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Effect of different concentration of chromium salt on growth of some blue green algae

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Abstract : Effect of chromium salt was tested on 4 local strains of blue green algae *Microcysts aeruginosa, Spirulina princep*, *Oscillatoria amphibian* and *Anabaena macrospora* on their growth. Upto the concentration of 2% growth increased but after that growth gradually decreased.

Keywords : Chromium salt, *Microcysts aeruginosa, Spirulina princep*, *Oscillatoria amphibian* and *Anabaena macrospora*

INTRODUCTION

Hexavalent chromium compounds are genotoxic carcinogens. Chronic inhalation of hexavalent chromium compounds increases the risk of lung cancer. (The lungs are the most vulnerable, followed by the fine capillaries in kidneys and intestines).[1] Soluble compounds, like chromic acid, are much weaker carcinogens. Chromate-dyed textiles or chromate-tanned leather shoes can cause or exacerbate contact dermatitis. Ingestion of chromium VI can also cause irritation or ulcers in the stomach and intestines.[2] Of 2,345 unsafe products in 2015 listed by the EU Commission for Justice, Consumers and Gender Equality some 64% came from China, and 23% were clothing articles, including leather goods (and shoes) contaminated with hexavalent chromium.[3-5]

Hexavalent chromium is transported into cells via the sulphate transport mechanisms, taking advantage of the similarity of sulphate and chromate with respect to their structure and charge. Trivalent chromium, which is the more common variety of chromium compounds, is not transported into cells.[6] Inside the cell, Cr (VI) is reduced first to metastable pentavalent chromium (Cr (V)), then to trivalent chromium (Cr (III)). Vitamin C and other reducing agents combine with chromate to give Cr(III) products inside the cell.[7]

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MATERIAL & METHODS

Four local strains of Blue Green Algae *Microcysts aeruginosa, Spirulina princep, Oscillatoria amphibian* and *Anabaena macrospora* collected from local area were selected to evaluate the effect of Chromium on their growth. Axenic culture of each strain was prepared and cultured in BG11 medium.

To evaluate effect of chromium salt on growth of selected Blue-green algae, different concentrations of potassium di chromate was prepared (0.5% to 5%) and mixed in culture medium. The effect was observed on 3rd, 6th, 9th, 12th and 15th day and also effect of different concentrations after 15 days.

RESULT

Growth response of different selected Blue Green Algae was observed in different concentration of Chromium salt on 3rd, 6th, 9th, 12th and 15th day and also after 15th day. Up to the concentration of 2% Chromium salt the growth linearly increased. In higher concentration, growth decreased. At the concentration of 5% the growth of all test algae decreased linearly from 3rd day to 15th day. The result is shown in Fig no. 1 to 8.

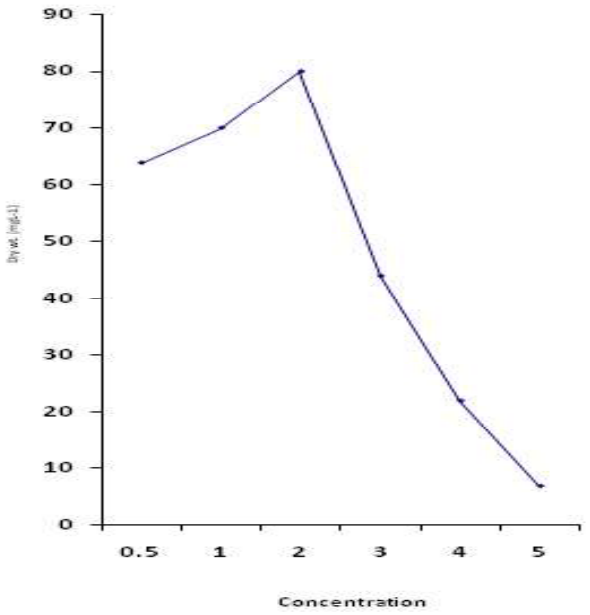

Fig. No. 1 Growth response of *Microcystis aeruginosa* in different concentration of Chromium salt on 15th day

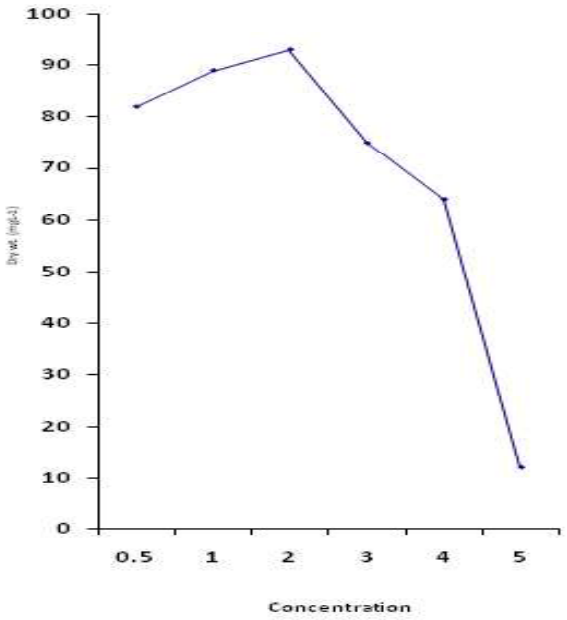

Fig. No. 3 Growth response of *Spirulina princep* in different concentration of Chromium salt on 15th day

