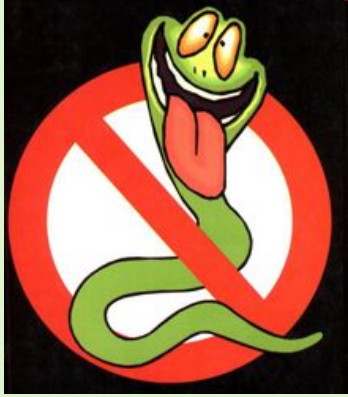
ТЕМА ЛЕКЦИИ 05:



Общая и медицинская гельминтология.

Цестоды

Тип Плоские черви (Plathelminthes).

Класс Ленточные черви

ЦЕСТОДЫ И ЦЕСТОДОЗЫ

Ветеринарно-медицинское значение имеют представители двух отрядов, относящихся к подклассу настоящих ленточных червей (***Eucestoda***):

цепни — ***Cyclophyllidea***

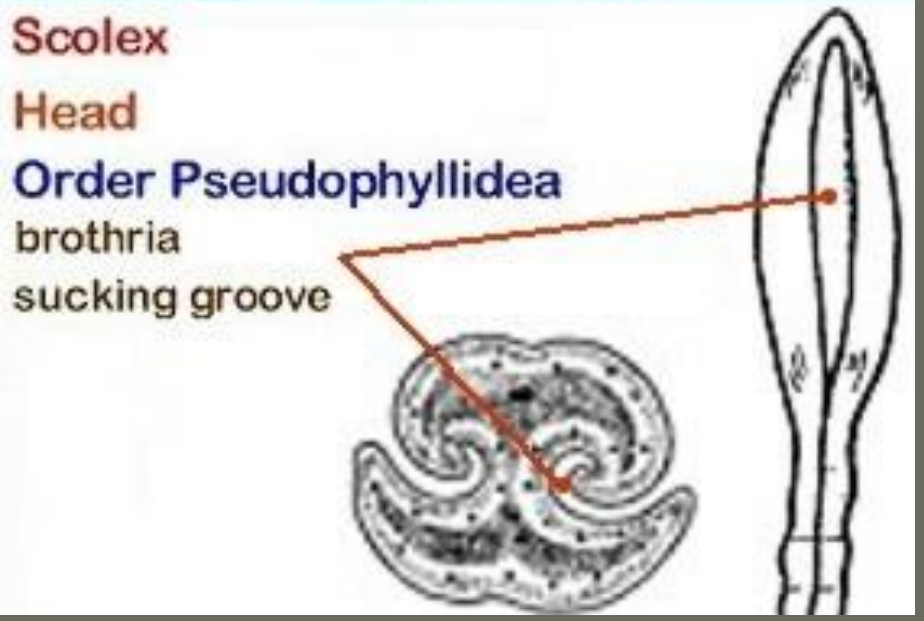
и

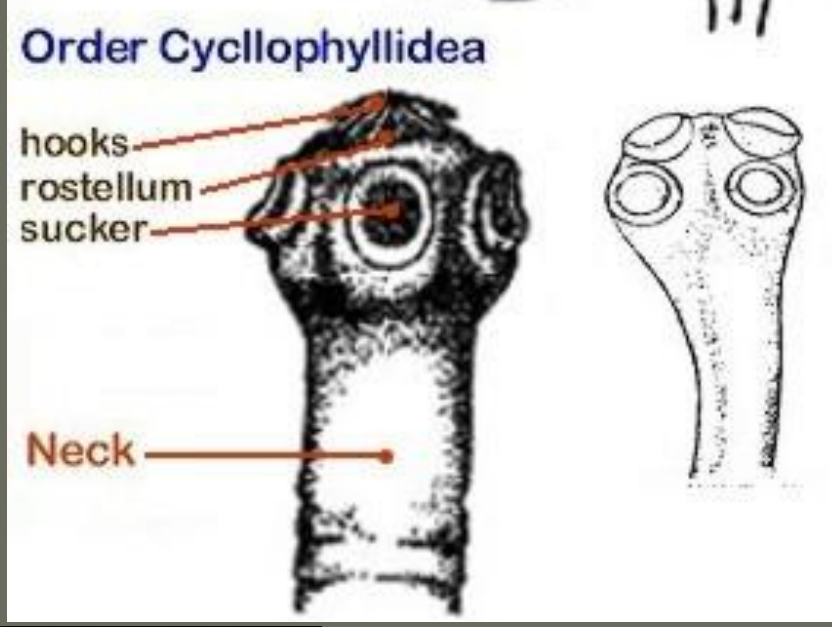
лентецы — ***Pseudophyllidea.***

В ленточной стадии цестоды обитают в органах пищеварения позвоночных.

Все цестоды — биогельминты,
их развитие происходит при участии
одного (цепни) или двух (лентецы)
промежуточных хозяев.

В организме промежуточных хозяев личинки имеют разнообразное строение.





Тело = Стробила

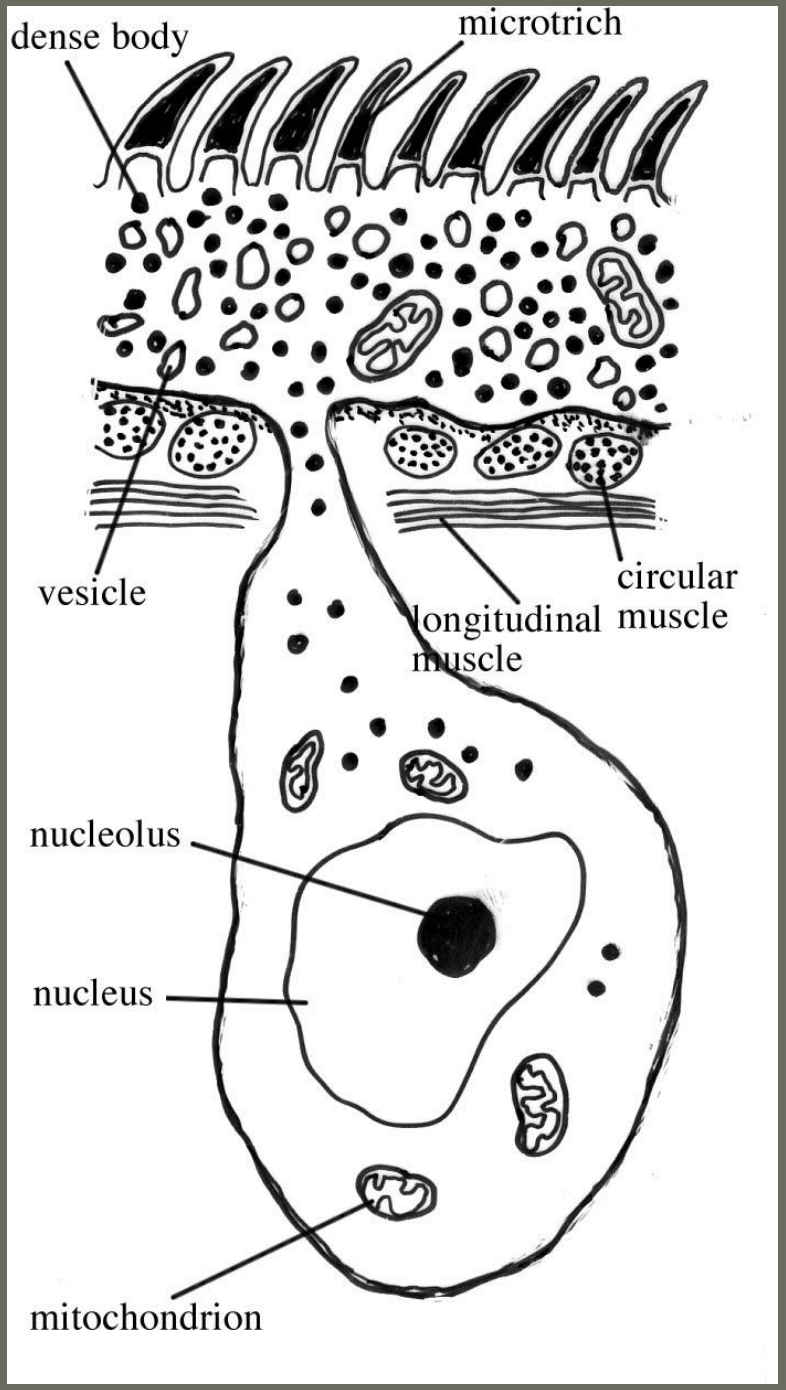
Головка = Сколекс
Шейка
Цепочка члеников =
Цепочка проглоттид

