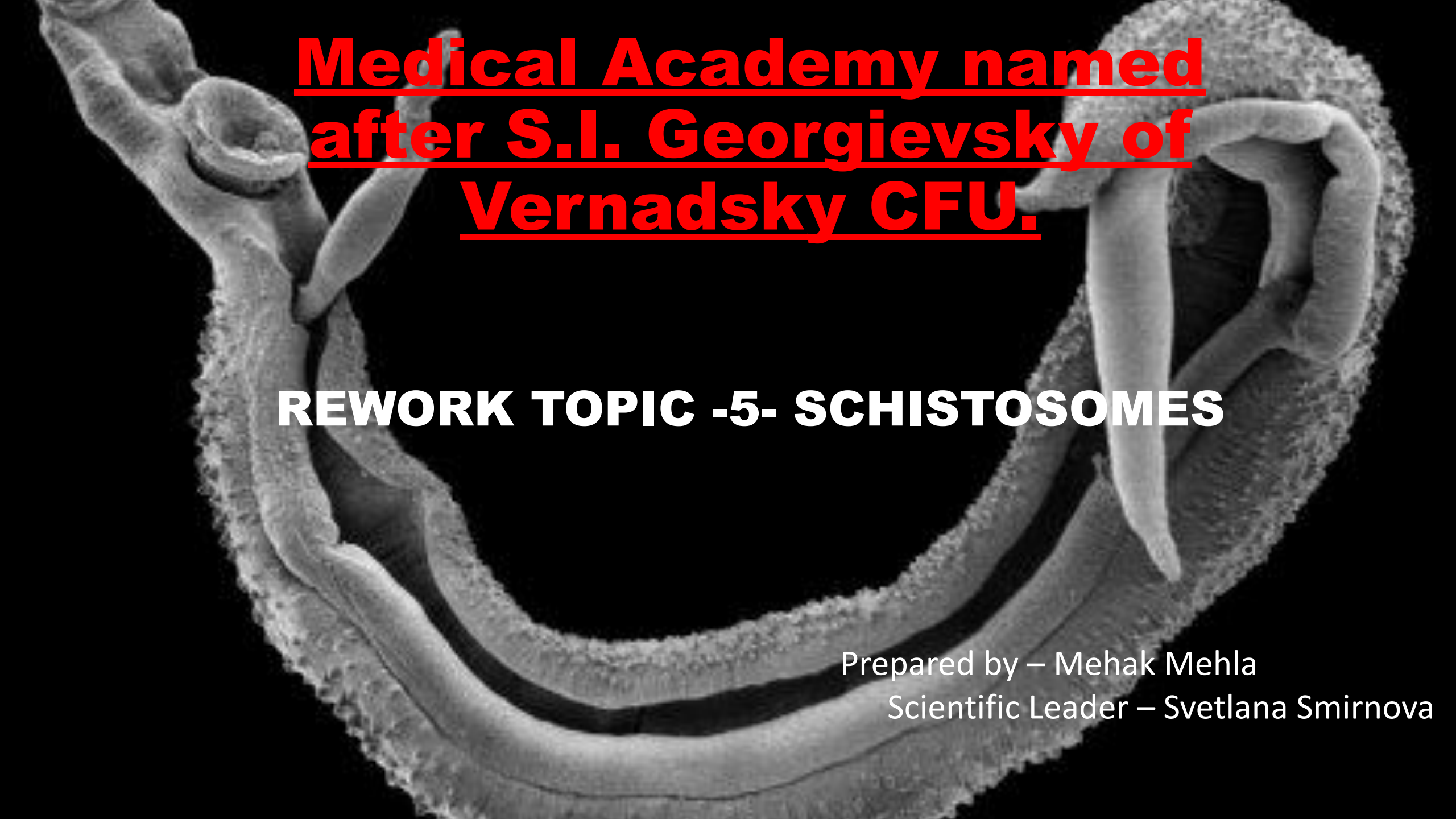


# Medical Academy named after S.I. Georgievsky of Vernadsky CFU.

## REWORK TOPIC -5- SCHISTOSOMES

Prepared by – Mehak Mehla
Scientific Leader – Svetlana Smirnova

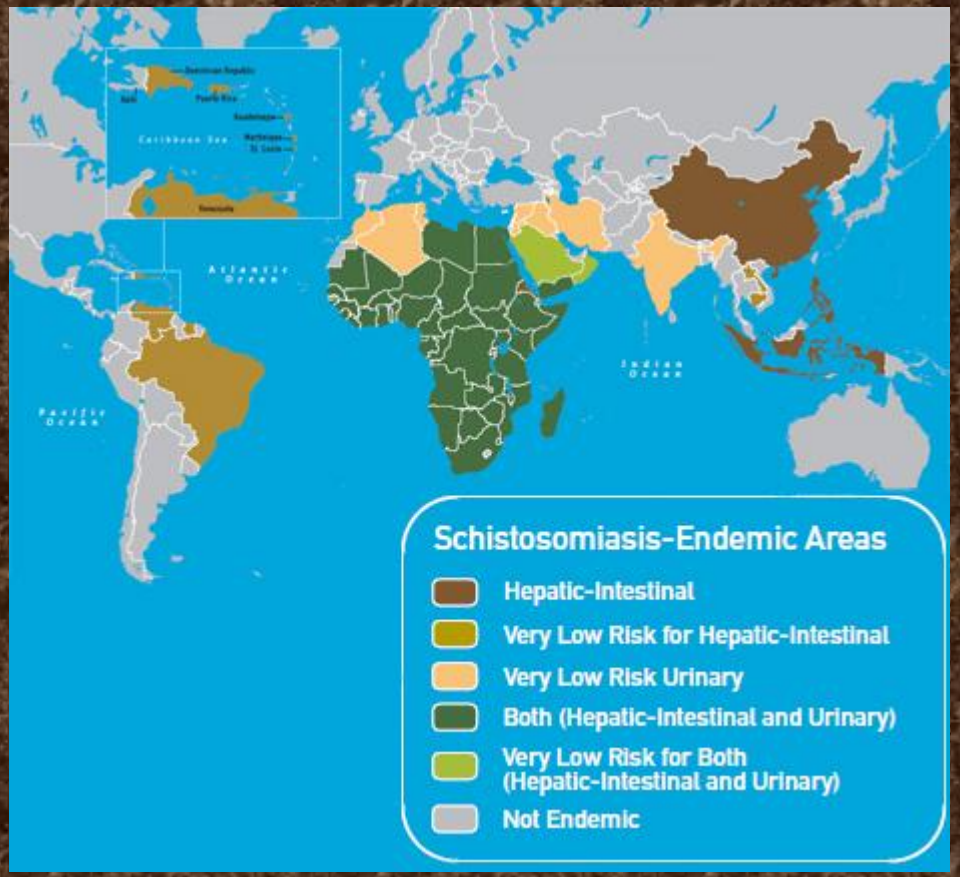
# *Schistosomes*

***Schistosoma*** is a genus of trematodes, commonly known as **blood flukes**. They are parasitic flatworms responsible for a highly significant group of infections in humans termed *schistosomiasis*, which is considered by the World Health Organization as the second-most socioeconomically devastating parasitic disease (after malaria), with hundreds of millions infected worldwide

