A bristleworm (*Spiophanes bombyx*)

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

Olwen Ager  
2005-11-24

A report from:  
The Marine Life Information Network, Marine Biological Association of the United Kingdom.

**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/1705](https://www.marlin.ac.uk/species/detail/1705). All terms and the MarESA methodology are outlined on the website (https://www.marlin.ac.uk)

This review can be cited as:  

The information (TEXT ONLY) provided by the Marine Life Information Network (MarLIN) is licensed under a Creative Commons Attribution-Non-Commercial-Share Alike 2.0 UK: England & Wales License. Note that images and other media featured on this page are each governed by their own terms and conditions and they may or may not be available for reuse. Permissions beyond the scope of this license are available [here](https://www.marlin.ac.uk). Based on a work at [www.marlin.ac.uk](https://www.marlin.ac.uk)
Spiophanes bombyx is a small, slender bristleworm (5-6 cm long by 0.15 cm wide). Its body is divided into approximately 180 chaetae bearing segments (chaetigers). Chaetigers 5-15 have tufts of long, silky threads laterally along them. Spiophanes bombyx has two long frontal horns on the prostomium and a stout rearward pointing horn. Its palps are short. Spiophanes bombyx has no gills or anal funnel. It is bright pink in colour turning greenish brown at the rear end. Spiophanes bombyx inhabits a stiff sandy tube which usually protrudes slightly above the surface.

Recorded distribution in Britain and Ireland
Spiophanes bombyx is found off most British coasts.

Global distribution
Spiophanes bombyx is found in the Mediterranean, the north Pacific and the north-east and North American coasts of the Atlantic.

Habitat
Spiophanes bombyx is found in clean sand from the low water mark to over 60 m. It may occupy...
A bristleworm (*Spiophanes bombyx*) - Marine Life Information Network

depths down to over 1 km and may penetrate into estuaries.

**Depth range**

0-60m

**Identifying features**

- Flattened body, 5-6 cm long, 0.15 cm wide.
- Up to 180 chaetae bearing segments.
- Tufts of long, silky threads laterally on chaetigers 5-15.
- Short palps.
- Prostomium with 2 long frontal horns.
- Gills absent
- Two longitudinal ciliated sensory grooves.
- Bright pink to red, greenish brown at rear.

**Additional information**

-none-

**Listed by**

**Further information sources**

Search on:

https://www.marlin.ac.uk/habitats/detail/1705
## Biology review

### Taxonomy

<table>
<thead>
<tr>
<th>Phylum</th>
<th>Annelida</th>
<th>Segmented worms e.g. ragworms, tubeworms, fanworms and spoon worms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>Polychaeta</td>
<td>Bristleworms, e.g. ragworms, scaleworms, paddleworms, fanworms, tubeworms and spoon worms</td>
</tr>
<tr>
<td>Order</td>
<td>Spionida</td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td>Spionidae</td>
<td></td>
</tr>
<tr>
<td>Genus</td>
<td>Spiophanes</td>
<td></td>
</tr>
<tr>
<td>Authority</td>
<td>(Claparède, 1870)</td>
<td></td>
</tr>
</tbody>
</table>

### Biology

- **Typical abundance**: High density
- **Male size range**: 1-6cm
- **Male size at maturity**:  
- **Female size range**: Small-medium(3-10cm)
- **Female size at maturity**:  
- **Growth form**: Tubicolous
- **Growth rate**: No information found
- **Body flexibility**: High (greater than 45 degrees)
- **Mobility**:  
- **Characteristic feeding method**: Passive suspension feeder, Surface deposit feeder
- **Diet/food source**: Sediment particles, planktonic organisms, meiobenthic organisms (Dauer et al., 1981).
- **Sociability**:  
- **Environmental position**: Infaunal
- **Dependency**: Independent.
- **Supports**: None
- **Is the species harmful?**: No information

### Biology information

#### Feeding

During suspension feeding captured particles are accumulated in a ciliated groove before being transported to the pharynx, this is termed 'basal' food groove accumulation behaviour (Dauer et al., 1981). *Spiophanes bombyx* is thought to be the only spionid that displays this unique behaviour.

#### Habitat preferences
A bristleworm (*Spiophanes bombyx*) - Marine Life Information Network

**Physiographic preferences**
Open coast, Strait / sound, Sea loch / Sea lough, Estuary, Enclosed coast / Embayment

**Biological zone preferences**
Lower eulittoral, Lower infrafllittoral, Sublittoral fringe, Upper infrafllittoral

**Substratum / habitat preferences**
Fine clean sand, Sandy mud

**Tidal strength preferences**
Moderately Strong 1 to 3 knots (0.5-1.5 m/sec.), Very Weak (negligible), Weak < 1 knot (<0.5 m/sec.)

