

## *Alitta succinea*

**System:** Marine

| Kingdom  | Phylum   | Class      | Order     | Family     |
|----------|----------|------------|-----------|------------|
| Animalia | Annelida | Polychaeta | Aciculata | Nereididae |

**Common name** ragworm (English), nereidid worm (English), pile worm (English)

**Synonym** *Nereis (Neanthes) succinea* , Hartman 1945  
*Nereis alatopalpis* , Wesenberg-Lund, 1949  
*Nectoneanthes oxypoda* , Imajima 1972  
*Nectoneanthes alatopalpis* , Wu *et al.* 1985  
*Neanthes succinea* , Imajima 1972  
*Nereis succinea* , Leuckart 1847.

## Similar species

**Summary** The infaunal polychaete *Alitta succinea*, also known as the pileworm, is native to the Atlantic coast and now occurs along the coasts off North, Central and South America, Europe, Africa and the Black Sea. *A. succinea* can alter nutrients available in sediments, which affect other sediment dwellers.



[view this species on IUCN Red List](#)

## Species Description

*Alitta succinea* is a sedentary worm, growing up to 190mm in length and having up to 160 segments. It has a darkly pigmented head area, with a greenish-yellow or pale red posterior region, and white or dark dots over the entire body, the ventral surface is pale. There are four pairs of tentacles, one pair of palps and one of antennae. The parapodia (feet) differ in form from the head end to the rear of the organism. This worm resides in U-shaped burrows in the sediment (NIMPIS 2006).

At sexual maturity, benthic adults metamorphose into nektonic heteronereids (Detwiler *et al.* 2002). The most obvious difference between the heteronereids and the non-reproductive forms is that the parapodia are enlarged and more lobate in the former (Chris Glasby., pers.comm., 2007).

Please see PaDIL (Pests and Diseases Image Library) Species Content Page [Nereidid worm: \*Alitta succinea\* \(Leuckart, 1847\)](#) for a detailed description and high quality diagnostic and overview images of the pileworm.

## Notes

*Alitta succinea* was previously known as *Neanthes succinea* (Hayes *et al.* 2005).

The infaunal polychaete *A. succinea* is the key benthic link between detritus accumulation on the sediments and higher trophic level organisms, including predaceous birds and fish (Detwiler *et al.* 2002).

## Lifecycle Stages

*Alitta succinea* spend most of their life in burrows in the mud and among the masses of barnacles. Mature polychaetes leave their protective burrows at night and swim to the surface to spawn. The swimming, or epitokol, stage lasts only a few days and then the worm dies after releasing its gametes into the surface water layers (Carpelan and Linsley 1961).

## Uses

Polychaetes are one of the most useful marine organisms to detect pollution because they live at the water-sediment interface. This layer is biologically reactive and chemically active (Rhoads and Boyer 1982, in Elías *et al.* 2003). Polychaetes have been used in bioassays, to monitor toxic compounds, and as pollution indicators, from community or populational levels to species level (Pocklington and Wells 1992, Reish and Gerlinger 1997, in Elías *et al.* 2003).

## Reproduction

Although *A. succinea* live burrowed in sediment, they migrate to the water column to reproduce. Adult worms transform into the reproductive form called the heteronereid, which swim to the water surface and swarm in massive numbers. The swarming increases the chance of fertilisation which is triggered by light levels. Individuals die, after spawning (Detwiler *et al.* 2002). Eggs turn into small, setigerous two segmented larvae within approximately 36 hours (Carpelan 1961c, in Tiffany *et al.* 2002). Larvae are planktonic until they reach the 9 to 12 segment stage, when they begin to settle in sediments to start a benthic existence (Tiffany *et al.* 2002).

## Nutrition

*Alitta succinea* is a deposit feeder, consuming mainly sediment, but has been recorded with small amphipods and polychaetes in its gut contents (NIMPIS 2006).

## General Impacts

*Alitta succinea* can alter available nutrients in the sediment due to its burrowing activity (NIMPIS 2006). Nutrient changes may affect many species living in the sediments, and may also promote bacterial activity (NIMPIS 2006).

*A. succinea* is able to transfer contaminants from sediment to biota. *A. succinea* is a deposit-feeding invertebrate, which can uptake and accumulate persistent trace elements and organic contaminants (through sediment ingestion). In particular, it assimilates methylmercury two to 10 times more efficiently than mercury. Furthermore, assimilation of methylmercury increases when *A. succinea* is exposed to organic-rich sediment (Leatherbarrow *et al.* 2005).

## Management Info

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. *Alitta succinea* was one of two (the other being *Monocorophium insidiosum*) potential domestic target species whose impact potential could not be ranked, as no questionnaires were returned. The authors, however, note that it is possible that these two species have a greater impact than the listed top ten.

