

Effects of Dietary Polyunsaturated Fatty Acids and Beta Glucan on Maturity, Immunity and Fry Quality of Pabda Catfish, *Ompok pabda*

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Abstract : A nutritionally balanced diet and selection of appropriate species are important criteria in aquaculture. The present study was conducted to evaluate the effects of polyunsaturated fatty acids (PUFAs) and beta glucan containing diet on growth performance, feed utilization, maturation, immunity, early embryonic and larval development of endangered Pabda catfish, *Ompok pabda*. In this study, squid extracted lipids and mushroom powder were used as the source of PUFAs and beta glucan, respectively, and formulated two isonitrogenous diets such as basal or control (CON) diet and treated (PBG) diet with maintaining 30% protein levels. During the study period, similar physicochemical conditions of water such as temperature, pH, and dissolved oxygen (DO) were 26.5 ± 2 °C, 7.4 ± 0.2 , and 6.7 ± 0.5 ppm, respectively in each cistern. The results showed that final mean body weight, final mean length gain, food conversion ratio (FCR), specific growth rate (SGR), food conversion efficiency (%), hepatosomatic index (HSI), kidney index (KI), and viscerosomatic index (VSI) were significantly ($P < 0.01$ and $P < 0.05$) higher in fish fed the PBG diet than that of fish fed the CON diet. The length-weight relationship and relative condition factor (K) of *O. pabda* were significantly ($P < 0.05$) affected by the PBG diet. The gonadosomatic index (GSI), sperm viability, blood serum calcium ion concentrations (Ca^{2+}), and vitellogenin level were significantly ($P < 0.05$) higher in fish fed the PBG diet than that of fish fed the CON diet; which was used to the indication of fish maturation. During the spawning season, lipid granules and normal morphological structure were observed in the treated fish liver, whereas fewer lipid granules of liver were observed in the control group. Based on the immunity and stress resistance-related parameters such as hematological indices, antioxidant activity, lysozyme level, respiratory burst activity, blood reactive oxygen species (ROS), complement activity (ACH50 assay), specific IgM, brain AChE, plasma PGOT, and PGPT enzyme activity were significantly ($P < 0.01$ and $P < 0.05$) higher in fish fed the PBG diet than that of fish fed the CON diet. The fecundity, fertilization rate ($92.23 \pm 2.69\%$), hatching rate ($87.43 \pm 2.17\%$) and survival ($76.62 \pm 0.82\%$) of offspring were significantly higher ($P < 0.05$) in the PBG diet than in the control. Consequently, early embryonic and larval development was better in PBG treated group than in the control. Therefore, the present study showed that the polyunsaturated fatty acids (PUFAs) and beta glucan enriched experimental diet were more effective and achieved better growth, feed utilization, maturation, immunity, and spawning performances of *O. pabda*.

Keywords : polyunsaturated fatty acids, beta glucan, maturity, immunity, catfish

Conference Title : ICFA 2025 : International Conference on Fisheries and Aquaculture

Conference Location : Toronto, Canada

Conference Dates : February 10-11, 2025