MarLIN
Marine Information Network
Information on the species and habitats around the coasts and sea of the British Isles

Laver spire shell (*Peringia ulvae*)

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

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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/1295]. All terms and the MarESA methodology are outlined on the website (https://www.marlin.ac.uk)

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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	Angus Jackson	**Refereed by**	Dr Richard S.K. Barnes
Authority	(Pennant, 1777)		
Other common names	-	**Synonyms**	*Peringia ulvae* , *Peringia ulvae* (Pennant, 1777), *Hydrobia ulvae*

Summary

Description

A small spiralling shell with six whorls. Up to 6 mm high but more typically around 4 mm. The shell is brown to yellow in colour. The body of the snail is a clear grey frequently with various pigment spots.

Recorded distribution in Britain and Ireland

Found on all British and Irish coasts

Global distribution

Atlantic, English Channel, North Sea and Baltic. Insufficient detail available to map distribution.

Habitat

Typically found on muddy sand, in estuaries and salt marshes. Sometimes also in lagoons and other

areas of reduced salinity. Frequently associated with seagrass beds. Highest densities found mid-tidally but has been recorded down to 100 m depth.

Depth range

0-100

Identifying features

- Very small brown spiral shell.
- Whorls of shell not swollen.
- Outer lip of operculum is straight where it meets the body whorl.
- Tentacles have a rectangular, black mark near the tip.
- Left tentacle thicker than the right.
- The shape of the penis is the best identification feature
- Larvae have characteristic conspicuous pigment cells in a v-shape on the foot.
- Larval shell has longitudinal ridges.

Additional information

Also known as the mud snail. Many synonyms have been used in the past but *Peringia ulvae* is the only one used recently. *Hydrobia ulvae* is now the standard usage although *Peringia* is often used as a sub-genus of *Hydrobia*. *Hydrobia neglecta* has a black 'v' mark near the tip of the tentacles.
The taxonomy of the Gastropoda has been recently revised (see Ponder & Lindberg 1997, and Taylor 1996). Ponder & Lindberg (1997) suggest that Mesogastropoda should be included in a monophyletic clade, the Caenogastropoda.

Listed by

Further information sources

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Biology review

Taxonomy

Phylum	Mollusca	Snails, slugs, mussels, cockles, clams & squid
Class	Gastropoda	Snails, slugs & sea butterflies
Order	Littorinimorpha	
Family	Hydrobiidae	
Genus	Peringia	
Authority	(Pennant, 1777)	
Recent Synonyms	Peringia ulvae Peringia ulvae (Pennant, 1777)Hydrobia ulvae	

Biology

Typical abundance	High density
Male size range	0.3 - 6mm
Male size at maturity	
Female size range	c. 1.5 - 2.0mm
Female size at maturity	
Growth form	Turbinate
Growth rate	Data deficient
Body flexibility	
Mobility	
Characteristic feeding method	No information, Surface deposit feeder
Diet/food source	
Typically feeds on	Detritus, periphytic microalgae.
Sociability	
Environmental position	Epifaunal
Dependency	Independent.
Supports	Host over 50 species of digenean trematode.
Is the species harmful?	No No text entered

Biology information

The males can be distinguished by a visible penis. Frequently found in very high densities - has been recorded up to 300,000 per square metre. Growth rate varies with time of year and with degree of parasite infestation. Parasite infestation is believed to cause increased growth rates, gigantism and altered morphology in this species. Parasitised snails may reach up to 9mm in height. Parasitism also affects behaviour, slowing locomotion and reducing burrowing activity. The feeding method of *Hydrobia ulvae* can also be classified as 'microbrowser'.

Habitat preferences

Physiographic preferences	Open coast, Sea loch / Sea lough, Ria / Voe, Estuary, Isolated saline water (Lagoon), Enclosed coast / Embayment, Open coast, Sea loch / Sea lough, Ria / Voe, Estuary, Isolated saline water (Lagoon), Enclosed coast / Embayment
Biological zone preferences	Lower eulittoral, Lower infralittoral, Lower littoral fringe, Mid eulittoral, Sublittoral fringe, Upper eulittoral, Upper infralittoral, Upper littoral fringe, Lower eulittoral, Lower infralittoral, Lower littoral fringe, Mid eulittoral, Sublittoral fringe, Upper eulittoral, Upper infralittoral, Upper littoral fringe
Substratum / habitat preferences	Mud, Muddy sand, Sandy mud, Mud, Muddy 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.), 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, Extremely sheltered, Sheltered, Ultra sheltered, Very sheltered
Salinity preferences	Full (30-40 psu), Low (<18 psu), Reduced (18-30 psu), Variable (18-40 psu), Full (30-40 psu), Low (<18 psu), Reduced (18-30 psu), Variable (18-40 psu)
Depth range	0-100
Other preferences	No text entered
Migration Pattern	Non-migratory / resident

Habitat Information

Often found as high as the high level strand line in a dried blanket of green algae. They appear to be dead but rapidly revive when returned to more suitable conditions. *Hydrobia ulvae* does not undertake any true migration but considerable dispersal is possible through floating at the surface using a mucous raft. A cycle of climbing, floating and crawling up and down the shore has been hypothesised. Work by Barnes (1981) suggests however that climbing is simply part of normal browsing behaviour.

