Egg Shell Formation in Cestodes

Structure
Like trematodes, fully formed egg of cestodes is usually provided with four primary membranes or embryonic envelops.

1. Capsule: Form a stiff water protecting envelop in members of the order Trypanorhyncha, Tetraphyllidea and Pseudophyllidea. But this is very poorly developed or absent in the members of the order Cyclophyllidea.

2. Outer Capsule: In certain genera it is hard covering like trematodes but in Cyclophyllidea it is divided to engender a coat and an outer envelop.

3. Inner Envelop: This is thin membranous structures arises after the formation of Capsule and outer capsule. It is believed that a part of this layer leads to the formation of embryophore.

4. Oncospheral Membrane: Is relatively thin but of immense physiological significance. It encompasses the oncosphere.
In case of cestodes four main types of eggs are found together with their formation set up. They are broadly divided into 2 categories -

**Types of Egg Shell**

1. **Pseudophyllidea type**
   This type of egg have thick sclerotin capsule and found in almost all species belonging to orders- Trypanorhyncha, Tetraphyllideaand Pseudophyllidea. Cestodes of these groups are generally provided with very well developed vitelline glands. In most of cases they generally use free living aquatic stage and aquatic intermediate hosts like trematodes. The physiology and mechanism of egg shell formation in this cestode group is more or less common as seen in case of trematodes.

   ![Diagram of Pseudophyllidea egg formation](image)

2. **Remaining Type**
   Eggs which don’t need a free living aquatic stage in their life cycle. They are embryonated when laid are placed in this category. They generally use terrestrial intermediate host. The eggs not only differ in size and morphology but also in density. On the basis of which they are differentiated into

   a) **Dipylidium type**
   Such eggs (Fig. B) posses a thin capsule and embryophore, and are embryonated when laid eg, *Hymenolepis, Moniezia, Dipylidium* etc. The shell in this group are formed from the globules released from single yolk cell. Quinone tanning takes place in this egg.

   b) **Taenia type**
   This type of egg (Fig. C) are normally surrounded by thin delicate membranous capsule and have thick embryophore eg., *Taenia, Echinococcus, Hydatigera* etc. In this case also just one vitelline cell is associated but it does not contribute shell materials etc. The Embryophore is very thick and made up of blocks of keratin this gives striated appearance.
c) **Stilasia type**

Cestodes belonging to this group are not provided with vitelline glands and Mehlies glands. Eg. *Stilesis, Avitellina* etc. The eggs (Fig. D) are made from sperm and ovum. However, the uterine wall provides a thick cellular jacket over the egg.
Egg Shell Formation in Nematodes

The egg shell is particularly well developed in most of the parasitic nematodes and is the most protective stage in the life cycle of nematodes. Since nematodes use to inhabit variety of biotopes the egg shell also exhibit significant variations, depending on the habitat.

Structure

Wharton (1980) gave a comprehensive review of structure and biology of different nematode eggs, described by various workers time to time. Nematode egg shell might consists of 1 to 5 layers. But the typical nematode egg has three basic layers –

1. Outer vitelline layer: This layer is made up of lipoprotein derived from the vitelline layer of the fertilized oocyte.
2. Chitinous layer: This is found to be the thickest layer of the egg shell and it use to provide structure strength to the egg. This layer is made up of chitin and protein. There is some evidence that quinine tanning is found in this layer.
3. Lipid layer: This layer is made up protein and lipid. This layer is responsible for the impermiablity and protect the contained embryo from variety of hazards. In case of Acaris it was found that there is 25% protein and 75% lipid. The lipid fraction contains alpha-glycosides called ascaroside.
4. Uterine and rectal secretions: Forms the sticky coat around the egg. The internal uterine linings use to contribute this layer made of protein layer.
There may be some typing or composing mistakes. The study material is compiled only for the students to enhance their understanding and learning of the subject. No copyright infringement is intended.