EVALUATION OF CHEMICAL COMPOSITION AND ANTIBIOTIC ACTIVITY OF SELECTED LICHEN SPECIES FROM MIHINTALE, SRI LANKA AGAINST FOOD-BORNE PATHOGENIC BACTERIA

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The indiscriminate use of antibiotics causes bacteria to develop drug resistance. The discovery of new compounds to challenge drug resistance is critically important. Lichen's far-developed efficient mechanisms largely depend on the products of chemical compounds against microbial pathogens. Therefore, they have been used in traditional medicine including Ayurveda in the treatment of wounds and skin disorders. The present study was conducted to investigate the chemical composition and the antibacterial activity of hexane, methanol, dichloromethane and aqueous extracts of four different lichens, namely *Lepraria* sp., *Parmotrema* sp., *Ramalina* sp., and *Dirinaria* sp., collected from Mihintale, Sri Lanka, against foodborne pathogenic bacteria including *Escherichia coli, Staphylococcus aureus* and *Enterococcus faecalis*. Lichens were identified using their morphological, anatomical, and chemical characteristics. Bacterial susceptibility was tested using a standard disc diffusion assay using hexane, methanol, dichloromethane, and aqueous extracts of four lichens against *E. coli, S. aureus,* and *E. faecalis.* Minimum inhibitory concentration (MIC) was determined by a broth microdilution method using 96 well plates. Vancomycin and ampicillin were used as the positive controls in both tests. Thin layer chromatography (TLC), thalline spot test, and TLC bioautography test were performed to determine the chemical composition and bioactive compounds of the four lichens. Methanolic extract of *Ramalina* sp. showed the highest activity against *S. aureus* with the MIC of 0.625 mg/mL. Only *Lepraria* sp., and *Parmotrema* sp. were active against *E. coli.* Bioactive compounds of lichen species were observed after visualizing the TLC plate and after carrying out the bioautography test against *S. aureus*. Atranorin, salazinic acid, and usnic acid were among the secondary metabolites identified by the TLC and spot test reactions. Atranorin and two other unknown compounds were identified as bioactive compounds after carrying out the bioautography test against *S. aureus*. In conclusion, all lichens represent potentially important sources of future antimicrobial drugs. Further investigation of the methanol extract of *Parmotrema* sp. and *Ramalina* sp. will enable us to determine the most active compounds for the activity and their mechanism of action against bacterial pathogens, and also their cytotoxicity against normal cells.

Keywords**:** *Lichen metabolites, Bioactive compounds, Drug resistance, Antimicrobial property, TLC bioautography*