**Extraction of bioactive compounds from prickly pear (*Opuntia ficus-indica*) using different methodologies**

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Abstract

For a long time, the food industry has incorporated various substances with the potential to reduce the deterioration caused by oxidation during the storage period, particularly the use of synthetic compounds that are approved for use within an acceptable daily intake limit. However, synthetic additives have been associated with several negative health implications, such as mutagenic effects and the generation of toxic and carcinogenic compounds. Furthermore, their use to extend shelf-life goes against the trend of consumers to seek “clean label” foods, i.e., formulated only with ingredients considered familiar and healthy. For these reasons, many studies have been carried out in order to replace synthetics with natural versions, such as fruits, vegetables and aromatic herbs extracts, demonstrating that they can effectively perform the same function as synthetic ones. There has been a remarkable interest in regular consumption of *Opuntia* and its positive correlation with the treatment and prevention of chronic diseases related to oxidative stress. In addition, its extracts may contain good amounts of antioxidant components. The prickly pear, although it has an interesting profile of bioactive compounds is still not well valued, and reports on its application as a natural antioxidant are scarce. Thus, we aimed to evaluate the antioxidant capacity of extracts obtained from *O. fícus-indica* capable of being used as natural additives. Four extraction methodologies (A, B, C and D) were tested: (A) dry peel solubilized in 80% ethanol in a 1:5 ratio (matrix:solvent) and agitation at 120 rpm for 1 hour; (B) fresh pulp extracted with 80% ethanol (1:4) and homogenization in ultraturrax (8000 rpm) for 10 minutes; (C) only fresh pulp; (D) whole fruit dried and ground extracted (1:10) with 80% ethanol for 24 hours at 120 rpm. Afterwards, the obtained solutions were filtered through paper filter, concentrated in a vacuum rotary evaporator from 45 to 60ºC and freezing at -18ºC.The yield was calculated considering the amount of extract obtained (mL) per gram of fresh fruit (% v/m) and the antioxidant activity was determined with the Folin-Ciocalteau reagent using a calibration curve (y= 10,148 x + 0,026; r² = 0,9968), expressing the results in mg equivalent of gallic acid (GAE)/g of extract. Extract A presented a yield of 0.54%, while B, C and D showed, respectively, 12.91, 7.87 and 9.36%. For the quantification of total phenolic compounds, A showed the best values (18.34 ± 1.30), followed by D (13,66 ± 0,06), C (3,81 ± 0,34) e B (1,51 ± 0,12). It is noted that the peel has the highest antioxidant activity, however, it must also be taken into account that its yield is very low, which implies a disadvantage for obtaining viable amounts to be applied for food conservation. Thus, it can be concluded that the extract obtained from whole fruit dried and ground (methodology D) is the best option among those tested, since it showed good results in both yield and antioxidant capacity.

**Key-words:** natural antioxidants, polyphenols, clean label.