

# Brackish Hydroid *Pachycordyle michaeli*

## Species information from international records

(compiled by Dave Fawcett from source materials – see reference list below)

### Contents

Previous names and synonyms used in literature and records:

Status and distribution

Records

Habitat

Seasonality

Identification

References

### Previous names and synonyms used in literature and records:

*Pachycordyle navis*

*Thieliana navis*

*Clavopsella navis*

*Clavopsella quadrangularia*

*Thieliana quadrangularia*

*Rhizorhagium navis*

*Aseonaris michaeli*

Stepanjants et al. (2000) placed *Clavopsella navis* and *Clavopsella quadrangularia* in the new genus *Thieliana*.

Schuchert (2004 and 2007) concluded that the species belonged in the genus *Pachycordyle* and suspected *Pachycordyle michaeli* from Boothbay Harbour, Maine might be the same species.

Calder (2012) concluded that *Pachycordyle navis* belonged within the species *Pachycordyle michaeli*

*Pachycordyle michaeli* is the currently accepted species name on the World Register of Marine Species <http://www.marinespecies.org/aphia.php?p=taxdetails&id=231682>

### Status and distribution

BAP Species (JNCC)

‘Internationally rare’ but not on Red Data List

It is an introduced species (presumed to have been transported around the world from its original region in the ballast water of ships)

Widewater is the only known UK site and one of just a handful of locations in Europe and worldwide. European records of are all from sites with reduced salinities (i.e. brackish)

**Google map** of the Brackish hydroid’s distribution:

<https://maps.google.co.uk/maps/ms?msid=215039501669700421067.0004cd6c7c40e6426b09d&msa=0&ll=58.904646,11.074219&spn=48.769721,112.675781>

### Records

**South Africa**

**Location: Table Bay, Cape Town, 1959.**

**Originally recorded as:** *Rhizorhagium navis*, (Millard 1959 & 1975).

Attached to a ship's hull in Table Bay, Capetown, South Africa in 1959 when *Rhizorhagium navis* was first identified by NAH Millard, South African Museum. The dock has since been infilled. The South African colony was growing on a ship hull that had never left South Africa.

## UK

**Location:** Widewater Lagoon, 1973-1993

**Originally recorded as:** *Clavopsella navis*

**Specimens:** Widewater specimen at British Museum of Natural History (illustrated on p268 of Schuchert 2007)

First noted in Widewater Lagoon in 1973? (P.F.S. Cornelius pers. comm, in Eno et al (1997). Non-native marine species in British waters: a review and directory. JNCC.)

? Original record by Carel Sartory (pers comm, Marco Faasse NE Atlantic Cnidaria Facebook group) Also recorded at Widewater in 1978-82, 83, 85, 87 and 1990 (records from Sheader & Sheader 1990. In 1990 it was 'relatively abundant attached to algae', 'common just to the East of the bridge.' in 1993 (Sheader), 1997 (Joyce et al, one sample contained a single hydroid thought to be *C.navis*, attached to basal region of a sea lettuce plant).

## Azores

Listed in Eno et al 97 and on WoRMS website but no source information found for this record.

## Germany

**Location:** Kiel Canal

Original recorded as *C. quadranularia* in Thiel, 1962

1960 in the Kieler Förde at the mouth of the Nordsee-Ostsee Kanal (Kiel is in Aussenhafen, Holtenuer Schleuse, Germany). Kieler Forde is at West End of Canal, which joins the North Sea in the East (Wadden Sea National Park) at mouth of River Elbe at Brunsbuttel.

## Denmark

**Location:** Isefjord Specimens originally described by Rasmussen (1973) as *Corydendrium dispar*.

Specimens kept by "The Isefjord Laboratory" at Vellerup Vig, University of Roskilde, Denmark

(<http://www.zmuc.dk/InverWeb/Isefjord.htm>)

Found on mussels in the strong currents of the intake of the Kyndby power station in Jaegerspris on the Hornsherred peninsular. Isefjord is a fjord on the Baltic Sea, in the north of the Island of Zealand.

