Pink Seafan Disease in Devon

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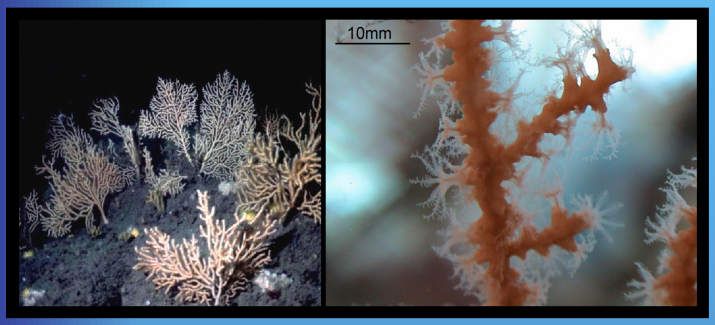
Background

The Pink Seafan (*Eunicella verrucosa*) is a gorgonian coral found in the W. Mediterranean and the E. Atlantic, from Morocco to SW. of Ireland and the UK.

This Seafan grows attached to hard surfaces, its fan is generally orientated in one plane across the prevailing current. It is found between 4-50m around the British Isles, were there is strong water movement. Sometimes this seafan occurs in dense aggregations, although in many places its populations are sparsely distributed. It feeds by extending tentacles of its numerous polyps into passing water currents, capturing suspended matter and plankton.

The Distribution of the Pink Seafan around the British Isles (www.marlin.co.uk).



Left: a Pink Seafan forest in Lyme Bay. Right: detail of extended feeding tentacles.

Conservation

The Pink Seafan is slow growing (around 10mm/year), long-lived (upwards of 50 years) and it is thought that its frequency of reproduction and dispersal is low in British waters. These factors make it vulnerable as populations may recover slowly or not at all from any loss. Consequently the Pink Seafan is protected from being collected, traded or harmed under the Wildlife and Countryside Act, 1981 and is also included in the UK Biodiversity Action Plan. Threats included damage and mortality due to being caught in fishing gear, entanglement in discarded line and disease.

A diseased Pink Seafan near Lundy Island, area of tissue necrosis indicated. When the skeleton is exposed by disease or damage many organisms will colonize it, seen here are barnacles, hydroids, bryozoans and tunicates.

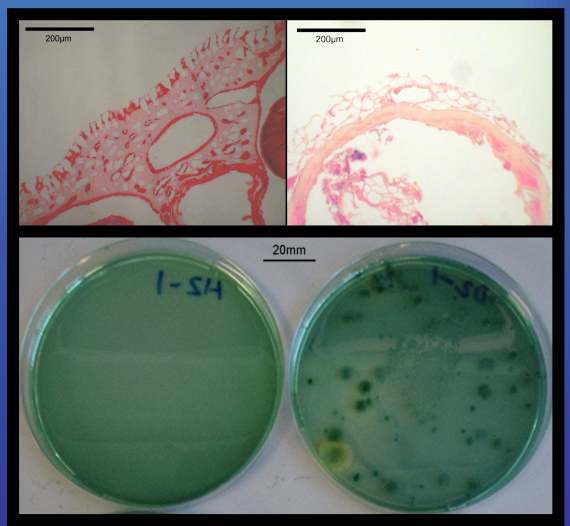
Pink Seafan Tissue Necrosis

Seafan disease has been increasingly reported in the vicinity of Plymouth Sound and Lundy Island over the last 4 years. It is characterised by a loss of tissue from the seafan skeleton, this usually begins towards the centre of the colony, with the remainder of the colony losing condition. The resulting exposed skeleton is colonized by a range of organisms. Mortality of the entire colony occurs as further tissue is lost and the seafan becomes smothered by the creatures that make the exposed skeleton their home, eventually toppling the Seafan with their weight.

Two clippings from Pink Seafans in Plymouth sound. Left: a healthy specimen with a bright pink/orange colour and plumpness to its tissue. Right: a diseased specimen with the black skeleton exposed by tissue necrosis and a hydroid growing on exposed skeleton indicated

Research at Plymouth University

Our initial hypothesis was that disease is caused by a microbial infection, as has been demonstrated for several diseases of tropical corals. Microbes associated with seafan samples were cultured; no fungi were found. There was a striking difference between the numbers of bacteria called 'vibrios' from the diseased and healthy specimens; 60% of the healthy samples having no vibrios present. The vibrios isolated from diseased seafans have been identified as strains of *Vibrio splendidus* using molecular techniques, these have been shown to produce potent extracellular proteases capable of damaging seafan tissue. Attempts to use these bacteria to induce disease have been unsuccessful, although it has been possible to transmit the disease directly from a disease seafan to a healthy one by placing them in contact. Experiments have shown that these seafans produce antibacterial compounds, the disease appears to inhibit their production. We have revealed a complex interaction between disease, resistance to microbial colonisation and seafan associated microbial communities.



Top: sections of seafan branches, healthy (left) and ~3mm from the site of exposed skeleton (right). The diseased tissue has lost its ectoderm and the mesoglea is greatly shrunken. Bottom: vibrio selective agar plates showing a vibrios cultured from a healthy (left) and a diseased Seafan (right).