



Unconventional food plants (PANCs) and their use in food: A review

Pedro Henrique Silva de Rossi ^{1*}, Juliana Audi Giannoni ²

^{1, 2} Department of Toxicology, Faculty of Food Technology of Marília, Marília, São Paulo, Brazil

* Corresponding Author: **Pedro Henrique Silva de Rossi**

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Abstract

Non-conventional food plants (PANCs) are edible parts of plants that can be easily found in urban and rural environments and that are not usually included in the diet. However, there is little or no use of these vegetables in the daily diet of the population. Therefore, the objective of this work was to demonstrate the great nutritional potential of these plants by establishing aspects related to their nutritional properties, antioxidants and use in food. This study is a bibliographic review. Scientific articles published in the last 5 years on the Scielo and Pubmed data platforms were used. The studies showed a great diversity of vegetables with excellent nutritional composition, rich in macronutrients and bioactive compounds that would increase and diversify the diet of the Brazilian population, but which are little or no used due to the lack of knowledge of their nutritional benefits and their employment in food production. As it was seen above, it is suggested that new research can be developed to allow the expansion of the population's knowledge about PANCs.

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1. Introduction

Currently, the so-called nutritional transition period is being experienced, with an increase in the intake of fatty, refined and high-sugar foods and a low consumption of fruits and vegetables, especially non-conventional ones. Non-conventional vegetables (taioaba, ora-pro-nobis, milkweed) are an alternative food and an option for cultural diversification, in agricultural activity, especially in family farming, for low-income rural and urban populations. However, the lack of information on the part of the population regarding its nutritional value and the method of preparation causes its consumption to be reduced (ALMEIDA; CORRÊA, 2012) ^[3].

Unconventional food plants (PANCs) are native vegetables, usually found on sidewalks, abandoned land and even in commercial monocultures and are considered by many to be weeds or weeds, as they are easy to cultivate and proliferate (BEZERRA; DE BRITO, 2020) ^[9].

The PANCs have great food potential, considering the importance of the species for the health and well-being of a population due to the nutritional offer such as vitamins, carbohydrates, proteins, fibers, antioxidants, minerals, among other contributions. PANCs can be added to the diet to improve nutrition and solve problems related to malnutrition in certain countries (SANTOS *et al.*, 2020).

Nutritional security, generate well-being and health, respect the culture, be accessible, value friendly cultivation, family farming and local and seasonal food, promote equity and fair trade, have a low environmental impact and respect biodiversity (LIMA *et al.*, 2020).

It was found that the use of non-conventional food plants, rich in nutrients and minerals, as a food supplementation strategy, is indicated as an alternative to minimize the situation of malnutrition and poor diet worldwide (DIAS *et al.*, 2018) ^[16].

PANCs can also generate opportunities in the field of food production with more balanced nutritional contents and without pesticides, inserting consumers themselves into the productive chain of cultivation of this type of crop. This would allow, in

general terms, not only the expansion of biodiversity on rural properties, but also the economic activity of rural populations.

Thus, one can point out as a possible long-term consequence of encouraging not only research on PANCs, but above all the cultivation and adoption of this type of food in the Brazilian population's dietary pattern, the promotion of a healthy and accessible diet for the population who suffer directly from the problems of malnutrition and obesity (PADILHA, 2021) ^[34].

The potential of PANCs in human food is addressed in almost all articles analyzed in this study. This is due to the guarantee of food supply and energy needs (caloric) of the population, in addition to having better nutritional value than the domesticated plants and vegetables used in the current diet (LIBERALESSO, 2019) ^[30]

Methods

Databases such as MEDLINE/Pubmed, Scielo, and Google Scholar were consulted.

Results and Discussion

However, in addition to sustainable management, cultivation, research and marketing of promising species, there is, of course, the need for competitive prices, product quality control and larger-scale production, thus meeting demands and markets. It is also understood that there is not only a need to publicize non-conventional species, but a whole set of actions that involve opening up the market for their insertion, as well as the wide cultivation and even the own value for money, because currently everything that is considered natural and that is good for the body is sold for a higher value than conventional products (BORGES, 2017) ^[11].

Plants of Food Interest

The acronym PANC designates plants that have at least one morphological part that is a source of food and that are not consumed routinely by the majority of the population of a region. The different species that fall into the PANC category are rich sources of macro and micronutrients, in addition to having bioactive compounds that may have important properties in disease prevention. In Brazil, the cultivation and consumption of unconventional vegetables has decreased in all regions of the country (rural and urban areas) and among all social classes. Some probable causes for this are globalization, which boosted the global offer of some products made with few plant species, and the growing use of industrialized foods, which has contributed to changes in the dietary pattern of Brazilians and losses of cultural characteristics and identity with the consumption of local and regional foods (GONÇALVES; LIMA; MORAES, 2021) ^[23]. The consumption of PANCs can be a strategy to maintain food diversification, stimulating forest maintenance. If carried out in a sustainable way, it can be considered a form of use with low impact in agriculture, associated with environmental conservation. PANCs are present in certain communities or regions, where they influence the diet of traditional populations, however, they started to have reduced economic and social expression, losing space for other products (BARREIRA *et al.*, 2015) ^[8].

