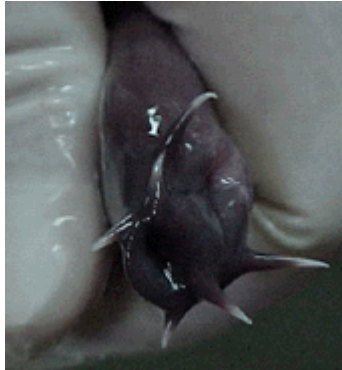


OceanLink

All about the ocean...



Hagfish

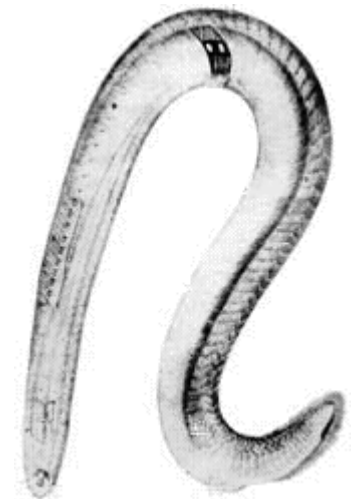


Lineage:

- Kingdom Animalia
- Phylum Chordata
- Class Myxini
- Order Myxiniformes
- Family Myxinidae

How can you tell a hagfish if you see one?

- They look kind of like eels or lamprey, being long, slender and light pinkish grey in colour.
- They are elegantly simple in design, having no fins (except for a primitive tail fin), knobby protrusions, and few accessories to speak of.
- Their eyes are reduced but they have good senses of touch and smell.
- They have a ring of short sensitive tentacles around their mouths.
- Large slime glands line their sides along the length of their bodies.



What do they do?

- For a long time, people thought of hagfish as scavengers and parasites, probably due to their habit of burrowing into dead or dying animals and eating them from the inside out. In fact, most of their diet is made up of marine worms and other invertebrates. Scientists used to think the hagfish looked primitive as

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a result of the loss of characteristics often associated with being a parasite. Now common belief is that hagfish just haven't needed to change for the last couple of hundred million years. Now that's a successful body plan and lifestyle!

● Another ability that had won fame for hagfish is the mass amounts of slime almost instantly secreted as a defense mechanism.



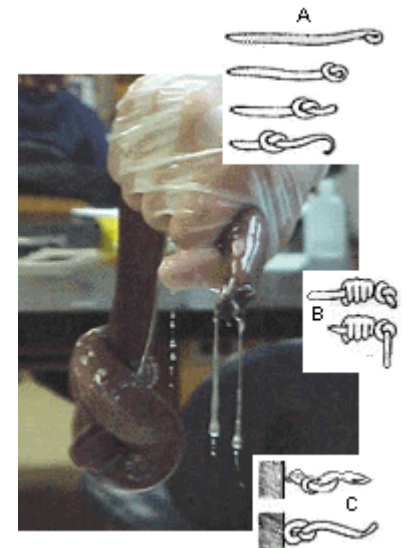
Where are they found?

- Hagfish can be found in the chilly waters of the antitropical north and south.
- They tend to live on and in muddy sea floors in very dense groups (up to 15,000 in an area). Because females tend to produce large eggs in small numbers, their population sizes suggest a low death rate.

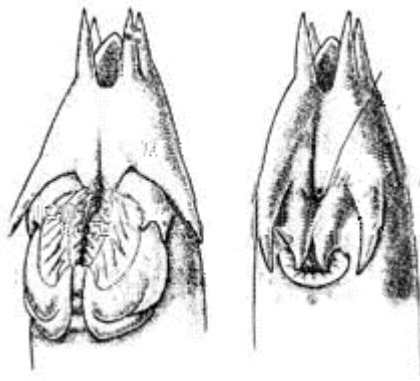
What kind of tricks can they do?

● One very useful trick hagfish have developed is the ability to tie themselves in knots, and be able to slide in and out of this knot. This can be used to escape predators, to clean themselves of slime, and to work their way into a carcass. This picture shows: A) knotting; this movement is used to clean slime off the body; B) escaping from capture using knotting, a very powerful motion; C) pulling on food by knotting

● They can also sneeze to unclog their nostrils of their own slime.



What else makes them special?



- Hagfish don't really have jaws. Instead they have two pairs of rasps on top of a tongue. They pull meat into their mouths with the tongue, then tear it off the prey with the rasps.

- Newly hatched hagfish look just like the adults, but have both male and female sex organs. When they mature, they will be either male or female, but have the ability to change from one to the other if the population structure demands it.

- They have a very low metabolism. Once they eat, they may not have to again for up to seven months.

- Although hagfish have a partial skull, they have no back bone, so are not true vertebrates. What skeleton they do have is made of cartilage.



How are they used by people?

Yes, humans will find a way to exploit even these seemingly useless and repulsive animals.



BMS Hagfish trap

- In Korea, almost 5 million pounds of hagfish meat are consumed each year.

- Hagfish skin is processed into "eelskin" boots, bags, wallets, purses, and other products.

- Overfishing in Asia has decimated their local hagfish stocks, so the Asian hagfish fishery has turned its eyes towards North America, where these "slime eels" are considered a worthless bycatch.

- It could mean a boost of over \$2 million to the local fisheries, but care must be taken not to damage these stocks as well. Hagfish may not be pretty in most people's eyes, but they serve a purpose and are slow to reproduce. It would take them a long time to recover from over-harvesting. Who can tell what removing them from the local food web would do?

Phylogenetics amongst species (for hard core scientists):

There are about 20 species of hagfish divided into four genera (*Myxine*, *Neomyxine*, *Paramyxine*, and *Eptatretus*). These four groups make a sort of evolutionary continuum with regards to external traits. For example, the *Myxine* and *Neomyxine* are considered more advanced than the latter two for several reasons:

- They have a single pair of common external gill openings. The latter two have two minute separate gill openings (considered primitive). *Paramyxine*'s openings are closer together than *Eptatretus*' so *Paramyxine* is considered more closely related to the first two.
- The eyes in *Myxine* and *Neomyxine* are smaller than those of the other two, suggesting a less primitive condition by an adaptation to the dark environment favoured my hagfish.



Click [here](#) to learn more about their **degenerate lateral line**

Click [here](#) to learn more about their **economic importance**

Click [here](#) to learn more about the **uses and properties of hagfish slime**

References:

- Brodal, A. and Ragnar Fange eds, 1963. The Biology of Myxine. Grondahl & Son, Oslo
- [Introduction to the Myxini](#)
- [Monterey Bay hagfish video!](#)
- [Sea Grant News Median Center](#)

