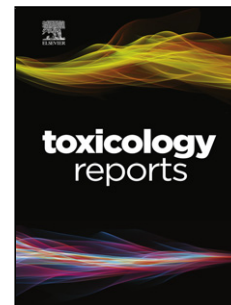


## Accepted Manuscript

Title: A Comprehensive Review on Chromium induced Alterations in Fresh Water Fishes

Authors: A. Bakshi, A.K. Panigrahi

PII: S2214-7500(18)30141-0  
DOI: <https://doi.org/10.1016/j.toxrep.2018.03.007>  
Reference: TOXREP 552



To appear in:

Received date: 11-5-2017  
Revised date: 20-2-2018  
Accepted date: 5-3-2018

Please cite this article as: A.Bakshi, A.K.Panigrahi, A Comprehensive Review on Chromium induced Alterations in Fresh Water Fishes, Toxicology Reports <https://doi.org/10.1016/j.toxrep.2018.03.007>

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## A Comprehensive Review on Chromium induced Alterations in Fresh Water Fishes

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### Highlights:

- Cr(VI) causes behavioural, histological, immunological changes in fresh water fishes.
- Cr(VI) induces formation of micronuclei, binucleated cell and DNA breakage in fish RBC.
- It also induces endocrine disruption in fish altering action of T<sub>3</sub>, T<sub>4</sub>, TSH and cortisol etc.
- Chronic exposure of Cr(VI) results in hyperglycemia and hyperlactamia in fishes.
- Enzymological activity has been found to be altered due to chronic exposure of Cr(VI).

### Abstract

Chromium is considered as one of the most common ubiquitous pollutants in the aquatic environment, but the pure metallic form is absent naturally. There are three oxidation states in case of Chromium viz., Cr (II), Cr (III), Cr (VI). Among which Cr (II) is most unstable. Cr (III) and Cr (VI) are the stable oxidation state of Chromium in the environment. Being one of the commonly used metals Chromium and its particulates enter the aquatic medium through effluents discharged from different industries like textiles, tanneries, electroplating workshops, ore mining, dyeing, printing-photographic and medical industries. Among these, hexavalent chromium is considered as the most toxic form because it readily passes cellular membranes and then reduced to trivalent form. This trivalent chromium combines with several macromolecules including genetic material inside the cytosol, and is ultimately exposes the toxic and mutagenic alterations due of chromium toxicity. Chromium is taken up either through gastrointestinal tract or respiratory tract. The amount varies depending upon the medium and the form of chromium. In this review, an attempt has been made to accumulate the mammoth available data regarding impact of chromium on fresh water fishes into a systematic representation. The main objective of the review is to provide a future guideline for the scientific community and public officials involved in health risk assessment and management ensuring a better environmental condition for human health.

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