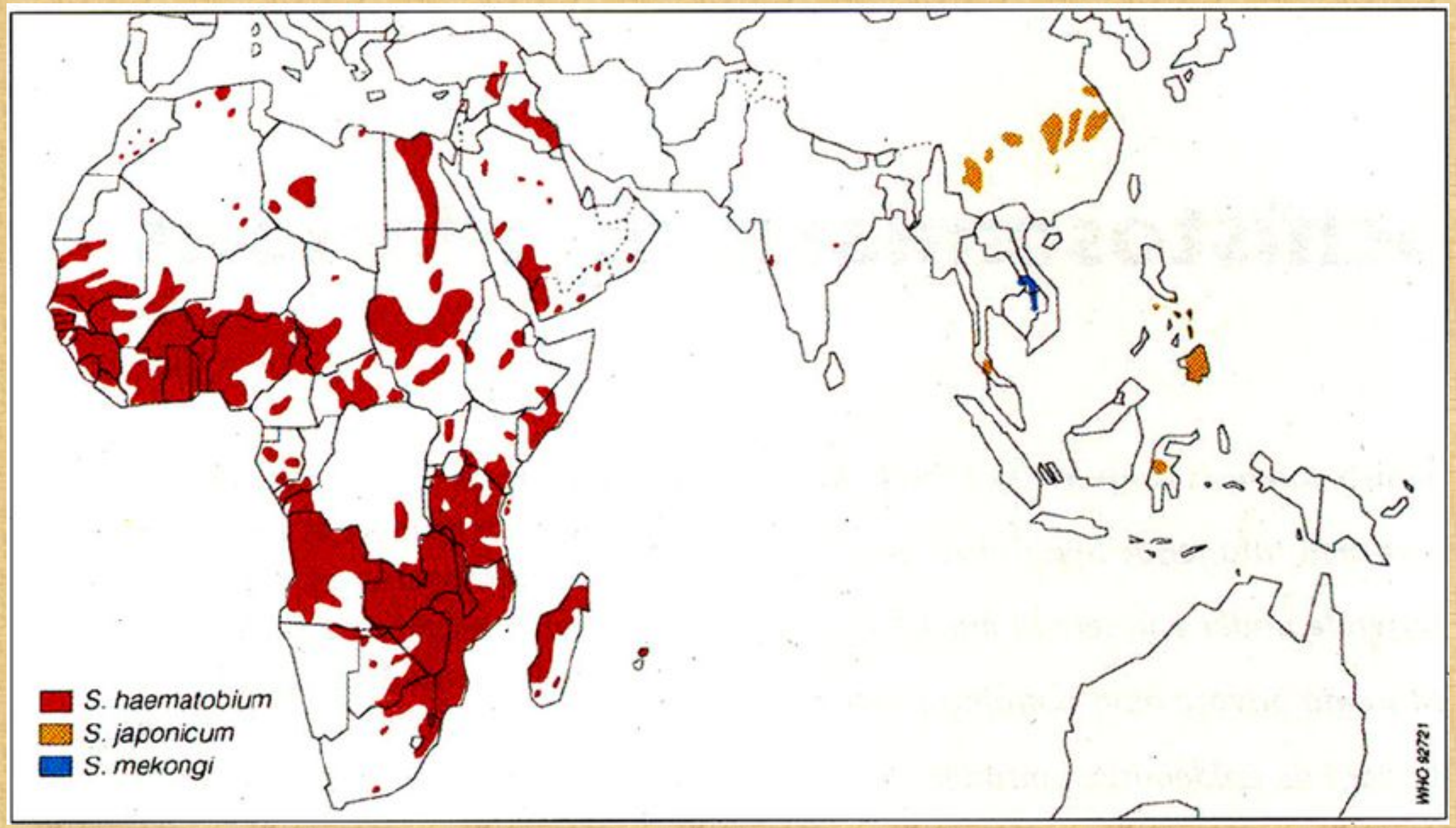
# Scientific classification

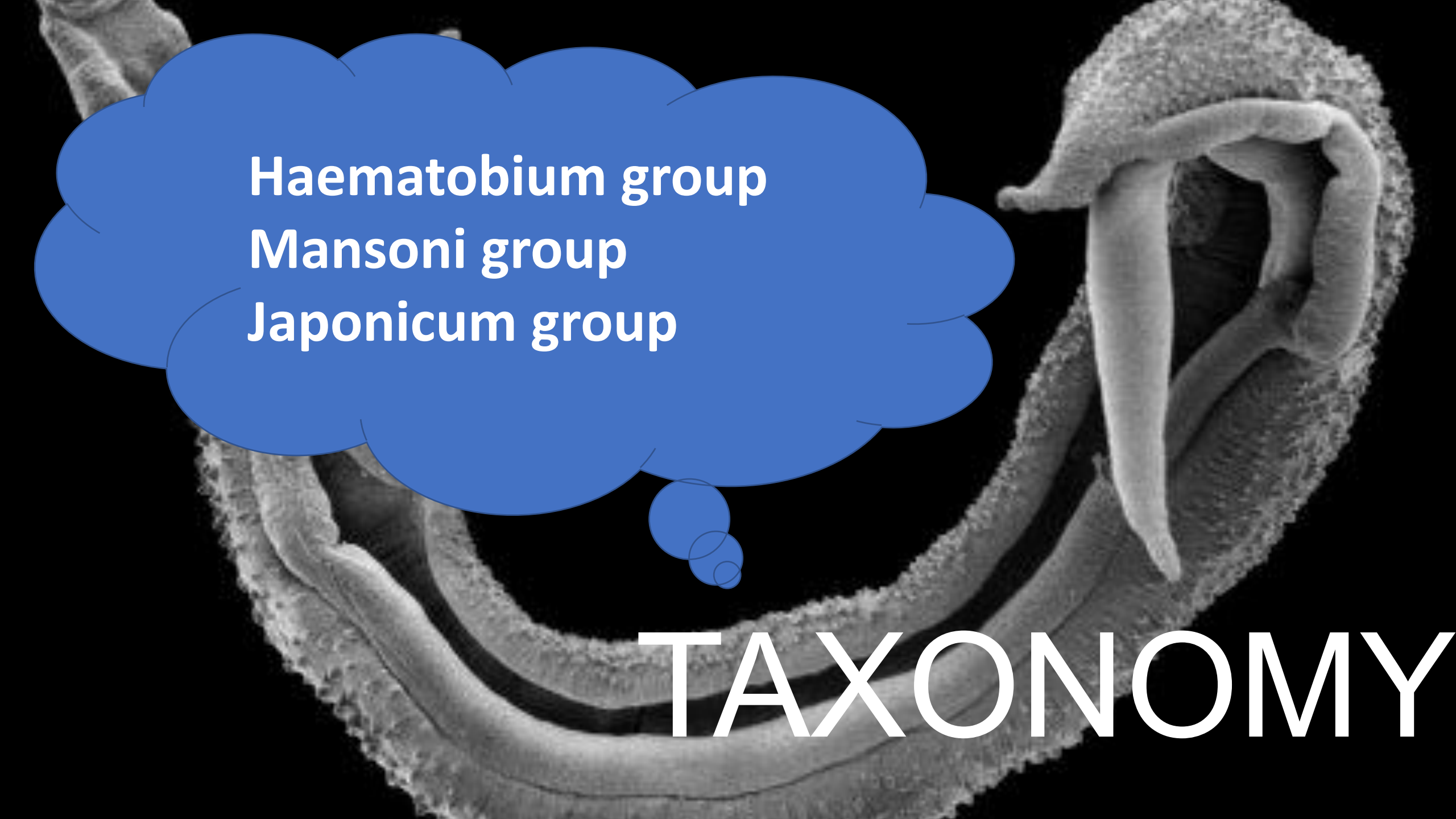
| | |
|---|---|
| Kingdom: | Animalia |
| Phylum: | Platyhelminthes |
| Class: | Trematoda |
| Order: | Diplostomida |
| Family: | Schistosomatidae |
| Genus: | ***Schistosoma*** |

