The culturing of sea grape *Caulerpa lentillifera* by using waste water of kelp grouper and estimating the ability of absorbing elements contained in waste water.

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Recirculating aquaculture system has a problem in the dealing waste water. Recently, it is aimed to combine the treatment of waste water with cultivation of marine algae to prevent environmental pollutions. In this study, kelp grouper and sea grape were used for experimental fish and alga and sea grape were cultivated for 28 days by using kelp grouper's waste water or synthetic medium (PES) in the tanks that had 50 L water volumes. Water temperature and pH were maintained at 28℃ and up to 8.0, respectively. In addition, salinities were set at 32 psu and 36 psu to confirm the tolerance of salinity, and photoperiod was controlled at 12 h light: 12 h dark in the all treatments. Sea grape cultured in 32 psu with waste water showed the highest specific growth rate (SGR) that is 7.16, similar to it of sea grape cultured with synthetic medium in 32 psu. While, the sea grape cultured in 36 psu with PES showed the lowest SGR that is 5.27. In addition, elements contained waste water, solid waste, foam waste and sea grapes were analyzed by using inductively coupled plasma atomic emission spectroscopy and total nitrogen analyzer. These results showed that the elements contained in the kelp grouper waste (i.e., waste water, solid waste and foam waste) are enough to grow up sea grape except manganese, copper and boron. Thus, these elements are needed to add to culturing water and their quantities are 189.8 µg, 99.4 µg and 157.5 µg respectively on 1 L basis.

Keywords: Kelp grouper, Sea grape, Recirculating fish culture system, Utilization of waste water, Culturing waste, Water quality

