



Mini review

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Potential Bioactive Compounds of Unconventional Food Plants



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Abstract

Brazil is one of the most biodiverse countries in the world, and this abundant variety of life translates into more than 20% of the total number of species on Earth. There are over 3,000 potential food plant species still underexplored in Brazil, many of them being native species. Many plant species that were widely consumed in the past are no longer consumed and are considered ruderal, being known as unconventional food plants (UFPs). This work aims to compile recent information on the bioactive composition of unconventional food plants. Carotenoids are the bioactive compounds that most appear in publications involving unconventional food plants and fruits. Secondly, the ones that appear most are the phenolic compounds. Other bioactive compounds found in these types of studies are flavonoids and anthocyanin. Consumption of these plants and fruits can improve the country's food insecurity situation and can improve the human healthy.

Keywords: UFP, Brazilian biodiversity, Composition

Abbreviations: UFPs: Unconventional Food Plants

Introduction

In recent years, there has been a growing interest in the Brazilian native species. Unconventional, neglected and underutilized species have also been the subject of worldwide interest. In this sense, many plant species that were widely consumed in the past are no longer consumed and are considered ruderal, being known as unconventional food plants (UFPs). In the last decade, the consumption of these plants has increased. They grow spontaneously and free of chemical additives, and some studies have shown higher nutritional value, often more significant compared to other common food plants [1]. This group is formed by species that are consumed by areas, considerable efforts have been made to evaluate the potential of using these species against chronic diseases, and several studies revealed that they might be important source of bioactive substances [2]. Large segments of the Brazilian population still suffer from malnutrition and diet related illnesses. In contrast, many native fruits have biodiversity and are underexploited sources of bioactive compounds and unknown to consumers [3]. Native species may represent alternatives to human nutrition and insertion of new food sources in markets, since Brazilians eat less than half of the daily nutrient recommendations, and this consumption is lower among low-income families. It is stressed that the consumption of these species may represent a new dietary option, mainly related to healthy eating. Although many native foods are part of the Brazilian diet, there is still limited information on their nutritional

composition. However, the inclusion of information on nutritional composition becomes important to evaluate the supply of these food sources and to verify the possibility of nutritional adequacy of these foods in the diet [4].

Fruit and vegetable consumption have become increasingly important due to its potential beneficial health effects related to its nutritional composition [5], such as the presence of vitamins, phenolic, anthocyanins, flavonoids, tannins, among others. Most of these compounds have the ability to prevent cancer, cardiovascular disease, diabetes, neurodegenerative diseases and osteoporosis [6]. Several plants from different Brazilian biomes are rich in bioactive compounds such as carotenoids and phenolic compounds [3]. Therefore, the evaluation of potential sources that could be used for this purpose and the study of new green extraction technologies are of great importance [7-8]. Many researchers have also reported nutritional composition of various types of wild edible plants being used in the developing countries. All of them emphasize that analyzing locally available plants for various nutrients would enable identification of unconventional food resources [9]. These new foods are envisaged to constitute a valuable source of bioactive healthy nutrients and non-nutrients that would contribute to delaying the onset of a number of chronic and disabling diseases as well as reducing their incidence and severity. In this sense, consumers are demanding a diversified range of foods that provide health benefits and contribute to

well-being. For the consecution of this objective, a wide range of plants, crops, and foods have been studied and characterized throughout the recent decades regarding their potential to exert effects on health, according to their nutritional content and bioactive phytochemical composition [10]. In this context, studies on the evaluation of bioactive compounds, especially unconventional fruits and vegetables, may provide important data on their use as food or medicine. In addition, assessing nutrient

content and bioactive compounds from unconventional crops may be an alternative to enhancing them by providing insight into the discovery of significant or high levels of specific nutrients or bioactive compounds that may improve market demand [11]. Table 1 summarizes the results found in the literature regarding the concentrations of bioactive compounds present in each vegetable.

Table 1: Main bioactive compounds found in unconventional food plants and fruits.

