PST22 - A large-scale assessment of Isoetes histrix swards in the Mediterranean basin

Bagella, S.[a] and Podani, J.[b]

[a]Department of Science for Nature and Environmental Resources, University of Sassari, Sassari, Italy
[b]Department of Plant Systematics, Ecology and Theoretical Biology, Eötvös University, Budapest, Hungary

Isoetes histrix Bory, an aquatic lycopod with a circum-Mediterranean distribution, is a diagnostic species of the habitat 3170* - Mediterranean temporary ponds, considered for protection with high priority. *I. histrix* swards have been investigated by several authors but the available information is mostly fragmented and dispersed. The present study, based on a literature review, was aimed to define patterns of plant communities with *I. histrix* and to identify the key factors driving these patterns at large spatial scale.

Data from 7 areas (Corsica, Crete, Italian peninsula, Portugal, Sardinia, Spain, Tunisia) were assembled into a composite matrix including 255 surveys and 314 species. To each survey the following abiotic variables were associated: geographic position, elevation, distance from the sea, annual precipitation, average annual temperature, and substrate type. Differences in plant community composition among the geographic areas were revealed by an UPGMA dendrogram and a PCoA ordination. Beta diversity relationships, calculated for the entire data set with the simplex approach (Podani and Schmera, 2011) was very high (90%) and dominated by contributions from species replacement (67%) while richness differences were responsible for 23%. Community structure within major geographic areas was fairly similar to this general picture for Portugal, Spain as well as for Italy and Corsica. Surveys from Sardinia exhibited somewhat lower beta diversity, just like the few sample sites from Tunisia while those from Crete were fairly similar to each other, and had similar species richness. Nestedness was relatively low, and only very few sample sites were completely nested. Matrix correlations between the Jaccard dissimilarity and environmental distance for each abiotic variable showed that the most influential is annual precipitation, which has a correlation of 0.466 with floristic dissimilarity confirming that the availability of water is the most important environmental variable. This was immediately followed by geographic distance (r=0.435) so that the distributional ranges of constituting species also affect greatly the actual species composition in a given site. The consequence of the sharp separation of plant communities and the high beta diversity from the viewpoint of nature conservation is straightforward: there are no specific sites, nor particular areas which could be given priority against the others. The fact that precipitation, a relatively unpredictable and unstable climatic variable is most influential confirms that the *Isoetes* communities of the Mediterranean region are vulnerable to climatic changes.