

SOUTH AFRICAN BROWN MUSSEL

PERNA PERNA

INFORMATION FOR AQUACULTURE INDUSTRY

March 2008

Description

Perna perna is a bivalve mollusc belonging to the Mytilidae family.

It generally grows to approximately 90 mm long, although can reach sizes of up to 120 mm.

Perna perna is extremely similar in appearance to the New Zealand green lipped mussel *Perna canaliculus* – a New Zealand native and our second largest seafood export. *Perna perna* is an edible species and could potentially be farmed.

Even mollusc experts have found it difficult to identify *Perna perna* using physical characteristics alone.



One small distinguishing feature is that *Perna perna* appears to have a proportionately longer hinge line than the New Zealand green lipped mussel.

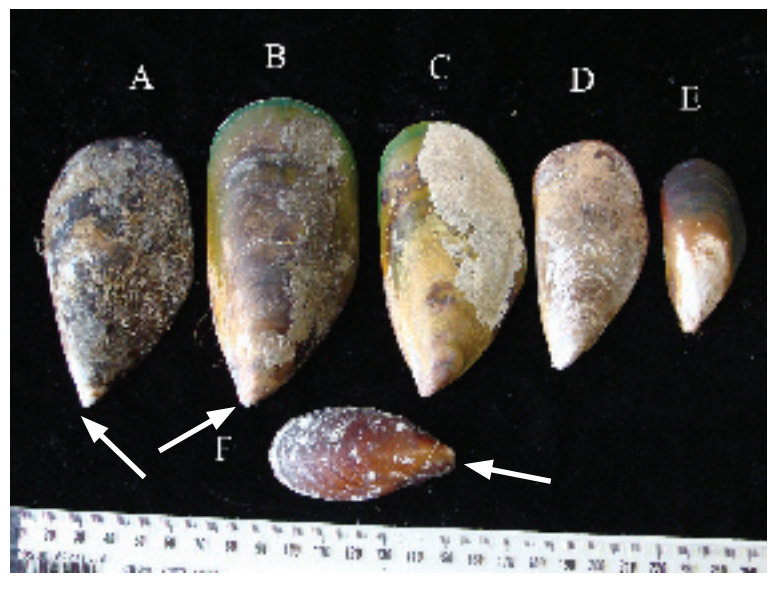


Illustration of left valves from specimens of mussels showing, in particular, the similarity between *Perna perna* and the New Zealand green lipped mussel.

- A Blue mussel *Mytilus* sp. from Tasman Bay.
- B Green lipped *Perna canaliculus* from Tasman Bay.
- C. Suspected *Perna perna* collected from Ocean Patriot in Taranaki – still unconfirmed, undergoing molecular identification.
- D. Suspected *Perna perna* from Tasman Bay – still unconfirmed, undergoing molecular identification.
- E. *Perna perna* collected from Port Elizabeth, South Africa.
- F. Native bearded mussel *Modiolus areolatus* (without beard) collected from Tasman Bay.

Photos: A. Hosie, NIWA

About *Perna perna*

The brown mussel *Perna perna* is native to the tropical and sub-tropical regions of the Atlantic Ocean. It is found in waters off the west coast of Africa and the coast of South America up to the Caribbean.

In its native range (South Africa) *Perna perna* is competitively inferior, being out-competed by the European mussel, as it is not as resistant to human disturbance (such as harvesting) nor to certain parasites

It is, however, an invasive species in the Gulf of Mexico and has the potential to be an invasive species in New Zealand.

It naturally colonises rocky shores but can also attach to submerged man-made structures. Its colonisation of the hard strata improves that surface's marine ecology – increasing surface area and encouraging other marine organisms such as limpets, polychaetes, barnacles, snails and algae to settle.

Survival is determined more by temperature than salinity. The adult brown mussel can tolerate a temperature range of 10 to 30°C and a salinity range of about 15 to 50 ppt.

The mussel uses external fertilisation during its spawning season over the summer months. The two sexes release eggs and sperm in the water during spawning to produce larvae. Fifteen hours after fertilisation the larvae have well-developed hinge teeth and 10-12 days after fertilisation the larvae settle on rocky surfaces.

Further facts

- The risk of *Perna perna* spreading from the site of defouling by the Ocean Patriot in Tasman Bay is likely to be low.
- As of 14 March 2008, dredging of the area seafloor is revealing very small numbers of suspect *Perna perna* – four provisional positive IDs (visual only, not genetic) out of more than nine tonnes of dredge debris collected.
- The area is a sub-optimal habitat for this species – adding up to a very small probability it could establish.
- *Perna perna* have been recorded as not metamorphosing (i.e. changing from larvae to spat) at temperatures below 18°C. This indicates that populations in New Zealand may only establish in warmer areas such as the top of the South Island and warmer parts of the North Island – areas of intense aquaculture.
- It is important to note that it is not known how *Perna perna* would perform in New Zealand, or whether it may still metamorphose below 18°C.
- A South African *Perna perna* expert estimates the likely survivorship of the mussel on sandy/muddy substrates (as in Tasman Bay) as low. He says intertidally they are very vulnerable to sand burial and often exhibit sand-induced mass mortalities. They may, however do better at depths where there are weak currents and little sand movement.
- Brown mussel spat are thought to be competitively inferior, but their ability to compete for space against native New Zealand species such as the green lipped mussel is unknown.
- If *Perna perna* spat successfully settle in Tasman Bay, there is a good chance they will be so sparse that they will fail to breed and die out. Experiences in South Africa indicate that when the source population of a pest mussel was removed, settlement levels were so low that the species died out.
- Working on an assumption that *Perna perna* is present in the area, and has spawned, simulations indicate the larvae could be carried with the currents around the Golden and Tasman Bay area, and potentially further. The floating larvae could settle on suitable rocky substrate or artificial structures, including the mussel and scallop spat lines in the region.
- On the positive side, it settles in groups, making populations potentially easier to find than if it were a solitary species.

Keep boats and equipment clean

As with many marine pests, *Perna perna* can spread easily on fouled hulls of vessels, aquaculture and other marine equipment, and in ballast water.

Its human-assisted spread can be prevented by:

- ensuring vessel hulls and marine equipment are free of fouling, and regularly treated with antifouling paint;
- regularly cleaning hulls in a facility with collection and land-based disposal of fouling material;
- minimising the movement of excessively fouled structures from one location to another.

Some useful resources

Further information on *Perna perna* can be found at:

http://nis.gsmfc.org/nis_factsheet.php?toc_id=149

http://en.wikipedia.org/wiki/Perna_perna

What you can do

KEEP A CLOSE EYE ON YOUR MUSSEL LINES AND SPAT GATHERING AREAS.

IF YOU FIND ANY MUSSELS OR SPAT THAT ARE OF CONCERN, CALL US ON THE 0800 NUMBER:

0800 80 99 66