Antioxidant Study Of *Berberis Integerrima* Aqueous Extracts Using Cyclic Voltammetry

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Introduction: Natural antioxidants, particularly in fruits and vegetables have gained increasing interest among consumers and the scientific community because epidemiological studies have indicated that frequent consumption of natural antioxidants is associated with a lower risk of cardiovascular disease and cancer.The Fruit of *Berberis integerrima* were collected from tarom, Iran, during Sep 2017.

Methods and Results: Extraction was performed by using maceration method for dried flower sample. The aqueous extract of the Fruit of Berberis vulgaris were obtained by adding 1 l of boiling water to 500 g of powdered plant material in a glass 2.5-l flask and incubated at room temperature for 8 h on a rotating shaker (200 rpm). The aqueous extract was filtered using Whatman No. 1 filter paper and then concentrated in vacuum at 40 °C using a rotary evaporator. in recent decades, the oxidation potentials determined by cyclic voltammetry (CV), enable a comparative investigation of the antioxidant potency of phenolics like benzoic acids, hydroxycinnamic acids, and flavonoids, with distinction between substrate types. Low oxidation potentials values reflect the propensity of a given molecule for electron donation and thus, for exhibiting significant antioxidant (antiradical) activity.The oxidation behavior of *Berberis integerrima* was studied by cyclic voltammetry (CV) in a solution of 200 mM *Berberis integerrima* in pH= 5 acetate buffer. In the first cyclic voltammogram, two anodic peaks were observed at scan rate v=100 mV s^{-1}, first peak at Epa =0.660 V and second peak at Epa =850 V. On the CV negative-going scan, two small cathodic peaks, peak at Epc =0.35 V and peak at Epc =0.48 V appeared. These two peaks correspond to the reduction of the berberine oxidation product formed at the GCE (glassy carbon electrode) surface during the first positive going scan.

Conclusions: The electrochemical behavior of *Berberis integerrima* was investigated by cyclic , differential pulse and square-wave voltammetry over a wide pH range. The oxidation is a quasireversible, diffusion-controlled process, and the oxidation occurs in a complex cascade electron and proton transfer mechanism. In acid buffer electrolyte, three consecutive charge transfer processes were observed whereas in neutral and alkaline media, due to a homogenous reaction in solution, only two oxidation processes occur.

Key words: *Berberis vulgaris*, Oxidation, Cyclic voltammetry, Electrochemical