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Antimicrobial activity of selected plant extracts against *Salmonella typhi* and *Escherichia coli* and their phytochemical screening

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Salmonella typhi and *Escherichia coli* are foodborne pathogens that cause food poisoning, various infections, and sepsis. Emergence of microbial resistance to currently available antibiotics creates a notable curiosity to find novel antibacterial drugs or complementary medicines. *Olax zeylanica* L. (Mella), *Phyllanthus debilis* (Ela pitawakka), *Osbeckia octandra* (Heen bowitiya) and *Artocarpus heterophyllus* (Kos) leaves are edible remedies used by local villagers. All four plants are abundantly utilized in ayurvedic medicine against different ailments. This study aims to evaluate the antimicrobial activity and screen the phytochemicals in these plant leaves. Initially, methanol and ethanol leaf extracts were prepared and then they were concentrated using the rotary evaporator. Antibacterial activity of the plant extracts (10 mg/ml) against *S. typhi* and *E. coli* was evaluated using the well diffusion method (40 µl/well) in Mueller Hinton agar and replicated thrice. Positive (Ciprofloxacin) and negative controls (ethanol and methanol) were also tested. The size of the microbial inoculum was adjusted to the cell count of 6.0×10^8 CFU/ml, approximately using the McFarland standard. Preliminary phytochemical screening was conducted for flavonoids, saponins, steroids, tannins, and terpenoids using standard techniques. Statistical analysis was conducted using two-way ANOVA and Fisher LSD method. The highest average diameter of the inhibitory zone against *E. coli* was recorded for the methanol extract of *O. zeylanica* (0.94 ± 0.02 mm) while the lowest was for *A. heterophyllus* ethanol extract (0.68 ± 0.02 mm). The methanol extract of *P. debilis* showed the highest average diameter of the inhibitory zone (1.79 ± 0.08 mm) against *S. typhi* while *O. zeylanica* ethanol extract showed the lowest diameter (0.59 ± 0.03 mm). The diameters were significantly different ($P<0.05$) among the four plants and different extract types of the same plant. Tannin was detected in *O. octandra*, *A. heterophyllus* and *P. debilis*. Saponin was detected only in *O. zeylanica*. Terpenoids were detected in all other plants except in *P. debilis*. Further analysis with more advance tests is needed to confirm the presence and quantity of phytochemicals with higher accuracy. Since all plants exhibited antibacterial activities, identification of the specific chemical compounds responsible is important for synthesizing plant-based antimicrobials.

Keywords: Antimicrobial, *Escherichia coli*, Phytochemicals, Plant extracts, *Salmonella typhi*

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