

## Lab 12

Phylum : Platyhelminthes

Class : Trematodes

Blood species : *Schistosoma*

Species	Common name	Disease
<i>S. haematobium</i>	Bladder fluke	Vesical schistosomiasis
<i>S. mansoni</i>	Manson 's blood fluke	Intestinal schistosomiasis
<i>S. japonicum</i>	Japanese blood fluke	Oriental schistosomiasis or katayma fever .

- Schistosomes are dioecious ( sex separated ) .
- The male has deep ventral groove known as the gynecophoric canal in which the ♀ lies during copulation .
- Both sexes have two suckers, an anterior and ventral suckers .
- Cercaria ( life up to 30 hours ) have a bifid tail and donot posses a pharynx. Tail is shed during penetration then called *schistosomula* .

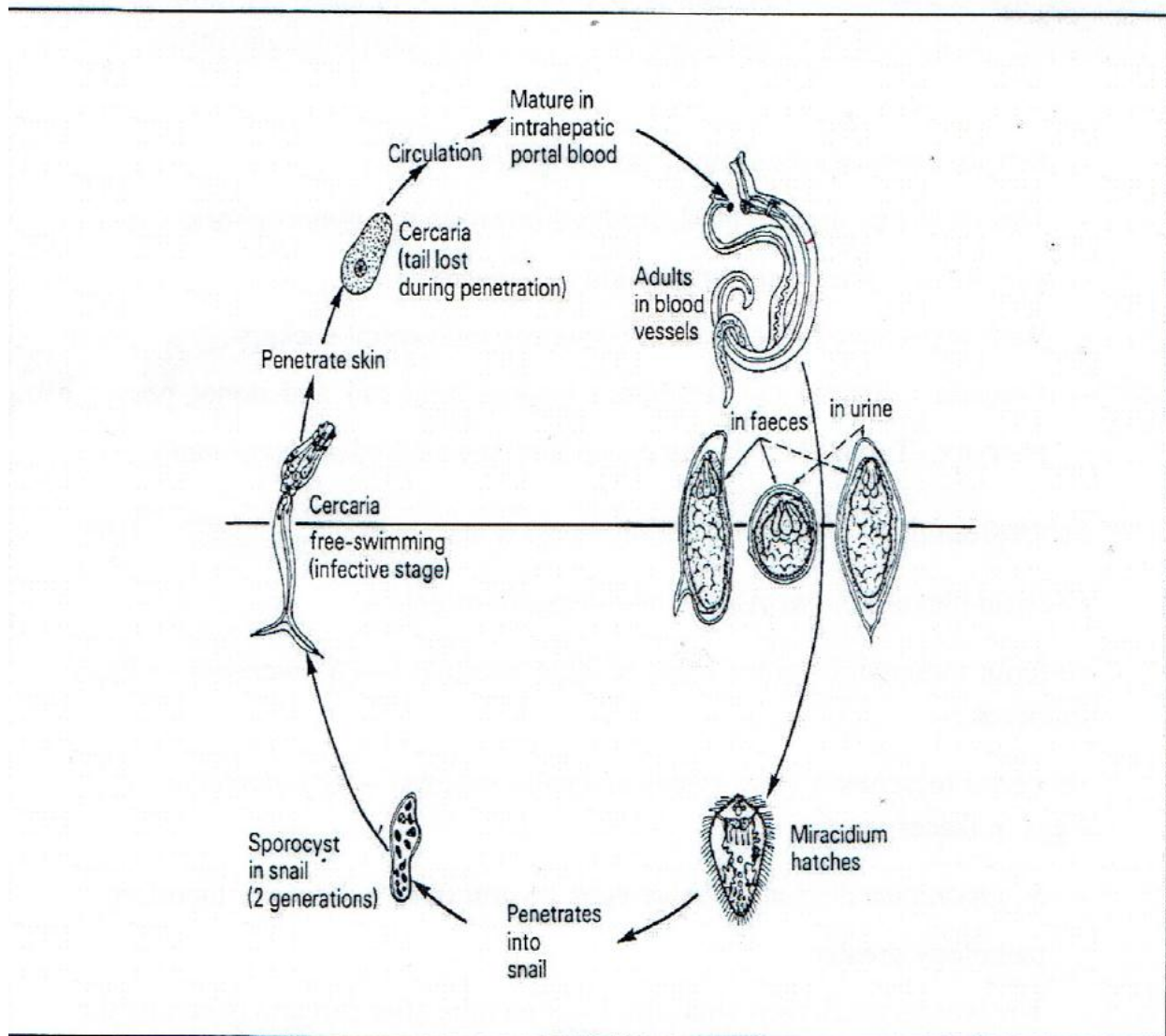
**Schistosomula** → Portal circulation → Then mature in :

- **Vesical plexus** : *S. haematobium* → Eggs in urine .
- **Inferior mesenteric veins** ( veins of large intestine ) → *S. mansoni* → Eggs in faeces .
- **Superior mesenteric veins** (viens of small intestine) → *S. japonicum* → Eggs in faeces .
- *S. japonicum* discharges more eggs / worm than *S. mansoni*, therefore pathology greater .
- The worms reach their final site 1 – 3 months after cercaria penetrate the skin .

