Obtaining and characterization of mango peel powder and its use as a source of fiber and a functional ingredient in natural yogurt

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ABSTRACT
The mango (Mangifera indica L) is a tropical fruit of high production and consumption in Valledupar and the entire Atlantic Coast, which is characterized by a high nutritional value. However, its use is limited to the pulp. In this research, it was decided to use ripe mango peel variety yarn by making a powder for use dual functional ingredient and additive, due to its high content of fiber and phytochemicals. The powder was obtained from mango variety yarn using the following processes: selection, washing, peeling, drying, grinding, packaging and heavy. Among the physicochemical characteristics are: moisture 6.24%, 2.24% fat, 2.82% protein, 10.35% neutral fiber, ash 4.23%, 2.82% citric acid, pH 4, 69, 0.032% ascorbic acid, reducing sugars 14.25% and 12.80% starch.

Keywords: Type your keywords here (up to 5), separated by semicolons (;)

INTRODUCTION
The mango (Mangifera indica L.) is native to India, but once it was introduced in Colombia was adaptability, due to climatic conditions prevailing in our country. One of the trade of tropical fruits and is used in a variety of products. (Paravankara., 2000). According to FAO (2004), annual production is 25 billion tons annually, from handle to produce a large number of processed products (juices, nectar, pickled, canned food, jam, mango deshidartado, etc.). (Loelillet, 1994), generated during processing large amounts of wastes are located approximately between 40% and 45%, representing between 12% and 15% and 15-20% husk seed (Kaur., 2004).

Interest in food production with a higher content of antioxidants and dietary fiber has been increasing rapidly and the importance of these constituents has helped develop a market for them. In this case the handle, which is a valuable dietary supplement and is rich in vitamin A and C, minerals, fiber and antioxidants.

Currently, consumption of fiber and phytochemicals such as polyphenols, carotenoids, tocopherols and ascorbic acid has been linked to health and protection from disease (cancer, cardiovascular disease, poor digestion) (Wang and Jiao, 2000), so the consumers have increased consumption of fruits and vegetables as these are a source of substances with antioxidant, anticarcinogenic and antimitagenic (Dillard and Germain, 2000).

Currently, there are many plant sources of dietary fiber which is obtained and carried out studies that indicate that the dust of mango (Mangifera indica L.) is high in fiber, so it can be a good alternative as a fiber source for the enrichment of diets deficient in this element. Not all foods have the appropriate conditions to be fortified with fiber and the ideal is that the benefits incorporated into food products are accessible to most of the population. Powdered products, this is the case of the handle can be used to manufacture juices, jellies, puddings, custards, in bakery products, etc., for having these great acceptance by consumers in different countries.
The mango (Mangifera indica L.) is a tropical fruit of high production and consumption in Valledupar and the entire Atlantic Coast, which is characterized by a high nutritional value. However, its use is limited to the pulp. In this research, it was decided to use ripe mango peel variety yarn by making a powder for use dual functional ingredient and additive, due to its high content of fiber and phytochemicals. The powder was obtained from mango variety yarn using the following processes: selection, washing, peeling, drying, grinding, packaging and heavy. Among the physicochemical characteristics are: moisture 6.24%, 2.24% fat, 2.82% protein, 10.35% neutral fiber, ash 4.23%, 2.82% citric acid, pH 4.69, ascorbic acid 0.032%, reducing sugars 14.25% and 12.80% starch.

MATERIALS & METHODS

The powder was obtained from mango variety yarn through processes of selection, washing, peeling, drying, grinding, packaging and heavy. Physicochemical analysis were performed respectively: Moisture, Fat, Crude Protein, Fiber neutral, Ash, Citric Acid, pH, Ascorbic acid, Reducing sugar, Starch.

We used healthy and ripe, with its characteristic color (yellow), the variety of yarn, from the estate of the Caribbean Biotech Center, located in the city of Valledupar, Colombia, during the period of April and May 2010. The degree of maturity was shown by the color, fruit firmness to the touch, and was considered at the same time the absence of physical damage and plant.

The fruits were washed and peeled, shells obtained were placed in a tray and introduced into a drying chamber vacuum BINDER VD 53, varying the drying temperature and maintaining the same time (50 °C, 60 °C, 70 °C, 80 °C and 90 °C for 24 hours), then the sample was weighed to determine yield milling, which was done with a blender IKA A 11, then took the product to a sieve No. 150 to homogenize the powder obtained was then packaged in sealable plastic bags, stored at a temperature of 20 °C, to perform the respective analysis by AOAC techniques.

Natural yogurt was elaborated within the parameters of asepsis and hygiene and was added different concentrations: 3%, 5%, 7% and 10% of mango peel powder, to note that the physicochemical and sensory characteristics had the yogurt with the addition of this dust.
RESULTS & DISCUSSION

Mango powder obtained was analyzed in the laboratory analysis of food Biotechnology Center of the Caribbean, the following results:

Table 1. Physicochemical analysis of mango

<table>
<thead>
<tr>
<th>Analyses</th>
<th>Results</th>
</tr>
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<tbody>
<tr>
<td>Moisture</td>
<td>6.24%</td>
</tr>
<tr>
<td>Fat</td>
<td>2.24%</td>
</tr>
<tr>
<td>Crude Protein</td>
<td>2.82%</td>
</tr>
<tr>
<td>Fiber neutral</td>
<td>10.35%</td>
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<tr>
<td>Ash</td>
<td>4.23%</td>
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<tr>
<td>Citric Acid</td>
<td>2.82%</td>
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<tr>
<td>pH</td>
<td>4.69</td>
</tr>
<tr>
<td>Ascorbic acid</td>
<td>0.032%</td>
</tr>
<tr>
<td>Reducing sugar</td>
<td>14.25%</td>
</tr>
<tr>
<td>Starch</td>
<td>12.80%</td>
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</tbody>
</table>

Source: Authors

The yield of mango peel powder after all processing, grinding and sieving was 40%

The drying temperatures and times were determinate at the time to standardize the drying process, since temperatures above 60 °C showed browning reflected in the shell with a dark color and bitter taste due to the sugars present in the product. 50° C present characteristic color and odor characteristic of the handle, so we decided to standardize the process with these parameters.

The natural yogurt made with addition of 10% of mango peel powder before inoculation, showed a good texture, flavor and color characteristic handle and had a shelf life of 1 month without adding preservatives.

CONCLUSION

The mango peel powder has a yield of 40%, has very good sensory characteristics, such as taste and characteristic yellow color, showed a 70% solubility in yogurt also providing its characteristic smell and color of mango, indicating that in addition to behaving functional ingredient due to its high fiber content also acts as a flavoring and coloring.

The significant content of beta carotene in the peel of mango yogurt offers a natural preservative system, since this was a useful life of 30 days.
REFERENCES


