

**AIPIM PRODUCTION  
IN PEATY SOILS OF  
ITAJAÍ: A POTENTIAL  
GEOGRAPHIC  
INDICATION MANIHOT  
PRODUCTION IN PEAT  
SOIL IN ITAJAÍ CITY.:  
A GI POTENTIAL**

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**Abstract:** Itajaí is a municipality located in the State of Santa Catarina, Brazil. Among 18 rural communities, there are three communities that grow cassava on peaty soils producing cassava for table. Farmers produce yellow-fleshed varieties, which are harvested early. They have different names such as Amarelo da Rama Alta, Manteiguinha and Catarina. The soil in which it is grown gives it special characteristics of flavor and low fiber content and, consequently, good acceptance by the consumer market. However, the pressure for the urbanization of the municipality and the low prices practiced in the market can threaten the continuity of the production. However, producers remain organized in a cooperative and rely on the support of public bodies such as the City Hall, through mechanized agricultural patrol and technical assistance, research, State rural extension and public policies implemented, such as subsidized rural credit. In addition, farmers clearly show their willingness to register their GI with the INPI and establish themselves with a differentiated product, thus promoting rural development, preserving the culture and valuing their product.

**Keywords:** Aipim, peat soil, Itajaí, IG.

## INTRODUCTION

Brazil presents a diversity in terms of food and agricultural products linked to its colonization, which incorporated the know-how of the populations, and adapted to the local environmental characteristics.

Among these products, table manioc (*Manihot esculenta* Krantz) stands out, so called, because it has a low content of HCN (hydrocyanic acid) and becomes suitable for consumption after simple cooking. It thus receives the popular name of aipim. In Itajai the production of cassava on peat is carried out in 3 communities. In these three communities, cassava is produced on peaty

soils. In Itajaí, 100 hectares are cultivated by 33 families of family farmers (EPAGRI, 2013) as can be seen in FIG 1. The farmers are of Portuguese, German and Japanese descent. Cassava from peaty soils in Itajaí is harvested early, six months after planting. As for the quality of the roots, it has few fibers, with good evaluation and acceptance by consumers, who look for cassava with traces of black soil (peat) adhered to the roots.

In the Americas, this plant has been cultivated in the region since pre-Columbian times, presenting distinct qualities linked to the region's soil and the local knowledge (savoir-faire) of the producers. Thirty-three families of family farmers produce these roots in Itajaí, SC, which undergoes a partial industrialization process, being peeled and then frozen, as it is highly perishable. Most of these producers are organized through a cooperative that sells the production to the regional commerce and supplies the product in the school lunch of Itajaí. The rural area of the Itajaí region, in the last 20 years, has been suffering strong pressure from urbanization because in the city there is a large commercial port, attracting industries, traders and immigrants. And this is a factor to strongly alter the local landscape. In Brazil, the Geographical Indication (G.I.) is a very new topic and still little known by producers and decision makers. They are based on the integration between producers, product and actors' governance. It can be divided into two aspects: Indication of Origin (IP), Denomination of Origin (DO). IP is the identification of a product or service as originating from a certain location, region or country. The reputation, characteristic and quality of this product are linked to its geographical origin, which can be legally protected against copying (INPI 2020).

## METHODOLOGY

In the study of value chains, secondary data as well as semi-structured forms are good sources of information. Thus, information was collected from the cooperative of local producers, their social organizations, literature review and interviews with producers.

Preliminary meetings were also held with groups of cassava producers, as well as with authorities and technicians who are directly linked to the daily lives of family producers in Itajaí.

