DISTRIBUTION AND BIOMASS OF *ZOSTERA NOLTEI* MEADOWS IN THE NORTHERN LAGOON OF TUNIS IN THE SUMMER OF 2014

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Abstract
Seagrass meadows of *Zostera noltei* Hornemann are widely distributed over the coasts of Tunisia. It plays key ecological roles in lagoon, estuarine and marine ecosystems. In the Northern lagoon of Tunis, *Zostera noltei* meadows represent relatively dominant populations especially after the plan of restoration that was implemented in the mid 1980's to deal with problems of eutrophication. *Z. noltei* meadows have gradually extended to the southern part where they are able to survive and to thrive. The total biomass in the North lagoon of Tunis was about 2512 tons of DW in June of 2014.

Keywords: Mediterranean Sea, Biomass

Introduction
The Northern lagoon of Tunis is a coastal Mediterranean lagoon located at the bottom of the Gulf of Tunis, on the Eastern side of Tunis City and communicates with the sea *via* kheireddine channel. Its average depth is about 1.5 m [1]. After the restoration project of this lagoon, completed in 1988, the biomass of the nitrophilous species (*Ulva* and *Cladophora*) has decreased progressively until it was totally replaced by other communities. Several species of Magnoliophyta such as *Ruppia cirrhosa*, *Cymodocea nodosa* and *Zostera noltei* found the favorable conditions for their Development [2]. The marine and brackish Magnoliophyta *Zostera noltei* forms relatively dominant populations in the Northern lagoon of Tunis. It was developed first in the North-east sector of the lagoon, the most influenced by trade with the Mediterranean sea, then gradually, it extended to the South-east sector. It seems to be the key species in understanding the ecological equilibrium of this restored ecosystem.

Materials and Methods
The observation of the phytobenthic communities was conducted during June 2014 at 125 stations distributed along 36 parallel transects spaced of 500m and covering the entire surface of the Northern lagoon [2]. The observations were obtained at each station by using a Glace Bottom Basket (GBB) or by diving and hand-collecting the macrophytes when transparency does not allow. The biomass was measured with its two components, above and below-ground, in 10 stations representative of the different types of seagrass meadows recovery (two replicas for each type of recovery) (Fig.1). The sampling of the biomass was done by diving and hand-collecting using 0.25 m² quadrat. After separating the *Zostera noltei* from the organic debris as well as from other vegetation present in the sample, the biomass as dry weight (DW) was determined by drying to a constant weight at 80ºC for 24 hours.

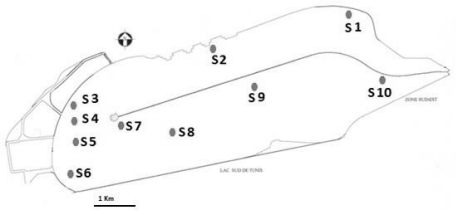

Fig. 1. Sampling stations for the biomass study of *Zostera noltei* in the Northern lagoon of Tunis in summer 2014

Results and discussion
Zostera noltei, observed on muddy and sandy-muddy bottoms, has a wide distribution spreading over 40% of the total area of the lagoon. It spread gradually to the Southern part of the lagoon but it was awfully absent in the South-East because of the relatively lower water quality. The total biomass in the North lagoon of Tunis was about 2512 tons of DW in June of 2014. Most of this biomass (48%) comes from dense beds with cover of 50 to 90%. Above-ground biomass is higher than the below-ground biomass for all depths in the lagoon (Fig.2). The evolution of the above-ground biomass shows fluctuations between stations ranging from a minimum of 63.4 g DW/ m² for the station S3 to a maximum of 450.4 g DW/ m² for the station S9 (the mean biomass is 213.2, g DW/ m², SD= 145.3). However the below-ground biomass is relatively stable for all stations. The ratio between below-ground biomass and above-ground biomass (g DW/m²) for all stations varies from 0.1 to 0.4. The small increase of below-ground biomass at this season is due to the increase of shoots density and thus to the biomass of leaves [3].

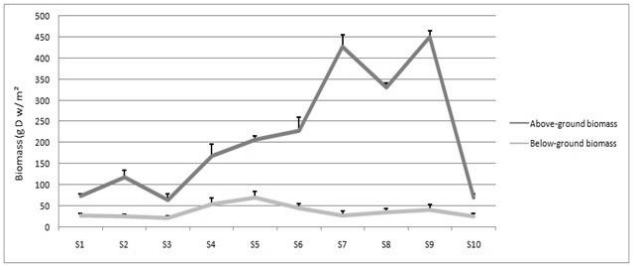

Fig. 2. Spatial variation of above and below-ground biomass (gDW/ m^2) of *Zostera noltei* in different stations (S1 to S10) of the Northern lagoon of Tunis (Summer 2014)

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