New crops for functional molecules: Açai and Blackberry

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A steady increase in the development of natural food colorants and functional food sources has been observed in recent years, not only due to consumer preferences for natural pigments but also for their health-related benefits and nutraceutical properties.
Anthocyanins are a viable replacement for synthetic colorants due to their bright, attractive colours and water solubility, allowing their incorporation into a variety of food systems.
We have studied two news crops for their functional molecules content: Açai and Blackberries.

- **Açai**

Euterpe oleraceae Martius is a large indigenous palm tree from the Brazilian Western Amazon Forest in the region of the Amazon River and its tributaries and estuaries in South America.

It belongs to the family of Palmae (Arecaeae) and to the class of Liliopsida Principes.

Its fruit, known as açai, is of great economic value to native and lower class people of Brazil, Colombia, and Suriname because it serves as a major food source.

The açai palm tree can reach up to 25 m in height. The trunk grows from 15 to 25 cm in diameter and forms into tall multi trunk trees. Its wood is used in rustic constructions around the areas where it can be found.

The fruit is a kind of cherry of 1 to 1.5 cm in diameter, violet, becoming nearly black when ripe, and generally used for the production of liqueurs, sweets, and juices.

Acai as a functional food

A recent study using modern procedures and a standardized freeze-dried acai fruit pulp and skin powder found nutrient analysis results from 100 g of powder to equal 533.9 calories, 52.2 g carbohydrates, 8.1 g protein and 32.5 g total fat. The carbohydrate portion includes 44.2 g of fibber *(Schauss and al. 2006).*

Having nearly one-third of its mass as dietary fibber, acai is an exceptional source of this valuable macronutrient: a 100 g serving of the powder would provide all there commended fibbers need for adults. (30 g per day).
Acai is particularly rich in fatty acids, feeling oily to the touch. It contains high levels of the monounsaturated fatty acid oleic acid (56.2% of total fats). It is also rich in palmitic acid (24.1% of total fats, a saturated fat) and the polyunsaturated omega-6 fatty acid linoleic acid (12.5% of total fats). *(Schauss and al., 2006).*

Two phytosterol that competes with dietary cholesterol for absorption and so may reduce blood cholesterol levels, is also unusually rich (78-91% of total sterols) *(Lubrano, 1994; Schauss 2006).*

This fruit has recently captured international interest, not only due to its perceived novelty and exotic flavour but also due to potential health benefits associated with its phytochemical composition.
Considerable interest has been generated by its high anthocyanin, a group of polyphenols and its antioxidant capacity. *(Coïsson and al., 2005)*

Two anthocyanins, cyanidin-3-glucoside and cyanidin-3-rutinoside were found to be predominant anthocyanins. Additionally, other major polyphenolic compounds present in açaí juice were identified.
Beneficial health effects of plant polyphenolics have been recognized to originate from their ability to inhibit oxidative reactions.

A recent study using a standardized oxygen radical absorbance capacity or ORAC analysis on a freeze-dried Acai powder reported that this powder showed a high antioxidant effect against peroxyl radical (1027 µmol trolox equivalent/g). This is approximately 10% more than lowbush blueberry or cranberry on a dry weight basis *(Wu, 2004).*

Acai as a natural food colorant

In regard to his high anthocyanins concentration, 1400 mg/L expressed in equivalent cyanidin-3-glucoside of juice of açai, and his stability, açai can be used as a new source of pigments.
Coïsson et al., 2005, concludes that açai juice could be use as a natural functional pigment for flavouring and colouring yogurt.

- **Blackberries**

Rubus glaucus Benth, the Andean blackberry or "mora de Castilla" is native to the broad area from the northern Andes to the southern highlands of Mexico. Although common in the wild, it is also abundant in the gardens of hundreds of towns and villages, especially in Ecuador and Colombia.
In two Ecuadorian towns, Ambato and Otavalo, nearly every garden has the plants, this fruit appears in the markets most of the year.
In Colombia, the mora de Castilla has become an increasingly important cash crop.

Its fruits are large (up to 3 cm long). When fully ripe, they range from dark red to nearly black in colour. Their seeds are small and hard, with little flesh adhering to them.

Blackberry as a functional food

Blackberries are also of particular interest in this regard, due to the high anthocyanin and phenolic contents that contribute to its noted antioxidant capacity. In addition, recent studies have demonstated the strong antioxidant activities of anthocyanins such as cyanidin-3-glucoside detected in blackberries.
The antioxidant capacity of the a freeze-dried blackberry powder measures by ORAC was 674.2 ± 52.4 µmol trolox equivalent /g. *(Elisia,et al., 2007)*

Blackberry as a natural food colorant

Considering the high anthocyanin concentration (1250 mg/L expressed in cyanidin-3-glucoside) *Rubus glaucus* can be also used as a new source of anthocyanin pigments.