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A Comparative Study of Murayya Koenigii Varieties for the Removal of Cr (VI) from Aqueous Solutions

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Abstract : Chromium (VI), a toxic metal ion, is widely used in electroplating, stainless steel production, leather tanning, paint, and textile manufacturing. Cr (VI) is mobile in the environment, acutely toxic and carcinogenic. In the present study, the ability to remove Cr (VI) from aqueous solutions has been compared using leaves of dwarf and gamthi varieties of Murayya koerigii abundantly available in Selaqui region of Dehradun as an adsorbent. Effects of temperature, pH, initial concentration of adsorbate and adsorbent dosage have been studied for effective removal of Cr (VI). The biosorptive ability of biosorbent was reliant on the pH of the biosorbate, with pH 2 being most favorable for both the varieties. The obtained results were analyzed by the Freundlich and Langmuir equation at different temperature and related parameters were determined for each adsorption isotherm. The study also includes results on the kinetic dimensions of adsorption of the Cr (VI) on the derived adsorbent. Gamthi variety has a promising absorption rate of 80% over the dwarf variety. FTIR studies confirmed that carboxyl and hydroxyl groups were the main groups involved in the metal uptake.

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