

# Paramphistomatidae

## Charakteristika:

- Břišní přísavka velká, na konci těla
- Tělo kulovitého tvaru
- Cizopasí hlavně u savců, včetně hospodářských zvířat a člověka

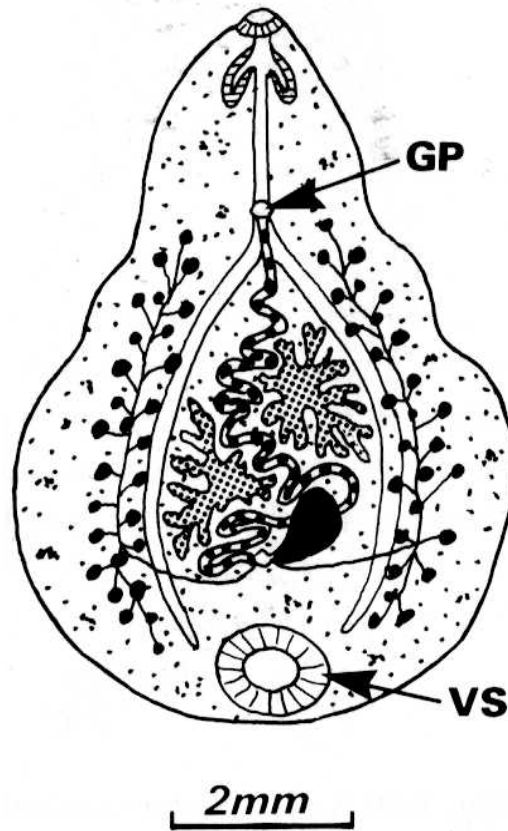
## Vývoj:

- 1.Mz –plži (Planorbidae) – paramfistomní cercárie
- Metacercárie (adoleskarie) na vegetaci

## Zástupci:

- *Paramphistomum cervi* – skot, jeleni, ovce
- ***Gastrodiscoides hominis*** (subtropy) - člověk

# Gastrodiscoides hominis



# Echinostomatidae

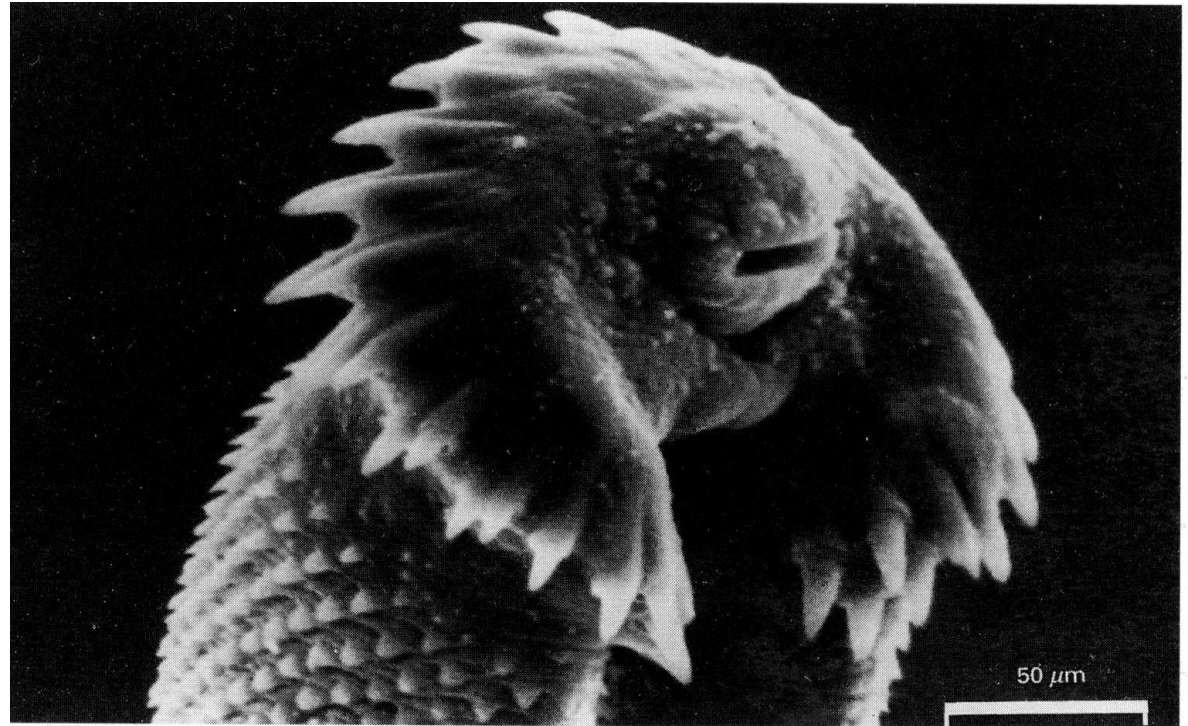
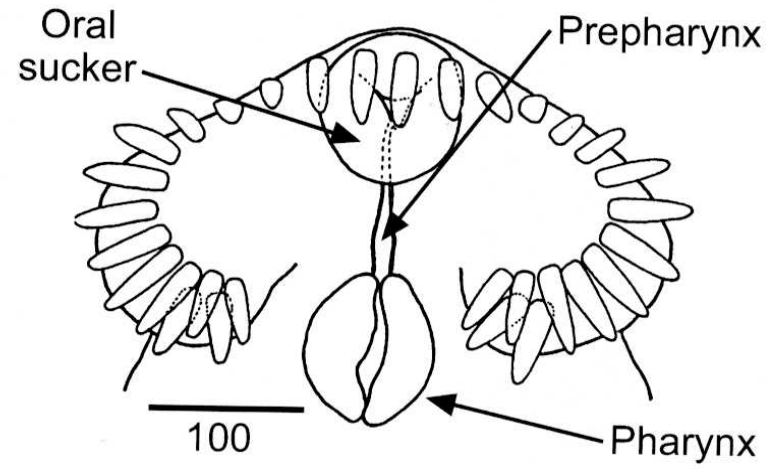
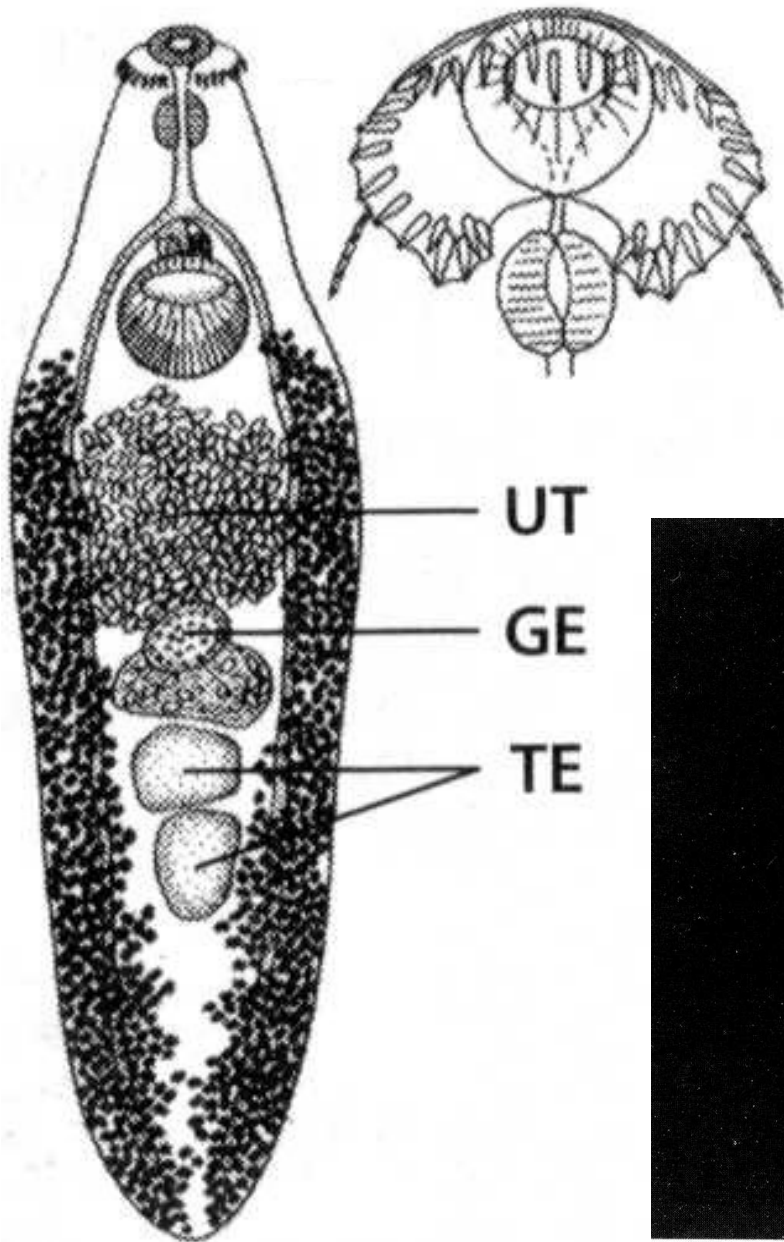
## Charakteristika:

- Běžné střevní motolice ptáků a savců, vzácně u lidí
- Límeč s trny

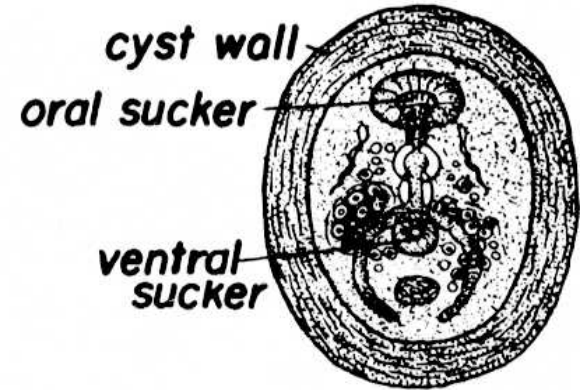
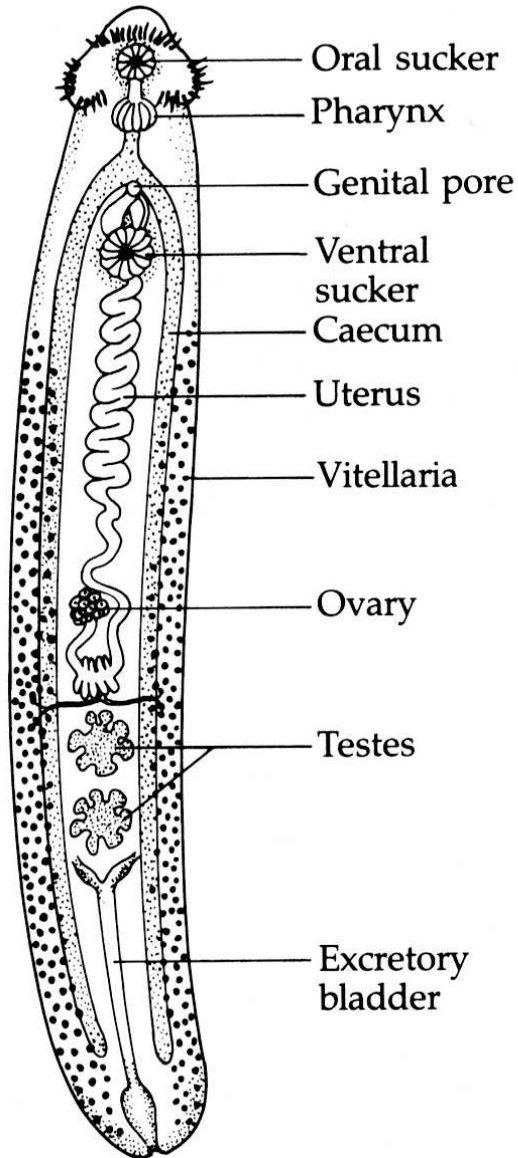
## Vývoj:

- 1. Mz – plži (Lymnaea, Physa, Bithynia) – echinostomní cercárie
- 2. Mz – bezobratlí (především, měkkýši) ale i obratlovci (žáby, ryby)
- **Zástupci:**
- **Echinostoma revolutum**
- Echinoparyphium, Petasiger, Hypoderaeum

# Echinostoma revolutum

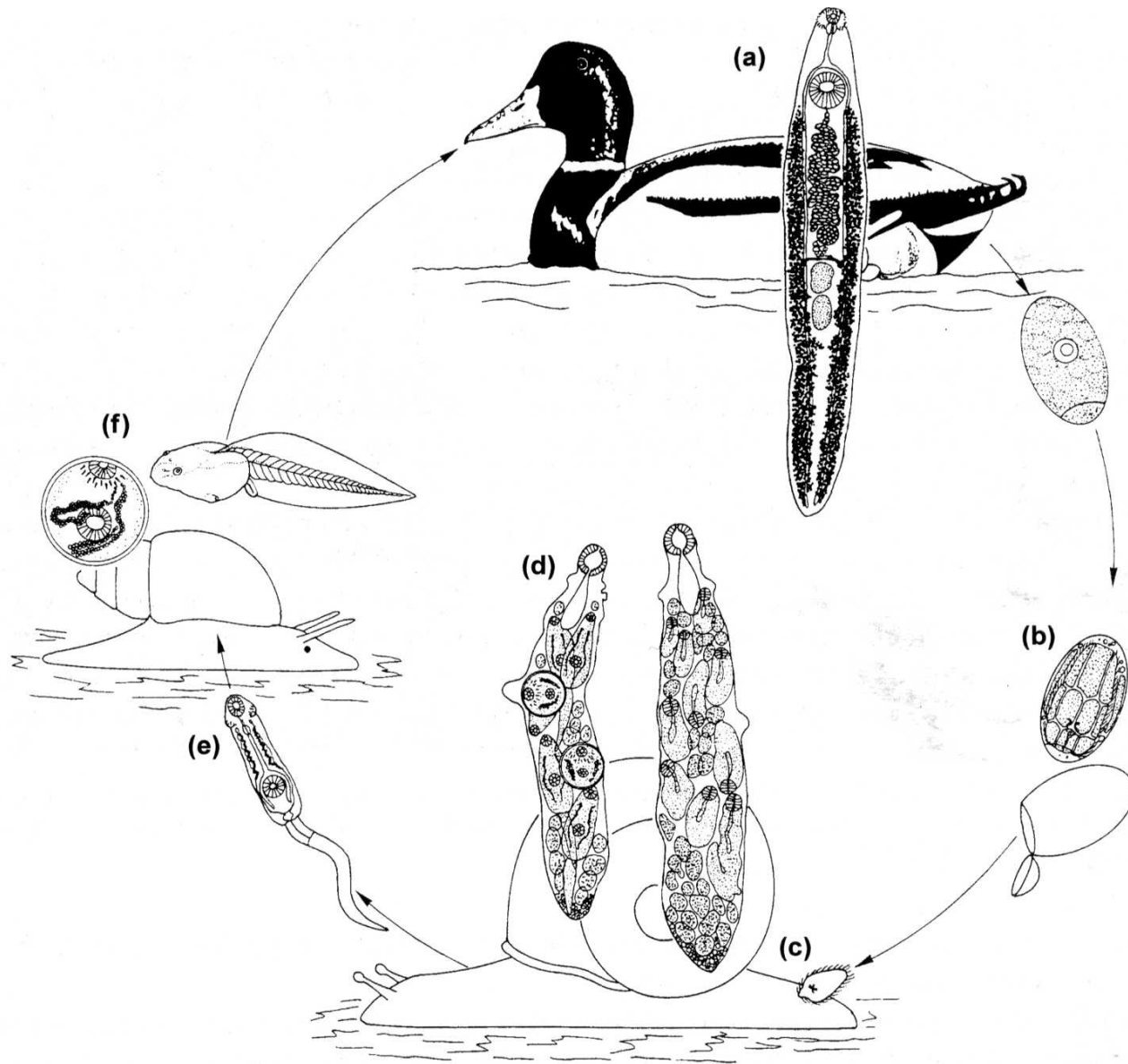


# Echinostoma revolutum



**METACERCARIA  
(X 100)**

# Echinostoma revolutum



# Paragonimidae

## Charakteristika:

- Plicní cizopasníci

## Vývoj:

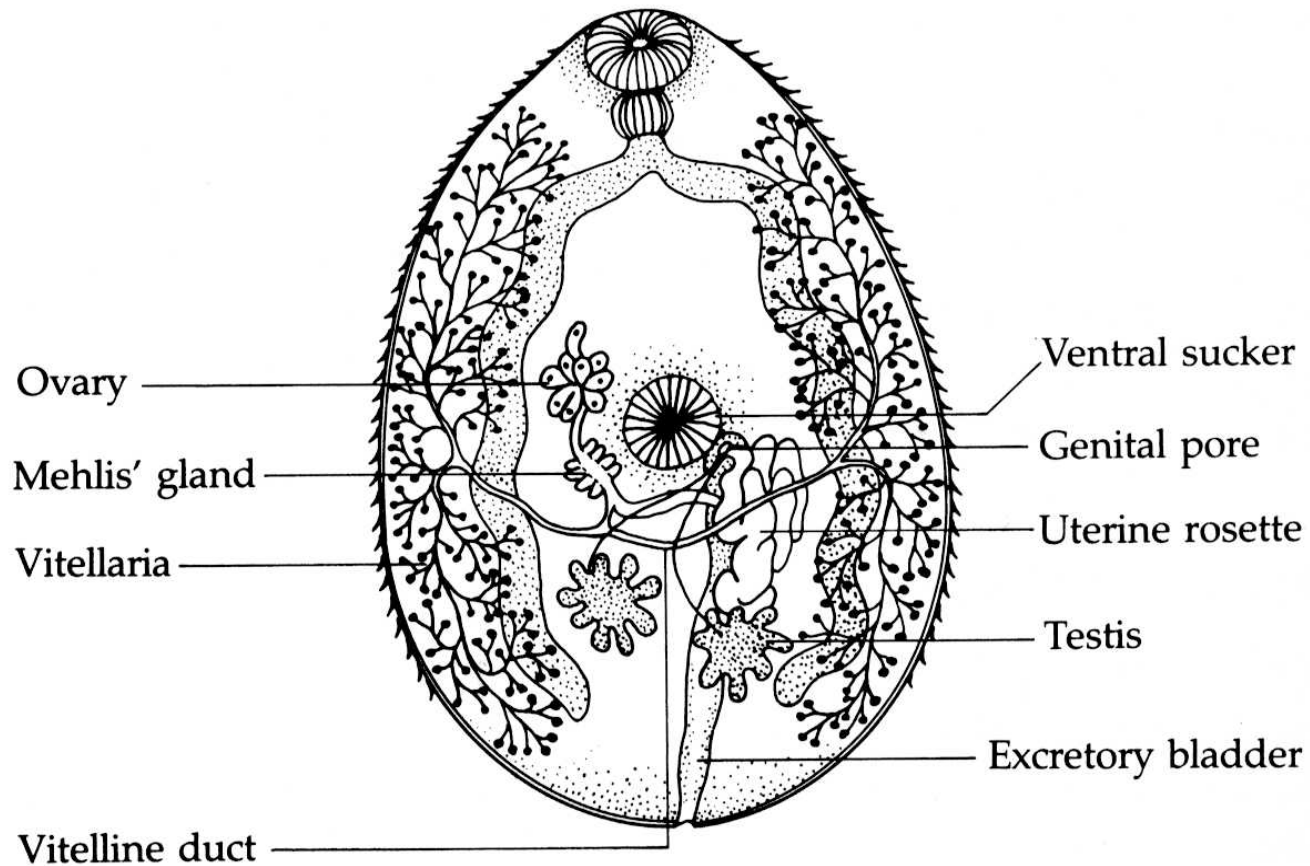
- 1. Mz – okružáci (Planorbis, Melania) – mikrocerkárie
- 2. Mz – krabi a raci (Astacus sinensis, Eriocheir sinensis)

