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 residues-maintained 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.