## Netherlands,

**Gat van Ouwerkerk, Goesse Meer and Westkapelse Kreek**

Originally recorded as: *Thieliana navis* (in Faasse & Vervoort 2001) at three sites in SW Netherlands.

Marco Faasse (pers comm): All three collecting localities are landlocked water bodies of relatively recent origin (1953, about 1990 and 1944, respectively), with salinities higher than 20ppt. The brackish hydroid can be considered an established species in The Netherlands, occurring and reproducing in at least three rather widely separated localities. Faasse took a few colonies to deposit in a museum and to make photos through a stereomicroscope. It seems to be a polyhaline species.

**Location:** **Gat van Ouwerkerk** (recorded 1964), on the island of Schouwen-Duiveland, Zeeland province). The Gat is a non-tidal artificial lagoon, adjacent to the Oosterschelde (a National Park and former estuary of river Scheldt, closed off by flood defence dam in 86). The Gat was formed when caissons (concrete retaining structures) were built to repair the dike which had been breached by the disastrous North Sea Flood ("watersnood") in 1953 when high tides breached dikes. The estuaries in the Rhine-Scheldt Delta were blocked with new sea defences.

**Location:** **Goesse Meer** (recorded in 2000 as "quite common"), Zuid-Beveland Island, South of Oosterschelde. This artificial wetland was created about 1990.

**Location:** **Westkapelse Kreek** (recorded in 2001), near small city of Westkapelle, Veer municipality, on the island of Walcheren, Zeeland province.

This brackish lake was formed in 1944 by flooding after the dike was bombed – an event still known in Westkapelle simply as "t Bombardement" ("the Bombardment"). The bombing and flooding destroyed the village and 180 inhabitants were killed. The gap in the dyke was closed in 1945.

### **Ukraine**

**Location:** Collected in May 1981, Sevastopol Bay on the Black Sea

(Sevastopol's'ka bay [http://www.marbef.org/wiki/Sevastopol Bay](http://www.marbef.org/wiki/Sevastopol_Bay))

Originally recorded as: *Cordylophora inkermanica* (Marfenin 1983).

A natural harbour on the Black Sea on the Crimea Peninsula, Ukraine) in the vicinity of Inkerman . In surface water from *Mytilus galloprovincialis* (mussels), Marfenin 1983 notes that the species also settles on eelgrass (*zostera*). According to Stepanjants *et al.* (2000), *Cordylophora inkermanica* appears indistinguishable from *P. navis*.

### **Sweden**

**Location:** Tjärnö, on a floating dock at Sven Lovén Centre for Marine Sciences, at Tjärnö, Strömstad) by Koster fjord, West coast of Sweden. Within Kosterhavet Marine National Park.

Originally recorded as: *Pachycordyle michaeli* (Calder 2012)

**USA.** Boreal waters along the east coast from Virginia to Maine

**Location:** York River estuary and James River, Virginia, on the east coast of North America

Originally recorded as: *Aselomaris michaeli*, (in Calder 1971)

Gloucester Point, York river, 1966-7 and Norfolk Navy Base Pier 12, James River. Fairly common just below water line of objects floating at the surface.

Brackish waters (c. 17–24 ‰)

Dense colonies were found there just beneath the surface of the water on floating objects. Hydroids were active from mid-October through early June at water temperatures ranging from 3.5° C to 20° C, and gonophores were observed from mid-November through early June. The species remained dormant during summer and early autumn.

Source: Calder 1971

**Location:** Boothbay Harbor, Maine, USA,

Originally recorded as: *Aselomaris michaeli* (in Berrill 1948)

Found throughout the general region of Boothbay Harbor, attached to the sides of floats, occasionally on *Fucus* fronds, in widely separated localities, namely Lobster Cove, Townsend Gut and the town wharves. In every place it was associated with *Bouganvillia superciliaris* which it resembles in some respects, such as color, size and form of the hydranths. Forms an encrusting mat often several centimetres square but with very little height. Most of the specimens obtained were collected only by shaving off the wood to which they were attached

Source: Berrill 1948.

