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Comparative study of plants waste biosorption efficiency

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In this study, sorption efficacy study of selected bio- materials was carried known for their potential usage as natural dyes. *Hibiscus rosa sinensis* flower and *Trapa natans* fruit skin (exocarp) were used for sorption study. These plant parts after the extraction of natural dye and evaluated for bio-sorption of heavy metal from effluent. Batch tests indicated that hexavalent chromium sorption capacity (q_e) followed the sequence q_e (Trapa) > q_e (Hibiscus). Due to high sorptive capacity, Trapa fruit skin (exocarp) was selected for further processes like drying crushing and sieving in powder form of even mess size. Sorption kinetic data has shown first order reversible kinetic model for all the sorbents in which bio- sorption of chromium by Trapa natans biomass occurred in two stages. In the first stage, 95% sorption was reported for Cr (VI) in 15 minutes followed by a slower second stage which reached in equilibrium in one hour at which all heavy metals were 90-98% bio-sorbed by Trapa natans. Experimentally reported equilibrium data fitted well to both the Langmuir and Freundlich Isotherms. The FT-IR, XRD and XPS analysis showed that the main mechanism of Cr(VI) biosorption onto Trapa dried powder was their binding with amide group.

Biography

Ashish Kr. Dwivedi completed his PhD work from Indian Institute of Technology, Kanpur India in Applied/Environmental Chemistry under Dr. Padma S Vankar Principal Research Scientist Indian Institute of Technology, Kanpur. He is currently DST-Fast Track young scientist fellow in Department of Chemistry at Indian Institute of Technology, Kanpur. He has published 6 international publications in peer reviewed journals and 2 book chapters.

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Mitigating India's surface and groundwater scarcity

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About 500 large dams across India have passed 50 years of age and 100 among them were built a century ago. Decommissioning dams is not an easy task. India also lacks legally binding dam accountability. So, the question is: How did the largest democracy manage to build over 5000 large dams without a safety bill? One way the government can tackle this ecological nightmare is to revive building of smaller check dams - small barriers using stones, cement, and concrete built across the direction of water flow on rivers. They retain excess flow during rains in catchment areas, and the stored water can be used for irrigation. India's oldest check dam, the Grant Anicut is only 4.5 m tall; it was built by the Chola King in river Cauvery during 2nd century AD, which is still in use. In 2007, the Sadguru Foundation has built a large check dam on Mahi River in Rajasthan with a cost of USD 1.18 million, which is 7.25 m tall (length 367 m). The check dam with 350 million cubic feet capacity irrigates 7000 acres and benefiting 18,000 farmers. Upstream lays a large dam, Mahi-Bajaj Sagar with a construction cost of USD 300 million, which irrigates 154,000 acres or 22 times more than the irrigation area of the check dam. If 22 more check dams were to be built in series, it would cost USD 24.2 million, with the potential to irrigate the same area of the Mahi-Bajaj Sagar dam. So, this check dam model has remarkable potential to reduce irrigation water stress and river water conflicts.

Biography

Govindasamy Agoramoorthy currently serves as Distinguished Research Professor at Tajen University, Taiwan. His research ranges from environmental sciences to sustainable development and he has carried out field research in Asia, Africa, and South America. He is Editor-in-Chief of the American Journal of Social Issues & Humanities, Consulting Editor of Journal of Environmental Biology and serves in the Editorial Board of Journal for Nature Conservation (Elsevier). Between 1989 and 1993, he served as visiting Scientist at Smithsonian Institution, USA. He is currently Tata Visiting Chair at Sadguru Foundation, India where he reviews water and natural resources management projects. He has authored 25 books, 80 book chapters, and 300 scientific articles in international journals with impact factor.

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