Bowerbank's halichondria (*Halichondria (Halichondria) bowerbanki*)

MarLIN – Marine Life Information Network
Biology and Sensitivity Key Information Review

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Please note. This MarESA report is a dated version of the online review. Please refer to the website for the most up-to-date version [https://www.marlin.ac.uk/species/detail/1841]. All terms and the MarESA methodology are outlined on the website (https://www.marlin.ac.uk)

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Halichondria (Halichondria) bowerbanki.
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See online review for distribution map

Distribution data supplied by the Ocean Biogeographic Information System (OBIS). To interrogate UK data visit the NBN Atlas.

Researched by	Dr Keith Hiscock & Hugh Jones	**Refereed by**	Dr Rob van Soest
Authority	Burton, 1930		
Other common names	-	**Synonyms**	*Halichondria bowerbanki*

Summary

Description

The growth form varies from thin to massively encrusting, with tassel-like irregular branches which form flattened masses. Colonies can be up to 25 cm across with branches reaching 12 cm high. It is beige to dull brown in the summer, and light grey/yellow in the winter. It typically turns a characteristic yellow-orange when spawning because of the colour of the larvae. There are no obvious large exhalent openings (oscules) present and the surface is smooth or uneven with a breadcrumb-like texture.

Recorded distribution in Britain and Ireland

Commonly found in southern England, Pembrokeshire and north-west Wales, also frequently found in western Scotland. Isolated records from the North Sea.

Global distribution

Present on both sides of the North Atlantic. In Europe, it has been reported south to Brittany and is found in the south-west Netherlands and in harbours of the Wadden Sea. It is a non-native species in North America.

Habitat

Present on rocky surfaces in the shallow subtidal, with occasional intertidal specimens under overhanging rocks. *Halichondria bowerbanki* occupies wave-sheltered, sediment-rich environments. It often grows intertwined with hydroids and algae and may be common in estuaries. May occur in areas sheltered from strong tidal flow through to tidal sounds.

Depth range

0 to 90 m

Identifying features

- Characteristic stringy appearance.
- Breadcrumb-like texture.
- No apparent exhalent openings.
- Colour variable but often yellowish beige in colour.

Additional information

Microscopic examination of the spicules reveals that they are relatively long and thin, and taper to the apices. Named after James S. Bowerbank (1797-1877), a pioneering authority on sponges. Easily confused with *Halichondria panicea* but *Halichondria bowerbanki* is distinguished by the absence of the chimney-like oscules that occur in *Halichondria panicea*.

Listed by

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Biology review

Taxonomy

Phylum	Porifera	Sponges
Class	Demospongiae	Siliceous sponges
Order	Suberitida	
Family	Halichondriidae	
Genus	Halichondria	
Authority	Burton, 1930	
Recent Synonyms	Halichondria bowerbanki	

Biology

Typical abundance	Data deficient
Male size range	<25 cm
Male size at maturity	Data deficient
Female size range	<25 cm
Female size at maturity	Data deficient
Growth form	Crustose soft
Growth rate	1.1 mm / day (in summer)
Body flexibility	High (greater than 45 degrees)
Mobility	Sessile
Characteristic feeding method	Active suspension feeder, Passive suspension feeder
Diet/food source	No information
Typically feeds on	Fine suspended organic matter
Sociability	Colonial
Environmental position	Epifaunal, Epilithic
Dependency	Insufficient information.
Supports	No information
Is the species harmful?	No

Biology information

Under optimal conditions (and with a low sample number) Vethaak *et al.* (1982) recorded a mean length increase of 1.1 mm / day in summer and no growth in winter. Vethaak *et al.* (1982) identified five distinct growth forms (plus intermediate forms) including encrusting, bush-like and massive forms. They reported a maximum colony size of 25 cm width to 12 cm high although most colonies are rarely this big.

In some sheltered locations, the branches grow over other species and loop like bramble stolons attaching to any suitable object they encounter. Found to house a large community of associated amphipod species which show seasonal variation (Biernbaum, 1981). The green filamentous algae *Microspora ficulinae* lives in association with the tissues of *Halichondria bowerbanki*.

