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The first ecological study of a Red Sea maerl bed

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INTRODUCTION

Maerl (Corallinaceae, Rhodophyta) forms a living gravel deposited by unattached calcified red algae - its highly branched form provides protection for many invertebrate species. Scotland is home to some of the most extensive maerl beds in Europe but in 2001 Glasgow University students found a maerl bed within Nabq Managed Resource Protected Area, South Sinai, Egypt. Maerl has not previously been described in the Red Sea, so in 2002 a return trip was made to study the site in detail. This poster summarises the findings.

The maerl occurred in a lagoon sheltered by an outer fringing reef with an inner fossil patch-reef that was covered in branched coralline algae. We observed that chunks of this algae were undermined by burrowing sponges and polycheates and could break off and form rhodoliths. Wave action had caused rhodoliths to accumulate in the lee of the reef flat. Inshore of the reef, calm lagoonal conditions allowed the rhodoliths (Fig. 1) to grow into delicately branching maerl beds (Fig. 2).

METHODS

The lagoon biotopes were mapped using three parallel transects marked from the beach to the fringing reef. Depth, time and substratum type were recorded at 10 m intervals along the transects. Depths were later related to Chart Datum. At high and low tide, physical factors were measured at 60 m, 150 m and 220 m along the mid-transect line covering sand, maerl and sea grass biotopes respectively. Water/air temperatures were noted and currents were measured by timing a neutrally buoyant object over 5 m. Horizontal underwater visibility (to measure turbidity) and near-bottom salinities were measured. Prevailing winds were estimated using the Beaufort scale.

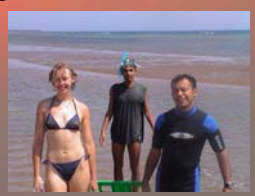
Table 1. Physical environmental conditions

Position on reef	Temperature (°C)	Current ($m\ s^{-1}$)	Turbidity (m)	Salinity (‰)
Inner (60 m, sand)	28.5 - 34.0	1.7 –7.0	0.6 – 9.0	45 - 48
Mid (150 m, maerl)	29.0 - 31.0	4.2 – 6.0	8.0 – 16.0	43
Outer (220 m, seagrass)	28.5 - 30.0	3.6 – 6.0	12.0 – 23.0	42 - 43

CORE SAMPLING

Fauna and flora were collected in 15 cm long x 10 cm circumference cores on four biotopes; sand 6 cores, seagrass 6 cores, centre of maerl area 12 cores, edge of maerl 6 cores. Samples were sieved (1 mm mesh) and placed in plastic bags with 8% formalin (Fig. 3) then labelled and transported to Glasgow University for counts and identification. The samples have been sorted into major Phyla and are now being identified to Family, counted and weighed.

3. Core sample sieving, preservation and sorting



PRELIMINARY FINDINGS

The maerl has been identified as *Neogoniolithion* sp. and is produced by a 'rhodolith factory' on the leeward fossil reef platform. Calm conditions within the lagoon allow finely branched thalli to develop - live maerl was only found >30 cm water depth but it could withstand a wider range of temperature and salinity than that found on the outer reef. The maerl requires light, for photosynthesis, coupled with currents to prevent smothering by silt.

Preliminary results show that the maerl harbours an outstanding diversity of associated fauna, particularly Polychaeta, Crustacea and Mollusca. Grazers are very common which may explain why the calcified algae are able to compete with the seagrasses and algae within the lagoon. Once core analyses are complete we hope to provide the first ecological description of this rich Red Sea habitat.

References:

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