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Original Research Article

Phytoremediation Chromium and Iron by *Elodea canadensis* and *Myriophyllum verticillatum*

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Abstract: The objective of this study was to extract different levels of heavy metal salts, such iron and chromium, from a few aquatic plants, including *Elodea Canadensis* and *Myriophyllum verticillatum*, over the course of a month. The results showed that the components' concentrations in the test aquatic plants rose at the conclusion of the research in a different way from those in the control sample.

Keywords: Chromium and Iron, *Elodea Canadensis* and *Myriophyllum Verticillatum*.

INTRODUCTION

Phytoremediation is a technique that uses plants that can concentrate environmental elements and compounds and detoxify a variety of chemicals. It is considered a cost-effective treatment method that can benefit both stagnant water and contaminated soil environments [3]. Phytoremediation relies on the plant's ability to grow and survive in an environment that is not ideal for natural plant growth, even if it allows for on-site treatment of environmental concerns and to reduce the impact of contaminants in soil, water, or air. A major drawback of phytoremediation is that it requires a long-term commitment [7]. Phytoremediation has been successfully applied in the restoration of abandoned metal mines and sites where organic pollutants or heavy metals have been disposed of [6]. Some plants, known as "hyperaccumulators," have the ability to bioaccumulate chemicals, concentrating them. The treatment effect varies widely. Toxic heavy metals cannot be degraded, but organic pollutants, which are generally.

MATERIALS AND METHODS

Ten plastic containers totaling fifteen liters were used to cultivate two plants, Myriophyllum verticillatum and Elodea Canadensis, in order to assess their capability to remove different concentrations of the minerals Chromium and Iron. Each plant was given 50 g of its fresh weight [10], liters of water each with three different concentrations of salts (10, 20, 30 mg/liter) iron and chromium. A month after the experiment, samples of the plants were collected and exposed to different element salt concentrations in order to determine the elimination percentage [8]. Heavy elements were measured in water and plant samples using flame atomic spectrometry [9].

RESULTS & DISCUSSION

Figure (1) shows the accumulation of Chromium in the aquatic plant Myriophyllum verticillatum (5.867, 6.161, 6.458) in comparison to the control, while the concentration of Chromium in the plant Elodea Canadensis (5.127, 5.383, 5.562) in comparison to the control. The study's findings indicated an increase in the concentration of heavy elements in the aquatic plants at the end of the experiment. Figure (2) proves the accumulation of Iron in the aquatic plant Myriophyllum verticillatum (5.442, 5.912, 6.454) and the concentration of Iron in the plant Elodea Canadensis (4.225, 4.604, 5.021) in comparison to the control. The study's findings also demonstrated an increase in the concentration of heavy elements in the aquatic plants under investigation at the conclusion of the experiment.

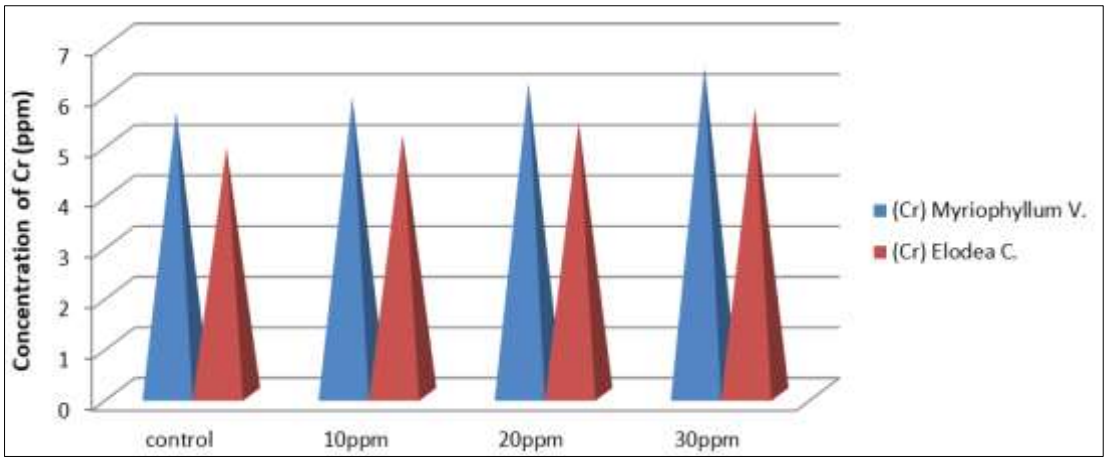

Figure 1: Showed the accumulation of Chromium in Myriophyllum verticillatum and Elodea Canadensis tissues

