Effect of *Ulva* supplemented feeds, with and without probiotic (*Debaryomyces hansenii*) supplementation, on the growth, immunity, oxidative stress response and gut morphology/microbiome of the dusky kob *Argyrosomus japonicus*

Vuyokazi Kutu[1,2*], Brett M. Macey[1,2], Maria J. Darias[3]
[1] Department of Forestry, Fisheries and the Environment, Cape Town 8001, South Africa
[2] University of Cape Town, Rondebosch 7701, South Africa
[3] MARBEC, Univ Montpellier, CNRS, Ifremer, IRD, Montpellier, France
[*] VKutu@dffe.gov.za

Globally, several seaweed species are reported to have great potential as functional ingredients in aquafeed for a variety of fish species, including *Solea senegalensis*, *Clarias gariepinus*, *Salmo salar* and *Oreochromis niloticus*. *Ulva* has been cultivated by the South African abalone industry in Integrated Multi-trophic Aquaculture (IMTA) systems for use as feedstock or crop-based dietary ingredients in formulated feeds for aquacultured abalone (*Haliotis midae*) for almost two decades, and more recently for sea urchins (*Tripneustes gratilla* and *Parechinus angulosus*). The current study aims to enhance the growth, immunity, oxidative stress, gut morphology and microbiome of *Argyrosomus japonicus* (dusky kob) through dietary supplementation with dried *Ulva lacinulata*. Dried *U. lacinulata* inclusion levels of 5, 10 and 15% (w/w) will be tested and compared with a non-supplemented (0% *Ulva*) control feed, totalling to four (4) dietary treatments- of 3 replicate tanks each. Data will be collected for (1) growth performance, and nutrient utilization: Weight gain, feed conversion ratio, specific growth rate, condition factor, hepatosomatic index, viscera-somatic index and survival rate; (2) Haematology: blood glucose, haematocrit and blood histology; (3) Immune response by assessing variation in the expression of relevant immune genes such as IL-1β, IL-10, TNF-α and IgM from selected tissue samples (liver, intestine, head kidney and spleen). This will be conducted using semi-quantitative Real-Time Polymerase Chain Reaction (RT-PCR); (4) Flesh proximate analysis; (5) Antioxidant indicators of serum and liver; (6) Histology of the intestine; (7) Microbiome associated with gut tissue. Results from this study will help inform the aquaculture industry about how dietary *Ulva*-supplementation can help improve the health and welfare of one of South Africa's promising aquacultured fish species, the dusky kob *A. japonicus*. The presentation will provide an overview of the work that is planned and currently underway.

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