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ABSTRACT

Isolation of bacteria that are able to digest keratin as an alternative to harmful chemicals used in tanning industries.

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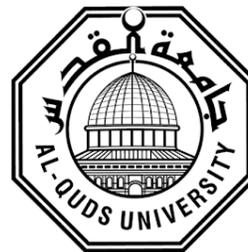
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Published in December 2020

Abstract: Macroccocus is a bacteria that was isolated from a soil sample containing decaying hair and It was found to contain keratinase enzyme due to its high ability to digest keratin protein. The isolated bacteria by this study can be used as an alternative to harmful chemicals tanning processes represents a safe and, clean technology that achieves economic feasibility in the process of skin soaking and hair removal.

Background: Leather tanning is considered one of the ancient professions that Hebron has been known for hundreds of years which is the only source of raw materials for Palestinian factories that depends on this commodity. In the past, the industry relied on environmentally friendly natural materials in tanning, but today they have become a source of pollution of soil and groundwater, especially after the entry of chemicals in this craft, such as chromium and some acids that infect humans and destroy the Palestinian environment because of the toxic gases that result from the process of soaking and hair removal.



Objectives:

1. To Isolate keratinolytic bacteria from soil sample
2. To test the bacterial effectiveness for hair degradation
3. To identify and characterize of bacteria by sequencing tool.

Methods: Soil sample containing decaying hair was collected from the industrial area in Hebron city and processed in the lab, bacteria were isolated by using spreading and streaking plate technique, their ability for hair degradation was tested by incubating bacterial colony, hair and water for several days, after the bacterial ability for hair degradation appeared bacterial isolate was identified by sequencing tool and the type of bacteria was determined by bioinformatics tool.

Results: Isolated a bacterial strain that is able to digest keratin and was tested on several samples and proved to be effective in degrading hair. It has been welcomed by the Modern Leather Tanning Company (MLTC-Hebron), which has cooperated with us in this project. The strain was genotyped and appeared to belong to macrococcus, this is the first report to find an industrial value for such bacteria which is also safe for human and the environment.

Conclusions: Among microbial isolate screened for keratin digestion by using soil sample, a newly isolated *Macroccocusequipericus* was found with a greater ability for hair degradation, the use of such bacteria as an alternative to harmful chemicals tanning processes represents a safe and, clean technology that achieves economic feasibility in the process of skin soaking and hair removal. but in the same time, the full sequence of these strains of bacteria is unknown and not significantly studied. Therefore, additional researches have to be done for characterization of this type of bacteria

Key words: Bacterial hair degradation, keratin, leather tanning industry, Biotechnology.