Life history

Adult characteristics

Reproductive type	Gonochoristic (dioecious)
Reproductive frequency	Annual protracted
Fecundity (number of eggs)	11-100
Generation time	Insufficient information
Age at maturity	6 - 12 months
Season	March - October
Life span	1-2 years

Larval characteristics

Larval/propagule type	-
Larval/juvenile development	Lecithotrophic
Duration of larval stage	11-30 days
Larval dispersal potential	Greater than 10 km
Larval settlement period	Insufficient information

Life history information

The longevity of this species is debatable. *Hydrobia ulvae* may live up to five years in aquaria and over four years in the arctic. Various studies have suggested that it lives from just over 1 year up to 2.5 years. Individuals hatching from eggs laid in spring can breed in autumn, whereas those hatching in autumn overwinter before breeding in spring. The species is gonochoristic and sperm transfer occurs by copulation. Minimum egg hatching time has been recorded as five days. There is considerable conflicting evidence over the developmental mechanism of the larvae of this species. Some workers (Fish & Fish, 1977a,b) have found the planktonic stage to last up to four weeks and development to be entirely planktotrophic. Others (Pilkington, 1971) have found the planktonic stage to be completely absent with a nonfeeding benthic larva that metamorphoses after just two days. Snails producing planktotrophic forms have several (7-22) smaller eggs that hatch into veliger larvae at around 150 microns. Snails producing lecithotrophic forms lay fewer (3-7) larger eggs. Maximum number of eggs recorded from one mass is 50. The timing of the breeding season varies with latitude. In the north of Scotland there is a short spawning period in Spring. In populations further south the spawning period is more protracted and is split into two peaks (spring and autumn). Eggs are laid preferentially on the shells of live individuals of this species but also on empty shells and grains of sand. The egg mass acquires a protective layer of sand grains.

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

Removal of the substratum will also result in the removal of the population. The breeding season is often quite protracted. The dispersive ability of the abundant pelagic larval form is considerable. Populations that have the benthic larval form will recover less rapidly. Adults can immigrate into the area by floating on a mucous raft.

Smothering	Intermediate	Very high	Low	High

For an epifaunal species, *Hydrobia ulvae* is quite tolerant of smothering. However, survival depends and several factors. The snail can only burrow up through certain sorts of sediment. If the silt content of the smothering sediment is high and the water content low then it is unlikely that the surface will be regained from 5 cm down. Looser sediment with high water and low silt content can be negotiated quite rapidly. The surface is generally regained within a day. If the surface cannot be regained then *Hydrobia ulvae* can survive burial for quite extended periods although this is highly temperature dependent. Temperatures of 20 degrees Centigrade result in all individuals dying after 10 days. Survival is much better at lower temperatures. It is thought that oxygen stress is the cause of mortality. The breeding season is often quite protracted. The dispersive ability of the abundant pelagic larval form is considerable. Adults can also immigrate into the area by floating on a mucous raft.

Increase in suspended sediment	Tolerant	Not relevant	Not sensitive	Low

Detritus forms one of the main food sources for this species so increased siltation may be beneficial. As the snail lives in and on sediment, increases in sediment deposition will probably not affect locomotion.

Decrease in suspended sediment

Dessication	Low	Immediate	Not sensitive	Moderate

When emersed and not active the snail part buries itself in the mud to reduce desiccation and temperature extremes. The species can tolerate desiccating conditions for extended periods. The snail can be left at the high strandline and not be covered by the tides for periods over a week without any adverse effects. Feeding and/or reproduction is limited during this time. Activity resumes as normal when the next spring tides wash the snails back into regular tidal coverage.

Increase in emergence regime	Low	Immediate	Not sensitive	Moderate

The snail is subject to highly variable emergence regimes anyway. Following any flotation on a mucous raft the snails location on the shore depends on where the previous tide left it. Feeding or reproduction may be hindered at higher elevations on the shore. Activity resumes as normal when the next spring tides wash the snails back into regular tidal coverage.

Decrease in emergence regime

Increase in water flow rate Intermediate Very high Low Moderate

This species prefers some water movement but is also found in isolated lagoons with negligible water flow. Decreases in water flow are unlikely to have any effect. Increases in water flow rate may restrict locomotion on the seabed, wash floating individuals elsewhere, continually displace individuals on the seabed and reduce the detritus available for feeding. The breeding season is often quite protracted. The dispersive ability of the abundant pelagic larval form is considerable. Adults can also immigrate into the area by floating on a mucous raft.

