

Deep sea angler fish

The angry-looking deep sea anglerfish has a right to be cranky. It is quite possibly the ugliest animal on the planet, and it lives in what is easily Earth's most inhospitable habitat: the lonely, lightless bottom of the sea.

There are more than 200 species of anglerfish, most of which live in the murky depths of the Atlantic and Antarctic oceans, up to a mile below the surface, although some live in shallow, tropical environments. Generally dark gray to dark brown in color, they have huge heads and enormous crescent-shaped mouths filled with sharp, translucent teeth. Some angler fish can be quite large, reaching 3.3 feet (1 meter) in length. Most however are significantly smaller, often less than a foot. Their most distinctive feature, worn only by females, is a piece of dorsal spine that protrudes above their mouths like a fishing pole—hence their name. Tipped with a lure of luminous flesh this built-in rod baits prey close enough to be snatched. Their mouths are so big and their bodies so pliable, they can actually swallow prey up to twice their own size.

The male, which is significantly smaller than the female, has no need for such an adaptation. In lieu of continually seeking the vast abyss for a female, it has evolved into a permanent parasitic mate. When a young, free-swimming male angler encounters a female, he latches onto her with his sharp teeth. Over time, the male physically fuses with the female, connecting to her skin and bloodstream and losing his eyes and all his internal organs except the testes. A female will carry six or more males on her body.

<http://animals.nationalgeographic.com/animals/fish/anglerfish.html>

<http://aquaraiders.lego.com/en-us/Products/aquaraiders/7771.aspx>

The Deep Sea Anglerfish

(*Melanocetus johnsoni*)

The **deep sea anglerfish** is one of the most bizarre-looking fish in the sea. Known scientifically as *Melanocetus johnsoni*, it is also one of the best-known creatures of the deep. It is one of about 200 species of anglerfish found throughout the world's oceans. The angler gets its name from the elongated dorsal spine that supports a light-producing organ known as a photophore. Through a chemical process known as bioluminescence, this photophore can produce a blue-green light similar to that of a firefly on land. The fish uses this appendage like a fishing lure, waving it back and forth to attract its prey.



Closeup of female anglerfish showing its large teeth & lure (Image courtesy of [Danté Fenolio](#))

The deep sea anglerfish has a round body that resembles a basketball, and indeed, it looks like it could easily swallow one. It has a very large mouth with sharp, fang-like teeth. Its grotesque appearance has earned it the nickname "common black devil". Despite its ferocious appearance, the angler is a small fish, reaching a maximum length of only about five inches (12 centimeters). The color of this anglerfish ranges from brown to dark gray or black. It has soft flesh and bones and small eyes. Its skin is specially adapted to reflect blue light. Since nearly all light emitted from bioluminescent creatures is blue, the anglerfish can be nearly invisible to other deep sea animals. Due to its wide, round body, it cannot swim very fast. Instead, it somewhat "wobbles" through the water. The anglerfish uses its illuminated lure as its hunts for prey. This specialized spine is highly maneuverable and can be

moved in any direction. The anglerfish is known to remain completely motionless, waving its lure back and forth like a fishing pole. When the prey fish gets close enough, the angler snaps it up with its powerful jaws and swallows it whole. The sharp teeth of the angler are angled inwards, which helps to prevent the prey from escaping. The anglerfish can extend both its jaw and its stomach to an incredible size, allowing it to swallow prey twice the size of its entire body. Since food can be scarce in the deep sea, this special adaptation allows it to stock up on food during times of plenty.



