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Vegetation patterns in natural and cultural landscapes

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Chiarucci A.

Oral Presentation

Structure and diversity of a metacommunity system in the Tuscan archipelago

Session: Green infrastructures and vegetation science

Alessandro Chiarucci¹ *, Giulia Finotti¹, Enrico B.L. Cerabolini², Bruno Foggi³, Daniele Viciani³, Marco Caccianiga⁴, Simone Fattorini⁵

¹*BIGEA, Alma Mater Studiorum University of Bologna, Bologna, Italy*

²*DISTA, University of Insubria, , Varese, Italy*

³*BIO, University of Florence, Florence, Italy*

⁴*DBS, University of Milan, Milan, Italy*

⁵*MESVA, University of L'Aquila, L'Aquila, Italy*

*Presenting author: alessandro.chiarucci@unibo.it

Biogeographical patterns of metacommunities at archipelagic level are still poorly understood because of the lack of information at different geographical scales (i.e. within islands vs. between islands). However, the availability of large vegetation databases may pave the way for testing explicitly formulated hypotheses based on theoretical metacommunity assumptions using local data from relevés and floristic data concerning the whole islands. In this work we analysed plant communities and entire floras from the seven major islands of the Tuscan Archipelago (Italy): Elba, Giglio, Capraia, Montecristo, Pianosa, Giannutri and Gorgona. Our aims were to test: (1) if plant species composition at the metacommunity level was more affected by local conditions (i.e. the abiotic characteristics at single sampling sites) or by the island where sampling sites were located, and (2) how island species pools influenced local species diversity. For these purposes, we assembled a large data set from all phytosociological relevés available in published and unpublished sources, from the year 1973 to the present day.

The final database included 1334 relevés, for a total of 790 species and subspecies. Multivariate analyses, sample-based rarefaction curves, regression techniques and beta-diversity analyses were used to test the role of island belonging and local abiotic factors in controlling variation in plant community. We found that the sampling effort (represented by the number of available relevés and hence the sampled area) was affected by temporal and spatial biases, which can explain some biogeographical inconsistencies. However, we found a positive relation between the overall floristic richness known from each island and the biodiversity patterns emerged from relevés. We also found that local factors and island belonging interact in a complex way in generating beta-diversity patterns