

**COMPARISON OF PROTEIN QUALITY OF THREE SEAWEED
SPECIES (*Sargassum polycystum*, *Sargassum oligocystum* and *Ulva
pertusa*) FROM PANAY AND GUIMARAS ISLAND,
PHILIPPINES FOR POTENTIAL USE IN MILKFISH FEED**

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ABSTRACT

Aquafeed production is the largest expenditure in intensive aquaculture operations, contributing to about 40-60% of total costs (Yildirim *et al.*, 2009; Akiyama *et al.*, 1992 cited in Ali *et al.*, 2009). This is mostly due to the ingredients being used, particularly the protein source fishmeal (Millamena, 2002). The variable and finite supply of fishmeal, however, result in high costs, prompting the search for cheaper alternative ingredients as a priority in cost reduction practices regarding the production of aquafeeds (Attala and Mikhail, 2008). Seaweeds have known nutritional values, and are naturally abundant in Philippine waters, thus their potential could be tapped to reduce costs in aquaculture and could therefore maintain the sustainability of the industry (Shields and Lupatsch, 2012; Trono, 1999). In this study, the protein quality of two brown seaweeds (*Sargassum polycystum* and *Sargassum oligocystum*) and one green seaweed (*Ulva pertusa*) was evaluated by determining their crude protein content, inhibitory activities against trypsin and chymotrypsin, and *in vitro* protein digestibility. Among the three species, the green seaweed *U. pertusa* has the highest crude protein content at 23.43%. The obtained crude protein content was 8.28% for *S. polycystum* and 9.22% for *S. oligocystum*. Trypsin inhibition of the seaweeds ranged from 54-57%, and chymotrypsin inhibition was from 57-64%. Total phenolic content (TPC) was highest in *S. polycystum*, and lowest in *S. oligocystum*. *In vitro* protein digestibility action of milkfish gut enzyme was highest in *S. oligocystum* (92.30 ± 2.80), followed by the observed digestibility in *U. pertusa* (75.01 ± 2.14), and lowest in *S. polycystum* (64.99 ± 8.11). Determination of Pearson's correlation (r) showed a negative correlation ($r=-0.99$, $p=0.08$) existing between the TPC and %RPD values. Based on the results, among the three species, *U. pertusa* with 23.43% crude protein content and a %RPD of 75.01% has a potential for partial inclusion in aquafeeds to reduce costs.