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.

For more details, please see [Hayes \*et al.\* 2005](#).

## Pathway

### Principal source:

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

**Review:** Dr. Chris Glasby Curator of Annelids (segmented worms) Museums and Art Galleries of the Northern Territory Australia

**Publication date:** 2007-05-14

## ALIEN RANGE

|                               |                               |
|-------------------------------|-------------------------------|
| [3] ARGENTINA                 | [2] AUSTRALIA                 |
| [1] BRAZIL                    | [1] CANADA                    |
| [1] COLOMBIA                  | [1] DENMARK                   |
| [1] GERMANY                   | [1] GREECE                    |
| [1] IRAN, ISLAMIC REPUBLIC OF | [5] ITALY                     |
| [1] JAPAN                     | [1] PACIFIC - EASTERN CENTRAL |
| [2] SWEDEN                    | [2] UKRAINE                   |
| [4] UNITED KINGDOM            | [20] UNITED STATES            |
| [1] URUGUAY                   |                               |

## BIBLIOGRAPHY

32 references found for *Alitta succinea*

### Management information

Detwiler, P.M., Coe, M.F. and Dexter, D.M. 2002. The benthic invertebrates of the Salton Sea: distribution and seasonal dynamics, *Hydrobiologia* 473: 139-160.

**Summary:** This study documents the composition, abundance, and seasonality of macroinvertebrates associated with specific benthic habitats in the Salton Sea.

[Hayes, K., Sliwa, C., Migus, S., McEnulty, 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]

[National Introduced Marine Pest Information System \(NIMPIS\). 2006. \*Alitta succinea\*.](#)

**Summary:** This is an online database that provides information about taxonomy, description, distribution, habitat, reproduction and growth, feeding preference, control methods and similar species.

Available from: <http://www.marine.csiro.au/crimp/nimpis/Default.htm> [Accessed 12 December 2006].

[Wilson, R. 2006. Nereidid worm \(\*Alitta succinea\*\) Pest and Diseases Image Library. Updated on 18/07/2006 2:34:51 PM.](#)

**Summary:** The Pests and Diseases Image Library was set up to provide high quality images showing primarily exotic targeted organisms of plant health concern to Australia, assist with plant health diagnostics in all areas, provide linkage developments between training and research organisations, create educational tools for training undergraduates/postgraduates and engender public awareness about plant health concerns in Australia.

Available from: <http://www.padil.gov.au/viewPestDiagnosticImages.aspx?id=547> [Accessed 19 December 2006].

### General information

Ahrens, M.J., Hertz, J., Lamoureux, E.M., Lopez, G.R., McElroy, A.E. and Brownawell, B.J. 2001. The role of digestive surfactants in determining bioavailability of sediment-bound hydrophobic organic contaminants to 2 deposit-feeding polychaetes, *Marine ecology progress series* 212: 145-157.

**Summary:** This paper elucidates the role of digestive surfactants in determining bioavailability of chlorinated HOCs to deposit feeders.

Bakken, T. and Wilson, R.S. 2005. Phylogeny of nereidids (Polychaeta, Nereididae) with paragnaths, *Zoologica Scripta* 35 (5): 507-547.

**Summary:** This paper investigates the monophyly of currently accepted genera, subgenera and informal subgeneric groupings within the Nereidinae.

Bemvenuti, C.E. 1995, The role of habitat selection and refuge in distribution and abundance of *Neanthes succinea* (Frey and Leuckart, 1847), *Iheringia Serie Zoologia* 0(79): 121-127.

**Summary:** The role of habitat selection and refuge on the distribution and abundance of the epifaunal polychaete *Neanthes succinea* is studied.

Botto, F., Valiela, I., Iribarne, O., Martinetto, P. and Alberti, J. 2005. Impact of burrowing crabs on C and N sources, control, and transformations in sediments and food webs of SW Atlantic estuaries, *Marine ecology progress series* 293: 155-164.

**Summary:** This paper used isotopic values of N and C in plants, consumers, and sediments in areas with and without crabs of the Mar Chiquita coastal lagoon to evaluate the relative influence of burrowing crabs on habitat and food web.

Carpelan, L.H. and Linsley, R.H. 1961. The pile worm, *Neanthes succinea* (Frey and Leuckart). In Walker, B.W. (ed.). *The Ecology of the Salton Sea, California, in Relation to the Sportfishery*. Calif. Fish Game Fish Bull. 112: 63-76.

**Summary:** This paper provides information about the spawning, fertilization and larval development, plankton etc. of *A. succinea*.

