



SCIENCE

A Marine Magician's Vanishing Act

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CreatureCast

By **CASEY DUNN**

Being transparent comes with obvious benefits — and some hidden costs. A transparent animal can hide in plain sight from predators that would eat it, and can easily ambush its own prey. But many other animals use sight to navigate their environment, and if you are clear they can bump right into you.

Imagine walking down a crowded sidewalk if light went straight through your body: you would be lucky to escape with minor bruises.

Turning transparency on and off could give an animal the best of both worlds. It could hide from predators and prey, and announce its presence to passers-by that might otherwise crash into it. This is what the marine jellyfish *Hippopodius hippopus* does. Under most conditions, *H. hippopus* is glassy clear. When disturbed, though, it transforms to a bright translucent white. This is called blanching, a sudden and beautiful display that does not last. The animal's milky shroud fades to see-through within minutes.

H. hippopus is fragile. It usually avoids coastal waters where it can be easily killed by the surf and sediment. One exception is the bay at Villefranche-sur-Mer, a village in southern France between Nice and Monaco. The bay's proximity to deep waters with favorable currents

makes it one of the best places in the world to collect ocean plankton close to land. Many of the animals found in the bay are usually seen only hundreds of miles from the coast.

This site is the home of Observatoire Océanologique de Villefranche, a research station. Much of the equipment at the station is state of the art, but the building itself is more than two centuries old. The Duke of Savoy built it as a prison for galley slaves, and there were still iron bars among the scientific equipment.

Last spring, several members of my lab visited the observatory to collect and study siphonophores like *H. hippopus*, which particularly intrigued Pathikrit Bhattacharyya, an undergraduate student in the lab. He was inspired to create this episode of CreatureCast about blanching.

Some of the few experiments on the changeable transparency of *Hippopodius* were done 50 years earlier in Villefranche by George and Gillian Mackie. Pathikrit presents these experiments in his animation.

For more information on transparent marine animals, see Sonke Johnsen's book, "The Optics of Life," Sophia Tintori's video and Riley Thompson's previous episode of CreatureCast. The music in this episode is by Lee Rosevere, Alex Gross and Thiaz Itch. More animations and images can be found at nytimes.com/creaturecast and creaturecast.org, a project supported in part by the National Science Foundation.

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