

Miracle Fruit - Miracle Berry (*Synsepalum Dulcificum Daniell*)-Basic Aspects for Contextualization

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Abstract: Among the wide range of exotic fruits there are many belonging to the group of berries, as mentioned in specialized books due their attributes, they are fruits which give or provide to the human body a series of important nutritional benefits, like: providing a low-calorie intake, zero-cholesterol, and a lot of fiber per serving; supplying significant amounts of C vitamin and folic acid, several antioxidants, minerals and vitamins. For all these reasons and more, it is highly recommend their inclusion in the daily diet of humans. Miracle fruit or miracle berry (*Synsepalum dulcificum Daniell*), as cited in specialized studies revealed representative rates of vitamin C compared to other fruits and vegetables, those rates are almost as important as certain varieties of lemons, making from sweet berries as also called, fruits to study within the group of possible foods improving life quality in humans, besides their possible anti-cancer effect by having a great percent of important antioxidants; until now it is all speculation, because there is only one known significant attribute in this kind of berry: to change bitter or acid flavors in a more pleasant taste. Miraculin is the agent that has the effect of changing taste buds to give the feeling of sweet and acidic foods is caused by masking acid glycoprotein. Miracle fruit is a simple tree or a shrub native to Africa from two to five meters high and not so pleasant appearance, these particularities and its name, miracle fruit, makes this shrub practically unknown in the Colombian scientific and agricultural communities, nothing or not much is known about it and several of its attributes are known in our country, nowadays, due to studies from other countries. This fruit is included within the so-called promising fruits classification; their special characteristics described above achieves a special attention to fulfil an important role with a great assortment of possible applications in products development and its implications in the commercial context due to reduced field of industrial researches on this plant. Is here where product development can give a hand to the knowledge of what could be a diversification of raw materials in the world's only known the properties given by the glycoprotein, this is where you enter in fields where the investigative process is incipient so it is necessary to resort to exploratory methodology of how they could make the process of getting a product from purely industrial product development and as you will get a base or principle for an agro-industrial product based on a fruit little studied and known, which needs support from industry for research and development, so that the project in terms of the research presented is only in the planning of a possible scenario a fruit that has a large agribusiness potential.

Keywords: Sweetener, Promising, Product Development, Glycoprotein, Miraculin and Planning

1. Introduction

In the world there are many varieties of fruits with a lot of different combination of characteristics in their composition; making them more or less desirable ones, either by their degree of sweetness, acidity, degree of industrialization or in most of the cases their exotic origin provide sometimes an important mode of exploitation by their attributes.

Among the wide branch of exotic fruits there are many belonging to the group of berries, as mentioned in the

specialized books and studies these fruits give or provide an enormous number of important nutritional benefits and improve life and health quality in humans; within the so-called berries are well-known: raspberries, strawberries, blueberries cranberries, and blackberries, and many other today there are nearly 200 cultivated varieties of berries.

There are other less known representative species as the currant, calaface, and our study case: miracle berry or miraculous fruit. Latter berry is considered to have the characteristics that are representative of them as they are, refreshing taste, bright color, pleasant smell and others.

Berries provide a lot of soluble fiber per intakes, low calories natural supplements, non-cholesterol foods, significant amounts of C vitamin, folic acid and they are especially rich in antioxidants, minerals and other vitamins, making them a recommended option and a great step in disease preventions their inclusion in the daily diet of humans.

For all these reasons it is recommended to consume them regularly, aimed to reduce the risk of cardiovascular diseases, chronic and neurodegenerative diseases and some kind of cancers, particularly for its antioxidant, anticancer and anti-inflammatory power, these fruits also act as cell protectors. Studies from the Institute of Nutrition and Food Technology (INTA), highlights the potential of these fruits, which contain many micro and macronutrients. The researchers suggest that their benefits are mainly due to its high amount of polyphenols and phytochemicals.

Is known that some berries have special features and are more representative than others, i.e.: blueberries have already revealed to be important sources of antioxidants and C vitamin; raspberries supplying a very representative amount of soluble fiber to diet. There are also other berries not only providing features such as cited above but also components of major importance, very specific characteristics such as the miracle fruit or miracle berry (*Synsepalum dulcificum* Daniell) have been mentioned in specialized studies and in the International Journal of Electrochemical of Science in his article "Vitamin C Contents of Tropical Vegetables and Foods Determined by Voltammetry and Titrimetric Methods and Their Relevance to the Medicinal Uses of the Plants"¹ as cited in specialized studies revealed representative rates of vitamin C compared to other fruits and vegetables, those rates are almost as important as certain varieties of lemons, making from sweet berries as also called, fruits to study within the group of possible foods improving life quality in humans, besides their possible anti-cancer effect by having a great percent of important antioxidants; until now it is all speculation, because there is only one known significant attribute in this kind of berry: to change bitter or acid flavors in a more pleasant taste.

