

ABSTRACTS

The effect of plant derived polymers in the removal of microorganisms, nutrients and dissolved solids from water collected at Timberlake Ranch

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Water treatment facilities aim to remove suspended solids, dissolved solids, and microorganisms before releasing the water to prevent degradation of ecosystems and to lower human health risks. Treatment facilities often use flocculation followed by sedimentation or filtration to treat the water. Currently this is achieved by flocculating agents, such as synthetic polymers, which are slower to biodegrade and often have associated human health hazards. For this study natural polymers derived from plants were used as adsorbents and compared with a commercially used polymer, polyacrylamide to remove the pollutants. Water samples were collected from the Colorado River at Timberlake Biological Field Station, Stephenville City Park, and wells in Lubbock. To test the efficiency of the polymers in the removal of contaminants the Jar test method was used. Dissolved solids in the form of anions and cations were tested before and after treatment through ion chromatography. Presence of *E. coli* was tested before and after treatment using the modified mTEC method. The polymer dose used ranged from 5-15g/L and the contact time ranged from 5-60 minutes. Preliminary experiments showed that the maximum removal of fluoride was 55.64%, chloride was 29.13%, bromide was 6.05%, phosphate was 43.75%, and sulfate was 76.21%. It was also shown that the maximum removal of sodium was 22.13%, calcium was 21.76%, and magnesium was 24.62%. *E. coli* studies showed a maximum removal of 71.87%. The preliminary results from this study were promising, however further testing is needed to further confirm and optimize these results.