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Species richness of resident microcrustaceans in temporary freshwater rockpools in the Maltese Islands

The sensitivity of maximum species richness of resident microcrustaceans to pool surface area was investigated in 36 autumnal freshwater rockpools from four localities in the Maltese Islands and compared to the basic predictions of island biogeographic theory.

The pools included in this investigation were ephemeral and small (maximum surface area 7.11m²). They flooded in September and eventually desiccated in April with the onset of the dry season. Previous work indicated that maximum diversity of microcrustaceans in these pools is achieved within three weeks of flooding. Monitoring of the abiotic environment of the pools commenced in September 1995 and synchronous sampling of microcrustaceans was carried out in January 1996, well after maximum diversity would have been attained. Detailed records of potentially relevant factors including hydroperiod length and duration as well as vegetational diversity were kept for five of these pools prior to the present investigation.

No significant correlation between pool surface area and maximum species richness of microcrustaceans was detected. Similarly, pool volume and maximum species richness were not significantly correlated either. Results obtained from detailed study of five pools indicate that maximum species richness of crustaceans is more sensitive to hydroperiod duration ($r = 0.75$; $P < 0.001$) and to species richness of vegetation ($r = 0.79$; $P < 0.01$) than to the physical properties of the pools. This implies that models of microcrustacean population dynamics in small temporary pools should be preferentially weighted towards biotic and temporal properties of these habitats rather than towards their size.