Antioxidant Activity, Total Phenolic, and Total Flavonoid Contents of Green and Purple Eggplant Extracts

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ABSTRACT

Thai eggplant (*Solanum melongena* L.) is a rich source of antioxidant phytochemicals. This study evaluated antioxidant activity, total phenolic content (TPC), and total flavonoid content (TFC) of methanolic extracts from green and purple Thai eggplant using DPPH radical scavenging, Folin–Ciocalteu, and aluminum chloride colorimetric assays. The green eggplant extract exhibited higher antioxidant activity (IC_{50} = 6.13 mg/mL) and TPC (123 mg GAE/g extract) and TFC (12.9 mg QE/g extract) than the purple variety. These results suggest that green Thai eggplant may serve as a promising natural antioxidant source for nutritional applications.

INTRODUCTION

Phenolic and flavonoid compounds are important plant secondary metabolites known for their antioxidant properties. These compounds neutralize free radicals by donating hydrogen atoms or electrons, thereby reducing oxidative stress. Thai eggplant is widely consumed and valued for its nutritional benefits; however, comparative data on phytochemical content between different color varieties remain limited. Therefore, evaluating TPC, TFC, and antioxidant activity provides insight into their functional and health-promoting potential.



METHODS

Extraction

Dried eggplant samples were ground into fine powder and extracted with methanol using the maceration method for 48 hours at room temperature. The extracts were filtered and concentrated prior to analysis.

Total Phenolic Content (TPC)

Total phenolic content was determined using the Folin–Ciocalteu method. The extract was reacted with Folin–Ciocalteu reagent and sodium carbonate, then incubated in the dark. Absorbance was measured at 765 nm. Results were expressed as mg gallic acid equivalents per gram extract (mg GAE/g extract).

Total Flavonoid Content (TFC)

Total flavonoid content was analyzed using the aluminum chloride colorimetric assay. The extract was mixed with aluminum chloride solution and incubated at room temperature. Absorbance was measured at 415 nm. Results were expressed as mg quercetin equivalents per gram extract (mg QE/g extract).

DPPH Radical Scavenging Assay

Antioxidant activity was evaluated using the DPPH assay. The extract was mixed with DPPH solution and incubated in the dark. Absorbance was measured at 517 nm. Radical scavenging activity (%) was calculated, and IC_{50} values were determined. All experiments were performed in triplicate.

CONCLUSION

This study evaluated the total phenolic content (TPC), total flavonoid content (TFC), and antioxidant activity of green and purple eggplant extracts. Both extracts contained bioactive compounds and showed DPPH radical scavenging activity, with differences in TPC and TFC corresponding to variations in antioxidant capacity. The findings indicate that eggplant is a valuable natural source of phenolic compounds and antioxidants, with potential applications in functional foods and health-related products.

OBJECTIVES

To determine Antioxidant activity TPC and TFC methanolic extracts from green and purple Thai eggplant.

RESULTS & DISCUSSION

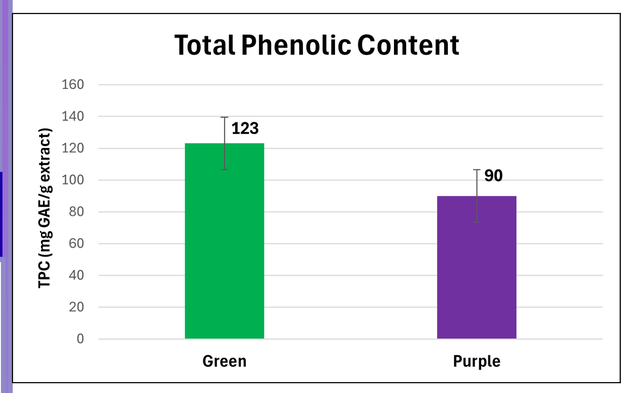


Fig.1 TPC of green and purple Thai eggplant extracts. Values are expressed as mean ± SD

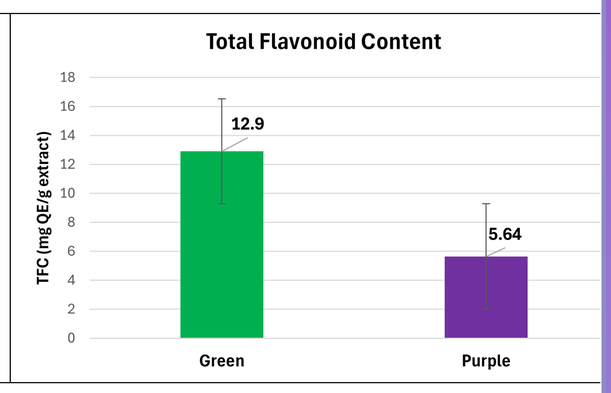


Fig.2 TFC of green and purple Thai eggplant extracts. Values are expressed as mean ± SD

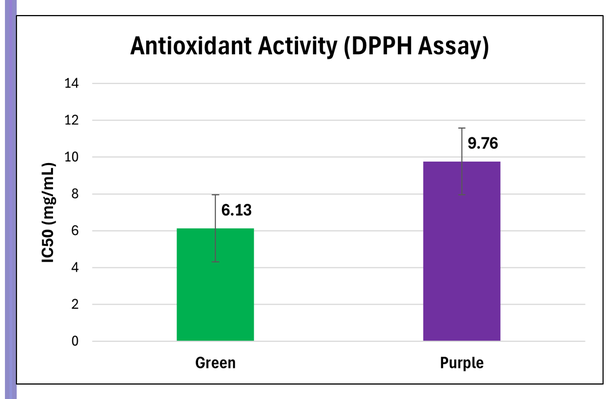


Fig.3 Antioxidant activity of extracts determined by DPPH radical scavenging assay. IC_{50} values are expressed in mg/mL. Lower IC_{50} indicates stronger antioxidant activity.

Both green and purple Thai eggplant extracts contained measurable amounts of phenolic and flavonoid compounds and exhibited antioxidant activity.

The green variety showed higher total phenolic content (123 mg GAE/g extract) and total flavonoid content (12.9 mg QE/g extract) compared to the purple variety (90 mg GAE/g extract and 5.64 mg QE/g extract, respectively). In the DPPH assay, the green extract demonstrated higher antioxidant activity with a lower IC_{50} value (6.13 mg/mL) than the purple extract (9.76 mg/mL).

These findings suggest that higher phenolic and flavonoid contents contribute to greater antioxidant capacity. A positive relationship between phytochemical content and antioxidant activity was observed.

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