

# Barnacles prove hard to please when house-hunting

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(PhysOrg.com) -- It's a tough life out at sea so you might think a small crustacean would be happy to take what it can get when it comes to finding a home - not the humble barnacle.

Researchers at Newcastle University have shown this tiny sea creature is super choosy about where it lives and, like ourselves, spends a lot of time picking the perfect environment to raise a family.

Co-funded by International Paints and the Natural Environment Research Council, the research – published this week in *Biofouling Journal* – has wide implications for the shipping industry.

Biofouling – the accumulation of marine life on ship's hulls – increases drag on ships and costs the global industry an estimated 7.5 billion US dollars a year in wasted fuel.

It is hoped that by understanding how the barnacle – the single, biggest cause of the problem – selects a home, scientists will be able to create more effective bio-fouling paints thereby reducing pollution and fuel consumption.

Studying barnacles in their natural habitat, lead researcher Dr Gabrielle Prendergast used underwater cameras to capture how the creatures select a home.

Looking primarily at the importance of surface texture, the study

showed the young barnacles – or larvae – were attracted to rougher surfaces that offered a micro-environment of grooves and crevices.

Smooth surfaces and surfaces that were too textured were both rejected by the larvae as were sites that were too over-crowded or, conversely, had too few barnacle ‘neighbours’.

'They proved to be very choosy customers,' explains Dr Prendergast.

'Barnacles have been studied widely under laboratory conditions but we wanted to see how they actually behave out at sea and what factors determine how they select a home.

'And what we found was that it's not an easy decision for them. Like sponges and corals, barnacles stay in the same spot all their lives so it's vital for the survival of the species that when it comes to choosing a home they get it right.'

Creating a range of different surface textures similar to different grades of sandpaper, the Newcastle-led team watched the young larvae – which are less than 1mm in size – roam the different surfaces in search of the perfect spot.

They found the barnacles tended to travel further and faster over unsuitable surfaces but attached quickly to surfaces that met their tough criteria.

Very smooth or very rough surfaces were rejected by the barnacles but micro-textures that were of a similar size to the larvae meant individuals could ‘slot’ themselves into the tiny dips and grooves and take advantage of the protection these offer.

The larvae were initially attracted to sites already colonised by fellow

barnacles but sites that were too overcrowded were dismissed.

Newcastle University's Dr Jeremy Thomason, who supervised the project, explained: 'Barnacles attach for life so they need to be close to other barnacles to reproduce but they also need to make sure they have enough space around them to grow without the risk of being out-competed and pushed out.'

'The research suggests they pick surfaces with slight grooves and crevices in them which are easier to cling on to and offer some protection and a barrier against the currents.'

'What is incredible is the life-long, complex decisions these microscopic larvae are making when they are just hours old.'

Dr David Williams, Principal Research Technologist at International Paint's Marine and Protective Coatings Unit in Gateshead, added: 'Research like this is vital because it helps us to understand how the marine species interact in their natural environment and how this can be used to make improved, environmentally benign anti-fouling products.'

Provided by Newcastle University

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