## Lab 12

- **Mode of infection** : Cercaria ( liberated from the snail ) penetrates skin through swimming .
- Epidemiology : *S. haematobium*, has been occurred in the old world .

Nearly all of Africa and portions of middle east, including Iran, Iraq, and Arabia, are considered endemic region .



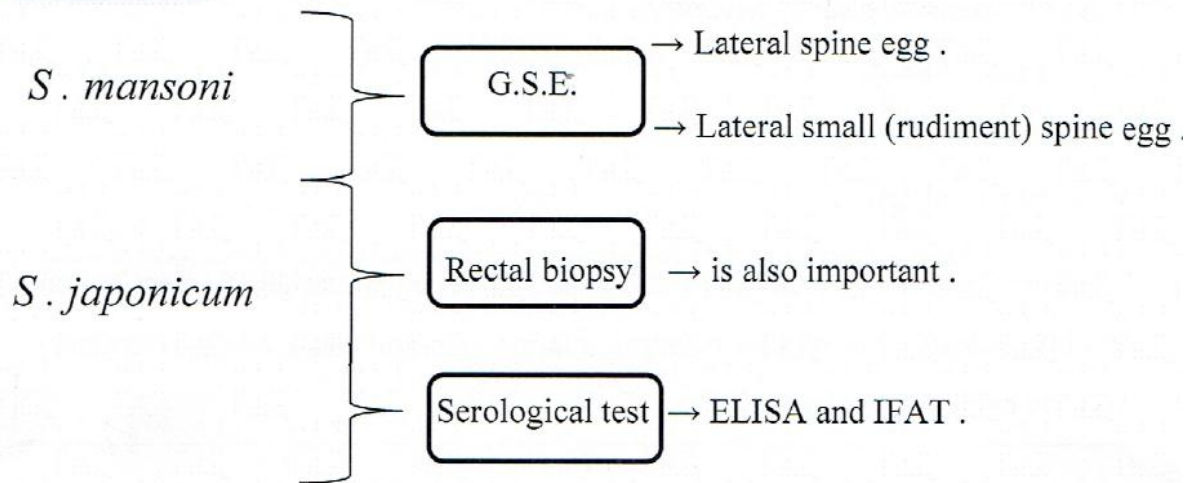
Life cycle of *Schistosoma* spp.

## Lab 12

Intermediate host : Snail .

<i>S. haematobium</i>	→ <i>Bulinus truncatus</i> .
<i>S. mansoni</i>	→ <i>Biomphalaria</i> species .
<i>S. japonicum</i>	→ <i>Oncomelania</i> species .

### Diagnosis :



*S. haematobium* : 1) G.U.E. → Terminal spine egg .

2) Cytoscopy .

3) Serological test : ELISA .

### Clinical aspects :

1. It is believed that most chronic *Schistosoma* infections, remain asymptomatic .
2. The first symptoms of *Schistosoma* :
  - Inflammation at the cercaria penetration site .
  - Acute infection include :
    - \*Abdominal pain \*Fever \*Chills \*Weight loss
    - \*Eosinophilia \*Bloody diarrhoea \*Haematuria .
    - \*Cough

## Lab 12

3. A number of associated condition have been identified :

a) In *S. haematobium* .

1. Chronic cystitis and urethritis .
2. Fibrosis and obstruction of urethral orifice .
3. Hydronephrosis, then renal failure .
4. Bladder stones and carcinoma .

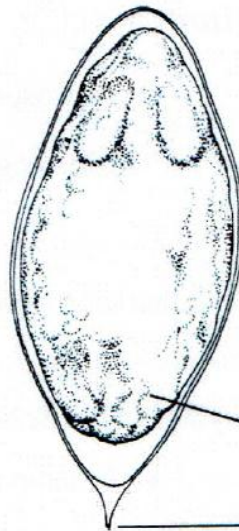
B) *S. mansoni* and *S. japonicum* :

1. Liver fibrosis .
2. Portal hypertention .
3. Splenomegaly .

**Swimmer 's itch** : A condition ( zoonosis ) in which cercariae of select animal and bird *schistosoma* species penetrate human skin and cause allergy response .  
The life cycle is not completed .



*S. haematobium* egg



developed  
miracidium  
large  
terminal spine

160  $\mu$ m  $\times$  80  $\mu$ m

### Disease Names

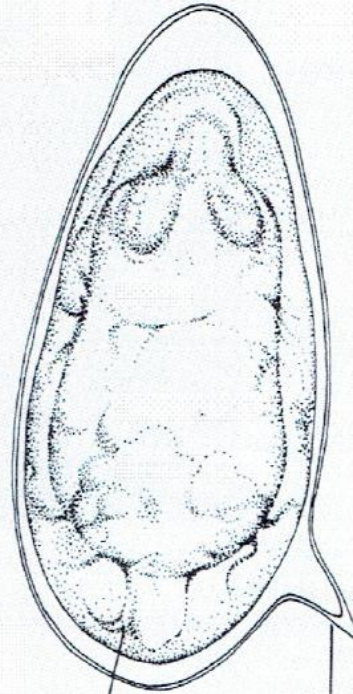
- Schistosomiasis
- Bilharziasis
- Swamp fever