## AREA CHARACTERIZATION

The municipality of Itajaí is located on the northern coast of Santa Catarina, a state in southern Brazil, where the mouth of the Itajaí River is located (Figure 1), an important river in the region, formed by the confluence of several rivers, such as the Caeté, Itajaí do Sul, Itajaí do Oeste, Itajaí Açú, Itajaí Mirim, among others. The region's climate is subtropical (Cfa, according to the Koppen classification), with hot summers (temperatures above 22°C) and more than 30 mm of rain in the driest month. It is contained in the Serra do Mar eco region, which has mountain ranges that determine the soil and climate characteristics of the region. The influence of the coastal coast, the Serra do Mar and the climate allows us to observe soils with a high degree of weathering (Nitosols), poorly evolved (Cambisols), without defined horizons (Quartzarenic Neosols, Litholic Neosols and Fluvic Neosols). As the climate of the region favors the oxidation of organic matter, organic soils are found almost exclusively in the vicinity of rivers, where organic matter is formed by the accumulation of sediments from Serra do Mar and is preserved by the anoxic conditions provided by the water dynamics of rivers. Among the organic soils found in the region, peat stands out (peat soil). It is a soil whose organic matter results

from the accumulation and preservation over thousands of years. Its chemical structure presents a high degree of polymerization, which confers important structural stability. Organic matter plays a key chemical role in this soil, for example: bioavailability of nutrients, toxic and potentially toxic elements, CTC, buffering power, among others, which directly and indirectly influence the organoleptic and nutritional characteristics of cassava.

## DISCUSSION

The navigability of the Itajaí River allowed the operation, started in the middle of the last century, of what is now one of the main port complexes in southern Brazil, composed of the Ports of Itajaí (south bank) and Navegantes (north bank). Thus, the main economic activities of the municipality are related to foreign trade and industry. These characteristics impose strong pressure on the rural areas of the municipality, especially with regard to real estate speculation. However, with the organization of the farmers and the support of the public power, important productions of table manioc are found in the peat soils. This production prevails in three distinct areas, where peaty soil is found, in the communities of Espinheiros (26°53'01.86" S, 48°44'31.93" W), São Roque (26°55'20.47" S, 48°45'24.70" W) and Rio New (26°55'16.40" S, 48°42'55.73" W). (FIG 1). In the communities of São Roque and Espinheiros, cassava cultivation was already present in the 1960s. In Rio Novo, production began after 1975, a few years after the rectified channel of the Itajaí Mirim River was excavated. This area was flooded, composed of peaty soils, and it took a few years to become suitable for the cultivation of cassava and other plants. of the city.

Table manioc is grown by smallholders in more than 100 tropical and subtropical countries, as well as in Itajaí. In a survey



FIGURE 1 - Location of Santa Catarina and Itajaí in Brazil and cassava production area.

carried out by Epagri in 2013, it was found that out of 40 properties of olericulturists existing in Itajaí, 32 cultivated cassava, mainly in peat soils and with family labor. It is a species adapted to acidic soils. They grow well under pH less than or equal to 5.5. As this is the pH range with the highest bioavailability of heavy metals (both micronutrients (Cu, Zn, Fe, Mn, etc.) absorb and accumulate these elements. However, as the organic matter of peat soils is quite stable and coordinates the dynamics of metallic elements, the cassava produced in Itajaí, in peat soils, is, hypothetically, less susceptible to the accumulation of heavy metals. Nutritional characteristic that can differentiate it from the cassava produced in other regions, especially in weathered soils. In clayey and compacted soils, cassava roots have limited growth with low accumulation of starch in the roots (KAEWKAMTHONG et al., 2014). On the other hand, organic soils, according to ANDRIESSE (1988), are defined as being formed by partially carbonized plant tissue, under humid conditions, by the decomposition of various plants and mosses. They are soils that have peculiar physical and chemical characteristics, composed of a large amount of macropores, storing large amounts of water and their density is 4 to 5 times lower than a mineral soil (BOELTER, 1965). The organic matter of this soil can increase

the availability of phosphorus, since it can promote chemical reactions antagonistic to its fixation to soil minerals. It also increases plant tolerance to water stress and pest occurrence. These characteristics allow reasonable yields (on average 16 t/ha) with little use of inputs, obtaining very nutritionally rich roots. With an abundance of carbohydrates, which make them an important source of energy in the diet, they are consumed fresh, cooked or through processed products or can be fed to animals. With the awareness of new generations looking for healthier foods, this root with a low glycemic index, has been falling in favor of consumers. According to FAO, the world importance of cassava has suffered drastic prospects, with a harvest reaching more than 280 million tons in 2012, that is, an increase of 60 percent since the year 2000.

