# Study scratches the surface of biofouling

A DEEPER understanding of barnacle behaviour could lead to improvements in hull coatings, according to research conducted at Newcastle University in England, *writes Craig Eason.*

Barnacles are one of the major causes of hull biofouling, especially in hard to access locations such as water inlets and rudder stocks.

While coating manufacturers have developed self-polishing coatings and other products that reduce the onset of biofouling, many rely on the vessel having a high service speed to be effective.

The trend towards slower steaming has led some shipowners to reassess their use of these products.

Researchers at the university have monitored the larval stage of the barnacle as it selects the location where it will develop into the final, non-moving stage of its life cycle.

Looking primarily at surface texture, the study found that the larvae were more selective than originally thought in selecting their final fastening point.

"They are very choosy," said lead researcher Gabrielle Prendergast.

Dr Prendergast used underwater cameras to study barnacles in their natural habit rather than in the sterile environments of a laboratory.

"We wanted to see how they behave in the sea and what factors determine how they select a home," she said.

The study found that surfaces that were too smooth were unlikely to be attractive. It also revealed that surfaces that were too textured, too crowded or even with too few other barnacles with which to breed, were also as likely to be rejected.

Paint manufacturers have turned to marine scientists to understand the main causes of biofouling, such as barnacles, weeds, slimes and tubeworms, now that they are no longer permitted to simply kill them with biocides in hull coatings.

"There are improvements we can make and that is the point of our research," said International Paint principal research technologist David Williams.

"We are looking at the next generation of coatings, and not just against barnacles but a wider range of species.

"We now have to understand the enemy, not just kill it."

Dr Williams' team researches how marine animals, such as the barnacle larvae, determine their surface and adapt the enzyme that acts like a glue to attach itself to the hull.

"The barnacle is at a non-feeding stage at this point, so it has to settle at some point in time and it gets less choosy as it gets older," he said.

"As well as making the surface unattractive to a range of species, we are looking then at how the bond can be weakened."

By fooling the animal into creating a weaker enzyme glue, the researchers' aim is to make it fall off at slower speeds. The ultimate goal is to have it fall off when the ship is stationary.