

Pine Trees for Cleaner Water

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A new ecofriendly material synthesized from pine trees can efficiently adsorb toxic dyes from water, claim scientists at the Himachal Pradesh University and Gyeongsang National University, Republic of Korea in their recent study.

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Various industries such as leather and fabric release approximately 70K tons of harmful dyes annually worldwide. This burdens the water bodies with chemicals that are toxic and carcinogenic for humans. Water-soluble dyes are difficult to remediate because they have stable chemical structure and their degradation products are potent carcinogens. Methylene blue is a popular dye that contaminates water because it readily dissolves in water at fairly large concentrations.

Researchers at the Himachal Pradesh University and Gyeongsang National University, Republic of Korea have synthesized polyurethane foam from cellulose derived from pine trees that are abundant in the western Himalayas. By an easy, convenient and fast process, they synthesize cellulose nanowhiskers to make polyurethane that adsorbs harmful dyes such as methylene blue from water with 97% efficiency in just 20 minutes.

Unlike the prevalent methods of removing dyes that use chemicals, the new material is environment friendly because it uses cellulose derived from natural and non-toxic plant sources. Therefore this method also helps manage waste efficiently because the process uses biodegradable and ecofriendly materials. The scientists proclaim, "...polyurethane (synthesized in their study) can be a promising alternative adsorbent to replace conventional expensive ones, with utilization of bio-waste at the core of its origin and for rapid, efficient and low-cost wastewater purification processes for the removal of toxic pollutants".

The newly synthesized material has enhanced adsorption capacity for toxic dyes owing to its nano structure and greater surface area. This low cost, biodegradable and ecofriendly material can prove to be a superior agent to manage water pollution in industrial areas that release toxic effluents into water bodies.

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