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ANTIBACTERIAL ACTIVITY OF DIFFERENT PLANT EXTRACTS AND THEIR COMBINATIONS WITH TURMERIC EXTRACT AGAINST *STAPHYLOCOCCUS AUREUS* STRAINS

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Drug resistance in bacteria has become a major concern in pharmaceutical research. Natural products have high structural diversity and potent antibacterial activity (AA). Hence, they can be a good source for antibacterial drug development. This study aimed to investigate the AA of *Coffea arabica* (Coffee- CF) leaves, *Murraya koenigii* leaves (Curry leaves- CL), *Tabernaemontana dichotoma* (Poison nut- PN) leaves and *Curcuma longa* (Turmeric-TR) rhizomes and their combinations. The crude extracts were prepared using dried, powdered plant parts where the leaves were extracted into water-acetone (v/v 1:1), and TR rhizomes were extracted into methanol-acetone (v/v 1:1) using a bottle shaker. The individual extracts and the nine combinations of three plant extracts with TR extract in 1:3, 1:1 and 3:1 ratios were assessed for AA by broth microdilution assay against five *Staphylococcus aureus* bacterial strains as they are involved in wound infections. Among the four individual extracts, TR showed the lowest Minimum Inhibitory Concentration (MIC) of 98 mg/l, for all five bacterial strains and the lowest Minimum Bactericidal Concentration (MBC) values ranging from 195 - 390 mg/l resulting in the highest AA. CL, CF and PN showed MICs ranging from 780 - 1,560 mg/l, 1560 - 3,125 mg/l and 780 - 6,250 mg/l, respectively and MBCs ranging from 1,560 - 6,250 mg/l, 6,250 - 12,500 mg/l and 1,560 - 12,500 mg/l, respectively. From the nine combinations, CL/TR with 3:1 ratio showed the highest AA (MIC- 48 mg/l, MBC- 98 mg/l). However, in CF/TR and PN/TR, 1:3 ratio showed the majority of low MIC and MBC values against the five bacterial strains. An enhanced AA for the three leaf extracts was observed when combined with TR extract. Amongst the four individual extracts and the nine combinations, CL/TR 3:1 combination exhibited the highest antibacterial properties. Though TR shows the highest AA among individual extracts, it increased the overall AA when present in the mixture of CL/TR in 3:1 ratio. The results revealed that using these plant extracts in combination with TR enhances the AA more than using them as individual plant extracts.

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