Harbour crab (*Liocarcinus depurator*)

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/1175](https://www.marlin.ac.uk/species/detail/1175). All terms and the MarESA methodology are outlined on the website ([https://www.marlin.ac.uk](https://www.marlin.ac.uk))

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**Summary**

**Description**

The carapace of *Liocarcinus depurator* is wider than long, about 51 mm wide and 40 mm long. The species is immediately recognised by the violet-tinted paddle of the fifth leg in larger crabs. The rest of the body is pale reddish-brown with transverse rows of hairs on the carapace, most conspicuous towards the rear.

**Recorded distribution in Britain and Ireland**

All British and Irish coasts.

**Global distribution**

Distributed from Norway to West Africa including the Mediterranean.

**Habitat**

Found on the lower shore and sublittoral on fine, muddy sand and gravel.

**Depth range**

This information is not refereed.

**Researched by** Jacqueline Hill

**Authority** (Linnaeus, 1758)

**Photographer:** Keith Hiscock

**Copyright:** Dr Keith Hiscock

**Synonyms** -

**Distribution data supplied by the Ocean Biogeographic Information System (OBIS). To interrogate UK data visit the NBN Atlas.**

See online review for distribution map
-5m to -300m+

Identifying features

- Carapace broader than long, relatively flat, with numerous transverse, hairy, crenulations.
- The antero-lateral margins of the carapace have 5 pointed teeth.
- Wide orbits and three similar-sized rounded lobes between eyes.
- Front of carapace with a median lobe slightly more prominent than two similar flanking lobes.
- Chelipeds equal and stout.
- Pereopods 2-4 of slight build, pereopod 5 with violet tinted strongly padded dactylus.

Additional information

Other common names include the 'swimming crab'.

Listed by

Further information sources

Search on:

G G NBN WoRMS
Biology review

Taxonomy

- Family: Polybiidae
- Genus: Liocarcinus
- Authority: (Linnaeus, 1758)
- Recent Synonyms: -

Biology

- Typical abundance: Moderate density
- Male size range: Carapace width up to 56mm
- Male size at maturity: Carapace width 30mm
- Female size range: Carapace width 24mm
- Female size at maturity: Carapace width 24mm
- Growth form: Articulate
- Growth rate: None (less than 10 degrees)
- Body flexibility: None (less than 10 degrees)
- Mobility

- Characteristic feeding method: Predator, Scavenger
- Diet/food source
  - Typically feeds on: Polychaetes, crustaceans, molluscs, ophiuroids and fishes constitute most of the diet (Freire, 1996).

Sociability

- Environmental position: Demersal
- Dependency: None
- Host
- Supports
  - The polychaete worm *Iphitime cuenoti* and the parasitic nemertean *Carcinonemertes carcinophila* that live in the branchial chambers of some individuals.
- Is the species harmful?: No

Biology information

- **Size range and size at maturity**: values given are for Mediterranean individuals (Muino et al., 1999).
- **Feeding**: Swimming crabs may exploit a wide range of dietary items including algae, sponges and many small invertebrates and may be considered omnivorous. However, *Liocarcinus depurator* is typically a scavenger and a carnivore. Freire et al. (1996) suggest the high diversity of food items in the diet of *Liocarcinus depurator* is due to the versatile functional structure of the chelipeds.
- **Host for**: Abelló et al., (1988) found 5% of individuals in the northwestern Mediterranean infested with the polychaete *Iphitime cuenoti*. No evidence of disease in the branchial
chamber was found and the authors suggest a commensal relationship between the crab and the polychaete. However, the relationship may involve some degree of parasitism. In the Firth of Lorne the parasitic nemertean Carcinonemertes carcinophila was found the gills of over 90% of Liocarcinus depurator sampled (Comely & Ansell, 1989(b)).

Habitat preferences

- **Physiographic preferences**: Open coast, Offshore seabed, Strait / sound, Ria / Voe
- **Biological zone preferences**: Circalittoral offshore, Lower circalittoral, Lower infralittoral, Sublittoral fringe, Upper circalittoral, Upper infralittoral
- **Substratum / habitat preferences**: Coarse clean sand, Fine clean sand, Muddy gravel, Muddy sand
- **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**: No text entered
- **Salinity preferences**: Full (30-40 psu)
- **Depth range**: -5m to -300m+
- **Other preferences**: No text entered
- **Migration Pattern**: No information found

Habitat Information

**Salinity**: Liocarcinus depurator is essentially a marine species although a few individuals were found at the lower reaches of the Forth estuary where salinity varied between 24-35 psu (Mathieson & Berry, 1997).

