Mytilus galloprovincialis 简体中文 正體中文

System: Marine

Kingdom	Phylum	Class	Order	Family
Animalia	Mollusca	Bivalvia	Mytiloida	Mytilidae

Common name Mittelmeer-Miesmuschel (German), blue mussel (English), Mediterranean mussel (English), bay mussel (English)

Synonym

Similar species *Mytilus spp., Mytilus edulis, Mytilus trossulus*

Summary Mytilus galloprovincialis (blue mussel or the Mediterranean mussel) is native to the Mediterranean coast and the Black and Adriatic Seas. It has succeeded in establishing itself at widely distributed points around the globe, with nearly all introductions occurring in temperate regions and at localities where there are large shipping ports (Branch and Stephanni 2004). Ship hull fouling and transport of ballast water have been implicated in its spread and its impact on native communities and native mussels has been suggested by a number of studies and observations (Carlton 1992; Robinson and Griffiths 2002; Geller 1999).

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Species Description
Mytilus galloprovincialis is dark blue or brown to almost black. The two shells are equal and nearly quadrangular. The outside is black-violet coloured; on one side the rim of the shell ends with a pointed and slightly bent umbo while the other side is rounded, although shell shape varies by region. It also tends to grow larger than its cousins, up to 15cm, although typically only 5-8cm.

Lifecycle Stages
Adult mussels spawn gametes, after which fertilization of an egg occurs. The egg undergoes gametogenesis, forming a larvae. The larva forms into a juvenile which settles and attaches itself using byssal threads after 2 to 4 weeks (Matson 2000).

Uses
Mytilus galloprovincialis is widely cultivated in Japan and China (Morton 1996).

Habitat Description
In its native range, *M. galloprovincialis* can be found from exposed rocky outer coasts to sandy bottoms (Ceccherelli and Rossi 1984). As an invader it typically requires rocky coastlines with a high rate of water flow. In fact, unlike the other 26 Asian and Atlantic molluscs introduced into Pacific regions only one introduced species, the Mediterranean mussel *M. galloprovincialis*, occurs in open coast, high energy environments on the Pacific coast; all remaining species are restricted to bays and estuaries (Carlton 1992).

Reproduction
Gonochoristic reproduction where males and females spawn simultaneously. *M. galloprovincialis* also has high fecundity and spawns at the time of year with the highest water temperature (Bayne 1976).

Nutrition
A filter-feeding bivalve that eats a wide range of planktotrophic organisms. This species prefers fast moving water that is free of sediment and thrives in regions where nutrient-rich upwelling occurs.

General Impacts
The alteration of benthic community dynamics by introduced bivalves on the Pacific coast remains largely uninvestigated including the impact of such invasives as *M. galloprovincialis*, but also *Geukensia demissa*, *Musculista senhousia*, *Mya arenaria*, *Crassostrea virginica*, *Venerupis philippinarum*, and *Gemma gemma*. It is known that *M. galloprovincialis* is able to outcompete and displace native mussels and become the dominant mussel species in certain localities. This is because *M. galloprovincialis* may grow faster than native mussels, be more tolerant to air exposure and have a reproductive output of between 20% and 200% greater than that of indigenous species (Van Erkom Schurink and Griffiths 1993, in Branch and Stephanni 2004). In a experiment to test the tolerance of the three native South African species to aerial exposure (in comparison to *M. galloprovincialis*) mussels were held for 42 weeks at the high-tide level where they experienced up to 7 days of continuous exposure to air. Under these conditions, survivorship of *M. galloprovincialis* was 92%, but 78% for *Perna perna*, 37–46% for *Choromytilus meridionalis* and 0–10% for *Aulacomya ater* (Hockey and van Erkom Schurink 1992, in Branch and Stephanni 2004). In South Africa the indigenous ribbed mussel *A. ater* was progressively displaced from semiexposed and exposed shores as the cover of *M. galloprovincialis* rose there. At sites where *M. galloprovincialis* was experimentally removed, there were no declines of *A. ater* (G.M. Branch Unpub. Data, in Branch and Stephanni 2004). Similarly, in southern California the introduction of *M. galloprovincialis* has been associated with a decline in the closely related native mussel *M. trossulus* (Geller 1999).
Since the 1980s the introduced Mediterranean mussel (*M. galloprovincialis*) has successfully invaded the southern African coastline and has become the dominant species on rocky intertidal shores of the west coast. A comparative study by Robinson and Griffiths (2002) to investigate differences between *M. galloprovincialis* invaded areas and non-invaded areas was conducted in Langebaan Lagoon, South Africa, and highlighted the affect *M. galloprovincialis* has on naturally-occurring communities. Communities in invaded areas differed significantly from non-invaded areas with figures indicating that naturally-occurring sandbank communities were being replaced with communities more typical of rocky shores. To conserve the natural biota of the centre banks, which lie within a national park, the mussel beds should to be removed (Robinson and Griffiths 2002).

