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ASSESSING THE CHELATING ABILITY OF *AERVA LANATA*: ADSORPTION OF CHROMIUM FROM TANNERY EFFLUENT AND ITS TOXICITY MEASUREMENT

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The chelating ability of aqueous leaf extract of Aerva lanata was assessed in vitro. The aqueous leaf extract showed a dose dependent decrease in chelating ability using $FeCl_2$*. The highest chelating ability of aqueous leaf extract was observed at* $2 \cdot 10^{-5}$ *g/mL (100 ± 0.00). The antioxidant activity of the aqueous leaf extract ranged from 42.13% to 88.66%. At* $2 \cdot 10^{-5}$ *g/mL concentration, a strong positive significant correlation was observed between chelating ability and total phenolics concentration (R = 0.94; P = 0.001). The chelating ability of aqueous leaf extract (*$2 \cdot 10^{-5}$ *g/mL) showed a high positive significant correlation with antioxidant activity (R = 0.78; P = 0.001). Aqueous leaf extract removed the chromium from tannery effluent by 43 mg/g. Allium cepa toxicity test was performed on tannery effluent treated with aqueous leaf extract that increased the root length of onion.*

Keywords: *Aerva lanata*, chelating ability, chromium, resin, toxicity assessment.

Introduction

A wide variety of industries such as petroleum refining, chemical manufacturing, metal finishing and circuit manufacturing create waste water streams that are polluted with heavy metals. Recent federal amendments to the clean water act limit the metal concentrations that can be discharged from these industries [1]. Therefore, there is a need to develop cost-effective and environmental friendly processes to recover the heavy metals from waste water streams.

The environmental impact and building up of heavy metals in flora and fauna at soil ecosystem has been a cause of great concern in recent years. Chromium is introduced in ecosystem as a result of different industrial activities such as iron and steel manufacturing, tannery, chromium plating and other anthropogenic sources [2]. In particular, Cr(III) is widely used in tannery industries in Tamil Nadu. Heavy metals are usually removed from aqueous waste streams by chemical precipitation and electrical deposition [3 – 5]. The