

## **NAJAS SPP. GROWTH IN RELATION TO ENVIRONMENTAL FACTORS IN WADI ALLAQI (NASSER LAKE, EGYPT)**

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### **ABSTRACT**

The study aims to evaluate the pattern of *Najas* spp. (aquatic plant) distribution along the shores of Allaqi, Lake Nasser, to identify the effect of physico-chemical variables on the growth and on the expansion of the plants. *Najas* spp. are vital for nomadic groups (Bedouins) living in the area, they harvest the plant out of lake to utilize it as fodder resource for their sheep and goats. Drought conditions that extended more than ten years increase the demands for the plants, in order to compensate the reduction of available grazing areas and the lack of grazing terrestrial plants. It was noticed that *Najas* growth declined in many areas in Allaqi due to anthropogenic and natural factors. *Najas* was exposed to negative conditions caused by human activities, including shores agriculture and fishing. The dense flocks of large migratory birds and the expansion of aquatic plants (other species of macrophytes and epiphytes) are additional factors that threaten in many ways the *Najas* spp. presence. Environmental patterns were assessed over 17 abiotic parameters related to water (depth, temperature, pH, TDS, conductivity, dissolved oxygen, light transparency, phosphate, nitrate, nitrite, ammonium, sulphate) and hydrosol (phosphate, nitrate, nitrite, ammonium, organic matter). Three field samplings were performed (May, July and September 2008) in the period when *Najas* (mainly *Najas horrida* which is dominant) starts and completes its life cycle; this period also represents the maximum human impact (harvesting time of *Najas* by Bedouins and the period of shores cultivation) covering a wide range of natural and anthropogenic conditions variations. The temporal and spatial variation of *Najas* spp. growth was obvious in Allaqi due to conditions related to: 1) variation in water and hydrosol qualities caused mainly by human impacts, 2) variation in the nature and physical features of the shores, 3) mechanical damage from migratory birds and 4) competition of epiphytes and other macrophytes species for light, nutrients oxygen and space. CCA statistical technique was extremely useful in understanding the response of different *Najas* species growing in Allaqi (*Najas horrida*, *Najas marina* subsp. *armata* and *Najas minor*) to various conditions. It indicated that depth, TDS, water ammonium and hydrosol phosphate are the key factors that control *Najas* growth in Allaqi, and this agreed with field observation, where *Najas* thrived and dominated in shallow sheltered areas with low nutrient contents. Remarkable reduction in *Najas* growth was recorded at cultivated shores, due to fertilizers reaching the water, and causing high ammonium contents. *Myriophyllum spicatum* known to be a severe competitor, able to grow in wide range of environmental conditions, and our study showed that *Myriophyllum* was more adapted to unfavourable conditions than *Najas*, suggesting the invasive ability of this species in future.

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