Castaldelli, G., Mantovani, S., Welsh, T., Rossi, R., Mistri, M. and Fano, E.A. 2003. Impact of commercial clam harvesting on water column and sediment physicochemical characteristics and macrobenthic community structure in a lagoon (Sacca Di Goro) of the Po River Delta, *Chemical and Ecology* 19(2-3): 161-171.

**Summary:** This study accesses the potential impact of clam harvesting on the water column (oxygen and nutrient concentrations) and sediment layers (nutrients, macrofaunal populations and sediment trophic availability).

Derrick, P.A. and Kennedy, V.S. 1997. Prey selection by the hogchoker, *Trinectes maculatus* (Pisces: Soleidae), along summer salinity gradients in Chesapeake Bay, USA, *Marine Biology* 129: 699-711.

**Summary:** This paper investigates feeding by the hogchoker, *Trinectes maculatus*, in freshwater, oligohaline, mesohaline, and polyhaline regions of Chesapeake Bay, USA.

Elías, R., Rivero, M.S. and Vallarino, E.A. 2003. Sewage impact on the composition and distribution of polychaeta associated to intertidal mussel beds of the Mar Del Plata rocky shore, Argentina, *Iheringia, Sér. Zool., Porto Alegre* 93(3):309-318.

**Summary:** This paper studies the polychaete composition and distribution within mussel beds in order to assess organic pollution due to domestic sewage in a rocky shore of Mar del Plata (Argentina) during 1997.

[ERMS \(European Register of Marine Species\). 2006.](#)

**Summary:** The European Register of Marine Species (ERMS) is an authoritative taxonomic list of species occurring in the European marine environment, defined as up to the strandline or splash zone above the high tide mark and down to 0.5 (psu, ppt) salinity in estuaries.

Available from: <http://www.marbef.org/data/aphia.php?p=taxdetails&id=130391> [29 December 2006].

[ITIS \(Integrated Taxonomic Information System\). 2006. Online Database \*Neanthes succinea\*.](#)

**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=65918](http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=65918) [Accessed 27 December 2006]

[Leatherbarrow, J., Ross, J., David, N. and Yee, D. 2005. Fate of contaminants in sediment of San Francisco estuary: a review of literature and data. San Francisco Estuary Institute.](#)

**Summary:** This paper investigates distribution and natural transport of sediment contaminants in San Francisco Estuary and other regions. It investigates the potential impact of contaminants on biota that utilise this water body.

Available from: [http://www.sfei.org/rmp/reports/Contaminant\\_Fate/05\\_No394\\_FateofContaminants.pdf](http://www.sfei.org/rmp/reports/Contaminant_Fate/05_No394_FateofContaminants.pdf) [Accessed 27 December 2006].

Londoño-Mesa, M., Polanco, J. and Vélez, I. 2002. Polychaetes of the mangrove-fouling community at the Colombian Archipelago of San Andrés and Old Providence, Western Caribbean, *Wetlands Ecology and Management* 10: 227-232.

**Summary:** This study records the polychaetes found on the submerged roots of *Rhizophora mangle* on San Andrés and Providence Islands, Colombian Caribbean.

Maggiore, F., Cerretti, G. and De Ros, O. 2001. Benthic community studies in the Piave River estuary (North Italy), *Bollettino del Museo Civico di Storia Naturale de Venezia* 51: 147-155.

**Summary:** This study analysed the macrobenthic community structure in the Piave River estuary.

Magni, P., Micheletti, S., Casu, D., Floris, A. and DeFalco, G. 2004. Macrofaunal community structure and distribution in a muddy coastal lagoon, *Chemistry and Ecology* 20: 397-409.

**Summary:** This study investigates the distribution of macrofaunal communities in a coastal lagoon characterized by muddy sediments and high organic carbon concentrations at the basin scale. It also assesses the relationship between distribution of dominant macrofauna and sediment properties.

Magni, P., Micheletti, S., Casu, D., Floris, A., Giordani, G., Petrov, A.N., DeFalco, G. and Castelli, A. 2005. Relationships between chemical characteristics of sediments and macrofaunal communities in the Cabras lagoon (Western Mediterranean, Italy), *Hydrobiologia* 550: 105-119.

**Summary:** This study documents impoverished macrofaunal communities in the Cabras lagoon.

Mistri, M. 2003. The non-indigenous mussel *Musculista senhousia* in an Adriatic lagoon: effects on benthic community over a ten year period. *In J. Mar. Biol. Ass. U.K.* 83: 1277-1278.

**Summary:** This study assesses the effects of *Musculista senhousia* on macrobenthic biodiversity over a ten year time period in the Sacca di Goro.

Mistri, M., Ghion, F., Modugno, S. and Rossi, R. 2002. Response of macrobenthic communities to an hydraulic intervention in an enclosed lagoon (Valle di Gorino, northern Italy), *J. Mar. Biol. Ass. U.K.* 82: 771-778

**Summary:** Macrobenthic assemblages are studied throughout a two year period, before and after the opening of a floodgate, in order to assess the recovery of the lagoon in the Valle di Gorino, Italy.