Image of a female deep sea anglerfish
(Image courtesy of [Danté Fenolio](#))

The deep sea anglerfish has an extremely unusual method of reproduction. The male angler is much smaller than the female and completely different in appearance. It is about the size of a small finger and black in color. When a male angler matures, its digestive system degenerates, making it impossible for it to feed on its own. It must now find a female or die of starvation. The male angler has

small hook teeth, which it uses to attach itself to the female. Once he bites into her skin, he releases an enzyme that dissolves the skin of his mouth and that of her body. The two become fused together and their blood vessels join as one. The male will spend the rest of its life joined to the female like a parasite, getting all of his nourishment from her body. A female can carry up to six males on her body at a time. This bizarre method of reproduction helps to ensure that when the female is ready to spawn, she has a mate instantly available. The female will lay her eggs in a thin sheet of gelatinous material two or three feet (about one meter) wide and about 30 feet (9 meters) long. This thin sheet of eggs floats free in the sea until the eggs hatch into tiny larvae. Once hatched, the larvae swim to the surface and feed on plankton. As they mature, they return to the depths below.

The deep sea angler is found throughout the world's oceans at depths of over 3,000 feet (914 meters). At this depth, there is almost no light and the water is near freezing. Many species of anglerfish are fished commercially throughout the world. They are compared to lobster in taste and texture. In Japan, anglerfish is considered a delicacy and can fetch a premium price. <http://www.seasky.org/deep-sea/anglerfish.html>

Habitat: The angler fish lives in the twilight zone, dark zone, and abyss
Prey: plankton, lantern fish, viper fish, hachet fish, dragon fish, fangtooth

Predator:



Angler Fish



Anglerfishes are named for their characteristic method of predation, which involves the use of the modified first spine from the first or spinous dorsal fin. This spine (the illicium) protrudes above the fish's eyes, with a fleshy growth (the esca) at the tip of the spine (the netdevil anglerfish has similar growths protruding from its chin as well). This growth can be wiggled so as to resemble a prey animal, and thus to act as bait to lure other predators close enough for the anglerfish to devour them whole.

Deep sea anglerfishes, habitat and range

Eleven families of the order Lophiiformes (anglerfishes) live in the deep sea, with nearly a hundred species, more than any other group of bathypelagic fishes.

Suborder of Ogocephaloidei: Caulophrynidae (Fanfins), Centrophrynidae (deep-sea anglerfishes), Ceratiidae (Seadevils), Diceratiidae (Double anglers), Gigantactinidae (Whipnose anglers), Himantolophidae (Footballfishes), Linophrynidae (Leftvents), Melanocetidae (Black seadevils), Neoceratiidae (Toothed seadevils), Oneirodidae (Dreamers) and Thaumatchthyidae (Wolftrap anglers). There are two more families of anglerfishes which live in deep waters, Chaunacidae (Sea toads) and Lophiidae (Goosefishes). A third family, Ogocephalidae (Batfishes) lives mostly in shallow water but can also be found in deep water. In contrast species of the family Antennariidae (**frogfishes**) live mostly in shallow water, close to coral reefs.

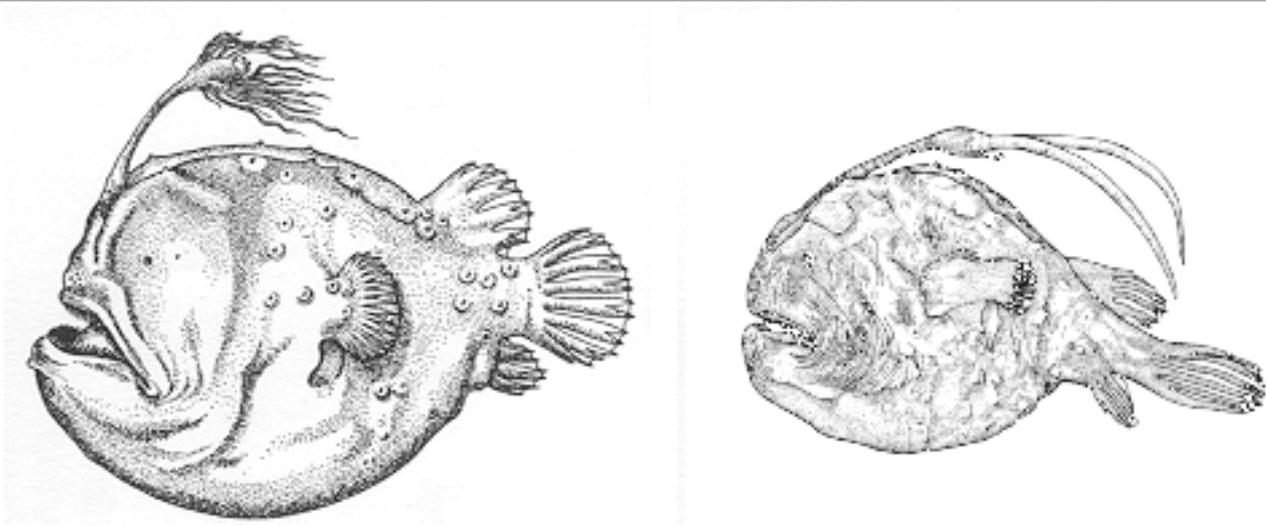
Please look at the [taxonomic classification](#) of Lophiiformes (anglerfishes)