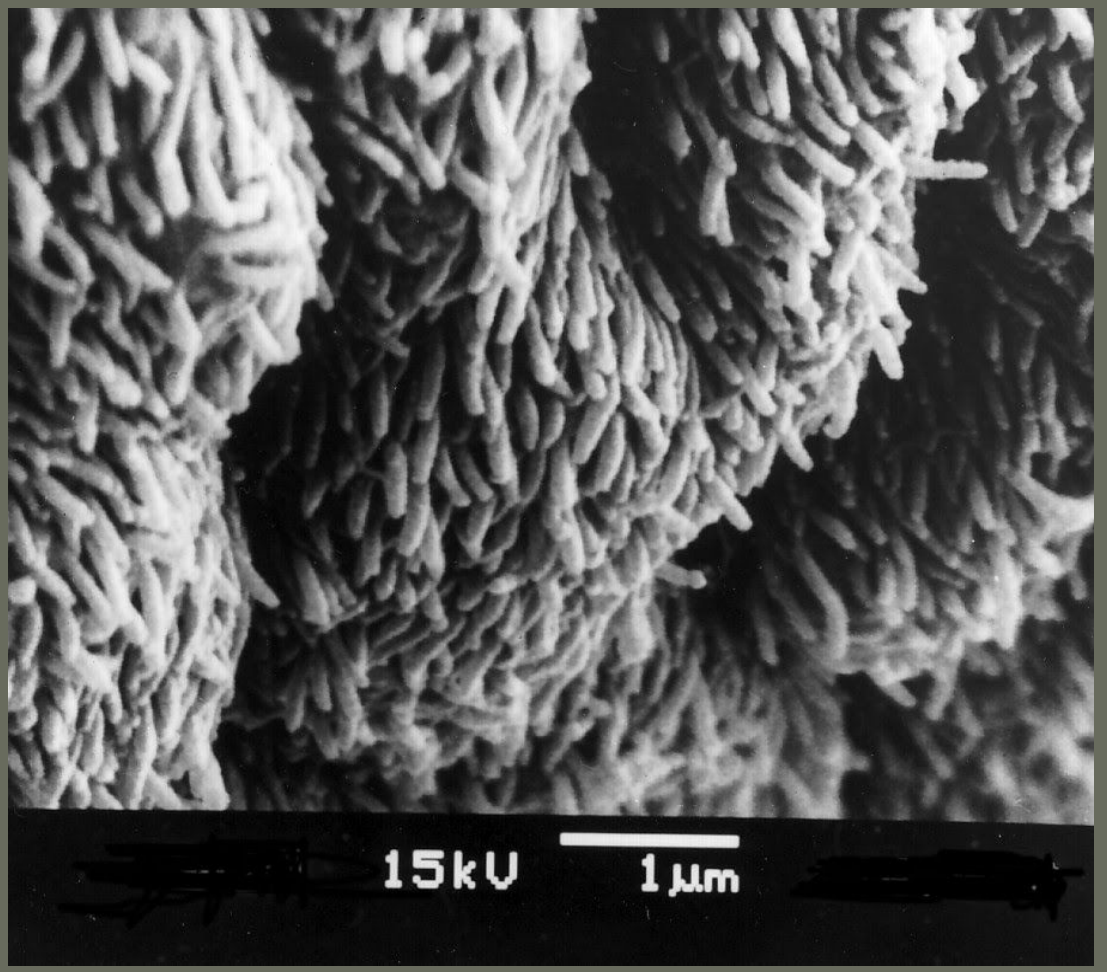
Присоски

Крючки

Ботрии


MP
S
GP
IMP
0
10cm

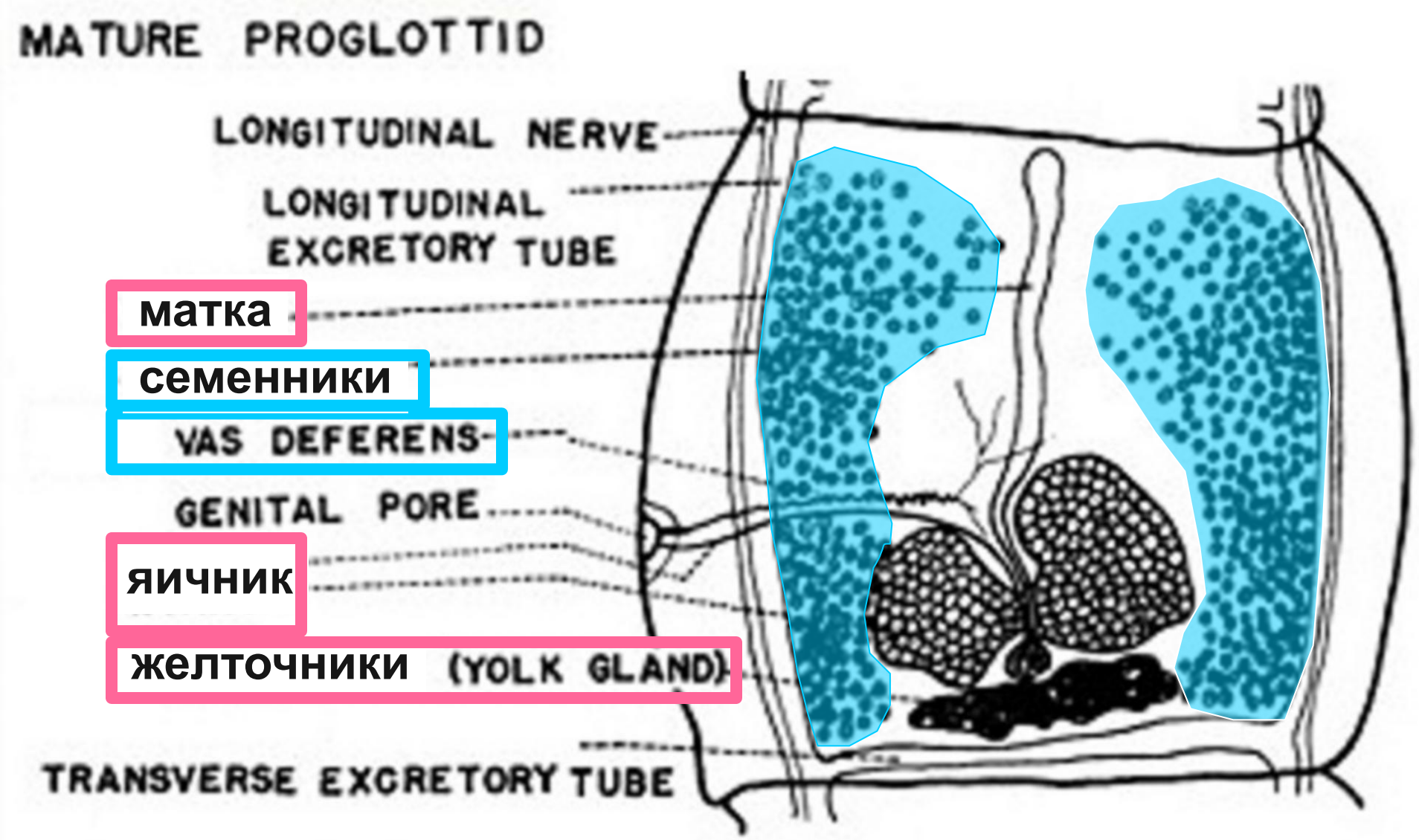




Строение покровов ленточных червей

Reproductive System

Hermaphroditic



Развитие *Cyclophyllidea*

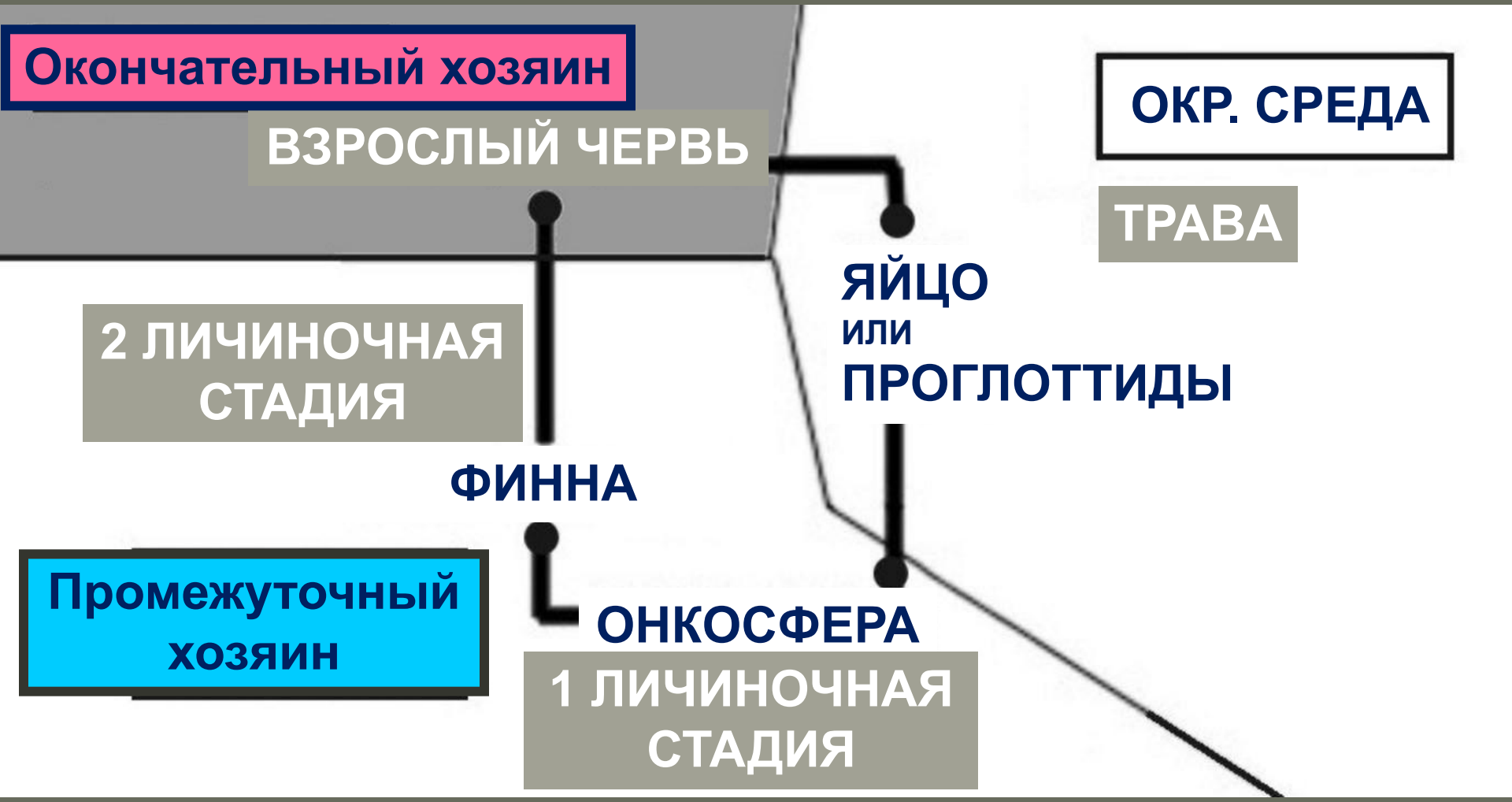
цепень

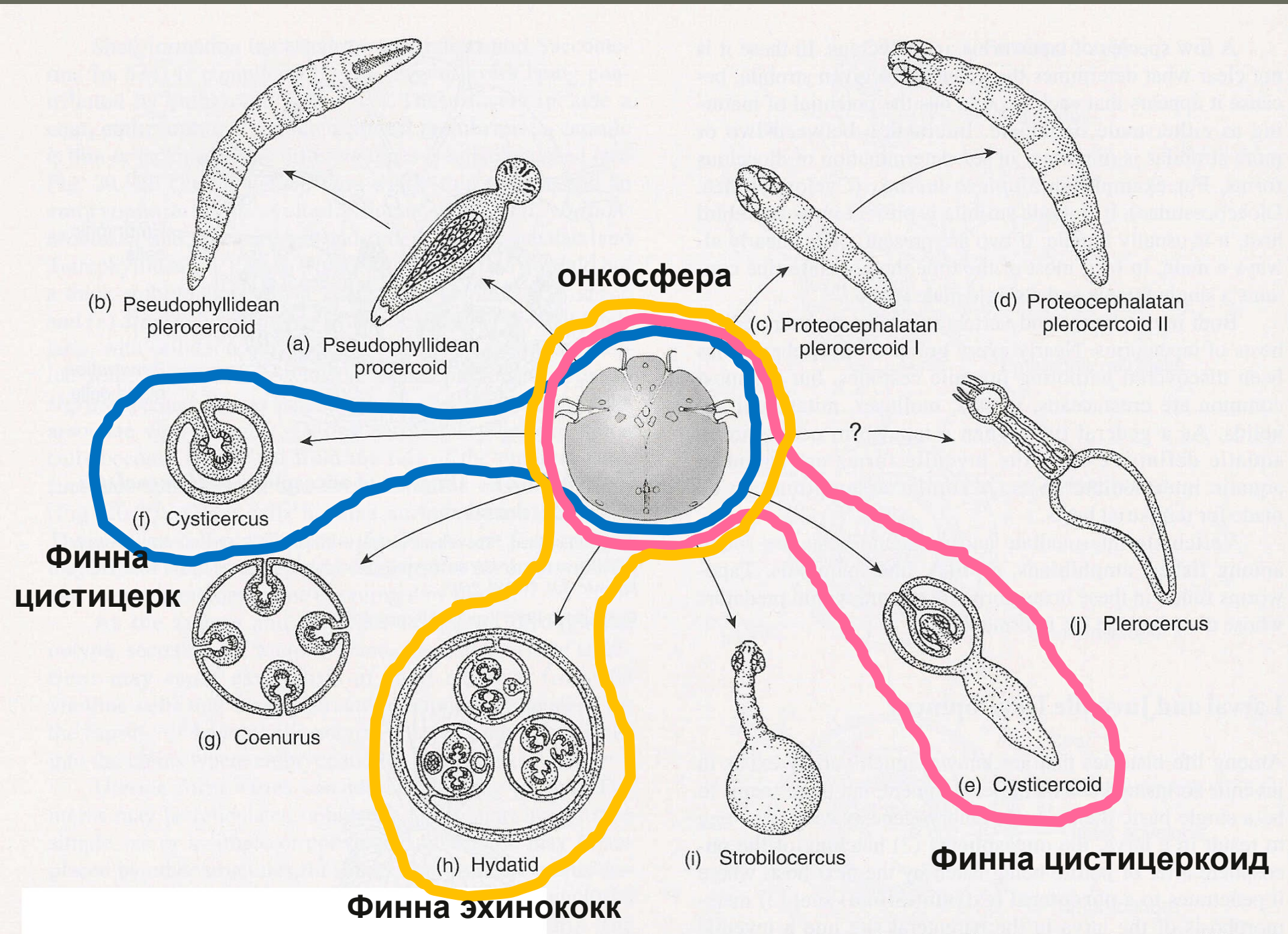
яйцо

онкосфера

финна

взрослый червь


Окончательный хозяин
ВЗРОСЛЫЙ ЧЕРВЬ
ОКР. СРЕДА
ТРАВА
ЯЙЦО
или
ПРОГЛОТТИДЫ
2 ЛИЧИНОЧНАЯ СТАДИЯ
ФИННА
Промежуточный хозяин
ОНКОСФЕРА
1 ЛИЧИНОЧНАЯ СТАДИЯ

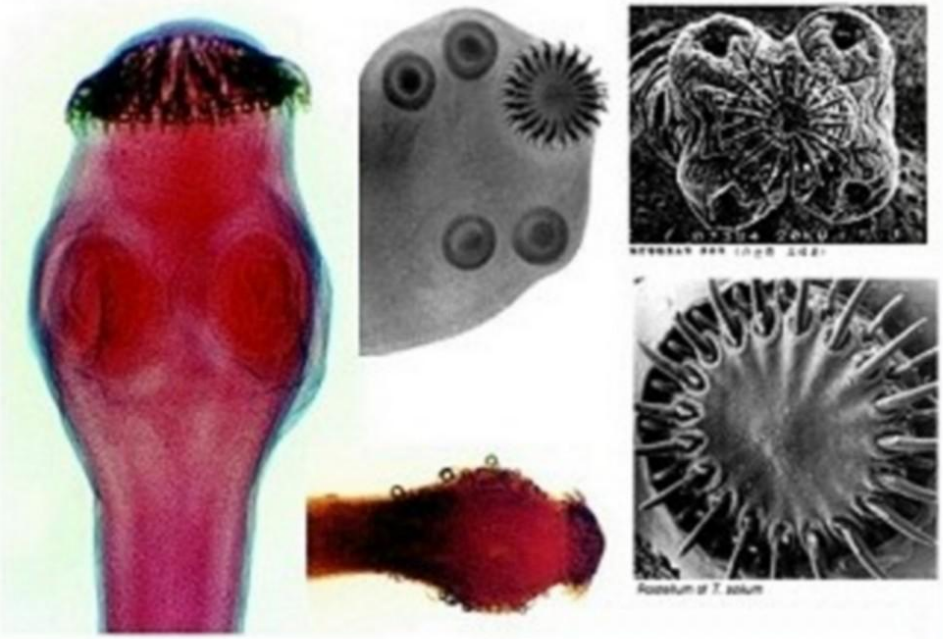

онкосфера
(b) Pseudophyllidean plerocercoid
(a) Pseudophyllidean procercoid
(c) Proteocephalatan plerocercoid I
(d) Proteocephalatan plerocercoid II
?
(f) Cysticercus
Финна цистицерк
(g) Coenurus
(h) Hydatid
Финна эхинококк
(i) Strobilocercus
(e) Cysticercoid
Финна цистицеркоид
(j) Plerocercus

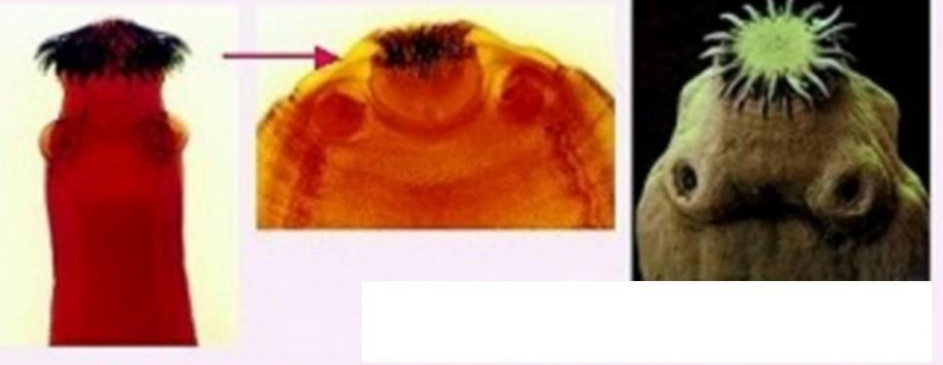
Свиной цепень

Scolex

Taenia solium

1 mm in diameter，4 suckers，an armed rostellum with 22-32 hooklets (in 2 rows)

