Abstract

Diospyros digyna is a wonderful fruit because of the fruit's delicacy but not only that also because of how the fruit is easy to grow in most environments it can encounter and pest free mostly due to the effect of secondary metabolites called phytochemicals compounds. The study aimed to investigate the antibacterial properties of Unripe and ripe *Diospyros digyna* fruits against *S. aureus* and *P. aeruginosa*. To investigate this, *Diospyros digyna* was extracted by UAE (Ultrasonic Assisted Extraction) using hydrophilic and hydrophobic solvents, followed by phytochemical screening of the extracts, and microdilution dilution assay to test the antibacterial property. For the total extraction it was shown that polar solvent obtained greater crude extract compared to non polar solvent. From the phytochemical screening it was found that for the unripe and ripe polar of the black sapote fruit extract showed to contain glycosides, phenolic, flavonoid, saponin, carotenoid, saponin, and anthraquinone specifically for unripe polar extract. Hydrophobic extract of *Diospyros digyna* showed inhibition against *S. aureus* and *P. aeruginosa* with 1 mg/ml and 2 mg/ml respectively showed it has the highest inhibition. Even compared to known antibiotics that work against both bacteria the extract shows promising candidates as an alternative for antibiotics agents.

The unclear mechanism of action of the fruit extract's antibacterial activity can be clarified through methods like agar dilution or time-kill curve assays, while the use of MTT, a sensitive method for assessing bacterial viability which can accurately determine compound efficacy without interference from dead bacteria.

Keywords: *Diospyros digyna*, *S. aureus*, *P. aeruginosa*, *Microdilution, Antibacterial plant extract*