

Co-biosorption potential of *Acacia nilotica* bark in removing Ni and aminoazobenzene from contaminated wastewater

Ghulam Murtaza^a, Allah Ditta^{b,c,*}, Zeeshan Ahmed^{d,e,f}, Muhammad Usman^g,
Muhammad Faheem^h, Akash Tariq^{i,j,k,l}

^aFaculty of Environmental Science & Engineering, Kunming University of Science & Technology, Kunming 650500, China, email: murtazabotanist@gmail.com

^bDepartment of Environmental Sciences, Shaheed Benazir Bhutto University, Sheringal, Dir (Upper) Khyber Pakhtunkhwa 18000, Pakistan, ORCID ID: <http://orcid.org/0000-0003-1745-4757>, Tel. +92-944-885525; email: ad_abs@yahoo.com/allah.ditta@sbbu.edu.pk

^cSchool of Biological Sciences, the University of Western Australia, Perth, WA 6009, Australia

^dXinjiang Institute of Ecology and Geography, Chinese Academy of Sciences, Urumqi, Xinjiang 830011, China, email: zeeshanagronomist@yahoo.com

^eXinjiang Desert Plant Roots Ecology and Vegetation Restoration Laboratory, Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences, Urumqi, Xinjiang 830011, China

^fCele National Station of Observation and Research for Desert-Grassland Ecosystems, Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences, Xinjiang 848300, China

^gDepartment of Botany, Government College University Lahore, Lahore 54000, Pakistan, email: usmanphytologist@gmail.com

^hSchool of Environmental Studies, China University of Geosciences, Wuhan, PR China – China, email: faheem2u12@yahoo.com/faheem@cug.edu.cn

ⁱXinjiang Institute of Ecology & Geography, Chinese Academy of Sciences, Urumqi, Xinjiang, China, email: akash.malik786@mails.ucas.ac.cn

^jCele National Station of Observation and Research for Desert-Grassland Ecosystem, Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences, Xinjiang, China

^kState Key Laboratory of Desert and Oasis Ecology, Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences, Urumqi, China

^lXinjiang Key Laboratory of Desert Plant Root Ecology and Vegetation Restoration, Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences, Urumqi, China

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ABSTRACT

In this biosorption study, the potential of *Acacia nilotica* bark in simultaneous removal of Ni and aminoazobenzene was investigated. For this purpose, the impact of different experimental conditions on the co-biosorption potential of *Acacia nilotica* bark was studied. In result, the maximum biosorption of Ni and dye was in the acidic range pH, that is, 6 and 4, with sorbent dosage of 1 and 0.8 g after 40 min of the experiment when both were at 4 ppm, respectively. In case of adsorption isotherms, both mono- and multi-layer adsorption occurred simultaneously in the case of Ni as clear from the R^2 values of isotherms (R^2 for Langmuir = 0.999) and (R^2 for Freundlich = 0.941). In case of dye, uniform monolayer adsorption was predominant (R^2 for Langmuir = 0.980) as compared to the multi-layered adsorption. The maximum amount of monolayer adsorption of Ni and dye onto the biosorbent was 0.60 and 0.348 mg g⁻¹, respectively. From the kinetics model, chemisorption was predominant in the case of both Ni and dye adsorption on biosorbent. In conclusion, the bark of *Acacia nilotica* has great potential for Ni and dye removal from co-contaminated wastewater.

Keywords: Dye; Heavy metal; Freundlich; Langmuir; Kinetics; Biosorption

* Corresponding author.