

Phytochemical compounds, antioxidant activity, and HPLC analysis of *Morinda Citrifolia* (noni) fruit extract in Cambodia

Abstract

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Abstract

Introduction: *Morinda citrifolia* (noni) is a Rubiaceae family evergreen tree that is native to the Pacific Islands and Asia. Secondary compounds in noni are used in supplements, functional foods, and traditional medicines. However, research on the noni fruit in Cambodia remains limited. This study uses HPLC to analyze its phytochemicals, evaluate antioxidant activity, and identify flavonoids.

Methods: 100 mg of noni fruits were collected from Battambang and Pursat provinces, Cambodia. The sample was extracted using 1000 mL of methanol containing 10 mL of hydrochloric acid, corresponding to 99% methanol and 1% (v/v) HCl. Total phenolic content (TPC) was measured using Folin-Ciocalteu reagent, and total flavonoid content (TFC) was measured using an aluminum chloride assay. Antioxidant activity by ferric reducing antioxidant assay (FRAP), and rutin was analyzed using HPLC. Data were analyzed using Microsoft Excel and SPSS version 25. Statistical significance was set at $p < 0.05$.

Results: Our research showed that the Pursat extract had a higher total phenolic content (23.8 ± 2.19 mg GAE/g) than the Battambang extract (17.93 ± 0.53 mg GAE/g). In contrast, the total flavonoid content was significantly higher in the Battambang extract (5.33 ± 0.31 mg QE/g) compared to Pursat (1.11 ± 0.04 mg QE/g). Antioxidant activity using the FRAP assay from Pursat showed (0.34 ± 0.02 mM Fe^{2+} /g) and (0.29 ± 0.01 mM Fe^{2+} /g) from Battambang. HPLC analysis detected rutin in both extracts, with concentrations of 1.21 mg/g in Pursat being greater than 0.908 mg/g in Battambang.

Conclusion: The phytochemical compound and antioxidant activity indicate that the noni from both provinces offer a variety of therapeutic and health benefits, which are potentially utilized for the development of new nutraceuticals for functional pharmaceutical products.

Ethics statement: Our research study was approved by the UP Research Committee (UPRC) No.24IR24, 11 November 2024, University of Puthisastra.

Conflicts of interest: There is no conflict of interest to declare.

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