***Phyllorhiza punctata*** **System:** Marine

| Kingdom | Phylum | Class | Order | Family |
|---|---|---|---|---|
| Animalia | Cnidaria | Scyphozoa | Rhizostomeae | Mastigiidae |

**Common name** Australian spotted jellyfish (English), spotted jellyfish (English), white-spotted jellyfish (English)

**Synonym**
*Mastigias ocellatus* , Modeer, 1791
*Mastigias albipunctatus* , Stiasny, 1920
*Mastigias andersoni* , Stiasny, 1926
*Mastigias scintillae* , Soares Moreira, 1961
*Cotylorhiza pacifica* , Mayer, 1915
*Cotylorhizoides pacificus* , Light, 1921

**Similar species**

**Summary** The jellyfish, Phyllorhiza punctata, has been introduced to North America from the Western Pacific Ocean and is threatening large commercial fisheries by feeding on the eggs and larvae of fish, crab and shrimp; clogging fishing nets; damaging boat intakes and fishing gear; and causing the closure of productive areas to fishing activities.

view this species on IUCN Red List

**Species Description**
The umbrella or bell of *Phyllorhiza punctata* is nearly semi-spherical; about half as high as broad and punctuated by white crystalline inclusions, giving the appearance of spots. The eight radial canals communicate directly with the stomach and there are 8 thick transparent branching rhopalia (oral arms) which terminate with large brown bundles of stinging cells. 14 lappets are found in each octant of the umbrella. *P. punctata* average 45-50cm in bell diameter but there has been a maximum reported size of 62cm. Sub-genital ostia are wider than they are high, and the circular sub-umbrella muscles are interrupted by the 8 radial canals. (Hawaii Biological Survey, 2001; and Perry, 2005 in Graham *et al.* 2003).
There are several differences between Gulf of Mexico populations of *P. punctata* and others found globally. The two most obvious differences are pigmentation and size. Most populations of *P. punctata* are very deep brown, owing to the presence of zooxanthellae (algal symbionts). However, the Gulf of Mexico population does not host zooxanthellae. Populations in the Gulf of Mexico are also larger than those found elsewhere (A maximum size of 65cm rather than 35-40cm) (Graham *et al.* 2001).

**Habitat Description**
*Phyllorhiza punctata* prefers warm temperate seas and is often abundantly aggregated in nearshore waters (Elkhorn Slough Foundation, undated). *P. punctata* is indigenous to the tropical western Pacific Ocean. It can often be found swimming near the surface in murky waters near estuaries in harbours and embayments. *P. punctata* has a wide distribution along Australian coastal and lagoon waters and range throughout the Indo-Pacific Ocean including the Philippine archipelago (Graham *et al.* 2003; Hawaii Biological Survey, 2001; and Perry, 2005).

**Reproduction**
Basic cnidarian reproduction involves an asexually reproducing polyp stage, alternating with a sexually reproducing medusoid stage. This reproductive strategy is known as \"alternation of generations\". The scyphozoan reproductive cycle is typically dominated by the medusoid stage. The adult planktonic medusa is commonly referred to as a jellyfish. The planktonic planula larvae of the sexually reproducing medusa typically settles to the bottom where it attaches and grows (scyphistoma stage). It may then either directly form additional scyphistoma *via* a process of budding, and/or develop into a strobila, a benthic form which asexually produces and releases young medusa known as ephyrae. This alternation of generations may facilitate the transport of *P. punctata* by shipping through ballast water (planktonic planula, ephyrae or medusa) or fouling (benthic scyphistoma or strobila) (Hawaii Biological Survey, 2001).

**Nutrition**
Fluid enters the sub-umbrella space of *Phyllorhiza punctata* during the relaxation phase and flows over clusters of mouthlets near the base of the oral arm disk and in the centre of the fused oral arm cylinder. The pulsing contraction and relaxation phases of the bell transports prey to different capture surfaces within. Prey is ingested by small polyp-like mouthlets. Swimming activity, and the creation of fluid flows used for prey capture, is continuous, as is feeding, and is central to *P. punctata*'s foraging behaviour (Ambra *et al.* 2001).

**General Impacts**
*Phyllorhiza punctata* threatens large commercial fisheries of shrimp and crab in the Gulf of Mexico. It is feared this species will feed directly on the eggs and larvae of fish, crab and shrimp, having serious economic implications for commercial fishing. Similar invasive jellyfish have been known to cause major disruptions in marine fisheries in Europe and in some instances have driven out certain marine species. Whether or not *P. punctata* has this potential is yet to be determined (Martin, 2000). *P. punctata*'s greatest economic impact thus far has been the clogging of shrimp nets. Estimated economic losses range in the millions of dollars. The indirect effect of predation on eggs and larvae of commercially important finfish and shellfish remains intangible (Graham *et al.* 2003). *P. punctata* also damages boat intakes and fishing gear, and have caused the closure of productive areas to fishing activities (Perry, 2005).
In their research, Graham *et al.* (2003) believe that *P. punctata* may have had an indirect effect on zooplankton production through changes in chemical or physical properties of the water. The manifestation of surface foam streaks down-wind of a super-swarm were likely due to high dissolved organic material (DOM) loading by the swarm. Mucus shed into the water when jellyfish are concentrated increases the viscosity of the water and may also elevate toxins as mucus-bound nematocysts are discharged (Graham *et al.* 2003).

