

COMPETITION AMONG INTRODUCED AND INDIGENOUS SUBMERGED MACROPHYTES IN A SOUTHERN MEDITERRANEAN SHALLOW SYSTEM.

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Halophila stipulacea (Forsskål) Ascherson is a tropical seagrass distributed along the western coasts of the Indian Ocean and in the Red Sea. Plant fragments were found in the eastern Mediterranean in 1894 but the first occurrence of living plants was reported in Rhodes (Lipkin, 1975). This species is considered a Lessepsian immigrant entered the Mediterranean Sea after the opening of the Suez Canal (1869). *H. stipulacea* remained in the eastern Mediterranean for several decades and only recently it spreads towards the western basin through Malta and the Ionian coast of Sicily (Lanfranco, 1970; Alongi *et al.*, 1993). The spreading of *H. stipulacea* along the Tyrrhenian coasts of Sicily is actually in progress as proved by the last records off the coast of Termini Imerese (Pa) and in the Gulf of Palermo (Mannino *et al.*, 2009). *H. stipulacea* is generally considered a classic r-strategy species: rapidly growing, good coloniser, but weak competitor. In its area of origin *H. stipulacea* shows a perennial growth cycle except for shallow soft bottoms where it undergoes natural denudations in winter (Lipkin, 1979). In the Mediterranean Sea *H. stipulacea* has shown a perennial growth cycle (Lipkin, 1975; Di Martino *et al.*, 2006).

In Termini Imerese *H. stipulacea* has been recorded inside artificial basins, located near the harbour, built arranging breakwater barriers along the coast in order to protect the coastal road. The basins, in contact with the sea through a central opening, are characterized by a sandy bottom ranging from 0.80 to 2.5 m depth. From July until the beginning of November the seagrass formed beds with cover values ranging from 70% to 80%, and it was in contact either with the seagrass *Cymodocea nodosa* (Ucria) Ascherson (cover values of 20-25%) or the green alga *Caulerpa prolifera* (Forsskål) Lamouroux (cover values of 10-15%). Our observations on *H. stipulacea* revealed neither flowers nor fruits. Moreover, *C. nodosa* cover resulted lower (20-25%) in presence of *H. stipulacea* than in the basins where *H. stipulacea* was absent (55%). In winter *H. stipulacea* completely disappeared except for some rhizomes, undergoing natural denudations also observed in the Red Sea (Lipkin, 1979). But in April, in the place of the new plants of *H. stipulacea* that we would be expected to find, we recorded the presence of *Caulerpa racemosa* var. *cylindracea* (Sonder) Verlaque, Huisman & Boudouresque that in May (only one month later) reached cover values of 40%. Moreover, a significant *C. nodosa* cover increase was observed.

Therefore, *H. stipulacea* in good health conditions shows a clear competition strategy with *C. nodosa* as proved by registered cover values. But during natural denudations occurring in winter, *C. racemosa* var. *cylindracea*, showing a faster spreading ability than that of *H. stipulacea* and a very high invasive potential, negatively interferes with the rhizomes of *H. stipulacea* not only preventing them from spreading and forming new leaves, but also causing their regression.

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