

Antibiotic Resistance and Susceptibility of Bacteria Strains Isolated from Sheep Milk

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Abstract : This study evaluated the in vitro resistance and susceptibility of Enterobacteriaceae (*Escherichia coli* and *Klebsiella oxytoca* strains) and Staphylococci strains, isolated from sheep's milk, against antibiotics and essential oils from *Thymus satureioides* and *Mentha pulegium*. Antibiotic resistance tests were done using disc diffusion while essential oils were extracted by steam distillation, and yields were calculated relative to plant dry matter. Gas chromatography-mass Spectrometry (GC-MS) was used to analyze each oil's chemical composition. The AMC, CTX, FOX, NA, CN, CIP, and OFX were very effective against the *E. coli* strains tested. Half of the strains were resistant to AMC, 60% to TIC, and 80% to TE. The *K. oxytoca* was resistant against AMC, FOX, and TIC (100%). Antibiotic-resistant testing on Staphylococci strains indicated *Staphylococcus capitis* and *Staphylococcus chromogenes* as the most sensitive. *Staphylococcus aureus*, *Staphylococcus xylosus*, and *Staphylococcus cohnii ureal* exhibited less resistance to OX, TE, PT, E, and P. The *M. pulegium* resulted in a higher yield of essential oil of 3.2% oil compared to *T. satureioides* with only 1.85% yield. *Staphylococcus aureus*, *Staphylococcus xylosus*, and *Staphylococcus cohnii ureal* had lower OX, TE, PT, E, and P resistance. *M. pulegium* yielded 3.2% essential oil compared to 1.85% for *T. satureioides*. The monoterpene oxygenated derivatives, monoterpene hydrocarbons, and phenols are found in essential oil extracts. *T. satureioides* essential oil had high antibacterial activity even at low concentrations (0.2; 0.55 g/mL). The Minimal Bactericidal Concentration (MBC) values indicate that the essential oils from the plants analyzed had bactericidal effects on all strains tested and are similar to the Minimal Inhibitory Concentration (MIC) values. The high antibacterial properties of these medicinal plants, against bacteria isolated from sheep's milk, provide an opportunity to use these medicinal plants in the breeding sector as additives and preservatives in the dairy industry.

Keywords : antibiotic resistance, medicinal plants, essential oils, enterobacteriaceae, staphylococci, sheep milk

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