= Neotrypaea californiensis =

Neotrypaea californiensis (formerly Callianassa californiensis) , the Bay ghost shrimp , is a species of ghost shrimp that lives on the Pacific coast of North America . It is a pale animal which grows to a length of 11 @.@ 5 cm (4 @.@ 5 in) . One claw is bigger than the other , especially in males , and the enlarged claw is thought to have a function in mating . N. californiensis is a deposit feeder that lives in extensive burrow systems , and is responsible for high rates of bioturbation . It adversely affects oyster farms , and its numbers are controlled in some places by the application of pesticides . It carries out an important role in the ecosystem , and is used by fishermen as bait .

= = Description and life cycle = =

Neotrypaea californiensis reaches a length of 11 @.@ 5 centimetres (4 @.@ 5 in) . The body is creamy white , with patches of pale colour (pink , yellow or orange) on the appendages , and a pink abdomen .

Adult N. californiensis have one claw larger than the other , and in the males , the " master claw " can make up as much as 25 % of the animal 's mass ? compared to only 10 % in females ? with the minor claw making up around 3 % of the total body mass in both sexes . The enlarged claw is equally likely to be on the right side or the left side . The male 's larger claw is thought to be used in agonistic encounters or during mating , and may be the result of sexual selection .

Eggs are laid in spring or early summer , and the larvae hatch in summer , living as plankton . They settle to the sea floor again as post @-@ larvae in the late summer and fall .

= = Taxonomy = =

N. californiensis was originally described in 1854 by James Dwight Dana as a member of the genus Callianassa , giving the type locality as " California " ; the material Dana studied was probably collected from San Francisco Bay or Monterey , but the original specimens have since been lost . In 1991 , Raymond Manning and Darryl Felder transferred the three species in that genus that come from California and Oregon into the new genus Neotrypaea . N. californiensis is distinguished from the other two species of Neotrypaea by the lack of a rostrum (which is present in Neotrypaea gigas) and the acute and diverging tips of the eyestalks (which are short , blunt and not diverging in Neotrypaea biffari) .

= = Ecology and human impact = =

Both Neotrypaea californiensis and the mud shrimp Upogebia pugettensis live in mudflats and sandy substrates in the intertidal zone of estuaries in western North America . N. californiensis is found from Mutiny Bay , Alaska to Punta Abreojos , Mulegé , Baja California Sur , Mexico . Its habitat is also used for the aquaculture of the Pacific oyster , Crassostrea gigas . Since the bioturbation carried out by N. californiensis and U. pugettensis reduces the productivity of the oyster beds , they are considered pests . Their effects may , however , have knock @-@ on effects across the entire ecosystem , and may buffer it from the hazards of nutrient enrichment and increase primary and secondary productivity by increasing the amount of dissolved inorganic nitrogen .

The burrows made by N. californiensis have many branches , and a number of other animals live in them , including snapping shrimp of the genus Betaeus , the copepod Clausidium vancouverense , and the crab Scleroplax granulata . The gut flora of N. californiensis includes a wide range of bacteria , comprising around 40 % Alphaproteobacteria , 20 % gram @-@ positive bacteria , 20 % in the Cryptophaga ? Flavobacteria ? Bacteroides group , and 5 % of each of Gammaproteobacteria and Epsilonproteobacteria . Predators of N. californiensis include bottom @-@ dwelling fish and Dungeness crabs (Metacarcinus magister) .

N. californiensis has a negative impact on oyster production , and as a result , the insecticide carbaryl (1 @-@ napthyl N @-@ methyl carbamate) is sprayed in some areas (including Willapa

Bay , Washington) to reduce the population of N. californiensis . The addition of shelly debris also reduces numbers of N. californiensis both by preventing the settlement of larvae , and through predation on the young N. californiensis by young Dungeness crabs in the shelly debris .

N. californiensis is used as fishing bait , and is frequently transported alive between U.S. states , prompting fears that existing population structure may be obliterated , and that it could introduce the castrating parasitic isopod Ione cornuta outside its native range .