



بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة / حسام الدين محمد مغربي

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى

مسئولية عن محتوى هذه الرسالة.

ملاحظات : لا يوجد



**ISOLATION AND IDENTIFICATION OF
ANTIMICROBIAL AGENTS FROM
EGYPTIAN BEE GLUE
(PROPOLIS)**

BY

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B. Sc. High Institute for Agricultural Cooperation, 1995

M. Sc. Agric. Sc. (Economic Entomology), Fac. of Agric., Benha Univ., 2008

A Thesis Submitted in Partial Fulfillment

Of

The Requirements for the Degree of

DOCTOR OF PHILOSOPHY

in

**Agricultural Sciences
(Economic Entomology)**

**Department of Plant Protection
Faculty of Agricultural
Ain Shams University**

2022

Approval Sheet

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ABSTRACT

Ahmed Hosny Ahmed: Isolation and Identification of Antimicrobial Agents from Egyptian Bee Glue (Propolis). Unpublished Ph.D. Thesis, Department of Plant Protection, Faculty of Agriculture, Ain Shams University, 2022.

This study aimed to determine the best methods for the production of propolis in the New Valley and Qalyubia governorates. In this regard, the bee propolis trap type, 2 (Hand-cut fiber screens with circular holes in a diameter of 1 mm.) outperformed the other tested methods, the superiority of the three traps without significant differences among them over the traditional method in regard to the % yield of ethanolic extract propolis (EEP). In addition to evaluating the effect of the three different extraction methods (maceration (ME), microwave-assisted (MAE) and ultrasonic-assisted (UAE) extraction) on the yield of the extract of the used propolis samples (New Valley, Qalyubia, Sohag, Gharbia and imported propolis), as well as contents of total phenolic and flavonoid compounds, furthermore the antimicrobial properties of extracts on pathogenic bacterial strains, in terms of yield of the extract highest percentage of extraction yield (%) was recorded in (ME), followed by (UAE), while the lowest by (MAE) method with an average 22.75, 19.44 and 14.85% for (MAE), (UAE) and (ME) method respectively, the highest yield of total phenolic and total flavonoid content (regardless of the type of propolis sample) was obtained with (UAE) , followed (ME), while the lowest yield was recorded with (MAE). Ultrasonic-assisted (UAE) was shown to be the most efficient method based on yield, extraction time and selectivity. Screening for antibacterial activity of EEP showed that, New Valley and Gharbia EEP which extracted by (UAE) were given the highest significant inhibition against *Paenibacillus larvae* (25.84 and 22.10 mm), *Escherichia coli* (23.41 and 20.22 mm) and *Salmonella typhimurium* (with diameter zone of 21.24 and 17.53 mm). Minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC)

values by New Valley EEP was lowest than values by Gharbia EEP for *Escherichia coli*, *Salmonella typhimurium* and *Paenibacillus larvae*. New Valley and Gharbia EEP had bactericidal effect against 3 the tested pathogenic bacterial strains. GC-MS Chromatogram of the New Valley and Gharbia propolis samples extracted by (UAE) were identification of chemical composition of EEP was assessed by mass spectral analysis and the retention time RT of each compound.

Key words: Propolis, Propolis traps, Extraction, Antibacterial Activities, *Paenibacillus larvae*, *Salmonella typhimurium*, *Escherichia coli* and GC-MS.

ACKNOWLEDGEMENT

I would like to express my deep gratitude and appreciation to **Dr. Mahmoud Abd El-Samie Mohamed Ali** Professor of Economic Entomology and Apiculture, Faculty of Agriculture, Ain Shams University for continuous supervision, assistance, and guidance throughout the whole period of study, and revising the manuscript for this thesis. I would like to express my deep gratitude to my thesis supervisor, **Dr. Khadiga Ahmed Ahmed Abou-Taleb** Professor of Microbiology, Faculty of Agriculture, Ain Shams University to provide invaluable guidance during this research. The methodology taught me to conduct research and to present research work as clearly as possible. It was a great honor and a great privilege to work and study under her supervision. Sincere thanks to **Dr. Azza Abd El- Khalek Abd El- Khalek**, Professor Emeritus of Plant Protection Department, Desert Research Center for sharing in supervision.

I am also very grateful and indebted to **Dr. Mahmoud Ali Hassan, Dr. Hamdi Hamed** and **Mr. Essam Mohamed** for the assistance they provided in conducting field experiments in their apiaries.

Deep thanks are also due to all the staff members and colleagues in the Plant Protection Department, Desert Research Center for the help and encouragement they offered to me during the course of this work.

Finally, I thank my wife and sons for their love, understanding and continued support in completing this research work.

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