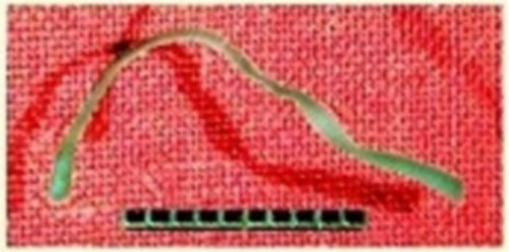




Бычий цепень

Taenia saginata

1.2 - 2.0 mm in diameter
Non rostellum and hooklets

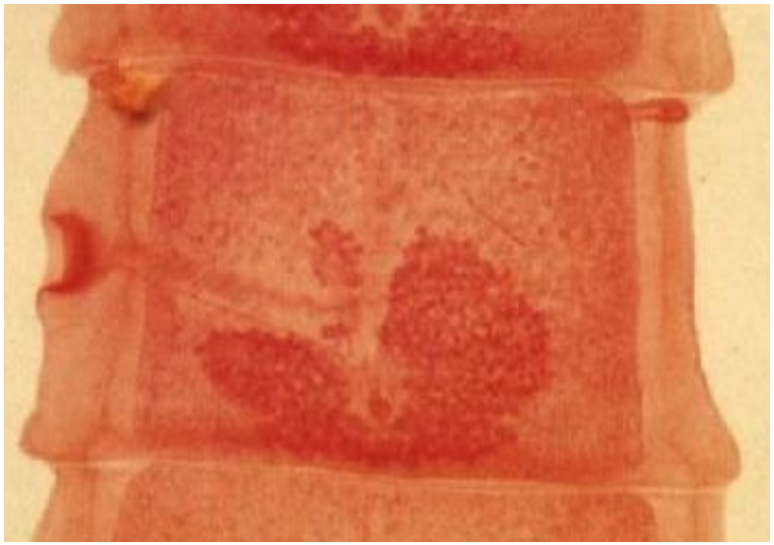


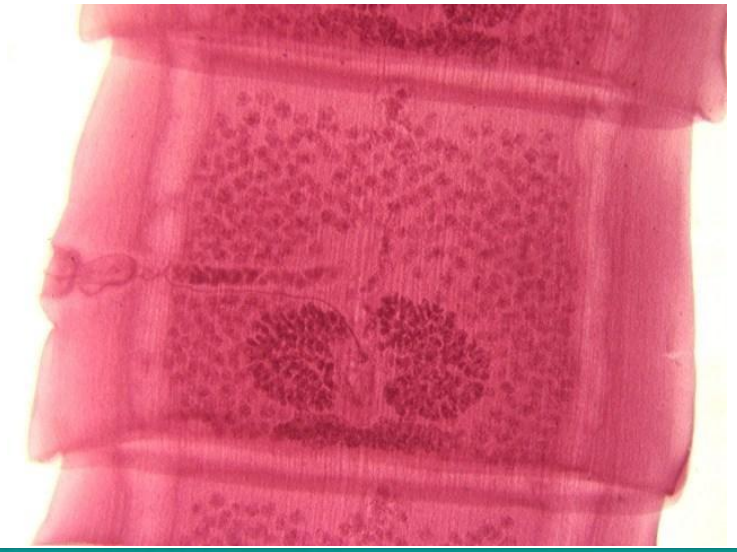
Свиной цепень

Бычий цепень

Taenia solium,

Taeniarhynchus saginatus,

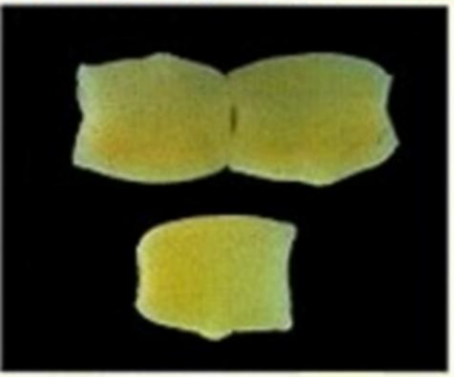




Taenia sp. Gravid proglottids

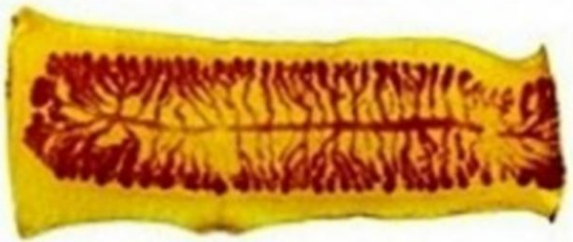
Taenia solium

10 - 12 X 5 - 6 mm 7-12 lateral uterine branches



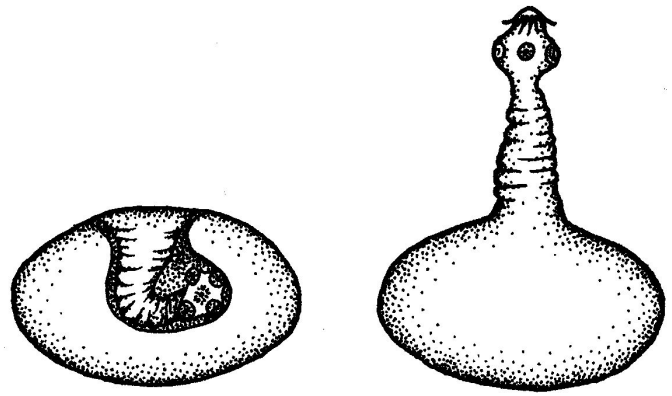
Taenia saginata

16 - 20 mm X 4 - 7 mm 15 - 30 lateral uterine branches

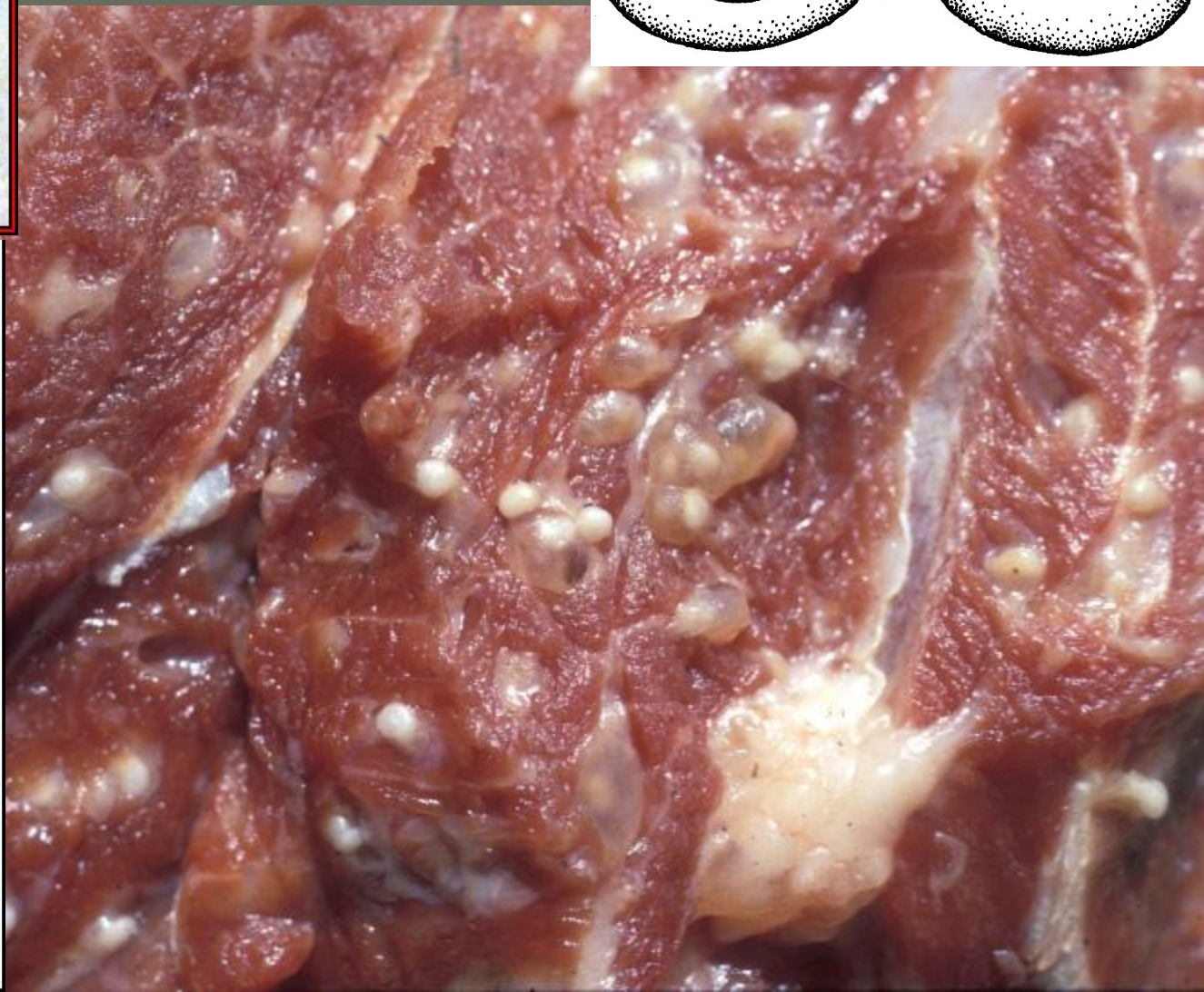


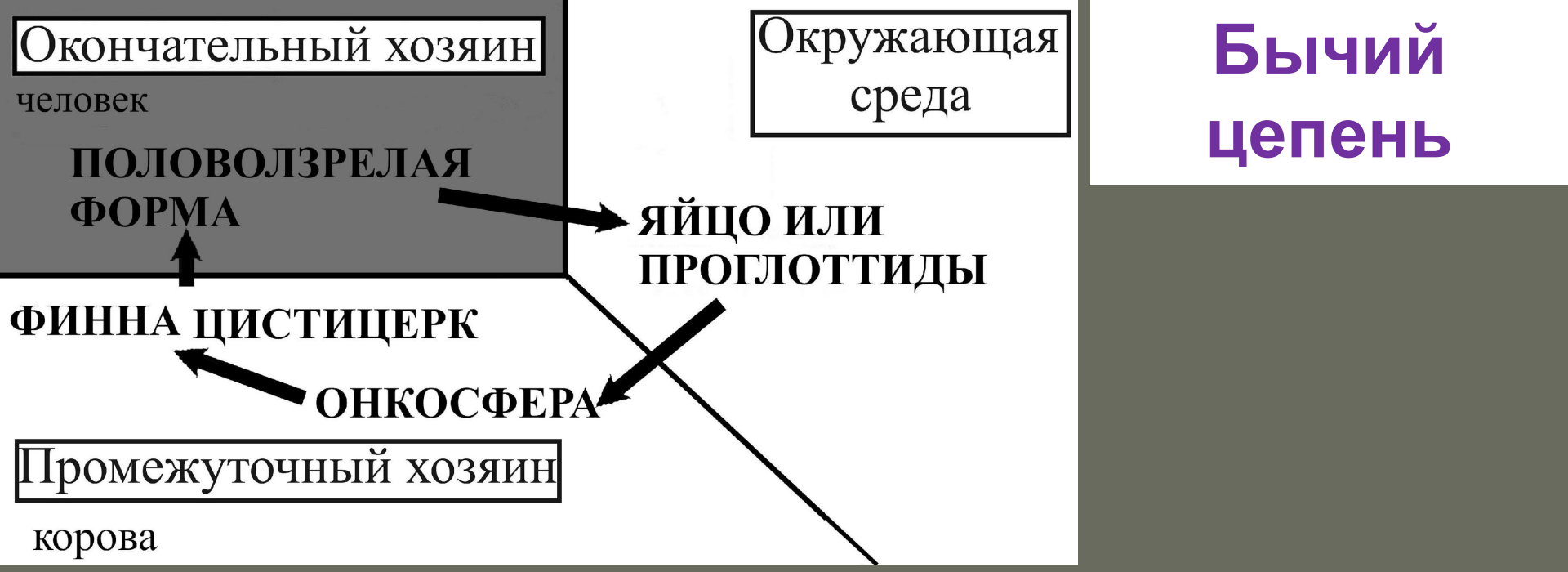

Taenia
egg

цистицерк



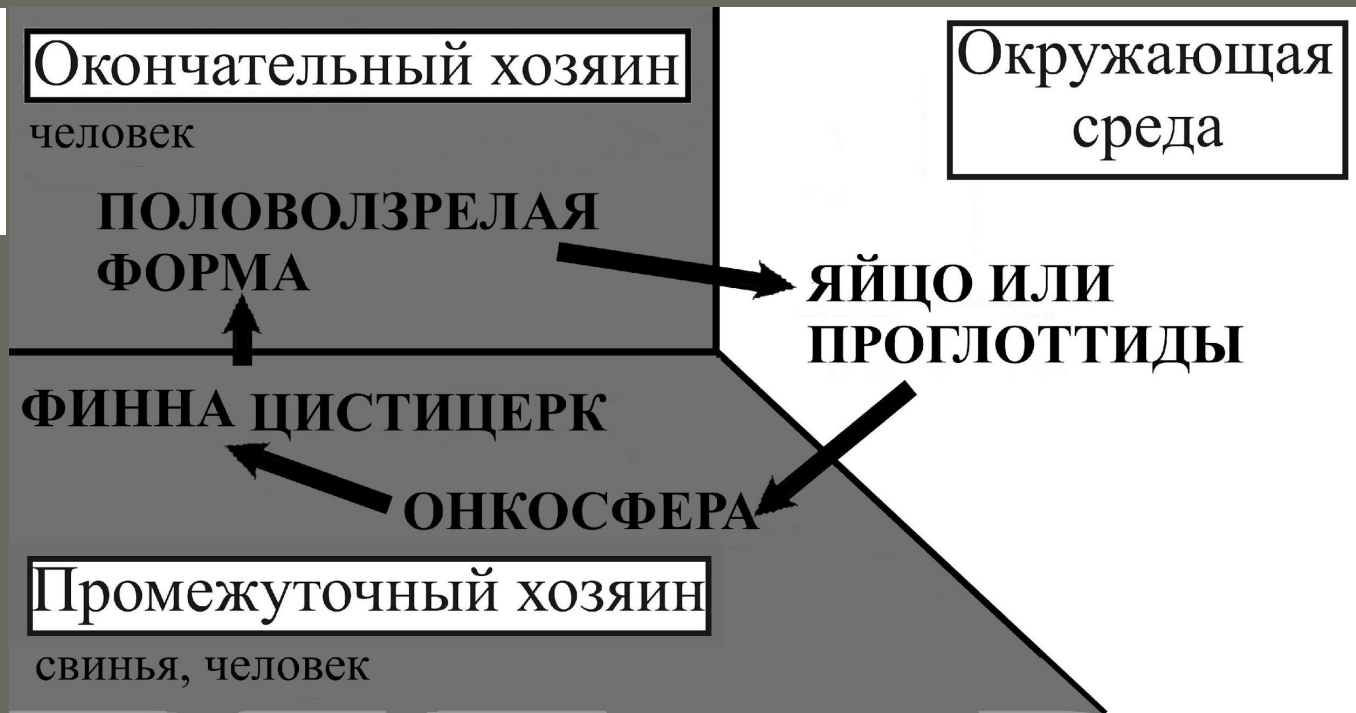

YULIN
scolex
hooklet
neck
sucker
purse
hnyljy.en.alibaba.com
MP060060 猪带绦虫囊尾蚴装片
1、头节 2、颈节 3、囊 4、吸盘 5、小钩
Cysticercus Cercaria of Taenia solium W.M.
http://hnyljy.en.alibaba.com

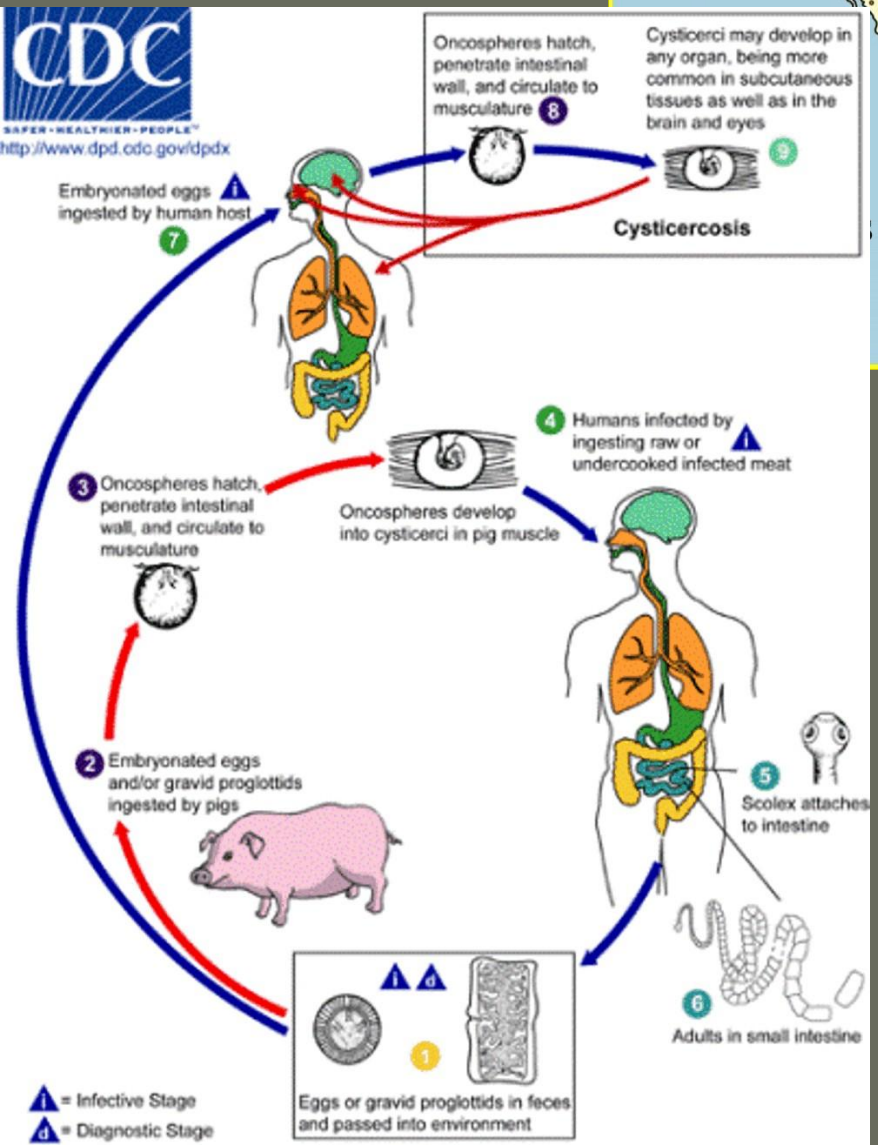


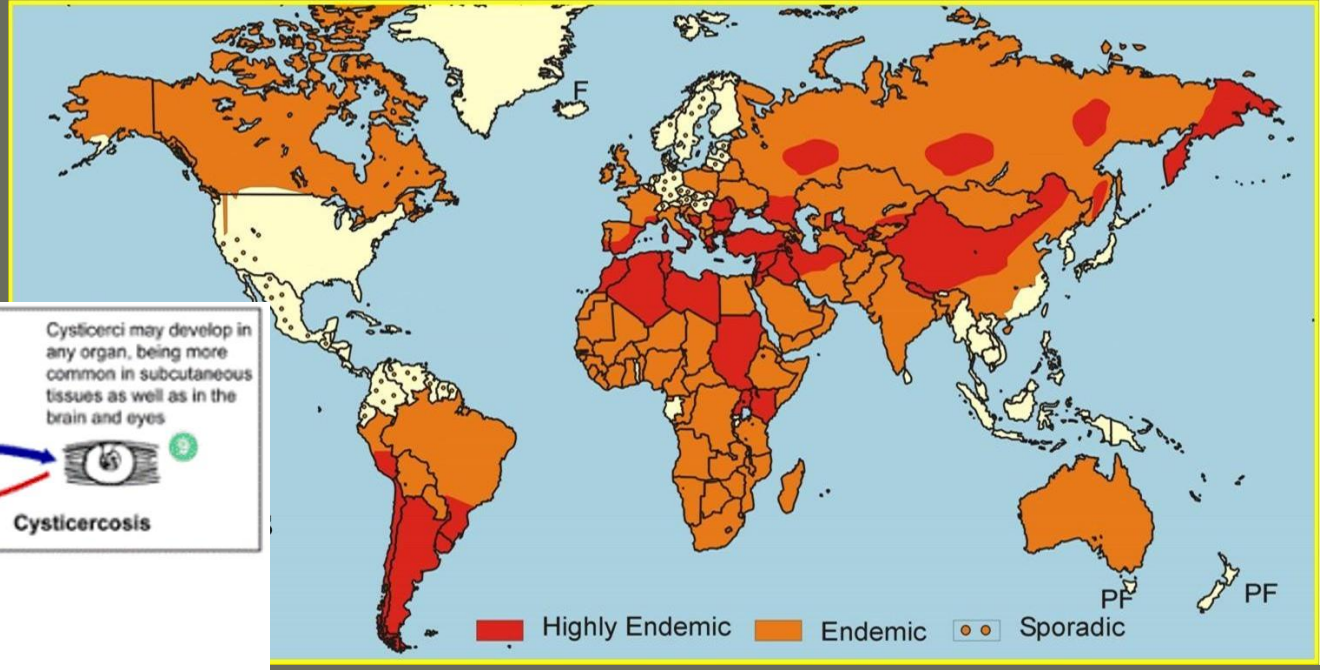


Бычий цепень

Свиной цепень

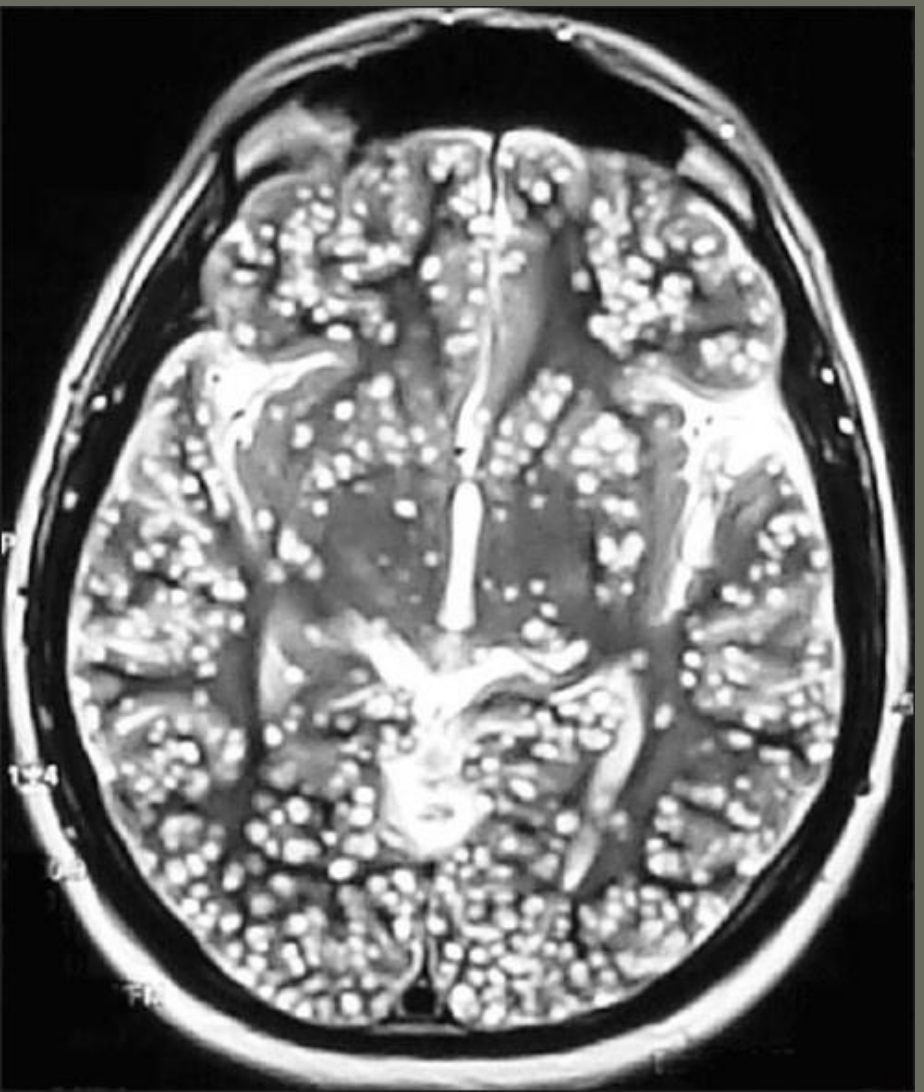



CDC
SAFER·HEALTHIER·PEOPLE
http://www.dpd.cdc.gov/dpdx
Oncospheres hatch, penetrate intestinal wall, and circulate to musculature 8
Cysticerci may develop in any organ, being more common in subcutaneous tissues as well as in the brain and eyes 9
Cysticercosis
Embryonated eggs ingested by human host 7
4 Humans infected by ingesting raw or undercooked infected meat
3 Oncospheres hatch, penetrate intestinal wall, and circulate to musculature
Oncospheres develop into cysticerci in pig muscle
2 Embryonated eggs and/or gravid proglottids ingested by pigs
5 Scolex attaches to intestine
6 Adults in small intestine
1
Eggs or gravid proglottids in feces and passed into environment
= Infective Stage
= Diagnostic Stage


F
PF
PF
Highly Endemic
Endemic
Sporadic

Taenia solium

- Infective forms:
  - Egg
  - Cysticercus
  - Cysticercosis
  - Adult infection
- Prepatent period : 2 - 3 months
- May be Autoinfection