Appearance

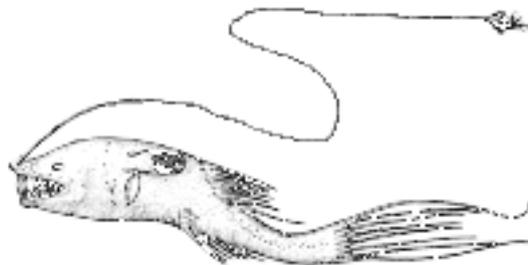


[Theodore W. Pietsch and Christopher P. Kenaley](#) (click [here](#) for a larger image)

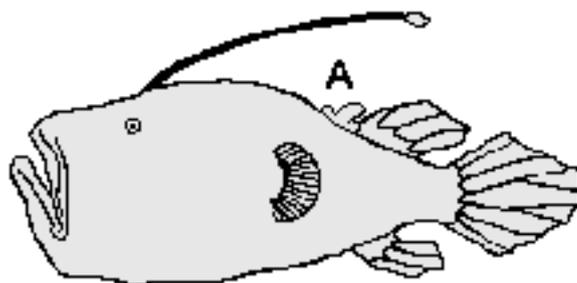
Female deep sea anglerfishes have a globular shape, not adapted for sustained rapid swimming, but designed for remaining motionless much of the time. Only Gigantactinidae (whipnose anglers) have an elongate form that is suitable for brief bursts of swimming. Unlike the colorful frogfishes that live in coral reefs, deep-sea anglerfish skin is grimy black or gray and fragile, without scales. In fact, their skin is so thin it can slip off their bodies when touched by human hands retrieving them from deep-ocean nets! They have flabby muscles and weak skeletons. Gill slits are very small, C-shaped and placed below the pectorals and a little behind them.



Himantolophidae (Footballfishes) with a globular shape ideal for hovering motionless. *Himantolophus groenlandicus* (left) has a whip shaped lure, *Himantolophus maui* (right) has a forked lure.

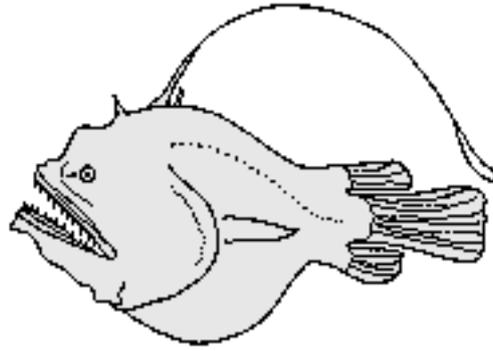


Gigantactis macronema (Family Gigantactinidae or Whipnose anglers) with a more elongate body and a long whip-like lure attached to the tip of the snout. In some cases the lure can be four or five times longer than the fish itself.