Habitat preferences

Physiographic preferences	Estuary, Isolated saline water (Lagoon), Ria / Voe, Strait / sound
Biological zone preferences	Circalittoral, Infralittoral, Sublittoral fringe
Substratum / habitat preferences	Overhangs
Tidal strength preferences	Moderately Strong 1 to 3 knots (0.5-1.5 m/sec.), Strong 3 to 6 knots (1.5-3 m/sec.), Weak < 1 knot (<0.5 m/sec.)
Wave exposure preferences	Sheltered
Salinity preferences	Full (30-40 psu), Reduced (18-30 psu)
Depth range	0 to 90 m
Other preferences	
Migration Pattern	Non-migratory / resident

Habitat Information

Occurs in muddy environments where the similar sponge *Halichondria panicea* cannot survive. It reaches its best development in harbours. In the Oosterschelde, *Halichondria bowerbanki* was found growing on tunicates (especially *Styela clava*), molluscs and, in a brackish lagoon, on small reefs of *Electra crustulenta* (Vethaak *et al.*, 1982). In the United Kingdom, *Halichondria bowerbanki* (studied as *Halichondria coalita*) was recorded to depths of 90 m (Bowerbank, 1874, cited in Vethaak *et al.*, 1982).

Life history

Adult characteristics

Reproductive type	See additional information
Reproductive frequency	No information
Fecundity (number of eggs)	Data deficient
Generation time	Insufficient information
Age at maturity	No information
Season	No information
Life span	Insufficient information

Larval characteristics

Larval/propagule type	Parenchymella
Larval/juvenile development	Viviparous (Parental Care)
Duration of larval stage	No information
Larval dispersal potential	No information
Larval settlement period	Insufficient information

Life history information

In the Oosterschelde, large oocytes and embryos found from early August until mid-October which coincided with a drop in water temperature from maximal summer values to about 14°C (Vethaak *et al.*, 1982). Wapstra & van Soest (1987) recorded that *Halichondria bowerbanki* from the same area contained oocytes from April through to November although embryos were only observed from June to November. Newly settled colonies were seen within just over a year, i.e. the following September and October (Vethaak *et al.*, 1982). Wapstra & van Soest (1982) noted that it was possible that *Halichondria bowerbanki* could be protandrous or protogynous hermaphrodites.

No information was found concerning the lifespan of *Halichondria bowerbanki*, although a lifespan of about 3 years was suggested for the closely related *Halichondria panicea* in Fish & Fish (1996). *Halichondria bowerbanki* survives over the winter months as a dormant form with no growth and a disintegration of tissue. In the Oosterschelde, this species experienced a drastic reduction in biomass during the severe winter of 1978/9, especially in the intertidal (Vethaak *et al.*, 1982).

Sensitivity review

This MarLIN sensitivity assessment has been superseded by the MarESA approach to sensitivity assessment. MarLIN assessments used an approach that has now been modified to reflect the most recent conservation imperatives and terminology and are due to be updated by 2016/17.

Physical Pressures

	Intolerance	Recoverability	Sensitivity	Confidence
Substratum Loss	High	High	Moderate	Moderate

The sponge is attached to the substratum and is unlikely to survive substratum loss. However, settlement of new colonies is likely within one year and growth rate is almost certainly rapid. Therefore, intolerance and recoverability have been recorded as high.

Smothering	Intermediate	High	Low	Low

Halichondria bowerbanki has extensive erect tasselated growths that will most likely extend above settled silt. In the Oosterschelde, *Halichondria bowerbanki* has been found growing covered in silt and debris (Vethaak *et al.*, 1982), therefore the colony will most likely survive smothering by silt at the level of the benchmark. However, there may be significant inhibition of feeding and respiration and small colonies may suffer mortality if deoxygenation below the silt occurs. On balance, therefore, an intolerance of intermediate has been suggested. However, settlement of new colonies is likely within one year and growth rate is most likely rapid. Hence, a recoverability of high has been recorded.

Increase in suspended sediment	Low	Immediate	Not sensitive	High

Halichondria bowerbanki lives in situations such as the entrance to estuaries and in harbours where suspended sediment levels and settlement of silt is often high. The similar sponge *Halichondria panicea* has a mechanism for sloughing off their complete outer tissue layer together with any debris (Bartel & Wolfrath, 1989). It is expected that the sponge can, therefore, cope with increased siltation rates and suspended sediment. However, there is probably an energetic cost in clearing sediment from tissues and an intolerance of low has been recorded.

Decrease in suspended sediment	Tolerant	Not relevant	Not sensitive	Moderate

The sponge may derive some benefit from organic matter as food in the suspended sediment but there is probably an energetic cost in clearing sediment from tissues. On balance, tolerant is suggested.

