

Effect of *Curcuma longa* on Non-specific immunological profile of Indian Snakehead

Channa punctatus infected with *Aeromonas hydrophila*

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INTRODUCTION:

The use of immunostimulants in aquaculture is becoming popular for enhancing the activity of non-specific defense mechanisms and increasing disease resistance in fish, the use of antibiotics and other chemotherapeutics has several drawbacks such as (i) risk of generating resistant pathogens (ii) problem of drug residues accumulating in treated fish and (iii) detrimental effect on the environment. Commercial vaccines are expensive for fish producers and may not be available for all species and against emerging diseases. Therefore use of immunostimulants seem to be an alternative way of reducing disease risk in fish culture.

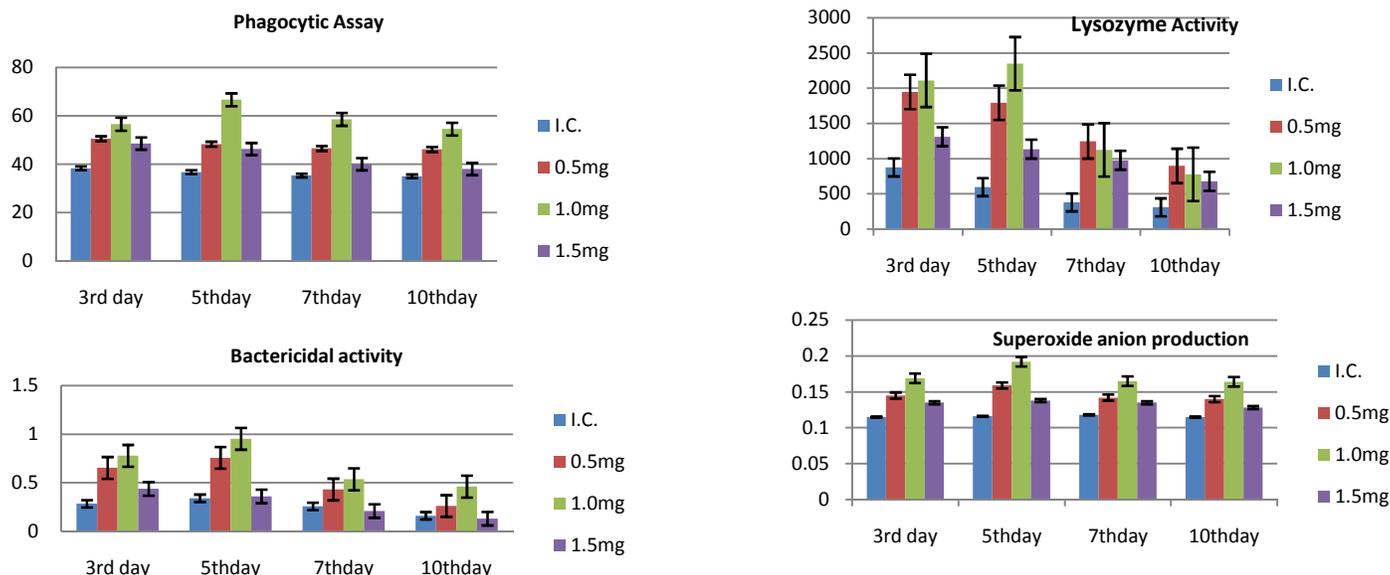
Curcumin an orange yellow phytochemical hydrophobic and polyphenolic compound of turmeric (*Curcuma longa*, Linn.) has been known to be a potent immunomodulatory agent in many animal species. Several research findings indicate that curcumin can act as a potent immunomodulatory agent that can modulate the activation of T cells, B cells, Macrophages, Neutrophils, natural killer cells, dendritic cells, transcription factors, cell cycle proteins and signal transducing kinases. It also has a strong effect on cytokine production, humoral and cell mediated immunity. In this Way, Curcumin regulates multiple targets, which is needed for treatment of most diseases. Moreover, it is inexpensive, extremely safe even at very high doses and used as an immunomodulator in various animal models including human beings. Till date very little information is available regarding the use of curcumin in fish health management.

OBJECTIVES:

The aim of our study was to evaluate the immunomodulatory properties and disease resistance of Curcumin against the opportunistic pathogen *Aeromonas hydrophila* in *Channa punctatus*, which is an important food fish of our region.

MATERIALS AND METHODS: Fishes were challenged intraperitoneally with a dose of *Aeromonas hydrophila* (1×10^8 cells/ml). Control and Immunocompromised fishes were given three different doses of curcumin viz. 0.5 mg, 1.0 mg, 1.5 mg/ 100 gm of body weight respectively. Treated fishes were sacrificed on 3rd, 5th, 7th and 10th day after the dose was given and various Non specific immune parameters were assessed :

>Phagocytic Assay: Narnaware *et al* 1994 , Lysozyme assay - Parry *et al* (1965) , Bactericidal activity - Welkar *et al* (2007), Superoxide anion production - Secombes (1990)



Non specific immune parameters observed on various assay days after intraperitoneal injection of different doses of Curcumin .

RESULTS: All the non-specific immune parameters were enhanced significantly, but the maximum enhancement was seen on the fifth day with the dose of 1.0 mg/ 100gm body weight and the same dose also showed maximum disease resistance as compared to other two doses. Higher dose did not show any significant enhancement.

CONCLUSION: The results obtained from the present study shows that, Curcumin can significantly stimulate some of these immune parameters without any side effects and act as an immunostimulant at low doses. However it's use and efficacy in fish health management needs to be further evaluated by using various pathogens.

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