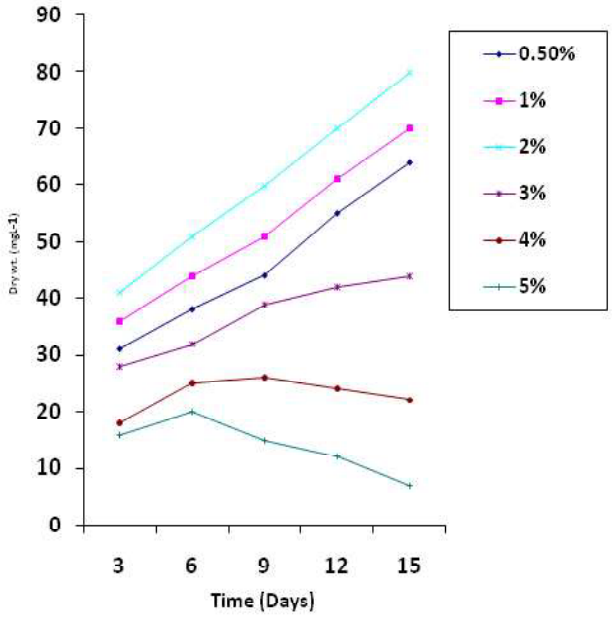

Fig. No. 2 Growth response of *Microcystis aeruginosa* in different concentration of Chromium salt

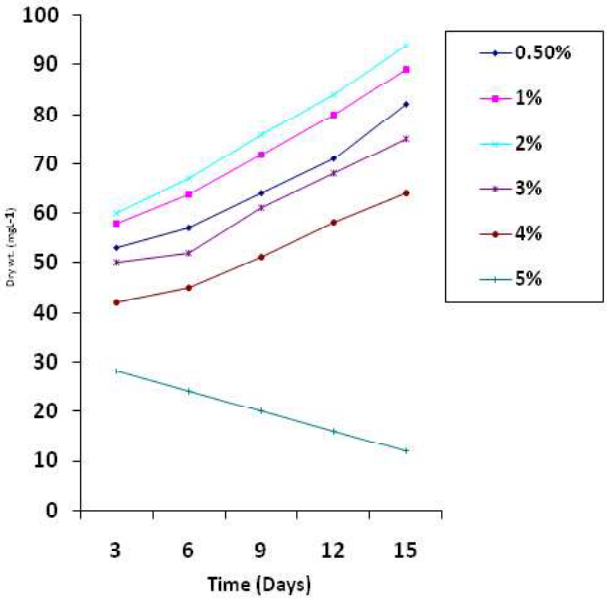

Fig. No. 4 Growth response of *Spirulina princep* in different concentration of Chromium salt

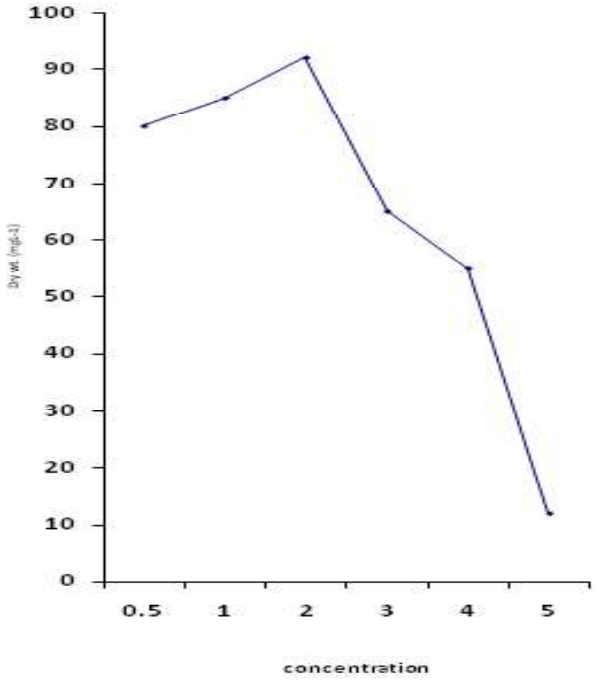

Fig. No. 5 Growth response of *Oscillatoria amphibia* in different concentration of Chromium salt on 15th day

