of rectal biopsies has been used to diagnose *S. haematobium* infections.
- Immuno-serological tests have been developed to detect host antibodies against infection
- More recently, molecular techniques have been used to detect parasite antigens or DNA in host samples.





Source: Google



Eggs : *Schistosoma mansoni*

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Eggs : *Schistosoma nasale*

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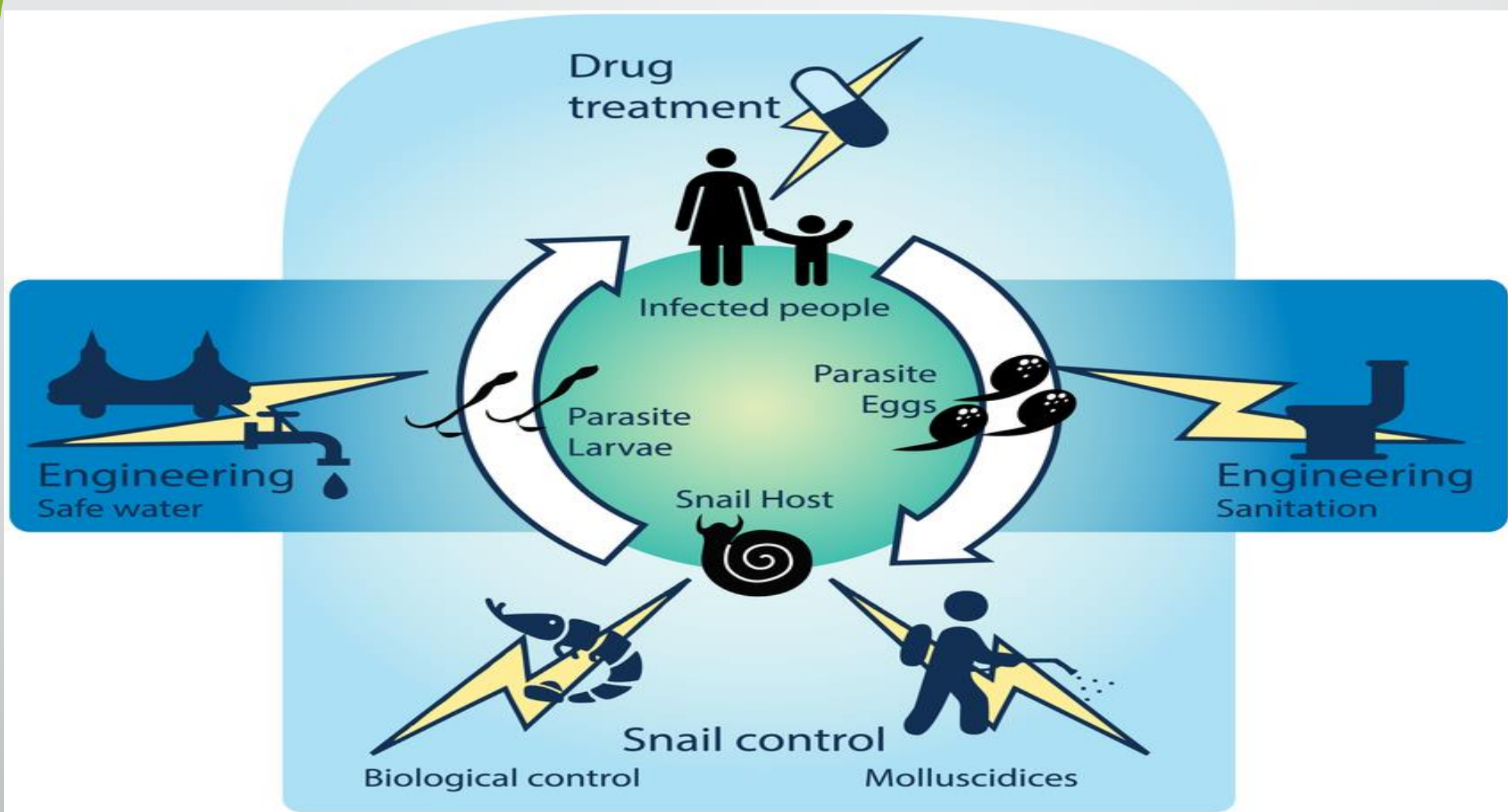
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# Eggs : *Schistosoma spindale*

# Schistosoma : Prevention & control

- Avoid swimming or wading in freshwater. Swimming in the ocean and in chlorinated swimming pools is safe.
- Drink safe water, because water coming directly from canals, lakes, rivers, streams, or springs may be contaminated with a variety of infectious organisms.
- Water used for bathing should be brought to a rolling boil for 1 minute to kill any cercariae, and then cooled before bathing to avoid scalding.
- Water held in a storage tank for at least 1 – 2 days should be safe for bathing.





Source: Google

# Schistosoma : Control

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SCHISTOSOMIASIS  
JAPONICUM  
INFECTION

# ENVIRONMENTAL SANITATION



Use water-sealed  
toilets

Use water from  
pitcher pumps  
or artesian wells



Use footbridge  
over small areas

control of  
stray animals



Source: Google

## Schistosoma : Prevention & control

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# HELP EDUCATE THE PEOPLE ABOUT SCHISTOSOMIASIS



By Explaining Schistosomiasis  
Prevention and Control at study  
Groups like mother's class



By Explaining Schistosomiasis  
Prevention and Control at  
Barangay Meetings / Assemblies.

Source: Google

## Schistosoma : Prevention & control

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