Penzance B.S.A.C.
Conservation Officer's Report
February 2009

The Spookfish was discovered 120 years ago, and it looked as if it had four eyes, in fact it only has two, each of which is split into two connected parts. One half point upwards, giving it a view of the ocean above, and potential food, and the other half, which looks like a bump on the side of the fish's head, point downwards into the abyss below, keeping an eye out for other creatures below it's vulnerable belly. These 'diverticular' eyes are unique among all vertebrates in that they use mirrors to create an image. No one had discovered its reflective eyes until now because a live animal had never been caught. Recently a live specimen was caught off the Pacific island of Tonga and members of a research team used flash photography to confirm the fish's upward and downward gazes. Photographs taken looking down on the live fish produced eye-shine in the main tubular eyes that point upwards but not in the diverticular eyes that point downwards. Instead, these reflect light when seen from below. When looking at sections of the eyes that had been prepared for microscopy the research team found that the mirrors uses tiny plates, (probably made of guanine crystals, the stuff that make slivery fish look silvery,) and the arrangement and orientation of the guanine crystals is precisely controlled so that they direct the light to a focus. Computer simulation showed that the precise orientation of the plates within the mirrors curved surface is perfect for focusing reflected light onto the fishes retina. The use of a single mirror has a distinct advantage over a lens in its potential to produce bright, high-contract images. That must give the fish a great advantage in the deep sea, where the ability to spot even the dimmest and briefest of light can mean the difference between eating and being eaten.


Spookfish


Lumpsucker

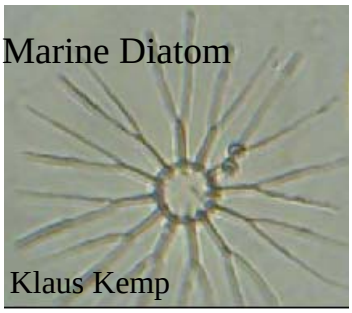
Photo
Ray Dennis

A foot long Lumpsucker Fish was landed by a Newquay fisherman on January 15th and presented alive to the Blue Reef Aquarium, Newquay. Lumpsuckers spend most of their time in deep water, but spring time they come into the shallows to spawn. The female returns to deep water but the male remains to protect the clump of up to 200,000 eggs until they have hatched. The male attaches himself to a rock with a sucker disk on the underside and not only guards the eggs but also keeps them ventilated. Females are usually dark grey to greenish but the breeding male orange to brick red.

Diatoms are one-celled organisms that live in exquisitely ornate glass cases, and are so prolific they account for a quarter of all the photosynthesis on the planet. In photosynthesis organisms use sunlight and carbon dioxide to make sugar and oxygen. But why live in a glasshouse? Researchers have found that the benefits are enormous.
It's all to do with the chemistry of silicon, a chief ingredient of glass. Researchers found that silica in the glass changes the acid-base chemistry of the water inside the shell, creating ideal conditions for one of the chemical reactions involved in photosynthesis. The study offered an explanation for why diatom shells are ornate. The many pores and filigrees create a lot of surface area, exposing much more glass to water than would be the case for a smooth structure. That extra surface area might make photosynthesis more efficient for the diatom. These are pretty things and their beauty might in fact be related to their function. They are also very useful to us because they are using up the carbon dioxide that we create, which is causing global warming.


Marine diatoms

On a slide prepared by Klaus Kemp


Marine Diatom

Klaus Kemp

A pod of 6 to 9 Bottlenose Dolphins, including a juvenile, was seen moving along the coast between Longrock and Penzance on 5th January, the only other reports of Bottlenose during January were off Cape Cornwall at 0830 and again in the afternoon at 1650 hrs. A pod of 15 to 20 Common Dolphins moved in from the west to a point about 1km off Gwennap Head at 0945 hrs and stayed loafing at the surface until 1200 or later on January 8th. There were also 5 Harbour Porpoise about 1 to 1½ Km SW of the lookout during that time. Single Harbour Porpoises were seen off Pendeen Watch in very rough seas on 23rd and feeding off St. Clements Isle on 26th. There was also the Lumpsucker mentioned above.

Conservation Officer Raymond Dennis