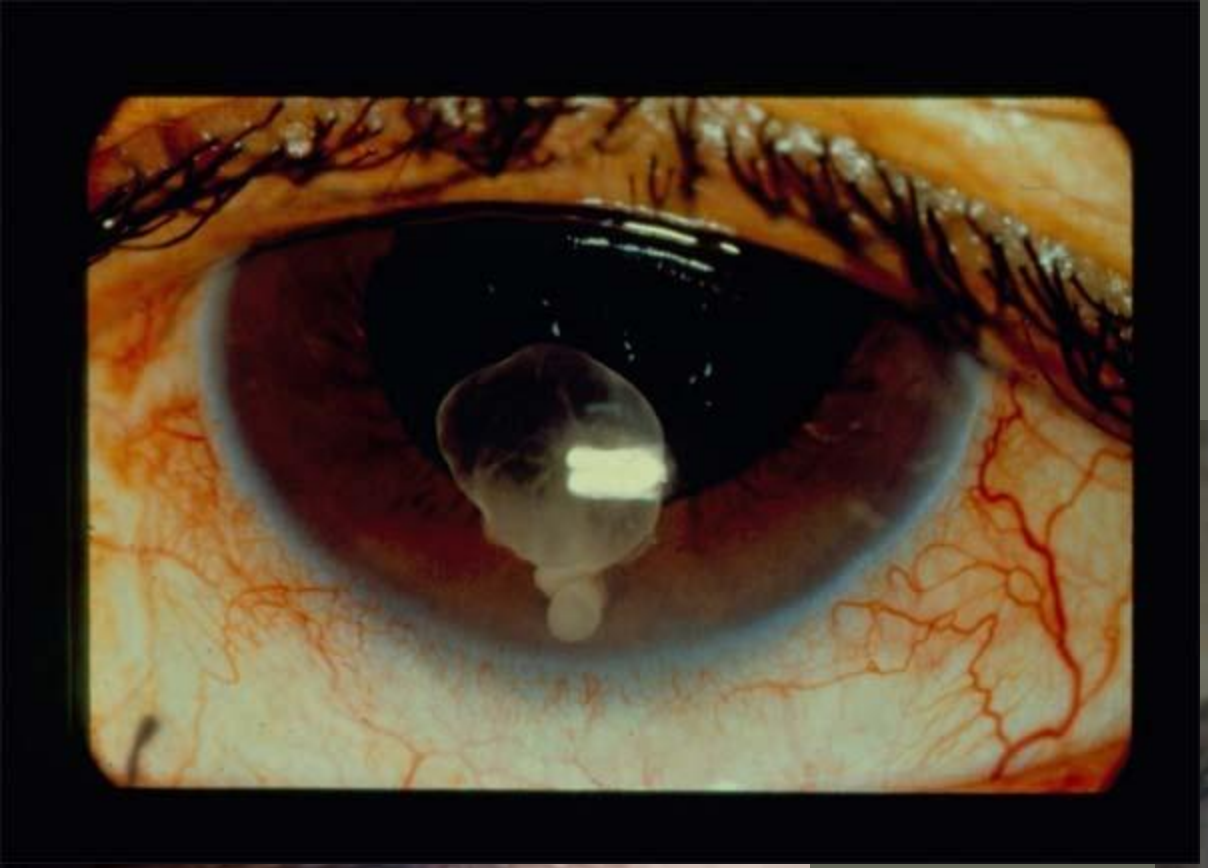


Adult infection:

- Digestive disturbance
- Intoxication
- Nervous disorders

Cysticercosis:

- Subcutaneous tissues
  heart , liver , lungs,
  eye, brain, muscles,
  abdominal cavity etc.
- Epilepsy
- Failing vision

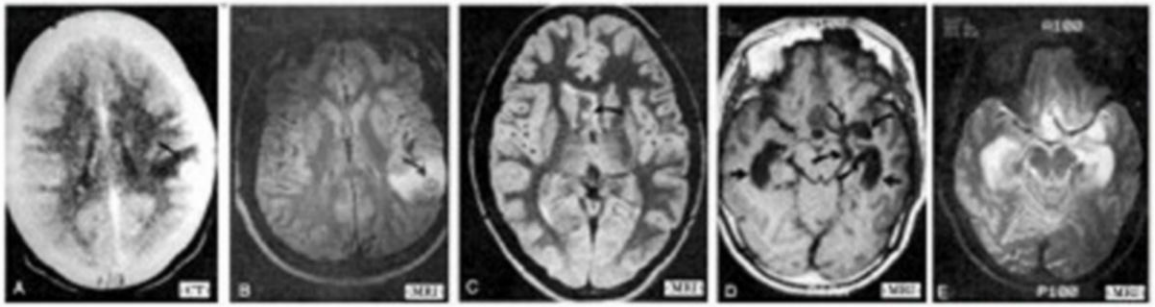



B

Taenia solium Diagnosis

Adult:

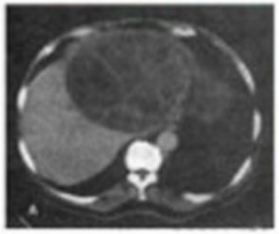
- Gravid segments or eggs in feces
- Anal swabs

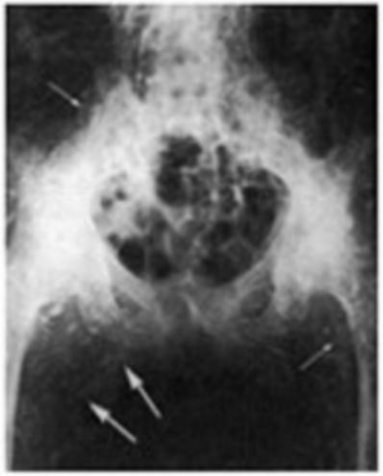


CT-scan、MRI

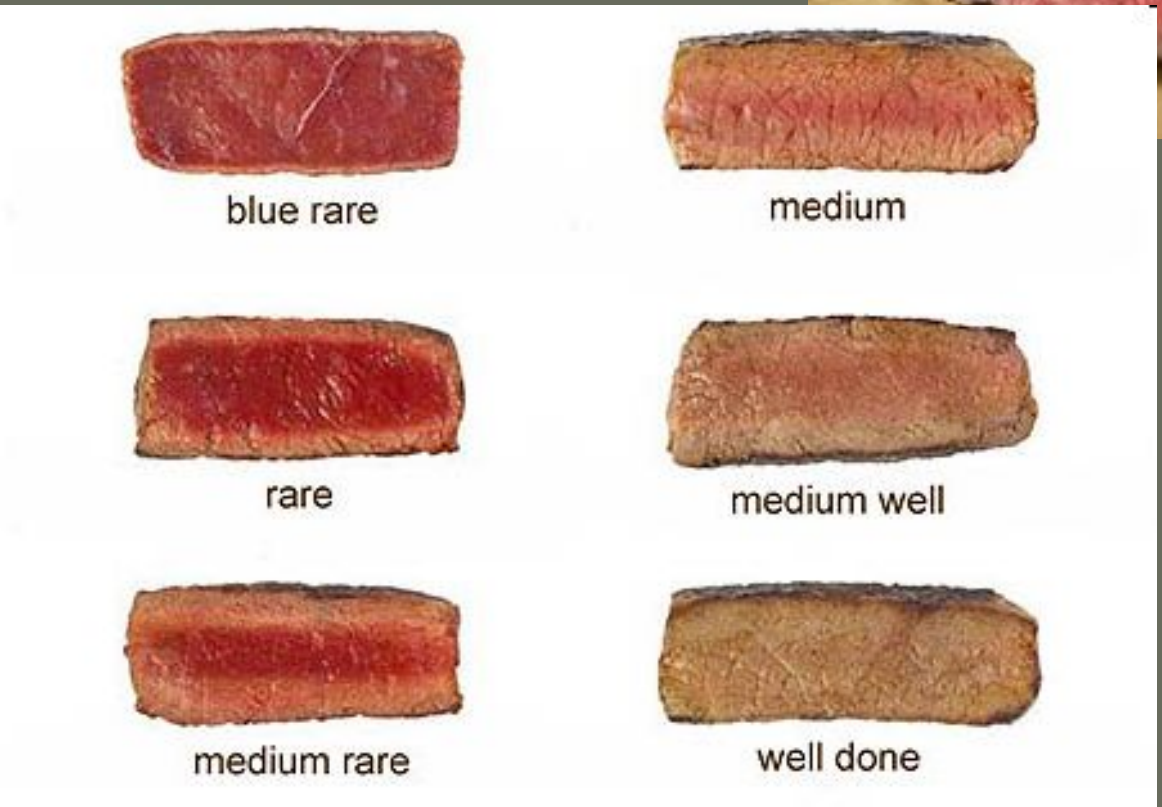
Cysticercus:

- Identification of surgically removed cysticerci
- Immunologic tests
- CT-scan、MRI
- X-ray





Бифштекс с кровью

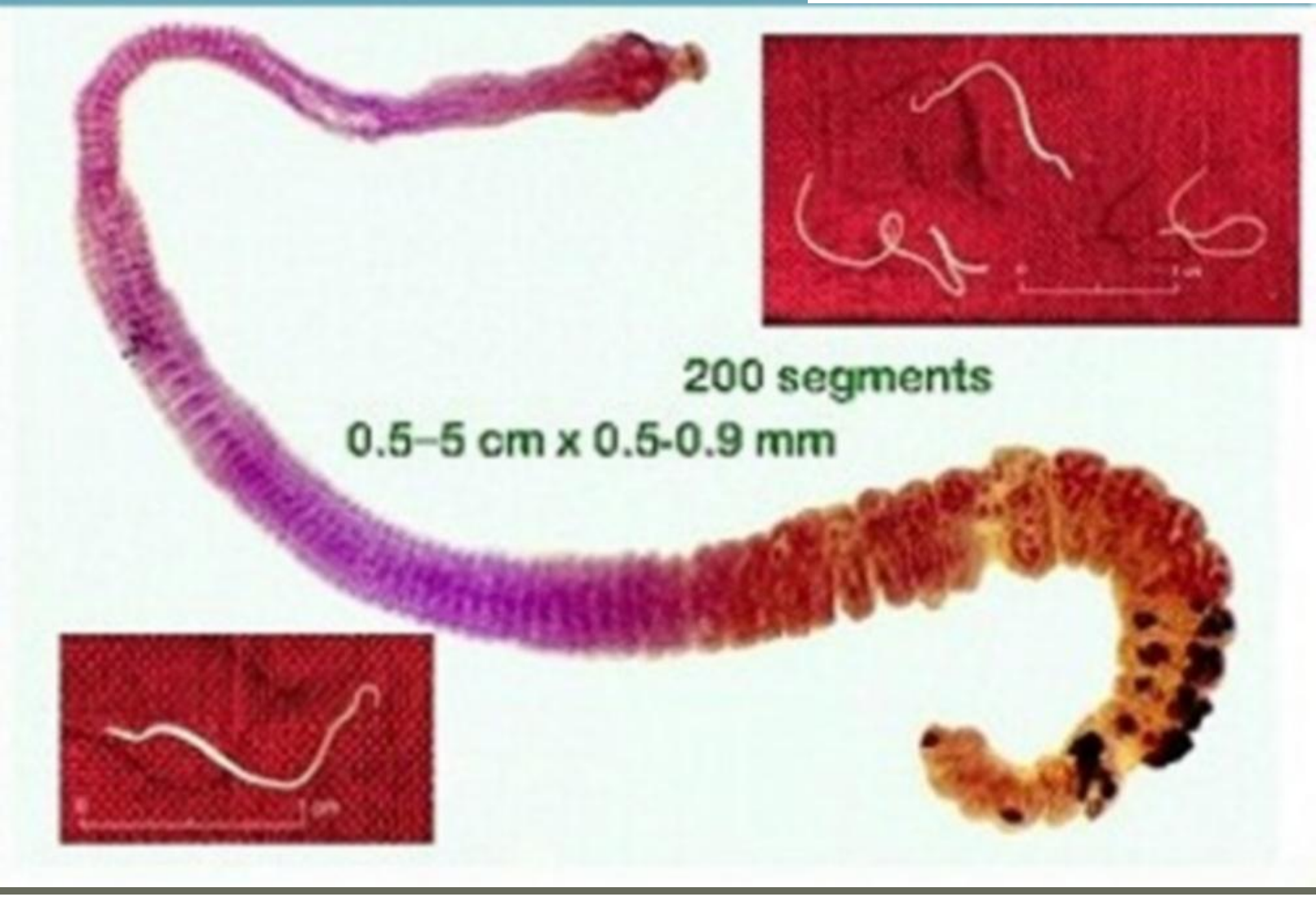


Фарш

Шашлык

Hymenolepis nana

Карликовый цепень



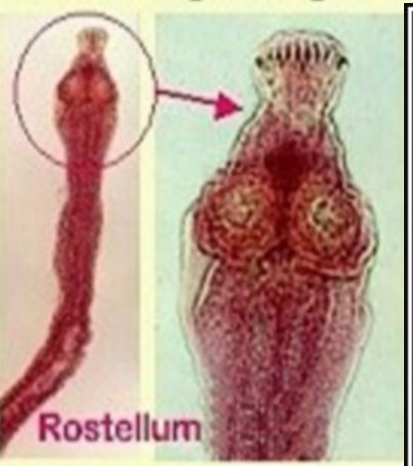
Hymenolepis diminuta — **Крысиный цепень**

Hymenolepis nana

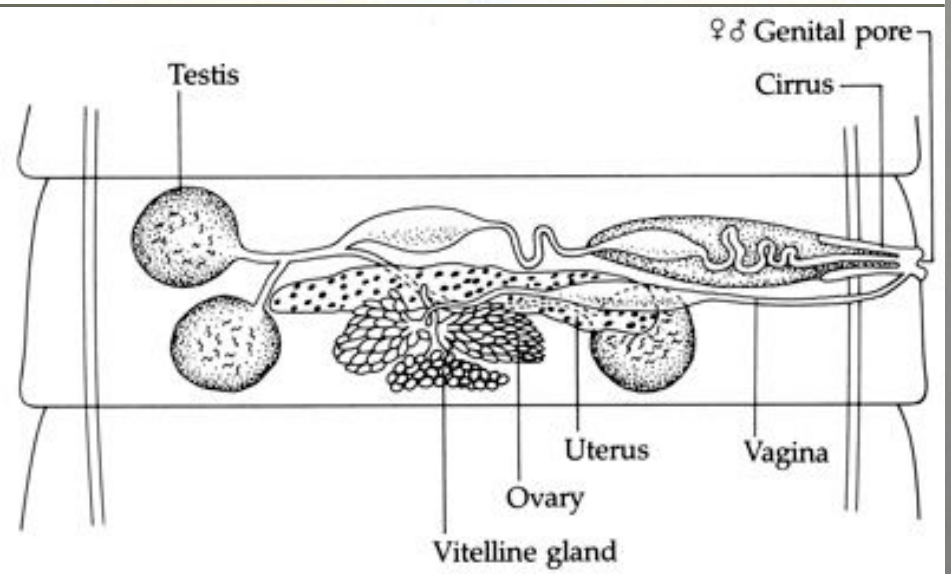
Scolex : Globular shape , 0.3 mm

Short retractile rostellum

with a single ring of 20 - 30 small hooks

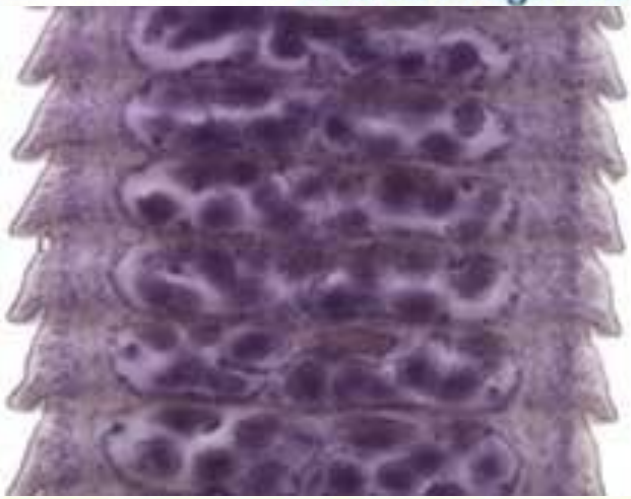


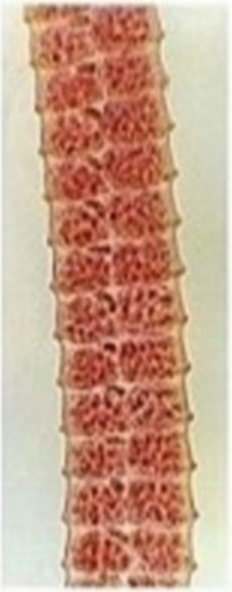
Mature Proglottid -MP



Hymenolepis nana

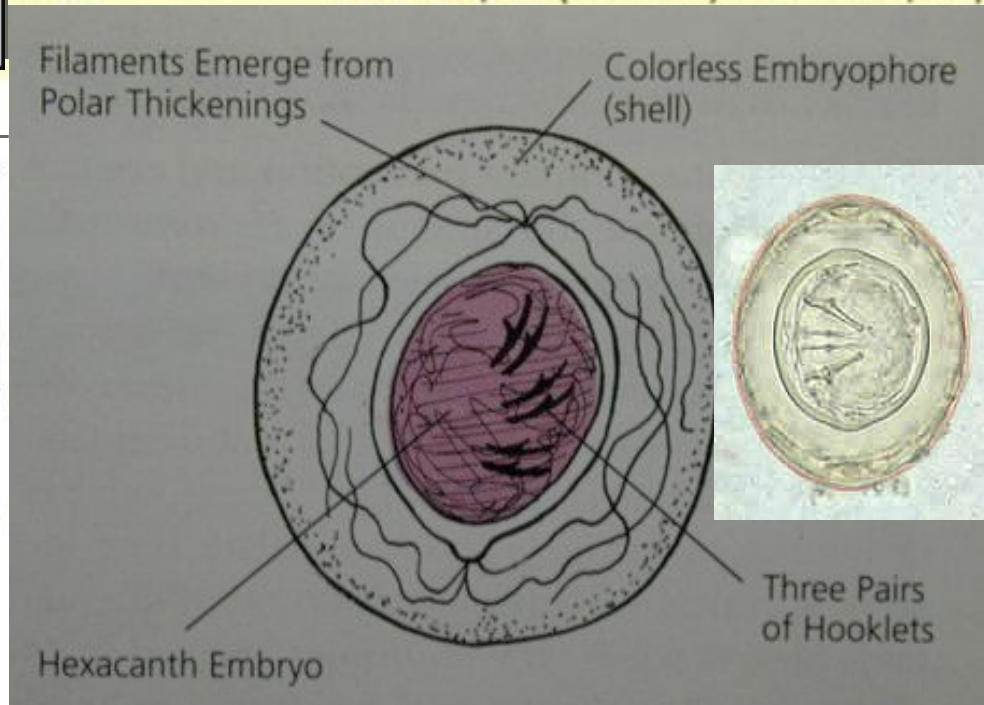
Gravid Proglottid -GP





Egg

46 x 37 µ m (30 – 60) x 16 - 34 µ m)