Biodiversity depends on the availability of raw materials, whether from production (cultivation, management or extractivism), or from processing and the market, which needs to be recognized. Here in our region, this potential is

unknown, for cultural reasons, which lead us to consume exotic products, leaving aside many benefits that could be incorporated into the menu, if we knew how to identify and use, and, therefore, value its natural resources (REIS, 2017). Traditional communities deserve special attention because, with a lot of effort, they maintain traditions, mainly in the field of cultural manifestations, in soil management for planting and harvesting, in more sustainable agricultural practices, in living spaces. With this, they have contributed to the conservation of biodiversity and local/regional agrobiodiversity (SOUZA; JÚNIOR; BENEVIDES, 2019). PANCs can serve as food for people, however, in general, they are not or are rarely used for this purpose. Considering the current agricultural system, in which a very limited number of plants are available for sale, PANCs have the potential to diversify and improve food nutritional quality (LEAL *et al.*, 2015; SOARES, 2019) ^[28].

Unconventional food plants, normally, they were part of the eating habits of the ancients, grandparents and great-grandparents, being traditional at the time. However, with advances in genetic improvement, in addition to the modernization of agriculture and the rural exodus, its consumption was forgotten to be passed on to future generations. It is also noteworthy that there are common plants that have edible parts that, in turn, do not have the habit of consuming it (FUHR, 2016) ^[20].

Vacant lots and sidewalks. Thus, PANCs do not necessarily need to be cultivated, but maintained and managed according to soil conditions and interest in their maintenance and propagation (TERRA; VIERA, 2019).

This little food variety that becomes almost a restriction due to the lack of offer on the market, transformed what was widely used in cooking, a rare thing known as “weeds” and “weeds”, and which is today only found in small models of agriculture, considered family-owned, which are often restricted even to localities (REIS, 2018).

Therefore, due to the importance of these substances for human health and the interest in the use of these plants by the pharmaceutical and food industries, the objective of this work was to evaluate the influence of the harvest time on the bioproduction of phytochemicals and on the physicochemical characteristics of PANCs, as well, used as medicinal herbs, as well as performing an analysis of the profile of phytochemicals during this period an extra source of income. In this case, income generation does not only occur with the direct sale of products, but also in the savings that families make by reducing the purchase of food and medicine (PROENÇA *et al.*, 2018).

PANCs are excellent sources of nutrients, Vitamins and mineral salts also have characteristics that confer antioxidant, anti-inflammatory and therapeutic properties. The consumption of PANCs must respect the characteristics and ways of preparation of each plant, so that its benefits are acquired safely. Several PANCs are recognized for their use as medicinal plants, but not as food (JESUS *et al.*, 2020) ^[16]. Existing studies show that traditional populations, indigenous and non-indigenous, know and use a large number of plants in their daily lives unconventional foods existing in traditional communities. Cultivating and caring for plants is something that is learned very early in life and involves affection, those who get used to planting hardly ever leave this activity, even when they migrate to more urbanized areas (FERREIRA; MARQUES, 2019) ^[18].

Conclusion

Emphasizing the importance of these non-conventional food plants, for the aggregation of values as well as in food health education, essential aspects for the quality of life of the individual, providing important nutrients and bioactive compounds capable of preventing the occurrence of many diseases. non-transmissible chronic diseases, have great nutritional potential, being able to provide a source of important bioactive compounds, capable of contributing to healthy aging, thus promoting longevity with social quality. Stressing that healthy eating involves much more than choosing nutritionally adequate foods. It is related to the defense of the biodiversity of species, the recognition of cultural heritage, the historical value of food and the encouragement of typical regional cuisine, thus contributing to the rescue of traditions and the pleasure of food.

The PANCS, contribute to the use of previously unproductive areas, as they have different seasonal requirements, bring a greater supply of food throughout the year. By opting for more resistant species, this offer is less affected by excessive rainfall or heat or cold waves. Another important factor that its consumption is supported by a series of scientific research, which indicates not only the safety of its use, but its nutritional properties.

Many plants little used in Brazil are famous in other countries and regions. Everything is a question of culture and inserting these species of consolidated use in our food. Evidently, the PANCS, contribute in several aspects, in all stages of life, through the complementation of the basic cultures of the diets, the generation of income in regions with greater vulnerability, in addition to acting as a strategy to strengthen farmers to reduce climate and economic risks.

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