## Zástupci:

- **Paragonimus westermani** (východní Asie)
  - Šelmy, buvoli, člověk
  - Červi žijí 20 – 30 let
  - Častá záměna s TBC (krvavé sputum), kaverny v plicích až smrt
  - Léčba málo úspěšná



# Paragonimus westermani (motolice plicní)



# Paragonimus westermani

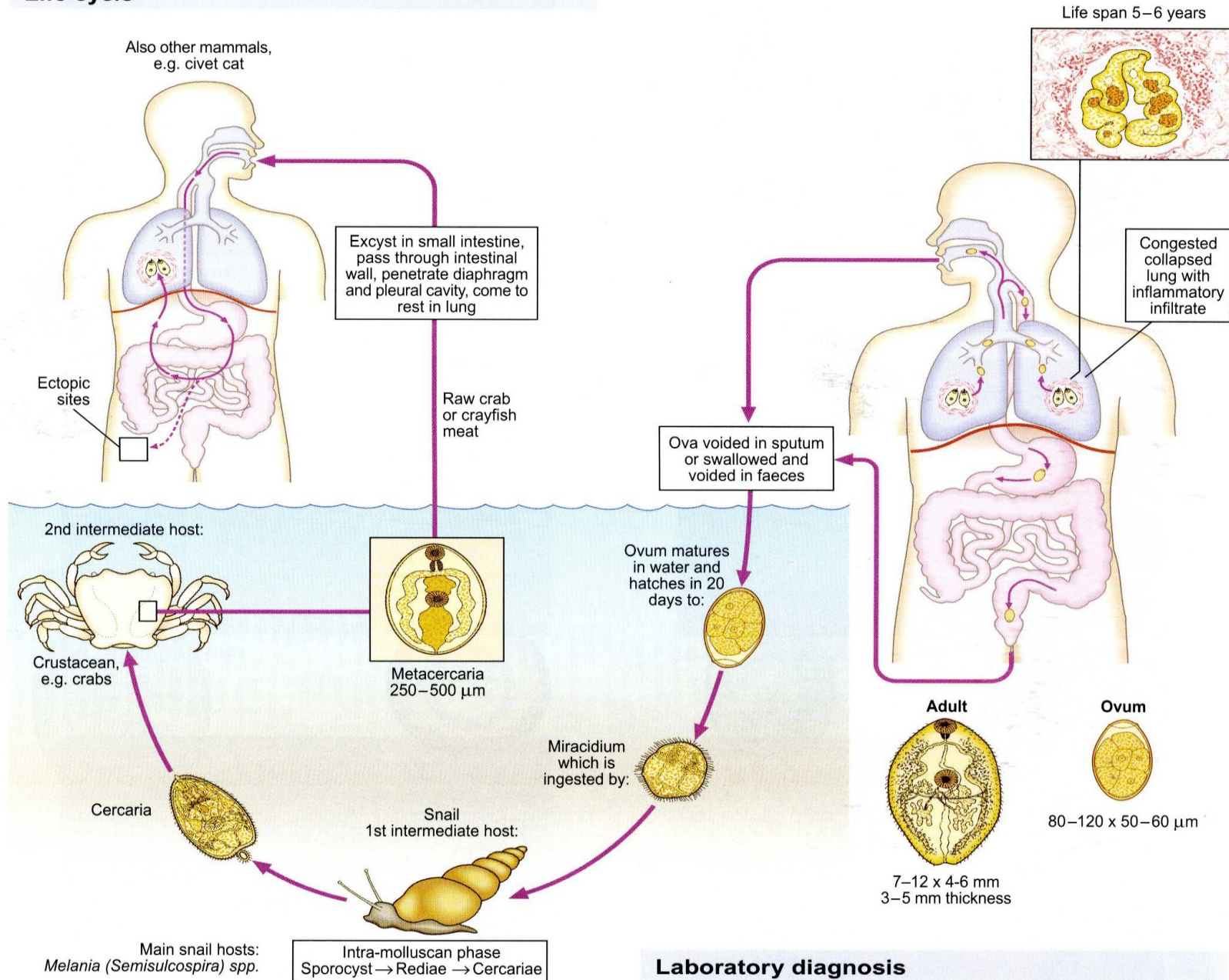
## Distribution

5 million infected worldwide.



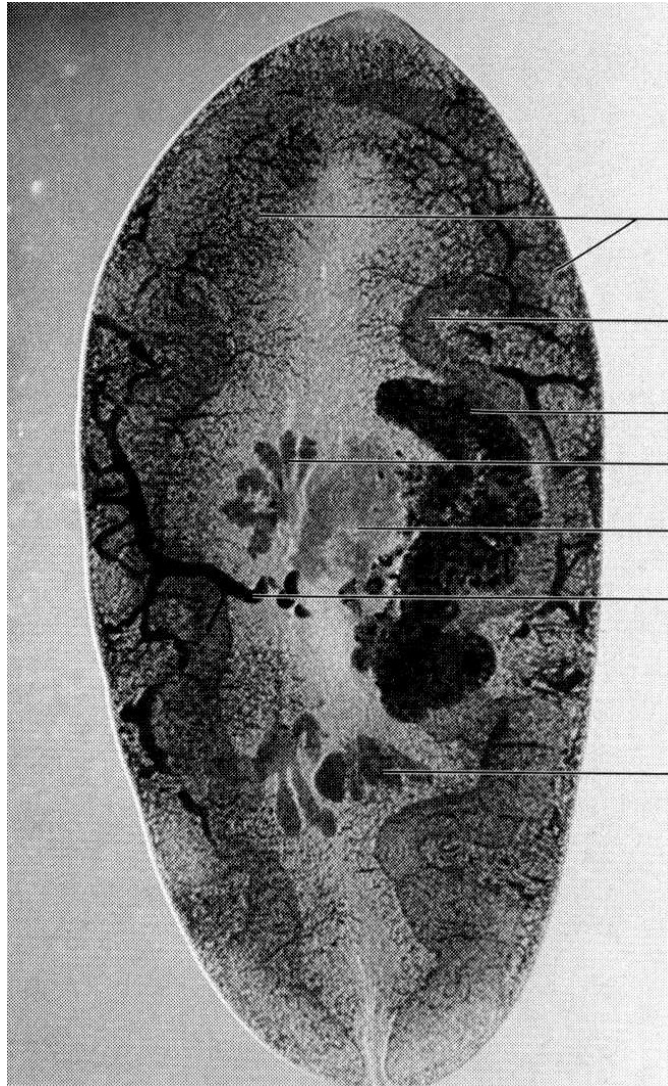
# Paragonimus westermani (lung fluke)

## Life cycle

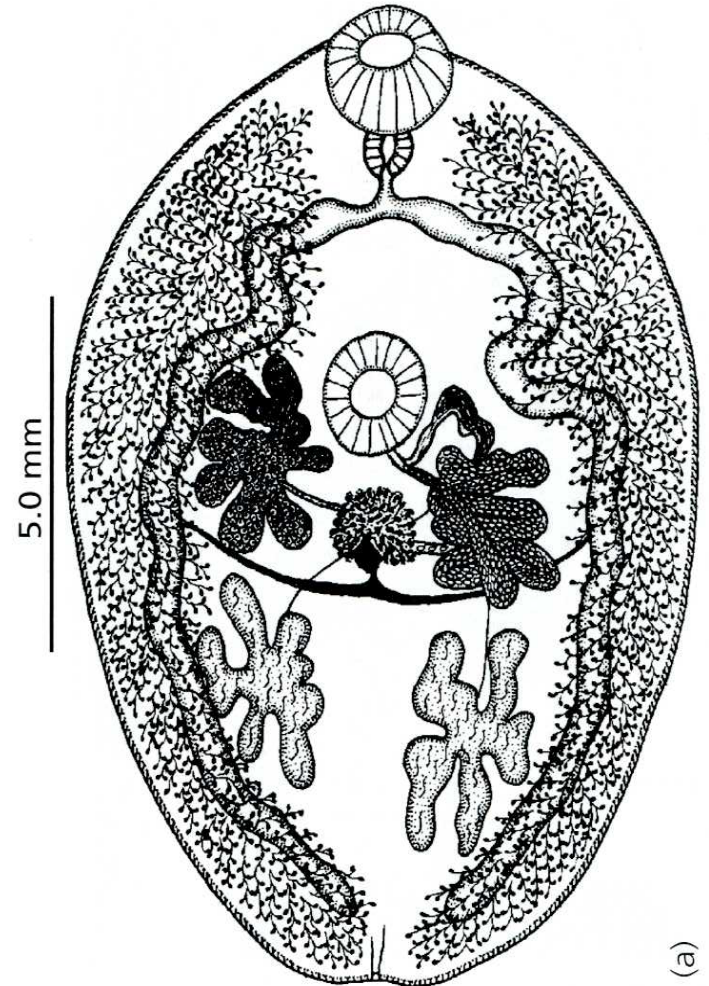


## Laboratory diagnosis

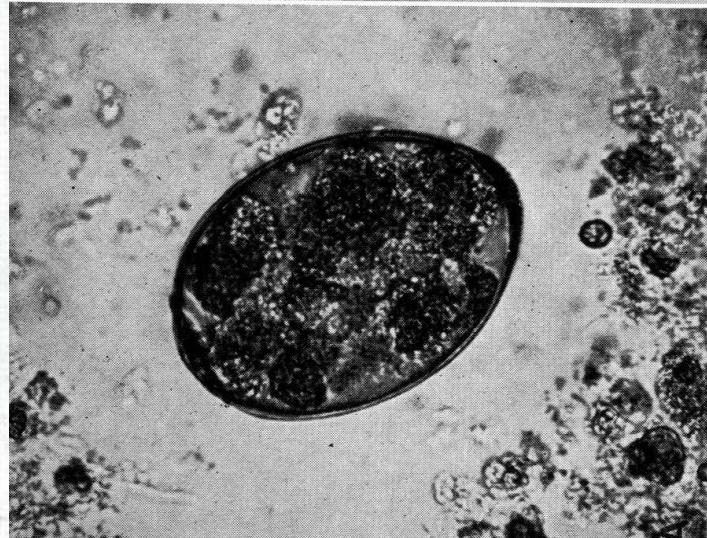
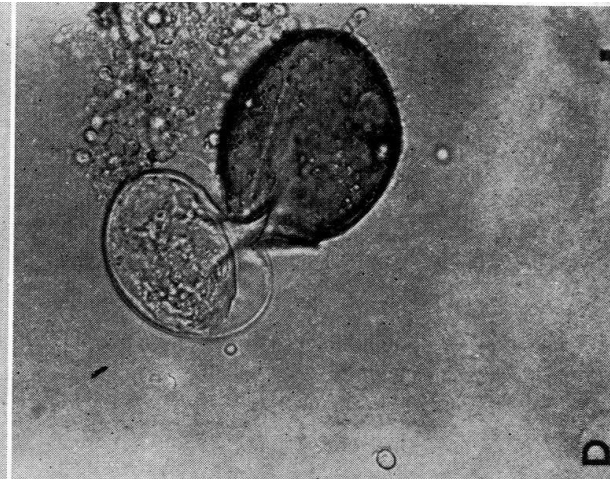
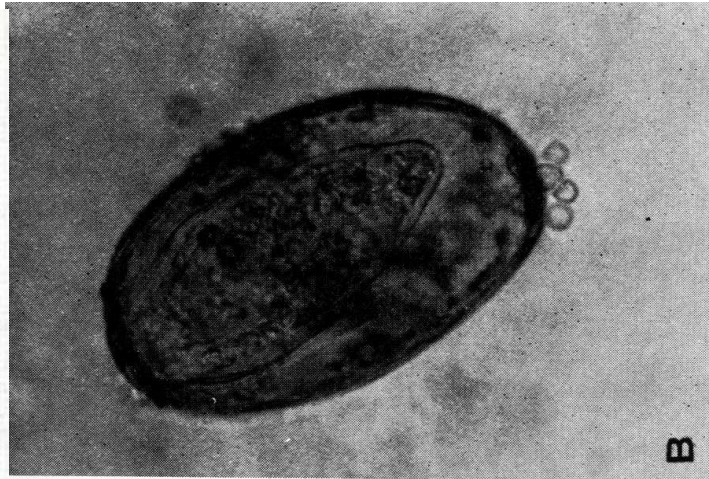
# Paragonimus westermani



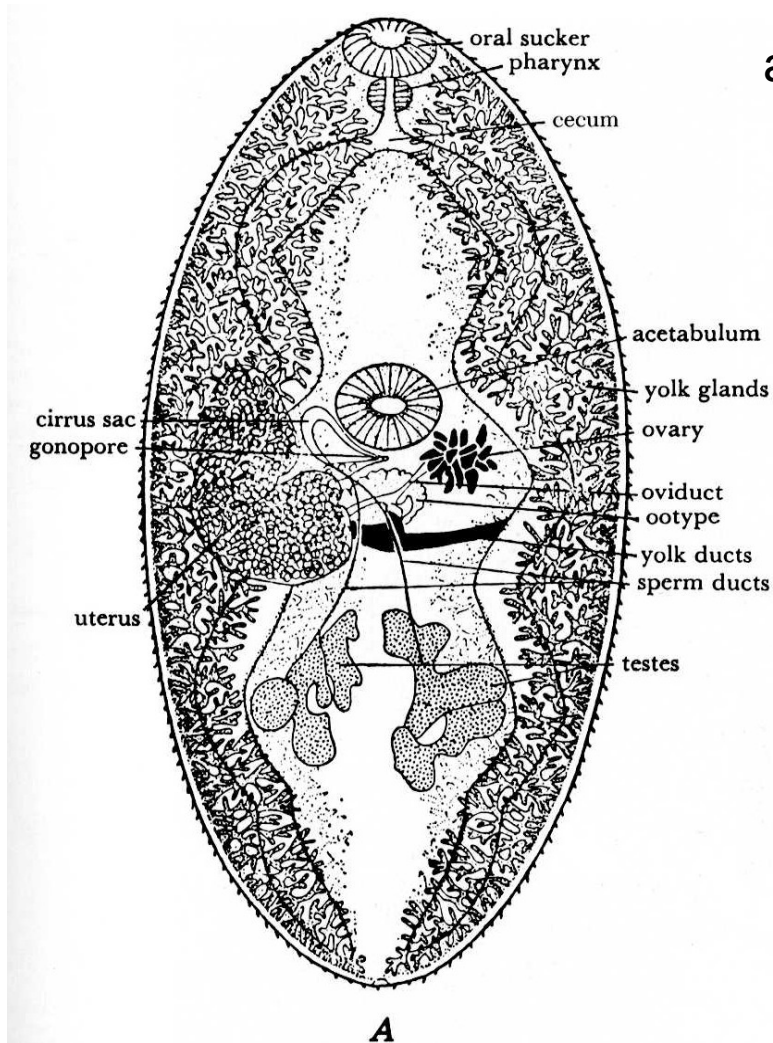
- Vitellaria
- Intestine
- Uterus
- Ovary
- Mehlis' gland
- Vitelline duct
- Testis