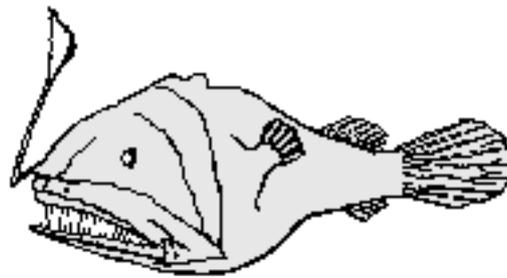


Cryptopasaras couesi (triplewart sea devil) belongs to the family of Ceratiidae. The female has three luminescent sacs, called caruncles (A), in front of her dorsal fin. These are a pair of low, fleshy appendages and have been interpreted as vestiges of the first dorsal fin, for each of them encloses a spine that can be felt if not seen. Their exact function is not known, presumably they also aid in enticing prey to within striking distance.

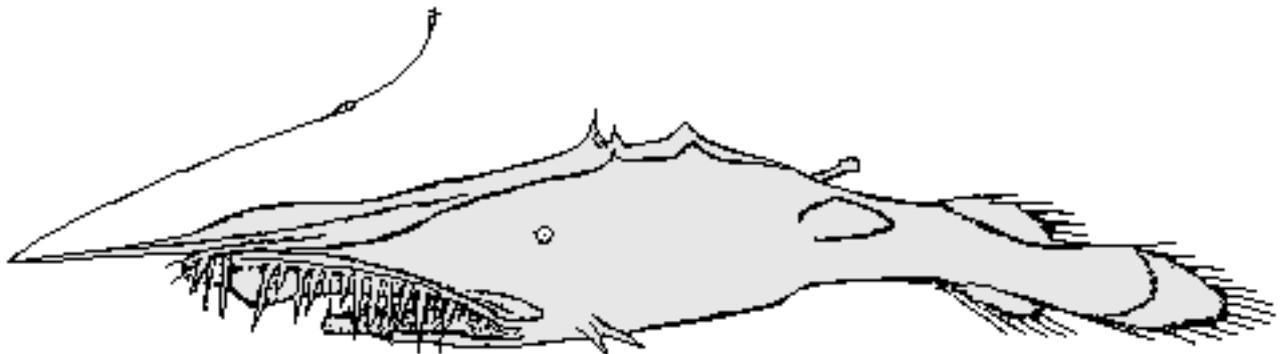
The female seadevils are the largest deepsea anglerfishes, reaching up to one and a half meters and then weighting around 10 kg, compared with them the males are dwarfs, weighting only about 150 grams.



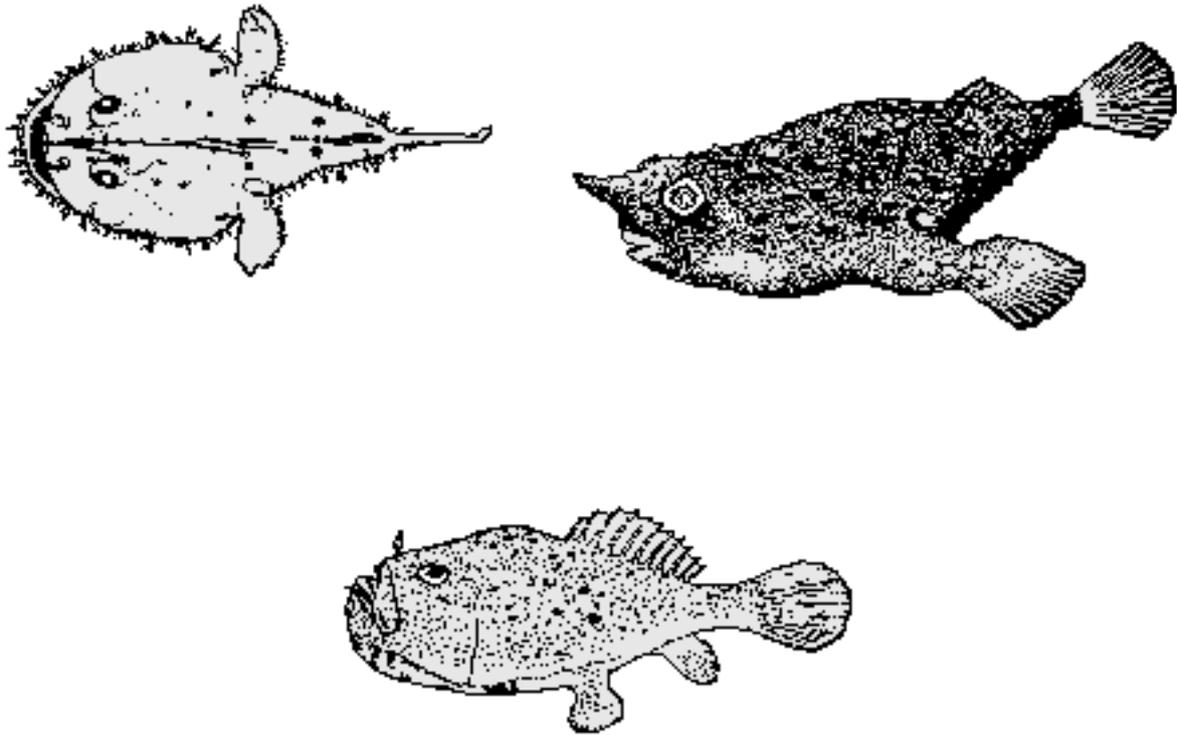
Buciferatiidae *wedli* of the family *Diceratiidae* (Double anglers) with two lures visible on the back, a smaller behind the larger one



