

RESEARCH METHODS

Preparation of enclosures:

This research was done in 12 m x 16 shrimp pond that belongs to LPWP, Diponegoro University in Jepara, Central Java. The seawater was pump into the pond, at level of 1m depth. The pond was divided into 12 of 1m x 1m x 1.2m of polyethylene enclosures. All enclosure was set up inside the pond and filled with 1m³ of seawater. The enclosure was hung on a rope that tightens by wire and attached to the stick. The sticks were than anchored in every side of the shrimp pond.

Gracilaria cultivation method:

Gracilaria is cultivated by hanging on a rope. This method is the most suitable to conduct seaweed cultivation in shrimp pond. This technique was applied to avoid the sink of *Gracilaria* into the bottom. Beside that, *Gracilaria* that cultivated by hanging on a rope will grow more rapidly. *Gracilaria* that grow in the bottom will get smaller sunlight.

Research conduction and treatment:

This research was done using *Gracilaria* at different density. There were three different of *Gracilaria* density; it was 1 a/m³, 2 kg/m³, and 3 kg/m³. *Gracillaria* was divided at small bunch. Each bunch was weighing at average of 50 gram. Into each enclosure, 50 of ± 0.06 gram and ± 1.4 cm shrimp were stocked. Each treatment was replicated 3 times. Three enclosures without *Gracilaria* were served as controls. The content of ammonia, nitrite and nitrate in every enclosure was monitored weekly.

RESULTS AND DISCUSSION

Results indicated that the presence of *Gracilaria* significantly reduced the content of ammonia, nitrite and nitrate. *Gracilaria* density significantly affects the removal of these three inorganic nitrogen content in the water.

Ammonia removal

The average of ammonia content during this research was ranged between 0.00049 to 0.033 mg/l. In general, ammonia concentration in shrimp pond was relatively low. This probably also caused by degradation of ammonia by bacteria (Wetzel, 1983). Beside that, ammonia is inorganic compound that will be absorbed quickly by aquatic plants (Boyd, 1990). Handoyo (1990) found that in the shrimp pond where traditionally managed will have low content of ammonia. Its ammonia content is almost undetected. In the shrimp pond that intensively managed, will have relatively high content of ammonia. It was ranged 0.10 mg/l to 0.46 mg/l. This result indicated that all ammonia content in enclosures was above the average of ammonia content in the pond that traditionally managed, but it was far below the concentration of ammonia in the pond that intensively managed. The range of ammonia content in this research was in the safe condition to raise shrimp. According Poernomo (1998), the safe level of ammonia content in the shrimp pond was lower than 0.3 mg/l. At concentration of 0.01 mg/l, ammonia content is in good level to support the growth of shrimp (Darmono, 1993).