Окончательный хозяин человек грызуны

ПОЛОВОЗРЕЛАЯ ФОРМА → ЯЙЦО

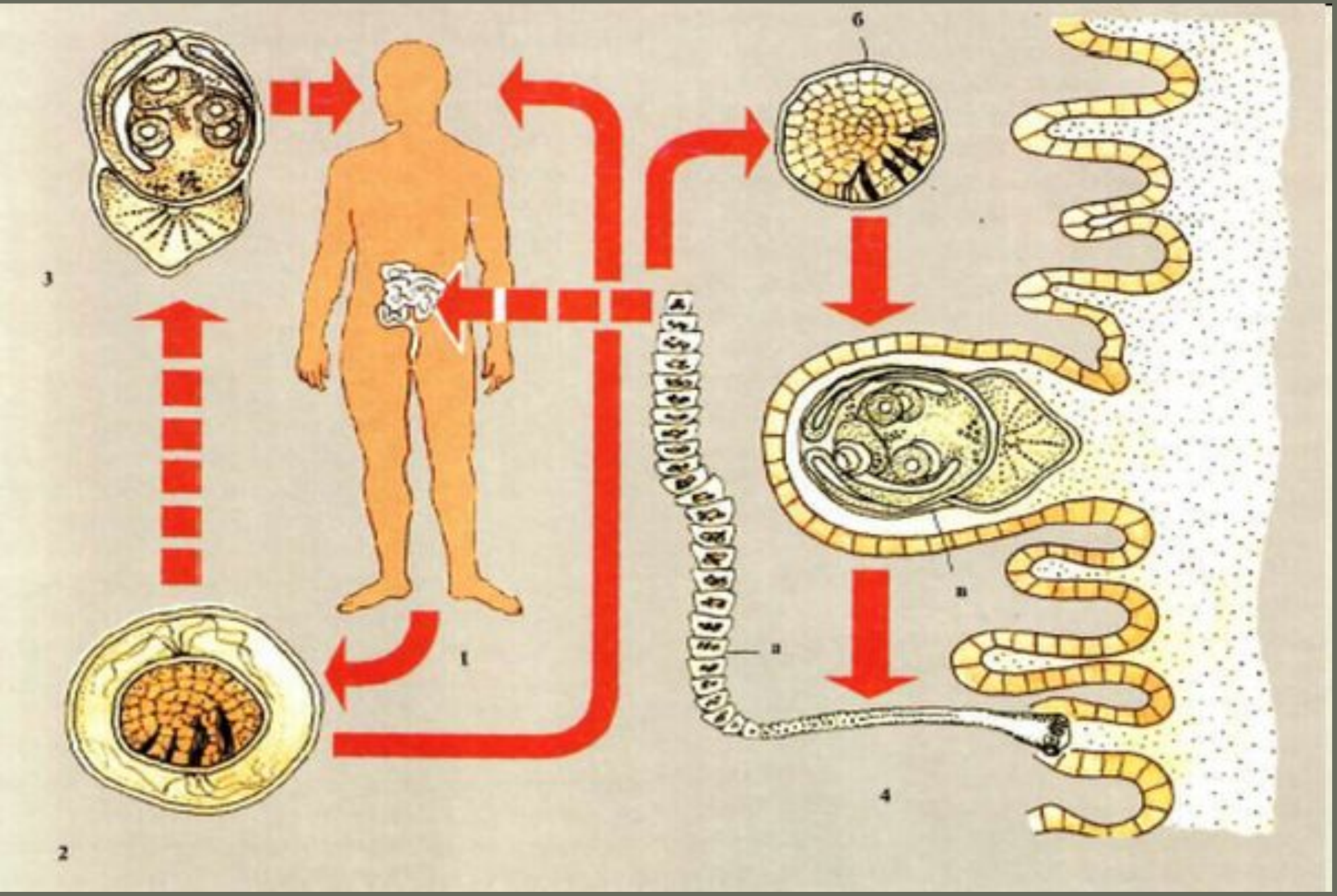
ЯЙЦО → ОНКОСФЕРА

ОНКОСФЕРА → ЦИСТИЦЕРКОИД

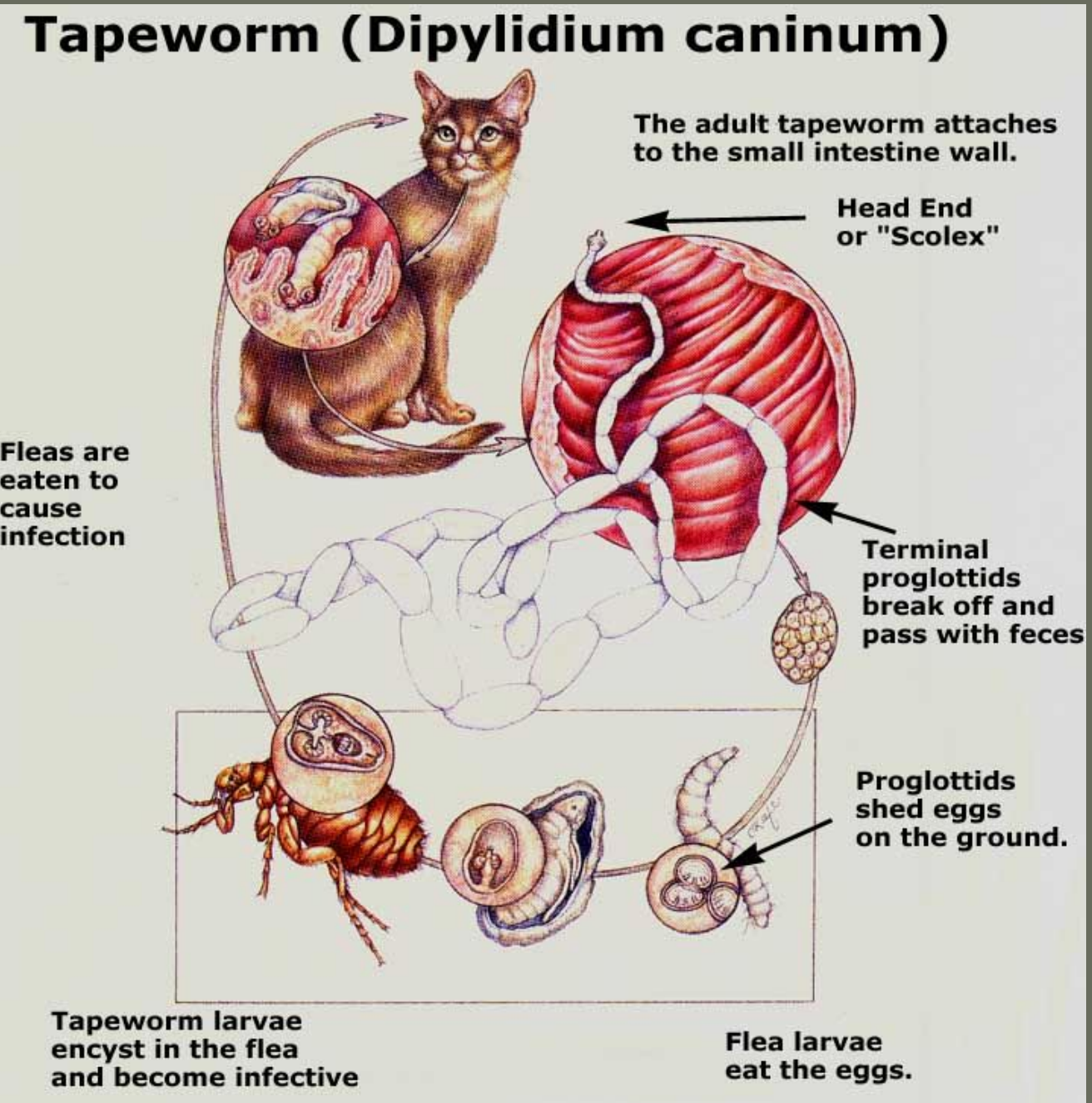
ЦИСТИЦЕРКОИД → ПОЛОВОЗРЕЛАЯ ФОРМА

ФИННА ЦИСТИЦЕРКОИД ← ОНКОСФЕРА

Промежуточный хозяин мучной хрущак Tenebrio


6
3
A
B
a
1
4
2

Тыквовидный цепень



Echinococcus granulosus

Echinococcus multilocularis
Echinococcus oligarthrus
Echinococcus vogeli

Disease

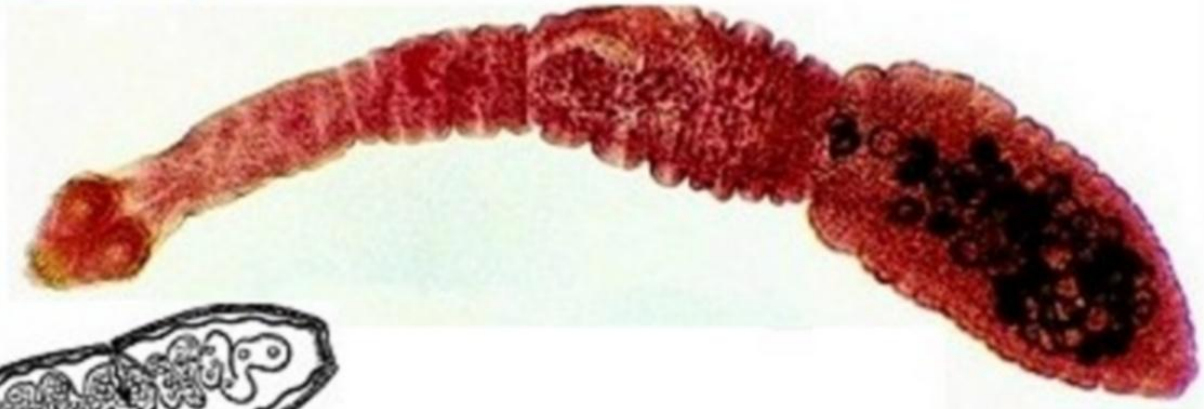
Echinococcosis
Hydatid Disease

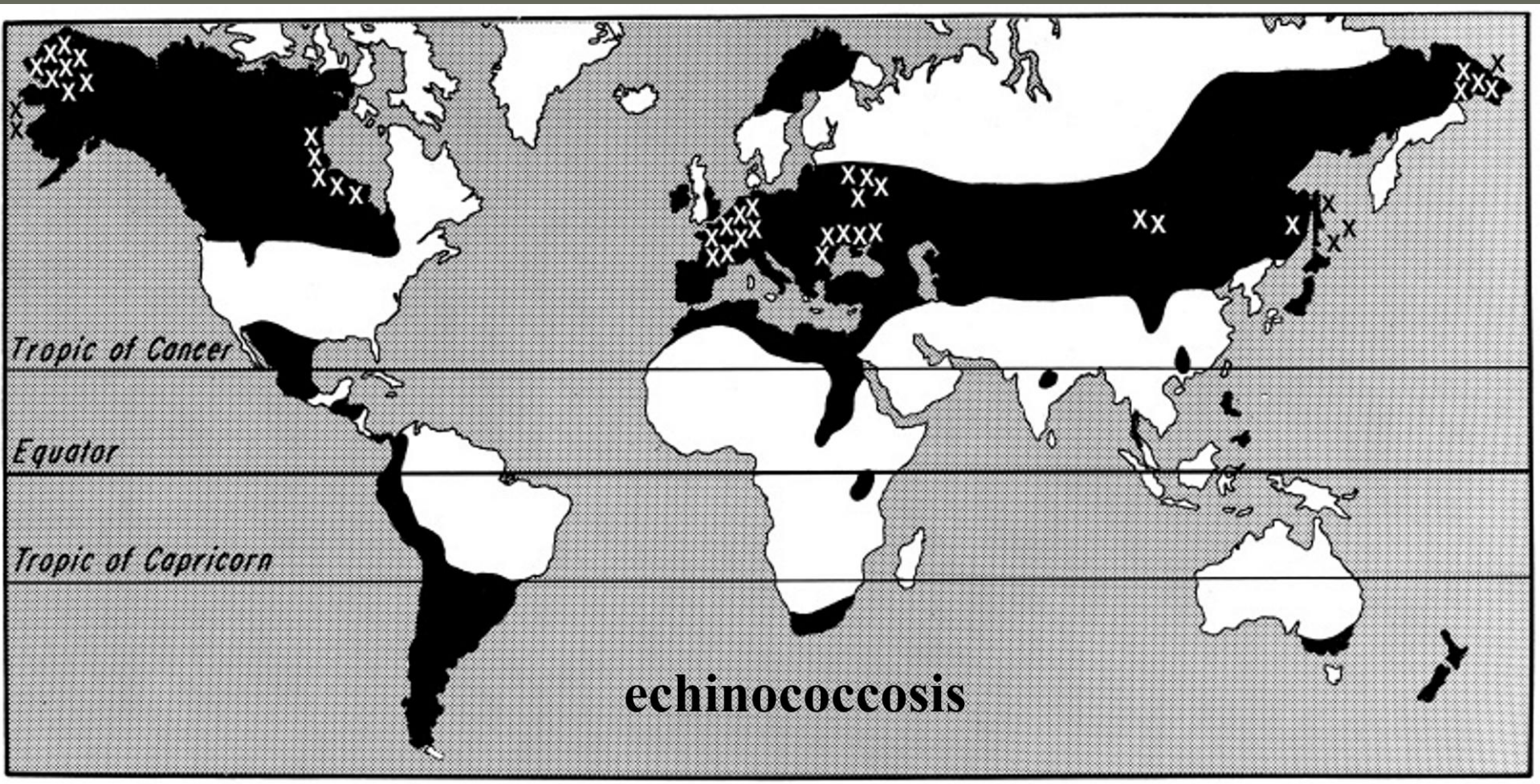
Distribution

Ice Island , Siberia
South America, Australia, New Zealand, Tasmania, South Africa, Asia,
Central & Northern Europe, the Mediterranean Countries of Asia & Africa,

Morphology

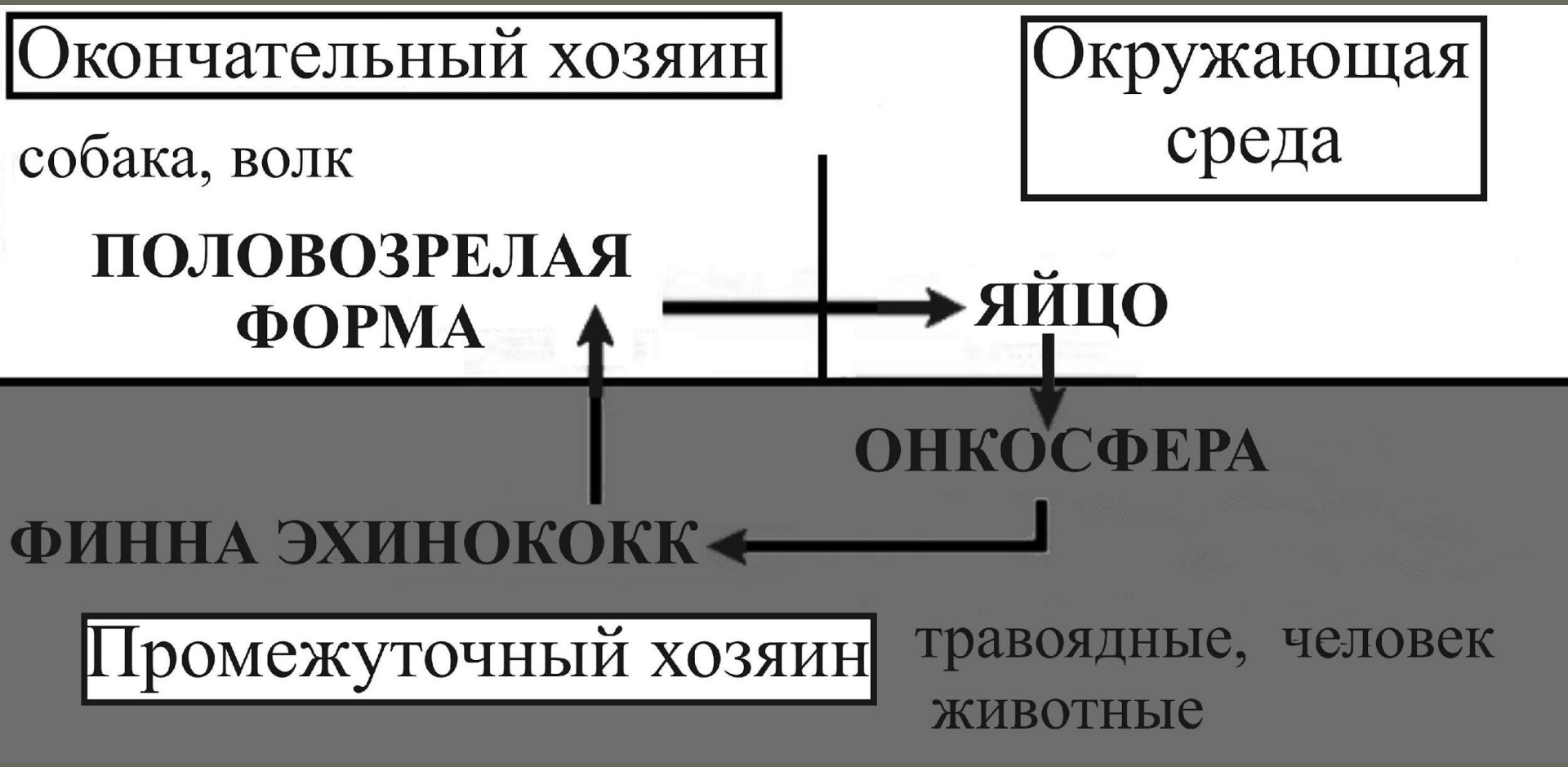
Adult worm 6.0 (2.5 to 9.0) mm in length
(1.2 ~3.7 mm in E. multilocularis)

