

A male horseshoe crab, back, grasps a female, front, that is preparing a depression in the sand for depositing eggs.



ECONOMIC VALUE

Horseshoe crabs are important in medical research. The large lateral compound eyes are used to study cellular mechanisms of retinal function in humans. Horseshoe crab blood and blood products are used in cancer research, to test sterility of drugs and antibiotics and to signal the presence of chemical poisons, endotoxins, produced by certain bacteria. Chitin, a substance found in the horseshoe crab's shell, is non-toxic, biodegradable and used in contact lenses, skin creams and hair sprays.

Horseshoe crabs have been intensively harvested for medical research, for industry and for bait in certain fisheries. Many states are now regulating their capture and are formulating management plans to ensure the survival of this species that has outlived the dinosaurs.

~Revision by Harriet Perry

Produced by

Center for Fisheries Research and

Development

for

J.L. Scott Marine Education Center & Aquarium

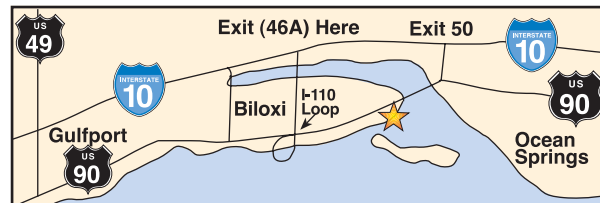
Come discover the ocean through hands-on programs for families and groups of all ages at the...



J. L. Scott Marine Education Center & Aquarium

115 Beach Blvd. (Hwy 90) • Biloxi, MS 39530
(228) 374-5550 • scott.aquarium@usm.edu

www.usm.edu/aquarium



GULF COAST
RESEARCH LABORATORY

AA/EOE/ADA
© 2004 Gulf Coast Research Laboratory

Scott Aquarium

Mississippi's Gateway to the Gulf

MARINE EDUCATION LEAFLET #3

The Horseshoe Crab



THE HORSESHOE CRAB (*Limulus polyphemus*)

DISTRIBUTION

The Atlantic horseshoe crab, *Limulus polyphemus*, is found along the eastern coasts of North and Central America and occurs throughout the Gulf of Mexico. One of the largest concentrations of horseshoe crabs in the United States is found in Delaware Bay. Horseshoe crabs are often called "living fossils" because their body shape has remained virtually unchanged for millions of years. Long before dinosaurs appeared on earth, there were hundreds of species of horseshoe crabs. Today only four species are found worldwide.

CLASSIFICATION

Although called crabs, horseshoe crabs are more closely related to scorpions and spiders of the Subphylum Chelicerata due to their similar mouthparts and number of walking legs. Horseshoe crabs have eight walking legs and belong to the Class Merostomata. True crabs are in Subphylum Crustacea, have 10 walking legs and are in the Class Malacostraca.

DESCRIPTION

The horseshoe crab has three small simple eyes on the dome-shaped carapace or shell. There are also two large compound eyes and two additional simple eyes on each side of the carapace. The shell provides protection and its shape helps the animal move and burrow in the sand. During winter, horseshoe crabs lie halfburied in the ocean sediments. With the advent of spring the animals migrate toward shore. They usually seek beaches that are partially protected from the surf. The males arrive first, followed by the females a week or two later.

REPRODUCTION

Horseshoe crabs normally mate from April through December with peak mating during high tides associated with full and new moons in late May and early June. Spawning usually occurs at night. The females attract the males by releasing a pheromone, a natural chemical that serves as a sexual attractant.

The males have a specially modified leg with an extension resembling a hook. This clasper is used to grasp the female during spawning. A female crawls up on the beach with one or more males clinging to the back of her shell. After digging a shallow depression near the high tide mark, the female deposits several thousand eggs and then drags the male over the nest to fertilize the eggs. The female makes several nests during the beach trip, and the coupled adults will return on successive tides to lay more eggs. Afterwards, wave



action eventually covers the eggs with sand.

Females can produce more than 80,000 eggs each year. The new eggs are about 1.5 mm (1/16 inch) in diameter and are an opaque, pastel green. They double in size in a few days and the outer layer peels away, leaving them transparent. The combination of warmth from the sun and moisture from the tides promotes rapid egg development. Within about two weeks the eggs hatch and tiny horseshoe crabs, about 3 mm (1/8 inch), emerge. These larvae swim feebly about in the water column for about one week before settling to the bottom. Juvenile horseshoe crabs spend their first two summers of life on intertidal flats where they feed before the daytime low tide and then burrow for the rest of the day. Horseshoe crabs dig through the sand to locate molluscs, worms and other invertebrate prey items. They molt and grow for up to 10 years before reaching sexual maturity.

ECOLOGICAL VALUE

Horseshoe crabs are an important component in the food web for migrating shore birds. These birds depend on horseshoe crab eggs to replenish and build their fat reserves. A host of invertebrate and fish species also feed on the eggs and larvae. Juvenile Atlantic loggerhead turtles prey on adult horseshoe crabs.

