Simulation of 'Net' Nutrients Removal by Green Mussel (Perna viridis) in Estuarine and Coastal Areas

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Abstract : Green mussels (Perna viridis) can effectively remove nutrients from seawater through their filtration process. This study aims to estimate 'net' nutrient removal rate by green mussel through calculation of nutrient uptake and release. Nutrients (carbon, nitrogen, and phosphorus) uptake was calculated based on the mussel filtration rate. Nutrient release was evaluated from carbon, nitrogen, and phosphorus released as mussel feces. By subtracting nutrient release from nutrient uptake, net nutrient removal by green mussel can be found as 3302, 380 and 124 mg/year/indv. Mass balance model was employed to simulate nutrient removal in actual green mussel farming conditions. Mussels farm area, seawater flow rate and amount of mussels were considered in the model. Results show that although larger quantity of green mussel farms lead to higher nutrient removal rate, the maximum green mussel cultivation should be taken into consideration as nutrients released through mussel excretion can strongly affect marine ecosystem.

Keywords : carbon, ecretion, filtration, nitrogen, phosphorus