

Phytoconstituents and antioxidant properties among commercial tea (*Camellia sinensis* L.) clones of Iran

ABSTRACT

Background: Tea (*Camellia sinensis*), a well-known beverage is consumed frequently worldwide due to its high antioxidant properties. The present study determines the amount of phytochemicals and antioxidant activities among 12 high yielding tea clones cultivated in Iran.

Results: Among the 12 clones studied, tea clone Iran 100 had the highest total phenolic content and total flavonoid content with values of 8.44 ± 1.03 mg gallic acid equivalents per gram dry weight and 4.50 ± 0.16 mg rutin equivalents per gram dry weight respectively. High performance Liquid Chromatography (HPLC) analysis of phenolics and flavonoids in 12 clones revealed the presence of (+)-catechin, (-)-epicatechin, (-)-epigallocatechin, (-)-epigallocatechin-gallate, (-)-epicatechingallate, gallic acid and caffeine. The 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radical scavenging assay showed the existence of variation in the antioxidant activity ranging from 22.67 to 65.36%. The highest antioxidant activity with IC₅₀ value of 218.24 $\mu\text{g/mL}$ was observed in the leaf extract of the clone Iran 100, while the lowest was found in the clone Iran 482 with IC₅₀ value of 234.44 $\mu\text{g/mL}$. The antioxidant activity had a positive correlation with total phenolic content, total flavonoid content, (-)-epigallocatechin-gallate, (-)-epicatechingallate and caffeine ($0.59 \leq r \leq 0.97$, $P < 0.05$).

Conclusion: From the study it can be concluded that the clone Iran 100 has a superior quality compared to any other clones studied due to occurrence of more phenolic compounds and a greater antioxidant activity. Hence, we recommend the use of tea clone Iran 100 for commercial planting.

Keyword: *Camellia sinensis*; DPPH assay; Methanolic extract; Total flavonoid content; Total phenolic content