Also, according to FAO, (2013) productivity increased by around 1.8 percent per year, rising to 12.8 tons per hectare, reaching 23 tons per hectare.

Farmers in Itajaí, with the objective of organization, created a cooperative, called "Cooperar", which provides school lunches for students in Itajaí, in addition to selling in other neighboring municipalities, supplying vegetables, including frozen cassava. The Food Acquisition Program (PAA) and the National School Food Program (PNAE) are directly

linked to the commercialization of this cooperative. There are consumers from other regions of the country who buy and stock the product for its flavor and quality. The cassava, in some cases is minimally processed, that is, it is first washed manually or in some cases by machine (FIG 2). This washing removes the film that surrounds the root, followed shortly after for peeling.

Peeling on almost 100% of properties is done manually, employing several people, as it is a time-consuming and painstaking process. A few years ago, a prototype of a peeling machine was developed, which is still being tested, but after the necessary adjustments, it will greatly facilitate the lives of farmers in Itajaí. (FIG 3).

After washing and peeling, the cassava is frozen and packaged and remains stored in cold rooms. Itajaí farmers have an advantage in terms of the proximity of the rural area to the urban area, so marketing is very easy. It is common for producers to receive people from the city who buy their production directly. Consumers from other regions also go there to buy the product. Several intermediaries also visit the producers daily to buy cassava and resell them in their small shops. Farmers benefit from the National Family Agriculture Program, acquiring light utilities, through the elaboration of investment projects prepared by the SC Rural Research and Extension Company (EPAGRI). These vehicles are used daily in the delivery of production to small markets in Itajaí, Balneário Camboriú, Navegantes, Piçarras, which are located very close by. Peat soils also present their intrinsic problems, that is, they need constant maintenance of their drainage channels, which are frequently silted up.

For this service, they have a mechanized patrol maintained by the municipal government, which provides backhoe loaders that work at subsidized prices.

## ABOUT IG AND SIGNS

In Brazil, the GI legislation dates back to 1996 through the Industrial Property Law 9,279 of May 14, 1996 – LPI/96.

In Santa Catarina, due to its diversity of colonizers combined with different indigenous peoples and environmental characteristics, it has a large number of products linked to these factors. Seeking to encourage and preserve its local products, in the early 2000s the state of Santa Catarina already expressed its concern to create legislation on Signs of Identity and Quality through Law 12117 of January 7, 2002, regulated by Decree 4323 of March 25 2002. (DOE, 2002). In Brazil, the INPI (National Industrial Property Institute), a Brazilian body responsible for granting and managing GI titles. In Brazilian legislation IG is divided into IP and DO. Indication of origin (IP) is considered in the geographical name of a country, city, region or locality of its territory, which has become known as a center of extraction, production or manufacture of a certain product or provision of a certain service. Denomination of Origin (D.O.) details production more in items such as quality, flavor, and is also linked to the land, people and history of the region. When a product transitions to a D.O., the rules and controls become much more specific such as the maximum quantities that can be harvested and the process of making the product. Not every product with the IP seal evolves into D.O. of the region. (INPI 2020). Several authors among them VANDECANDELARE et al, (2010), Valente et al (2012) , emphasize the need to preserve the culture, the know-how of the community. In INPI IN 95/2018, there is no reference to this concept of culture, knowing how to do it. Only the term notoriety appears. Within an IP, nothing prevents modernizing production, mechanizing a traditional process, replacing men with machines. On the other hand, the



FIGURE 02: Machine used to wash and remove the outer skin of the cassava root, acquired by Cooperar, a cooperative of farmers in Itajaí.

