A bristleworm (*Spiophanes bombyx*)

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

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Spiophanes bombyx.
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Researched by	Olwen Ager	**Refereed by**	This information is not refereed.
Authority	(Claparède, 1870)		
Other common names	-	**Synonyms**	-

Summary

Description

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

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

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Biology review

Taxonomy

Phylum	Annelida	Segmented worms e.g. ragworms, tubeworms, fanworms and spoon worms
Class	Polychaeta	Bristleworms, e.g. ragworms, scaleworms, paddleworms, fanworms, tubeworms and spoon worms
Order	Spionida	
Family	Spionidae	
Genus	Spiophanes	
Authority	(Claparède, 1870)	
Recent Synonyms	-	

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	
Typically feeds on	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

Physiographic preferences	Open coast, Strait / sound, Sea loch / Sea lough, Estuary, Enclosed coast / Embayment
Biological zone preferences	Lower eulittoral, Lower infralittoral, Sublittoral fringe, Upper infralittoral
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	
Migration Pattern	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	
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

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

	Intolerance	Recoverability	Sensitivity	Confidence
Substratum Loss	High	High	Moderate	Low

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).

Smothering	Low	High	Low	Low

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.

Increase in suspended sediment	Tolerant	Not relevant	Not sensitive	Low

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

Decrease in suspended sediment	Low	Immediate	Not sensitive	Low

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.

Dessication	Intermediate	High	Low	Low

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).

Increase in emergence regime	Intermediate	High	Low	Low

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 Tolerant* Not relevant Not sensitive* Low

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 sensitve* has been recorded.

Increase in water flow rate High High Moderate Low

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 Tolerant* Not relevant Not sensitive* Low

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 Low Very high Very Low Low

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 Low Very high Very Low Low

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 Tolerant Not relevant Not sensitive Not relevant

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 Tolerant Not relevant Not sensitive Not relevant

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

Increase in wave exposure High High Moderate Low

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).

Decrease in wave exposure Tolerant Not relevant Not sensitive Not relevant

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.

Noise Not relevant Not relevant

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.

Visual Presence Not relevant Not relevant

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

Abrasion & physical disturbance Intermediate Very high Low High

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).

Displacement Low Very high Very Low Low

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).

Chemical Pressures

	Intolerance	Recoverability	Sensitivity	Confidence
Synthetic compound contamination	High	High	Moderate	Very low

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/m^2 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 Intermediate High Low Low

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 Intermediate High Low Moderate

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 Not relevant Not relevant

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

Changes in nutrient levels Low High Low Moderate

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 Not relevant Not relevant Not relevant Not relevant

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 Low High Low Moderate

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	Intermediate	High	Low	Moderate

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 O_2/l in large areas and < 1mg O_2/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 O_2/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

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

No information was found on diseases of *Spiophanes bombyx*.

Introduction of non-native species		Not relevant		Not relevant

No information was found on non-native species that may compete with *Spiophanes bombyx*.

Extraction of this species		Not relevant		Not relevant

No information was found that *Spiophanes bombyx* is extracted deliberately, therefore, not relevant has been recorded.

Extraction of other species	Intermediate	High	Low	High

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

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

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)

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