# Líhnutí miracidia z vajíček

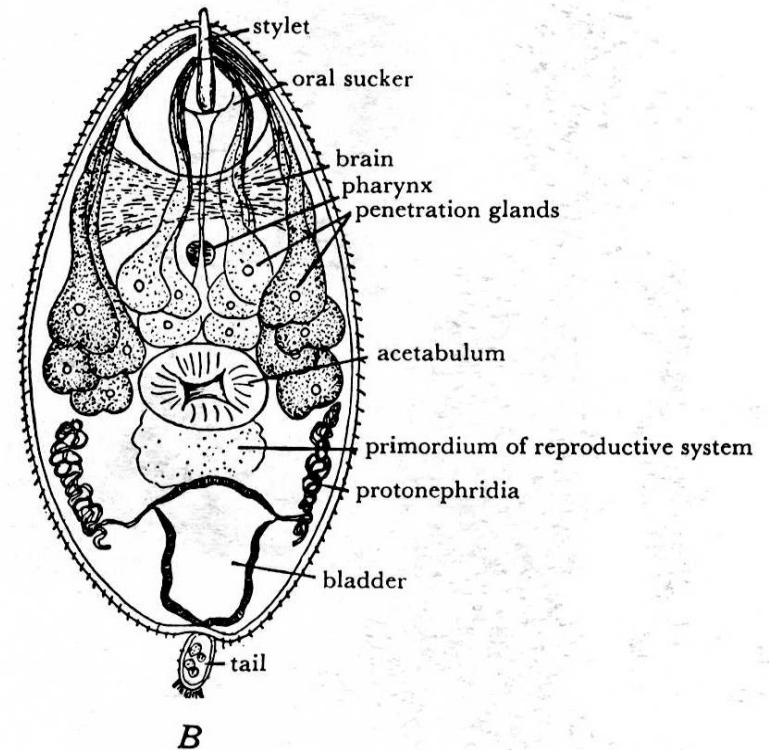


# Paragonimus westermani

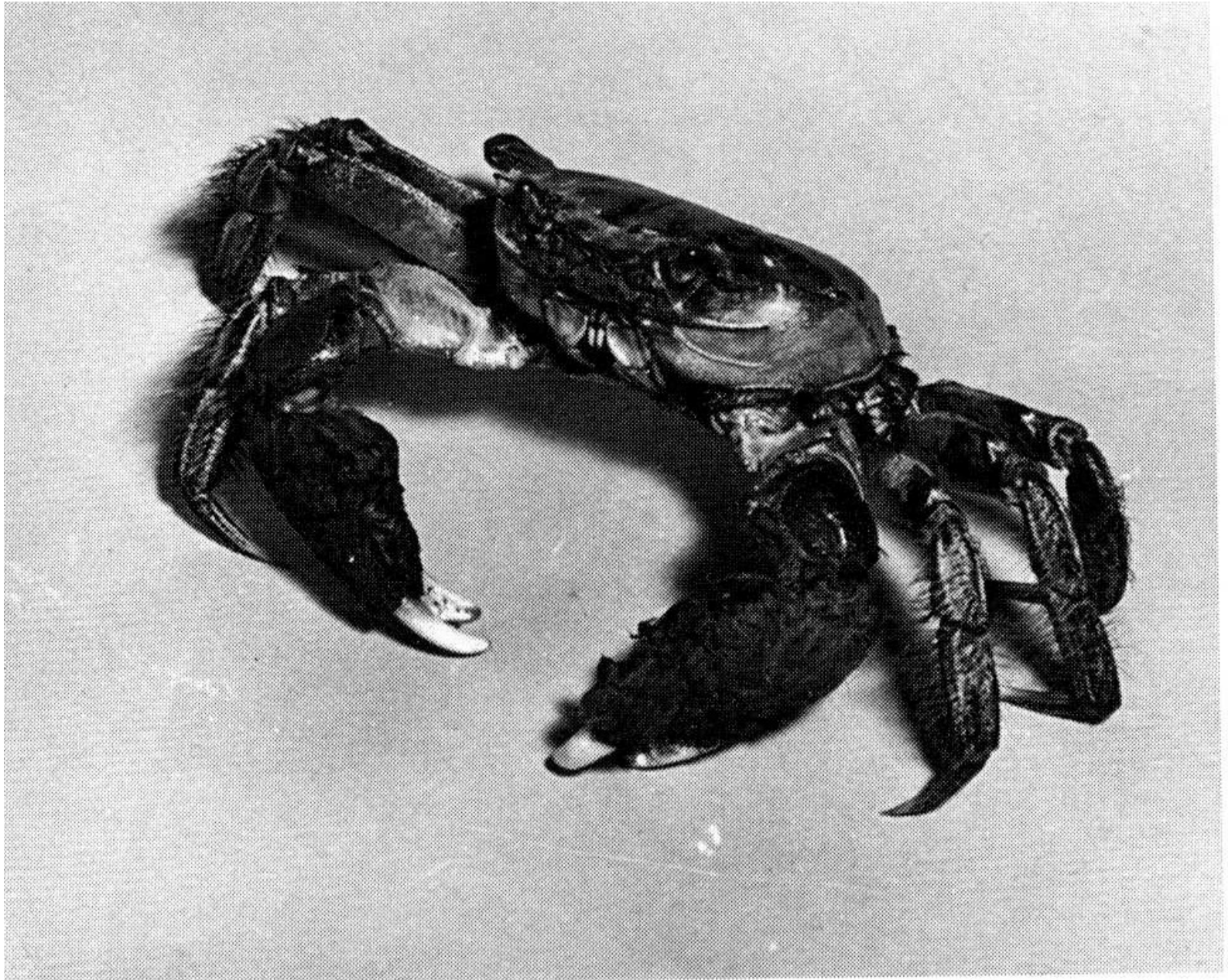


adultní motolice

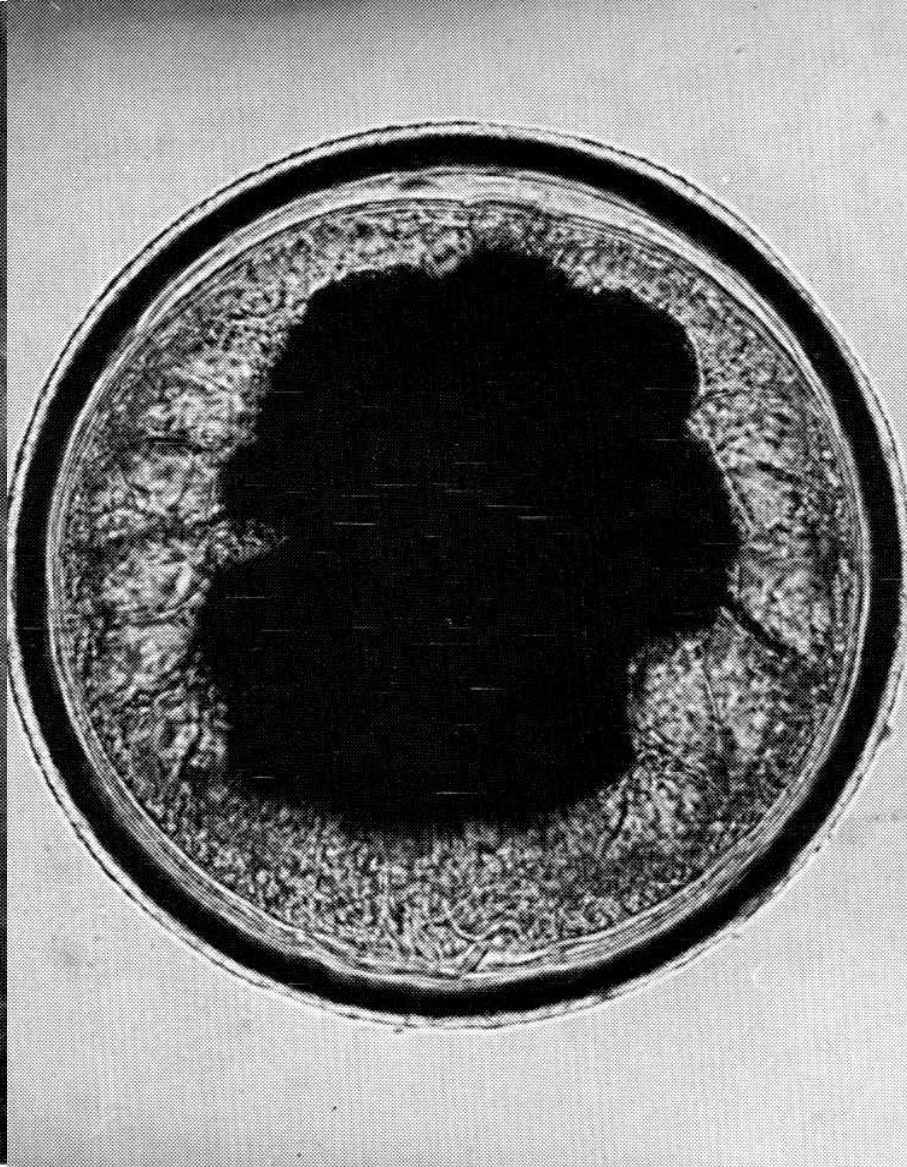
cerkárie



# Eriocheir japonicus - mezihostitel

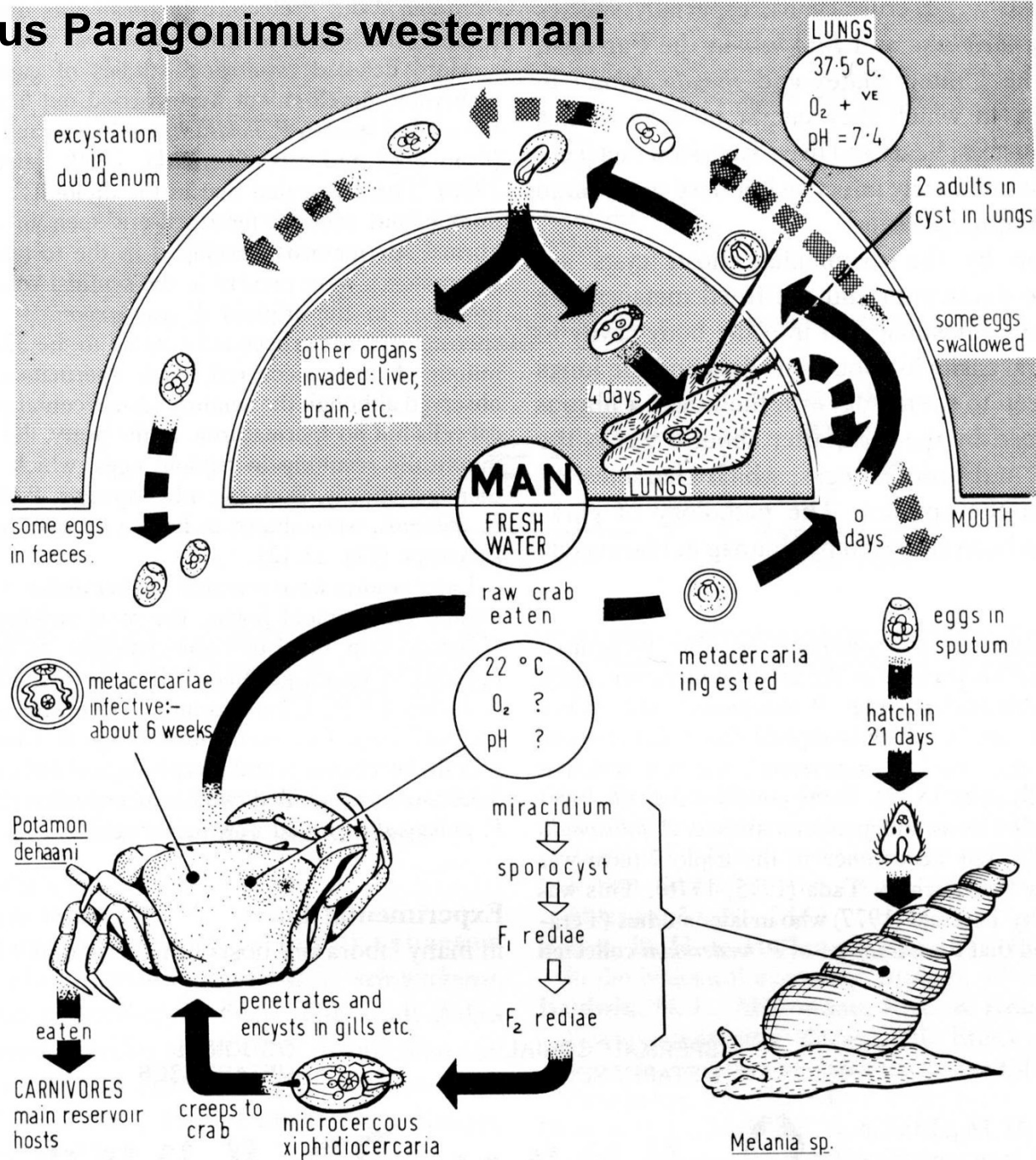


# Metacerkarie *Paragonimus westermani*





# Životní cyklus *Paragonimus westermani*



# Dicrocoelidae

## Charakteristika:

- Cizopasníci jater a žlučovýchodů ptáků a savců
- Hospodářsky významné druhy
- Suchozemské prostředí

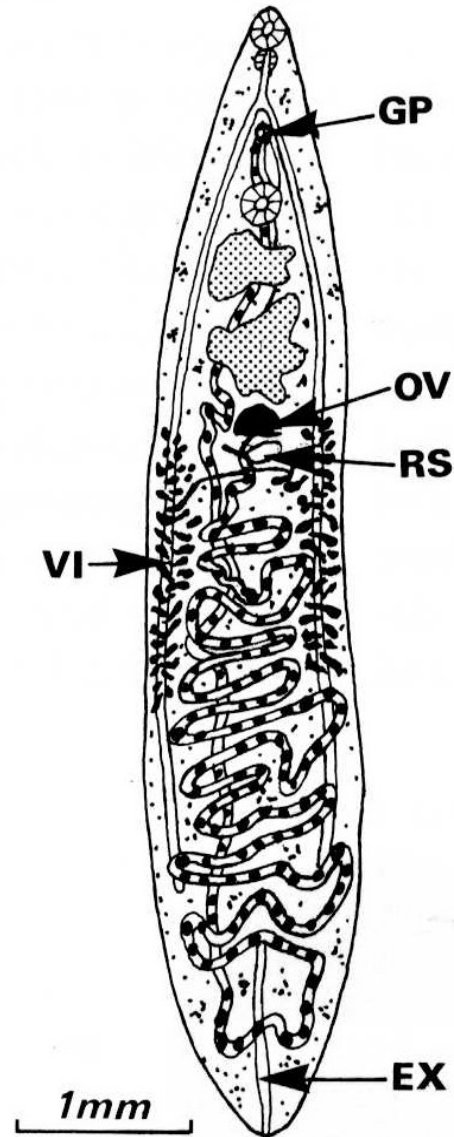
## Vývoj (*D. dentriticum*):

- 1. Mz – suchozemští plži (*Zebrina*, *Theba*, *Helicella*) – cercaria vitrina – se slizem v kuličkách na vegetaci
- 2. Mz – mravenci (*Formica*, *Tetramorium*)

## Zástupci:

- ***Dicrocoelium dentriticum*** (syn. *D. lanceolatum*)
- Přežvýkavci, divoká zvěř, člověk, záněty a rozšíření žlučovýchodů

# Dicrocoelium dentriticum



# Fasciolidae I

## Charakteristika:

- Jaterní (Fasciolinae) nebo střevní (Fasciolopsinae) motolice
- Významní cizopasníci lidí, hospodářských zvířat i zvěře
- Velké tělo listovitého (kopinatého) tvaru
- Keříčková varlata i vaječník
- Střevo bohatě rozvětvené (pouze Fasciolinae)