# Lab 12

## Diagnostic Stages



*S. mansoni* egg



developed  
miracidium

large  
lateral spine

$180\ \mu\text{m} \times 80\ \mu\text{m}$



*S. japonicum* egg

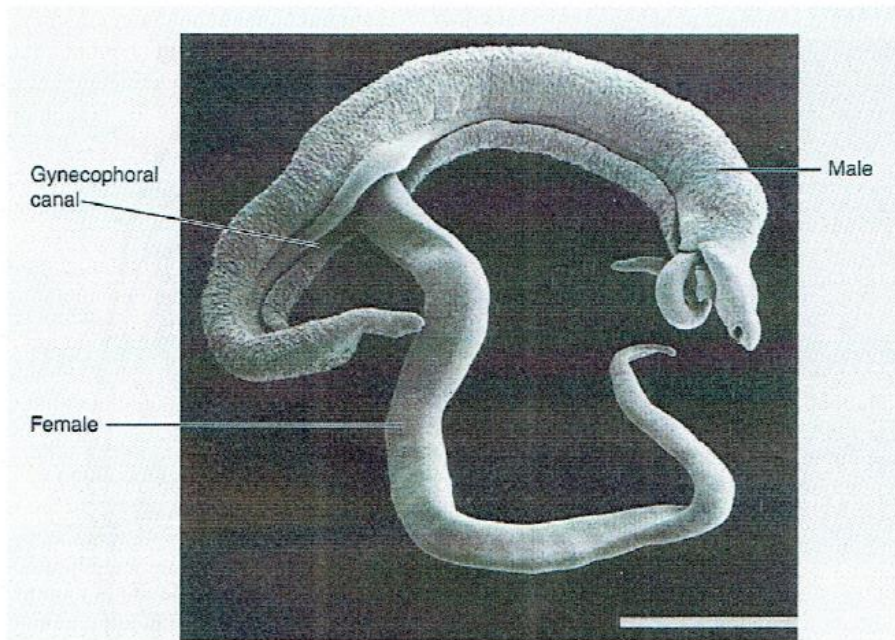


developed  
miracidium

small  
lateral spine  
(difficult to see)

$80\ \mu\text{m} \times 60\ \mu\text{m}$

# Lab 12



Scanning electron micrograph of male and female *Schistosoma*

*mansoni*.

The female is lying in the gynecophoral groove in the ventral surface of the male. (Bar = 2 mm)

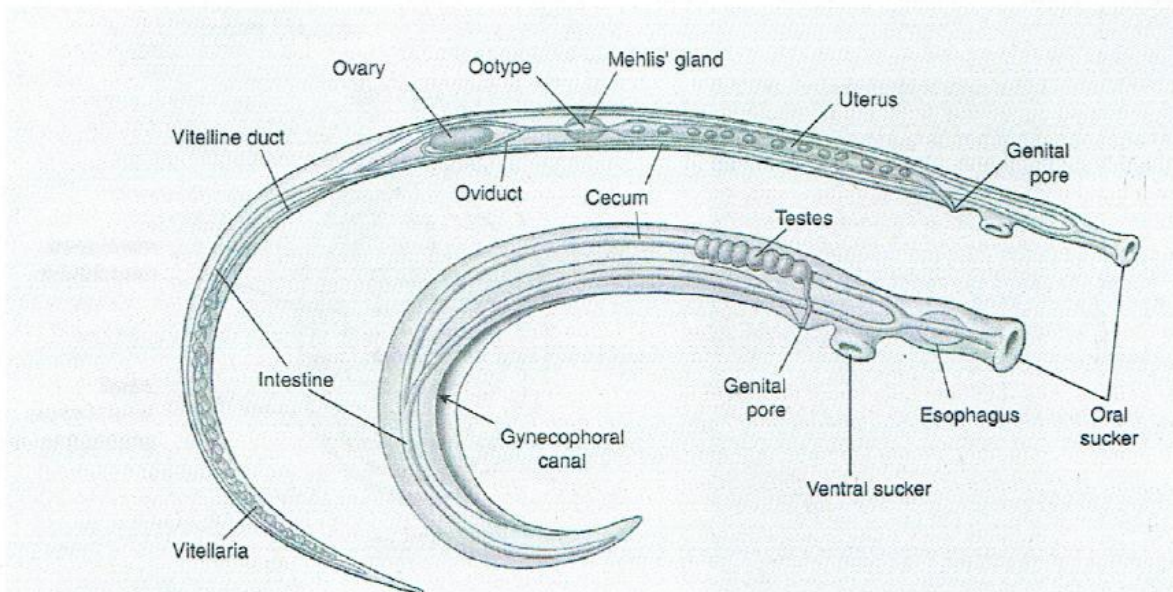


Diagram of *Schistosome* anatomy.

Drawing by William Ober and Claire Garrison.