INFLUENCE OF MACROALGAL BASIBIONT MORPHOLOGY ON EPIPHYTE COMMUNITY STRUCTURE IN THE MALTESE ISLANDS

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Abstract
The aim of this study was to investigate the influence of basibiont morphology on macroalgal epiphytic communities in the Maltese Islands. The complexity of basibionts was characterised in terms of a number of variables related to the measured epiphyte species richness and total abundance. Species richness was mainly predicted by size of the host while total abundance was predicted by size and coarseness of the host.

Keywords: Malta Channel, Mediolittoral, Phytobenthos, Rocky shores, Algae

Introduction
Marine macroalgal host species vary in their suitability to support macroalgal epiphytic communities, with the epiphyton on more 'favourable' basibionts being characterised by higher species richness and abundances [1]. The factors that promote higher colonisation of a given basibiont by epiphytes are unclear, with surface characteristics and age being suggested as possible determinants by previous studies [1]. The present study was carried out to test the hypothesis that higher structural complexity of basibionts will also increase epiphyte species richness and abundances.

Method
Sampling was carried out at eight locations around Malta (Central Mediterranean). At each site, two 20 x 20 cm quadrats were placed in the mediolittoral zone and all macroalgae within them were collected and identified. For each basibiont, all epiphyte present were identified to the lowest taxonomic level possible, and their abundances estimated using a percentage cover scale. The morphology of each basibiont was characterised using seven factors: size, roughness, coarseness, degree of branching, order of branching, planes of branching and type of surface. Roughness and coarseness were both defined as measures of the deviation of the surface from a flat plane, with roughness measured at the millimetre scale and coarseness measured at the centimetre scale.

Results and Discussion
Epiphyte species richness was positively correlated to mean total epiphyte abundance (r = 0.874, p <0.05) (Fig. 1), which may indicate that these two variables are influenced by the same basibiont characteristics. Multiple linear regressions including all measured covariates indicated that the main predictor of species richness is the size of the basibiont (R^2 = 0.738), while total abundance is predicted by size and coarseness (R^2 = 0.664). The model obtained for species richness accounted for more variation in the dependent variable than the model obtained for total abundance; this may indicate that the factors influencing epiphyte abundances are more complex. The influence of basibiont size may be due to the relationship between size and surface area or between size and age of the basibiont. It was assumed that, within a species, the size of an alga may be considered as an indicator of its age [1]. As such, larger basibionts would also be older, providing more opportunities for colonisation than younger, smaller algae of the same species. While size of the basibiont alone predicts epiphyte species richness, total abundance is predicted by both size and coarseness. Therefore, it is possible that while the number of epiphyte species present on a basibiont is a result of how long the basibiont has been exposed to colonisation, the abundance of each species is affected by both age (using size as a proxy) of the basibiont and the surface area available (represented by coarseness).

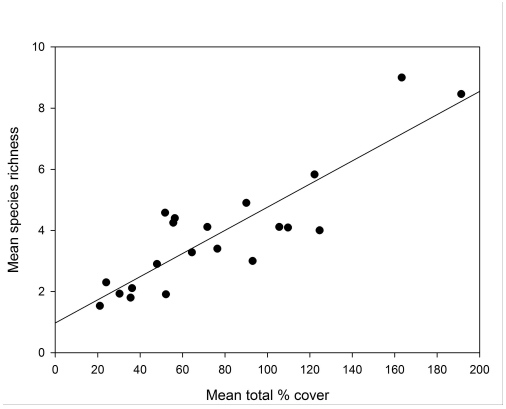

Fig. 1. Relationship between epiphyte species richness and mean total abundance (as % cover) (r = 0.874, p <0.05).

References
1 - Ballantine, D. L. (1979). The distribution of algal epiphytes on macrophyte hosts offshore from La Parguera, Puerto Rico. *Botanica Marina, XXII*, 107-111.