## **Habitat - where colonies have been found**

*Pachycordyle michaeli* is known from brackish water environments in Europe, tolerating salinities down to about 8 ‰ (Calder 2012)

Dense colonies just beneath the surface of the water on floating objects including a pontoon float, stern of a skiff and on *Zostera marina*. (York River estuary, USA. Calder 1971)

Grows on algae, wood, iron constructs, mussels and other solid substrates. (Schuchert 2004). Also found on *Chaetomorpha* and *Ruppia*. Relatively abundant attached to algae at Widewater (Sheader).

## **Seasonality**

York River Estuary: Hydroids active from mid-Oct to early June at water temperatures ranging from 3.5° C to 20° C, Gonophores were observed from mid-November through early June. The species remained dormant during summer and early autumn. (Calder 1971)

Kiel Canal: fertile colonies were observed by Thiel (1962) in spring, and again from late summer to autumn.

Tjärnö, Sweden: Gonophores were present on colonies during early September 2010, at water temperatures of about 17–18° C (Calder 2012)

## Identification

### Photograph

<http://www.cryptosula.nl/Thieliananavis.html>

<http://www.marlin.ac.uk/glossaries/imageproviders.php#Marco%20Faasse>

(*Thieliana navis* on *Ruppia*, Goesse Meer, The Netherlands. © Marco Faasse)

### Identifying features (From White 2005)

- Stem simple and unbranched bears a single terminal hydranth.
- Hydranth (terminal part of polyp that bears mouth and tentacles) with 2-4 whorls of tentacles close to mouth.
- Gonophores in the form of fixed sporosacs.
- Planulae (larval form) develop within apical part of gonophore. (in *P. michaeli*, Planulae were planktonic for about one day before settling to the bottom. By one day after settling, each planula metamorphosed into a hydranth with tentacles and with a bipolar stolon).

### Description (From White 2005)

A simple hydroid consisting of an erect, unbranched stem, up to 5 mm in height, with a single terminal polyp (hydranth). Each upright stem rises from a creeping stolon (hydrorhiza). The stem is sheathed by a chitinous sheath, the perisarc. The perisarc is often wrinkled, especially near the base, and terminates below the hydranth. The hydranth bears 8 to 16 tentacles in 2 to 4 alternating whorls, depending on hydranth size. It is creamy white in colour, with hints of pink around the mouth of the hydranth. The reproductive bodies (gonophores) are borne on short stalks in an irregular spiral below the hydranth. (Female gonophore = sporosac)

### Species description (From Schuchert 2004)

Colony stolonial or variably branched, height 7-30 mm, 1-30 hydranths per shoot. (Colonial hydroids expand by means of vascular tubings, termed stolons, which elongate, generate new polyps, and branch at regular intervals). Stolons ramified, initially creeping on substrate, in larger colonies detached and forming tangled masses, sometimes also growing along stems of older shoots. Pedicels and stems covered by perisarc, terminating below hydranth. Perisarc mostly smooth, some annulated stretched in European colonies. Perisarc often double-layered, inner layer may be annulated while outer layer is smooth (Fig. 12C). Pedicel length variable but relatively long, diameter 0.1-0.15 mm. Hydranth body 1.0-1.8 mm high (1.4 mm mean), diameter about 0.35 mm, spindle-shaped. Hypostome high, dome-shaped. Tentacles 12-24, in a narrow band below hypostome, 2-4 closely approximated alternating whorls. Gonophores about 0.4 mm, borne in irregular spiral on stem or hydranth pedicels. Gonophores with relatively long pedicel, completely sheathed in perisarc. Gonophores fixed sporosacs (heteromedusoids) with distinct spadix, lacking tentacle rudiments, radial canals, circular canal, or velum. Colonies dioecious. Male sporosacs spherical to spindle-shaped. Female sporosacs club-shaped, distal end obtuse, containing a very variable number of eggs, 5-20, if up to 12 eggs then these in one tier, but arrangement can also be irregular, eggs about 0.1 mm in diameter, covered with a few nematocysts only. Eggs develop into planulae in situ. Nematocysts: microbasic euryteles, desmonemes. Colour: perisarc clear to brown, coenosarc white to reddish, hydranths red (depends on food).

