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# A Novel Water Pretreatment Approach for Turbidity Removal Using Date Seeds and Pollen Sheath

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Author(s)
Mukheled Al-Sameraiy

## ABSTRACT

Turbidity is a characteristic related to the concentration of suspended solids particles in water and has been adopted as an easy and reasonably accurate measure of overall water quality. The most widely applied water treatment processes, a combination of some or all of coagulation, flocculation, sedimentation and filtration to reduce or eliminate turbidity and improve water quality. In this research, proposed approach was adopted on the basis of applying two sequent treatments that used coagulation, flocculation and sedimentation processes under certain operating conditions of mixing speed, mixing time and settling time for each treatment. The environmentally friendly natural coagulants of date seeds (DS) or pollen sheath (PS) from local Iraqi palm was used in the first treatment and alum was used in the second treatment at their predetermined optimum doses to treat low ( NTU), medium ( NTU) and high ( NTU) ben- tonite synthetic turbid water. Experimental results clearly show that the proposed approach was superior in perform- ance in terms of residual turbidity compared with conventional approach using both of (DS) and (PS) natural coagulants in which it achieved a significant reduction in turbidity to less of 5 NTU that meeting WHO drinking water guidelines for all tested synthetic turbid water. Moreover, in some cases, it produced excellent water quality having residual tur- bidity less of 0.1 NTU. In addition to decrease the settling time to 30 minutes and minimize risks of alum dose required to 60%. These viable advantages are significant to current practices in advanced water treatment technologies such as reverse osmosis in cost, energy, effectiveness, safety and maintenance. So, it is recommended to consider proposed approach in this research work to be a novel pretreatment approach in advanced water treatment.

## KEYWORDS

Coagulation; Flocculation; Date Seeds; Pollen Sheath; Turbidity Removal; Bentonite

## Cite this paper

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