**Vývoj:** 1. Mz – plži (Lymnaeidae, Planorbidae) – gymnocephální cercárie

- Metacercárie (adoleskárie) na vegetaci

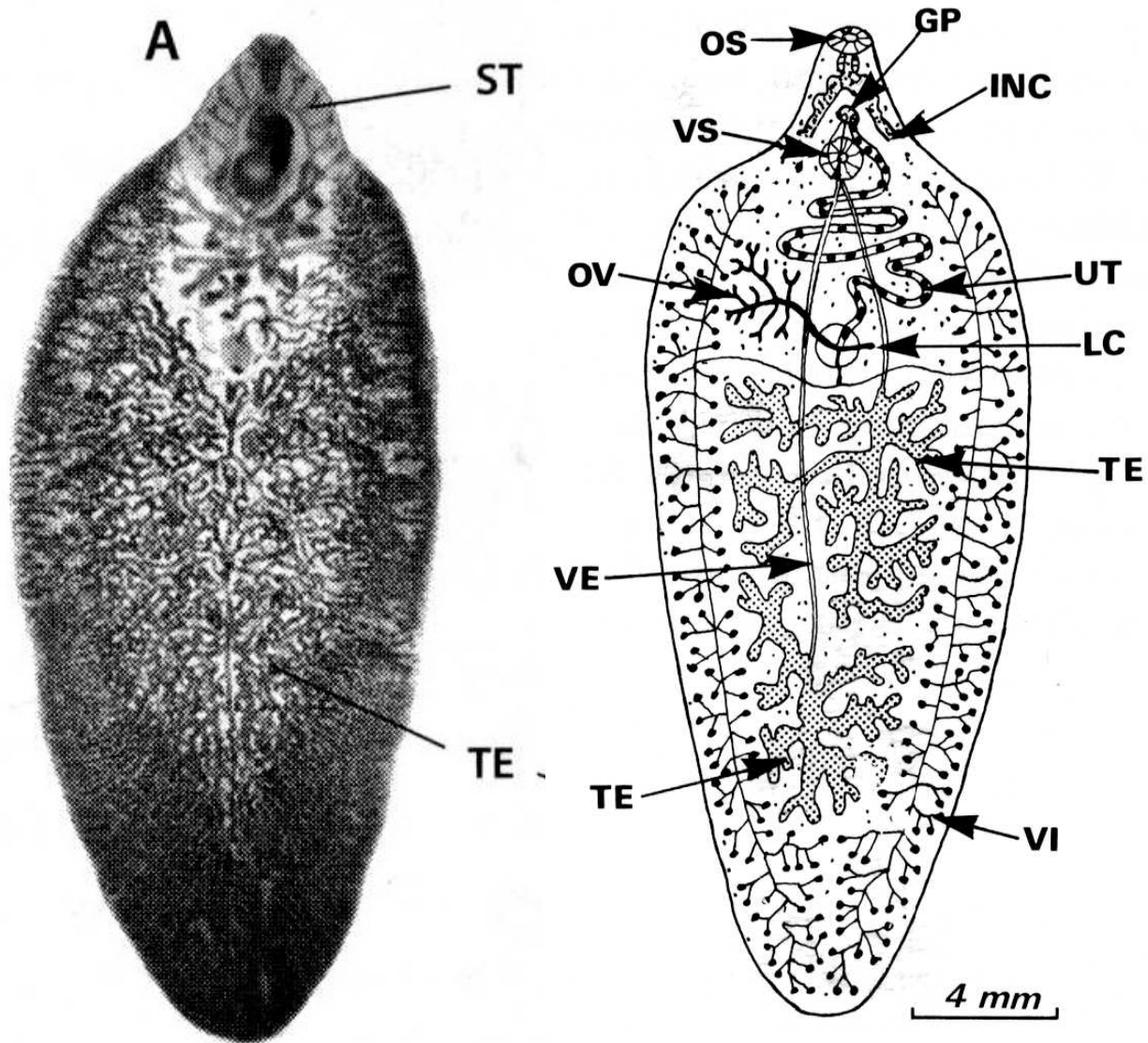
# Fasciolidae II

## Zástupci:

- **Fasciola hepatica**
  - Ovce, skot, jeleni, člověk
  - Kosmopolitní rozšíření
  - Asi 2 mil vajíček za život
  - Mz *Lymnaea* (= *Galba*) *truncatula* (bažinný druh)), *Lymnaea*, *Physa*,
  - Migrace v definitivním hostiteli (bránice, játra)
- **Fasciola gigantica** – až 8 cm, *Bulinus truncatus*

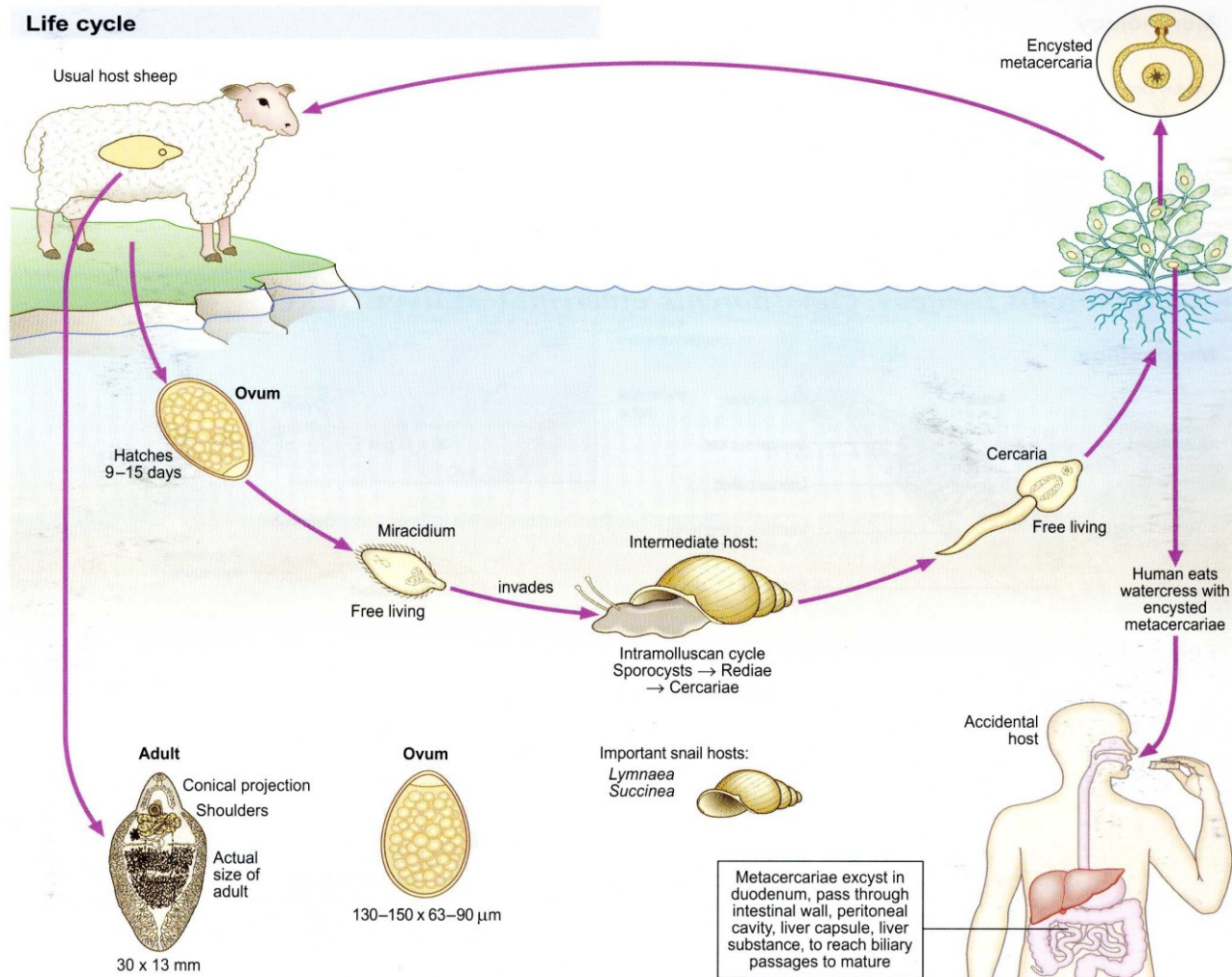
# Fasciola hepatica

(motolice jaterní)



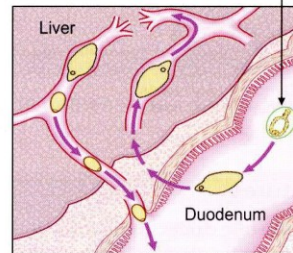
# Fasciola hepatica (sheep liver fluke)

## Life cycle



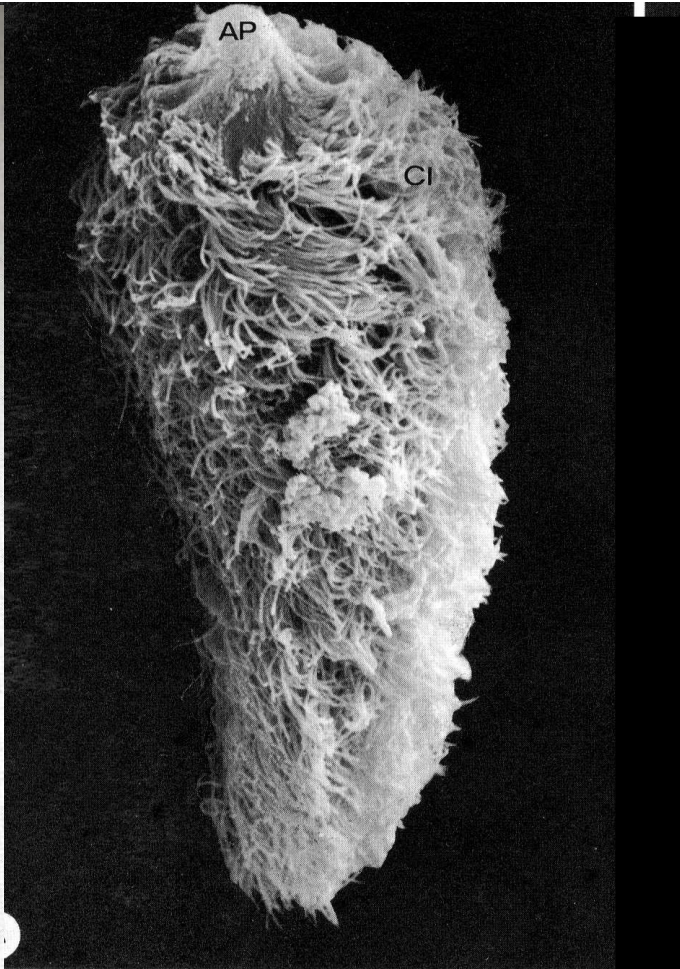
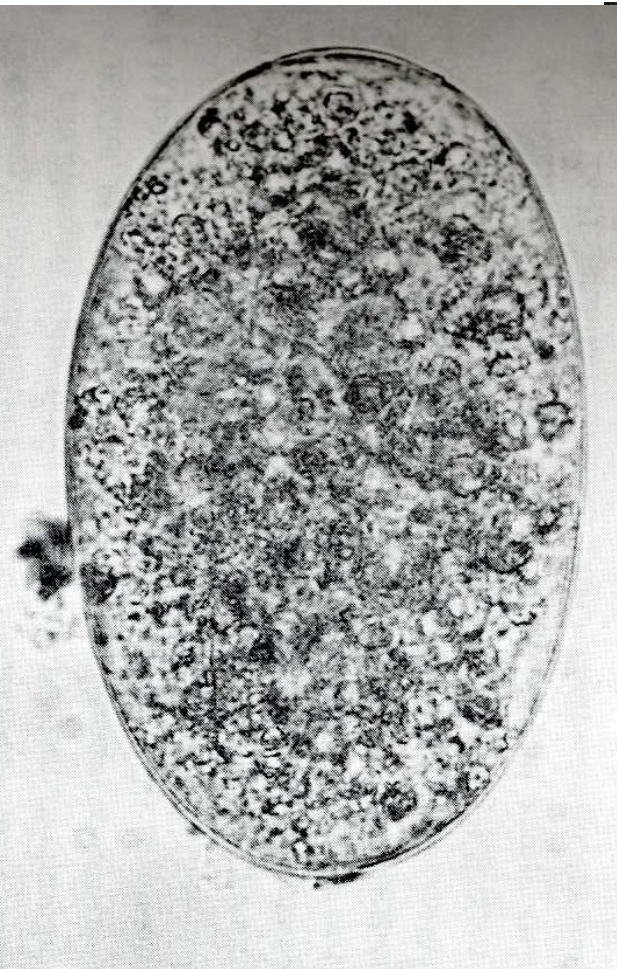
## Pathology and Clinical features

Transit of immature worms through the liver can cause mechanical and toxic irritation with toxæmia, necrosis and secondary fibrosis. Development in the bile ducts causes cystic enlargement, endothelial hyperplasia and adenomata, and secondary inflammatory infiltration causing fibrosis and cholangitis. There can be secondary bacterial infection causing abscesses. Eosinophilia is marked. Worms can appear

