Lagoon snail (*Paludinella globularis*)

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

Nicola White

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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/2282]. All terms and the MarESA methodology are outlined on the website (https://www.marlin.ac.uk)

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Three live shells and one empty one of *Paludinella globularis*.
Photographer: Dennis R. Seaward
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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	Nicola White	**Refereed by**	Dennis R. Seaward
Authority	(Hanley in Thorpe, 1844)		
Other common names	-	**Synonyms**	*Rissoa littorea* Jeffreys, 1856, *Paludinella littorina* (Delle Chiaje, 1828) sensu Philippi, 1841, *Cingula globularis* Hanley in Thorpe, 1844

Summary

Description

A small, globose snail that grows up to 2 mm high. The shell is glossy and semitransparent. The animal is pale grey and appears whitish through the shell. The tentacles are short and stubby with eyes seen as two black dots. It is often easily confused with juvenile *Littorina saxatilis*.

Recorded distribution in Britain and Ireland

Recorded from the Isle of Wight, the Fleet, North Devon, South Devon, Pembrokeshire, Cornwall and Isles of Scilly.

Global distribution

Primarily a Mediterranean species (absent from the Black Sea) which extends along Eastern Atlantic coasts from Madeira north to a limit on the south coast of England.

Habitat

Occurs in crevices, caves, under rocks and in lagoonal shingle, at or just above the water line. The

caves are usually sheltered and the surface of the walls colonized by green and red algal films and soft crusts. Sites in caves are associated with lithologies which are foliated and fissile allowing the development of fissures and crevices.

Depth range

Not relevant

Identifying features

- Tiny globose tarn-coloured shell.
- Broad bifid snout.
- Tentacles broad, joined and rounded, with a black eye in the centre of each left and right lobe.

Additional information

The pulmonate *Otina ovata* is a frequent associate of *Paludinella globularis*, in caves etc. In shingle, it often occurs with the pulmonates *Ovatella myosotis* and (slightly lower on the shore) *Leucophytia bidentata*, and the prosobranch *Truncatella subcylindrica*.

Kadolsky (2012) showed that the original description of type species of *Paludinella littorina* (originally described as *Helix littorina* Delle Chiaje, 1828), was most probably based on small specimens of *Melarhaphe neritoides* (Linnaeus, 1758). The original type description was, therefore, incorrect. In addition, Pfeiffer (1841) based the genus *Paludinella* on the taxonomic extension given to that name by Philippi (1841), i.e. a misidentified type species. Furthermore, Kadolsky noted that the correct name for specimens of *P. littorina* is, in fact, *P. globularis*. Therefore, for specimens of *Paludinella littorina* of authors, non Delle Chiaje, Kadolsky restored the name *Paludinella globularis* and designated the latter as type species of *Paludinella* (Kadolsky, 2012; Bouchet, 2012).

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Biology review

Taxonomy

Phylum	Mollusca	Snails, slugs, mussels, cockles, clams & squid
Class	Gastropoda	Snails, slugs & sea butterflies
Order	Littorinimorpha	
Family	Assimineidae	
Genus	Paludinella	
Authority	(Hanley in Thorpe, 1844)	
Recent Synonyms	Rissoa littorea Jeffreys, 1856Paludinella littorina (Delle Chiaje, 1828) sensu Philippi, 1841Cingula globularis Hanley in Thorpe, 1844	

Biology

Typical abundance	Moderate density
Male size range	max. 2cm
Male size at maturity	No information
Female size range	max. 2cm
Female size at maturity	No information
Growth form	Globose
Growth rate	No information
Body flexibility	None (less than 10 degrees)
Mobility	Creeper
Characteristic feeding method	Sub-surface deposit feeder, Surface deposit feeder
Diet/food source	Detritivore
Typically feeds on	No information
Sociability	Gregarious
Environmental position	Epifaunal, Interstitial
Dependency	No information found.
Supports	No information
Is the species harmful?	No information

Biology information

Very little data on biology found. The animal crawls by alternately extending the front and rear halves of the foot forward, producing a shuffling gait. The foot is short and rounded. It is found at low to moderate densities in narrow, linear habitats.

Habitat preferences

Physiographic preferences	Isolated saline water (Lagoon), Open coast
Biological zone preferences	Lower littoral fringe, Supralittoral, Upper littoral fringe

Substratum / habitat preferences	Bedrock, Caves, Crevices / fissures, Gravel / shingle, Under boulders
Tidal strength preferences	Very Weak (negligible), Weak < 1 knot (<0.5 m/sec.)
Wave exposure preferences	Sheltered
Salinity preferences	Variable (18-40 psu)
Depth range	Not relevant
Other preferences	No information
Migration Pattern	

Habitat Information

Paludinella globularis is probably under-recorded due to its small size, inaccessible habitat and the similarity of its shell to that of *Littorina saxatilis*. An update on the distribution of *Paludinella globularis* (as *littorina*) was compiled by Light & Killeen (2001). Frequent molluscan associates are the pulmonate *Otina ovata* in the crevice or cave habitat, and the pulmonates *Ovatella myosotis* and *Leucophytia bidentata* and prosobranch *Truncatella subcylindrica* in shingle interstices. Other species particularly associated with *Paludinella gobularis* are the Isopoda *Ligia oceanica* in cave habitats (unless *Ligia oceanica* is excessively dominant, then *Paludinella globularis* is excluded), and *Bdella* mites in the interstitial habitat of the upper shore shingle or boulders (Light & Killeen, 2001).