Management Info
Ballast water management could stop the spread of its larvae.
A new technique used in the aquaculture industry is the production of triploid and tetraploid mussels, which are functionally sterile, thereby eliminating the risk of wild populations establishing (McEnnulty *et al*. 2001).

Pathway
Shipping is held to be the most probable original mode of introduction of *M. galloprovincialis* to South Africa (Grant *et al*. 1984, in Branch and Stephanni 2004) and to Mexico (Carlton 1992).Late twentieth century distribution od *M. galloprovincialis* was probably enhanced by ballast water transport as well as ship fouling (Carlton 1992).*M. galloprovincialis* is sometimes transferred through mariculture as a food source and because it is confused with other *Mytilus* species

Principal source: Branch, G.M. and Steffani, C.N. 2004. Can we predict the effects of alien species? A case-history of the invasion of South Africa by *Mytilus galloprovincialis* (Lamarck). *Journal of Experimental Marine Biology and Ecology*. 300:189-215.

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ALIEN RANGE

[1] AFRICA
[1] CANADA
[1] IRELAND
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[1] MEDITERRANEAN & BLACK SEA
[1] NAMIBIA
[1] NORTH AMERICA
[2] UNITED KINGDOM
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[1] HONG KONG
[1] JAPAN
[1] KOREA, REPUBLIC OF
[1] MEXICO
[1] NETHERLANDS
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[6] UNITED STATES

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37 references found for **Mytilus galloprovincialis**

Managment information

Centre for Environment, Fisheries & Aquaculture Science (CEFAS)., 2008. Decision support tools-Identifying potentially invasive non-native marine and freshwater species: fish, invertebrates, amphibians.
Summary: The electronic tool kits made available on the Cefas page for free download are Crown Copyright (2007-2008). As such, these are freeware and may be freely distributed provided this notice is retained. No warranty, expressed or implied, is made and users should satisfy themselves as to the applicability of the results in any given circumstance. Toolkits available include 1) FISK- Freshwater Fish Invasiveness Scoring Kit (English and Spanish language version); 2) MFISK- Marine Fish Invasiveness Scoring Kit; 3) MI-ISK- Marine invertebrate Invasiveness Scoring Kit; 4) FI-ISK- Freshwater Invertebrate Invasiveness Scoring Kit and AmphISK- Amphibian Invasiveness Scoring Kit. These tool kits were developed by Cefas, with new VisualBasic and computational programming by Lorenzo Vilizzi, David Cooper, Andy South and Gordon H. Copp, based on VisualBasic code in the original Weed Risk Assessment (WRA) tool kit of P.C. Pheloung, P.A. Williams & S.R. Halloy (1999).
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The guidance document is available from http://www.cefas.co.uk/media/118009/fisk_guide_v2.pdf [Accessed 13 January 2009].
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Available from:
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