BioMEDIA ASSOCIATES LLC
HIDDEN BIODIVERSITY Series
From Eggshell to Bodyshell

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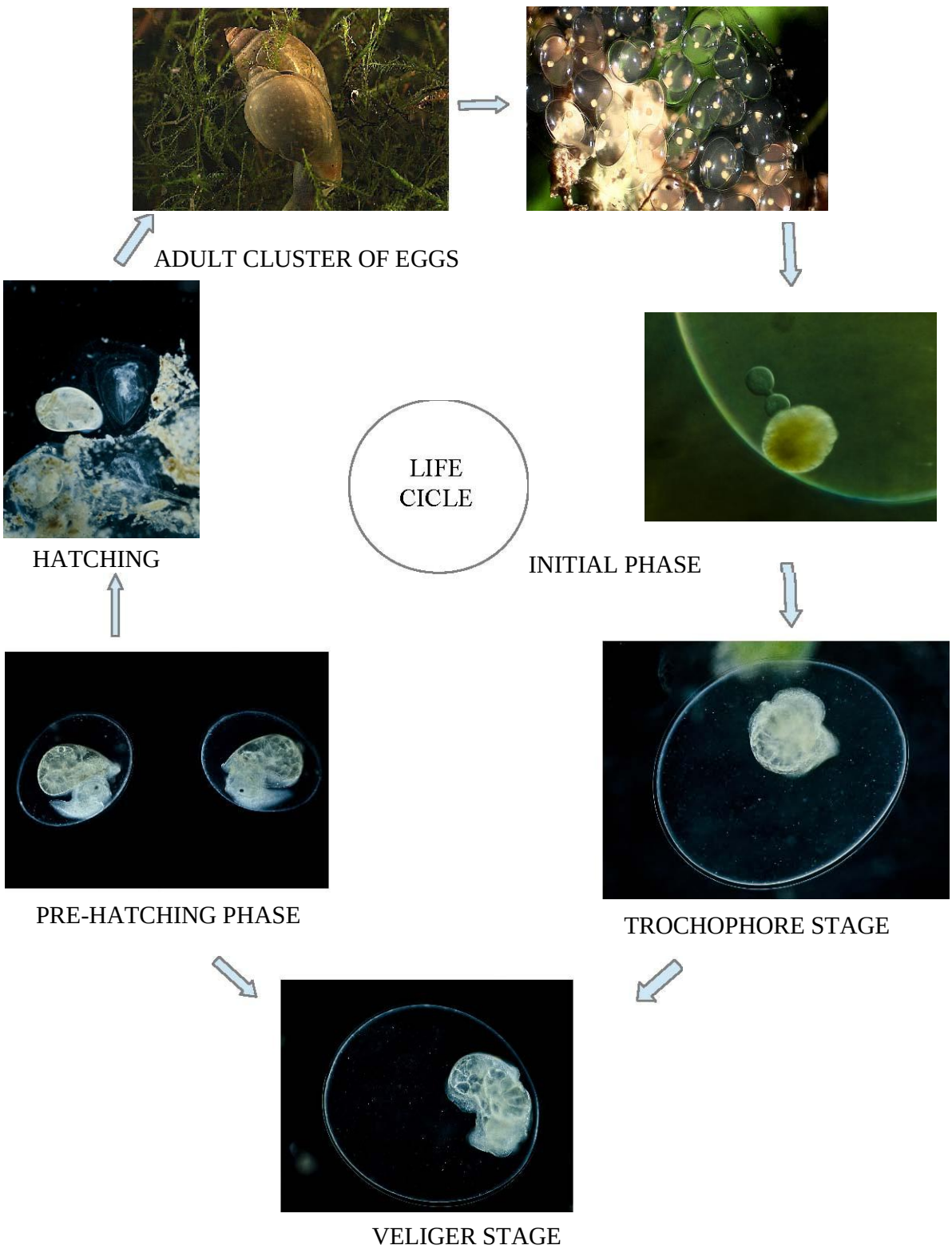
Supplement to Video Program

The water snail stands out as an extraordinary animal for more than its work as controller of algae and various aquatic plants populations. For example, the transparency of its eggs allows us to observe and study the evolution of embryonic development, a process that is in many of its phases common to other animals, whatever class they are members of.

