

EFFECT OF WATER HARDNESS AND BREWING TIME ON FLUORIDE RELEASE FROM DIFFERENT TYPES OF IRANIAN TEA

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SUMMARY: Tea leaf is a known fluoride accumulator and the high consumption of tea liquor may cause both systemic and, with childhood consumption, dental fluorosis. The fluoride concentration in tea liquor depends on several factors and the aims of the present study were to investigate the fluoride concentration in tea leaves and the influence of brewing time and water hardness on fluoride release, during tea infusion, from different types of commonly used Iranian tea. The concentrations of fluoride, nitrate, sulfate, and chloride were measured, after 3 to 120 min brewing time, in 100 tea samples, including white, green, Oolong, and black tea (Refah-Lahijan). The daily fluoride intake was also assessed. The fluoride concentration was measured with the ion chromatography method. The results were analyzed with the Statistical Package for the Social Sciences (SPSS), version 16.0. The results showed that the minimum and maximum concentrations of fluoride in the tea, after 10 min infusion, were 0.217 mg/L (green tea) and 0.582 mg/L (black tea) respectively. Fluoride release from the tea leaves into the infusion increased significantly with increased brewing time ($p < 0.05$). Approximately 85% of the fluoride was released from the tea leaves into the infusions after brewing. Fluoride extraction was less in hard water.

Key words: Brewing time; Daily intake of fluoride; Fluoride in tea; Water hardness.

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