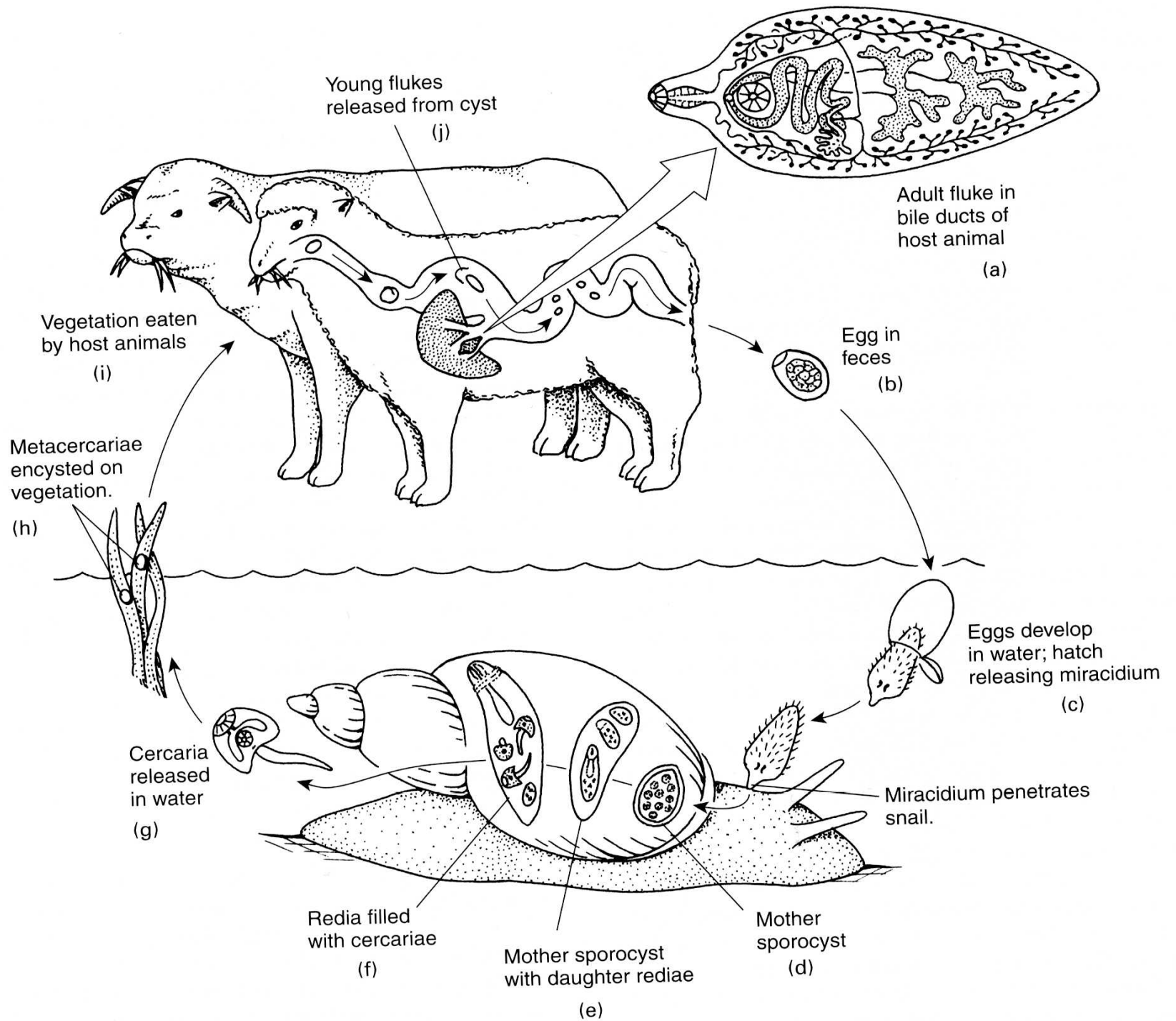


Ova  
Laid in biliary passages, pass to intestine and voided in faeces

# Vajíčko a miracidium

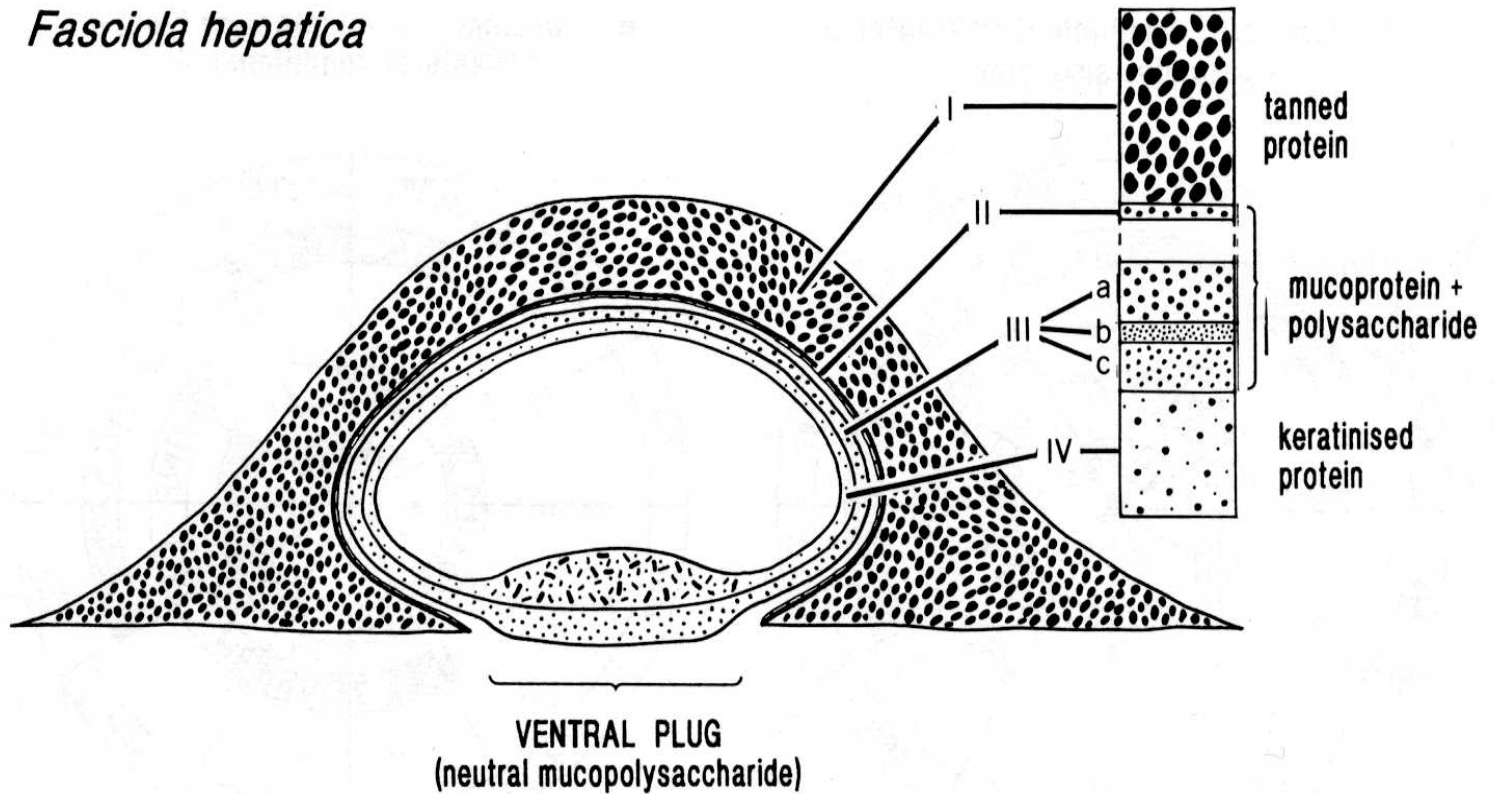






# Tvorba metacerkárie - adoleskárie

*Fasciola hepatica*

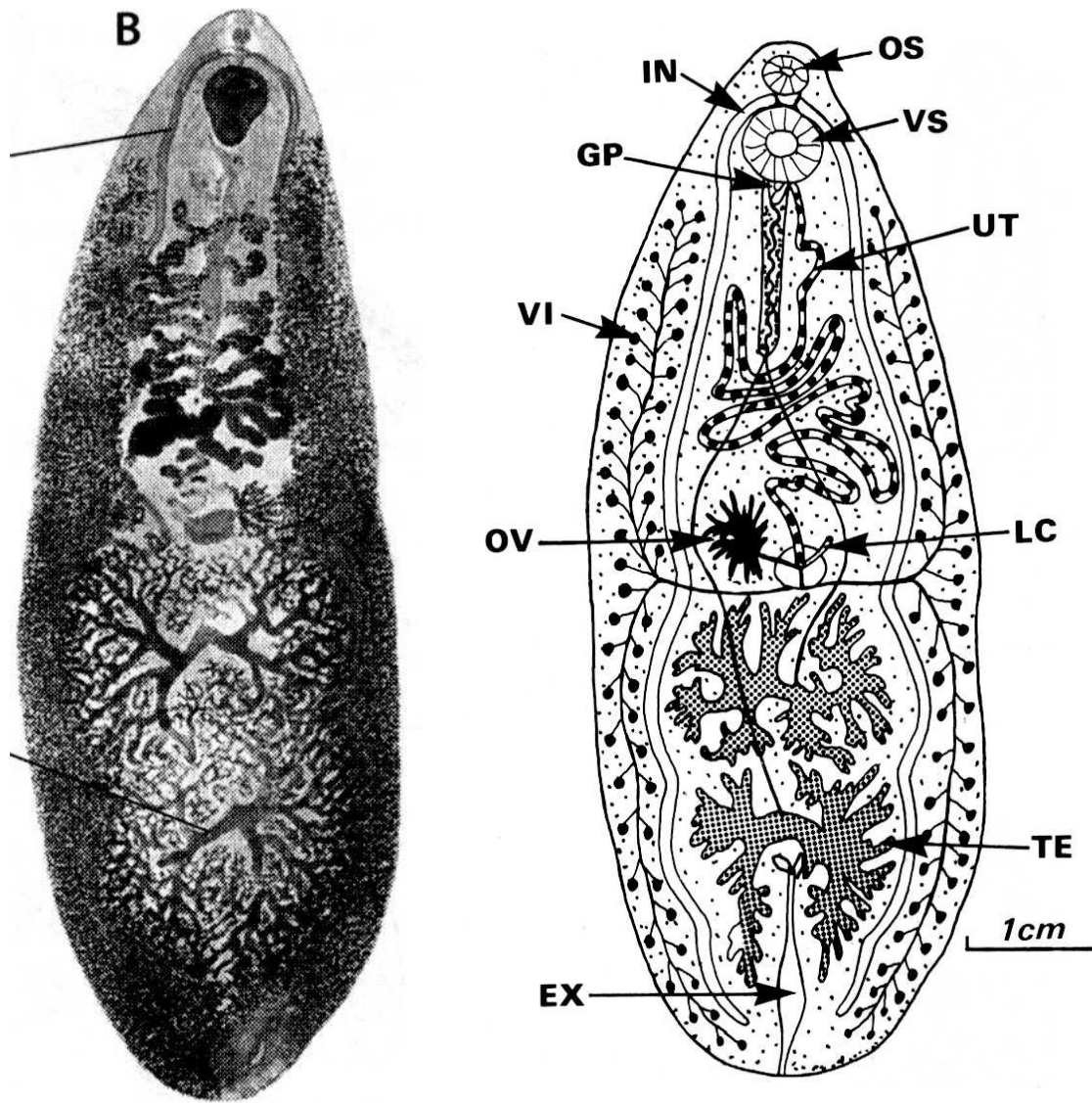


# Fasciolidae III

## Zástupce:

- **Fasciolopsis busci**
- Velikost až 7 cm
- Střevní parazit prasat, psů, člověka v Asii
- Mz – Melania, Oncomelania, Planorbis
- Adoleskárie na Trapa natans, lotosu
- Těžké poškození střev

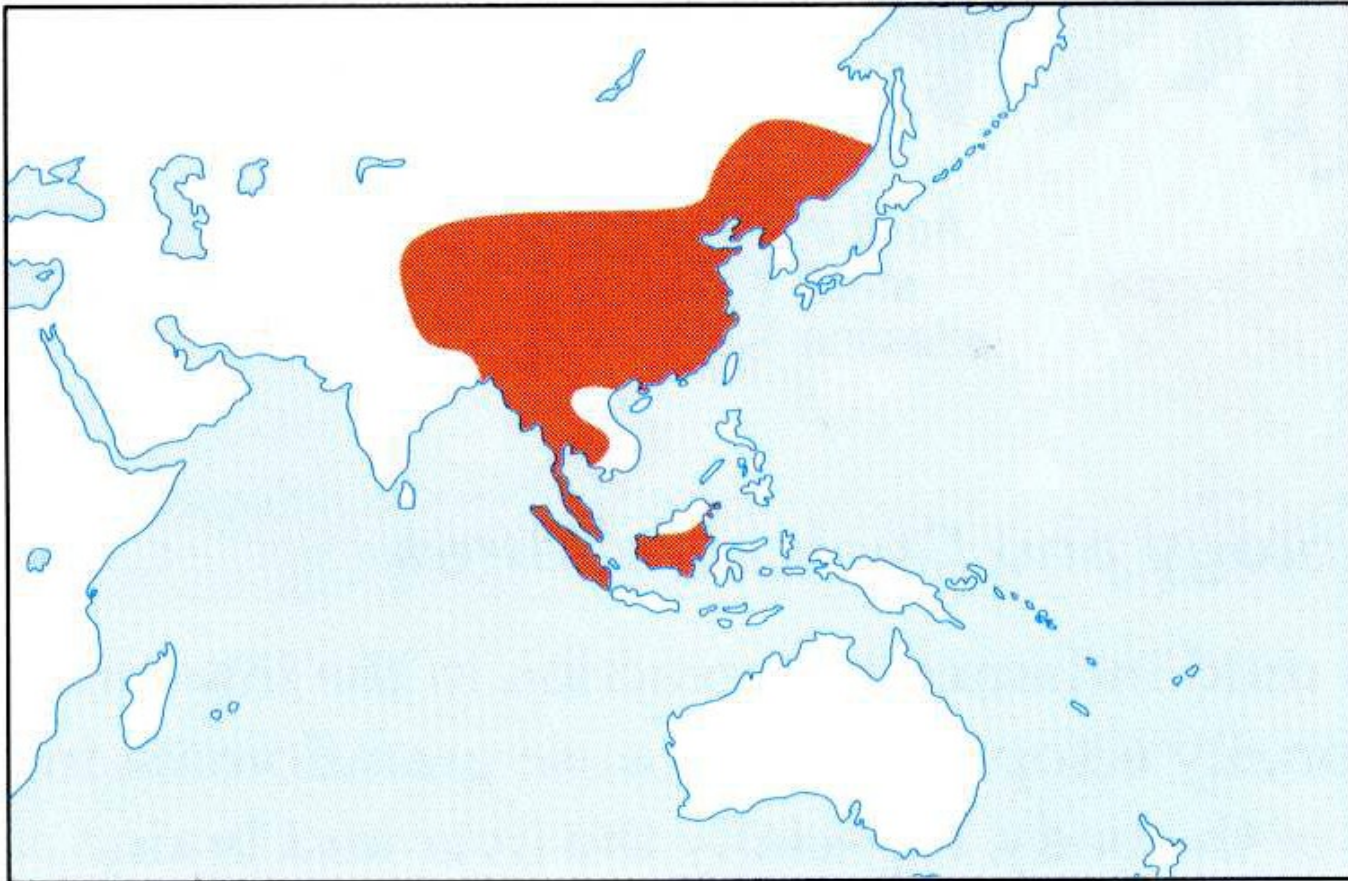
# Fasciolopsis busci



# Fasciolopsis busci

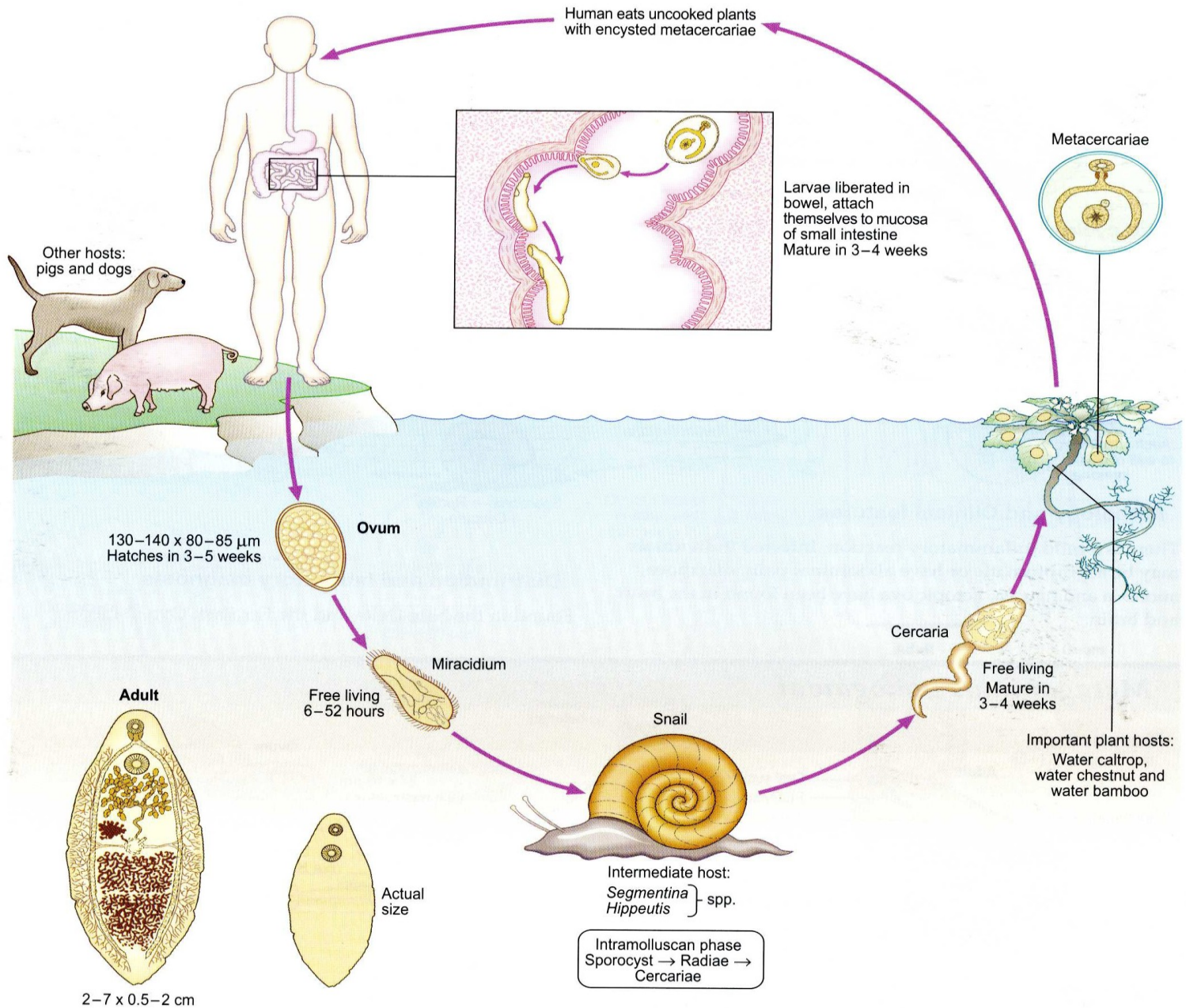
## Distribution

15 million infected worldwide.



# Fasciolopsis buski

## Life cycle



# Heterophyidae

## Charakteristika:

- Střevní motolice ptáků a savců, včetně člověka (fish-born diseases)
- Malé motolice
- Otrněný tegument
- Břišní přísavka modifikována (ventrogenitální komplex s trny a sklerity; někdy genitální přísavka)

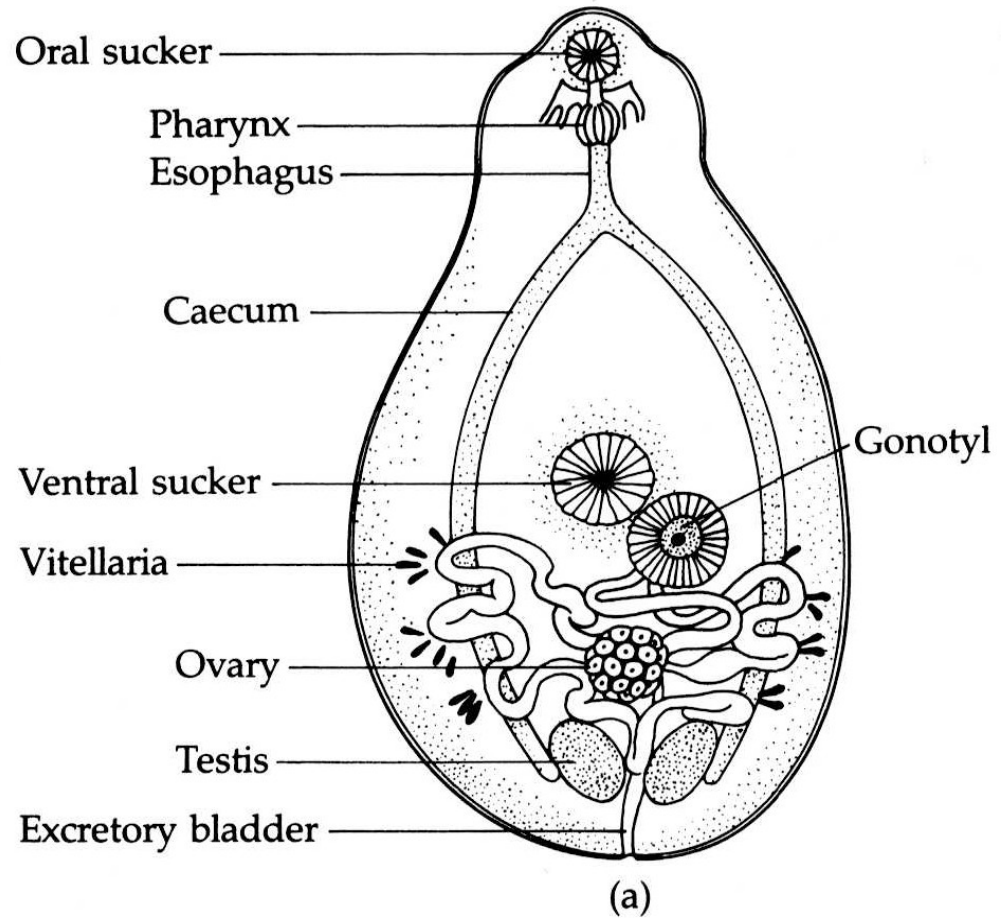
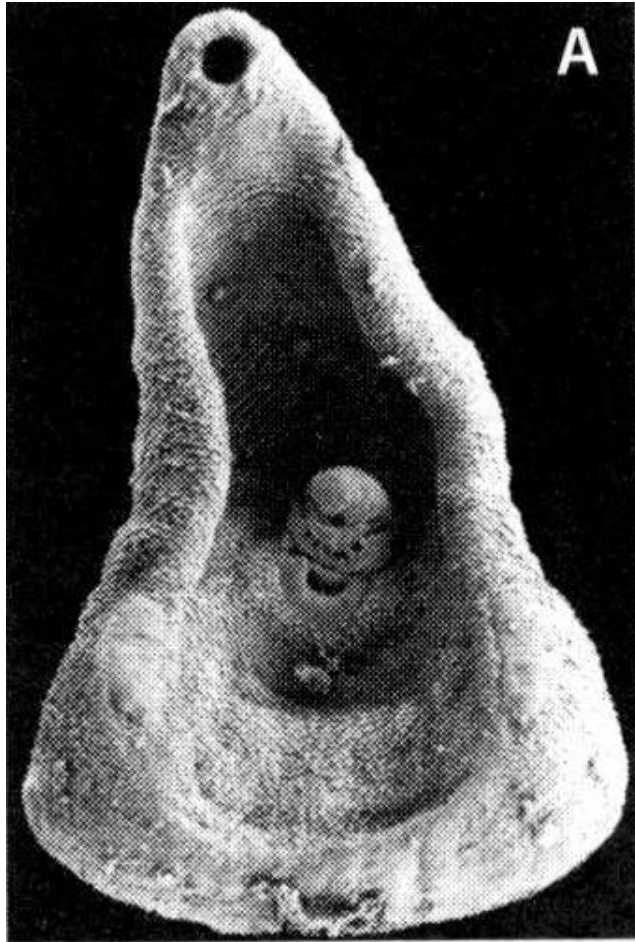
## Vývoj:

- 1. Mz – plži – oculopleurocercárie
- 2. Mz – ryby

## Zástupci:

- **Heterophyes heterophyes** – Asie, středomoří, 1,5mm
- **Metagonimus yokogawai** - šelmy, člověk, Asie, Podunají; Melania, Oncomelania, Melanoides; metacercárie pod šupinami
- **Haplorchis spp** – nákazy lidí v jv. Asii

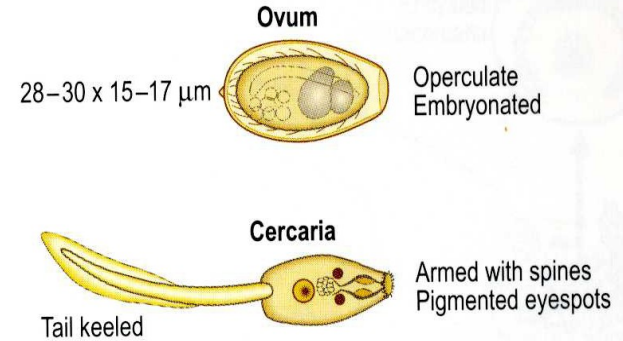
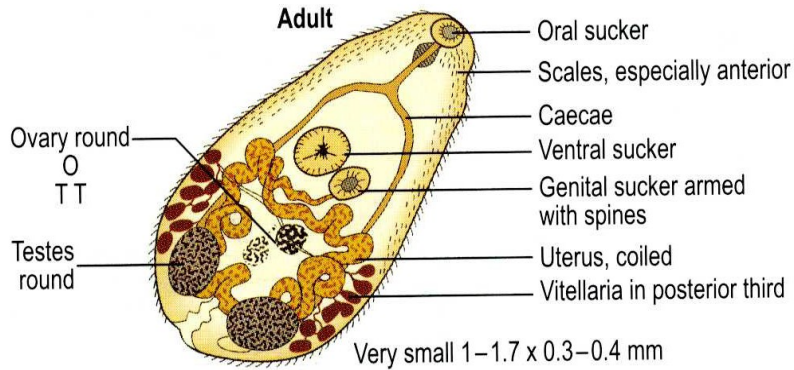
# Heterophyes heterophyes



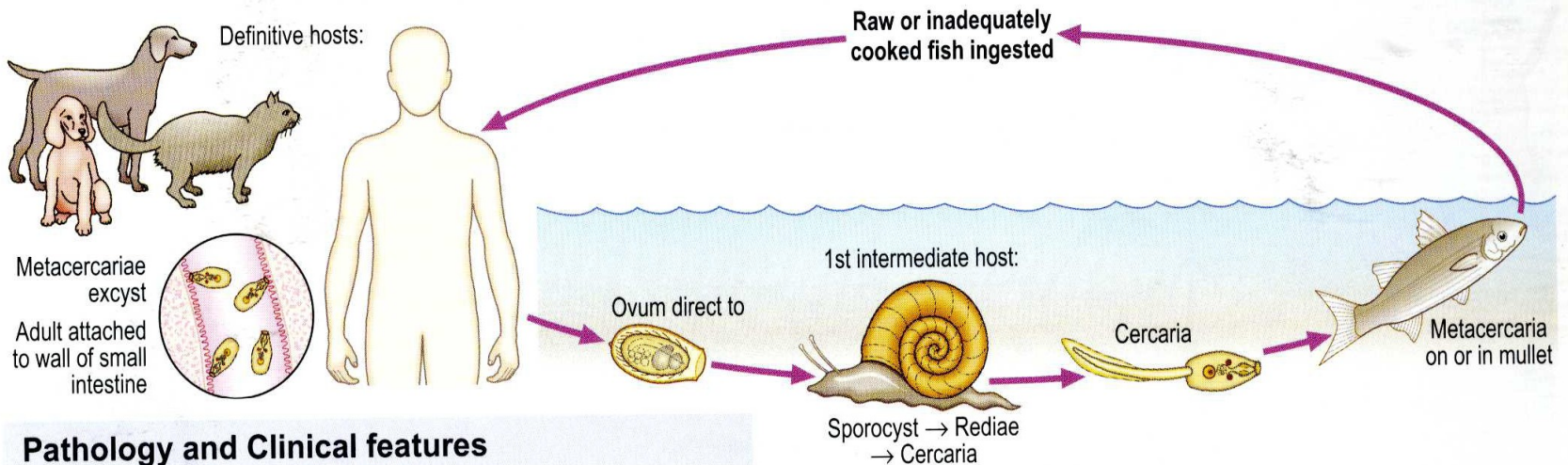


# Heterophyes heterophyes

## Morphology



## Life cycle



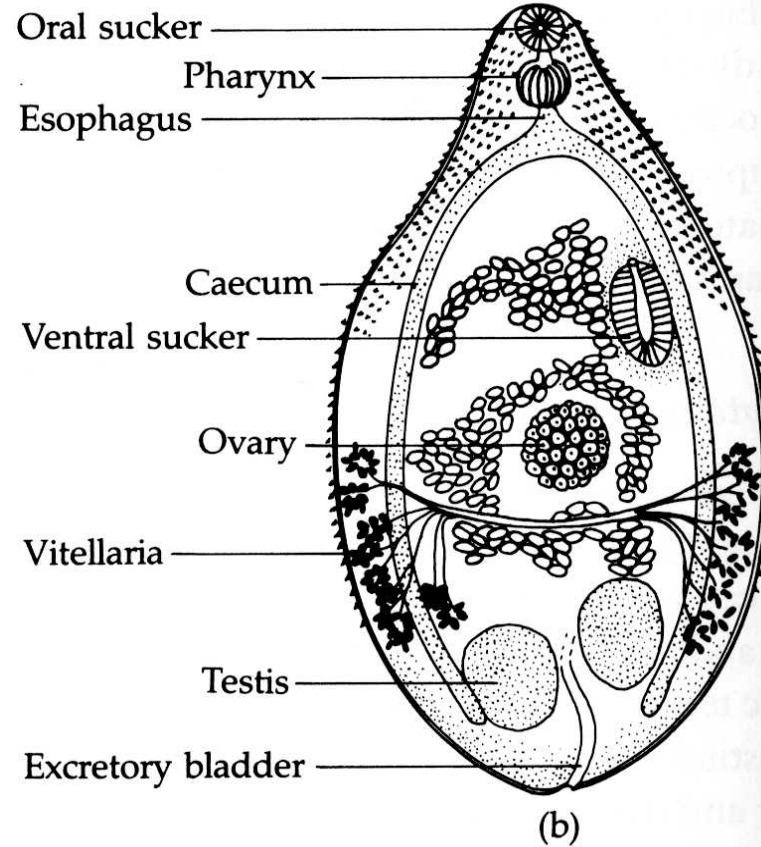
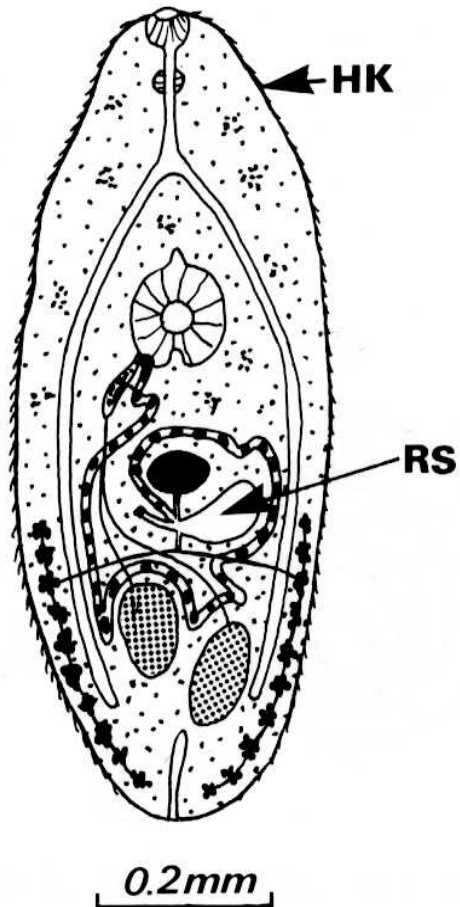
## Pathology and Clinical features

There is a mild inflammatory reaction. Infected individuals may be asymptomatic or have abdominal pain, diarrhoea, anorexia and nausea. Ectopic ova have been found in the heart and brain.

## Distribution and laboratory diagnosis

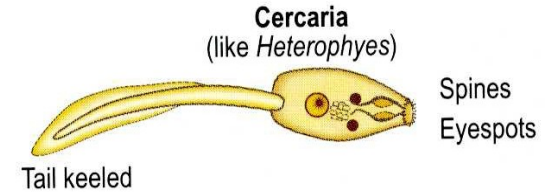
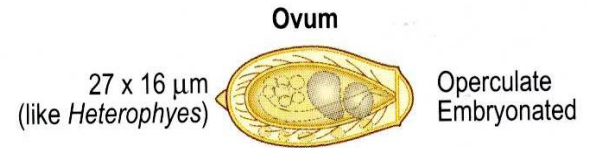
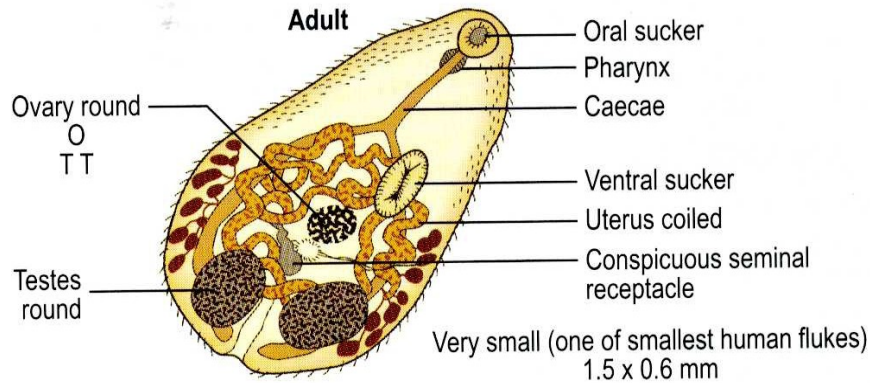
Found in the Nile Delta and the Far East. Ova in faeces.

# Metagonimus yokogawai

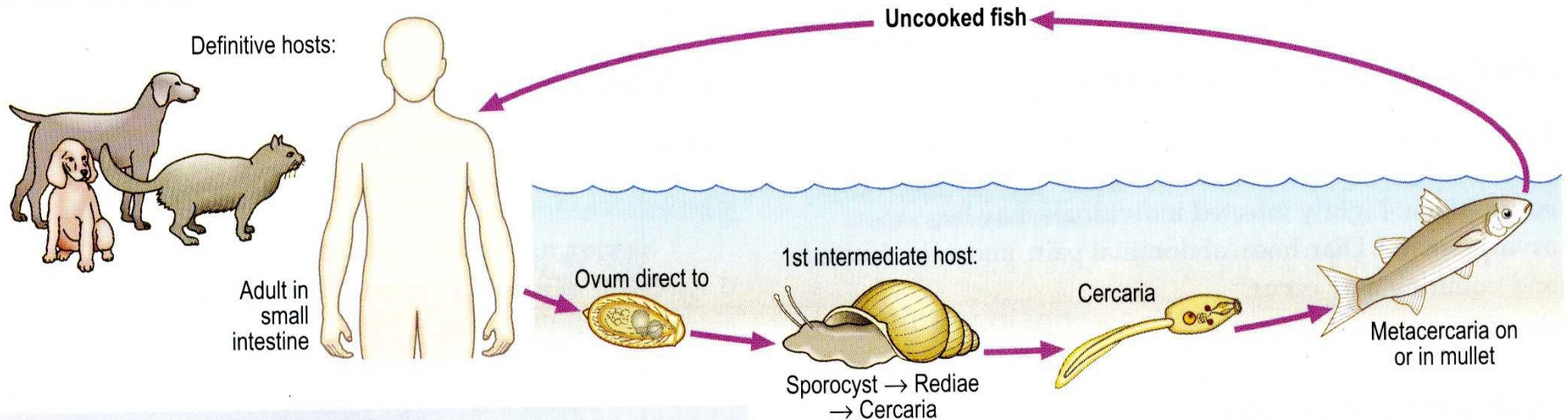


# Metagonimus yokogawai

## Morphology



## Life cycle



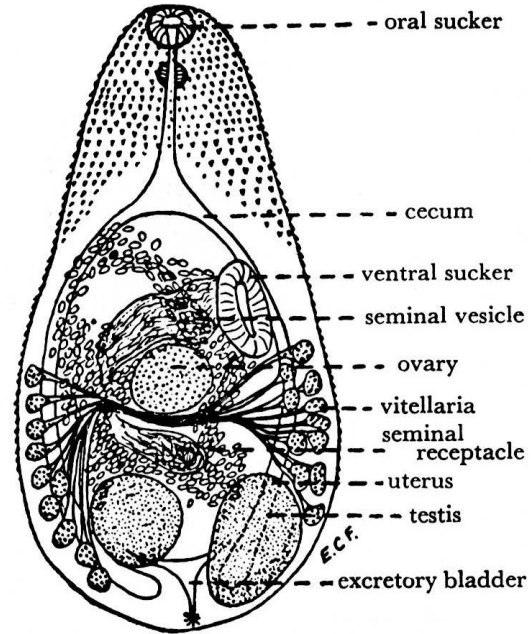
## Pathology and Clinical features

Causes mild inflammatory reaction in the intestine.  
Occasionally ectopic ova can cause granulomata in other organs of the body, especially the liver and brain.

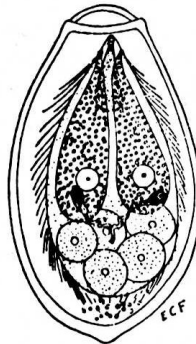
## Distribution

Prevalent in the Far East.