Life history

**Adult characteristics**

- **Reproductive type**: Gonochoristic (dioecious)
- **Reproductive frequency**: Annual protracted
- **Fecundity (number of eggs)**: 100,000-1,000,000
- **Generation time**: Insufficient information
- **Age at maturity**: 1 year
- **Season**: See additional text
- **Life span**: Insufficient information

**Larval characteristics**

- **Larval/propagule type**: -
- **Larval/juvenile development**: Planktrophic
- **Duration of larval stage**: Not relevant
- **Larval dispersal potential**: -
- **Larval settlement period**: Insufficient information

Life history information

https://www.marlin.ac.uk/habitats/detail/1175
• **Time of gametes:** In the northwestern Mediterranean female moult and copulation takes place between May and July (Abelló, 1989a).

• **Spawning:** Females with eggs occur all year (Ingle, 1997) although a maximum proportion of ovigerous females has been observed indicating the existence of an annual reproductive cycle. In Plymouth, ovigerous females are reported from March to October, from April to May in Bristol, January to June in the Clyde and Argyll and from January to May in Galway (Ingle, 1997). In the warmer waters of the northwestern Mediterranean numbers of ovigerous females peak in the winter months from November to February and males were found to be sexually mature throughout the year (Abelló, 1989a). In Plymouth, *Liocarcinus depurator* was found to incubate three or more batches of eggs over the spring and summer breeding season (Wear, 1974).

• **Fecundity:** The number of eggs carried by ovigerous females in the north western Mediterranean ranged from about 30,000 to 230,000 clearly increasing with the size of the female (Abelló, 1989a). However, a maximum of 140,000 eggs for the largest females was estimated in the Ligurian Sea (Mori & Zunino, 1987).

• **Age at maturity:** In the Gulf of Genoa in the Ligurian Sea *Liocarcinus depurator* females attain sexual maturity, are fertilized and bear eggs within the first year (Mori & Zunino, 1987).

• **Larvae:** in the plankton during spring and summer in British and North Sea waters (Ingle, 1980).
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>Substratum Loss</th>
<th>Intolerance</th>
<th>Recoverability</th>
<th>Sensitivity</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermediate</td>
<td>High</td>
<td>Low</td>
<td>High</td>
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</table>

Although a swimming crab, *Liocarcinus depurator* normally crawls on the seabed. The species only really swims *in extremis*. Therefore, substratum loss, such as caused by dredging, is likely to result in the loss of some individuals whilst others may be able to escape. Intolerance is therefore, assessed as intermediate. Recovery should be good because *Liocarcinus depurator* has planktonic larvae and is able to reproduce several times a year (Wear, 1974).

Smothering

*Liocarcinus depurator* is a mobile crab, able to crawl and also swim when necessary, and therefore unlikely to be affected by any smothering as it would be able to move up through the sediment or to an unaffected area.

Increase in suspended sediment

*Liocarcinus depurator* is tolerant of changes in suspended sediment because it is a demersal species and feeds by predation and scavenging. The species is also able to move to more suitable conditions if necessary.

Decrease in suspended sediment

*Liocarcinus depurator* is a sub-littoral species and so desiccation is not relevant.

Increase in emergence regime

Emergence is not likely to occur in the species’ preferred zone.

Decrease in emergence regime

*Liocarcinus depurator* is likely to be tolerant of a range of temperatures consistent with a distribution north and south of Britain and Ireland populations and so will not be very intolerant of long term changes in temperature. Experiments with the species showed that a

https://www.marlin.ac.uk/habitats/detail/1175
threefold decrease in egg incubation time of eggs can occur naturally in successive batches of eggs incubated during the early spring to mid-summer breeding season (Wear, 1974). At 13.1°C incubation time was 31.5 days and at 15.0 °C was 25.5 days. However, a rapid rise in water temperature of as little as 3°C can disrupt the natural sequence in the spawning and incubation of successive egg batches and also reduce fecundity by more than 90% (Wear, 1974) so that the viability of the population will be reduced. Intolerance is therefore assessed as intermediate. Very low water temperatures can cause mass mortalities of Liocarcinus spp.. During the severe winter of 1962-63 where water temperatures fell to 0°C for several weeks, many dead crabs were caught in research vessel trawls from the Dutch coast (Crisp, 1964). Recovery should be good because Liocarcinus depurator has planktonic larvae and is able to reproduce several times a year (Wear, 1974).

Decrease in temperature

Increase in turbidity

Liocarcinus depurator lives at depths of 300 m plus, is most active at night (Abelló et al., 1991), feeds by predation and scavenging on other invertebrates and is therefore, unlikely to be sensitive to changes in light brought about by increases in turbidity. The crab is commonly found in turbid conditions in harbours.

Decrease in turbidity

Increase in wave exposure

Liocarcinus depurator is a swimming crab and so is likely to be tolerant of some changes in wave exposure. However, it is likely that the species is unable to keep its position in areas of strong wave action so intolerance has been assessed as intermediate. The species also inhabits deep waters where wave action will have little impact.

Decrease in wave exposure

Noise

Liocarcinus depurator is not likely to be sensitive to noise disturbance.

Visual Presence

Crabs have well developed visual acuity and are likely to respond to movement in order to avoid predators. However, it is likely that the species will be little affected by visual disturbance caused by the continuous presence for one month of moving objects not naturally found in the marine environment (e.g., boats, machinery, and humans). Therefore, the species is assessed as not sensitive.

