

Cuttlefish: The Ultimate Shape Shifters

Phylum Mollusca/Class Cephalopoda/Order Sepiida/Family Sepiidae

Common cuttlefish - *Sepia officinalis* (described in 1758)

You might guess from their round bodies, eight short arms and paired tentacles that cuttlefish are related to nautilus, squid, and octopus. Each of these animals is part of the class "Cephalopoda," meaning head-footed from the Greek words "kephalos" and "podos." The ancestors of modern cephalopods have roamed the seas for half a billion years.

The mysterious cuttlefish is adept at camouflage, a shape-shifter that can modify its appearance to look like coral, rock, sand, or a member of the opposite sex. Outside of the aquarium, cuttlefish are enigmatic and can be difficult to find. One of their favorite hiding places is underneath the sand, where they bury themselves and change color to match patterns on the bottom. In the case of the Giant Cuttlefish, *Sepia apama*, small males use their color changing capabilities to change color and posture to disguise themselves as members of the opposite

sex, sneak past dominant males, and reach the "real" females first.

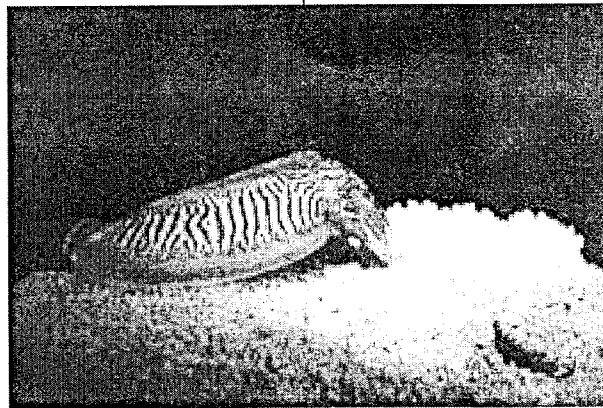
The greatest diversity of cuttlefish is found in the shallow tropical waters of the Indian and Pacific oceans, but different species are found around the globe and as deep as 7,000 meters. The common cuttlefish seen here at BAS, *Sepia officinalis*, typically grows from between 15 and 25 centimeters to a maximum of half a meter. It lives in eastern Atlantic coastal surface waters to a depth of 200 meters, from Scandinavia to South Af-

rica. Researchers have observed seasonal migration from north to south, and from inshore to offshore within this range.

With powerful eyesight, cuttlefish stalk their prey, communicate with each other, and keep watch on potential threats. They use two feeding tentacles to

grab their prey, draw it within reach of their arms, and quickly bite the nerve cord to kill it. Alternatively, they can ambush fish, shrimp, or crabs by jumping on top of them. Like other cephalopods, they chew food by grinding a hard, toothed plate called a radula against their beak.

Cuttlefish are a preferred meal for many animals, including people and other cuttlefish. Their primary predators include fish, sharks, dolphins, humans, and cannibalistic cuttlefish. The common cuttlefish is a popular food, and is caught



Cuttlefishes can change color to blend in with their surroundings

throughout its range by industrial trawlers and by subsistence fishers who use traps and spears. The market for this fishery is especially active in Spain, Italy, Japan, and Korea (Roper et al. 1984).

In the Netherlands, large numbers of *Sepia officinalis* gather each spring to breed in the Easter Scheldt estuary at the end of their relatively short lives (they only live around 1 to 2 years). They hold on to each other with their arms, and transfer a packet of sperm that can be stored or used immediately. Once fertilized, clusters of eggs are attached to algae or a hard surface, where they hatch on their own a few months later. Common cuttlefish also lay eggs while living in the aquarium, where they are hatched to provide the next generation of cuttlefish on display.

References

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How Does the Giant Clam Reproduce?

The giant clam, *Tridacna sp.*, is a simultaneous hermaphrodite. It can act as male or female, but not both at the same time. At one spawning event it may act as a female and at the next, a male. Usually, one clam will release sperm first and then nearby clams release eggs. The presence of eggs in the water causes clams further away to release sperm. This indicates that there is a chemical signal (pheromone) that keeps the proper sequence on track.

The release of sperm can be initiated by any of several external conditions, such as changes in sea water salinity, water temperature, or light conditions. Daily, monthly, and yearly cycles also have an effect.

When spawning begins, the clam will rapidly open and close its shell several times, apparently to get a flow of