Polysiphonia brodiei 简体中文 正體中文

System: Marine

Kingdom	Phylum	Class	Order	Family
Plantae	Rhodophyta	Rhodophyceae	Ceramiales	Rhodomelaceae

Common name red macroalga (English)

Synonym
Polysiphonia brodiei
Ceramium brodiaei
Conferva brodiaei
Grammita brodiaei , Bonnemaison
Hutchinsia brodiaei
Hutchinsia penicillata
Polysiphonia penicillata

Similar species *Polysiphonia*

Summary Polysiphonia brodiei (red macroalga) is a common red alga with filamentous branches. It is abundant in northern Europe and has been introduced via ships to North America, Australia, New Zealand and Japan.

view this species on IUCN Red List

Species Description
Polysiphonia brodiei is a dark reddish brown macroalga, typically 4 to 12cm in height, but occasionally reaching 40cm. Many soft, filamentous branches arise from one or several main stems which grow from a holdfast of numerous small rhizoids. Delicate forked hairs (trichoblasts) are abundant and present on each branch. Tetrasporangia (reproductive structures) are round to oval in shape and are spirally arranged in the ends of the upper branches of the tetrasporophyte. Spermatangia (reproductive structures) develop from one branch of a trichoblast on male plants. Stalked cystocarps (reproductive structures) are round to oval in shape and are present on female plants (NIMPIS 2002).

Notes
There are no known consumers of *P. brodiei*, but fish, crabs and small crustaceans are known to feed on other *Polysiphonia* spp. (NIMPIS 2002). It has been discovered that the growth of the sporelings (young individuals developed from spores) of *P. brodiei* can be markedly influenced by coumarin, a common compound found in plants (Boney 1967).

Lifecycle Stages
Polysiphonia brodiei has a complicated three-stage life cycle. The macroscopic tetrasporophyte plant bears many tetrasporangia . These each release 4 microscopic spores that settle to form macroscopic male and female gametophyte plants. Male gametes are called spermatia (plural) or spermatium (singular) – fusion with the carpogonia (reproductive structures of the female plant) takes place *via* a trichogyne – hair like receptive surface. The resultant zygote develops into a cystocarp (borne on the female plant) that produces and releases carpospores which settle and develop into tetrasporophyte plants (Wendy Nelson., pers.comm., 2007; NIMPIS 2002).

Habitat Description
Polysiphonia brodiei is usually found in the subtidal zone just below low tide level. This species colonises wooden structures such as jetties and pylons, floating structures such as ropes, buoys and vessels and other species such as mussels *Mytilus edulis*. *P. brodiei* seems to prefer moderately exposed localities. In Australia, New Zealand and California, specimens have been mostly collected from port environments (NIMPIS 2002).

Reproduction
In Victoria (Australia) and Newfoundland (Canada) *P. brodiei* reproduces in summer (NIMPIS 2002).

Nutrition
Polysiphonia brodiei is a primary producer or an autotroph. It creates its own food by fixing carbon through photosynthesis (NIMPIS 2002).

General Impacts
In California and New Zealand *Polysiphonia brodiei* is frequently found as hull fouling organism on slow moving vessels, such as barges. It is also fouls ropes and buoys and harbour structures such as pylons and boat ramps (NIMPIS 2002).

Management Info
Preventative measures: A two year study was undertaken for the Department of Environment and Heritage (Australia) by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to identify and rank introduced marine species found within Australian waters and those not found within Australian waters.
All of the non-native potential target species identified in this report are ranked as high, medium and low priority, based on their invasion potential and impact potential. *Polysiphonia brodiei* is identified as one of ten most damaging potential domestic target species, based on overall impact potential (economic and environmental). A hazard ranking of potential domestic target species based on invasion potential from infected to uninfected bioregions identifies *P. brodiei* as a 'medium priority species' - these species have a reasonably high impact/or invasion potential.
For more details, please see Hayes *et al.* 2005.
The rankings determined in Hayes *et al.* 2005 will be used by the National Introduced Marine Pest Coordinating Group in Australia to assist in the development of national control plans which could include options for control, eradication and/or long term management.

