

# Antioxidant Activity and Total Phenolic Contents of Local Medicinal Plants: *Microsorium Scolopendria*, *Artocarpus Atilis*, *Antigonon Leptopus* and *Phyllanthus Amarus*

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## Abstract

Natural products research has increased more than threefold since 2010. Guam has a rich source of tropical medicinal plants. The local *Microsorium scolopendria* (MS), *Artocarpus atilis* (AA), *Antigonon leptopus* (AL) and *Phyllanthus amarus* (PA) have been employed in folk medicine, yet there is minimal research done in Guam. This study aimed to examine the antioxidant activity and Total Phenolic Contents (TPC) of the local MS, AA, AL and PA. The effects of different extraction methods on the antioxidant activities and TPC of the different parts of the plants were also investigated. The plant powders were extracted (successively or non-successively) by different solvents under different temperatures for different time. The antioxidant activity and TPC were determined by 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity assay and Folin-Ciocalteu redox assay, respectively. For the PA, the 10 minute-reflux methanol extracts of PA displayed the best antioxidant activity with the smallest DPPH IC<sub>50</sub> (5.664 ug/mL) and highest antioxidant capacity (599.53 ug AAE /mg Extract); the 30 minute-reflux methanol extracts showed the highest TPC (296.58 ug GAE/mg Extract). For the AL, the 3- day maceration methanol extracts of AL leaves showed the lowest DPPH IC<sub>50</sub> (8.799 ug/mL) and the highest TPC (356.378 ug GAE/mg Extract). For the AA, the methanol reflux extracts of AA leaves showed the smallest DPPH inhibition IC<sub>50</sub> (6.647 µg/mL) and the highest TPC (146.860 µg GAE/mg Extract). For the MS, the water-reflux leaf extract displayed the smallest DPPH IC<sub>50</sub> (22.67 ug/ml) and the methanol-reflux stem extract showed the highest TPC (76.00 ug GAE/ mg Extract). Overall, PA displayed the strongest antioxidant activity, AL had the highest TPC, and MS showed the lowest antioxidant activity and TPC. Reflux extraction for longer time led to higher extraction yield but lowered TPC and antioxidant activities of plant extracts. Methanol extracts exhibited stronger antioxidant activity and higher TPC in comparison to water extracts. TPC wasn't the only factor accounting for DPPH radical scavenging activity. Further research on isolation & characterization of components of the plants will be needed to better understand the bioactivities and pharmacological properties they may have.

## Keywords

Antioxidant Activity, Total Phenolic Contents, Folin-Ciocalteu, DPPH Radical Scavenging Activity, *Microsorium Scolopendria*, *Artocarpus Altilis*, *Antigonon Leptopus*, *Phyllanthus Amarus*