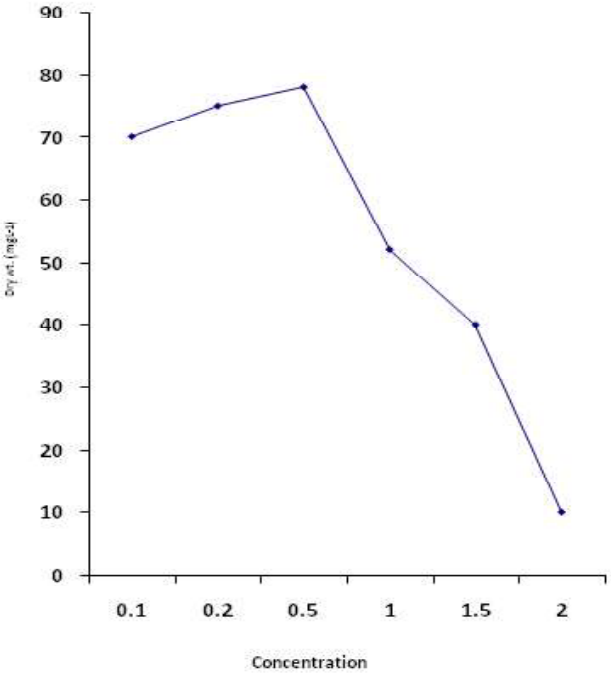

Fig. No. 7 Growth response of *Anabeana macrospora* in different concentration of Chromium salt on 15th day

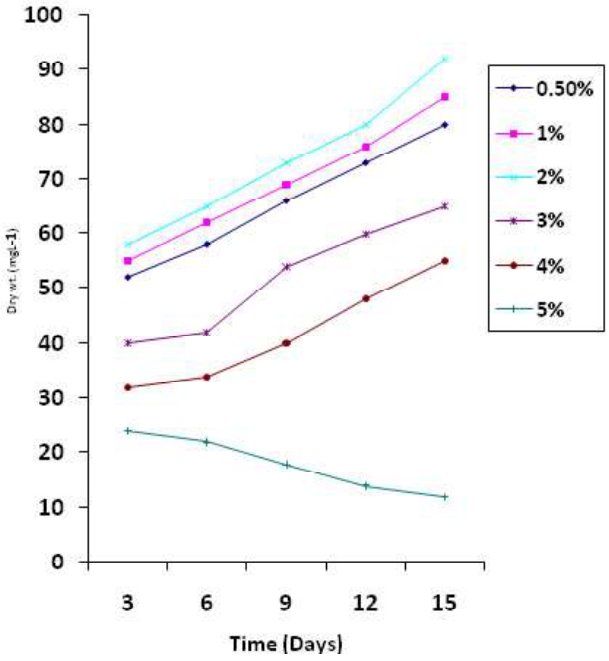

Fig. No. 6 Growth response of *Oscillatoria amphibia* in different concentration of Chromium salt

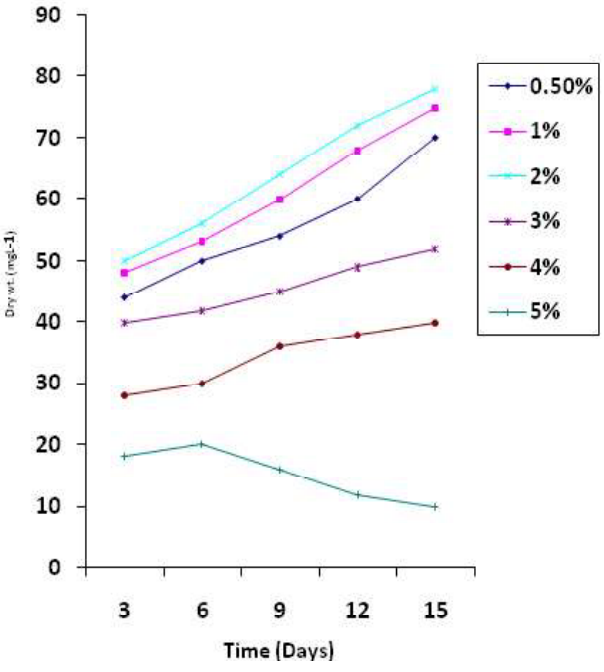

Fig. No. 8 Growth response of *Anabeana macrospora* in different concentration of Chromium salt

CONCLUSION

Most of the blue green algae are capable of absorbing heavy metal salt from the water up to a limited concentration. Chromium salts are carcinogenic and damage lungs. These salts are also absorbed by some blue green algae. In the present study, it was observed that four local strains of blue green algae *Microcysts aeruginosa, Spirulina princep, Oscillatoria amphibian* and *Anabaena macrospora* are capable of absorbing Chromium salt up to 2% but higher concentration of the salt have adverse effect on the growth of these blue green algae.

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