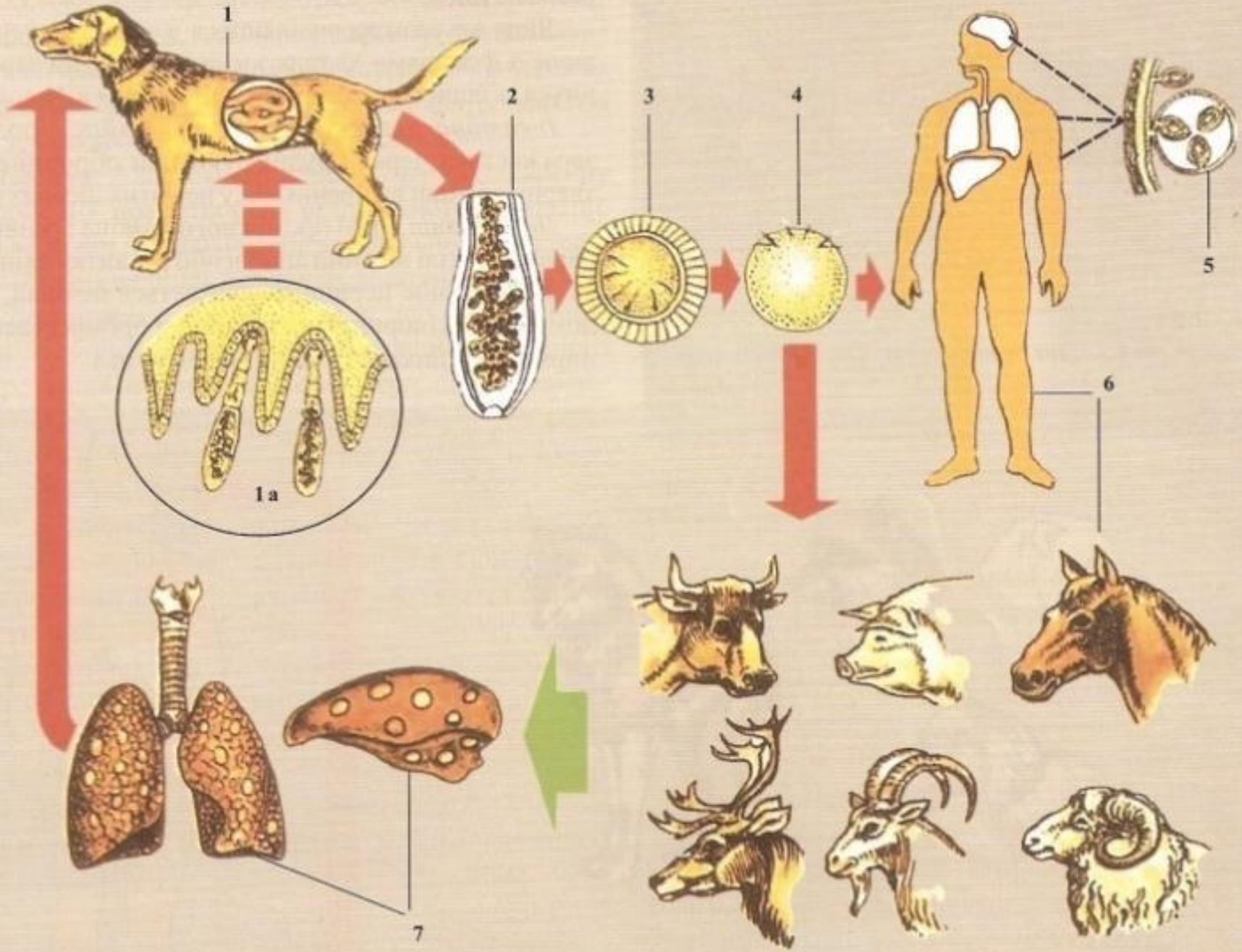




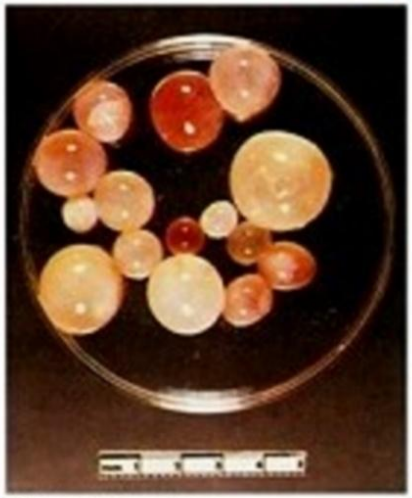
echinococcosis

Схема развития *Echinococcus granulosus*




1
1a
2
3
4
5
6
7

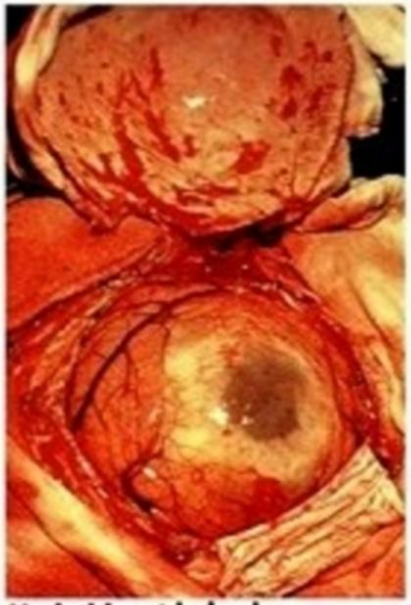
Unilocular Hydatid Cyst



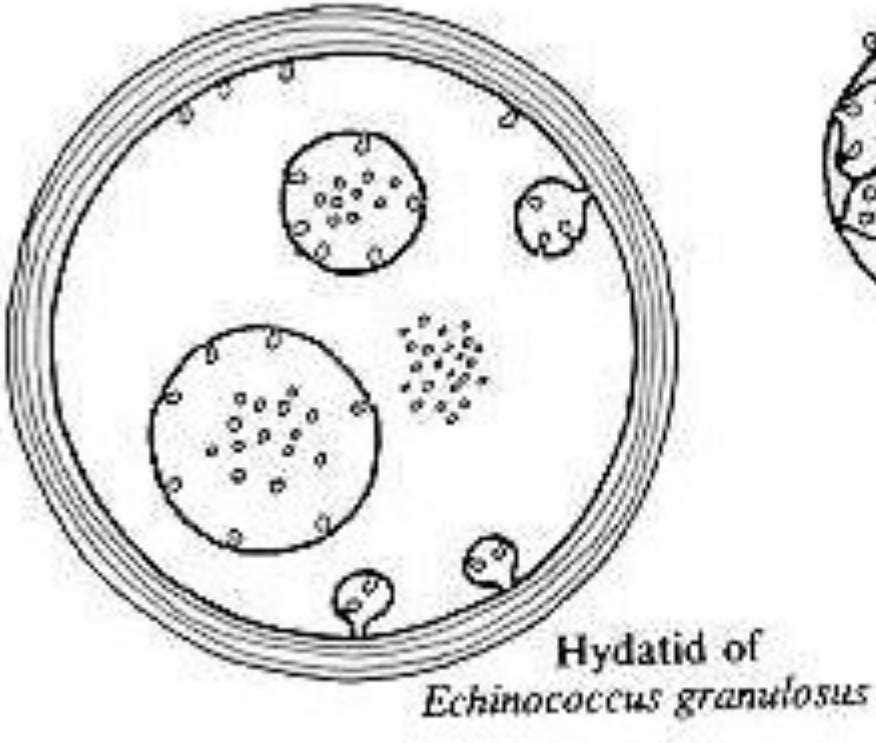
Echinococcus granulosus.
Hydatid brood capsules removed from the cyst

Coenurus in human eye This infection necessitated enucleation of the eye.

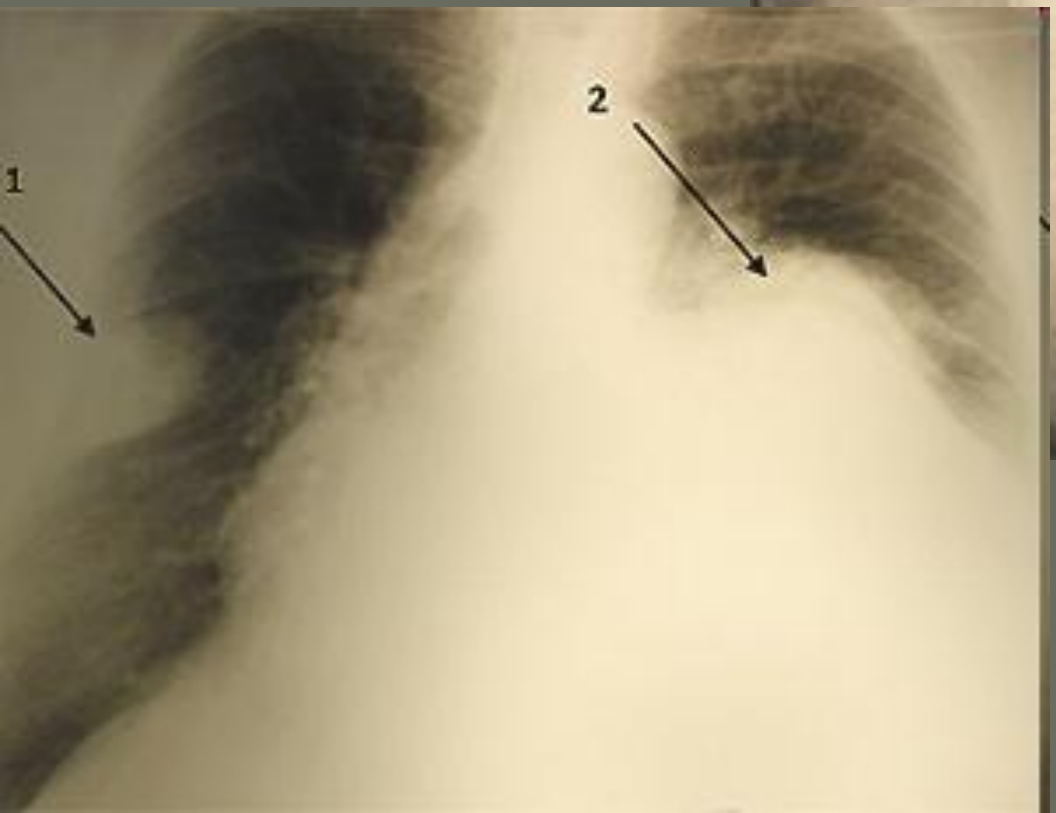
Hydatid c



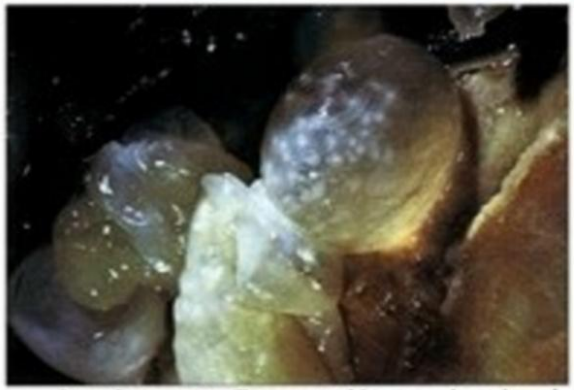
Hydatid cyst in brain
This cyst was found in the brain of a 4 year-old girl.



Hydatid of
Echinococcus granulosus


1
2

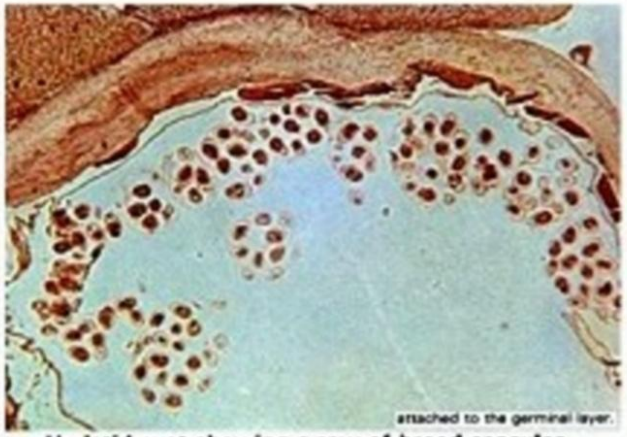
Hydatid sand



Daughter cysts The germinal layer produces brood capsules inside which grow scolices.

A bunch of protoscolexes. The opening in each protoscolex is the point of invagination. In this case the membrane covering the protoscolexes has been removed.

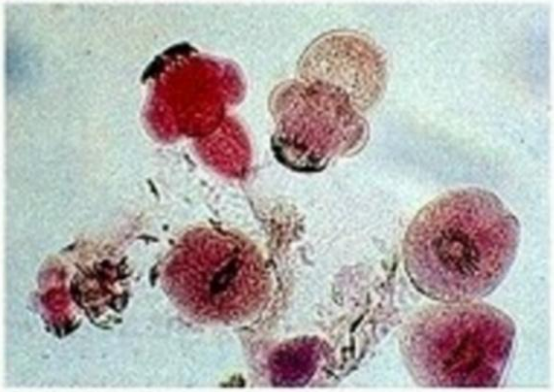
Hydatid cyst brood capsules appearing as irregular masses due to the membrane covering the protoscolexes. SEM ×600.



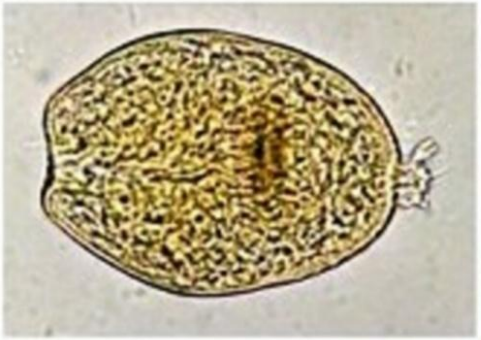
Hydatid cyst showing a row of brood capsules

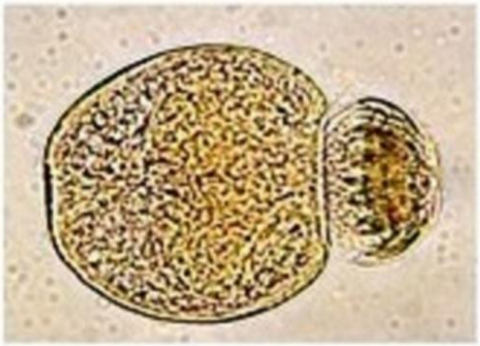
A single protoscolex showing the hooks in the centre and a number of oval to irregular bodies which are calcareous corpuscles. Phase contrast. ×400. CC = calcareous corpuscle.

