

{rokbox title=|Study sites in Mallorca, Spain :: Image: Authors|
thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-measurements-nitrogen-posidonia-agawin-et-al-2019-thumb.jpg|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-measurements-nitrogen-posidonia-agawin-et-al-2019.jpg{/rokbox}

Nona S. R. Agawin, Pere Ferriol, **Eva Sintés**, 2019. [Simultaneous measurements of nitrogen fixation in different plant tissues of the seagrass *Posidonia oceanica*](#)

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Abstract: The lack of simultaneous measurements of N₂ fixation associated with different plant tissues in seagrasses led us to investigate the temporal (seasonal and diurnal) variability of N₂ fixation rates associated with the different plant tissues (leaves, rhizomes and roots) of *Posidonia oceanica* along the Mallorcan coast (Mediterranean Sea) in areas with differing local nutrient regimes. Additional measurements were taken to quantify the activities of endophytic N₂ fixers in the roots. N₂ fixation in the different portions of the plants showed variability through the seasons, with generally higher activity associated with the leaves during summer (reaching up to $0.29 \pm 0.00 \mu\text{g N g}^{-1} \text{ dry weight [DW] h}^{-1}$ [mean $\pm$ SD] during the day) and higher activity associated with the roots (reaching up to $0.12 \pm 0.02 \mu\text{g N g}^{-1} \text{ DW h}^{-1}$) during the day and night in winter. Root endophytic N₂ fixers also showed maximal rates ($0.11 \pm 0.07 \mu\text{g N g}^{-1} \text{ DW h}^{-1}$) during winter. N₂ fixation associated with the rhizomes remained low throughout the seasons (minor than $0.01 \mu\text{g N g}^{-1} \text{ DW h}^{-1}$). N₂ fixation associated with the leaves can contribute up to 86% of total plant N₂ fixation during summer, while during the colder months, the belowground tissue parts play a more significant role in the plant's N₂ fixation. The rhizomes can contribute up to 67% of total N₂ fixation of the plant in autumn, because of their high biomass, while the roots can contribute up to 30% in winter.

Keywords: Nitrogen fixation, *Posidonia oceanica*, Mediterranean Sea