**Wave exposure preferences**
Extremely sheltered, Sheltered, Ultra sheltered, Very sheltered

**Salinity preferences**
Full (30-40 psu), Variable (18-40 psu)

**Depth range**
0-60m

**Other preferences**
Non-migratory / resident

**Habitat Information**

---

**Life history**

**Adult characteristics**

**Reproductive type**
Gonochoristic (dioecious)

**Reproductive frequency**
Annual protracted

**Fecundity (number of eggs)**
No information

**Generation time**
Insufficient information

**Age at maturity**
Insufficient information

**Season**
April - December

**Life span**
See additional information

**Larval characteristics**

**Larval/propagule type**
-

**Larval/juvenile development**
Planktotrophic

**Duration of larval stage**
See additional information

**Larval dispersal potential**
See additional information

**Larval settlement period**
Insufficient information

**Life history information**

**Reproduction**

*Spiophanes bombyx* is regarded as a typical 'r' selecting species with a short lifespan, high dispersal potential and high reproductive rate (Kröncke, 1990; Niermann et al., 1990). It is often found at the early successional stages of variable, unstable habitats that it is quick to colonize following
p perturbation (Pearson & Rosenberg, 1978). Its larval dispersal phase may allow the species to colonize remote habitats.
**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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Intolerance</th>
<th>Recoverability</th>
<th>Sensitivity</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Substratum Loss</strong></td>
<td>High</td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
</tr>
</tbody>
</table>

*Spiophanes bombyx* lives in the sediment and a loss of substratum would cause a loss of population. Therefore, an intolerance of high has been recorded. Recoverability has been recorded as high (see additional information below).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Low</th>
<th>High</th>
<th>Low</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smothering</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Spiophanes bombyx* lives in the sediment and uses sediment grains to make its tube. It is likely that *Spiophanes bombyx* will be able to move up through any extra sediment, therefore, intolerance has been recorded as low. However, smothering by impermeable material is likely to result in anoxic conditions and have a greater impact.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Low</th>
<th>Not relevant</th>
<th>Not sensitive</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Increase in suspended sediment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Spiophanes bombyx* lives in the sediment and is unlikely to be perturbed by an increase in suspended sediment. Therefore, tolerant has been recorded.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Low</th>
<th>Immediate</th>
<th>Not sensitive</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Decrease in suspended sediment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Spiophanes bombyx* is a surface deposit feeder and relies on a supply of nutrients at the sediment surface. A decrease in suspended sediment is likely to lead to a reduction in the amount of available food. A reduction in food availability may impair growth and reproduction but is unlikely to cause mortality. Intolerance has, therefore, been recorded as low. The benchmark states the decrease in siltation would only happen for a month. Once the level of suspended sediment increases normal feeding could resume and recoverability has therefore been recorded as immediate.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Intermediate</th>
<th>High</th>
<th>Low</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dessication</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Spiophanes bombyx* is an infaunal species and is therefore, likely to be protected from desiccation by water retained in the sediment. *Spiophanes bombyx* is found in the intertidal suggesting some level of tolerance to emersion of the substratum. If an individual was removed from the substratum and was unable to reburrow it is likely to result in mortality. Intertidal populations are likely to be adversely affected by an increase in desiccation equivalent to a movement from low to mid shore. Therefore, intolerance has been recorded as intermediate. A recoverability of high has been recorded (see additional information below).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Intermediate</th>
<th>High</th>
<th>Low</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Increase in emergence regime</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

An increase in emergence will lead to an increase in desiccation stress. *Spiophanes bombyx* is found in the intertidal so may be tolerant to some emersion of the substratum. *Spiophanes bombyx* will probably retract into its tube to reduce the effects of desiccation. Intolerance has, therefore, been recorded as intermediate. A recoverability of high has been recorded (see additional information below).
**Decrease in emergence regime**

*Spiophanes bombyx* is found subtidally and a decrease in emergence is unlikely to have any detrimental effects. It is possible that decreased emergence may allow the species to colonize further up the shore. Hence, not sensitive* has been recorded.

**Increase in water flow rate**

A change in water flow rate will change sediment characteristics. An increase in water flow rate will increase deposits of coarser sediments. *Spiophanes bombyx* preferred substratum is fine sands, therefore a change in sediment characteristics may result in a reduced distribution and extent of the population. A recoverability of high has been recorded (see additional information below).

**Decrease in water flow rate**

A change in water flow rate will change sediment characteristics. A decrease in water flow rate will increase the deposit of finer sediments. The preferred substratum of *Spiophanes bombyx* is finer sands, therefore, a change in the sediment characteristics may lead to an increase in the distribution and extent of the population. Therefore, tolerant* has been recorded.

