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Investigation of Properties of Renewable Films Prepared With Aloe Vera Gel

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Aloe vera plant, known as yellow patience in Turkey, is a plant known for centuries in many ancient civilizations and used in various diseases and skin problems due to its healing power. Among its many health benefits, wound healing mainly, hypoglycemic or antidiabetic, hepatoprotective, anti-inflammatory, immune-boosting and gastroprotective, antioxidant, antimicrobial, antiviral and antifungal properties have also been reported. On the other hand, most of the monomers of polymer films produced in the industrial field are of petroleum origin. The fact that the depleting petroleum resources are both expensive and bring environmental problems such as waste problems lead scientists to seek cheaper and renewable resources. Therefore, synthesis studies of bio - based polymeric materials from different renewable sources such as oil - based sources are becoming increasingly important. In this study, aloe vera plant gel (AV), was used as a modifier for the preparation of film materials in biobased acrylated epoxidized soybean oil (AESO) resin matrix. Films were formed by adding aloe vera gel at different ratios (0 %, 10 %, 20 %, 30 %, 40 %, 50 % by weight). The effect of AV amount on pH change, swelling – solubility - water content, antibacterial and mechanical properties of the films were investigated. The prepared AV / AESO films were effective against Gram - positive (Staphylococcus aureus and Enterococcus faecalis) and Gram - negative (Escherichia coli and Klebsiella pneumoniae) bacteria. Finally, from the pH tests performed on the films, values between 7.23 and 7.35 were obtained. Accordingly, it showed that the films were compatible with the skin.

Keywords: Aloe Vera Gel, Antibacterial Activity, Biobased Film