

**Actinotrocha larva of Phoronida worm**  
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In a previous article I highlighted the difference in morphology between marine larvae and their adult form. One of the most intriguing is the larva of the phoronid worm (Horseshoe worm). Its metamorphosis into an adult is done in a very short time of the order of half an hour!

There are about a dozen species of phoronid worms, which as adults construct a tube from which only the tentacles of the lophophore emerge. This one has a horseshoe shape. However it is difficult to match a larva with the form of the adult, so that there are twice as many larval forms as adults!

This is what the adult looks like (length about 10 cm): the expanded lophophore bears ciliae which bring food particles to the mouth at the bottom of the funnel. I'm not sure of the species but other images can be found here:

<https://doris.ffessm.fr/Especies/Phoronis-hippocrepiia-Phoronis-au-lophophore-en-fer-a-cheval-115>

ou [http://paleopolis.rediris.es/LOPH-Album/PHO/P\\_ovalis.html](http://paleopolis.rediris.es/LOPH-Album/PHO/P_ovalis.html)

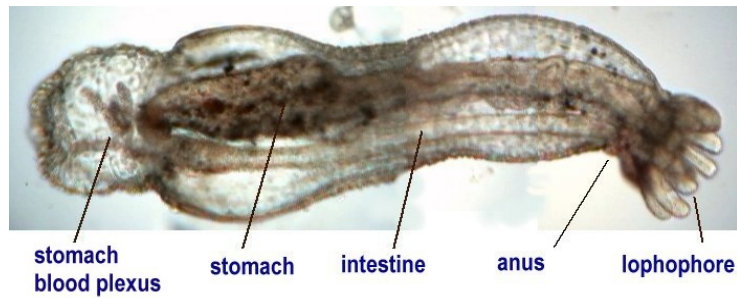


A larva is particularly interesting for microscopic examination because it is very transparent, it is *Actinotrocha muelleri* of which here is a commented image which allows to see the different parts of its anatomy: (the small round structure between stomach and intestine is in fact an algae ingested by the larva!) - Image with X 6 objective - length : 1,3 mm

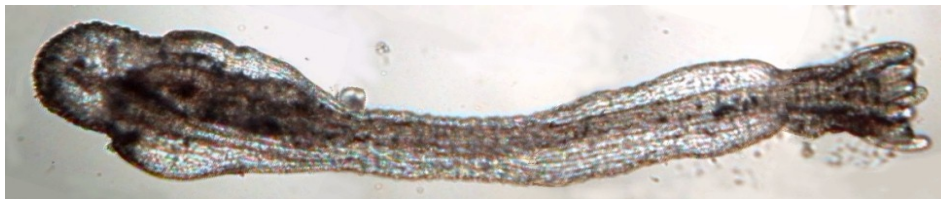


1 - Ganglion 2 - Mouth 3 - Stomach 4 - Intestine 5 - Larva tentacles  
6 - Perianal ciliated ring 7 - Pigmentation 8 - Protonephridium

Here is what the adult form looks like: a larva preserved in a sample has evolved into a young adult with the essential organs found: (the photo is not very good, reconstructed from three elementary images of an individual which wasn't moving too much!) Notice the "U" shaped digestive system that opens through the anus to the outside of the lophophore: The dark part above the stomach contains the gonads.



Another image of the same specimen stretched NB: the pigmentation of the body hinders the observation a little:



A special feature is the circulatory system which includes an ascending vessel to the base of the lophophore and a descending vessel. There is no heart but the blood circulates thanks to the contractions of the vessels. [See video here](#) (use back arrow to return to article). Oxygenation takes place through the branches of the lophophore. At the level of the tentacles of the lophophore which are more transparent, we observe a circulation of granules (arrow): [See video here](#) (use back arrow to return to article).



Some datas about metamorphosis and internal details on adult worm:

[https://www.researchgate.net/profile/Ludwik-Gasiorowski/publication/370400749\\_Phoronida\\_-\\_A\\_small\\_clade\\_with\\_a\\_big\\_role\\_in\\_understanding\\_the\\_evolution\\_of\\_lophophorates/links/644d7920809a5350213a13d9/Phoronida-A-small-clade-with-a-big-role-in-understanding-the-evolution-of-lophophorates.pdf](https://www.researchgate.net/profile/Ludwik-Gasiorowski/publication/370400749_Phoronida_-_A_small_clade_with_a_big_role_in_understanding_the_evolution_of_lophophorates/links/644d7920809a5350213a13d9/Phoronida-A-small-clade-with-a-big-role-in-understanding-the-evolution-of-lophophorates.pdf)

<http://paleopolis.rediris.es/Phoronida/EMIG/REPRINTS/58.pdf>

The phoronids are hermaphroditic (each individual produces male and female gametes) These are ejected by the protonephridia which are located at the base of the adult lophophore. The lifespan of the worm is about one year.

In the Mediterranean sea there are mainly two species *Phoronis muelleri* and *Phoronis harmeri*, a little more rarely *Phoronis hippocrepia* of which here is a larva: [See video here](#) (use back arrow to return to article).



On the right image we see the cilia of the perianal ring and on the right the mouth with the beginning of the stomach. There are also hairs (probably sensitive) on the apical ganglion



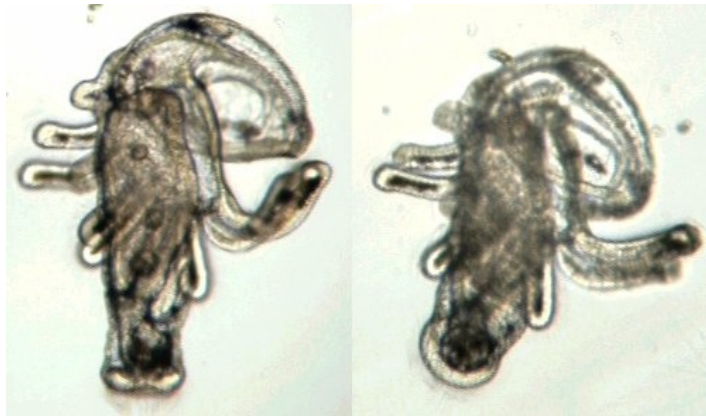
Randomly, other forms are found at different stages of evolution, which does not facilitate identification!: here probably *Actinotrocha hippocrepeia* too. We distinguish the mouth which is prolonged by a stomach with thick walls and the pigmentation of the larva which seems characteristic of this species.



Another specimen at an earlier stage of evolution: the tentacles begin to develop: we see in the lower left side the rest of the metasomal sac.



And to finish these images taken in 2001, with a modest video surveillance camera, when I did not yet know what *Actinotrocha* was and even less *Actinotrocha muelleri*! (you have to persevere to get to the identification) NB: the other images in this article were taken with a 5 Megapixel mobile phone held above the eyepiece...



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