**Increase in temperature**

No information was found regarding the intolerance of *Spiophanes bombyx* to temperature. However, inferences can be made from its geographical distribution. *Spiophanes bombyx* is found in the Mediterranean (Hayward & Ryland, 1995), which is likely to be warmer than the waters around Britain and Ireland. Chronic temperature change is likely to have little, or no effect. An acute change in temperature at the benchmark level may cause physiological stress but is unlikely to lead to mortality. Intolerance has, therefore, been recorded as low. A recoverability of very high has been recorded (see additional information below).

**Decrease in temperature**

No information was found regarding the intolerance of *Spiophanes bombyx* to temperature. However inferences can be made from its geographical distribution. *Spiophanes bombyx* is found in water off Denmark (Thorson, 1946) which are likely to be colder than British and Irish waters. Chronic temperature change is likely to have little, or no effect. An acute change in temperature at the benchmark level may result in physiological stress, but is unlikely to lead to mortality. Intolerance has, therefore, been recorded as low. A recoverability of very high has been recorded (see additional information below).

**Increase in turbidity**

*Spiophanes bombyx* is found in estuarine regions which experience high levels of turbidity. An increase in turbidity will lead to reduced light penetration of the water column. *Spiophanes bombyx* is not affected by light availability, therefore, tolerant has been recorded.

**Decrease in turbidity**

*Spiophanes bombyx* is not affected by light availability, therefore, tolerant has been recorded.

**Increase in wave exposure**

*Spiophanes bombyx* inhabits low energy depositional environments. An increase in wave exposure will lead to erosion of the substratum, which will alter the extent of suitable habitats available for *Spiophanes bombyx*. Intolerance has, therefore, been recorded as high. Recoverability has been recorded as high (see additional information below).
Spiophanes bombyx occurs from sheltered to ultra sheltered habitats. A decrease in wave exposure is unlikely to adversely affect Spiophanes bombyx and, therefore, tolerant has been recorded.

No information was found concerning intolerance of Spiophanes bombyx to noise. However, it is unlikely to be affected by noise and vibrations at the level of the benchmark.

Spiophanes bombyx inhabits a tube and its visual range is probably very limited. Not sensitive has, therefore, been recorded.

Spiophanes bombyx is a soft bodied organism that exposes its palps at the surface while feeding. It lives infaunally in sandy sediment and any physical disturbance that penetrates the sediment, for example dredging or dragging an anchor, would lead to physical damage of Spiophanes bombyx. Bergman & Hup (1992) reported a 40-60% decrease in the total density of Spiophanes bombyx after 3 trawling events. Therefore, an intolerance of intermediate has been recorded. Hall et al. (1990) investigated the impact of hydraulic dredging for razor clams. They reported that any effects only persist for a short time, with the community restored after approximately 40 days. Similarly, Jennings & Kaiser (1995) suggested that the top few centimetres of the sediment were usually occupied by opportunistic species, such as spionids, capitellid polychaetes and amphipods, which were able to recolonize disturbed areas quickly. They further suggested that this surface community would probably recover within 6 -12 months. Therefore, a recoverability of very high has been recorded (see additional information below).

If Spiophanes bombyx is displaced from the substratum it is likely that it could burrow back into the sediment. It would however, be more susceptible to predation. Therefore, intolerance has been recorded as low. A recoverability of very high has been recorded (see additional information below).

No information was found directly relating to the effects of synthetic chemicals on Spiophanes bombyx. However, there is evidence from other polychaete species. Collier & Pinn (1998) investigated the effect on the benthos of ivermectin, treatment for infestations of sea-lice on farmed salmonids. The ragworm Hediste diversicolor exhibited 100% mortality after 14 days when exposed to 8mg/m² of Ivermectin in a microcosm. The blow lug, Arenicola marina, was also intolerant of Ivermectin through ingestion of contaminated sediment (Thain et al., 1998; cited in Collier & Pinn 1998) and it was suggested that deposit feeding was an important route for exposure to toxins. Beaumont et al. (1989) investigated the effects of tri-butyl tin (TBT) on benthic organisms. At concentrations of 1-3µg/l there was no significant effect on the abundance of Hediste diversicolor or Cirratulus cirratus after 9 weeks in a microcosm. However, no juvenile polychaetes were retrieved from the substratum so TBT may have had an effect on the larval and/or juvenile stages of these polychaetes. The high mortality rate of polychaetes
due to exposure to Ivermectin suggests a high intolerance to synthetic chemicals. Therefore, an intolerance of high has been recorded at a very low level of confidence. Recoverability has been recorded as high (see additional information below).

**Heavy metal contamination**

No direct information was found regarding the intolerance of *Spiophanes bombyx* to heavy metals. However, Crompton (1997) suggests the following concentrations of heavy metals would result in the mortality of annelids after short term (4-14 days) exposure:

- Hg 0.1-1mg/l.
- Cu 0.01-0.1mg/l.
- Cd 1-10mg/l.
- Zn 1-10mg/l.
- Pb 0.1-1mg/l.
- Cr 0.1-1mg/l.
- As 1-10mg/l.
- Ni 10-100mg/l.