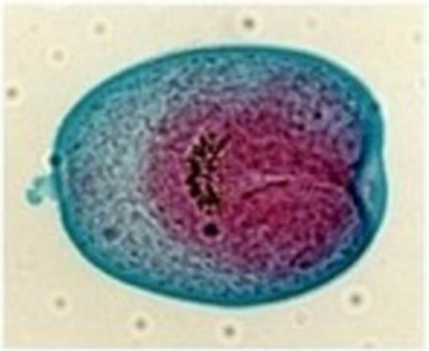
細粒棘球絛虫 [illegible]（×300）

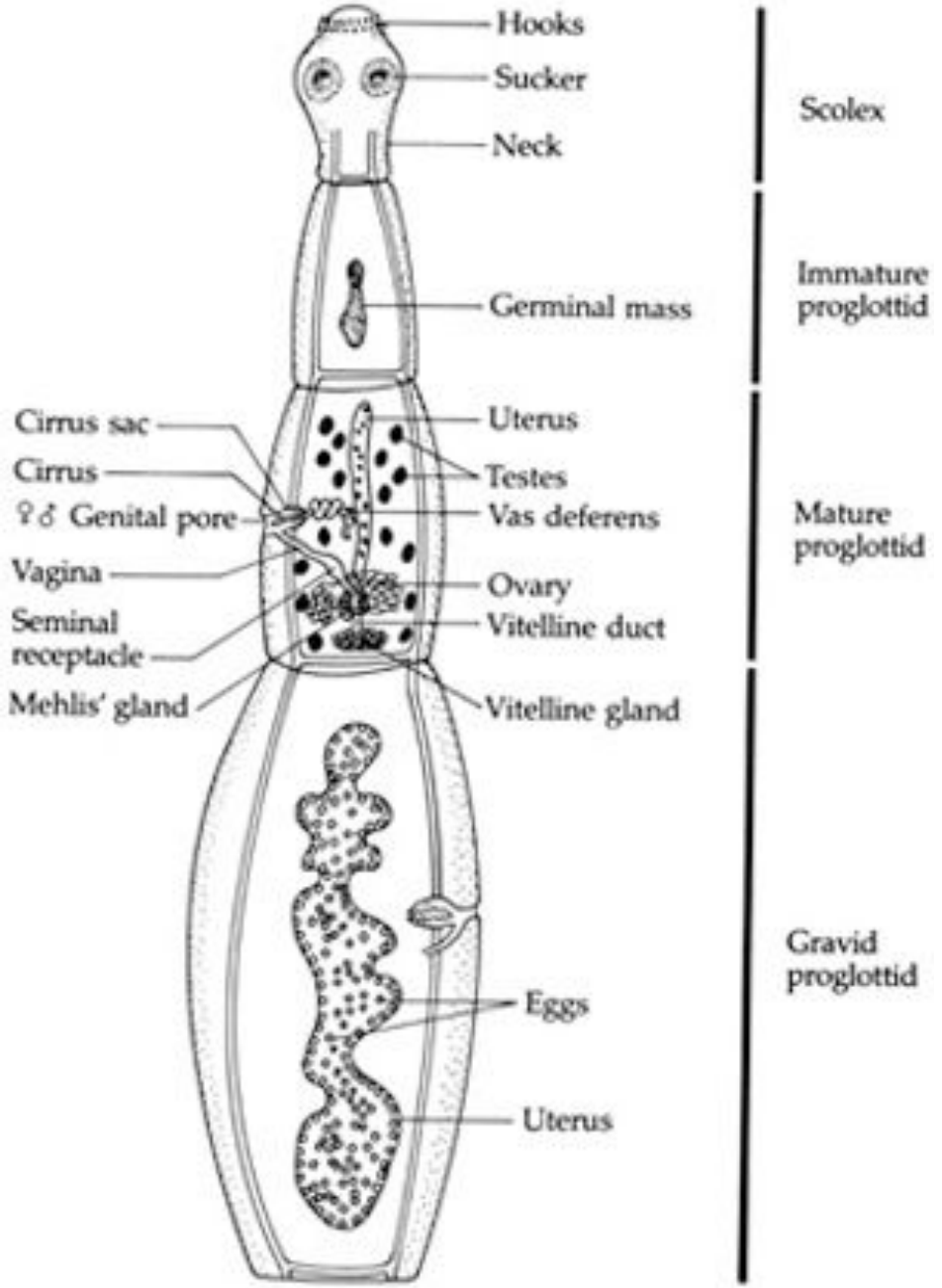


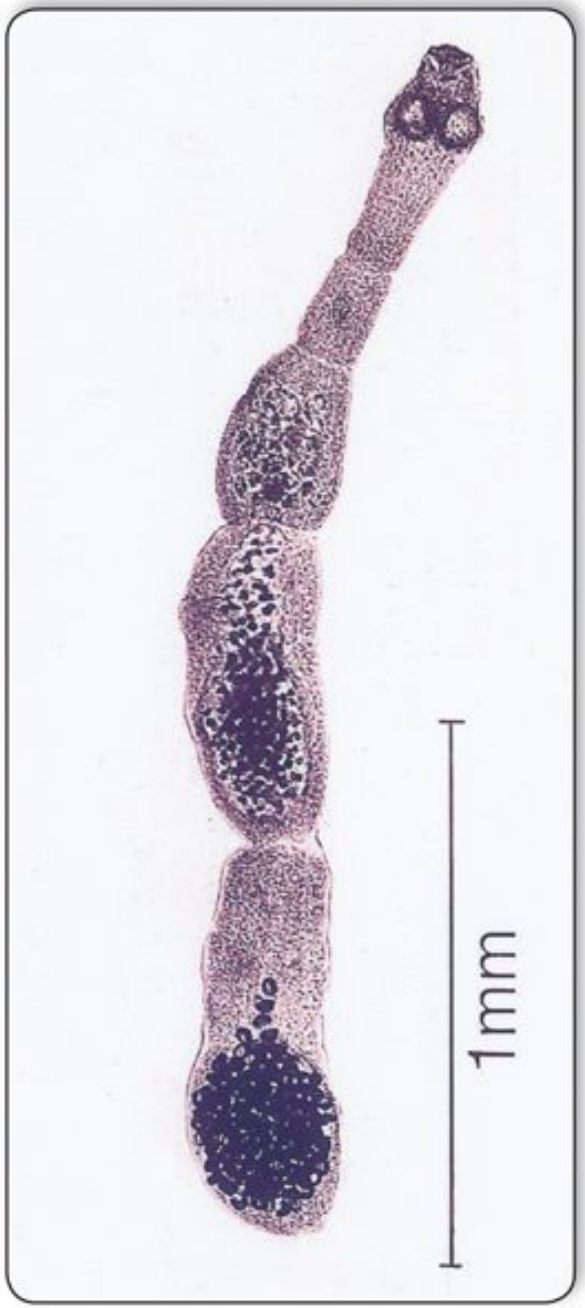
hydatid sand







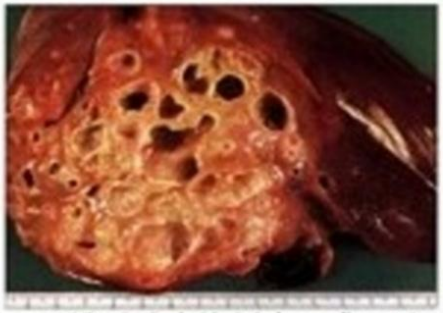

Hooks
Sucker
Neck
Scolex
Germinal mass
Immature proglottid
Cirrus sac
Cirrus
♀♂ Genital pore
Vagina
Seminal receptacle
Mehlis' gland
Uterus
Testes
Vas deferens
Ovary
Vitelline duct
Vitelline gland
Mature proglottid
Eggs
Uterus
Gravid proglottid


1mm

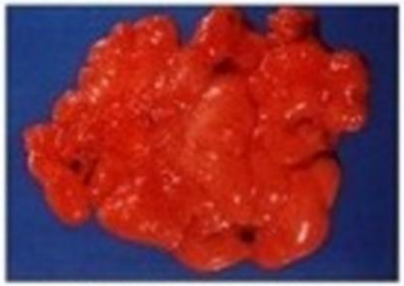
Alveolar Hydatid Cyst multilocular

E. multiloculare infection, with many locules infiltrating the liver

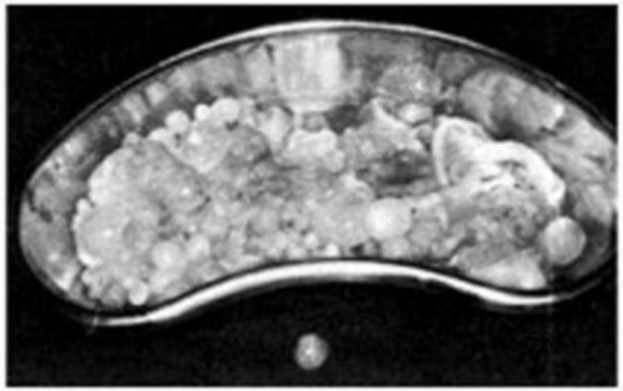
Echinococcus vogeli: polycystic hydatid cyst, human pericardium. (From D'Alessandro A et al. Am J Trop Med Hyg 1979; 28:303.)

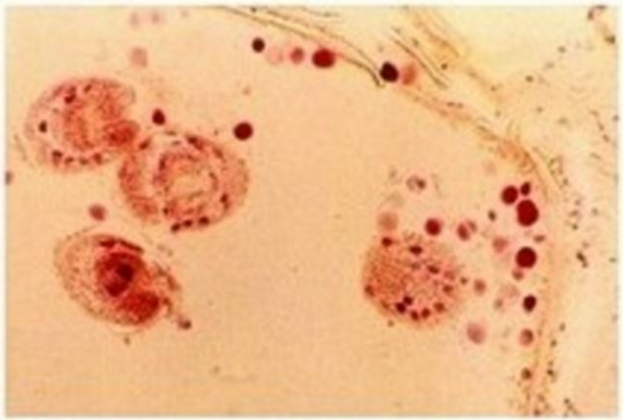


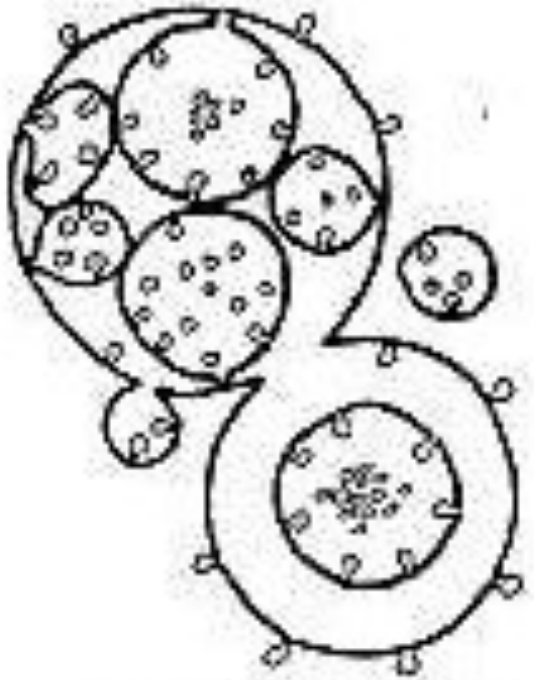
Multilocular hydatidosis in human liver Multilocular or alveolar cysts are caused by infection with *Echinococcus multilocularis*. The adult of this species is found in wild canines, and the usual larval hosts are rodents. The alveolar cyst in the human liver may mimic hepatic carcinoma, but it is usually discovered only at postmortem, as in this case.



Polycystic mass of *E. vogeli* This mass was removed surgically from a 22-year-old black Colombian complaining of repeated episodes of fever and purulent cough. At first suspected from a CT scan of having a neoplasm, he was found at laparotomy to have polycystic masses on the surface of the liver. Subsequently, at thoracotomy, groups of cysts were removed from various sites, including the one shown here which was in the pericardium. [Natural size]

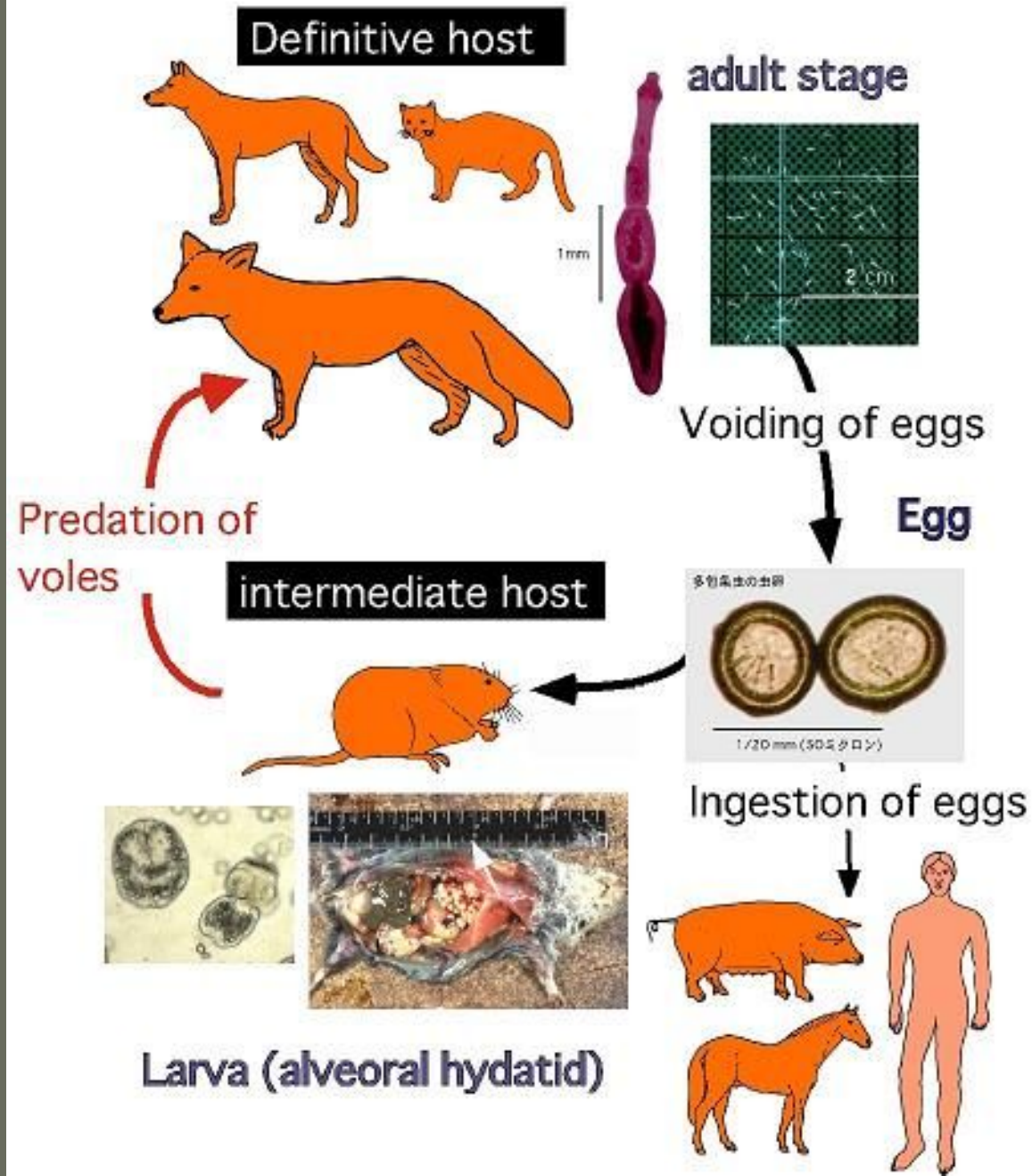






Alveolar hydatid of *E. multilocularis*

Life-cycle of *Echinococcus multilocularis*



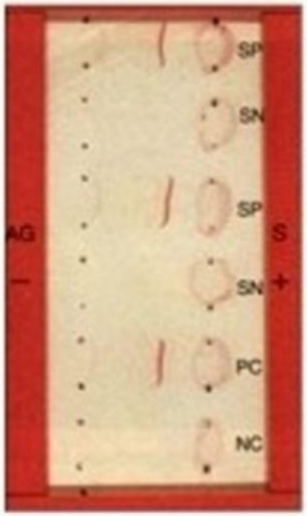
Diagnosis

- Clinical Symptom
- X- ray
- Hydatid Thrill
- Immunodiagnosis :
  - Skin Test
  - Complement-Fixation Test
  - Bentonite Flocculation Test
  - Elisa
- Eosinophilia : 20 - 25 %

Echinococcus cyst of liver. There is a single, round, partially calcified Echinococcus cyst in the inferior portion of the right lobe (white arrows).
(From Teplick JG et al. Roentgenologic Diagnosis, vol. 1, 3rd ed. 1976. WB Saunders, Philadelphia.)

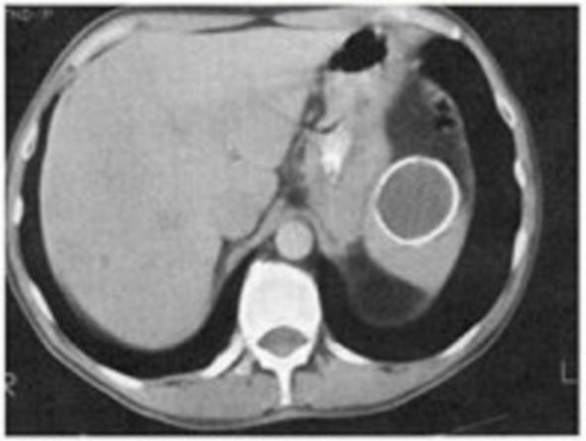
Hydatid cyst in liver

Hydatid cyst in lung



Immunodiagnosis of hydatidosis The Casoni skin test employed formerly used crude hydatid fluid as antigen. This has been largely replaced by purified antigens such as 'arc 5' which is employed in counter immuno-electrophoresis. (SP – positive; SN – negative sera; PC – positive controls; NC – negative controls; AG – antigen at cathodic; S – serum at anodic ends)

CT scan of hydatid cyst in liver



CT shows hydatid cyst of spleen. (Courtesy Dr. J. F. Catchpool,

Развитие *Pseudophyllidea*

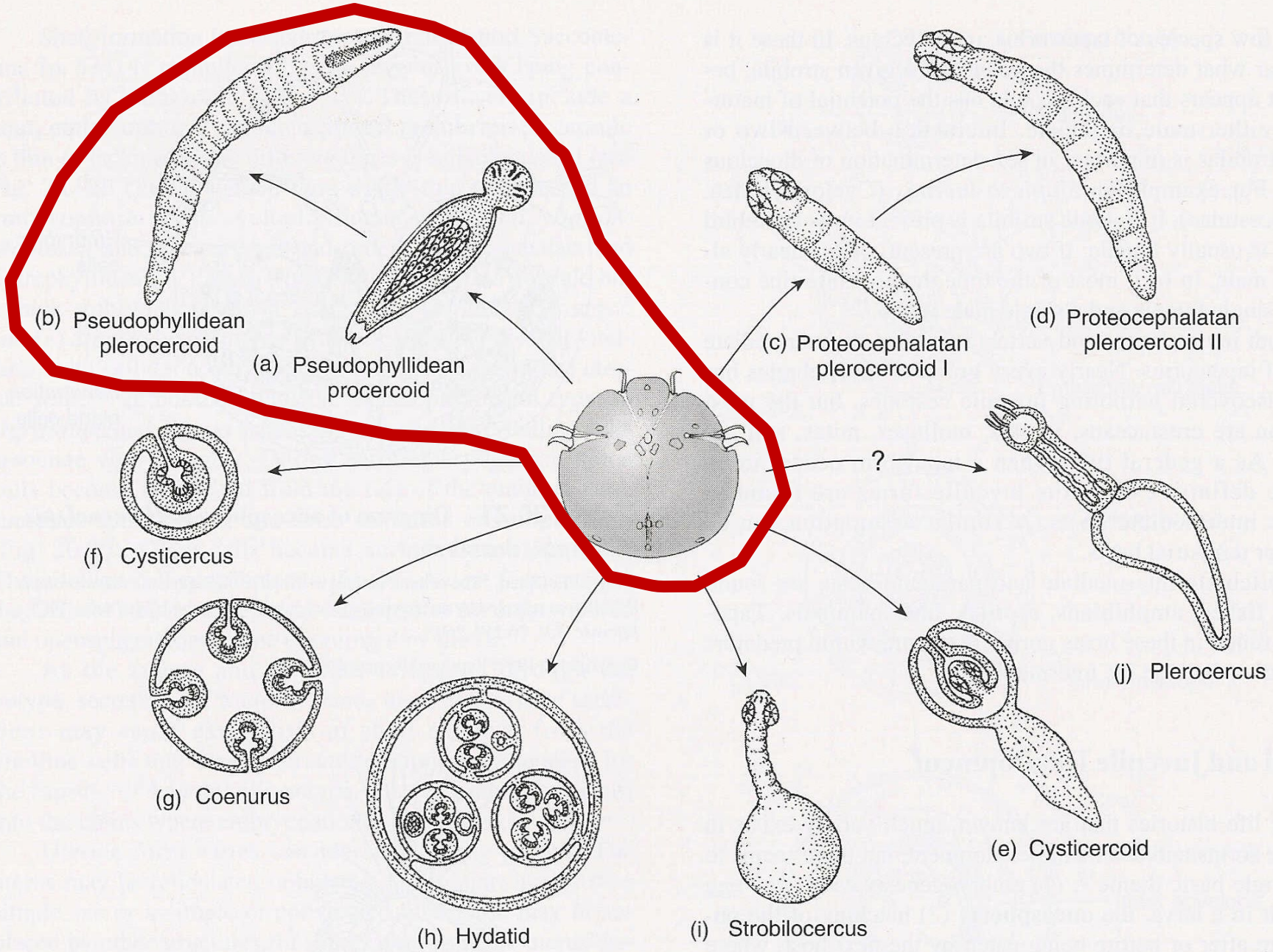
яйцо

корацидий

процеркоид

плероцеркоид

взрослый червь


(b) Pseudophyllidean plerocercoid
(a) Pseudophyllidean procercoid
(c) Proteocephalatan plerocercoid I
(d) Proteocephalatan plerocercoid II
?
(f) Cysticercus
(j) Plerocercus
(g) Coenurus
(e) Cysticercoid
(h) Hydatid
(i) Strobilocercus