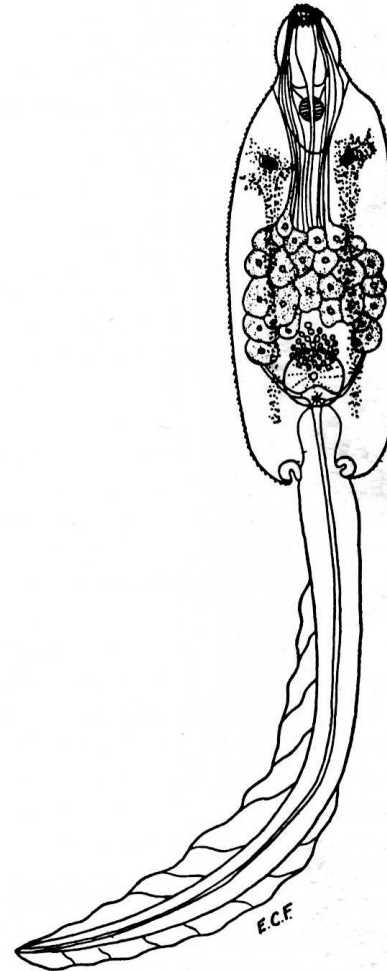
# Vývojová stádia



**A**



**B**



**C**

# Opisthorchidae

## Charakteristika:

- Cizopasníci žlučového měchýře a žlučvodů savců včetně člověka, (fish-borne diseases)
- Dlouhodobé přežívání – podíl na vzniku karcinomu jater

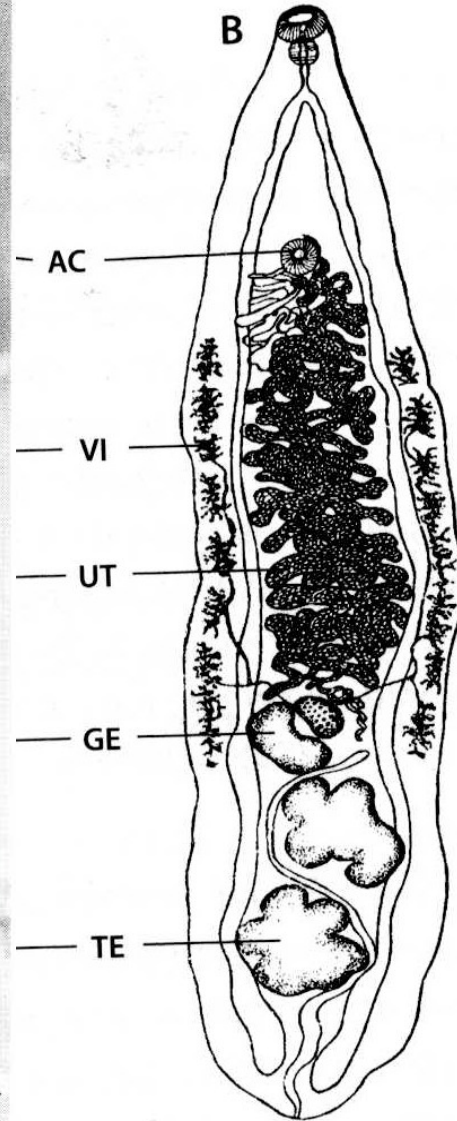
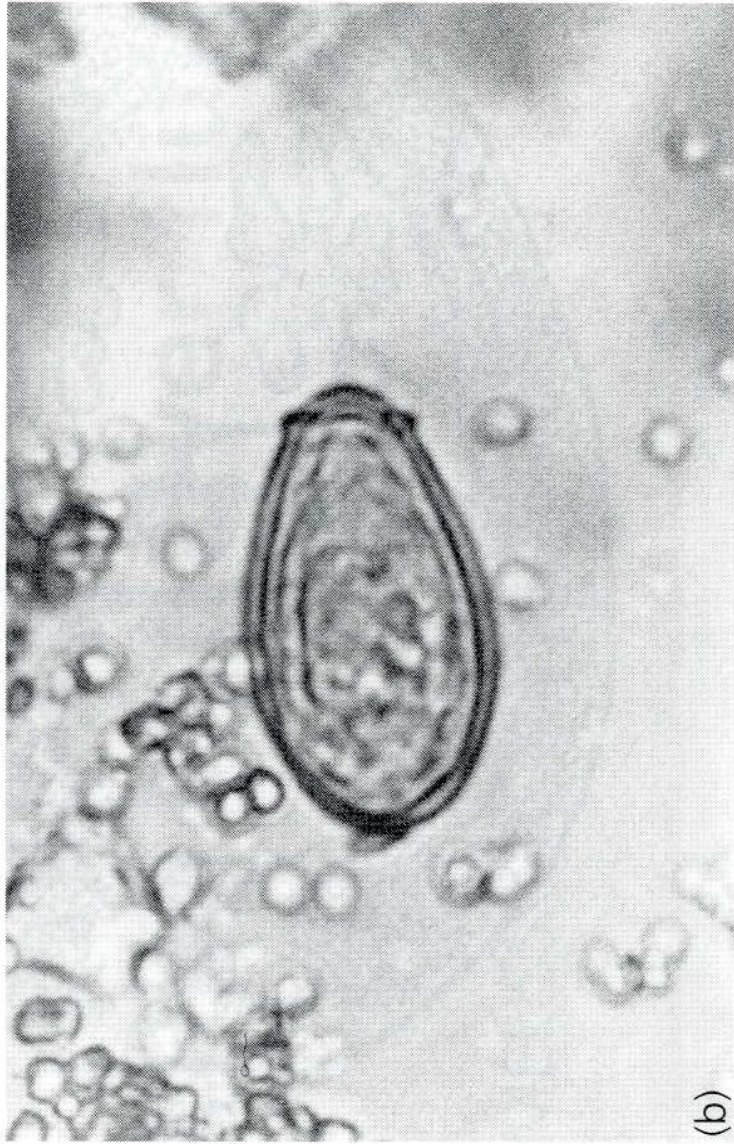
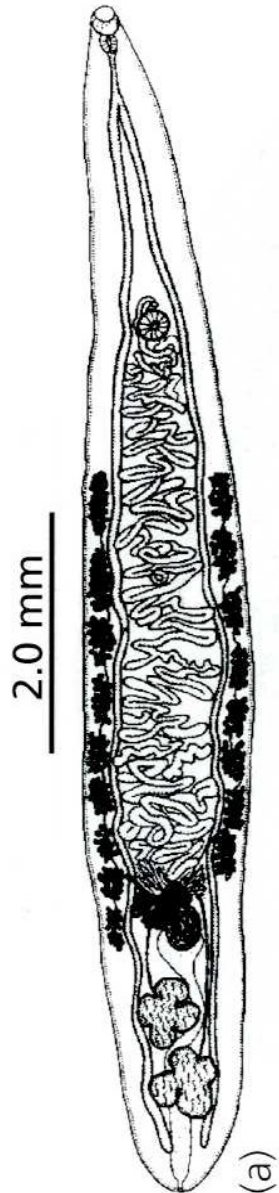
## Vývoj:

- 1 Mz. – předožábří plži (Bithynia) – oculopleurocercárie
- 2. Mz – ryby (svalovina)

## Zástupci:

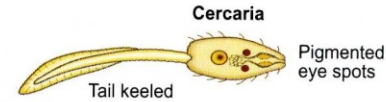
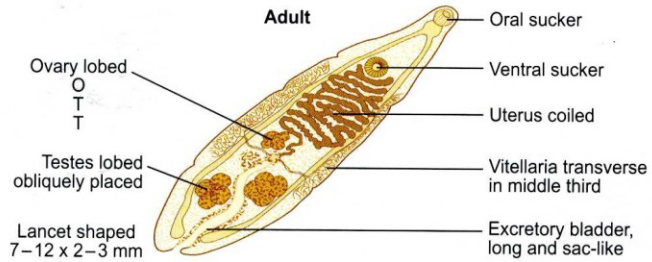
- **Opisthorchis felinus** – severní Evropa, Sibiř
- **Opisthorchis viverrini** – Thajsko, Indočína
- **Clonorchis sinensis** – Čína, Korea, Dalní východ

# Opistorchis viverrini a O. felineus

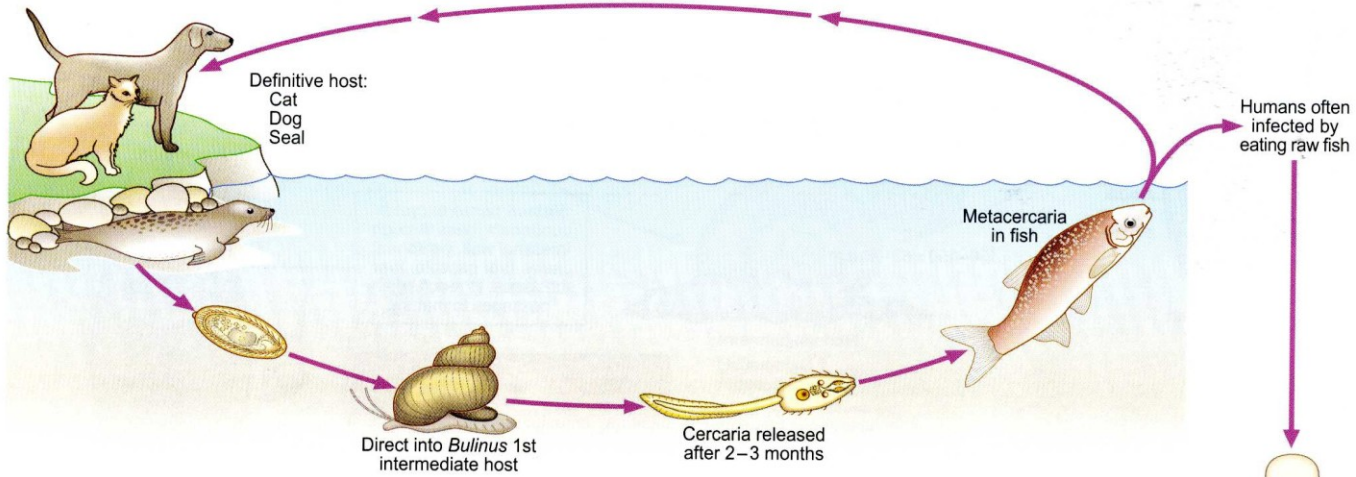


# *Opisthorchis felinus*, *Opisthorchis viverrini* (cat liver fluke)

## Morphology



## Life cycle



## Pathology and Clinical features

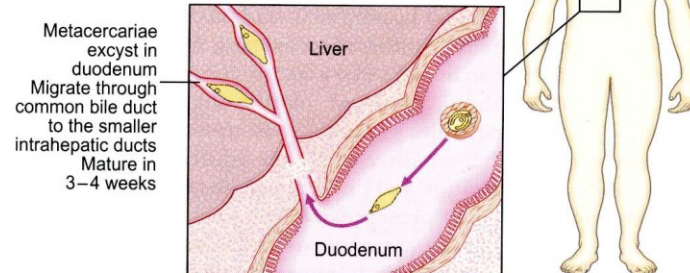
There are proliferative changes in the bile ducts. If the infection is massive or repeated then there may be chronic cholangitis. Clinical features are similar to those of clonorchiasis.

## Laboratory diagnosis

Ova can be found in faeces.

## Distribution

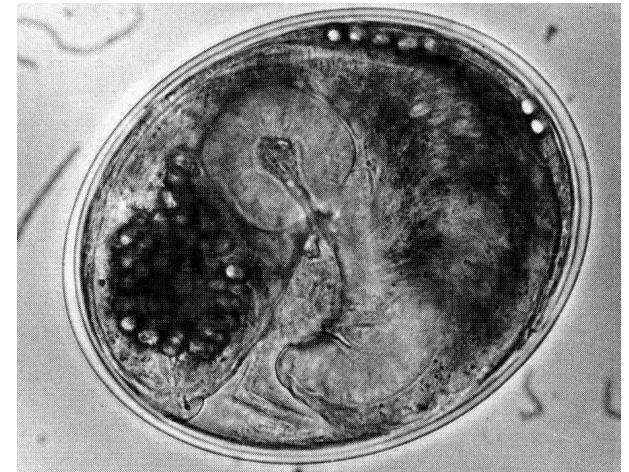
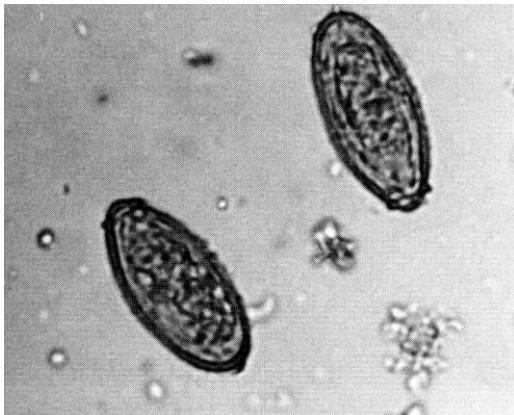
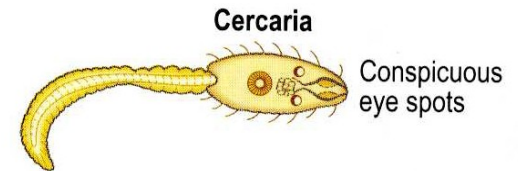
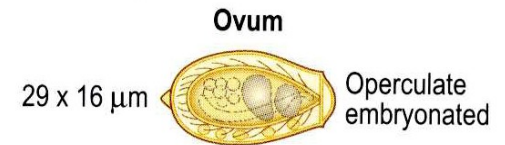
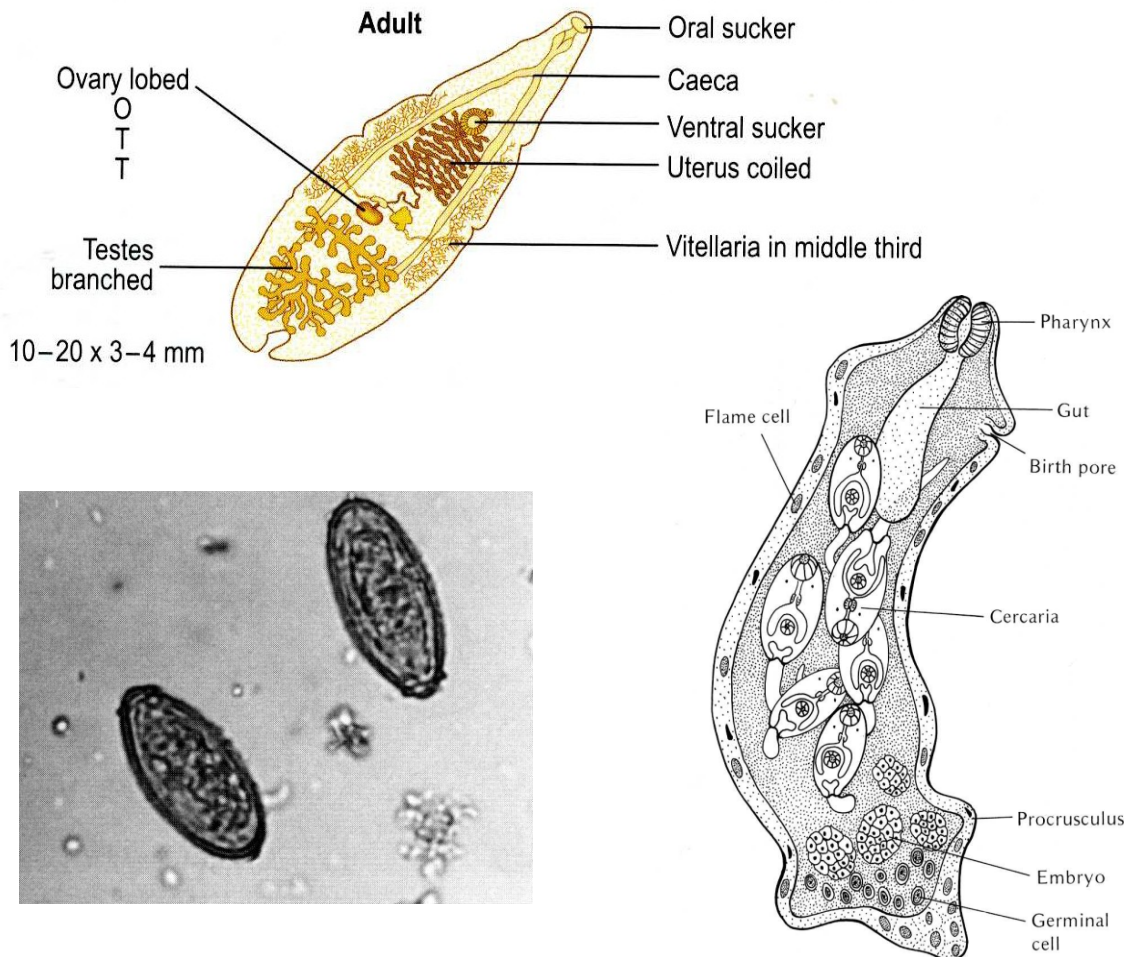
*O. felinus* is found mainly in Eastern Europe and Russia.  
*O. viverrini* occurs in Thailand.



