

Accepted Manuscript

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PII: S0044-8486(17)31916-6
DOI: doi:[10.1016/j.aquaculture.2018.02.046](https://doi.org/10.1016/j.aquaculture.2018.02.046)
Reference: AQUA 633094
To appear in: *aquaculture*
Received date: 25 September 2017
Revised date: 9 February 2018
Accepted date: 27 February 2018

Please cite this article as: Mathan Ramesh, Thangavel Thilagavathi, Racky Rathika, Rama Krishnan Poopal , Antioxidant status, biochemical and hematological responses in a cultivable fish *Cirrhinus mrigala* exposed to an aquaculture antibiotic Sulfamethazine. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. *Aqua*(2017), doi:[10.1016/j.aquaculture.2018.02.046](https://doi.org/10.1016/j.aquaculture.2018.02.046)

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**Antioxidant status, biochemical and hematological responses in a cultivable fish
Cirrhinus mrigala exposed to an aquaculture antibiotic Sulfamethazine**

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Abstract

Aquaculture development, pathogens, and antibiotics were laid in parallel. Sulfadruugs are widely recommended as antibiotics in agriculture and aquaculture sectors. Among the sulphonamide group, sulfamethazine (SMTZ) are predominantly used to treat bacteria and other diseases. SMTZ are not acutely toxic but chronic exposure has effects on organisms. Fish are highly sensitive to slight environmental alterations, their physiological and biochemical alterations reveal the health status of organism and its surroundings. Fish biomarkers such as hematology, biochemical, and antioxidants in blood and organ were routinely analysed to assess the health condition of the fish. In the present study an Indian major carp, *Cirrhinus mrigala* was exposed to two different (1 and 10 mg/L) concentrations of SMTZ for 28 days. Hematological parameters such as haemoglobin (Hb), hematocrit (Hct), red blood cells (RBCs), and white blood cells (WBCs) were found to be altered in SMTZ exposed fish when compare to control groups in both the concentrations. Likewise, significant alterations in erythrocyte indices such as mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), and mean corpuscular haemoglobin concentration (MCHC) were found to be altered in SMTZ exposed fish. Biochemical parameters such as glucose and protein, and antioxidant status of super oxide dismutase (SOD), catalase (CAT), glutathione peroxides (GPx), and lipid peroxides levels were also found to be altered in fingerlings exposed to SMTZ in both 1 and 10 mg/L concentration when compare to their respective control groups. The data of the present study indicates that SMTZ is mild toxic to fingerlings at environmental relevant concentration. The interaction of SMTZ or its metabolites may be responsible for the observed alterations in the studied parameters. However, more data on combined effect of SMTZ with other antibiotics on other cultivable fish are urgently needed.

Keywords: antioxidant, biochemical, hematological, biomarkers, sulfamethazine, *C. mrigala*.

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