

# Comparative Study on Total Chlorophyll, Carotenoid, Fucoxanthin in Seaweeds *Ulva reticulata*, *Sargassum ilicifolium* and *Gracilaria multipartita* and Colour Enhancing Commercial Ornamental Fish Feeds

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Seaweeds are photosynthetic marine macro algae, contain various natural colour pigments. Considering high bioavailability and low cost of processing, this study aimed on evaluating the potential of using seaweeds as a feed additive for colour enhancement of ornamental fish compared to commercial colour enhancing ornamental fish feeds by assessing three types of pigments. Three algae species (green algae-*Ulva reticulata*, brown algae-*Sargassum ilicifolium* and red algae-*Gracilaria multipartita*) were collected from Dickwella area. Pigments were extracted into 10 ml of 99% acetone from sun-dried algae and from 3 types of commercial feeds having green, brown and red colours. Total chlorophyll, carotenoid and fucoxanthin content of seaweeds and commercial feeds were quantified using UV spectrophotometer. Non-normally distributed data were analyzed by Kruskal Wallis test in Minitab version 17 at 0.05 significant level. Highest total chlorophyll content was observed in *U. reticulata* ( $70.50 \pm 0.39 \mu\text{g g}^{-1}$ ) & *S. ilicifolium* ( $59.53 \pm 4.34 \mu\text{g g}^{-1}$ ) and it was significantly different from their respective colour feeds (green  $4.57 \pm 1.63 \mu\text{g g}^{-1}$  and brown  $7.69 \pm 5.56 \mu\text{g g}^{-1}$ ). Similarly, *U. reticulata* and *S. ilicifolium* had significantly different carotenoid content ( $1.44 \pm 0.16$ ,  $2.11 \pm 0.07 \mu\text{g g}^{-1}$ ) compared to their respective colour feeds (green  $0.22 \pm 0.09 \mu\text{g g}^{-1}$  & brown  $0.21 \pm 0.07 \mu\text{g g}^{-1}$ ). Chlorophyll & carotenoid content had no significant difference between *G. multipartita* and its respective red colour feed. Fucoxanthin content was also higher in seaweeds (*U. reticulata*  $2.12 \pm 0.89 \mu\text{g g}^{-1}$ , *S. ilicifolium*  $4.69 \pm 3.05 \mu\text{g g}^{-1}$  and *G. multipartita*  $1.52 \pm 0.82 \mu\text{g g}^{-1}$ ) than three commercial feeds (green  $1.82 \pm 1.81 \mu\text{g g}^{-1}$ , brown  $0.53 \pm 0.33 \mu\text{g g}^{-1}$  & red  $0.49 \pm 0.06 \mu\text{g g}^{-1}$ ) with no significant difference. Results indicate that sun-dried seaweeds contained comparatively high level of pigments studied; the selected sea weeds may be taken as an effective feed additive for the colour enhancement of ornamental fish.

**Keywords:** Pigment extraction, Seaweeds, Ornamental feed, Chlorophyll, Carotenoid

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