Abrasion & physical disturbance

Liocarcinus depurator was observed to be frequently injured and killed as a result of capture in a commercial 4m beam trawl (Kaiser & Spencer, 1995) and so an intolerance high has been recorded. Recovery should be good because Liocarcinus depurator has planktonic larvae and is able to reproduce several times a year (Wear, 1974).

Displacement

The species is highly mobile and probably not sensitive to displacement to another area.

Chemical Pressures

Intolerance Recoverability Sensitivity Confidence
Synthetic compound contamination  

Bryan & Gibbs (1991) report that crabs appear to be relatively resistant to TBT although some deformity of regenerated limbs has been observed.

Heavy metal contamination  

Crompton (1997) reports that the concentrations above which mortality of crustaceans can occur is 0.01-0.1mg/l for mercury, copper and cadmium, 0.1-1mg/l for zinc, arsenic and nickel and 1-10mg/l for lead and chromium. Crustaceans are generally regarded as being more intolerant of cadmium than other groups (McLusky, 1986). However, crustaceans in general are less intolerant of most heavy metals than annelid worms and so intolerance has been assessed as intermediate. On return to normal conditions, recovery should be good because *Liocarcinus depurator* has planktonic larvae and reproduces several times a year.

Hydrocarbon contamination  

Insufficient information.

Radionuclide contamination  

Insufficient information.

Changes in nutrient levels  

Insufficient information.

Increase in salinity  

*Liocarcinus depurator* is essentially a marine species although a few individuals were found at the lower reaches of the Forth estuary where salinity varied between 24-35psu (Mathieson & Berry, 1997) and so intolerance is assessed as intermediate. Although the species is mobile and some individuals will be able to avoid unfavourable salinity changes, individuals are likely to be affected if salinity changes are widespread. On return to normal conditions, recovery should be good because *Liocarcinus depurator* has planktonic larvae and reproduces several times a year.

Decrease in salinity  

Cole *et al.* (1999) suggest possible adverse effects on marine species below 4mg/l and probable adverse effects below 2mg/l. Crustaceans are generally less tolerant of hypoxia than polychaetes and bivalves and are rarely described from hypoxia stressed environments (Diaz & Rosenberg, 1995). Experiments looking at the resistance of marine invertebrates from the Baltic Sea, where temperature was 10°C and salinity 15psu, crustaceans had the shortest LD<sub>50</sub> times (between 2 and 48 hours) at 0.15ml O<sub>2</sub> (Theede *et al.*, 1969). Therefore, a reduction in oxygen concentration to the benchmark level of 2mg/l for a week is expected to cause some individuals to die. Although the species is mobile and some individuals will be able to avoid hypoxic conditions changes individuals are likely to be affected if oxygen changes are widespread. On return to normal conditions recovery should be good because *Liocarcinus depurator* has planktonic larvae and reproduces several times a year.

**Biological Pressures**

<table>
<thead>
<tr>
<th>Introduction of microbial pathogens/parasites</th>
<th>Intolerance</th>
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<td>High</td>
<td>Low</td>
<td>Moderate</td>
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</table>
The incidence of black necrotic disease has been recorded for *Liocarcinus depurator* from sites on the west coast of Scotland (Comely & Ansell, 1989). The disease, which is believed to be caused by one or more of the chitinoclastic bacteria with secondary invasion by fungi, was found in the gills of almost 90% of *Liocarcinus depurator*. In the most extreme cases the gill lamellae were completely missing, only the blackened gill rachi being left. Intolerance has therefore, been assessed as intermediate. On return to normal conditions recovery should be good because the species has high fecundity and pelagic larvae.

**Introduction of non-native species**  
Tolerant  Not relevant  Not sensitive  High

There are no known non-native species competing with *Liocarcinus depurator*.

**Extraction of this species**  
Intermediate  High  Low  High

*Liocarcinus depurator* is often extracted as a by-catch species in benthic trawling. The species produces eggs several times a year which develop into planktonic larvae so recovery should be high.

**Extraction of other species**  
Tolerant  Not relevant  Not sensitive  Moderate

*Liocarcinus depurator* has no known obligate relationships.

**Additional information**
Importance review

Policy/legislation
- no data -

Status
National (GB) - Global red list (IUCN) category -

Non-native
Native -
Origin - Date Arrived -

Importance information
- *Liocarcinus depurator* is one of the most important by-catches of the Mediterranean demersal fishery (Abelló, 1989a).
- Enclosure experiments in a sea loch in Ireland have shown that high densities of this decapod led to a significant decline in infaunal organisms (Thrush, 1986).
Bibliography


Fish, J.D. & Fish, S., 1996. A student's guide to the seashore. Cambridge: Cambridge University Press.


Datasets


Centre for Environmental Data and Recording, 2018. Ulster Museum Marine Surveys of Northern Ireland Coastal Waters.