Scientific Name	Common Name	Bioactive Compound	Quantification	References
<i>Campomanesia coubaril</i>	Cambuci	Carotenoids	81.69 mg.100g ⁻¹	3
<i>Dovyalis abyssinica</i>	Dovialis	Carotenoids	65.4 μ.100 g ⁻¹	12
<i>Elaeocarpus serratus</i>	Ceylon Olive	Flavonoids Carotenoids	120.49 mg QE.100 g ⁻¹ CE.100g-1 4.97 mg.100 g ⁻¹	13
<i>Emilia fosbergii</i>	Algodão-de-preá	Phenolic compounds	223.42 mg g ⁻¹	1
<i>Emilia sonchifolia</i>	Serralhinha	Phenolic compounds	89.57 mg g ⁻¹	1
<i>Erechtites valerianifolia</i>	Capiçova	Carotenoids Carotenoids Phenolic compounds	4.8 mg 100 ⁻¹ 4.99 mg 100 ⁻¹ 4.65 mg AGE.g ⁻¹	4 14
<i>Eugenia dysenterica</i>	Cagaita	Carotenoids	269.96 mg.100g ⁻¹	3
<i>Hancornia speciosa</i>	Mangaba	Carotenoids	160.11 mg.100g ⁻¹	3
<i>Hypochaeris chillensis</i>	Chicória-do-campo	Phenolic compounds	202.26 mg g ⁻¹	1
<i>Jaracatia spinosa</i>	Jaracatiá	Carotenoids	104.8 μ.100 g ⁻¹	12
<i>Odontocarya acuparata</i>	Capeba	Carotenoids	1290.0 μ.100 g ⁻¹	12
<i>Pereskia aculeata Mill.</i>	Ora-pro-nobis	Carotenoids Phenolic compounds	3.33 mg.100g ⁻¹ 7.86 mg AGE.g ⁻¹	14
<i>Rumex obtusifolius</i>	Língua de vaca	Phenolic Compounds Flavonoids	387.25 mg (GAE) 100 g ⁻¹ 403.78mg (GAE) 100 g ⁻¹	15
<i>Sinapis arvensis L.</i>	Wild mustard	Carotenoids Phenolic compounds	5.15 mg.100g ⁻¹ 13.2 mg AGE.g ⁻¹	14
<i>Sonchus arvensis L</i>	Serralha	Carotenoids Phenolic compounds	5.39 mg.100g ⁻¹ 3.60 mg. AGE.g ⁻¹	14
<i>Spondias dulcis</i>	Cajá manga	Carotenoids Flavonoids Anthocyanin	227.87 μ.100 g ⁻¹ 1.95 mg. 100 g ⁻¹ 0.43 mg. 100 g ⁻¹	16
<i>Spondias tuberosa Arruda Câmara</i>	Umbu	Carotenoids Phenolic compounds	4632 μg.100 g ⁻¹ 9.0 mg. 100 g ⁻¹	17
<i>Xanthosoma sagittifolium</i>	Taboia	Carotenoids Phenolic compounds	83.19 mg.100g ⁻¹ 54,44 mg EAG g ⁻¹	18 19

Carotenoids are the bioactive compounds that most appear in publications involving unconventional food plants and fruits. Secondly, the ones that appear most are the phenolic compounds (Table 1). Other bioactive compounds found in these types of studies are flavonoids and anthocyanin. All of these bioactive compounds have antioxidant activity and have been studied in the treatment of diseases such as cancer, Parkinson's disease and Alzheimer. Furthermore, some carotenoids still have pro-vitamin A activity, which acting on vision and improve the immune system [17,19,20]. The nutritional value demonstrated by this vegetable, associated with its availability in the wild environment and its acceptance as a food resource, indicates that these species can supply the daily recommendations of nutrients and contribute

to reduce the nutritional deficiency of the population living in regions of occurrence this species. However, more studies should be done on variations in nutrient contents under different environmental conditions in these species [4]. Natural resources remain important sources of bioactive substances, with great therapeutic potential, not only because of the vast number of plant species with untapped medicinal properties, but mainly because of the variety of primary and secondary metabolites which are synthesized by those plant species [20].

Conclusion

One must know the composition of the bioactive compounds present in the natural resources from this country. On the analyzed

studies, the most commonly occurring bioactive compounds were carotenoids. They have antioxidant activity and some are pro-vitamin A. Furthermore, other bioactive compounds also are also present in these unconventional food plants and fruits, such as flavonoids and anthocyanin. Few studies detail the composition of these fruits and vegetables. Consumption of these plants and fruits can improve the country's food insecurity situation and can improve the human healthy.

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