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Research article

The Effect of Some Essential Oils Against Subclinical Mastitis Bacteria Isolated from Dairy Goats

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Abstract The bacteria causing mastitis in goats reduce the quality of milk products resulting in economic losses and the use of antiseptic agents leave residues in the milk. Therefore, this study investigated the antibacterial activity of lemongrass, kaffir lime and holy basil essential oils against subclinical mastitis bacterial isolates from dairy goats. A total of 47 bacteria were isolated, consisting of 40 staphylococci (34 coagulase-negative staphylococci (CNS), 5 *S. aureus* and 1 *S. epidermidis*), 4 *α-Streptococcus* spp., 2 *Bacillus* spp. and 1 *Alcaligenes faecalis*. The main components of essential oil of lemongrass were geranial, nerol, myrcene and geraniol (45.32-4.12%), kaffir lime consisted of β-pinene, DL-limonene, terpinene-4-ol and α-terpineol (25.58-12.24%) and holy basil consisted of methyl eugenol, caryophyllene and eugenol (52.43-8.68%). Lemongrass essential oil showed the highest antibacterial activity against CNS and *S. aureus* with average inhibition zone diameters of 25.00 ± 1.75 and 31 ± 6.61 mm, respectively, and minimum inhibitory concentration for 90% of tested samples (MIC_{90}) and minimum bactericidal concentration for 90% of tested samples (MBC_{90}) values at least eight fold less than kaffir lime and holy basil essential oils. The time-kill assay demonstrated that lemongrass essential oil at 5-10 times MIC_{90} reduced the survival of *S. aureus* by 99.9 and 99.99% respectively within 30 min, a greater reduction than seen for 0.54% w/v iodine solution. The results of this study show that lemongrass essential oil has the potential to be developed as an antibacterial agent or teat dip formula for control of subclinical mastitis in goats.

Keywords: Antibacterial activity, Essential oil, Mastitis

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