# GEOGRAPHICAL DISTRIBUTION




Africa, Brazil, Cambodia, the Caribbean, China, Corsica, Indonesia, Laos, the Middle East, the Philippines, Suriname, and Venezuela.[22] There had been no cases in Europe since 1965, until an outbreak occurred on Corsica


S. haematobium
S. japonicum
S. mekongi
WHO 92721



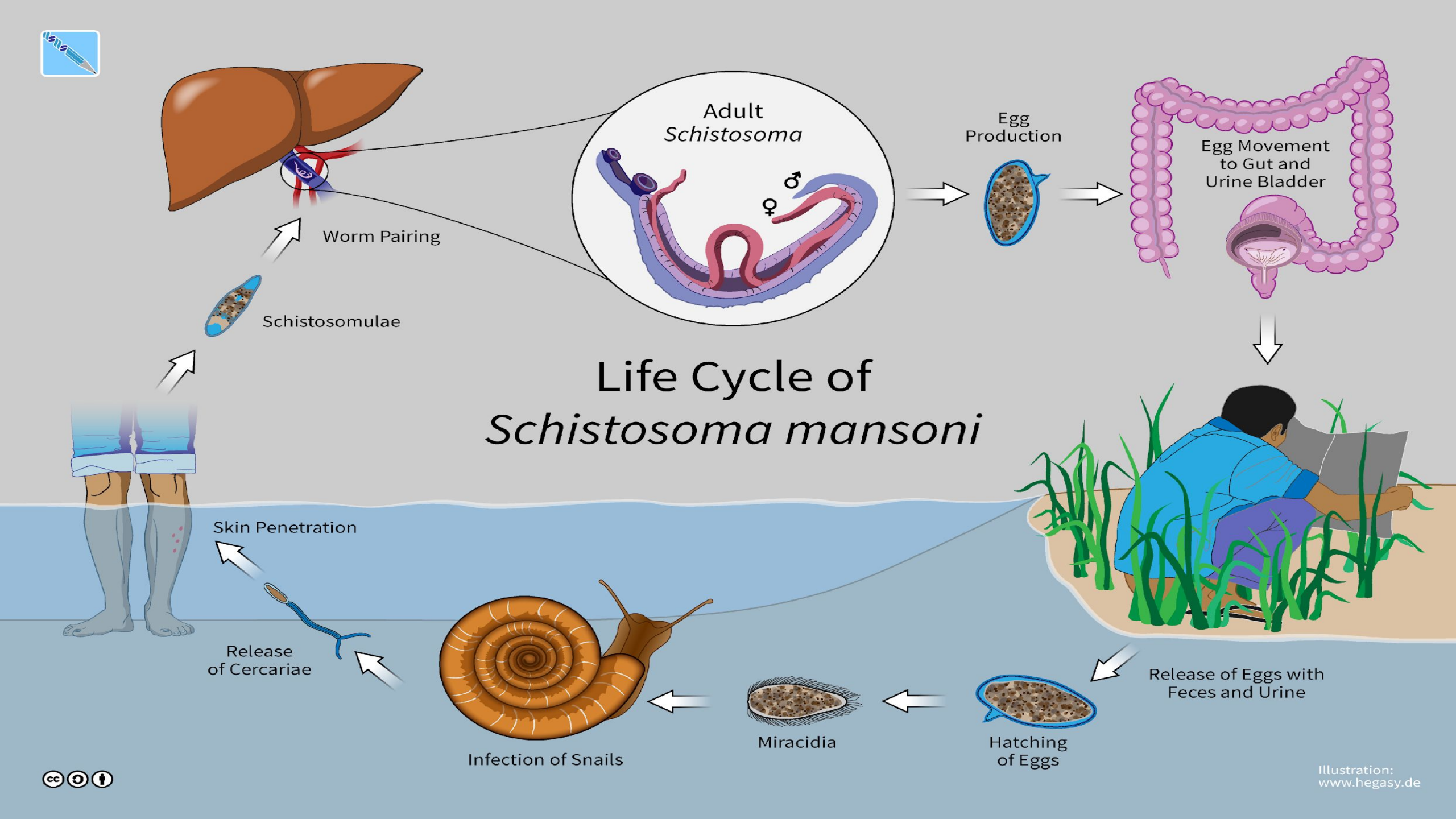

# TAXONOMY

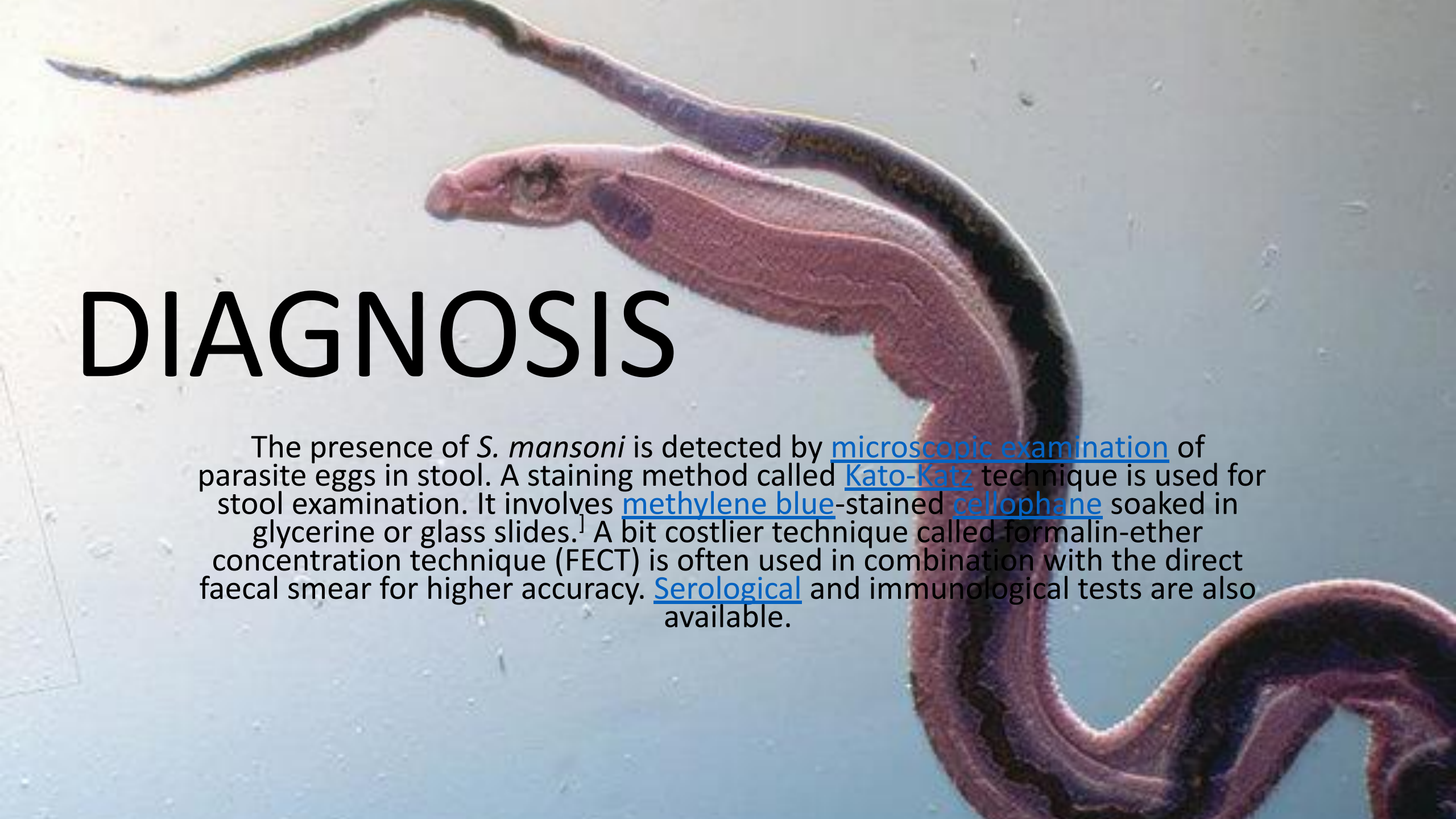
# MANSONI GROUP

***Schistosoma mansoni*** is a water-borne parasite of humans, and belongs to the group of blood flukes (*Schistosoma*). The adult lives in the blood vessels (mesenteric veins) near the human intestine. It causes intestinal schistosomiasis (similar to *S. japonicum*, *S. mekongi*, *S. guineensis*, and *S. intercalatum*). Clinical symptoms are caused by the eggs. As the leading cause of schistosomiasis in the world, it is the most prevalent parasite in humans.

# Egg

The eggs are oval-shaped, measuring 115-175 µm long and 45-47 µm wide, and ~150 µm diameter on average. They have pointed spines towards the broader base on one side, i.e. lateral spines


Adult
Schistosoma
♂
♀
Egg
Production
Egg Movement
to Gut and
Urine Bladder
Worm Pairing
Schistosomulae
Life Cycle of
Schistosoma mansoni
Skin Penetration
Release
of Cercariae
Infection of Snails
Miracidia
Hatching
of Eggs
Release of Eggs with
Feces and Urine
Illustration:
www.hegasy.de