Chaenophryne melanorhabdus of the family *Oneirodidae* (Dreamers) with its illicium (lure) which is sharply bent and can be positioned directly in front of the mouth.



Lasiognathus saccostoma of the family *Thaumatichthyidae* (Wolftrap anglers) with a large overbite with huge movable teeth and a lure with three bony hooks



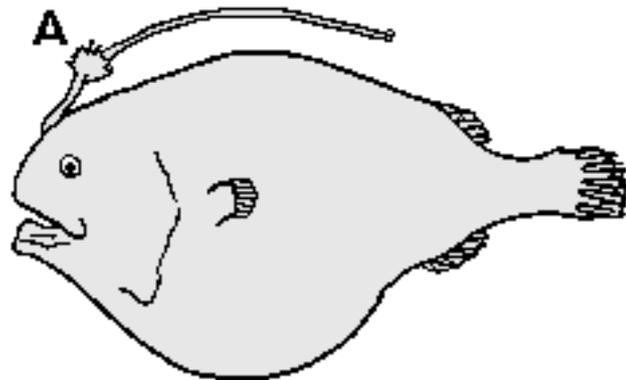
Lophiidae (Goosefishes) - Ogcocephalidae (Batfishes) - Chaunacidae (Sea toads)

These anglerfishes that live on the bottom (benthic) still have fins that look like legs, similar to the [frogfishes](#). Look at this [website](#) for more information about batfishes.

Luring with bioluminescence

In open water food is much more reliably available than in the deep ocean where meals are rare and unpredictable. Animals living in the deep sea have developed strategies to find food and ways to eat whatever food there may be with as little effort as possible. In deeper waters of the ocean there are a lot of animals, which prefer to await for the arrival of prey or food particles rather than to search them out actively. Many animals are not very selective in their diet and they can cope with amazing large prey.

