



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكرو فيلم

بسم الله الرحمن الرحيم



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**IMPACT OF BIO-FERTILIZATION ON GROWTH,
YIELD, ACTIVE INGREDIENTS AND CHEMICAL
COMPOSITION OF FENNEL (*FOENICULUM
VULGARE* MILL.) PLANT**

By

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B.Sc. Agric. Sci. (Horticulture), Fac. of Agric., Ain Shams University, 2017

**A Thesis Submitted in Partial Fulfillment
Of
The Requirements for the Degree of**

**MASTER OF SCIENCE
in
Agricultural Sciences
(Ornamental, Medicinal and Aromatic Plants)**

**Department of Horticulture
Faculty of Agriculture
Ain Shams University**

2022

Approval Sheet

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ABSTRACT

Omnia Mohsen Mahmoud Hassan Allam: Impact of Bio-Fertilization on Growth, Yield, Active Ingredients and Chemical Composition of Fennel (*Foeniculum vulgare* Mill.) Plant. Unpublished M.Sc. Thesis, Department of Horticulture, Faculty of Agriculture, Ain Shams University, 2022.

Pot experiment was carried out in seventeen levels of fertilization during two successive seasons of 2018/2019 and 2019/2020 at the experimental farm of Faculty of Agriculture, Ain Shams University, Cairo, Egypt to evaluate the effect of the bio-fertilizer mixture alone or in combination with chemical fertilizer (NPK) on Fennel (*Foeniculum vulgare* Mill). Bio-fertilizer was a mixture of *Azotobacter chroococcum*, *Bacillus circulans* and Vesicular-arbuscular mycorrhiza. Results indicated that the use of bio-fertilizer at 3.75 ml/pot four times with 25% of NPK gave the highest significant values of vegetative growth, yield parameters and also NPK uptake; however, fertilizing with bio-fertilizers without NPK application showed the lowest significant values in the two experimental seasons. The same addition of bio-fertilizer significantly increased total microbial count of soil and cumulative CO₂; whereas addition of 100% NPK gave the lowest significant values in both seasons. The full dose of NPK significantly increased volatile oil percentage, while the addition of bio-fertilizer only decreased it significantly in both seasons. The separated components of GC analysis from essential oil samples showed the presence of five components in the first season, which were anethole, estragole, 1.8 cineol, α -pinene and limonene. The highest percentage of estragole (83.37 %) was obtained by applying 3.75 ml/pot bio-fertilizer added three times + 25 % NPK, limonene (20.58 %) by applying 2.5 ml/pot bio-fertilizer added three times + 50 % NPK, anethole (12.77 %) by applying 3.75 ml/pot bio-fertilizer added once + 25 % NPK, 1.8 cineol (10.60 %) and α -pinene (2.90 %) by applying 100 % of NPK.

Keywords: Fennel, Bio-fertilization, *Azotobacter chroococcum*, *Bacillus circulans*, Vesicular-arbuscular mycorrhiza and Essential oil.

ACKNOWLEDGEMENT

I would like to express my deep and sincere gratitude to **Professor Dr. Sohaier El-Sayed Mohamed Hassan** for supervision, help and support to complete this thesis. Also, I would like to thank her for her advice and revision of the manuscript of this thesis.

I'm deeply indebted to **Professor Dr. Awaad Mohammed Abd-Allah Kandeel** for his valuable guidance, great help, devoted efforts and sincere concern for supervising the study.

I would like to thank **Dr. Ahmed Nazmy Abd-El hameed** for his help during this study and his kind supervision and revision of this thesis.

I would like to thank **Dr. Abdallah Sayed Mohamed Korayem** for his guidance, help and support to complete the microbial studies.

I would like to express my deepest thanks to **Dr. Ayman Kamal** for showing me the steps that I needed to take to find the right way and providing invaluable guidance throughout this research.

Sincere thanks and grateful appreciation are extended to **Dr. Ali El-Naggar** for help and teaching me the estimation of CO₂ efflux and for his valuable advice.

Finally, I am extremely grateful to my family for their continuous support and encouragement all the time. Also, I would like to express my deepest thanks to my friends for their help and support to complete this research.

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