

# Creep into the DEEPEND

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# SEAMAIL™

FROM: DEEPEND Science Team  
TO: DEEPEND Virtual Team Leaders  
SUBJECT: Some deep-sea animals are soooo transparent!

Hello Virtual Science Team

What would you do if you lived in a place full of predators, and there was no place to hide? Many animals face that problem in the middle of the ocean. We call it the "deep pelagic zone." The deep pelagic zone is far from shore, deep in the sea somewhere between the surface and the seafloor.

In the dark deep pelagic zone, there's nothing to hide behind. No trees, no bushes, flowers, or rocks.

If you lived in the deep pelagic zone, and you could choose a camouflage, how would you hide? What kind of camouflage would work in the middle of the sea?

Many deep-sea animals solve this problem by being invisible or transparent. Really! Being transparent means the animal is as see-through as glass! (See photos #1, #2, and #3) Cool, right?

It is a lot harder for other animals to see a transparent animal, especially in the dimly lit deep sea. Jellies, fish, squid, crustaceans, many animals in the deep are transparent.

Many larvae (baby animals that look nothing like their parents) use this type of camouflage. Larvae are often very small, so invisibility is a great camouflage. Especially since a predator's rule in the wild is "if you'll fit in my mouth, I will eat you!"

As larvae mature, most change into the adult form when they find the right place to settle down. Sometimes, if they can't find the right place to settle down, they get bigger and bigger. This is true for both the lobster larvae and the eel larvae (See photo #4 and #5).

One problem with being transparent is that you cannot have a lot of muscles. That's because muscles aren't transparent. That means a transparent animal cannot swim very fast. However, being invisible and difficult to see means you wouldn't need to out race predators.

Transparent jellyfish and some crustaceans remain transparent their entire lives. Some of the most amazing animals that I have ever seen (or is that seen through?) are crustaceans in a group called "hyperiid amphipods."

One kind is the Cystisoma (See photos #6 and #7). It gets huge. What I like most about Cystisoma is that its whole head is an eye!

Cystisoma is cool, but nothing can beat Phronima for the cool factor (See photo #8 and 9). It looks like a space alien, doesn't it?

A female Phronima has a challenge. She likes to care for and protect (brood) her eggs. But how does a crustacean in the middle of the ocean care for her eggs and newly hatched babies?

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She finds a floating home or at least she makes one. The female Phronima uses another animal to make a barrel for her eggs and herself. Not just any animal, of course, she uses either a salp or a pyrosome.

The female Phronima chews off a piece of the salp (or pyrosome) then smooths down the inside and outside to make a nice smooth barrel in which to lay her eggs. (See photos #10, #11, and #12) You can see Phronima in her barrel with the eggs placed around the edges. She broods her eggs until they hatch. The other two pictures show a piece of the barrel with eggs all over it and then little baby Phronima (as seen under a microscope) just about ready to leave mama. (See photo # 13)

Smaller Phronima have small barrels. When they get too big for the barrel, they dump it, find another salp, and smooth out another bigger barrel. Oddly enough, we sometimes find male Phronima in barrels, too, although they don't lay eggs. We hypothesize that when the females dump barrels that are too small, a male floating along finds the empty barrel and decides that it will make a nice safe home.

Of course, for every remarkable adaptation one animal uses to hide or avoid predators, a predator has an equally amazing adaptation to find prey. Many animals find and eat transparent creatures. This leads me to the last photo. What do you think it is? (See photo #14)

Some of you might have guessed a jellyfish or other jelly-like animal. Maybe an odd-looking squid or sea cucumber? Well, you'd be wrong.

(See photo #15)

It is a plastic bag floating in the water photographed by a scientist. Many predators, like fish, squid, sea birds, sea lions, sea turtles, and dolphins become ill because they inadvertently eat plastic like this. If you compare the plastic bag in water to photos #2 and #3, you can see how easy it would be to confuse it with a delicious jelly.

What we do on land affects the ocean and the animals -- whether it is carelessly disposing of trash or forgetting the importance of reducing, reusing, and recycling. Many people don't realize how much trash and pollution is sinking to the deep sea.

What are some ways you and your Science Team Members are protecting the ocean? I'm sure you are doing a lot. I have also attached a special mini-poster that you can use to make your own DEEPEND Explorer poster. You probably noticed that on the bottom of the DEEPEND Explorer mini-posters (and trading cards) we included three things we do to protect the Earth. Now you can make your own list and share it with your Team. Please share it with us. We'd love to hear.

Hope you enjoyed meeting some of the coolest animals in the sea and thank you for joining us at the DEEPEND!

*Tammy*

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Creep into the DEEPEND Mission

