Banded chink shell (*Lacuna vincta*)

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/1287]. All terms and the MarESA methodology are outlined on the website (https://www.marlin.ac.uk)

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The banded chink snail *Lacuna vincta* on kelp.
Photographer: Zoe Cairns

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 John Grahame
Authority	(Montagu, 1803)		
Other common names	-	**Synonyms**	*Lacuna carinata* (Montagu, 1803)

Summary

Description

A common, small sea snail with a distinctly conical shape. Generally a pale horn-colour becoming purplish towards the apex. Brown bands on whorls quite characteristic but sometimes faint or absent. Up to 12 mm high and 5 mm wide.

Recorded distribution in Britain and Ireland

Found on all British and Irish coasts.

Global distribution

Circumboreal extending south to Brittany.

Habitat

Commonly found near the low tide level or in shallow water on seaweed. Often common on *Fucus serratus* and dense red seaweed turf. Inhabits a wide variety of coastlines but requires the shelter of crevices or dense weed in more exposed areas.

Depth range

0-40

Identifying features

- A conical shell with five or six smooth whorls and a pointed apex.
- Umbilicus has a prominent groove or chink.
- Foot has two short flat metapodial tentacles characteristic of the genus.
- Typically pale horn-coloured with brown bands on the whorls.

Additional information

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	Littorinidae	
Genus	Lacuna	
Authority	(Montagu, 1803)	
Recent Synonyms	Lacuna carinata (Montagu, 1803)	

Biology

Typical abundance	Moderate density
Male size range	3-12mm
Male size at maturity	6mm
Female size range	6mm
Female size at maturity	
Growth form	Turbinate
Growth rate	Data deficient
Body flexibility	
Mobility	
Characteristic feeding method	
Diet/food source	
Typically feeds on	detritus, periphytic microalgae, macroalgae epidermis.
Sociability	
Environmental position	Epifaunal
Dependency	Independent.
Supports	None
Is the species harmful?	No

Biology information

Lacuna is a northern genus and the British Isles are near the southern edge of the range of this species. *Lacuna vincta* is rare in France but in north-east England densities have been recorded at 300 per square metre. In eastern Canada over 1,500 have been recorded per square metre. Adults die after spawning and very few can be found on the shore after April (in southern Britain). The population is at a maximum in July (in southern Britain). Immediately after metamorphosis the young snail is about 0.55mm high. The brown bands on the shell develop following settlement. There is a very slight but not conclusive sexual dimorphism with the females being slightly larger. As the snail eats, the radula becomes worn down. Teeth are replaced through new growth. The form of the teeth varies depending on what the snail typically feeds on. This is important for determining feeding effectiveness. Sharp teeth are used for rasping and eating macroalgae whereas broader blunter teeth are used for scraping microalgae from the surface of plants. They do not graze algal film on rocks like the similar winkles.

Habitat preferences

Physiographic preferences	Open coast, Sea loch / Sea lough, Ria / Voe, Estuary
Biological zone preferences	
Substratum / habitat preferences	Macroalgae
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, Moderately exposed, Sheltered, Very sheltered
Salinity preferences	Full (30-40 psu), Low (<18 psu), Reduced (18-30 psu), Variable (18-40 psu)
Depth range	0-40
Other preferences	No text entered
Migration Pattern	Seasonal (reproduction)

Habitat Information

The species is found on a wide variety of coasts round the British Isles. It occasionally settles from the plankton as high as the mid tide level but is more typically found much further down the shore. The larvae settle out on a variety of algal species. The preferred species in the British Isles include *Fucus serratus*, *Laminaria* spp. and on red algal turf, particularly *Lomentaria articulata*. Also sometimes found on *Zostera* spp. *Lacuna vincta* has been recorded in salinities as low as 12-13 psu. Larval settlement from the plankton may occur in water velocities of 2.2m/s. There is a possible inshore migration by subtidal individuals in spring for breeding. The species requires considerable shelter from wave action and water flow. It acquires this shelter by selecting suitable habitats Exposure to adversely strong water currents may result in lifting of the foot and production of long sticky mucus threads allowing passive drifting in the water column to disperse to better conditions.

Life history

Adult characteristics

Reproductive type	Gonochoristic (dioecious)
Reproductive frequency	Annual protracted
Fecundity (number of eggs)	10,000-100,000
Generation time	<1 year
Age at maturity	Insufficient information
Season	January - December
Life span	<1 year

Larval characteristics

Larval/propagule type	-
Larval/juvenile development	Planktotrophic
Duration of larval stage	1-6 months
Larval dispersal potential	Greater than 10 km

Larval settlement period	Peak May/June or September: See additional info.

Life history information

In the field the species survives for a year or less. Survival rates are very low. Only 2-5 percent of the population will reach maturity. An estimate of the number of eggs per female per season is 53,500. Each spawn mass contains 1,000 - 1,500 eggs. The egg mass has a definite ring doughnut shape and the colour of the mass varies with diet. Individual egg size is around 100 microns. Development inside the egg takes 2.5 to 3.5 weeks. Spawning occurs throughout the year but there is a distinct peak. In southern Britain this peak is in winter resulting in main larval settlement in late May / early June. Further north settlement peaks in September. Cold temperatures may delay oviposition. Settlement is probably induced by organic properties of substrata beneficial to the adult rather than the presence of or exudate from other individuals of the species.

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

Lacuna vincta uses a variety of seaweed species as substrata. The snail population will be lost along with the weed substrata if removed. The annual life cycle, high fecundity and long planktonic larval stage means that successful recruitment from other populations is likely.

