



First occurrence of the non-native bryozoan *Schizoporella japonica* Ortmann (1890) in Western Europe

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Abstract

Schizoporella japonica Ortmann was described from Japan but was subsequently introduced on Pacific oysters to the Pacific coast of North America, where it is now well established. In this paper we record it for the first time in European waters. The initial discovery was in a marina at Holyhead, North Wales, in July 2010 but *S. japonica* has since been observed abundantly in the Orkney Islands (from May 2011) and, subsequently, at other localities in northern Scotland. Introduction seems most likely to have been on an ocean-going vessel. The British material is here fully described and illustrated with SEMs and colour photographs; some unusual characters are discussed. Unlike other recently introduced bryozoans, *S. japonica* is a cold-water species and its breeding season in Britain extends through the winter. Extensive confusion between this and other species of *Schizoporella* on the west coast of Canada and the USA led us to make thorough morphometric comparisons between the species concerned (*Schizoporella unicornis* (Johnston in Wood), *Schizoporella errata* (Waters) and *Schizoporella pseudoerrata* Soule, Soule and Chaney). Zooid size in cheilostomate bryozoans is variable and often an unreliable character for species separation but shape (and therefore ratios between variables, which are independent of size) are often valuable: *S. japonica* zooids have a much greater length:width ratio than the other species. Density of frontal pseudopores provides a useful discriminatory character. *Schizoporella unicornis*, repeatedly reported in error from the Pacific coast of North America, does not occur there; it is a European species. Full comparisons are made between *S. japonica* and *S. unicornis* for European identification and between *S. japonica*, *S. errata* and *S. pseudoerrata* (which are also illustrated) for North American localities.

Key words: Bryozoa, Cheilostomatida, Japan, Pacific northwest, fouling, marina, pontoons, tidal turbine, boat hull, morphology, cheilostomate morphometrics

Introduction

In June 2008, when the aggressively invasive ascidian *Didemnum vexillum* Kott (2002) was discovered in Holyhead marina, it was perceived as a potential threat both to cultured molluscan shellfish in North Wales and to biodiversity in the Natura 2000 marine Special Area of Conservation (SAC) around Anglesey. Accordingly, during the 2009–2010 winter, an eradication programme was initiated. All floating and submerged structures in the marina were isolated by fitting waterproof barriers (bags and wraps of various sizes) and treated with lethal doses of calcium hypochlorite. Following this first attempt the submerged surfaces of the pontoons were monitored for the return of native and non-native species. By the end of 2010 recolonisation was evident and among the species was an unfamiliar, fast-growing, orange-red bryozoan, samples of which were given to JSR for identification at a meeting on non-native species held in February 2011. Despite being midwinter, the colonies were actively reproducing, suggesting that the bryozoan was not—unlike a majority of recent introductions—of warm-water

TABLE 7. The characters of *Schizoporella* species occurring on the Pacific coast of North America. Note that mandible lengths are foreshortened, as seen from above using a high-powered stereoscope, since they project upwards at very roughly 30°; the true length is about 15% greater than that given in the table. (*N* = number of colonies; *n* = number of zooids).

Feature	<i>S. errata</i>	<i>S. japonica</i>	<i>S. pseudoerrata</i>
Colony form	Initially encrusting, becoming multilaminar and 3-dimensional; often with tubular extensions	Mainly unilaminar; sometimes with an overgrowing layer and flaky.	Initially encrusting, becoming multilaminar and 3-dimensional
Colour	Reddish-brown to dark violet	Whitish-grey, pinkish or orange-red	Not recorded
Zooid shape	On average about 1.5 times as long as broad	On average about twice as long as broad	About 1.5–2.0 times as long as broad
Frontal wall	Covered with relatively few large, sunken pseudopores: ~310 (200–430) mm ⁻² (<i>N</i> = 3; <i>n</i> = 30)	Densely covered with slightly sunken pseudopores: ~615 (420–770) mm ⁻² (<i>N</i> = 4; <i>n</i> = 40)	Irregularly covered with variably sized sunken pseudopores: ~630 (560–725) mm ⁻² (<i>N</i> = 1; <i>n</i> = 10)
Orifice	Width ≈ length; inter-condyle distance ~75 μm	Width > length (0.9:1.0); inter-condyle distance ~100 μm	Slightly wider than long (0.90–0.95:1); inter-condyle distance ~100 μm
Condyles	In the form of blunt teeth about their own width distant from the sharply obtuse angle of the sinus	Shoulders with subacute angles close to the rounded angles of the shallow sinus	Pointed teeth, distomedially directed, quite close to the gently curved transition to the sinus
Ovicell	Porous; radial ridges absent or few	Porous; with well developed radial ridges; >1, in series, may be present on one autozooid	Porous; sometimes with radial ridges
Avicularia	Usually 1, proximolateral to orifice, sometimes displaced; hinge-line often proximal to condyles; average mandible length ~90 μm but sometimes longer, biconcave, tapering, orientation variable but > 45° from medial axis	Usually 0 or 1 (rarely 2 or more); proximolateral to orifice, hinge-line about level with condyles; mandible 75–95 μm long, orientation variable but <45° from medial axis; occasionally frontal and enlarged	0, 1 or 2 proximolateral to orifice; hinge-line beside or proximal to condyles; mandible ~80 μm (from SEMs); orientation somewhat variable each side of 45°

Acknowledgements

We have been dependent on colleagues for the supply of specimens from outside Western Europe, especially to Matt Dick and Jim Carlton. Shetland sampling was facilitated by Georgia Conolly, Rachel Shucksmith, Richard Shucksmith and Bob Anderson. Orkney sampling was arranged by Lindsey Craddock at Orkney Marinas Ltd. Scottish West coast sampling assistance was provided by Sally Rouse. Hamish Mair provided fieldwork assistance for all Scottish East coast and Orkney marine surveys. Andrew Want provided photographs of *Schizoporella* on Orkney tidal turbines. Hank Chaney provided new SEMs of *S. pseudoerrata*, Paul Taylor made the original batch of SEMs of *S. japonica* from Holyhead, Marie Meister registered and took the photo of the type material of *S. japonica* in the Strasbourg Museum. All of our scanning electron microscopy has been performed in the EMMA unit at NHMUK. The views expressed in this paper should not be interpreted as those of the Environment Agency or Natural Resources Wales.

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