## References (including websites)

Source: N. J. Berrill (1948) The Life Cycle of *Aselomaris Michaeli*, a New Gymnoblasic Hydroid. *Biological Bulletin*, Vol. 95, No. 3. (Dec., 1948), pp. 289-295  
[www.jstor.org/stable/1538184](http://www.jstor.org/stable/1538184)

Calder, D.R. (1971) Hydroids and hydromedusae of southern Chesapeake Bay. *Virginia Institute of Marine Science, Special Papers in Marine Science*, 1, 1–125.  
[http://www.academia.edu/514114/Calder\\_D.R.\\_1971.\\_Hydroids\\_and\\_hydromedusae\\_of\\_southern\\_ChESAPEAKE\\_Bay.\\_Virginia\\_Institute\\_of\\_Marine\\_Science\\_Special\\_Papers\\_in\\_Marine\\_Science\\_1\\_1-125](http://www.academia.edu/514114/Calder_D.R._1971._Hydroids_and_hydromedusae_of_southern_ChESAPEAKE_Bay._Virginia_Institute_of_Marine_Science_Special_Papers_in_Marine_Science_1_1-125)

Calder, D.R. 2012. On a collection of hydroids (Cnidaria, Hydrozoa, Hydroidolina) from the west coast of Sweden, with a checklist of species from the region (*Zootaxa* 3171)  
<http://www.mapress.com/zootaxa/2012/f/zt03171p077.pdf>

Eno et al (1997). Non-native marine species in British waters: a review and directory. JNCC.  
<http://jncc.defra.gov.uk/page-2597>

Faasse, M & Vervoort, 2001. Een nieuwe breakwater poliep, *Thieliana navis* (Millard, 1959) uit het Gat van Ouwerkerk, het Goess Meer en de Westkapelse Kreek. *Zeepaard* 61:181-190

Marfenin, N.N., 1983. A new species of the genus *Cordylophora* (Hydrozoa, Clavidae) from the Black Sea. *Zool. Zh.* 62 11: 1732-1734.

Millard, N.A.H. (1959) Hydrozoa from ship's hulls and experimental plates in Cape Town docks. *Annals of the South African Museum*, 45, 239–256.

Schuchert P (2007) The European athecate hydroids and their medusae (Hydrozoa, Cnidaria): Filifera Part 2. *REVUE SUISSE DE ZOOLOGIE* 114 (2): 195-396.  
<http://www.ville-ge.ch/mhng/hydrozoa/pdf/schuchert2007.pdf>  
<http://www.ville-ge.ch/mhng/hydrozoa/pdf/descriptions.htm>

Shearer M & Shearer A. (1990) A survey of Widewater Saline lagoon to determine the current status of the site, with special reference to Ivell's sea anemone *Edwardsia ivelli*. Preliminary report to NCC, Department of Oceanography, Southampton University.

Stephanjants, S.D., Timoshkin, O.A., Anokhin, B.A. & Napara, T.A., (2000). A new species of *Pachycordyle* (Hydrozoa, Clavidae) from Lake Biwa (Japan), with remarks on this and related Clavid genera. *Scientia Marina*, 64 (Suppl. 1), 225-236.

Thiel, H. (1962). *Clavopsella quadranularia* nov. spec. (Clavopsellidae nov. fam.), ein neuer Hydroidpolyp aus der Ostsee und seine phylogenetische Bedeutung. *Zeitschrift für Morphologie und Ökologie der Tiere*, 51, 227–260.

White, N. 2005. *Thieliana navis*. A hydroid. Marine Life Information Network: Biology and Sensitivity Key Information Sub-programme [on-line]. Plymouth: Marine Biological Association of the United Kingdom.  
<http://www.marlin.ac.uk/speciesfullreview.php?speciesID=4461>

World Register of Marine Species  
<http://www.marinespecies.org/aphia.php?p=taxdetails&id=117335>