EVOLUTION OF SUGARS FROM AGAVE TEQUILANA WEBER DURING COOKING BY USING INFRARED SPECTROSCOPY

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Introduction. The elaboration of distilled beverages like tequila, involve sugars ferments, principally fructose. However the sugars content in agave raw are not fermentable, for this reasons requires a hydrolysis process, commonly by cooking. The principal components of agave's head are water and fructans. The fructans are formed by fructose molecules united by links β (2→1) y β (2→6) and in minor proportion chain of glucose and saccharose (1, 2).
The objective this work was identify by Fourier transformed infrared (FTIR) spectroscopy the sugars evolution during different cooking times.

Methods. Four kg of *tequilana* Weber blue agave heads were cooking in an autoclave during 6, 12, 24, 36 and 48 h at 95°C. The juice cooked were extracted by milling. The samples obtained were analysis directly in a FTIR spectrometer Agilent model Cary 630 by using 10 scans and a resolutions of 4 cm^{-1}.

Results and discussion. Figure 1 shows the infrared spectrum of uncooked agave juice. In the region between 1300 and 700 cm^{-1} can be observed mainly peaks associated with agave fructans (3), located in 1135, 1060, 1030 and 930 cm-1.

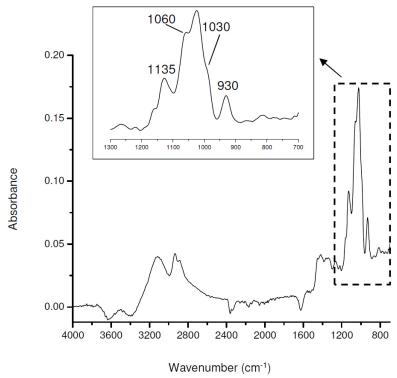

Fig. 1. Infrared spectrum of uncooked agave juice. The expanded region (1300-700 cm-1) shows the most representative area of agave fructans.

Figure 2 shows the infrared spectra of agave juice in function of the cooking times. In this figure can be observed the gradual disappearance of the peaks originally located in the infrared spectrum of the uncooked juice (rich in fructans) (Figure 2a). In the spectrum of the sample cooking at 48 h can be observed the total transformation of the fructans in fructose (Figure 2f), which present a principal peak approximately at 1060 cm^{-1}.

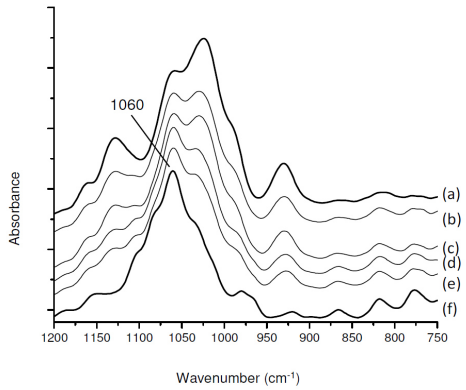

Fig. 2. Evolution of infrared spectra of samples juices agave cooked at different times, (a) uncooked agave juice.

Conclusions. In this work by using FTIR spectroscopy were observed the transformation of sugars from fructans during different cooking times. The complete transformation of fructans to fructose was observed for 48 h at 95°C.

References.

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