Potentiometric Determination of Fluoride and Iodide in Kales (Brassica oleracea var. Acephala) Grown In Eastern Black Sea Region

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Fluoride (F⁻) and iodide (I⁻) are essential trace elements of great importance in human nutrition. However, fluoride exposure via drinking water is an endemic problem in several parts of the world [1]. Drinking water has traditionally been considered the main reason for the development of fluorosis, but food items may also be a contributor in areas with high concentrations of fluoride in the soil [2]. Iodide is an essential part of the thyroid hormones triiodothyronine (T₃) and thyroxin (T₄), which in turn are necessary for human growth and development. However iodine deficiency is known to influence thyroid hormone metabolism. The best known effect of iodine deficiency is endemic goiter [3]. Kale (Brassica oleracea var. acephala) is a vegetable grown and consumed abundantly in Eastern Black Sea Region of Turkey.

In this study, the quantities of fluoride and iodide contained in the kales grown in Eastern Black Sea Region and in the soils where the kales were grown were determined. The kale leaves were decomposed using alkali fusion and the determinations were performed with fluoride- and iodide-selective electrodes. The results obtained for the samples taken from number of 16 different locations were compared with each other and with the values given for the various vegetables in the literature. Fluoride and iodide levels in kales were found to be in the range of 3.0–21.7 mg/kg [4] and 7.2–44.5 mg/kg, respectively. It was observed that the elemental contents of the kales were different. This result was attributed to the variation of the soils where the kales were grown, and the variation of the conditions.

References