Spatial patterns of the Zostera noltei meadows across the Atlantic coast of Morocco: is there a latitudinal gradient?

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Seagrass meadows exist in most shallow, sheltered, soft-bottomed marine coastlines and estuaries throughout the world and rank among the most productive systems in the ocean. Zostera noltei Hornemann is a small seagrass largely widespread in intertidal areas of Western Europe and North-West Africa, the Mediterranean Sea and in the Black Sea.

In Morocco, intertidal Zostera noltoi meadows were identified at six coastal ecosystems across c.a. 2500 km of its Atlantic coast (Tahaddart estuary, Moulay Bousselham, Sidi Moussa, Oualidia, Khnifiiss lagoons and Dakhla Bay). The present work aimed at assessing the spatial and latitudinal variation of Z. noltei meadows by measuring the density of shoots, leaf biomass, root-rhizome biomass, number of leaf /shoot and the average length and width of leaves. Samples were conducted between December 2014 and January 2015, using a hand PVC corer (12.5 cm of diameter). When possible, a downstream and upstream comparison is performed in each site.

Density of shoots fluctuated between 1972 and 9833 shoots m⁻². Leaves biomass varied between 32 and 259 gDW/m² and root-rhizome biomass oscillated between 21 and 314 gDW/m². Number of leaves per shoot fluctuated between 2.47 and 3.4 leaf per shoot, the leaf length between 4.9 and 30.8 cm and the leaf width 0.6 and 2 mm. These results showed, on the one hand, a clear spatial variation across a downstream-upstream gradient in each site and, on the other hand, a latitudinal pattern in the biomass and morphometry of the Z. noltei meadows across the Atlantic coast of Morocco. Significant differences were evidenced for all variables (ANOVA, p<0.05). The root-rhizome biomass and density of shoots are higher southward while the number of leaves per shoot, leaf biomass and the average length and width of the leaves are greater northward.

These results are compared with literature data from the distribution range of Z. noltei. Further analysis regarding the genetics, the associated benthic invertebrates and the sediment contamination are being performed and will increase the knowledge on such ecosystems and help in understanding their interaction with environment conditions.