Dessication	Intermediate	High	Low	Low

Halichondria bowerbanki may occur under overhangs and in damp places on the lower shore but does not live in such open conditions as *Halichondria panicea*. Desiccation would be likely to have a significant adverse effect on the sponge with bleaching and tissue death likely at the edges of the colony. Regrowth will most likely occur rapidly as growth is likely from remaining tissue or settlement. However, for the level of the benchmark, an intolerance of intermediate

is suggested with a recoverability of high.

Increase in emergence regime	High	High	Moderate	Low

Desiccation is likely to be the main impact of increased emergence and established colonies are likely to be significantly damaged and lost at the upper limit of their intertidal range. The species prefers subtidal habitats and Vethaak *et al.* (1982) described intertidal colonies of *Halichondria bowerbanki* in the Oosterschelde as undersized. Where emergence is increased, intertidal colonies will most likely be killed and so, with reference to intertidal colonies, intolerance is assessed as high.

Decrease in emergence regime	Tolerant*	Not relevant	Not sensitive*	High

The species is mainly subtidal so that a decrease in emergence that makes intertidal species subtidal will benefit the species.

Increase in water flow rate	Intermediate	Very high	Low	High

Halichondria bowerbanki is tolerant of various hydrographic regimes (Vethaak *et al.*, 1982). The species is found in locations exposed to strong tidal flow but, where it is growing in habitats where tidal streams are normally weak, an increase in flow may result in damage to the colonies through tearing-off of erect structures or by poorly attached massive growths being swept away. The substratum may also be dislodged in part through the drag caused by the sponge. Feeding may be inhibited by strong flow. However, damage is likely to be rapidly repaired (see Bowerbank, 1857) and mortality is unlikely to be total with re-growth occurring once water flow rates return to normal. An intolerance of intermediate with a very high recovery has been suggested.

Decrease in water flow rate	Low	Immediate	Not sensitive	Low

Halichondria bowerbanki has been recorded in isolated lagoons with no water movement in the Oosterschelde (Vethaak *et al.*, 1982). Although small in its upper range, larger specimens were found growing lower down. A reduction in water flow rates in situations sheltered from wave action may lead to a reduced food supply and possible local de-oxygenation although in general, an intolerance of low has been suggested since mortality is unlikely.

Increase in temperature	Tolerant	Not relevant	Not sensitive	Moderate

Halichondria bowerbanki has a wide distribution in the north-east Atlantic with Britain and Ireland central to that distribution so that the species exists well-within its normal temperature survival range.

Decrease in temperature	Tolerant	Not relevant	Not sensitive	Moderate

Halichondria bowerbanki has a wide distribution in the north-east Atlantic with Britain and Ireland central to that distribution so that the species exists well-within its normal

temperature survival range.

Increase in turbidity	Tolerant	Not relevant	Not sensitive	Low

Halichondria bowerbanki was found to occur in higher population densities on more shaded and totally dark surfaces compared to well lit areas in the Oosterschelde (Vethaak *et al.*, 1982). It may extend its range to shallow areas previously dominated by algae if turbidity increases. However, change in turbidity may be caused by increased suspended sediment levels which may clog feeding pores or cause expenditure of energy to clean colonies (see Increase in suspended sediment above). On balance, 'tolerant' is suggested.

Decrease in turbidity	Tolerant	Not relevant	Not sensitive	Moderate

Halichondria bowerbanki occurs in low light levels and algae may encroach the upper limits of its range if turbidity declines and light levels increase. If the change in turbidity is caused by decreased suspended sediment levels, sponges will expend less energy in cleaning. On balance, tolerant is suggested.

Increase in wave exposure	Intermediate	High	Low	Low

The shape of sponge colonies is influenced heavily by the hydrodynamics of the environment and, in 'high stress' environments such as very wave exposed areas, the colonies are often undersized or encrusting (Vethaak *et al.*, 1982). Colonies of *Halichondria bowerbanki* live in areas sheltered from wave action and, where wave exposure increases, some large and poorly attached colonies may be displaced. For a closely related species, *Halichondria panicea*, the growth rate is rapid (about 5% increase per month: Barthel, 1988) and recovery would be expected to occur quickly after reversion to previous conditions. Intolerance is assessed as intermediate and recoverability as high.

