In Vitro Antioxidant and Antibacterial Activities of Leaf and Branch Extracts of *Morusindica*L.

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Abstract
Oxidative stress and bacterial pathogens are two main health issues currently. This research was aims to investigate the antioxidant and antibacterial activities of leaf and branch extracts from mulberry plant. The methanolic (80% v/v) extracts of mulberry leaf and branch were examined for their antioxidant properties by DPPH radical scavenging assay. Antibacterial activity of the extracts against *Staphylococcus aureus* and *Escherichia coli* was examined using disc diffusion method, broth microdilution method and Checkerboard assay. Mulberry branch extracts showed higher antioxidant activity compared to leaf extracts, with its IC_{50} value was 0.443 mg/mL and 0.559 mg/mL respectively. Mulberry leaf extracts demonstrated a larger inhibition zone against *Staphylococcus aureus* (12.83 ± 1.26 mm) compared to the branch extract and the combination of leaf and branch extract. The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of both plant materials was less than 0.79 mg/mL for *Staphylococcus aureus*, and 50 mg/mL for *Escherichia coli*. The combination of both plant materials produced an indifferent effect against *Staphylococcus aureus* (∑FIC = 2.0) and *Escherichia coli* (∑FIC = 4.0). In conclusion, the findings showed that methanolic extracts of mulberry leaf and branch contain antioxidant and antibacterial properties that have potential for pharmaceutical and nutraceutical industry.

Keywords:
*Morusindica*L. antioxidant activity, antibacterial activity, total phenolic content (TPC), *Staphylococcus aureus*, *Escherichia coli*