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## A comparative study on antioxidant and DNA protective activity of different skin coloured brinjal (*Solanum melongena*)

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### Abstract

The aim of this study was to investigate the *in vitro* antioxidant activity and DNA damage inhibition potential of aqueous extract of *S. melongena* with different skin colours. Water extracts of brinjal with four different skin colours: moderately purple (S1), light purple (S2), dark purple (S3) and purple with green lines (S4) were tested for their antioxidant and radical scavenging activities. The total phenolic content (TPC) was quantified using Folin-Ciocalteu's method. The effectiveness of brinjal extracts in preventing radical induced DNA damage was also determined. There was a significant difference ( $p < 0.0001$ ) between the skin colour and antioxidant activity. Brinjal with S3 skin colour showed the highest TPC and antioxidant activity measured by FRAP while, S2 showed the least. S1 displayed the highest percentage of DPPH radical scavenging activity with an  $IC_{50}$  value of  $3.51 \pm 0.62$  mg/ml while, S3 demonstrated the strongest total antioxidant capacity with an inhibition percentage of  $40.45 \pm 1.17$ . In the FTC (Ferric Thiocyanate) and egg yolk model, S1 and S3 showed better antioxidant activity than S2 and S4. The *in vitro* free radical quenching and antioxidant results well correlated with the *in vitro* lipid peroxidation assays. All extracts were able to effectively retain DNA against AAPH induced radical damage at the concentration levels (25 and 75 mg/ml) tested. All the extracts showed moderate to potent antioxidant activity, among which S3 and S1, intensely coloured skins, demonstrated better antioxidant activity which may be attributed to the higher phenolic content since a linear relation was observed between the TPC and the antioxidant parameters.

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## 1. Introduction

Brinjal (*Solanum melongena*) is one of the most widespread vegetables consumed all around the world which contains a variety of phytochemicals such as phenolics and flavonoids that provide important health benefits. Brinjal extracts have been reported to successfully suppress the development and growth of tumours, metastasis, inhibit inflammation, lung cancer and heart disease<sup>1</sup>. Brinjal is now receiving more interest from consumers and researchers worldwide because of its health benefits and is ranked amongst the top 10 vegetables in terms of antioxidant capacity<sup>2</sup>. The beneficial effects of brinjal can be attributed to the presence of plant bioactives, mostly phenolics. Brinjal cultivars vary in shape and colour, the most common ones being dark purple or violet. Extract from purple eggplant skin has been shown to possess a high capacity in the scavenging of superoxide radicals and inhibition of hydroxyl radical generation by chelating ferrous ion<sup>3</sup>. Therefore, the present work aims at evaluating the in vitro antioxidant and DNA damage prevention activity of brinjal with respect to skin colour.

## 2. Methodology

### 2.1. Sample collection and preparation

Fresh eggplants with different skin color viz., moderately purple (S1), light purple (S2), dark purple (S3) and purple with green (S4), were purchased fresh from Pambahinna, Belihuloya (Figure 1). Water extracts of brinjal (0.25 g/ml) was prepared and stored under 0°C until analysis.



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