Even when it seems to be a temporary effect Dr. Inglett² in 1965 tested and isolated the agent producing this effect in mouth, it was called miraculin and in terms of Chemistry is regarded as a glycoprotein, which is currently only employment is with pills that promise to this effect and are mixed with other ingredients to add volume, so they are not totally reliable in its effects to mask the sour taste and sweet flavor.

2. Early

Miracle fruit is a simple tree or a shrub native to Africa

from two to five meters high and not so pleasant appearance, these particularities and its name, miracle fruit, makes this shrub practically unknown in the Colombian scientific and agricultural communities, nothing or not much is known about it and several of its attributes are known in our country, nowadays, due to studies from other countries, people of these locations consume its berries as a main ingredient in their daily intake to make food more palatable and digestible, foreigners who first knew this fruit cannot explain how this plant could have such effects on the taste buds.

In the eighteenth century French explorers recorded this plant and its fruits in their trips and is categorized within the family Sapotaceae, and whose main characteristic is having maxima efficient productions in acid soils and humid regions,³ which is conducive to the tropics, its blossoms depending on the normal environmental conditions occurs during August - December and the fruit production from October to April, rising fruits of 2-3 centimeters, among the several given names to this bush are well known: berry, miracle fruit miracle, miracle tree, magic fruit, magic berry, magic berry fruit, miracle fruit berry.⁴

In other hands bringing this plant to Colombian plains with a first and incipient industrial approach, where conditions seem to be favorable for propagation and cultivation, opens up a way in the country to increase the field of investigation and projects related to its properties and employs for humans, this research is still in early phases because at the moment there are no clear reasons why this shrub or berry has not been marketed, or if they already exist in other countries at Southeast of Asia or in West Africa, and it is important not only to take a deep view on its organoleptic attributes but also their rootedness, climatic and agronomic conditions.

3. Miracle Fruit - Promising Products

In commercial context, the potential of the miracle fruit due to its physical chemical characteristics is related to sweetener and medicine industry, this plant and fruits have been included in the category of promising products, it should be noted that in other countries there is already a progress in their consumption alternatives as pills to avoid bitter and sour flavors, but as far as is natural or effectively this type of product, is where the giving promissory tagline goes beyond its almost nonexistent character in terms of research as the few articles or reports about this fruit is limited to management as the main component miraculin acid and masking bitter tastes, but knowing and wisely manage this glycoprotein, as it is named, put it on par achieved over other natural sweeteners like stevia products is widely recognized. Therefore having alternative management and high production makes this type of fruit can get a handle

1 International Journal of Electrochemical of Science. January 31, 2010. Vitamin C Contents of Tropical Vegetables and Foods Determined by Voltammetric and Titrimetric Methods and Their Relevance to the Medicinal Uses of the Plants
2 Revista La Granja, edulcorantes naturales. November 20, 2010.

3 University of Connecticut. December 11, 2013. Retrieved on December 13, 2013 in: <http://florawww.eeb.uconn.edu/199900066.html>

4 MBerry. 2010. Retrieved October 10, 2013 in: <http://www.miracleberrypill.org/miracle-fruit/miracle-berry-fruit>

on alternative agro-industrial production in the field of natural sweeteners at high levels and is an important alternative for the consumer, which is what is looking with a promising product.

4. Product Development

By having a product with great potential to be developed in areas where the competition becomes strong, it is necessary to raise as goods development strategy which would be directed towards the introduction, in this case the miracle fruit because it is essentially a fruit that does not have much knowledge in structure and its potential uses as a sweetener, as only limited to use in pill that is not well defined, and as for the existing market, are the countries of Asia, and the United States as their main consumers in the most traditional way is known tablets, but if you let go of racing as a natural sweetener where their potential is fully open and it is clear that such benefits have their leaves, stems his own skin that covers or if your seed has not been studied.

Within the strategy proposed in output growth it is necessary to consider requirements in the development of new capabilities that could become important in the management of the miracle fruit, and in new markets the range of opportunities is in the possibility of achieving, as mentioned, products arriving to meet the demand for patients with some kind of disease related to sugar or patients extreme cases are advancing processes radio or chemo therapy par ale cancer and effects of these substances your taste it becomes astringent or bitter taste, this is where the development of new products from the miracle fruit come to meet this need naturally, also within product development are involved permanently research and development as a strategic leverage, as well as its policies and especially the analysis of segmentation or the group to which will be directed, should be developed in agribusiness products such tasks as it can reach knowledge of the process.