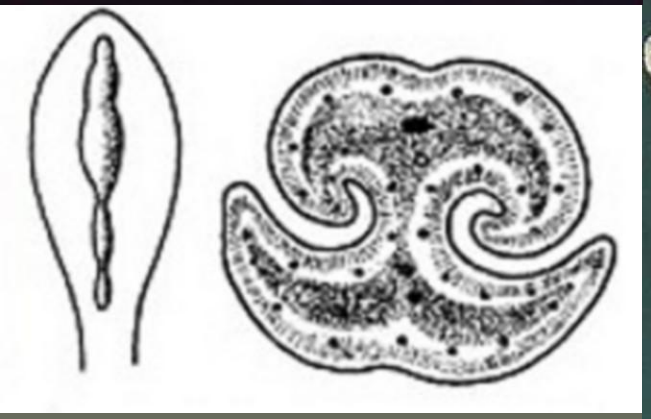
Широкий лентец

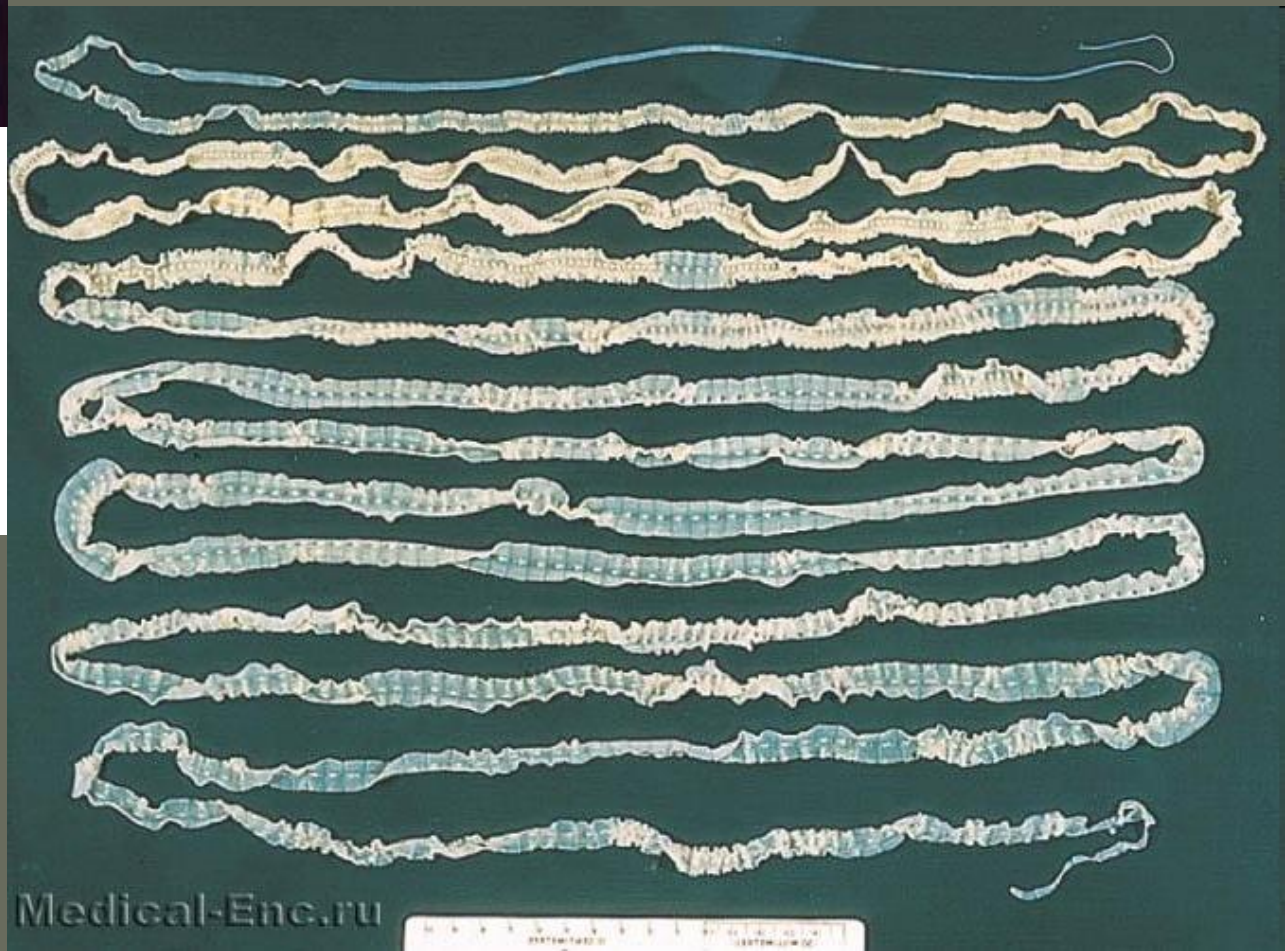
Morphology

Diphyllobothrium latum

Adult : 2 - 10 m X 1.5 - 2.0 cm
3,000 - 4,000 segments

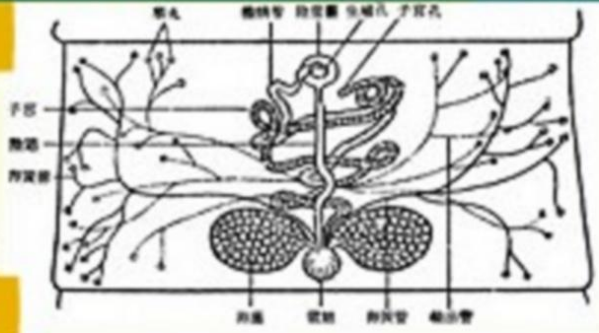
Scolex : 2 - 3 mm X 1 mm



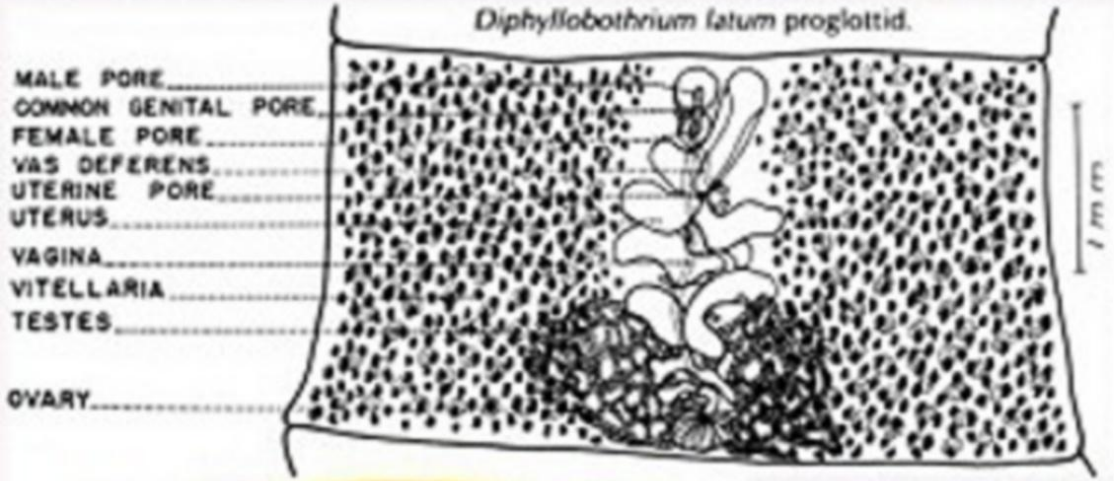


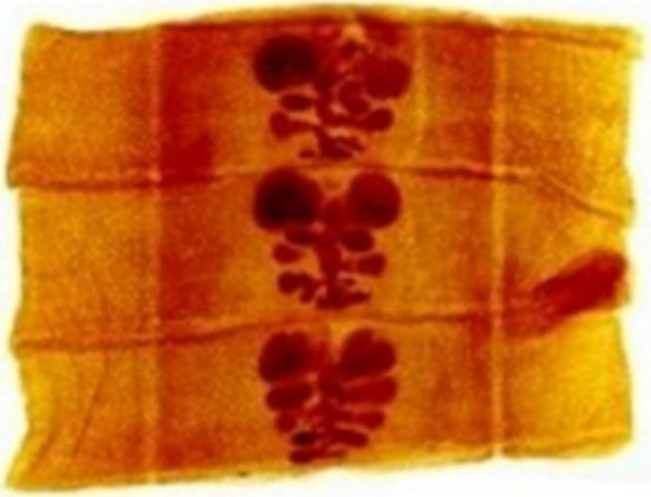
Strobila--Proglottids or segments

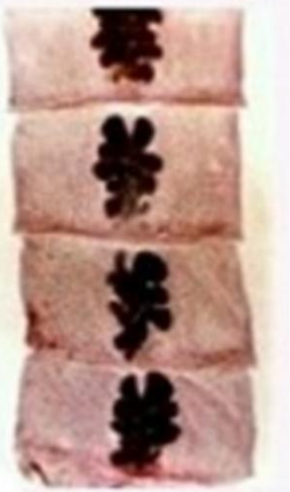
Mature Proglottid



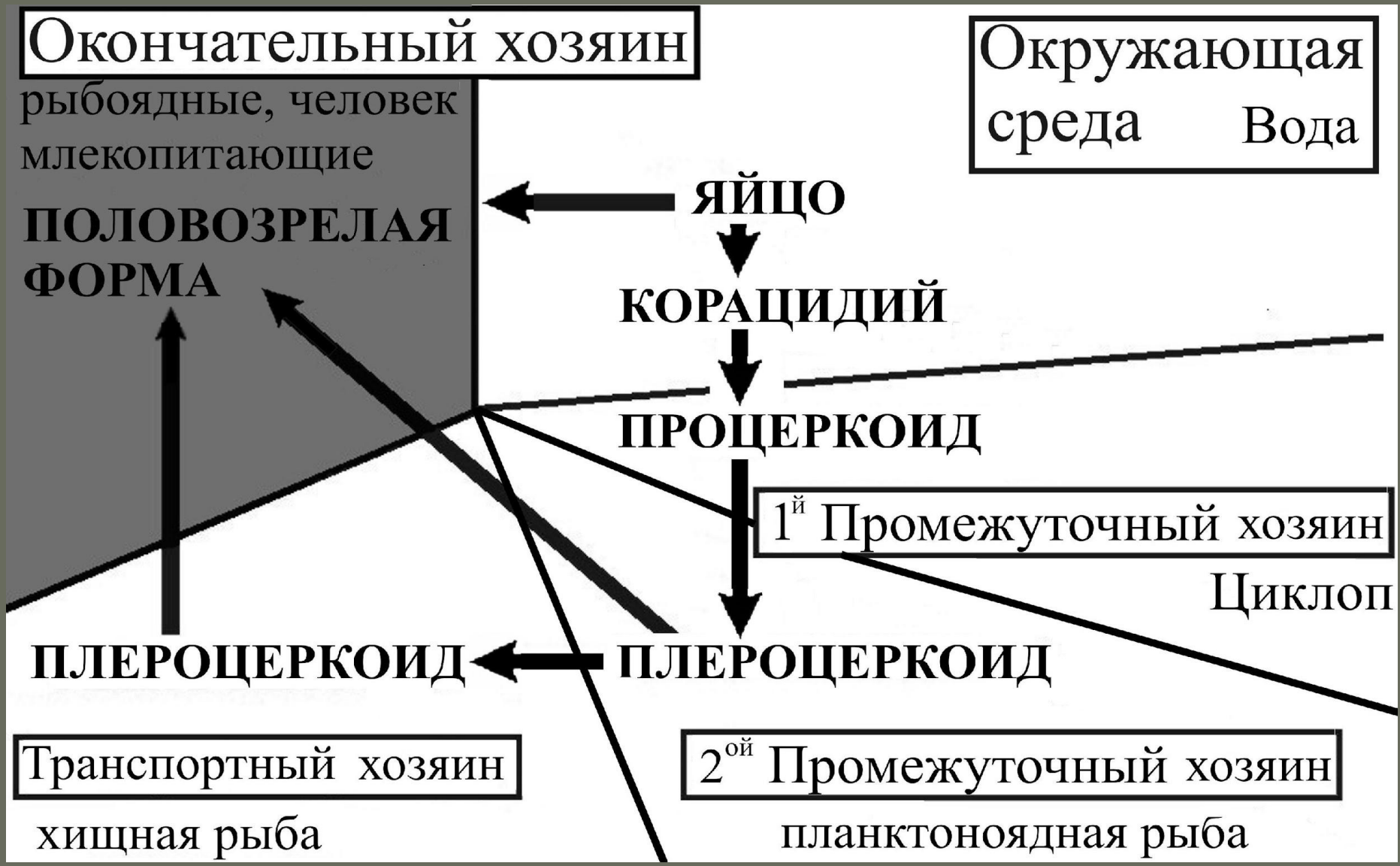
Gravid Proglottids



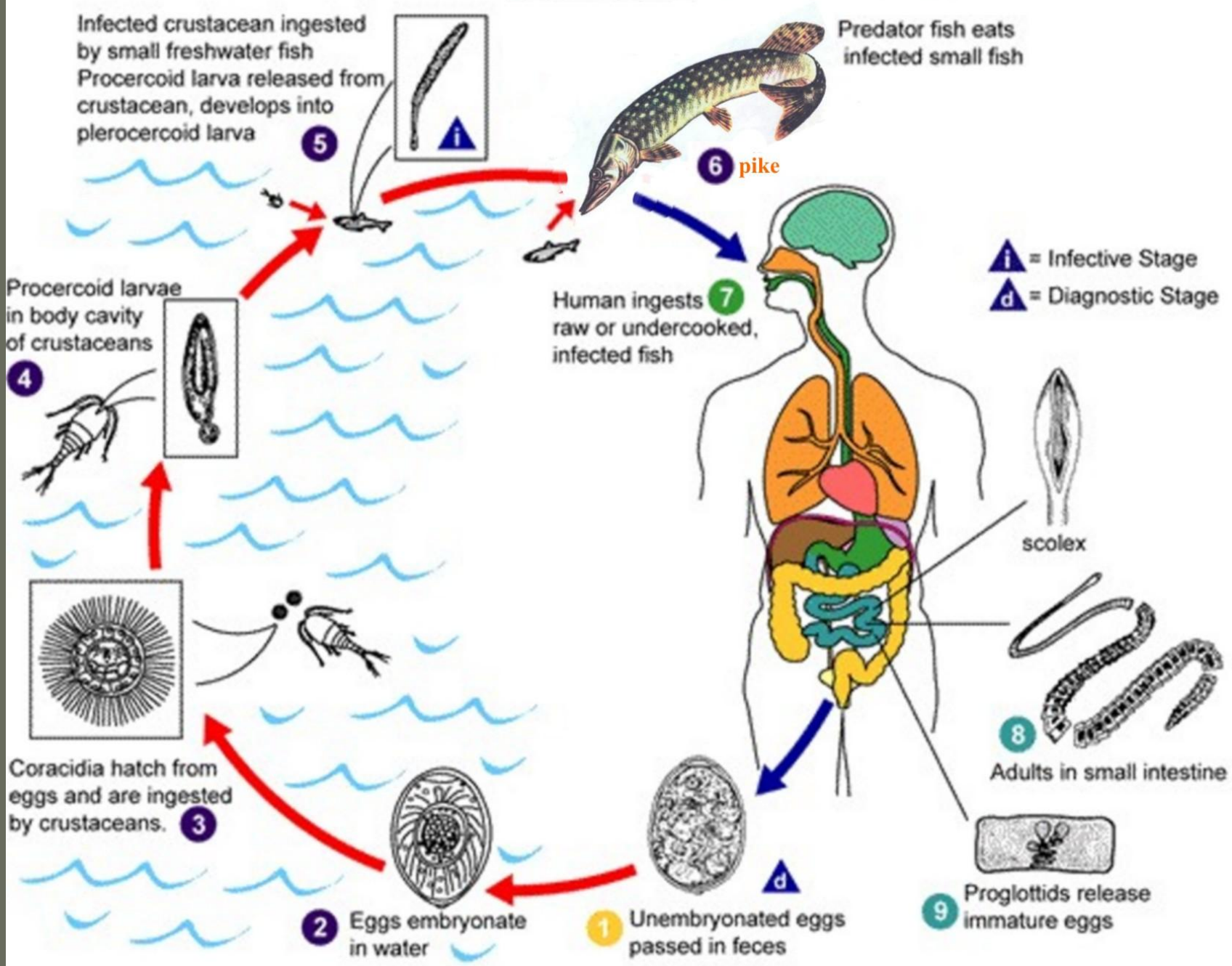




Egg


Окончательный хозяин
рыбоядные, человек
млекопитающие
ПОЛОВОЗРЕЛАЯ ФОРМА
Окружающая среда Вода
ЯЙЦО
КОРАЦИДИЙ
ПРОЦЕРКОИД
1й Промежуточный хозяин
Циклоп
ПЛЕРОЦЕРКОИД
ПЛЕРОЦЕРКОИД
Транспортный хозяин
хищная рыба
2ой Промежуточный хозяин
планктоноядная рыба

Life cycle ofDiphyllobothrium latum




©10mena

Proglottids	Scale: 0 5.5 11 mm  *Taenia solium*	 *Taenia saginata*	 *Diphyllobothrium latum*	 *Dipylidium caninum*	Scale: 0 1 2 3 mm  *Hymenolepis nana*	 *Hymenolepis diminuta*
Scoleces	Scale: 0 1 2 mm  *Taenia solium*	 *Taenia saginata*	 *Diphyllobothrium latum*	 *Dipylidium caninum*	Scale: 0 1 mm  *Hymenolepis nana*	 *Hymenolepis diminuta*

CESTODES

Scale:

0 24 48 µm

Taenia

Hymenolepis nana

Diphyllobothrium latum