**Management Info**
During the creation of this profile of *Phyllorhiza punctata*, no information about prevention, eradication, control, containment or mitigation was found

**Pathway**
*P. punctata* are thought to be introduced as ship-fouling scyphistomae or as ephyrae in ballast water (Hawaii Biological Survey, 2001).The coastal invasion was initially reported with biologists theorising that the jellyfish broke off the Loop Current that circulates through the Gulf and ended up in an eddy south of the Alabama and Florida panhandle. The Naval Research Laboratory at the Stennis Space Center confirmed this through satellite imagery (Martin, 2000).
Among invasive marine species, *P. punctata* has a relatively well-documented history of invading tropical and subtropical environments. Despite this, there is no direct evidence of translocation routes or the mechanisms by which translocation has occurred. The invasion of the Northern Gulf of Mexico has been theorised to represent an inevitable distributional shift of an invasive hub population in the Caribbean Sea facilitated by periodic oceanographic connections between the regions, or by the transportation of benthic scyphistomae on the hulls of ships (Bolton and Graham, 2004).

**Principal source:** DeFelice, R., Lu Eldredge and James Carlton., 2002 Hawaii Biological Survey, Bishop Museum *Phyllorhiza punctata von Lendenfeld, 1884*
Bolton and Graham, 2004 *Morphological variation among populations of an invasive jellyfish.*

**Compiler:** National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

**Review:**

**Pubblication date:** 2006-05-24

## ALIEN RANGE

**[1]** ATLANTIC BASIN
**[1]** AUSTRALIA
**[1]** MEDITERRANEAN & BLACK SEA
**[1]** PUERTO RICO
**[1]** ATLANTIC - WESTERN CENTRAL
**[2]** BRAZIL
**[1]** PHILIPPINES
**[14]** UNITED STATES

## BIBLIOGRAPHY

**13** references found for **Phyllorhiza punctata**

**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).
The decision support tools are available from:
http://cefas.defra.gov.uk/our-science/ecosystems-and-biodiversity/non-native-species/decision-support-tools.aspx [Accessed 13 October 2011]
The guidance document is available from http://www.cefas.co.uk/media/118009/fisk_guide_v2.pdf [Accessed 13 January 2009].

**General information**

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Bolton, T. F., and W. M. Graham. 2004. *Morphological variation among populations of an invasive jellyfish*. Marine Ecology - Progress Series, 278:125-139.
**Summary:** Available from: http://www.int-res.com/articles/meps2004/278/m278p125.pdf [Accessed 23 March 2006]
CONABIO. 2008. Sistema de informaci&#65533;n sobre especies invasoras en M&#65533;xico. Especies invasoras - Otros invertebrados. Comisi&#65533;n Nacional para el Conocimiento y Uso de la Biodiversidad. Fecha de acceso.
**Summary:** English:
The species list sheet for the Mexican information system on invasive species currently provides information related to Scientific names, family, group and common names, as well as habitat, status of invasion in Mexico, pathways of introduction and links to other specialised websites. Some of the higher risk species already have a direct link to the alert page. It is important to notice that these lists are constantly being updated, please refer to the main page (http://www.conabio.gob.mx/invasoras/index.php/Portada), under the section Novedades for information on updates.
Invasive species - Aquatic invertebrates is available from:
http://www.conabio.gob.mx/invasoras/index.php/Especies_invasoras_-_Otros_invertebrados [Accessed 30 July 2008]
Spanish:
La lista de especies del Sistema de informaci&#65533;n sobre especies invasoras de m&#65533;xico cuenta actualmente con informaci&#65533;n aceca de nombre cient&#65533;fico, familia, grupo y nombre com&#65533;n, as&#65533; como h&#65533;bitat, estado de la invasi&#65533;n en M&#65533;xico, rutas de introducci&#65533;n y ligas a otros sitios especializados. Algunas de las especies de mayor riesgo ya tienen una liga directa a la p&#65533;gina de alertas. Es importante resaltar que estas listas se encuentran en constante proceso de actualizaci&#65533;n, por favor consulte la portada (http://www.conabio.gob.mx/invasoras/index.php/Portada), en la secci&#65533;n novedades, para conocer los cambios.
Especies invasoras - Otros invertebrados is available from:
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**Summary:** Available from: http://massbay.mit.edu/publications/marinebioinvasions/mbi2_abstracts.pdf [Accessed 13 February 2008]
ITIS (Integrated Taxonomic Information System), 2005. Online Database *Phyllorhiza punctata*
**Summary:** An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.
Available from: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=51829 [Accessed 13 February 2008]
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