Antimicrobial Hydrogel from Residues of Olive Oil Industry

A thesis submitted

By

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بسم الله الرحمن الرحيم

﴿ إِنَّ ٱللَّهَ وَمَلَٰٓئِكَتَهُۥ يُصَلُّونَ عَلَى ٱلنَّبِيِّۚ يَٰٓأَيُّهَا ٱلَّذِينَ ءَامَنُواْ صَلُّواْ عَلَيۡهِ وَسَلِّمُواْ تَسۡلِيمًا ﴿٥٦﴾ ﴾ الأحزاب: ٥٦

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AIM of the WORK

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The main objective of this work is the utilization of biomass in chemical industry to convert it to value added product such as antimicrobial hydrogel.

The possibility of making use of agricultural waste that causes many environmental problems which are found in abundance in the agricultural environment and can be obtained at the lowest cost.

The aim of this work could be illustrated as follow:

- Preparation and characterization of hydrogel from residues of olive oil Industry as a result of extraction process which make large environmental pollution by conventional method such as grafting process by using synthetic monomer such as acrylamide (Am) and N, N'-methylenebisacrylamide (BMAm) as cross linker in precense of ceric ammonium nitrate (CAN) as intiator and studying optimum conditions like temperature, time, cross linker, and monomer concentration effect.

- Preparation and characterization of hydrogel by method depending on natural polymer which extracted from raw material such as carboxymethyle cellulose (CMC) and carboxymethyle cellulose dialdehyde (DCMC).

- Preparation and characterization of hydrogel by using polycarboxylic acid (succinic, citric, and maleic anhydride) and epichlorohydrin (ECH) as a cross linker with studying optimum conditions like temperature, time, and cross linker effect

- Preparation and characterization of new compounds such as succinic dihydrazid and carboxymethyle cellulose hydrazid (NCMC) which can be used to prepare cross linked.

- Biosynthesis of silver nanoparticles (AgNPS) from the leaves of *Ricinus communis* (Family: Euphorbiaceae) and loaded it to prepared hydrogel

- Studying of antimicrobial activity of different prepared hydrogel on Gram-ve bacteria as (***Pseudomonas aeruginosa***) and Gram +ve bacteria as (***Staphylococcus aureus***)

ABSTRACT