

ESSENTIAL OIL EXTRACTION FROM *LAVANDULA ANGUSTIFOLIA*, *JUNIPERUS COMMUNIS*, AND *HELICHRYSUM ITALICUM* FROM MALESIA E MADHE AND EVALUATION OF THEIR ANTIMICROBIAL AND ANTIFUNGAL ACTIVITY

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Abstract

The importance of this study was to evaluate the effect of the variable climate and factors such as soil and geographic location on essential oil yield quality and to prove the effectiveness of these essential oils in destroying several bacterial and fungal pathogens from human infections. Antibiotic-resistant bacteria have become nowadays a major concern worldwide so the usage of essential oils such as *Lavandula angustifolia*, *Juniperus communis*, and *Helichrysum italicum* could serve as an alternative way of combating resistant bacteria in different patients. The purpose of this study was to extract and evaluate the antimicrobial and antifungal properties of *Lavandula angustifolia*, *Juniperus communis*, and *Helichrysum italicum*.

Lavandula angustifolia, *Juniperus communis*, and *Helichrysum italicum* were collected from different locations in Malesia e Madhe District in Albania. The extraction of the essential oils from these plants was done by using a distillation process at the ecotoxicological laboratory at the Faculty of Natural Sciences, University of Shkodra "Luigj Gurakuqi". The essential oils were evaluated for antimicrobial and antifungal activity as follows: antimicrobial activity was done by disc diffusion test in Müller-Hinton Agar against *Staphylococcus aureus*, *Salmonella typhimurium*, and *Escherichia coli*, while against antifungal activity for *Candida albicans* on Sabourand agar. Microorganisms used in our study are samples which are taken from patients diagnosed with an infection from the throat, infection from the skin, infection from urine, etc. from the Center for Microbiological Diagnostication "Wolfdieter Sixl" at the above-mentioned faculty.

Essential oil yields of dried leaves and fruits ranged from *Lavandula angustifolia* 5.1 - 6.3%, *Juniperus communis* 0.7 - 1.1%, and *Helichrysum italicum* < 1%. The study demonstrates that these essential oils from *Lavandula*, *Juniperus*, and *Helichrysum* not only have bactericidal and fungicidal effects against microorganisms such as *Staphylococcus aureus*, *Salmonella typhimurium*, *Escherichia coli*, and *Candida albicans*, but they inhibit the bacteria and fungus growth comparable with antibiotics and antifungals like ampicillin, amoxicillin, ciprofloxacin, negram, nitrofurantoin, econazole, nystatin, ketoconazole, miconazole, clotrimazole, etc.

The inhibitory activity of the examined essential oil proved to be comparable to the antimicrobial and antifungal activity drugs used.

Key words: *Lavandula angustifolia*, *Juniperus communis*, *Helichrysum italicum*, Essential oil, Antibacterial, Antifungal activity.