SCREENING OF ANTIMICROBIAL ACTIVITY OF OIL OF SYZYGIUM AROMATICUM

T. Thayalini*, V. Thevanesam¹, S. Kathirgamanathar² and T.M. Gamage¹

¹Department of Microbiology, Faculty of Medicine, University of Peradeniya, Sri Lanka
²Industrial Technology Institute, Colombo 7, Sri Lanka
*thilipan2008@yahoo.com

Syzygium aromaticum is a medicinal plant of the family Myrtaceae, commonly known as clove (karabu-neti in sinhala and illavangappu/kiramb in tamil). The flower buds are spicy and have carminative, stomachic, stimulant and anthelmintic properties. In traditional medicine, the dried flower buds are used along with other ingredients to treat diseases of the respiratory system (cough, asthma), gastro intestinal system (diarrhea) and urinary system. Clove oil is also used for toothache. The antimicrobial activity of clove and clove bud oil has been published against five microorganisms, namely Streptococcus mutans, Staphylococcus aureus, Lactobacillus acidophilus, Candida albicans and Saccharomyces cerevisiae. The present study screened the antimicrobial activity of the oil of S. aromaticum against a spectrum of organisms. The panel of organisms tested included S. aureus (NCTC 6571), Escherichia coli (NCTC 10418), Pseudomonas aeruginosa (NCTC 10662), Gram positive cocci (methicillin resistant S. aureus [MRSA], vancomycin resistant enterococcus and Group A beta-hemolytic streptococci), Gram negative bacilli (multidrug resistant [MDR] Klebsiella pneumonia and Extended spectrum β lactamase [ESBL] positive Klebsiella pneumonia, Proteus spp., Enterobacter cloacae and Acinetobactor spp.), 5 species of Candida (C. tropicalis, C. krusei, C. albicans, C. glabrata and C. parapsilosis) and 3 clinical isolates of C. albicans. The oil of S. aromaticum was obtained using the Clevenger arm apparatus. Screening for antimicrobial activity was carried out using the disc diffusion method. Mueller-Hinton agar plates were inoculated with 1 ml of the liquid bacterial culture (~McFarland standard 0.5), the excess fluid was drained and plates allowed to dry at 37 ºC for 15 minutes. Five μl of the oil was impregnated on 6 mm sterile paper disc placed on the seeded plate. The zone of inhibition was measured after overnight incubation at 37 ºC.

The oil of S. aromaticum demonstrated inhibitory activity against all tested organisms excluding P. aeruginosa. The mean and SD of the diameter of the zone of inhibition produced by oil against the tested organisms are as follows: S. aureus (NCTC 6571): 16.3mm ± 0.47mm, E. coli (NCTC 10518): 17.6mm ± 0.47mm, Gram positive cocci (MRSA n= 5, VRE and Group A BHS); range 14.3 mm ± 0.47 mm - 17.66 mm ± 0.47 mm, Multi resistant Gram negative bacilli (K. pneumoniae n = 2, Acinetobacter, Enterobacter cloacae, Proteus); range 12.3 mm ± 0.47 mm - 21 mm ± 0.81 mm, Candida spp. (n=8); range 20.3 mm ± 0.47 mm - 29.3 mm ± 0.94 mm. It can be concluded that the oil of S. aromaticum has the ability to inhibit a wide spectrum of bacteria, including multiresistant organisms and Candida spp. Further studies are required to determine the potency and stability of this activity.

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