

Evaluation of Antioxidant, Anti-inflammatory and Anti-diabetic Properties of Noni Fruit (*Morinda citrifolia* L.) and its Simulated Gastrointestinal Digesta Fractions

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Noni (*Morinda citrifolia* L.) or 'Ahu' has been used for years in traditional medicine. Its juice has become one of the most popular fruit juices in the global market as a wellness drink due to its health benefits. As noni fruit is not utilized by the food industry in Sri Lanka, this study focused on determining bioactives and functional properties of ripe fruit (methanolic and water) and simulated gastrointestinal digesta fractions. Methanol (80%) showed higher extractability of bioactives than water. Moreover, antioxidant and anti-inflammatory properties were higher, and anti-diabetic properties were lower in methanolic extracts than that in water extracts. The total phenolic content (TPC) of 198.6 ± 1.7 μmol gallic acid equivalent/g FW, and ascorbic acid, anthocyanin and β -carotene contents of 53.01 ± 0.59 , 57.33 ± 0.96 and 0.27 ± 0.02 $\mu\text{g/g}$ FW, respectively were evident in the fresh fruit. DPPH and ABTS radicals scavenging percentages of the fresh fruit were 97.09 and 98.98, respectively. The total antioxidant capacity of the fresh fruit was 33.94 mg AAE/g FW. Singlet oxygen and NO scavenging abilities of the fresh fruit were above 90%. Percentages of heat-induced hemolysis, protein denaturation inhibition and proteinase inhibitory activities of the fresh fruit were 37.14, 42.32 and 5.23, respectively at 2 $\mu\text{g/mL}$. Furthermore, alpha-amylase and alpha-glucosidase inhibitory activities of the fresh fruit were 13.7 and 17.0%, respectively at 2 $\mu\text{g/mL}$. Content of bioactives, and antioxidant, anti-diabetic, and anti-inflammatory activities of dialysable fractions were significantly lower ($P < 0.05$) than their originals. Positive correlations between TPC and antioxidant activities, and anti-inflammatory and antioxidant activities were evident. As the results of this study revealed presence of bioavailable bioactive compounds possessing antioxidant, anti-diabetic and anti-inflammatory activities in the fruit, it would be beneficial for the food industry and consumers, if noni fruit incorporated food products possessing appealing sensory attributes could be developed.

Keywords: Antioxidant, anti-diabetic and anti-inflammatory activities, Bio-accessibility, *In vitro* digestion, Noni fruit

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