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Evaluation of antioxidant properties of Iran's native plants and investigation their synergistic effects with tea

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Background and Aims: Epidemiological studies have shown that population consuming tea and specified herbs have lower incidences of cardiovascular diseases and certain cancers. These effects have been attributed to the polyphenol content of the herbal plants. The aim of this study was to investigate antioxidant activity of 6 medicinal plants of Iran and their synergistic effects on total antioxidant activity of tea.
Methods: Galangal (Aplinia officinarum Hance), bitter orange flower (*Citrus aurantium* L.), wild chamomile (*Tripleurospermum disciforme*), wild thyme (*Zizphora clinopodioides* Lam), damask rose (*Rosa damascene* Mill), saffron (*Crocus sativus* L.) were collected from different regions of Iran. Aqueous extracts of these herbs and their mixture with tea were used for determination of total polyphenols by ferric reducing antioxidant potential (FRAP) and Folin-Ciocalteu reagent (FCR) assays. Total flavonoid contents have also been investigated by aluminum chloride method.
Results: The FRAP assay were interpolated in a calibration curve of FeSO4, 7H2O. Their results varied considerably 43.25-797.69 ?mol/L between the herbs. Total phenolic content varied from 15.92 to 70.15 mg GAE/L. Also total flavonoid content varied from 25.79 to 208.46 mg catechin /L. The results show that Damask rose had the highest and saffron had the lowest antioxidant activity in all measurements. Results of this study revealed that interactions between tea and herbs were synergistic and additive. A significant correlation was also found between FRAP assay and Folin –Ciocalteu method.
Conclusions: This work showed that the 6 herb samples contained phenolic and flavonoids compounds. Bitter orange flower, galangal, chamomile and wild thyme have synergistic effects. Damask rose and saffron has additive effect on tea, but all herbs have an antagonist activities on tea in total flavonoid content investigation.

Keywords: Antioxidant activity; FRAP; Iranin herbs