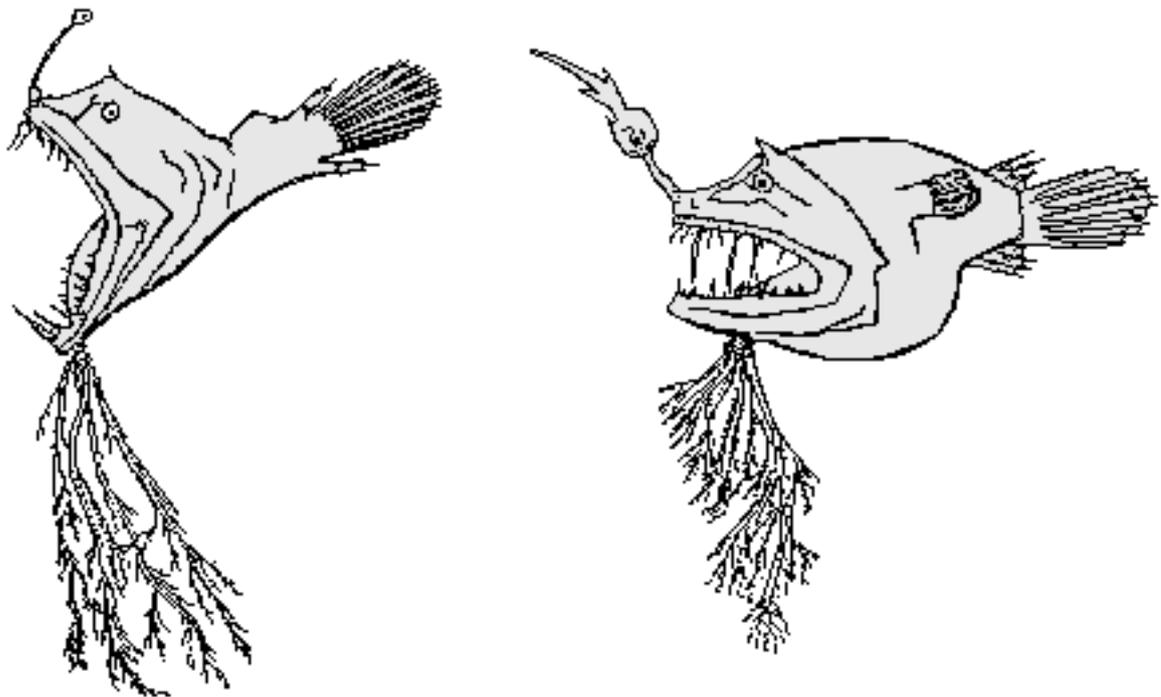
Female anglerfishes are classic lurk-and-lure predators. They have a large mouth and their teeth are huge compared to their body size. Instead of searching actively for prey, they wave a luminous lure to attract them. They can cope with very large prey, because their expandable jaws open double wide and they possess an elastic stomach and they eat any prey available. But their most amazing feature is a bioluminescent lure.



Phyllorhinichthys micractis (Oneirodidae - Dreamers) with lure and esca which has hair shaped appendices and a long pipe with a lens at the tip. There is a bulb like light organ (A) containing a gland with luminous bacteria.

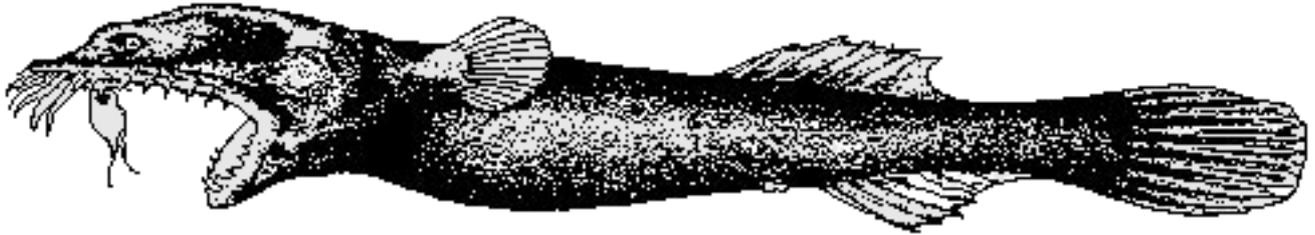
The lures of the female deep sea anglerfish (male anglerfish have no luminous organs) is much more elaborate than the lure of the shallow water species and in addition bioluminescence is used to attract the prey in the dark. The lures are modified dorsal fins and contain luminous bacteria which produce a bluish, greenish light. The light and movement of the lure attract the prey to within reach of the gaping jaws. The anglerfish *Cryptopsaras* can slide the rod part of the apparatus back into a groove, drawing the lure and prey closer to the mouth. It can rotate the lure tip and produce a flash from it as well as a glow. All this is controlled by enzymes and the contraction of chromatophores.