Photo by Antonio H. Dos Santos, personal archive.



FIGURE 03: Cassava peeling machine.

communities of Itajaí, perhaps due to the tenuous and temporary isolation caused by the BR 101, p and the rectification of the Itajaí Mirim River, through the action of the entities that interact there, developed a strong feeling of culture represented by their agricultural products with the table Aipim produced in the community turf. This adds, together with notoriety, a new factor to an eventual GI, due to its aspect of strengthening its community spirit and promoting development.

## **POSSIBILITIES AND PERSPECTIVE**

A geographical indication is a sign used on products that have a specific geographical origin and have qualities, notoriety or character essentially due to that place of origin. Most of the time, a geographical indication contains the name of the place of origin of the products. Agricultural products often have qualities that derive from their place of production and are influenced by specific local geographic factors such as climate and soil. Recognition of a sign as a geographical indication is a matter of farmers' rights and can be used for natural, agricultural or manufactured products. (WIPO, 2019). It is worth remembering that the notion of geographical indication emerged gradually, when producers and consumers began to perceive the peculiar flavors or qualities of some products that came from certain places. These qualities were typical, differentiated, not found in equivalent products produced elsewhere. Thus, it began to name the products, which had this notoriety, with the geographical name of their origin (CERDAN, 2009). The management of the GI, as well as at the request of the authorities, is carried out by rural producers, increasing their participation in the organization and management of protection, with the maintenance of defined quality standards.

The creation and recognition of a Geographical Indication is based on the local actors, the territory and the product, with the governance of the system being an important factor. This sum allows the development of products that generate a value creation process, resulting in the development of the region (FAO & SINERGI, 2010). According to CERDAN (op cit) current times are propitious for approaching two pertinent themes: sustainable development and product qualification. Thus, Projects already developed for the purpose of recording Geographical Indications have shown that, combined with research and studies already carried out, it is necessary to mobilize and organize territorial actors, for the empowerment of the population from its history and to protect it as intellectual and cultural property.

In addition, the definition of technical and production regulations, the construction of inter-institutional partnerships, the socio-economic, productive and environmental characterization, among others, are essential steps and procedures for the feasibility of a project for a Geographical Indication, as is the present case, from the Peat Soils Region for the production of cassava. The works for the realization of a Geographical Indication of Production of Aipim de Itajaí due to the organization of the producers, support from the government, the desire of the producers to preserve their culture and have the potential in:

- make the producer have greater participation in the value chain and in the processes of the production chain, as well as having control;
- value a product associated with sustainability;
- value a product associated with the history and culture of the territory;
- have a marketing tool for the cassava production chain

of peat and for the territory;

- have an instrument to enhance the territory and its products;
- develop and innovate the production chain;
- provide the improvement of product quality;
- create a competitive edge for the production chain and for the territory in consumer markets;
- organize and strengthen the production chain;
- Collaborate to preserve the countryside against increasing urbanization;
- bring technical and scientific support to the production chain;
- mobilize the production chain for adaptation actions to the new scenarios of consumer demands and demands;
- mobilize territorial actors for the maintenance and expansion of production and preservation of cassava production in the peatlands of Itajai and strengthening its identity.

## FINAL CONSIDERATIONS

In a globalized world, agri-food systems are moving towards the standardization and oligopolization of markets (BENKO & PECQUER, 2001). As a result of this modernization, several deleterious effects emerged, such as: reduction in the number of rural producers, abandonment of regional food production and economic pressure on family farming. by small farmers, is to promote their regional products and protect them through Geographical Indications. The potential recognition of a GI of cassava produced on peat soils in Itajaí presents possibilities for valuing the know-how of producers, adding value to the product and increasing the value chain. In addition, the culture would be preserved, the product with its own characteristics, and the pressure of urbanization in the area would be avoided and, consequently, would provide better income to family farmers.

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