Munari, C. and Mistri, M. 2006. Application of the exergy method to benthic assemblages of the Valli di Comacchio (Italy): Environmental gradient assessing, *Italian Journal of Zoology* 73(3): 237-245.

**Summary:** This study compares biodiversity of macrobenthic assemblages along a gradient of disturbance.

Muniz, P. and Venturini, N. 2000. Spatial distribution of the macrozoobenthos in the Solís Grande Stream estuary (Canelones- Maldonado, Uruguay), *Braz. J. Biol.* 61(3): 409-420

**Summary:** This study provides information about the sublittoral benthic communities of the Solís Grande Stream estuary.

[NOBANIS \(North European and Baltic Network on Invasive Alien Species\) 2006. \*Neanthes succinea\*.](#)

**Summary:** The North European and Baltic Network on Invasive Alien Species (NOBANIS) has developed a network of common databases on alien and invasive species of the region. By establishing a common Alien portal access to IAS-related data, information and knowledge in the region is facilitated. The NOBANIS network has a national contact in each of the participating countries - Denmark, Estonia, Finland, Faroe Islands, Germany, Greenland, Iceland, Latvia, Lithuania, Norway, Poland, Sweden and the European part of Russia.

NOBANIS is available from <http://www.nobanis.org>; this page is available from: <http://www.nobanis.org/speciesInfo.asp?taxaID=7184> [Accessed 24 September 2006]

Pardo, E.V. and Dauer, D. M. 2003. Particle size selection in individuals from epifaunal versus infaunal populations of the nereidid polychaete *Neanthes succinea* (Polychaeta: Nereididae), *Hydrobiologia* 496: 355-360.

**Summary:** Gut contents of *A. succinea* individuals collected from two epifaunal and two infaunal habitats are compared.

Parsons, K. 2006. Exotic marine pests survey Lord Howe Island, New South Wales.

**Summary:** This study surveys exotic marine species and recommends suitable monitoring and response protocols for detecting and treating invasions.



# GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Alitta succinea*

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[Ray, L.R. 2005 Invasive Marine and Estuarine Animals of the Pacific Northwest and Alaska. Aquatic Nuisance Species Research Program \(ANSRP\).](#)

**Summary:** This report is part of a series describing the biology and ecology of known invasive estuarine and marine animals in the major geographic regions of the United States. It described invasive animals of the Pacific Northwest and Alaska and identified species that pose a specific threat to USACE activities.

Available from: <http://el.ercd.usace.army.mil/elpubs/pdf/ansrp05-6.pdf> [Accessed 29 December 2006].

Sardá, R., Foreman, K. and Valiela, I. 1995. Macroinfauna of a Southern New England salt marsh: seasonal dynamics and production, *Marine Biology* 121: 431-445.

**Summary:** This paper examines the relationship of particle size to species assemblage by sampling in sandy and muddy sediments within Great Sippewissett Marsh.

Shalvoenkov, N. 2005. Restoration of some parameters in the development of benthos after reduction of anthropogenous loading in the ecosystem of the Sevastopol bay in the Black Sea, *Mitigation and adaption strategies for global change* 10:105-113.

**Summary:** This study follows the restoration of some biological parameters after reduction of anthropogenous loading on the Sevastopol Bay Ecosystem during the last five to ten years.

Tiffany, M.A., Swan, B.K., Watts, J.M. and Hurlbert, S.H. 2002. Metazooplankton dynamics in the Salton Sea, California, 1997-1999, *Hydrobiologia* 473: 103-120.

**Summary:** The study presents the current composition and dynamics of the zooplankton of the Salton Sea.

[Vary, E. 2001. The Marine Invertebrates of Peggy's Cove - A Contribution to the Marine Invertebrate Diversity Initiative.](#)

**Summary:** This report provides a current list of marine invertebrates found in Peggy's Cove, Nova Scotia, as well as a description of the habitat.

Available from: [http://www.fundyforum.com/MIDI/events\\_and\\_docs/peggyscove.pdf](http://www.fundyforum.com/MIDI/events_and_docs/peggyscove.pdf) [Accessed 29 December].

Weis, J.S. & Weis, P. 1994. Effects of Contaminants from Chromated Copper Arsenate-Treated Lumber on Benthos, *Arch. Environ. Contain. Toxicol.* 26: 103-109.

**Summary:** The study was designed to investigate the relationship of sediment concentrations of Cu, Cr, and As at varying distances from CCA bulkheads to their concentrations in the benthic biota, sediment toxicity, and benthic community structure.