

## **The role of *Zostera marina* on nutrient cycle in the shallow water ecosystem**

**Teruwo Morita**

**Mie Industry and Enterprise Support Center**

*Zostera marina* Linnaeus is a marine angiosperm and has wide distribution in the northern hemisphere. Since the 1950s the *Zostera* beds have decreased dramatically along the coast of Japan. There have been many recovery programs since the 1960s in various areas for conservation of the coastal environment and propagation of fishery resources. In general, *Z. marina* contributes to alleviation of eutrophication by absorbing nitrogen and phosphorus and contributes to the stability of bottom sediments. In this study, the nitrogen content of *Z. marina* was examined in order to elucidate their role in the nutrient circulation in a shallow water ecosystem. The present study is a part of the Ago Bay Environmental Restoration Project under the program of Japan Science and Technology Agency.

Study site was in the area of *Z. marina* beds in Ago Bay, central Japan. *Z. marina* absorbed nutrients mainly through roots in sandy and muddy bottom sediments. As for leaf blade, the nitrogen contents of younger leaf were higher than that of aged leaf blade, and gradually decreased toward the older leaf blade. When leaves died, nitrogen contained in them flow out to surrounding water. So, *Z. marina* plays an important role as a biological pump, ie, absorbing nutrients from bottom sediments and releases it into water. The nitrogen contents were 0.02 – 0.07mg/cm<sup>2</sup> of leaf area. As for fallen leaves, the nitrogen contents of fallen leaves on the bottom were 0.03 mg/cm<sup>2</sup>. The elution of nitrogen from aboveground organ was calculated by deducting the fallen leaves from leaf blades and sheaths of annual shoots. The elution of nitrogen from aboveground organ was estimated to be about 8Kg N/ha/year. The total amount of elution of nitrogen was 1.2t N/year on the total area of *Zostera* bed of 150ha at Ago Bay.

This research can become the theoretical backbone for recovery the “*Zostera* bed” and I think that this study has generated a new viewpoint of “Biological Pump” as a role of *Zostera* in the shallow water ecosystem.

**Preferred mode of presentation: oral**

**Main author: Teruwo Morita (t-morita@miesc.or.jp)**