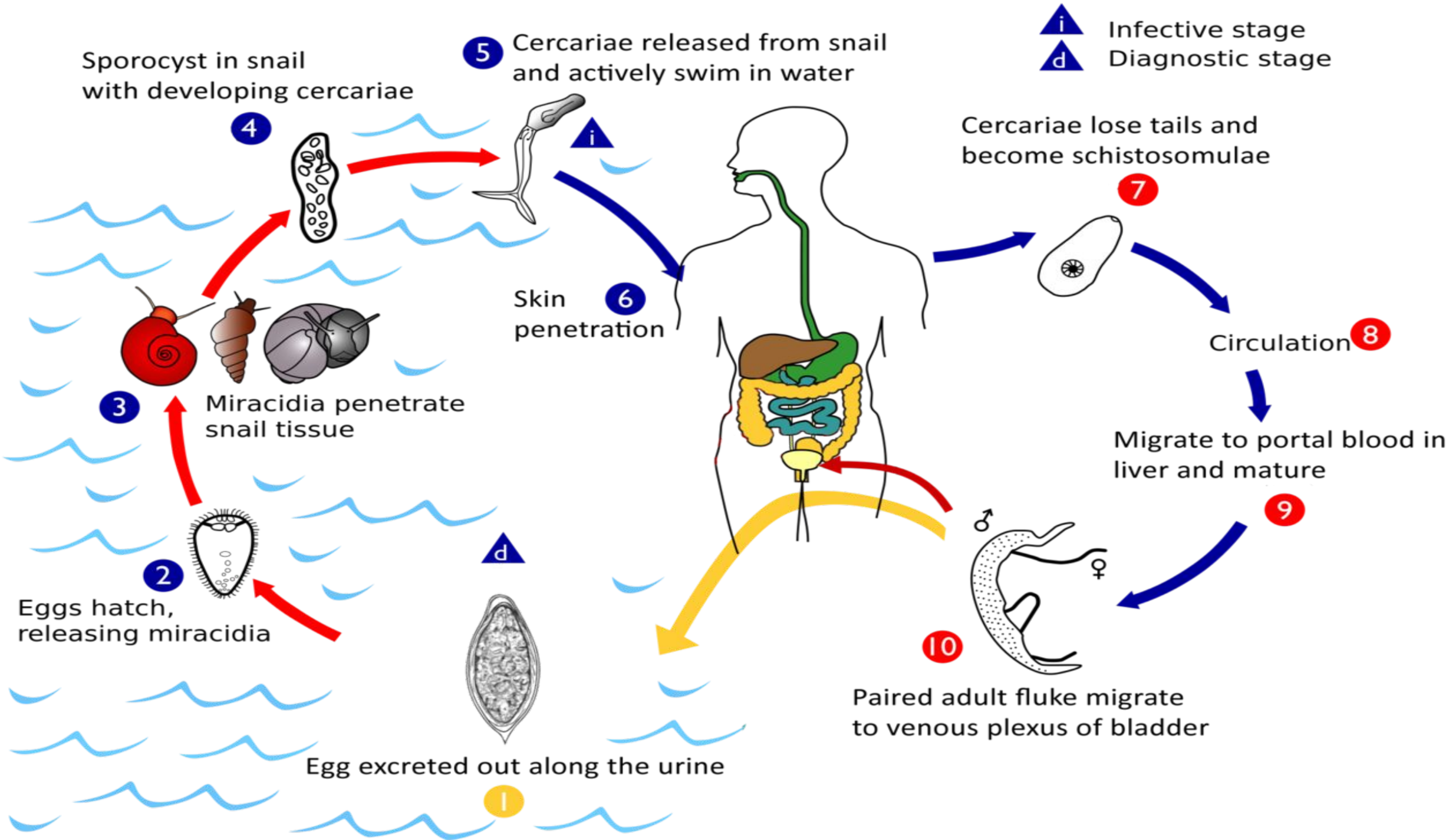
# DIAGNOSIS

The presence of *S. mansoni* is detected by microscopic examination of parasite eggs in stool. A staining method called Kato-Katz technique is used for stool examination. It involves methylene blue-stained cellophane soaked in glycerine or glass slides.] A bit costlier technique called formalin-ether concentration technique (FECT) is often used in combination with the direct faecal smear for higher accuracy. Serological and immunological tests are also available.

# HAEMATOBIUM GROUP

***Schistosoma haematobium*** (**urinary blood fluke**) is a species of digenetic trematode, belonging to a group (genus) of blood flukes (*Schistosoma*). It is found in Africa and the Middle East. It is the major agent of schistosomiasis, the most prevalent parasitic infection in humans

# EGG


i Infective stage
d Diagnostic stage
Sporocyst in snail
with developing cercariae
4
5 Cercariae released from snail
and actively swim in water
i
Cercariae lose tails and
become schistosomulae
7
Skin
penetration
6
Circulation 8
3
Miracidia penetrate
snail tissue
Migrate to portal blood in
liver and mature
9
♂
♀
d
2
Eggs hatch,
releasing miracidia
10
Paired adult fluke migrate
to venous plexus of bladder
Egg excreted out along the urine
1