Decrease in wave exposure	Tolerant*	Not relevant	Not sensitive*	High

Colonies of *Halichondria bowerbanki* thrive in areas sheltered from wave action so that they would be expected to benefit from a decrease in wave action.

Noise	Tolerant	Not relevant	Not sensitive	High

Sponges have no known receptors for noise.

Visual Presence	Tolerant	Not relevant	Not sensitive	High

Sponges have no known visual receptors.

Abrasion & physical disturbance	Intermediate	High	Low	Moderate

The sponge is attached to the substratum and is unlikely to survive abrasion and physical disturbance. However, where merely damaged, repair is likely to occur very rapidly as in the

related *Halichondria panicea* (Bowerbank, 1857) whilst settlement of new colonies is likely within one year and growth rate is rapid. Sponges may also regrow from tissue remaining in crevices or other irregularities and that were not affected by the abrasion. Therefore, an intolerance of intermediate is suggested with a recoverability of high.

Displacement	High	High	Moderate	Moderate

The sponge is attached to the substratum and is unlikely to survive being detached and displaced even though it remains in the area unless the location is very sheltered from disturbing conditions such as wave action. It is possible that detached colonies that become trapped under boulders or in fissures may re-attach. Settlement of new colonies is likely within one year and the growth rate is rapid. Sponges may also regrow from tissue remaining in crevices or other irregularities and that were not affected by the displacement.

Chemical Pressures

	Intolerance	Recoverability	Sensitivity	Confidence
Synthetic compound contamination		Not relevant		Not relevant

Insufficient information.

Heavy metal contamination		Not relevant		Not relevant

Insufficient information.

Hydrocarbon contamination	Low	High	Low	Low

Very little information has been found. It appears that the similar species *Halichondria panicea* survived in areas affected by the *Torrey Canyon* oil spill (Smith, 1968), although few observations were made. If mortality occurred, settlement of new colonies is likely within one year and growth rate is rapid.

Radionuclide contamination		Not relevant		Not relevant

Insufficient information.

Changes in nutrient levels	Not relevant	Not relevant		Not relevant

Insufficient information.

Increase in salinity	Tolerant	Not relevant	Not sensitive	Low

Halichondria bowerbanki is euryhaline (Vethaak *et al.*, 1982) and occurs in areas subject to full and low salinity and tolerant has been suggested.

Decrease in salinity	Tolerant	Not relevant	Not sensitive	Low

Halichondria bowerbanki is euryhaline and has been recorded in polyhaline lagoons in the Oosterschelde (Vethaak *et al.*, 1982). It seems likely that it will survive acute changes for a few days because the sponge grows in areas subject to high freshwater outflow in periods of heavy river flow and, overall, tolerant has been suggested.

Changes in oxygenation	Intermediate	High	Low	Low

Halichondria bowerbanki lives in areas of flowing water, which suggests that it is likely to need a good supply of oxygen for survival. Cole *et al.* (1999) suggest possible adverse effects on marine species below 4 mg/l and probable adverse effects below 2mg/l. However, no information was found concerning the tolerance of *Halichondria bowerbanki* to changes in oxygenation. Settlement of new colonies is likely within one year and the growth rate is rapid.

Biological Pressures

	Intolerance	Recoverability	Sensitivity	Confidence
Introduction of microbial pathogens/parasites		Not relevant		Not relevant

No literature was found concerning diseases and parasites in *Halichondria bowerbanki*. The similar sponge *Halichondria panicea* has a mechanism for sloughing off the outer tissue layer (Bartel & Wolfrath, 1989) which may also be a means of removing pathogens or epizooites.

Introduction of non-native species	Tolerant	Not relevant	Not sensitive	Low

There are no alien species currently known to compete with or adversely affect *Halichondria bowerbanki*.

Extraction of this species	Not relevant	Not relevant	Not relevant	Moderate

No targeted extraction of this species is known. Were it to be extracted, it is expected that tissue would be left behind and would regrow. Growth rates of about 5% per week are recorded for the similar *Halichondria panicea* (Barthel, 1988).

Extraction of other species	Not relevant	Not relevant	Not relevant	Not relevant

The species is not known to be associated with other species that might be extracted.

Additional information

Importance review

Policy/legislation

Status

National (GB) importance	-	**Global red list (IUCN) category**	-

Non-native

Native	Non-native		
Origin	Northwestern Pacific	**Date Arrived**	2008

Importance information

None.

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