Smothering	Intermediate	High	Low	Low

Lacuna vincta does not live on the seabed itself. It uses a variety of algal species as substrata. Smothering may affect populations that inhabit substrata close to the seabed such as *Zostera* spp., *Fucus serratus* or Rhodophycota. Populations on taller plants like *Laminaria* spp will be little affected by smothering. The annual life cycle, high fecundity and long planktonic larval stage means that successful recruitment from other populations is likely.

Increase in suspended sediment	Low	Immediate	Not sensitive	Low

Detritus forms one of the main food sources for this species so increased siltation may be beneficial. Increases in sediment deposition may also hinder locomotion. Once the increase in sedimentation has been removed then the ability to move freely should be restored and recovery should be immediate.

Decrease in suspended sediment

Dessication	Intermediate	High	Low	Moderate

Lacuna vincta is only found low on the shore. No species of the genus can tolerate long periods of desiccation. The species has some ability to relocate through crawling. Alternatively, dispersal by mucus thread drifting may be used to move away from unfavourable conditions when the tide is in. The annual life cycle, high fecundity and long planktonic larval stage means that successful recruitment from other populations is likely.

Increase in emergence regime	Intermediate	High	Low	Moderate

Lacuna vincta is only found low on the shore. No species of the genus can tolerate long periods of emergence. The species has some ability to relocate through crawling. Alternatively, dispersal by mucus thread drifting may be used to move away from unfavourable conditions when the tide is in. The annual life cycle, high fecundity and long planktonic larval stage means that successful recruitment from other populations is likely.

Decrease in emergence regime

Increase in water flow rate	Intermediate	High	Low	Moderate

Increased water flow rates may cause the snail to be washed away or restrict the ability to move and feed. In areas of higher water flow rates, this species selects microhabitats that provide considerable shelter - the dense turf formed by some red algae for example, often in

crevices etc. The annual life cycle, high fecundity and long planktonic larval stage means that successful recruitment from other populations is likely.

Decrease in water flow rate

Increase in temperature Intermediate High Low Moderate

The British Isles are near the southern limit of the *Lacuna vincta* range. Long term increases in temperature may limit the survival of the snail, restricting subsequent distribution. Short term acute temperature increases may cause death. The species distribution extends considerably northwards into colder waters so decreases in water temperature are unlikely to have any effect. Exposure to below zero air temperatures appears to have no effect. The annual life cycle, high fecundity and long planktonic larval stage means that successful recruitment from other populations is likely.

Decrease in temperature

Increase in turbidity Low Very high Very Low Low

This species probably has very limited facility for visual perception and as such is unlikely to be affected by turbidity. The algal substrata of *Lacuna vincta* also forms the main food source. Increased turbidity will reduce the photosynthetic capability of the algae and reduce the available food for the snail. However, the species is frequently found in turbid waters such as in estuaries and around the NE coast of England. As such it is unlikely to be particularly sensitive to changes in turbidity. If reduced food quality food causes a decline in condition or fitness then recovery may take a few weeks or months after restoration of food quality.

Decrease in turbidity

Increase in wave exposure Intermediate High Low Moderate

Increased wave exposure may cause the snail to be physically damaged, washed away or restrict the ability to move and feed. In areas of higher wave exposure this species selects microhabitats that provide considerable shelter - the dense turf formed by some red algae for example, often in crevices etc. The annual life cycle, high fecundity and long planktonic larval stage means that successful recruitment from other populations is likely.

Decrease in wave exposure

Noise Tolerant Not relevant Not sensitive Low

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 Low

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

Abrasion & physical disturbance High High Moderate Low

The species is small and the shell is probably quite easily damaged, abrasion is likely to cause death. The annual life cycle, high fecundity and long planktonic larval stage means that successful recruitment from other populations is likely.

Displacement Tolerant Not relevant Not sensitive Low

The species is mobile and can use mucus thread drifting to move away from unsuitable conditions. Displacement will have no effect

Chemical Pressures

	Intolerance	Recoverability	Sensitivity	Confidence
Synthetic compound contamination				Not relevant

Insufficient information

Heavy metal contamination				Not relevant

Insufficient information

Hydrocarbon contamination	Intermediate	High	Low	Moderate

Observations following the Amoco Cadiz oil spill at Roscoff showed that gastropod populations were greatly reduced. Populations had recovered a year later. The annual life cycle, high fecundity and long planktonic larval stage means that successful recruitment from other populations is likely.

Radionuclide contamination				Not relevant

Insufficient information

Changes in nutrient levels	Tolerant	Not relevant	Not sensitive	Low

The species occurs on all British and Irish coasts, including lower salinity areas such as estuaries where nutrient loading is likely to be higher than elsewhere. Higher nutrients may benefit the algal substrata and food used by the snail.

Increase in salinity	Tolerant	Not relevant	Not sensitive	Moderate

The species is found in a range of salinities and has been recorded in salinities as low as 12-13 psu.

Decrease in salinity

Changes in oxygenation	Intermediate	High	Low	Very low

Living in sheltered microhabitats with little water exchange, some individuals may die as a result of lowered oxygen concentrations. The annual life cycle, high fecundity and long planktonic larval stage means that successful recruitment from other populations is likely.

Biological Pressures

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

Insufficient information

Introduction of non-native species				Not relevant

Insufficient information

Extraction of this species	Not relevant	Not relevant	Not relevant	Low

It is highly unlikely that there would be a reason for extraction of this species. Despite its abundance, its small size means that it is too small to eat and not a popular subject for scientific research.

Extraction of other species	Intermediate	High	Low	Low

Some of the algal species used by the snail as substratum and food may be extracted for commercial use as fertiliser etc (*Laminaria* spp. for example). The annual life cycle, high

fecundity and long planktonic larval stage means that successful recruitment from other populations is likely.

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

Very limited use in research. National abundance classification is not available but is probably widespread.

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