= Dyspanopeus sayi =

Dyspanopeus sayi is a species of mud crab that is native to the Atlantic coast of North America . It has also become established outside its native range , living in Swansea Docks since 1960 , the Mediterranean Sea since the 1970s , the North Sea since 2007 and the Black Sea since 2010 . It can reach a carapace width of 20 mm (0 @.@ 8 in) , and has black tips to its unequal claws . It feeds on bivalves and barnacles , and is in turn eaten by predators including the Atlantic blue crab , Callinectes sapidus . Eggs are produced from spring to autumn , the offspring reach sexual maturity the following summer , and individuals can live for up to two years . The closest relative of D. sayi is D. texanus , which lives in the Gulf of Mexico ; the two species differ in subtle features of the genitalia and the last pair of walking legs .

= = Description = =

Dyspanopeus sayi is a small crab , similar in appearance to Eurypanopeus depressus . It reaches a maximum carapace width of 20 millimetres (0 @.@ 8 in) , with sexually mature females having a carapace 6 @.@ 1 millimetres (0 @.@ 24 in) or more across . The carapace is roughly hexagonal , about 1 @.@ 3 ? 1 @.@ 4 times as wide as long and strongly convex . It has a finely granular surface , and has a light covering of hair , especially towards the front and sides . The chelae (claws) are unequal : the right claw is stouter , and the left claw is narrower . The carapace is olive @-@ green to brown , but the tips of the claws are black .

= = Distribution = =

The natural range of D. sayi extends from the Baie des Chaleurs (eastern Canada) to the Florida Keys (south @-@ eastern United States) , where it lives from the intertidal zone down to depths of 46 metres (151 ft) . It tolerates a wide range of temperatures and salinities .

D. sayi has also been recorded from a number of locations in Europe . The first sighting was in Swansea Docks , South Wales (United Kingdom) in 1960 , and the scientist who reported it , E. Naylor , believed there was " no doubt " that the species had arrived through trans @-@ Atlantic shipping . The first record from the Mediterranean Sea was made in 1993 , when the species was discovered in the Venetian Lagoon (north @-@ eastern Italy) , although it is thought to have been living there since the late 1970s . In 2007 , D. sayi was recorded from the North Sea coast of the Netherlands . It was discovered in the Black Sea in 2010 , living in Constan?a harbour (Romania) , and in the Ebro delta of the Balearic Sea (western Mediterranean Sea) in 2012 .

= = Ecology = =

Dyspanopeus sayi lives predominantly on muddy bottoms , where it is a predator of bivalve molluscs . In its native environment , it hides among colonies of polychaetes to avoid being preyed on by the Atlantic blue crab , Callinectes sapidus . It is an important predator of the quahog , Mercenaria mercenaria , in Narragansett Bay , and of the barnacle Balanus improvisus in Delaware Bay . In the Adriatic Sea , it has been observed to feed on the striped venus clam , Chamelea gallina , and the introduced Asian date mussel , Musculista senhousia .

= = Life cycle = =

The life cycle of D. sayi begins with copulation , which normally takes place shortly after the female has moulted , while her exoskeleton is still soft . Spawning occurs within hours or days of copulation , and the eggs are brooded on the female 's pleopods (swimmerets) until they are ready to hatch . Females have been found carrying eggs from April to October ; in a study of crabs caught at Gloucester Point , Virginia in 1978 , females were observed to carry between 686 and 14 @,@ 735 eggs . The number of eggs increases with carapace width according to a power law ; extrapolation

of the power law suggests that the largest D. sayi females are capable of carrying over 32 @,@ 000 eggs each .

At 29 ° C (84 ° F) , the eggs can take only 9 or 10 days to develop , and this increases to 16 days at temperatures of 20 ° C (68 ° F) . The young crabs hatch as zoea larvae , and pass through three further zoeal stages and one megalopa before becoming juveniles . Juveniles are thought to reach maturity in the summer after they hatch . The total lifespan of an individual can be up to 2 years .

= = Taxonomy = =

The species had been noticed by the American zoologist Thomas Say , and formed part of the species he called " Cancer panope " ? a junior homonym of " Cancer panope " Herbst , 1801 , which is itself a junior synonym of Sphaerozius scaber (Fabricius , 1798) . In 1869 , Sidney Irving Smith described seven new species in the genus Panopeus , including " P. sayi " , in addition to the twelve species already placed in the genus at that time . Common names for the species include " Say 's mud crab " and " Say mud crab " .

Smith noted the similarity of the species to " Panopeus texanus " , which had been described ten years earlier by William Stimpson , and Smith considered that the two might be the same species . In 1880 , John Sterling Kingsley and Alphonse Milne @-@ Edwards independently synonymised " P. sayi " with " P. texana " , which remained until Mary J. Rathbun moved both taxa to the genus Neopanope and re @-@ established Smith 's taxon as a subspecies of " N. texana " . She argued that the two taxa should be considered subspecies , as hybrids between them occurred , although the specimens she saw are now thought to be D. sayi .

In 1972 , Lawrence G. Abele re @-@ examined " N. texanus texanus " , " N. texanus sayi " and N. packardi , and concluded that they were all good species , and so re @-@ elevated " N. sayi " to the rank of species . In 1986 , Joel W. Martin and Abele placed N. texanus and N. sayi in a separate genus , Dyspanopeus , reaffirming their close relationship . However , P. texana only occurs in the Gulf of Mexico , and can be distinguished from P. sayi by the form of the fifth pereiopod (last walking leg) and that of the male gonopod .