Decrease in water flow rate

Increase in temperature Intermediate Immediate Very Low

The species is quite tolerant of extremes in temperature. Can survive air temperatures below freezing. The snails can sometimes being exposed continuously to the air for several days between spring tides. This gives the potential for exposure to quite high air temperatures. Higher temperatures have been implicated in the proliferation of trematode parasites which have caused mass mortalities. The breeding season is often quite protracted. The dispersive ability of the abundant pelagic larval form is considerable. Adults can also immigrate into the area by floating on a mucous raft.

Decrease in temperature

Increase in turbidity Tolerant Not relevant Not sensitive Low

This species probably has very limited facility for visual perception and as such is unlikely affected by turbidity.

Decrease in turbidity

Increase in wave exposure High High Moderate Low

The species tends not to inhabit particularly exposed areas primarily due to the lack of suitable muddy habitat. Decreases in wave exposure will have no effect. Increases in wave exposure are likely to kill the population either directly through physical damage, continual displacement and washing away or indirectly through change of substratum. The breeding season is often quite protracted. The dispersive ability of the abundant pelagic larval form is considerable. Populations that have the benthic larval form will recover less rapidly. Adults can immigrate into the area by floating on a mucous raft.

Decrease in wave exposure

Noise Tolerant Not relevant Not sensitive High

This species probably has very limited facility for vibration detection and as such is unlikely to be sensitive to noise.

Visual Presence Tolerant Not relevant Not sensitive High

This species probably has very limited facility for visual perception and as such is unlikely to be sensitive to visual presence.

Abrasion & physical disturbance Low Very high Very Low Low

The small nature of the species means that physical impact may cause death. Slight damage to the shell at the growing edge can probably be repaired. However, this species is very small and

is likely to pass through a passing scallop dredge, or be pushed aside by an anchor. Physical disturbance is more likely to remove this species, its substratum (see above) or to displace individuals (see below). Therefore, an intolerance of low has been recorded. The breeding season is often quite protracted. The dispersive ability of the abundant pelagic larval form is considerable. Adults can also immigrate into the area by floating on a mucous raft.

Displacement	Tolerant	Not relevant	Not sensitive	Low

The species is mobile and can disperse by floating on a mucous raft. Displacement will have no effect.

Chemical Pressures

	Intolerance	Recoverability	Sensitivity	Confidence
Synthetic compound contamination	Low	Immediate	Not sensitive	Moderate

Reported as present in polluted waters, recorded from the Mersey estuary which is subject to industrial pollution.

Heavy metal contamination	Not relevant

Insufficient information

Hydrocarbon contamination	Intermediate	Very high	Low	Moderate

Information regarding Hydrobia ulvae in particular is not available although observations following the Amoco Cadiz oil spill at Roscoff showed that gastropod populations were greatly reduced. Populations had recovered a year later. The breeding season is often quite protracted. The dispersive ability of the abundant pelagic larval form is considerable. Adults can also immigrate into the area by floating on a mucous raft.

Radionuclide contamination	Not relevant

Insufficient information

Changes in nutrient levels	Low	Immediate	Not sensitive	Moderate

Reported as present in polluted waters, recorded from the Mersey estuary which is subject to sewage pollution.

Increase in salinity	Tolerant	Not relevant	Not sensitive	Moderate

The species is found in a wide range of salinities so changes of one or two salinity bands will be unlikely to have any effect.

Decrease in salinity

Changes in oxygenation	Intermediate	Very high	Low	Moderate

The species can live in conditions of reduced oxygen concentration but can die if combined with smothering or other stresses. The breeding season is often quite protracted. The dispersive ability of the abundant pelagic larval form is considerable. Adults can also immigrate into the area by floating on a mucous raft.

Biological Pressures

	Intolerance	Recoverability	Sensitivity	Confidence
Introduction of microbial pathogens/parasites	High	High	Moderate	Moderate

There are records of mass mortalities of *Hydrobia ulvae* caused by high temperatures triggering mass development of larval digenean trematodes within the snails. The breeding season is often quite protracted. The dispersive ability of the abundant pelagic larval form is considerable. Populations that have the benthic larval form will recover less rapidly. Adults can immigrate into the area by floating on a mucous raft.

Introduction of non-native species Not relevant

Insufficient information

Extraction of this species Not relevant Not relevant Not relevant Low

It is extremely unlikely that this species would be extracted.

Extraction of other species Tolerant Not relevant Not sensitive Low

This snail has no known obligate relationships with other species.

Additional information

Importance review

Policy/legislation

- no data -

Status

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

Non-native

Native	-		
Origin	-	**Date Arrived**	-

Importance information

National status is not available but is almost certainly widespread. This species can occur in very high densities (up to 300,000 per square metre - levels at which considerable inter and intra specific competition can occur) *Hydrobia ulvae* may comprise up to 75 % of biomass and 90 % of macrofaunal energy flow may pass through it. *Hydrobia ulvae* does not form a known unique food source for any other species but it does form a dietary component of the opisthobranch mollusc *Retusa obtusa*. The hydroid *Cordylophora caspia* may grow on the shell. The species is occasionally used for scientific research.

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