

Riunione Scientifica Annuale
27-28 ottobre 2023, Napoli

RIUNIONE SCIENTIFICA ANNUALE
GRUPPO DI LAVORO PER L'ALGOLOGIA
Società Botanica Italiana

Napoli, 27 - 28 ottobre 2023

Stazione Zoologica Anton Dohrn
Museo Darwin Dohrn (DADOM)



MO Tax



Preliminary results of *Cymodocea nodosa* (Tracheophyta, Alismatales) monitoring in the Mar Piccolo of Taranto (southern Italy, Mediterranean Sea) through *in situ* data and satellite images

G. Denti, A. Petrocelli, E. Cecere, F. Rubino, G. Fanelli, C. Richiardi, M.P. Adamo

On the basis of the SPA-BIO protocol of the Barcelona Convention relating to specially protected areas and biodiversity, seagrass associations are priority for the conservation of "coastal lagoons" (habitat 1150*, Directive 92/43/EEC). In fact, aquatic phanerogams offer a remarkable set of ecosystem services (e.g., nursery areas for fish and invertebrates, sediment stabilization, nutrient recirculation) and are important indicators of ecological quality (Bonometto et al., 2018). Therefore, their continuous monitoring is advisable. In compliance with the Water Directive (2000/60/EC) and according to the protocols established by ISPRA, ARPA Puglia, since 2010, annually conducts the "Monitoring Service of Surface Water Bodies of the Apulia Region" that includes the Mar Piccolo of Taranto, a site of the Natura 2000 network and priority habitat according to Directive 92/43/EEC. For the assessment of the ecological status, the MaQI index (Macrophyte Quality Index) is one of the indices used, which considers the presence and percentage coverage of both macroalgae and angiosperms. According to the ARPA last results, the only phanerogam detected was *Cymodocea nodosa* (Ucria) Ascherson, with a coverage between 15% and 25%, while the ecological status of the basin ranged between "good" and "high". However, the Water Directive does not provide for the quantitative and phenological study of seagrasses. Therefore, within the project "M.I.A. RETE Natura 2000" funded by the Apulia Region, an innovative monitoring plan for the protection of the Mar Piccolo is going to be designed using quantitative data. A rapid monitoring method could be mapping by remote sensing (Traganos and Reinartz, 2018). In particular, the integration of data collected *in situ* and from remote sensing in the spectral range of the Vis-NIR-SWIR, through the application of data-driven supervised algorithms (e.g., SVM), allows the automatic mapping of aquatic vegetation in conditions of adequate transparency along the water column and for shallow waters (within 2 m) (Tarantino et al., 2019). A preliminary survey, conducted with ARA along the entire coast and in deeper areas, allowed to identify areas where the species is present. Successively, in the season of maximum growth, in four stations identified as the most representative, a quantitative study was conducted according to the protocols in force (Sfriso et al., 2001; Pergent et al., 2006). The quantitative data collected "at sea" are now being integrated with the information coming from satellite images acquired by the Sentinel-2 multispectral sensor of ESA (European Space Agency). As a result, distribution maps useful for a faster and cheaper space-time monitoring system will be provided.

Letteratura citata

- Bonometto A., Sfriso A., Oselladore F., Ponis E., Cornello M., Facca C., Boscolo R. (2018) Il trapianto di fanerogame acquatiche come misura per il ripristino delle lagune costiere. ISPRA Quaderni - Ricerca marina n.12/2018, pp. 52.
- Traganos D., Reinartz P. (2018) Mapping Mediterranean seagrasses with Sentinel-2 imagery. Marine Pollution Bulletin 134: 197-209.
- Tarantino C., Casella F., Adamo M., Lucas R., Beierkuhnlein C., Blonda P. (2019) *Ailanthus altissima* mapping from multi-temporal very high resolution satellite images. ISPRS Journal of Photogrammetry and Remote Sensing 147: 90-103.
- Sfriso A., Facca C., Ceoldo S. (2001) Growth and production of *Cymodocea nodosa* (Ucria) Ascherson in the Venice Lagoon. Scientific Research and Safeguarding of Venice. Volume II: 229-236.
- Pergent G., Pasqualini V., Pergent-Martini C., Ferrat L., Fernandez C. (2006) Variability of *Ruppia cirrhosa* in two coastal lagoons with differing anthropogenic stresses. Botanica Marina 49: 103-110.

AUTORI

Giuseppe Denti, Antonella Petrocelli (antonella.petrocelli@irsa.cnr.it), Ester Cecere, Fernando Rubino, Giovanni Fanelli, Istituto di Ricerca Sulle Acque, Consiglio Nazionale delle Ricerche (IRSA-CNR), via Roma 3, 74123 Taranto.
Chiara Richiardi, Maria Patrizia Adamo, Istituto sull'Inquinamento Atmosferico, Consiglio Nazionale delle Ricerche (IIA-CNR), via Giovanni Amendola 173, 70125 Bari.
Autori di riferimento: Antonella Petrocelli, Maria Patrizia Adamo

Activities performed within the LTER network and the framework of: 1. POR PUGLIA FESR-FSE 2014/2020 - Axis VI, Action 6.5 "Interventions for protection and valorization of marine and terrestrial biodiversity" Sub Action 6.5.a, funded by the Apulian Region; 2. the Italian National Recovery and Resilience Plan (PNRR) funded by the Italian Ministry of University and Research, Mission 4, Component 2, "From research to business" NBFC, Investment 1.4, Project CN00000033.