Life history

Adult characteristics

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

Larval characteristics

Larval/propagule type	No information
Larval/juvenile development	No information
Duration of larval stage	No information
Larval dispersal potential	No information
Larval settlement period	No information

Life history information

-none-

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	Low	High	Very low

Paludinella globularis would be removed upon substratum loss. Light & Killeen (1997) suggest that cliff instability may be the main threat to those colonies. Recoverability would be low because populations of the species are sparse.

Smothering	High	Low	High	Very low

Smothering could block shingle interstices, prevent movement of the snail and reduce the level of oxygenation. Recovery would be low because it probably lacks an aquatic dispersal phase and other colonies are distant.

Increase in suspended sediment	Intermediate	Moderate	Moderate	Very low

The species should be able to move through new silt and may be able to feed on it, so long as interstices remain clear.

Decrease in suspended sediment

Dessication	Intermediate	Low	High	Very low

Paludinella globularis is adapted to tolerate desiccation by its hard shell and operculum. However, the individuals that occur in crevices may not be able to tolerate twenty five percent increase in the time exposed to air. Those animals that are found in shingle will be largely sheltered from the effects of desiccation.

Increase in emergence regime	Low	Moderate	Low	Very low

Increased or decreased emergence is likely to occur on a relatively long time scale during which the habitat and animals will probably be able to re-adjust.

Decrease in emergence regime

Increase in water flow rate	Low	Moderate	Low	Very low

Living at the high water mark, the species is inundated for only short periods so that increased

water flow is unlikely to have a significant effect unless it is so great as to erode the substrate and wash animals away.

Decrease in water flow rate

Increase in temperature	Intermediate	Moderate	Moderate	Very low

The species reaches the northern limits of its distribution in England so may be particularly intolerant of reductions in temperature. The species would be protected from extremes in temperature where it lives in shingle or in crevices and caves.

Decrease in temperature

Increase in turbidity	Tolerant	Not relevant	Not sensitive	Very low

The species will probably not be affected by a change in turbidity as it is not dependant on light availability.

Decrease in turbidity

Increase in wave exposure	Intermediate	Low	High	Very low

Increased wave action may damage or wash away this species or move shingle, damaging the animal by abrasion.

Decrease in wave exposure

Noise		Not relevant		Not relevant

No information.

Visual Presence		Not relevant		Not relevant

No information.

Abrasion & physical disturbance	High	Very low / none	Very High	Low

Individuals living in caves and crevices are likely to be protected from physical disturbance. However, significantly increased pressure or trampling along high water mark at shingle sites could produce serious abrasion, which would damage the delicate shells. Therefore, intolerance has been assessed as high. Recovery would be low because populations are sparsely distributed.

Displacement	High	Low	High	Low

Habitat displacement would cause physical damage to animals.

Chemical Pressures

	Intolerance	Recoverability	Sensitivity	Confidence
Synthetic compound contamination		Not relevant		Not relevant

No information.

Heavy metal contamination		Not relevant		Not relevant

No information.

Hydrocarbon contamination		Not relevant		Not relevant

Observations following the *Sea Empress* oil spill off Pembrokeshire found that the populations of *Paludinella globularis* were not affected (Light & Killeen, 1997). However, prosobranchs usually are affected by hydrocarbons.

Radionuclide contamination		Not relevant		Not relevant

No information.

Changes in nutrient levels		Not relevant		Not relevant

No information.

Increase in salinity	Low	Low	Moderate	High

Paludinella globularis can tolerate a wide range of salinities as evidenced by its distribution in lagoons and on open shore. The species may not be able to withstand low salinity for long periods of time.

Decrease in salinity

Changes in oxygenation		Not relevant		Not relevant

No information.

Biological Pressures

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

No information.

Introduction of non-native species		Not relevant		Not relevant

No information.

Extraction of this species	Not relevant	Not relevant	Not relevant	Not relevant

Not relevant.

Extraction of other species	High	Low	High	Very low

Could cause huge disturbance and damage but is unlikely.

Additional information

Importance review

Policy/legislation

Wildlife & Countryside Act	Schedule 5, section 9
IUCN Red List	Least Concern (LC)
Features of Conservation Importance (England & Wales)	☑

Status

National (GB) importance	Not rare/scarce	**Global red list (IUCN) category**	Least Concern (LC)

Non-native

Native	-		
Origin	-	**Date Arrived**	-

Importance information

-none-

Bibliography

- none -

Datasets

Conchological Society of Great Britain & Ireland, 2018. Mollusc (marine) data for Great Britain and Ireland. Occurrence dataset: https://doi.org/10.15468/aurwcz accessed via GBIF.org on 2018-09-25.

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