Use of Natural Spices to Boost the Immune System of Cultured Catfish *Clarias gariepinus*

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Intensification of fish production adversely affects the health condition of the fish and leads to the production of poor environment for fish and increases their susceptibility to parasites and infections, and ultimately, the occurrence of disease. Enhancing the immune system to develop the natural disease resistance of fish could be an effective way of increasing the immune competence and disease resistance of fish. Studies on the use of some herbs as immunostimulants to fish resulted in enhancing the specific and non-specific immune response of the test animal. A preliminary study on the effects of garlic *Allium sativum*, ginger *Zingiber officinale* and onion *Allium cepa* as dietary immunostimulants on the specific and non-specific immune response of African catfish *Clarias gariepinus* was conducted. Catfish fingerlings (1.45±0.23) were fed with experimental diets for six weeks. After the feeding experiment, blood was taken from the caudal region of anaesthetized fish and hematocrit, total lymphocyte count, total immunoglobulin and superoxide anion production were determined. Garlic-fed fish had the highest hematocrit (37.00 % ± 3.19) while the onion-fed group revealed the highest level (1.007 mg/ml) of immunoglobulin. On the other hand, the incorporation of ginger in the diet elevated the production of superoxide anion (1.018 OD at 540nm). However, no difference were found on the levels of hematocrit, total immunoglobulin and superoxide anion production between the control and the experimental groups (P>0.05). The total lymphocyte count showed significant difference between the control (10.37 ± 1.96) and onion (17.18 ± 1.72) fed group, but no significant difference with garlic (14.68 ± 1.0) and ginger (12.75 ± 1.20) fed group. The present study revealed that the incorporation of natural immunostimulants like garlic, ginger and onion could possibly increase the immunocompetence of the fish, and hence recommended to be tested for fish culture. The effects of age of fish, duration of feeding and the amount of immunostimulant to be used are to be investigated.

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