Accordingly raised the resort to the statement made by Eppinger and Ulrich⁵, in his book Design and product development, which some methodological parameters which must take the case of the miracle fruit is necessary are taken, showing that this type of processes that are clearly industrial products can bring fresh or as in the case of agro-industrial research, in such a way the authors above concepts are taken and with them a little analysis of the product is made in five phase to determine how serious this operation.

Phase 0 called planning in which there are a number of criteria and opportunities for market and market segmentation, in which as indicated above is stated that the niche is in people whose diabetes condition or the sugar can have on a potential miracle fruit in their food relief or as mentioned in the case of patients in treatment for cancer.

The book mentions Phase 1 development concept as a parameter in which the case the product may pose based on a customer's needs, leading users as in the above case and if

there are already two new parameters as are competing products or entering competition play a role within the circle in which they could handle the miracle fruit, also arises from and to create experimental to achieve the acceptance of investors or the target consumer persons prototypes.

Phase 2 is related has design level system as mentioned Eppinger and Ulrich, a stock option plan of product, i.e. not stay with just one basic product arises if not unlike the handle a number of Products falling under the line for diabetics and cancer patients and within it succeed to oxygenation many more choices for consumers, refining industrial product design to suit the needs given by the target consumer and finally handling components natural base for the product.

Phase 3 at this stage is a reference to detailed design in which develops marketing routing to raise awareness of the product and its qualities and in this case the miracle fruit can have a competitive and comparative advantage is in its structure the glycoprotein which makes a differentiator defining the product as such.

Phase 4 trials here and refinement where product promotion and acceptance in promoting general public comes to determine acceptance or possible changes if needed and reach a drivability on consumers begin.

Phase 5 finally starting production of the product based on the miracle fruit as its most important raw material and arrive in detail provide the end consumer product evaluation and satisfaction.

Thus managing product development may give this little fruit handled a very important role within the context of so-called functional products is nothing but products with a primary purpose within a range of generic and whose the name says a special function for a consumer in particular.

But it must be determined that the above is a generic process and as described in his book Eppinger and Ulrich, is a influenced by the market situation, this is where you resort to environment specialized products where the miracle fruit can be accommodated and their influence is given by the knowledge of the sweetener market in large synthetic measure where the market opportunity is given by the natural origin of the fruit, which is part toward a market influencing development decisions and is visible to the market requires natural products without contraindications such as the aspartame or sorbitol or medical restrictions which have in recent years stevia in amounts greater than 30 mg regimen per day is toxic.

As variants for product development is entered to a little more specific aspect of product development where the different variants and are located: product driven technology platform products, products of intensive process, personalized products, high risk products, rapid development and complex systems.

Among the variants mentioned in the case of miracle fruit products are conducive intensive process because strict restrictions on the product properties are set as necessary within the miracle fruit sweetener products would care about the aspects as stated above allergenic kind that could have

⁵Diseño y desarrollo de productos. Quinta edición. Mexico DF. 2013 pag. 14

implications in the same way as it is processed at this point mention would be made in similar products with the same composition but raw material is synthetic, which in the case of the development of a natural product such as preservation miraculin as its primary agent glycoprotein.

Similarly customized products are within those who are for a particular individual or a group of them as are people diagnosed as diabetic or radiation processes in the case of cancer patients. To be or to have a special and having to his credit a product which is suitable as a sweetener and masking acids, metal, is astringent flavors among others.

It could also give a product of high risk because it presupposes a risk as such the new, new being and in the marketing arena can have or not accepted in a public skeptical of the kind of benefits provided mainly as a natural sweetener and masking of astringent flavors and acids and combinations thereof, etc.

The road to a new product and easily spread to the miracle fruit is long gone a stage of product development phases and possible variables but mostly it is proposed that the first step to overcome is the face of existing products was raised miraculous fruit but are synthetic in most cases and the second is the search for new applications and products that provide natural alternatives to functional food needs.

5. Discussion

Learn and study in depth the miracle fruit is very prevalent to get to pay off in search of a natural sweetener that achieves meet the demands that the market needs for products with a lower level of harmful substances to health, but is also very important industry in their areas of research and development to reach new products from this plant, not just the fruit itself, but to conduct research in their stems, leaves, roots or because their own components in fruit, but very early research and more observations was to become established that this plant needs very long time to get to their first production, talking about 9-10 years and their growth is very slow, this is where you can start the investigative phase comes not arise in this research because you will, as previously explained, the stage of product development to determine their potential in the market and how they could behave in front of a particular consumer, but must also meet or inquire about their production, yet this scenario is all to do

with the miracle fruit and industry, who as has been repeated, in charge of taking the first step towards a rediscovery of this fruit.

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