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Y. Fernández Torquemada, J.L. Sánchez Lizaso

Department of Marine Sciences and Applied Biology, University of Alicante, P.O. Box 99; E-03080. Alicante (Spain).

EFFECTS OF SALINITY ON GROWTH AND SURVIVAL OF *CYMODOCEA NODOSA* (UCRIA) ASCHERSON AND *ZOSTERA NOLTII* HORNEMANN

Abstract

The aim of the present study was to examine the effects of salinity on growth and survival of Cymodocea nodosa *(Ucria) Ascherson and* Zostera noltii *Hornemann. Leaf growth and survival responses to salinity were characterized by several short-term experiments under controlled conditions. For each experiment, ten marked shoots were placed in plastic aquariums of 5 l and were exposed to different salinity treatments (ranging from 2 to 72 PSU). Growth and survival of both species were significantly affected by salinity. Under these laboratory conditions it has been detected that* Zostera noltii *tolerates hyposalinity conditions better than* Cymodocea nodosa*, but both species were very sensitive to salinity increases (> 41 PSU), what suggests that these seagrasses could be adversely affected by brine discharges from seawater desalination plants.*

Key-words*: salinity effects, desalination impact,* Cymodocea nodosa*,* Zostera noltii.

Introduction

Salinity is considered a constant factor in open waters of the Mediterranean Sea, but the recent development of new seawater desalination facilities can produce significant increases of salinity that may affect benthic organisms. Previous studies have shown that *Posidonia oceanica* is quite sensitive to salinity increments (Buceta *et al*., 2003; Fernández-Torquemada and Sánchez-Lizaso, 2005), but there is no information about the response of other Mediterranean seagrasses to this impact.

The aim of the present study was to examine the effects of salinity on growth and survival of *Cymodocea nodosa* (Ucria) Ascherson and *Zostera noltii* Hornemann.

Material and methods

Leaf growth and survival responses to salinity were characterized by several short-term (10 days) experiments under controlled conditions between February 2003 and August 2004. Both species were collected from a mixed shallow meadow (– 2 m) at Alicante (SE Spain), with an ambient salinity of 36.8-38.1 PSU. For each experiment, ten marked shoots were placed in plastic aquariums of 5 l with sediment and an additional overhead light, and were exposed to different salinity treatments (ranging from 2 to 72 PSU). Statistical analyses were performed with ANOVA and SNK post-hoc test.

Results

Growth and survival of both species were significantly affected by salinity. Maximum leaf growth occurred between 16 and 41 PSU for *C. nodosa* and between 2 and 41 PSU for *Z. noltii* (Fig. 1). *C. nodosa* plants sustained considerable mortal-

ity at salinities below 17 PSU and above 50 PSU, with 100 % mortality at 56 PSU, while *Z. noltii* showed maximum survival rates (> 90 %) at 2-43 PSU (Fig. 2).

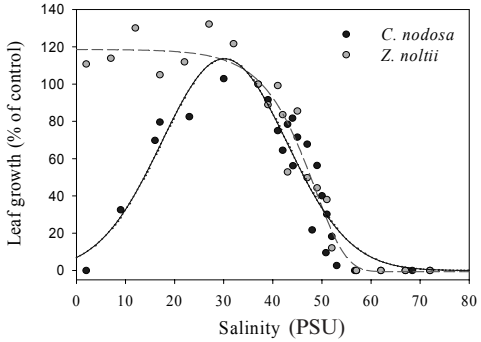

Fig. 1 - Leaf growth *versus* salinity as percentage of the growth of the control plants. Each point represents the mean for three aquaria at each salinity.

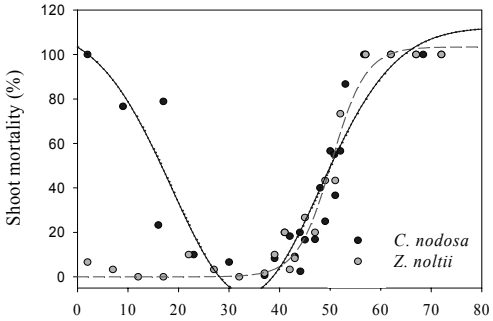

Fig. 2 - Shoot mortality of plants subjected to the different salinity treatments

Conclusions

Under these laboratory conditions it has been detected that *Zostera noltii* tolerates hyposalinity conditions better than *Cymodocea nodosa*, but both species were very sensitive to salinity increases (> 41 PSU).

Our results suggest that both seagrasses are more tolerant than *Posidonia oceanica* to salinity increase but also could be adversely affected by brine discharges from seawater desalination plants.

References

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