

Thyme extract established to investigate the antimicrobial properties of the resin bed

Kebria Diako*,fatan div sar,

Abstract Introduction: Thyme (thymus) is one the oldest medicinal plants and has anti-bacterial, anti-viral, anti-fungal and anti-oxidant properties. Hydrogels are polymers and hydrophilic copolymers with three-dimensional network which are used for drug release of hydrophilic and hydrophobic. **Methods:** The antimicrobial properties of thyme extract in the test growth inhibition zone around were determined as well as antibacterial activity and inhibit bacteria, by MIC and MBC were determined. In test GC-Mass, components of the extract was determined and then based on chitosan, hydrogel was synthesized. And the influence of synthetic factors in the structure of the hydrogel was evaluated. And the structure of the hydrogel by means of FT-IR, SEM, and TGA investigated. The inflation rate and the release of extracts the hydrogel were measured. Then thyme extract was loaded in the hydrogel and antimicrobial activity was studied. **Results:** According to the test results MIC and MBC, ethanol extracts of has a great deterrent effect. In the test pit thyme extract showed growth inhibition zone around antimicrobial activity against *Staphylococcus aureus* (*Staphylococcus aureus* PTCC 1431) and *E. coli* (*Escherichia Colli* PTCC 1397) that herb thyme antibacterial activity on Gram-positive bacteria was more than Gram-negative bacteria. Synthetic agents had an impact in the structure of the hydrogel and the optimum conditions for the synthesis of hydrogel chitosan amount of 1.2 grams and 0.1 grams of acrylamide, acrylic acid 0.1 g and a temperature of 80-60 ° C. In the present study, by increasing the load time the amount of extract loaded in hydrogel increases and then disappears. Extract loaded in the hydrogel has a gradual release, and showed activity growth inhibition and death against *Staphylococcus aureus* and *Escherichia coli*. **Conclusion:** Thyme extract loaded on hydrogel can be used as a new drug combination for treatment. **Key words:** thyme, hydrogels, anti-bacterial

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