

**Title** Identification and quantification of pigments in prickly pear fruit  
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### **Abstract**

Qualitative and quantitative analysis of betalains pigments in ten cultivars/lines of prickly pear (*Opuntia* spp.) fruit were conducted with reverse phase high-performance liquid chromatography-diode array detection (HPLC-DAD) coupled with electro spray mass spectrometry (ESI-MS). Betacyanins and betaxanthins were identified by comparison with the UV/Vis and mass spectrometric characteristics as well as the retention times of semi-synthesized reference betaxanthins. Carotenoids and chlorophylls were also identified and quantified based on their molecular mass determined by applying HPLC-DAD coupled with Positive Atmospheric Pressure Chemical Ionization Mass Spectrometry (APCI-MS). A total of 24 known/unknown betalains were present in the studied prickly pear fruit, including 18 betaxanthins and 6 betacyanins. The ratio and concentration of betalain pigments are responsible for the color in the different cultivars, showing the highest betalains content in fruit of purple color, comparable to that found in red beet (*Beta vulgaris* L. cv. Pablo). All cultivars/lines had a similar carotenoid profile, in which lutein was the most abundant compound in 'Camuesa', while neoxanthin was the most abundant compound in '21441'. Chlorophyll a was the most abundant in all cultivars/lines with the highest quantity in '21441'. To our knowledge, this is the first time that separation of carotenoids and chlorophylls has been reported in cactus pear fruit using mass spectroscopy. Our results indicate that prickly pear fruit can be considered as a potential source of yellow and red natural colorants.