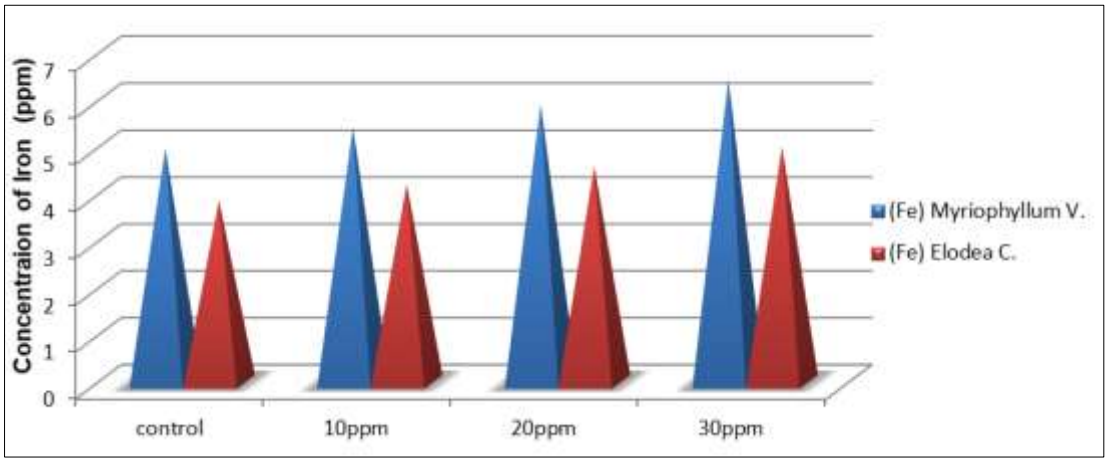

Figure 2: Showed the accumulation of Iron in Myriophyllum verticillatum and Elodea Canadensis tissues

Figure (3) explains the percentage of Chromium removal in the aquatic plant Myriophyllum verticillatum (26.898, 28.511, 30.225) in comparison to the control, and the percentage of Chromium removal in the plant Elodea Canadensis (27.815, 29.483, 31.252) in comparison to the control. These findings demonstrate the percentage of removal of heavy elements in the aqueous solution at the conclusion of the experiment. The percentage of Iron elimination in the aquatic plant Myriophyllum verticillatum (29.993, 32.692, 35.634) and the plant Elodea Canadensis (27.356, 29.818, 32.501) in comparison to the control was also displayed in Figure [4].

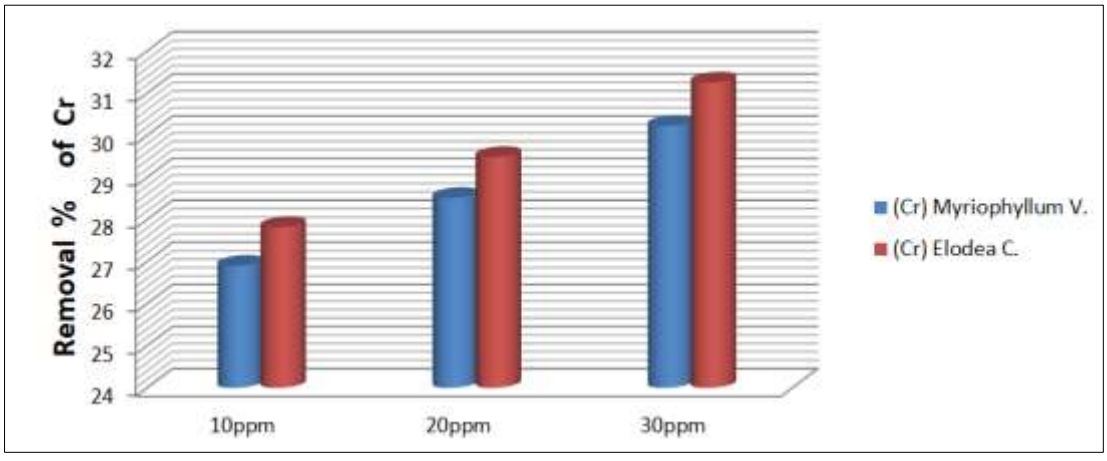

Figure 3: Showed the percentage removal of Chromium by Myriophyllum verticillatum and Elodea Canadensis

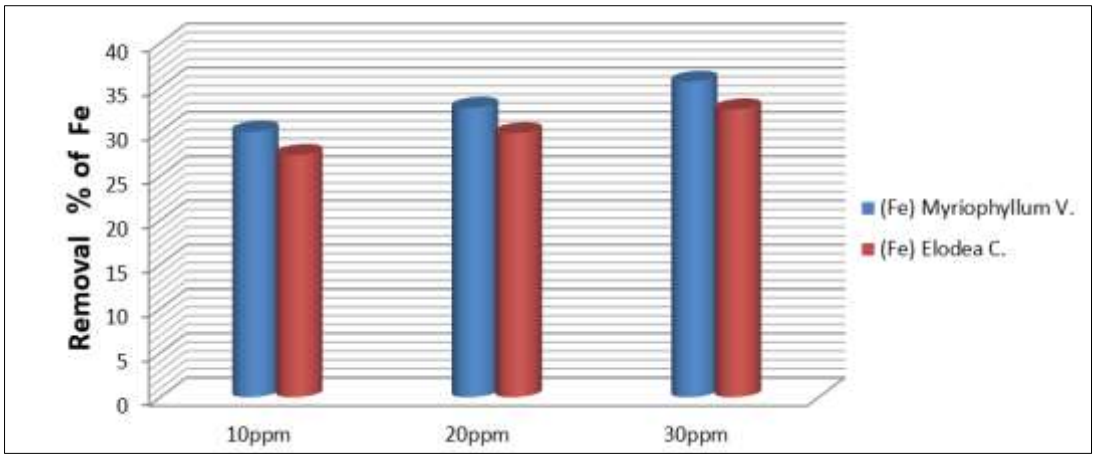

Figure 4: Showed the percentage removal of Iron by Myriophyllum verticillatum and Elodea Canadensis tissues.

CONCLUSIONS AND RECOMMENDATIONS

Growth processes are adversely affected by heavy metals, and the consequences worsen as the pollutant's concentration rises concurrently. The choice of plant species is based on the kind of pollutant and its concentration in the environment. Plants are an efficient biological agent for eliminating pollutants from highly polluted settings.

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