Pathway

Principal source: NIMPIS 2002 *Polysiphonia brodiei*

Compiler: IUCN/SSC Invasive Species Specialist Group (ISSG) with support from La Fondation d'entreprise Total

Review: Dr. Wendy Nelson Science Leader Aquatic Biodiversity National Institute for Water and Atmospheric Research (NIWA) Wellington, New Zealand

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ALIEN RANGE

[4] AUSTRALIA
[1] INDIA
[1] KUWAIT
[1] QATAR
[4] UNITED STATES
[1] CANADA
[1] JAPAN
[1] NEW ZEALAND
[1] SAUDI ARABIA

BIBLIOGRAPHY

10 references found for **Polysiphonia brodiei**

Managment information

Hayes, K., Sliwa, C., Migus, S., McEnnulty, F., Dunstan, P. 2005. National priority pests: Part II Ranking of Australian marine pests. An independent report undertaken for the Department of Environment and Heritage by CSIRO Marine Research.

Summary: This report is the final report of a two year study designed to identify and rank introduced marine species found within Australian waters (potential domestic target species) and those that are not found within Australian waters (potential international target species).

Available from: http://www.marine.csiro.au/crimp/reports/PriorityPestsFinalreport.pdf [Accessed 25 May 2005]

General information

Adams, Nancy M., 1991. The New Zealand species of *Polysiphonia* Greville (Rhodophyta). New Zealand Journal of Botany 29: 411-427

Summary: Fifteen species of *Polysiphonia* are recognised from New Zealand and the outlying islands.

Available from: http://www.rsnz.org/publish/nzjb/1991/39.php [Accessed 11 January 2006]

Adams, N.M. 1983. Checklist of marine algae possibly naturalised in New Zealand. N.Z.J. Botany 21: 1-2.

Boney. A. D. ., 1967. The Effects of Coumarin on the Growth and Viability of Sporelings of Red Algae. Planta (Berl.) 76, 114--123

Summary: This paper discusses the toxin action of eoumarin on algae.

Gibb., D.C, 1938. The Marine Algal Communities of Castletown Bay, Isle of Man. The Journal of Ecology 26 (1): 96-117

Guiry, M.D. & Guiry, G.M. 2007. *Polysiphonia brodiei* (Dillwyn) Sprengel. AlgaeBase version 4.2. World-wide electronic publication, National University of Ireland, Galway.

Summary: AlgaeBase is a database of information on algae that includes terrestrial, marine and freshwater organisms.

AlgaeBase is available from: http://www.algaebase.org; *Polysiphonia brodiei* information is available from: http://www.algaebase.org/speciesdetail.lasso?species_id=172&sk=0&from=results&-session=abv3:82D8100C07fc338277tKg3919FE3

Johansson., G., B.K. Eriksson, M. Peders&#65533;en and P. Snoeijs. 1998. Long-term changes of macroalgal vegetation in the Skagerrak area. Hydrobiologia 385: 121&#65533;138

Summary: This study reports the algae changes in distribution and abundance.

National Introduced Marine Pest Information System (NIMPIS), 2002. *Polysiphonia brodiei* species summary. National Introduced Marine Pest Information System (Eds: Hewitt C.L., Martin R.B., Sliwa C., McEnnulty, F.R., Murphy, N.E., Jones T. & Cooper, S.). [Online database]. Australia.

Summary: NIMPIS is a web accessible database developed by CSIRO to meet national needs for a central repository of information on known and potentially introduced marine species. The project is jointly supported by Environment Australia, with funding from the National Heritage Trust (NHT) Introduced Marine Pests Program, CSIRO and a consortium of State agencies. The NIMPIS database is one of a number key initiatives aimed at providing managers with tools to prevent further introductions of exotic marine species, facilitate rapid response to new incursions, and assist in the management of existing introduced species in Australian waters.

Available from: http://crimp.marine.csiro.au/nimpis [Accessed 11 January 2006]

Nelson, W.A. 1999. A revised checklist of marine algae naturalised in New Zealand. N.Z.J. Botany 37: 355-359.

Nelson, W.A., E. Villouta, K.F. Neill, G.C. Williams, N.M. Adams and R. Slivsgaard. 2002. Marine Macroalgae of Fiordland, New Zealand. Tuhinga 13: 117&#65533;152