Assessment of polyphenolic profile stability and changes in the antioxidant potential of maqui berry (*Aristotelia chilensis* (Molina) Stuntz) during in vitro gastrointestinal digestion

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**A B S T R A C T**

Maqui berry (*Aristotelia chilensis* (Molina) Stuntz) has demonstrated a great potential as functional ingredient. However, determining the effect to which the maqui extract or its phytochemicals will benefit the consumers requires further knowledge. Thus, the aim of the present study was to determine the effect of in vitro gastrointestinal digestion (GID) on (i) the recovery and bioaccessibility indexes, (ii) the stability of polyphenolic compounds (phenolic acids, flavonoids and anthocyanins) and (iii) the changes in antioxidant activity of maqui berry grown in Chile. The extracts obtained in each phase (oral, gastric and intestinal) of GID were used to analyse the stability of polyphenolic compounds by means of HPLC whereas the antioxidant activity was determined using four different methodologies.

All polyphenolic compounds decreased their concentration after GID and principally the anthocyanins content which was severely affected. The GID process decreased the scavenging powers in 89.9% and 84.2% with DPPH and ABTS assays, respectively, as well as the reducing power 74.1% with respect to non-digested sample. On the other hand, the chelating activity was increased (126.8%). At the end of GID process, the bioaccessibility of phenolic and flavonoid compounds was 78.19 and 14.20%, respectively. The results obtained suggest that although a great amount of maqui berry polyphenolic compounds are lost during digestion process they still have a great potential as antioxidants.

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1. **Introduction**

Due to the increasingly interest of population in consuming foods rich in healthy promoting compounds, the last years food science has focused its efforts on the search of new ingredients from fruits and vegetables. Today, these bioactive components are being intensively studied to evaluate their health properties. The evidence suggests that increasing the consume of plant-based foods can prevent some chronic diseases such as heart diseases, cancer, stroke, diabetes, etc. (Liu, 2013). The relation between plant-based food and health is the presence of bioactive compounds (Chen et al., 2007).

*Aristotelia chilensis* (Molina) Stuntz commonly known as maqui berry, Chilean blackberry or “maqui” is a wild edible berry from central and southern Chile. There are numerous health benefits related with maqui consumption such as anti-diabetic, cardio-protective, inhibition of adipogenesis and inflammation, prevention of digestive disorders and prevention of LDL oxidation (Céspedes et al., 2008; Schreckinger et al., 2010; Rojo et al., 2012; Gironés-Vilaplana et al., 2014). The most significant effect has been attributed to polyphenolic compounds with high antioxidant capacity (Brach et al., 2016). Regarding to its potential biological activity, maqui has the best performance in terms of α-glucosidase and lipase inhibitions compared with other fruits rich in phytochemicals (Gironés-Vilaplana et al., 2014), therefore it also can help in the digestive process of carbohydrates, delaying the breakdown of oligosaccharides and disaccharides into monosaccharides decreasing glucose absorption (Rubilar et al., 2011).