The lures of deep sea anglerfishes are extraordinary elaborate, with sensory filaments, papillae, light pipes and shutters. It may be, that different species mimic different kinds of small prey like shrimps to attract larger prey. One anglerfish (*Caulophryne*) has a lure ornamented with many filaments but it is not luminous. An other (*Linophryne*) has not only a luminous lure on the head but also a multibranched barbel hanging from the lower jaw. The barbel filaments contain many more bioluminescent organs.



Linophrynidae (Leftvent) with lure and barbels. The Latin name literally means "toad that fishes with a

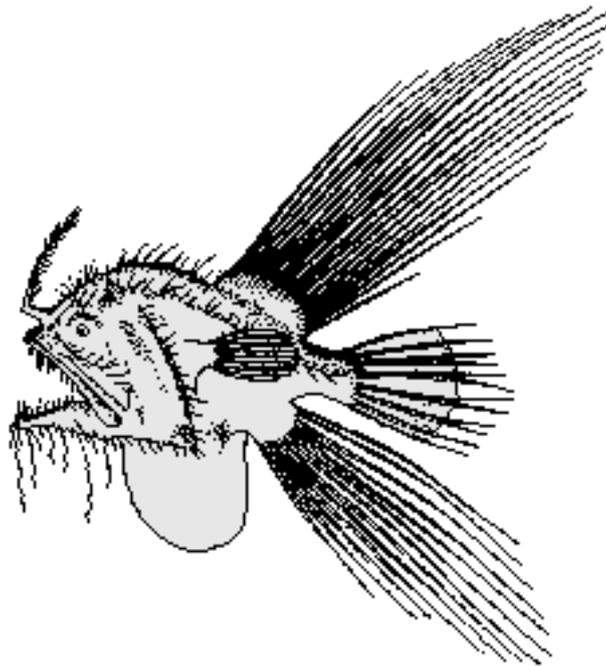
net". *Linophryne algibarbata* (left) and *Linophryne arborifera* (right).



Some deep sea anglerfish have positioned their lure inside the mouth. The wolfttrapangler *Thaumatichthys axeli* is a sit-and-wait ambush predator with a luminescent lure hanging from the roof of his overshot mouth, which is fringed with hooked sharp teeth. This anglerfish hovers just above the substrate (not sitting on it).

Other sense organs

Some deep sea anglerfishes have so called neuromast structures or organs formed by groups of hair cells. The structures look like antennae or thick hair and sit on the trunk or are mounted on long stalks or fin rays. With these freestanding structures they can sense the "noise" engendered by a fish's movement. While floating neutrally buoyant in the water, the anglerfish can probably sense the direction and the velocity of approaching prey.



Caulophryne polynema of the family *Caulophrynidae* (Fanfins) relies solely on its superficial sensory neuromast structures to find prey and doesn't have a luminous lure. It also has soft skin and a highly expandable stomach.

Photos

I can't offer you any of my [own photos](#), since I have never seen a live deep sea anglerfish. My photos are about [frogfishes](#) living on coral reefs. Please check out the following pages:

Fishbase has the largest collection of photos of deep sea anglerfishes - look at the [taxonomy](#) page and click on the link next to the species names.

The [Australian Museum](#) has a website with several photos and a good description and some close-ups of the lure, esca and caruncles. Search by Latin name.

[NOVA](#) has a page about deepsea anglerfishes with some nice photos of living anglerfishes taken

underwater.

[Google](#) image search works quite well, if you search for the Latin names.

[The Worsley school](#) has a page with photos of living deep sea anglers

Some really interesting black-and-white photos and illustrations I have found on [Tierlexikon](#), a German page. Even if you don't understand the text, just hover with your cursor over the text that says "(Abbildung ...)" and a small photo is visible. Then click on the underlined word to see a larger photo

<http://www.frogfish.ch/deepsea-anglerfish.html>