Bryan (1984) suggests polychaetes are fairly resistant to heavy metals, therefore, intolerance has been recorded as intermediate. A recoverability of high has been recorded (see additional information below).

**Hydrocarbon contamination**

Generally soft sediment inhabitants, especially infaunal polychaetes, are particularly effected by oil pollution (Suchanek, 1993). Jacobs (1980) investigated the effects of the Amoco Cadiz oil spill in 1978. The numbers of spionidae polychaetes decreased after the spill. Capitellid polychaetes recovered very quickly, spionids took slightly longer but did recover quickly. Intolerance has, therefore, been recorded as intermediate. A recoverability of high has been recorded (see additional information below).

**Radionuclide contamination**

No evidence was found regarding the intolerance of *Spiophanes bombyx* to radionuclide contamination.

**Changes in nutrient levels**

Moderate nutrient levels may be beneficial to *Spiophanes bombyx* but increased nutrient enrichment may result in a community dominated by opportunist species (e.g. capitellids followed by spionids). This results in an increase of abundance but a decrease in species richness eventually leading to abiotic, anoxic sediments (Pearson & Rosenberg, 1978). Intolerance, has therefore been recorded as low. A recoverability of high has been recorded (see additional information below).

**Increase in salinity**

No information was found concerning the reaction of *Spiophanes bombyx* to hypersaline conditions (>40psu). It is unlikely that *Spiophanes bombyx* would experience hypersaline conditions, therefore, not relevant has been recorded.

**Decrease in salinity**

*Spiophanes bombyx* is a euryhaline species (Bailey-Brook, 1976; Maurer & Lethem, 1980), inhabiting fully saline and estuarine habitats. Intolerance has, therefore, been recorded as low, at the benchmark level.
Changes in oxygenation

Nierman et al. (1990) reported changes in a fine sand community for the German Bight in an area with regular seasonal hypoxia. In 1983, oxygen levels were exceptionally low <3mg O₂/l in large areas and < 1mg O₂/l in some areas. Species richness decrease by 30-50% and overall biomass fell. Spiophanes bombyx was found in small numbers at some, but not all areas, during the period of hypoxia. Once oxygen levels returned to normal Spiophanes bombyx increased in abundance. The benchmark is for 2mg O₂/l for 1 week. The evidence suggests that at least some Spiophanes bombyx would survive hypoxic conditions, therefore, intolerance has been recorded as intermediate. A recoverability of high has been recorded (see additional information below).

Biological Pressures

<table>
<thead>
<tr>
<th>Biological Pressure</th>
<th>Intolerance</th>
<th>Recoverability</th>
<th>Sensitivity</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction of microbial pathogens/parasites</td>
<td>Not relevant</td>
<td>Not relevant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introduction of non-native species</td>
<td>Not relevant</td>
<td>Not relevant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraction of this species</td>
<td>Not relevant</td>
<td>Not relevant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraction of other species</td>
<td>Intermediate</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

Bergman & Hup (1992) found that there was a 40-60% decrease in the density of Spiophanes bombyx after beam trawling. Hall et al. (1990) investigated the impact of hydraulic dredging for razor clams. They reported that any effects only persist for a short time, after 40 days there was no significant difference in the infaunal community. Intolerance has therefore been recorded as intermediate. A recoverability of high has been recorded (see additional information below).

Additional information

Recoverability

Spiophanes bombyx is regarded as a typical 'r' selecting species with a short life span, high dispersal potential and high reproductive rate (Kröencke, 1980; Niermann et al., 1990). It is often found at the early successional stages of variable, unstable habitats that it is quick to colonize following perturbation (Pearson & Rosenberg, 1978). Its larval dispersal phase may allow the species to colonize remote habitats.
Importance review

Policy/legislation

- no data -

Status

<table>
<thead>
<tr>
<th>National (GB)</th>
<th>Global red list (IUCN) category</th>
</tr>
</thead>
<tbody>
<tr>
<td>importance</td>
<td>-</td>
</tr>
</tbody>
</table>

Non-native

| Native | - |
| Origin | Date Arrived |
|        | - |

Importance information

Structure

Tube building worms, including *Spiophanes bombyx*, modify the sediment making it suitable for later colonization and succession (Gallagher *et al.*, 1983)
Bibliography


Datasets


Environmental Records Information Centre North East, 2018. ERIC NE Combined dataset to 2017. Occurrence
South East Wales Biodiversity Records Centre, 2018. SEWBReC Worms (South East Wales). Occurrence dataset: https://doi.org/10.15468/5vh0w8 accessed via GBIF.org on 2018-10-02.