



EVALUATION OF HANDCRAFTED CORN MALT BEER: AN INNOVATIVE BEER SOURCE OF ANTHOCYANINS AND NEW FLAVORS

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Introduction. Corn based fermented beverages have existed in Mexico since the pre-Columbian era. With the purpose of recovering this tradition, an innovative fermented beverage with beneficial properties was developed using corn malt. Corn malt beer can be a source of anthocyanins, which show an antioxidant activity that contributes to prevent several human diseases (1).

The aim of this project was to identify and quantify the total anthocyanins, evaluate their antioxidant activity, the volatile compounds and the sensory profile in a new handcrafted beer made with 100% of corn malt.

Methods. The evaluated beers were elaborated with two different corn varieties (blue and red corn). Total anthocyanin content was measured by pH differential method (2) while anthocyanins identification was carried out by HPLC. Antioxidant character was measured by total soluble phenolic content (3). Volatiles compounds were analyzed using GC-MS with HS-SPME (4). Sensory analysis was performed by a conventional consensus profile based on Quantitative Descriptive Analysis (5).

Results. It is shown that beer made with blue corn had 8.1-fold higher total anthocyanin content than the red corn beer, although red corn beer had 1.4-fold higher total soluble phenols than the blue corn beer (Table1).

Table 1. Properties of blue and red corn beers.

	Blue corn beer	Red corn beer
Total Anthocyanins ^{a,b} (mg/L)	15.16 _a	1.85 _b
Total soluble phenolics ^c (mg/L)	464.4	650

^a Expressed as cyanidin 3-glucoside equivalents.

^b Expressed as pelargonidin 3-glucoside equivalents.

^c Expressed in gallic acid equivalents.

The volatile compounds that were found in both beers were esters as ethyl acetate, hexanoic acid ethyl ester, octanoic acid ethyl ester, alcohols as isobutanol and isoamyl

alcohol, and styrene which provide the specific flavor and taste to these beers.

Differences in taste and aroma were found between beers using by descriptive sensory evaluation. The attributes that best represented this kind of beer were cooked corn, nixtamal, chili and spicy.

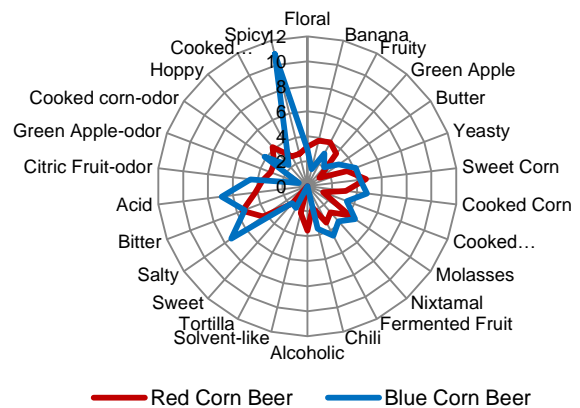


Fig.1 Plot obtained through QDA of Blue and Red Corn Beers.

Conclusions. Corn as a principal brewing material had an important effect on the antioxidant properties and also on the aroma and taste on beers. The descriptors generated have been used as quality indicators during the developing and standardization of the new corn malt beer. The potential nutraceutical properties of this kind of beers are of interest due to the high consumption of corn-based products in México.

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