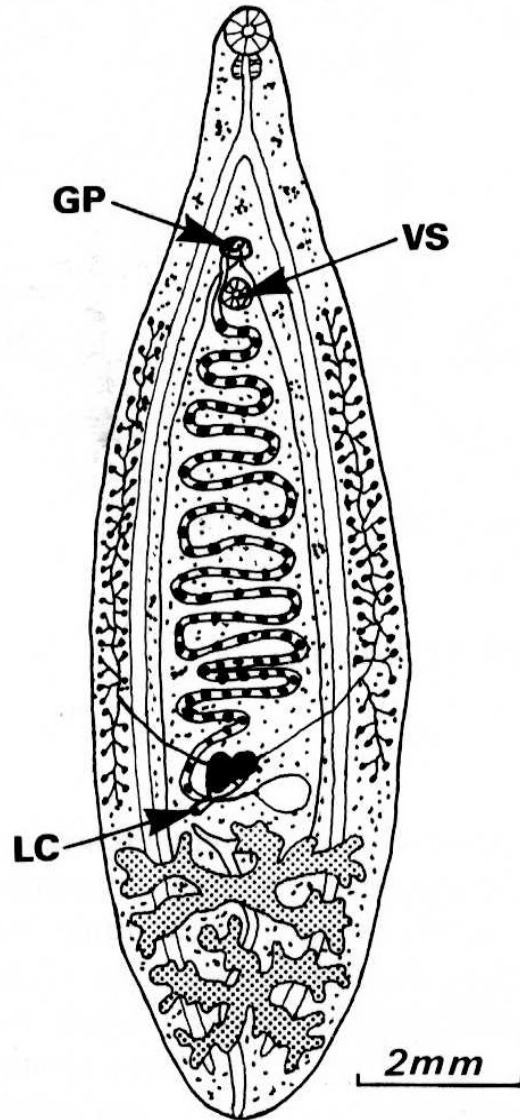
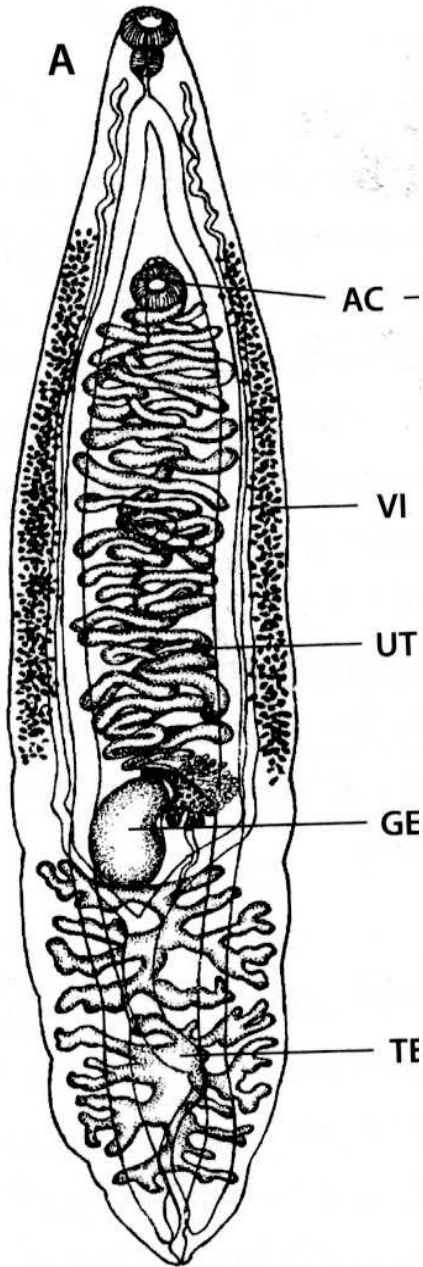
# Clonorchis sinensis

## *Clonorchis sinensis* (continued)

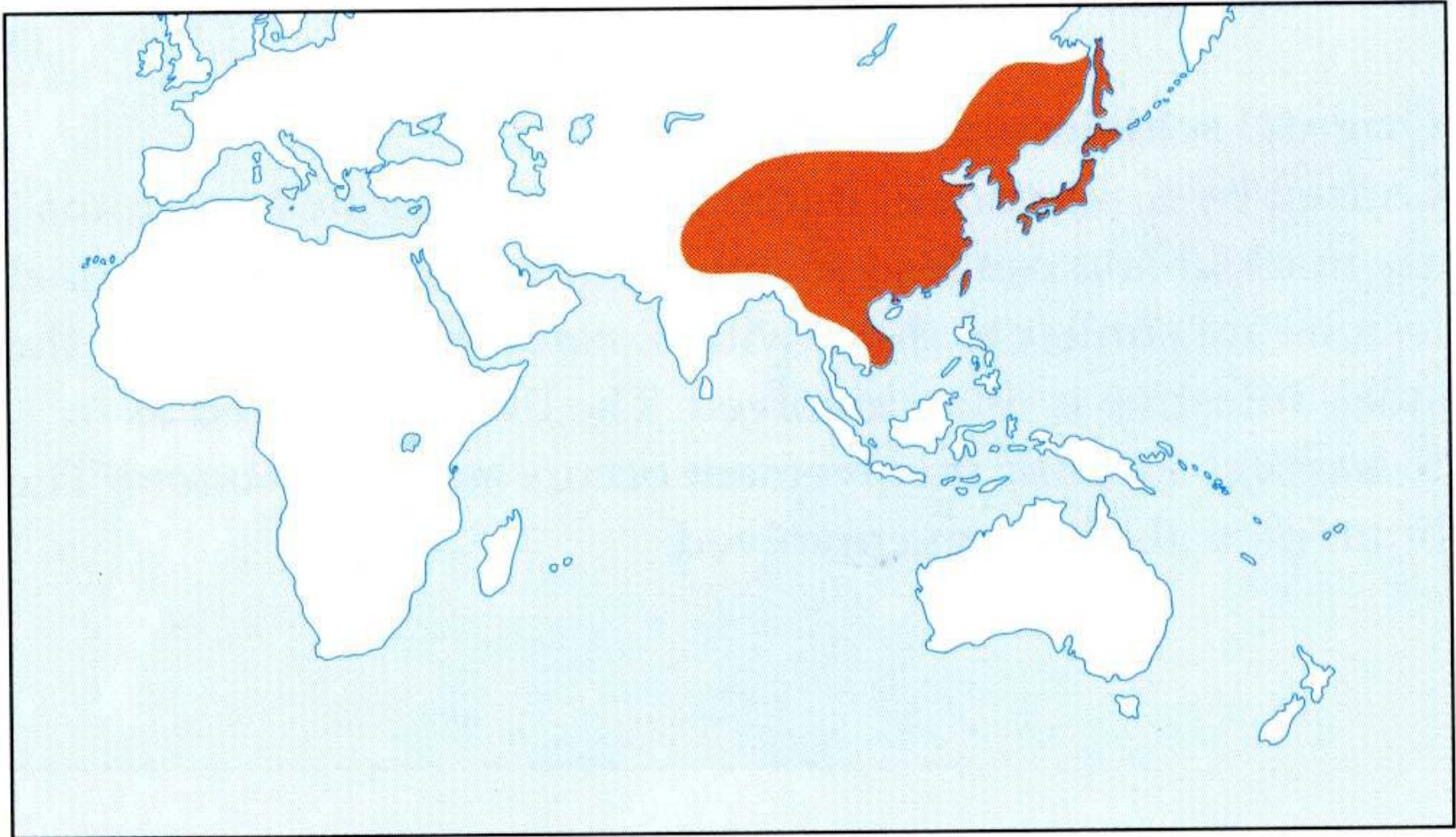
### Morphology



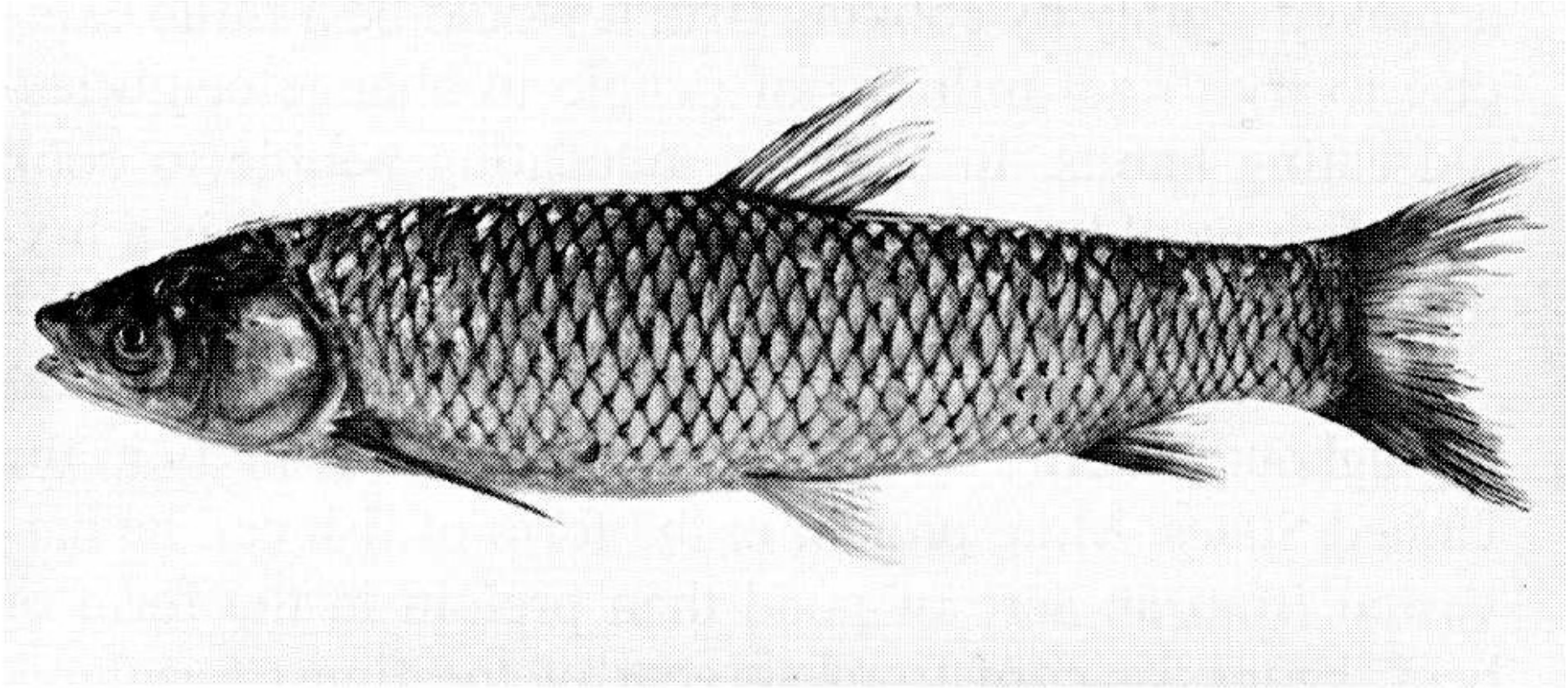




# Clonorchis sinensis

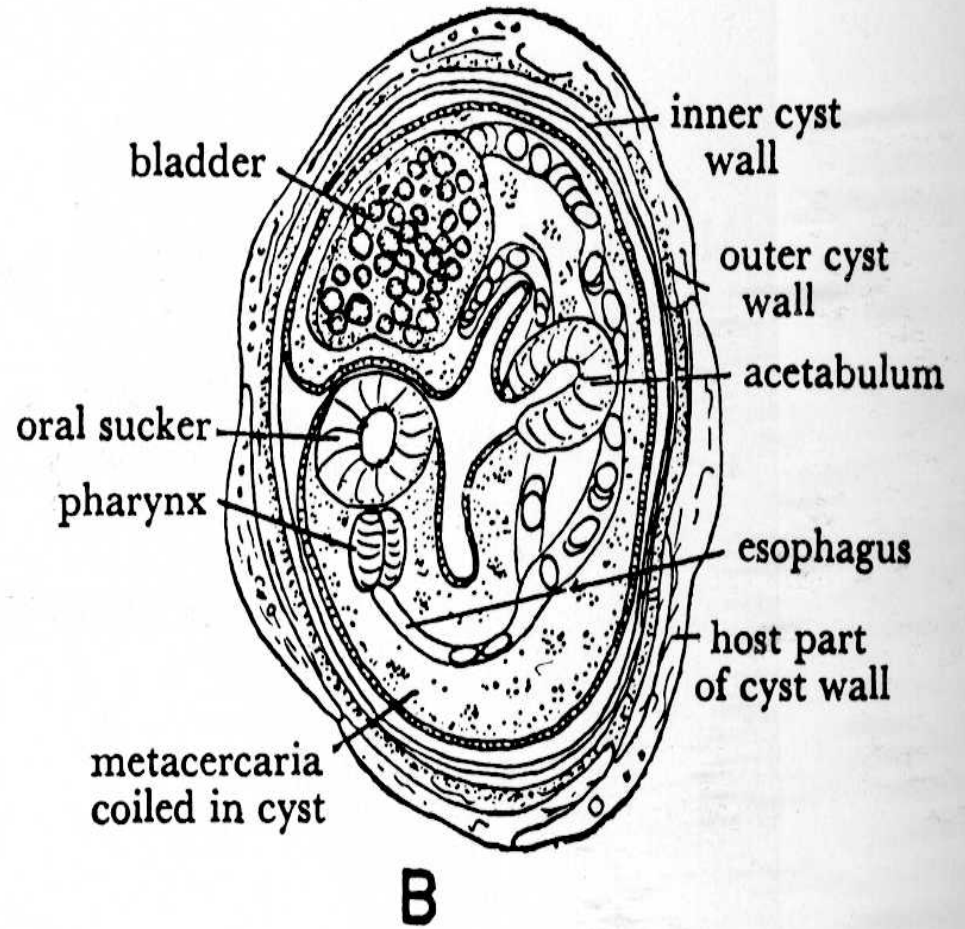
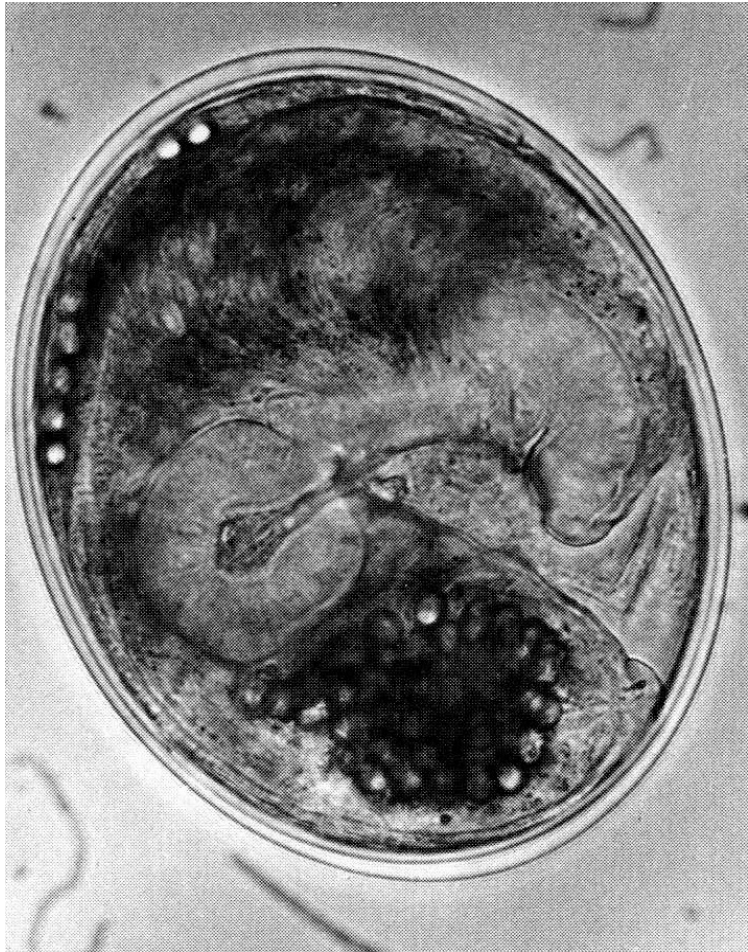


# Ctenopharyngodon idella – 2. mezihostitel



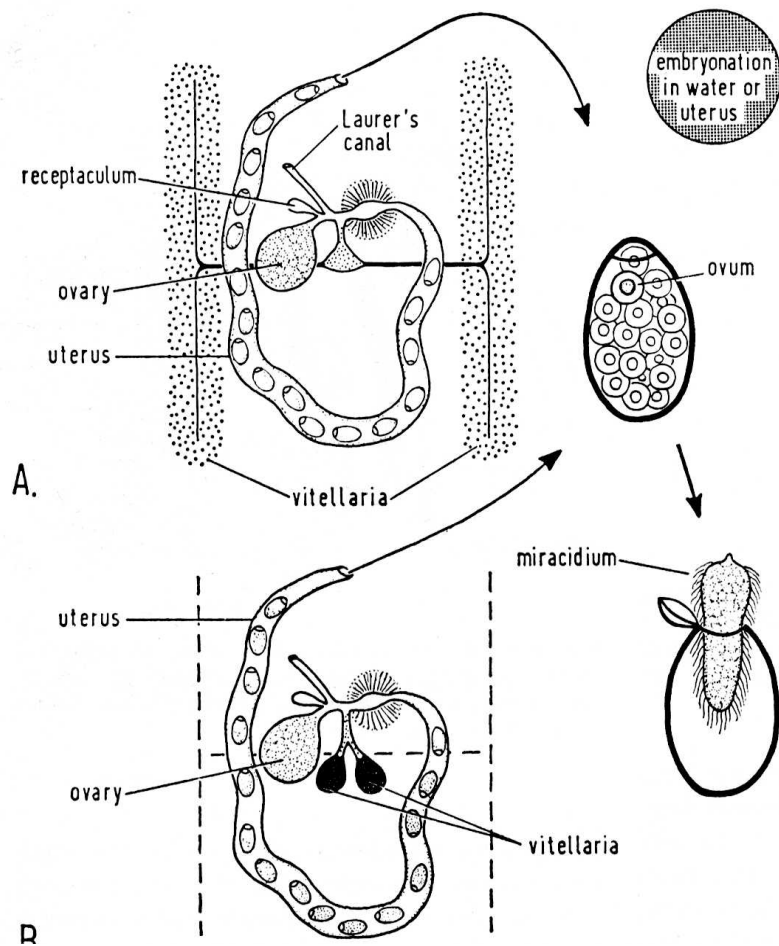
**Figure 18.22** Grass carp, *Ctenopharyngodon idellus*, a common second intermediate host of *Clonorchis sinensis*.

# Metacerkárie









**Fig. 9-7.** Diagrammatic representation of female genitalia of digenetic trematodes. *A*, with extensive vitellaria; *B*, with condensed vitellaria. (From Smyth and Clegg, courtesy of Exp. Parasitol.)