Treatment of Polluted Water From Wells and Aflaj Using Waste Materials From Date Palm Trees Enhanced With Carbon Nanoparticles Decorated With Activated Carbon

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The provision of clean pollutant-free water is one of the great challenges facing humanity. Therefore, this study was conducted to prove the ability of date palm tree waste: leaf, stalk, and dates core. These wastes were enhanced with nano-activated carbon which is used to purify and treat polluted water from wells and aflaj in Nizwa, Oman. The results showed that these residuesmaintained pH, TDS, and EC in relatively stable limits in well and falaj water samples. The microbiological analysis showed decrease in Coliform (by 82.8%) and fecal coliform bacteria (by 84.7%) from polluted water samples. The results also showed the ability of date palm tree residues to reduce cadmium by 48% from experimental water samples. The results of heavy elements analysis indicate a decrease in the concentrations of 5 heavy metals: iron by 98%, zinc by 77.5%, aluminum by 50%, nickel by 20%, and chromium by 10% from well samples. The chemical analysis showed a decrease in the concentrations of two anions: bicarbonate by 4.56% in the filtered well water and 11.02% in the filtered falaj water samples. The fluoride was reduced by 50% and 30.77% in the well and falaj water respectively. In contrast, it showed an increase of 3 cations: sodium by 9.09% in well water and 9.83% in falaj water, potassium by 55.51% in well water, 217.70% in falaj water, calcium by 1-3% for both water sources respectively. It can be concluded that date palm tree residues enhanced with nano-activated carbon can purify and treat polluted water.