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Asian Shore Crab (*Hemigrapsus sanguineus*)

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February 20, 2024

The invader who dominates the Narragansett Bay area is the Asian Shore Crab.



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Identification:

The Asian shore crab is a small crab of the intertidal zone and identified by having a square shaped shells with three spines on each side of the carapace. The carapace colors range from red, green, orangish brown, and purple. They also have red spots that cover their claws; legs are light and dark banded. An adult carapace width range from 3.5 to 4.3cm (1.4 to 1.7in.) (Cornell University 2019)

Similar species:

In Narragansett Bay, the Asian Shore Crab is most often confused with the European Green Crab. European Green Crab (*Carcinus maenas*) also vary in color, having a green, red, or orange shell which can be confused with the Asian shore crab. European Green crabs also contain five spines on their carpus while the Asian shore crab only have three spines on their carapace. The European Green crab is also much larger in width 5.5 to 8 cm (2.1 to 3.1in.). (Alaska Department of Fish and Game (n.d))

Classification:

Phylum: Arthropoda

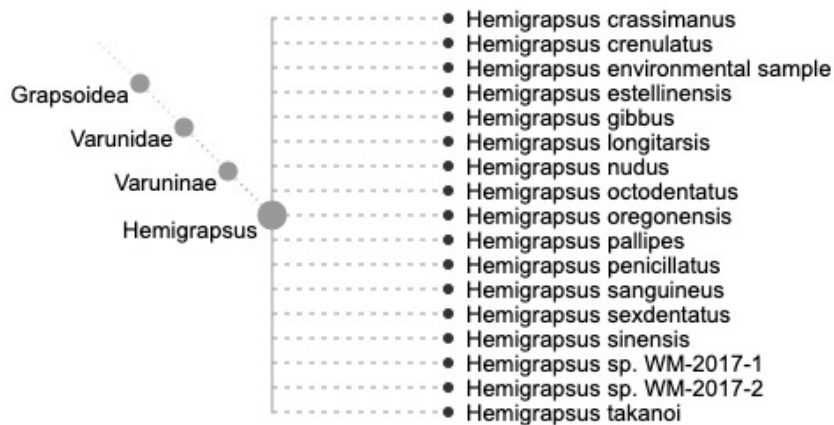
Class: Malacostraca

Order: Decapoda

Family: Varanidae

Genus: Hemigrapsus

(Cornell University 2018)



Open Tree of Life. (2023, Sep 18). *Hemigrapsus*.

<https://tree.opentreeoflife.org/opentree/opentree14.9@ott356745/Hemigrapsus>

Geographic Variation:

The Asian shore crab originated from the western part of the world, specifically in Japan, China, and Korea. It was first identified in New Jersey in 1998 and showed no phenotypic differences. Now the Asian shore crab has varied along the East coast of the United States in areas of Maine south to North Carolina (Cornell University 2023). Geographic variation is still shown today as the species is found in the Narragansett Bay area.

Fossil History:

The Malacostraca Class has had fossils recovered in areas of the former Cambrian Sea. Today these areas are near the continents of Africa, South America, Australia and Antarctica. The oldest Malacostraca was found 488 million to 472 million years ago during the Paleozoic area (Bousfield & Conlan n.d.).

Systematic Summary:

This is a recent invasive species in Narragansett Bay that has a lot of Geographical variation along the east coast of the United States. In the Narragansett Bay area, the species is most often confused with the European Green crab. Differences in appearance such as the number of spines and their overall size allow scientists to be able to identify the species. Fossil records show that the Malacostraca Class originated in areas such as Africa which is close to Japan where the Asian shore crab originated from.

Distribution in Rhode Island:

The Asian shore crab originated from the western part of the world, specifically in Japan, China, and Korea. It was first identified in New Jersey in 1998 and showed no phenotypic differences. Now the Asian shore crab has varied along the East coast of the United States in areas of Maine south to North Carolina (Cornell University 2023). Geographic variation is still shown today as the species is found in the Narragansett Bay area. The first report of Asian shore crabs in North America was a single ovigerous female collected at Townsend Inlet near the mouth of Delaware Bay in 1988 (Williams and McDermott, 1990). Subsequent collections at the same site in 1990 provided clear evidence of a breeding population and showed the occurrence of adult males, additional ovigerous females, and young-of-the-year juveniles (McDermott, 1991). Using a variety of evidence, including the estimated age of the first ovigerous female, McDermott (1998b) proposed an initial introduction of *H. sanguineus* via ballast water in the early 1980's from Epifanio, CE (2013).

Habitat:

The Asian Shore crab inhabits both subtidal and intertidal areas that contain substrates such as oyster reefs and mussel beds. Within these areas the Asian Shore crab prefers to live in rocky crevasse or under covered shells and debris (Houston Advance Research Center, 2023).

Feeding Behavior:

The Asian Shore crab is an omnivorous species meaning it eats both plants and animals. Their ability to eat a variety of residential species suggest an important role of the Asians shore crab as an invader. They eat species such as: macroalgae, salt marsh grasses, and small invertebrates including: amphipods, gastropods, bivalves, barnacles, and polychaetes (Brousseau and Baglivo 2005).

Breeding Behavior:

The Asian shore crab has their breeding season from May to September. Female Asian shore usually have 3-4 clutches per breeding with about 50,000 eggs produced in each clutch. As eggs hatch the crabs go through five stages: Zoea larva, four further zoea stages, and one megalopa stage. This process usually takes about a month to complete. Once the process is completed and the Asian shore crab is developed into a juvenile crab they may be transported over long distances by currents and can live up to 3-5 years (UDCEOE, 2021).

Breeding Summary:

The Asian Shore crab traveled from the Western part of the world to the East coast of the United States. There they inhabited subtidal and intertidal areas and prefer to live in rocky crevasses or under shells and debris. As an omnivorous species that eat both animals and plants. Due to them being able to gain an abundance of food they can reproduce more. The Asian Shore crab produces 3-4 clutches containing 50,000 eggs in each clutch.

Population Status in Narragansett Bay:

There are 5,450,020 Asian Shore crab species currently living in Narragansett Bay (USGS n.d).

Impacts of Human Activity:

Surgical masks during covid-19 polluted ocean and estuaries in the intertidal areas where Asian Shore Crabs live. Due to the leachate the Asian Shore crab began to produce anxiety-like behaviors. Meaning that they became more startled then in areas without the pollution (Delaeter et al., 2023).

Management:

There are no human control measures of the Asian shore crab due to them being an invasive species. However, the Asian Shore crab does contain natural predators such as rockfish and seagulls (Texas Invasive Species Institute 2014).

Priorities for Future Research:

Asian shore crabs have twice the length in their breeding season than any other native crab (USGS n.d.). Due to this it makes the Asian Shore crab one of the biggest threats to the aquatic environment as an invasive species for two reasons. One being their ability to reproduce quickly and two them being an omnivorous species. Though the Asian Shore crabs possess an invasive behavior, they could ultimately disrupt the food chain if they target one population when foraging for food (Texas Invasive Species Institute 2014). Biologists need to further study how we can manage this species for other species to not become extinct and that the food chain does not become disrupted.

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