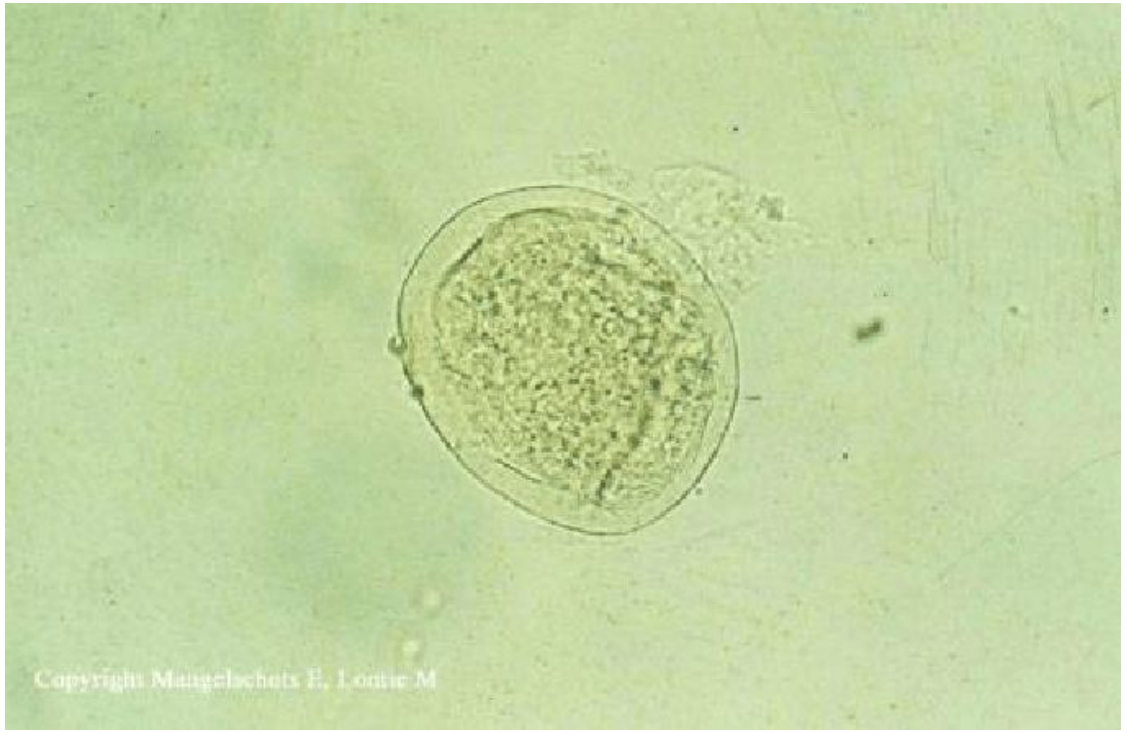
# DIAGNOSIS

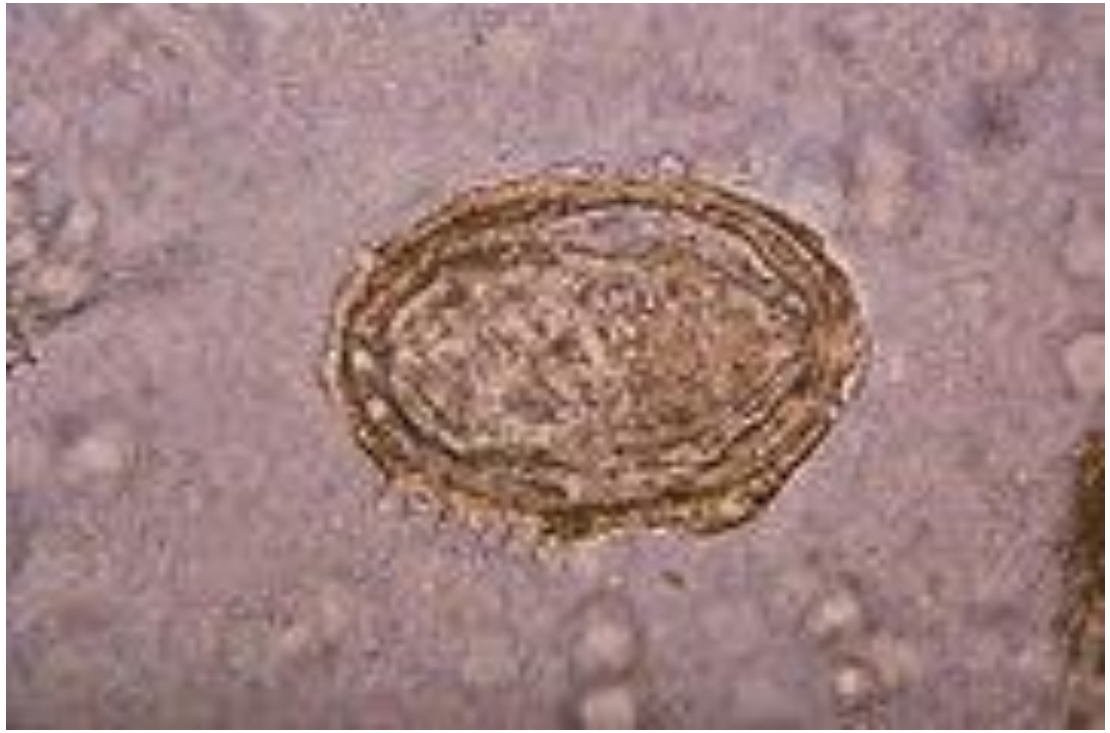
Traditionally, diagnoses has been made by examination of the urine for eggs. In chronic infections, or if eggs are difficult to find, an intradermal injection of schistosome antigen to form a wheal is effective in determining infection. Alternatively diagnosis can be made by complement fixation tests.[28] As of 2012, commercial blood tests included ELISA and an Indirect immunofluorescence test, but these have low sensitivity ranging from 21% to 71%

# JAPONICUM GROUP

***Schistosoma japonicum*** is an important parasite and one of the major infectious agents of schistosomiasis.This parasite has a very wide host range, infecting at least 31 species of wild mammals, including 9 carnivores, 16 rodents, one primate (Human), two insectivores and three artiodactyls and therefore it can be considered a true zoonosis.

