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Effects of Anthropogenic Pressure on *Posidonia oceanica* (L) Delile (1813) Ecosystems.

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The importance to understand and predict changes in the ecological/genetic structures of seagrass meadows is well known for *Posidonia oceanica* (L) Delile (1813), due to its wide distribution in the Mediterranean which guarantees the coastal ecosystem services and the health status of the habitat. Along the Mediterranean coasts seagrass meadows are exposed under continuous natural and anthropogenic pressure where the way meadow health correlates with its genetic and genotypic diversity: seagrass genetic diversity can influence a number of ecological factors as disturbance resistance and resilience having strong implications for ecological function in coastal communities.
Monitoring the changes of ecological structure of seagrass ecosystems is particularly important in coastal environments where the impacts of human activity are intense (e.g. presence of ports with a densely urban aggregate, power plants, aquaculture, etc) as well as where seagrass beds are exposed to natural environmental stress from waves. Recently the knowledge of the ecological structure of meadows is considered a pre-requisite for marine energy projects by which the renewable wave energy resource can be exploited in the Mediterranean and can play a key role in providing electrical power to small islands.
In this paper are presented the monitoring studies carried out along the Italian coast of Tyrrhenian sea, Ligurian Gulf and Pantelleria Island in order to assess the ecological/genetic structure of P. oceanica meadows and the changes under natural and anthropogenic impacts.
Furthermore, the spatial heterogeneity distribution of P. oceanica meadows were mapped by remote sensing techniques, showing different classes of density, indicated as disturbed beds.
We found a different genetic varibility in the meadows studied where P. oceanica population showed a phenotypic plasticity in response to different environmental conditions.
In particular our findings suggest that anthropogenic impacts to seagrass coverage can change the genotypic composition of populations over time as well as differences in leaf characteristics among genotypes are evidenced by morphological trait variation and explained by genetic variance. Therefore monitoring activity can assess the possible impacts on seagrass in the coastal marine ecosystems evidencing changes at different time scale and therefore contribute to their health state and conservation.