The process by which the initial single cell forming the egg turns into a snail is called embryonic development. This development begins with cell division of the zygote formed by the union of the female egg and the male sperm and has distinct phases, each with its own characteristics and duration.



Clusters of water snails are almost always attached to submerged vegetation or submerged stones from the shores of the bodies of water in which they live. This prevents them from being dragged by currents and water movements.

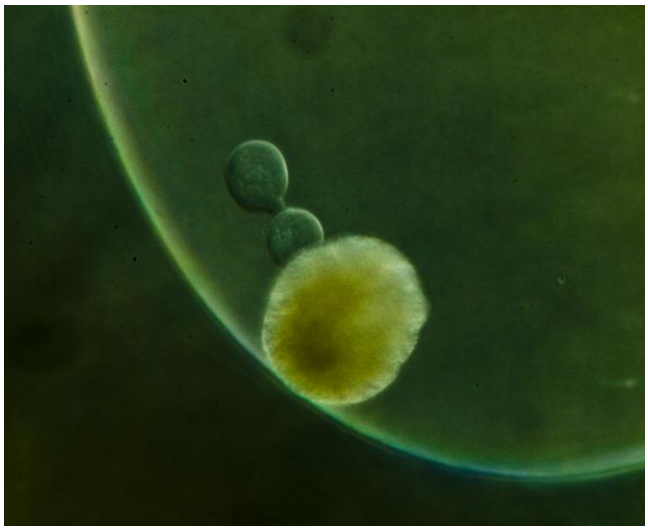
They look like transparent and gelatinous masses of irregular shape containing up to 50 eggs that can be clearly differentiated.

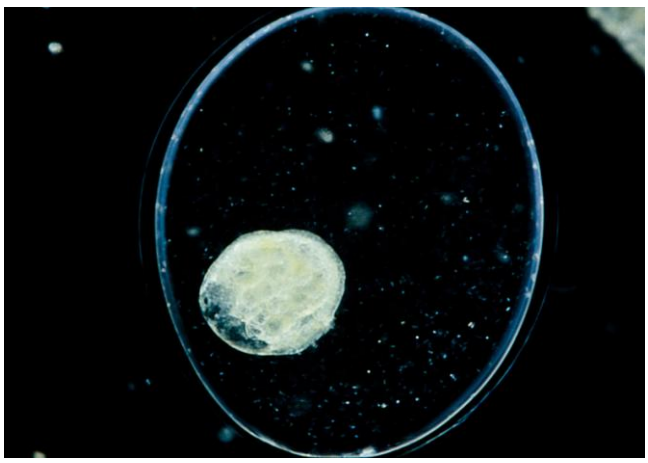
Gelatin coating the eggs and keeping them together has important functions. It prevents desiccation when exposed to air for an extended period and also acts as a barrier against bacteria and fungi that could prevent the proper development of the embryos.

Some questions:
What are the advantages of the cluster adhering to plants or submerged objects?
What do you think are the main threats to the water snail clusters? How have they solved these problems?

The initial phase of water snail development is characterized by a succession of changes in the zygote.

Approximately twenty minutes after eggs are laid, several lobes or corpuscles called polar bodies appear and disappear in turn.