# EGG



**Human** (definitive host)
Adult worms migrate to mesenteric and portal veins

Eggs excreted in faeces are passed into water

Miracidia hatch from egg into water

**Snail (intermediate host)**

miracidia penetrate snail

Sporocysts

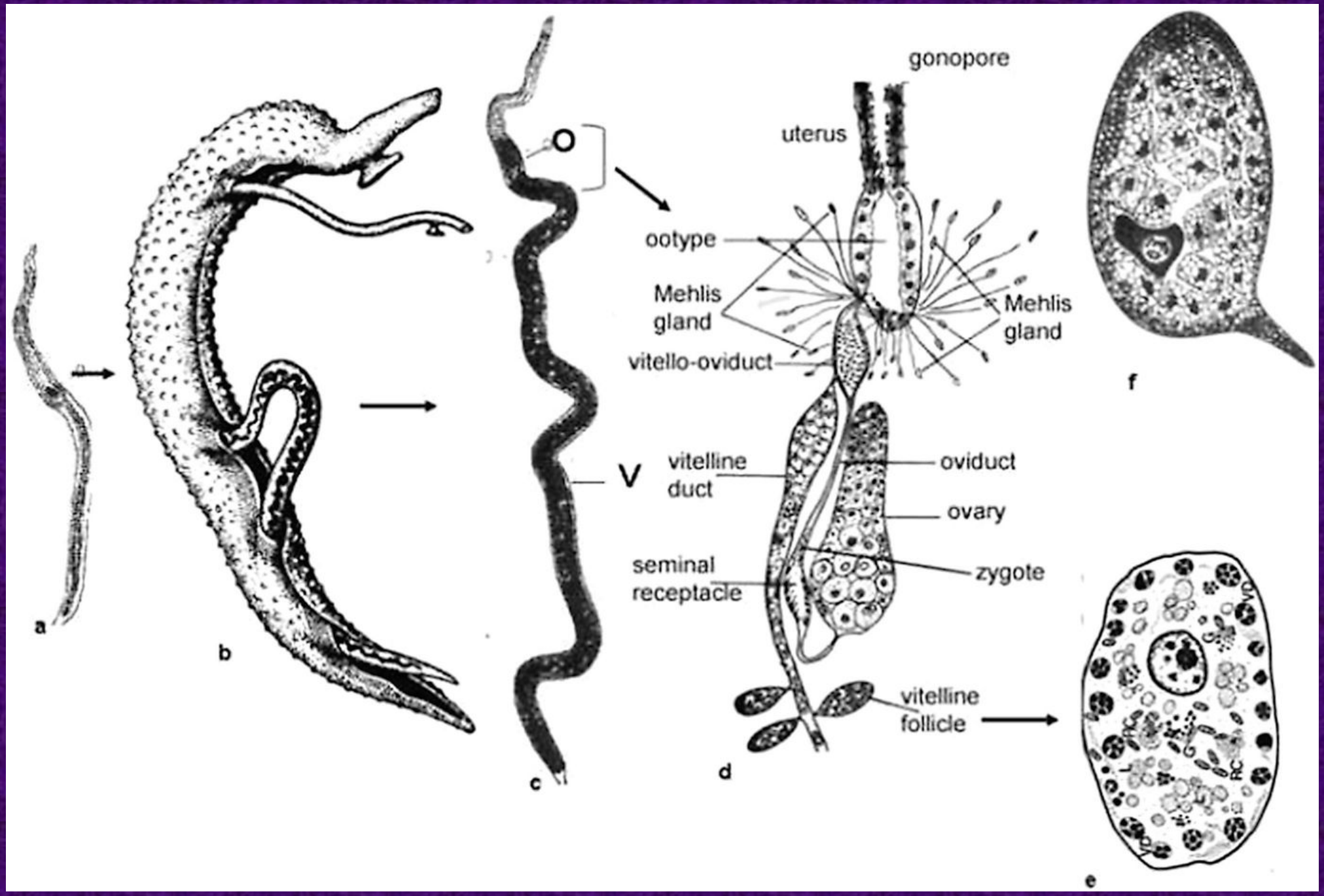
Cercaria

Cercaria are released into water

Cercaria penetrate skin when person is in contact with water

# DIAGNOSIS

Microscopic identification of eggs in stool or urine is the most practical method for diagnosis. Stool examination should be performed when infection with *S. mansoni* or *S. japonicum* is suspected, and urine examination should be performed if *S. haematobium* is suspected. Eggs can be present in the stool in infections with all Schistosoma species.


a
b
c
O
V
gonopore
uterus
ootype
Mehlis gland
Mehlis gland
vitello-oviduct
vitelline duct
oviduct
ovary
zygote
seminal receptacle
vitelline follicle
d
f
e

thank you