Antibacterial activity of decoction and methanolic extract of leaf of *Myristica fragrans* against MRSA

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The *Myristica fragrans* (English: nutmeg; Sinhala: sathikka; Tamil: sathikkai) is an evergreen tree, belonging to the family Myristicaceae. In Traditional medicine (Siddha medical system) the leaves are used as one of the ingredients of Parankikilangu choornam, Periyapatpam, Vellaruku patpam, Astabirava kulikai, Thankaellathi mathirai, kakkuvan lehiyam, Impooral lehiyam, Karisalai lehiyam and Brinhamila thylam. These medicines are used to treat skin diseases, respiratory diseases and arthritis. Very few studies have been carried out on the leaves of *M. fragrans* when compared to the seed and mace of this plant. Antimicrobial activity of common bacteria has been carried out but no report on the activity against Methicillin Resistant *Staphylococcus aureus* (MRSA). The decoction and methanolic extracts were screened against six bacterial isolates (*Staphylococcus aureus* – NCTC 6571, and five wild strains of Methicillin resistant *Staphylococcus aureus* (MRSA)). The aim of the study is to determine the antibacterial activity and Minimum inhibitory concentration (MIC) of decoction and methanolic extract of leaf of *M. fragrans* against these pathogens. The plant leaves were collected from Kandy, cleaned and ground to a coarse powder to prepare the decoction (40 g of coarsely powdered leaves boiled in 480 ml distilled water until the volume was reduced to 60 ml and further reduced to 30 ml using a reduced flame). Methanolic extract was obtained using Soxhlet extractor. Screening of the antibacterial activity of decoction and methanolic extract was performed by the cut well diffusion using Mueller – Hinton Agar (MHA). The MIC was detected using Agar dilution method. The mean ± SD of the diameter of inhibition zone of decoction against *S. aureus* NCTC 6571 (18.6 ± 0.5 mm) and all 5 MRSA (range 16.0 ± 0.0 to 18.0 ± 0.8 mm) was almost equal to the diameter of the inhibition zone of methanolic extract against these organisms (range from 18.0 – 19.0 mm). In agar dilution method this decoction showed activity against *S. aureus* NCTC 6571 and 5 MRSA in 1/10 dilutions. MIC of the methanolic extract for *S aureus* NCTC 6571 was 1.0 mg/ml. These values are similar to all tested 5 MRSA strains (1 mg/ml). In order to check the active ingredients phytochemical screening was carried out for leaves and the results revealed the presence of alkaloids, tannins, steroids, flavonoids, glycosides and triterpenoids in this plant. The ability of the decoction and methanolic extract of *M. fragrans* leaf to inhibit the growth of bacteria is an indication of its antibacterial potential which may be employed in the management of bacterial infections.

Key words: Antibacterial activity, MIC, *M. fragrans l*eaf, decoction, methanolic extract.

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