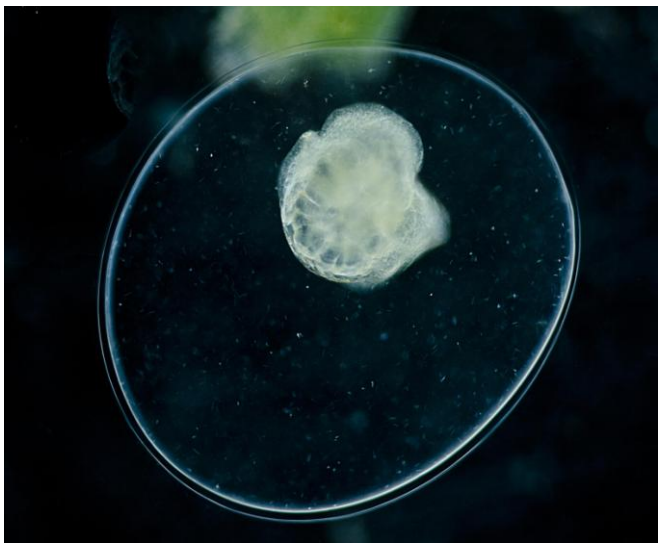
After six cell divisions occurring during the first day after spawning, the embryo is composed of 64 cells and gastrulation starts.

This **gastrula** stage lasts for about 6 to 8 hours during which the next phase of development is preparing: larval stage.

Some questions:
Why do you think that the initial phases of the embryonic development of the water snail are similar to those of any other animal?

During embryonic development, the water snail water goes through two larval stages. Unlike what happens with other invertebrates such as insects, these twos stages occur inside the egg.

The first larval stage is called **trochophore** larva. During this phase, which lasts about two days, the embryo moves freely in circles inside the egg.

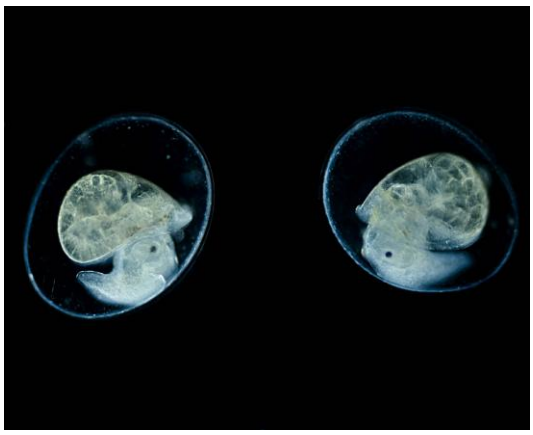


About four days after completion of the oviposition, the trochophore larva transforms into a **veliger** larva. This larva grows and adopts a more elongated shape. Future somatic regions begin to differentiate and certain movements can be observed in the mass of cells.

The veliger larva stage lasts about two days, and at the end of this period the embryo acquires a very similar appearance to that of the adult snail.

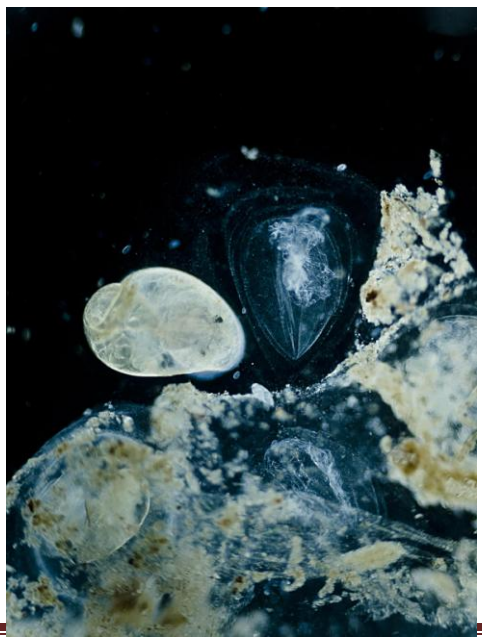
Some questions:
Do you know some other animals whose larval stages do not develop in the egg? Are they aquatic or terrestrial animals?

After about 7 or 8 days after oviposition, the embryo has already transformed into a tiny snail that can occupy most of the space inside the egg.



The vital organs of the new snail are now fully formed and it is possible to see its heart, eyes and gastric glands protected by a delicate and yet transparent shell.

Its movements inside the egg finally end up breaking the egg layers so the new snail can go outside and start its independent life.



Water snail

Mosquito fish *(Gambusia affinis)*

Dragonfly *(Odonata)*

Common frog *(Pelophylax perezi)*