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SPATIAL PATTERNS IN PLANT AND MACROFAUNAL ASSEMBLAGES IN MEDITERRANEAN TEMPORARY PONDS: RESPONSE TO CONNECTIVITY AND POND SIZE GRADIENT

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We studied the relation between three different biotic groups (animal active dispersers, animal passive dispersers and plants) and spatial patterns and environmental conditions in two networks of Mediterranean temporary ponds. Plant and macrofaunal assemblages in Mediterranean temporary ponds seem to have different spatio-temporal patterns, being plants more dependent on spatial factors and macrofauna on temporal changes. Moreover, environmental controls may differ across dispersal capabilities. All of this can affect the relationship between one biotic group and habitat size. Habitat size is supposed to have a positive relationship with species richness. However, this relationship is still unclear in the case of temporary ponds due to their environmental variability during the hydroperiod. Moreover, the spatial connectivity of the system can modulate the influence of pond size on the community structure. The two studied networks of Mediterranean temporary ponds were located in Vila Nova de Milfontes (SW Portugal) and Giara di Gesturi (Sardinia, Italy). Each network was characterized by a pond size gradient (from 245 to 79000 m² and from 565 to 80000 m², respectively) and by a high connectivity among ponds: the proximity and the absence of physical barriers between them enable the dispersal of organisms, especially in the case of active dispersers. Thus, a continuous exchange of organisms was expected in both networks. We hypothesised that 1) community similarity among assemblages of active dispersers would be higher than community similarity among the other biotic groups due to their dispersal ability; and 2) the higher number of micro- and mesohabitats in largest ponds could favour floristic richness more than faunal richness, since plants are more related to spatial factors than animals. The average of community similarity was quantified by means of SIMPER analysis. A correlation analysis was performed to study the possible relationship between pond size and species richness per group. Our first prediction was validated in both ponds networks. In relation to our second hypothesis, we only found a marginally significant relationship between pond size and active dispersers' richness in the Giara di Gesturi network.