

## **ANTIOXIDANT CAPACITY OF DIFFERENT TYPES OF SRI LANKAN TEA**

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Although Sri Lanka has been exporting tea mainly as black tea, antioxidant capacity was not adequately exploited for value addition to promote marketing. For exploitation, knowledge on antioxidant capacity of our made-tea, which might vary mainly with clonal characteristics, climatic conditions and manufacturing methods, is essential. This study was initiated to investigate the variation of antioxidant capacity of made-tea based on different cultivars, tea type (green or black tea), grades and the influence of seasonality (quality season vs their season).

Black tea samples (100 g from each grade) were collected from Pedro and Sarnia Estates separately to fulfill research objectives. Commercial scale orthodox manufacturing process was practiced in the estates and manufacturing conditions were the same for all the collected black tea samples. Green tea grades were collected from Oliphant estate. Ten different black tea grades from three different cultivars (PK-2, TRI 2025 and Seedling-tea) and six green tea grades from cultivar PK-2 were obtained. To check the seasonal effects on black tea, ten different grades were collected from Nuwara Eliya (Dimbula season: December to March and off season) and Uva region (Uva season: July to September and off season). Herbal teas were purchased from Canada. The total antioxidant activity (TAA) of brewed tea samples was analyzed using DPPH method and it specifies a spectrophotometric method used in determining the antioxidant activity of tea with respect to Trolox (water soluble Vitamin E analog), by a DPPH (which is a free radical) assay. TAA of tea samples were extrapolated using a standard series and trolox<sup>®</sup> was used as the standard antioxidant.

The cultivar TRI 2025 has 1.8 fold and 1.3 fold greater TAA compared to PK-2 and Seedling-tea respectively ( $p < 0.001$ ). Some tea cultivars have greater polyphenolic content and there is a positive correlation between total polyphenolic content and TAA. Also, different grades of a tea cultivar have significantly different TAA. Broken (smaller) tea grades have high levels (1.7 fold) of TAA compared to leafy (larger) grades. Analysis revealed that TAA is negatively correlated ( $r = -0.89$ ) with particle size. There is no significant difference in TAA of black tea vs normal green tea and organic green tea. Although flavour seasons affect on tea quality, there is no significant difference in TAA in Dimbula and Uva quality seasons vs their off seasons. Dust grade of black tea had nearly five times high TAA compared to the herbal teas. Sri Lankan OP grade has 3-3.5 high TAA compared to the herbal teas.

Results clearly indicate that both black and green tea types have greater antioxidant capacity. The TAA vary with cultivar and antioxidant capacities are greater in TRI 2025. Broken tea grades have high antioxidant activity compared to leafy grades in both black tea and green tea. The mean differences of TAA of black tea vs. green tea were not significant. TAA in black tea in Dimbula and Uva did not differ with seasons. When compared to the different herbal teas available in the market, Sri Lankan black tea has greater antioxidant potential.