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Filtering Kitchen Wastewater for Plants

Water is a precious commodity, so finding ways to re-use waste water, especially in arid regions is essential to sustainability. Researchers in India, have now carried out a study of various waste water filtration systems for kitchen waste water and found that even the most poorly performing can produce water clean enough for horticultural or agricultural use.

They report details in the International Journal of Environmental Technology and Management.

Recycling domestic wastewater is becoming an important part of water management and emerging technology and a shift in attitude to waste in the developing world means that more people would be willing to re-use this so-called gray water given the choice. Unfortunately, affordable and effective domestic wastewater treatment is not yet available particularly in parts of the world where financial and technical constraints are acute. Nevertheless domestic wastewater from showers, kitchen sinks and laundry washing in homes and offices offers a potential resource that differs from industrial wastewater. Domestic waste water might contain an organic load from food processing, utensil washing in the kitchen, soap and detergents, with the main contaminants being proteins, carbohydrates, detergents, oil and grease and other dissolved and suspended compounds.

Subrata Dasgupta of the Council of Scientific and Industrial Research, in Kolkata, and colleagues have explored the potential of ceramic microfiltration membrane s used alone or in conjunction with different physicochemical treatments, such as biotreatment and adsorption, for cleaning up dirty dishwater. The team compared cross-flow microfiltration with tubular ceramic membranes in single channel and multichannel configurations. Biotreatment involved using activated sludge or an adsorptive treatment based on the prepared dried roots of Eichhornia crassipes, an aquatic weed that grows well in polluted water.

The researchers found that, as one might expect, a 19-channel ceramic membrane performed better in terms of permeate quality than a single-channel filter. In terms of BOD (biological oxygen demand), COD (chemical oxygen demand), turbidity, TSS (total suspended solids), microfiltration of the waste water treated with adsorbent appeared to be most promising compared with other the approaches tested. In that approach, 98% removal of BOD and 99% removal of COD were seen. The quality of the treated water was found to be fit for use in horticulture and irrigation, the team concludes.

Source:
(Int. J. Environmental Technology and Management, 2010; 13: 336-347).