The Traditional Knowledge of Quilombola About Plants: Does urbanization matter?

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Research

Abstract

Quilombolas, or Maroons, are traditional groups of people of African-Brazilian descent, who self-identify as such, with their own historical background, which includes black ancestors and an identity related to the historical resistance to oppression. Studying three Quilombola communities as a case study, we aim to investigate their current relationship with plant resources. These communities exist in different types of environments, both rural and urban (Fortunato has rural characteristics, Aldeia is enclosed in a growing urban area, and Santa Cruz has intermediate characteristics). After obtaining prior informed consent, we interviewed 184 inhabitants of these communities, using free-lists of plants that the participants know and use. We collected additional data during participatory workshops. We registered 322 plants that were known and used. Of these plants, 48% were cultivated, 25% extracted, and 27% bought in local markets. The main uses of the listed plants were for medicine (31%) and food (28%), but the most citations were for food plants, showing that, individually, the people listed more food plants than plants for other uses. Quilombolas, from the three communities studied, maintain similar ethnobotanical repertoires, relying on several introduced plants. However, we were still able to register less frequent knowledge about native plant resources. When separated by plant uses, the results showed that more plants were known in the most urbanized area, with no clear gradient toward the rural area. The understanding of this new context of ethnobotanical knowledge, in communities that face transformations due to urbanization, can be deepened in further studies, including investigations into the role of managed environments, such as home gardens, as well as investigations into the cultural and ecological significance of plants and deeper analyses of medicinal plants and medicinal practices within these communities.

Introduction

Over the past 30 years, the visibility of issues concerning ethnic rights has grown worldwide. In Brazil, this growth is contributing to different traditional people giving new meanings to their own identity, as is the case with the Maroons, or Quilombolas (Marques & Gomes 2013). Quilombolas are traditional groups of African-Brazilian descent, defined by self-assignment, who have their own historical background, with black ancestry that is tied to the historical resistance to oppression and who are endowed with specific territorial relations (Brasil 2003). In Brazil, African labor was used, through slavery, from the colonial period in the 16th century until the end of 19th century. During the Brazilian colonial period, Quilombola communities were organized to resist the oppression of slavery, yet, even after the abolition of slavery and through the 20th century, several Afro-descendant groups remained relatively isolated, especially in rural areas.

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With the increasing attention to traditional groups, such as the Quilombolas, there is a growing interest in investigating aspects of their livelihoods, looking at groups that are in urban areas, as well as groups that are in areas of greater isolation, in rural locations. For example, local ecological and ethnobotanical knowledge of the Quilombolas has been investigated, both in areas of the rainforest and in other regions of Brazil, including the study of medicinal plants (Barboza da Silva *et al.* 2012, Franco & Barros 2006, Gomes & Bandeira 2012) and ethnopharmacology (Rodrigues 2007, Rodrigues & Carlini 2004). Other topics that have been investigated in the tropical Atlantic rainforest include the use of forest areas for slash-and-burn farming (Adams *et al.* 2013, Prado *et al.* 2014), the traditional practices associated with local production (Adams *et al.* 2013, Vizolli *et al.* 2012), the use and knowledge of plants (Crepaldi & Peixoto 2009), and the management of economically important species, such as the **juçara** palm (*Euterpe edulis* Mart.) (Barroso *et al.* 2010). For the subtropical Atlantic rainforest, Cruz & Hanazaki (2008) analyzed the use and knowledge of plants in a Quilombola community in Santa Catarina. These studies highlight the importance of plant resources, both cultivated and extracted, both native and introduced, for different Quilombola groups, and the importance of traditional practices for their livelihoods.

Rural-urban mobility of these groups has also been investigated, including studies conducted in the Amazon region (Nasuti *et al.* 2013). Descendants of traditional people, while living in urban areas, can still sustain part of their traditional knowledge, maintaining the adaptation of their cultural traits, even amidst the typical heterogeneity of these urban areas. However, because part of this traditional knowledge is no longer essential to their survival, it is believed that it may be lost before being recorded (Gandolfo & Hanazaki 2011).

Urbanization has increased significantly in developing countries (UN-Habitat 2013), and such transformations have resulted in many rural areas being encroached upon, leading to a new category of rural-urban areas (Baptista *et al*. 2013). This may result in the loss of areas of high biodiversity and, consequently, of the knowledge related to it because the activities that are directly related to, and dependent on, the use of natural resources are abandoned due to movement towards the economic activities associated with urban environments. However, the dynamism of the knowledge that is related to plant resources needs to be acknowledged. For example, in an urban area of Rio Branco (Brazilian Amazon), Wayland & Walker (2014) showed that while plant medicines are widely used and recognized as being better than industrialized drugs, no differences were identified between the knowledge that younger and older people had concerning plants, yet, older people use more medicinal plants than younger people. Thus, plant knowledge persists in these heterogeneous and dynamic environments that are marked by rural-urban gradients.

We start from the premise that even under varying degrees of urbanization, plant resources are important to the Quilombola groups. We aim to investigate the current relationship between Quilombolas and plant resources in three communities with differing rural and urban environments in southern Brazil. These different degrees of urbanization did not result from migration, rather than from the increasing in some urban areas engulfing rural communities, while other communities kept their rural features. We expect to find that more plants are known in less urbanized areas where farming practices are more present. We also expect to gain a better understanding of how plant knowledge is being adapted in more urbanized contexts.

Study site

The three Quilombola communities discussed here are located in the Santa Catarina State in the municipalities of Garopaba (Aldeia and Fortunato) and Paulo Lopes (Santa Cruz). Garopaba municipality has approximately 18,000 inhabitants, and Paulo Lopes has approximately 7000 (IBGE 2010). Both of these municipalities are located within the domain of the Atlantic rainforest. Forest cover varies, from dense rainforest to **restinga** (sand dune vegetation). Climate is classified as Cfa (mesothermal subtropical humid with hot summer), with the total annual precipitation ranging from 1500 to 1900 mm, and average annual temperatures ranging from 15°C to 27°C (Pandolfo *et al.* 2002).

Until the1960s, the livelihood of most people in the region was based on small-scale farming for family consumption and on artisanal fishing in locations near the coast. The opening of a main road connecting the capitals in the 1970s, and the ensuing growth of tourism and industry in the region, strongly contributed to changes in traditional livelihoods. The families from the studied communities are living in the same area for several generations, and some of these areas are suffering with real estate speculation and regional industrial growth.

The Fortunato community was recognized as a Quilombola territory in December 2006 (Fundação Cultural Palmares 2014). It has approximately 32 households and 128 people. The community is located on a hill, approximately 7 km away from Garopaba city, and is surrounded by native vegetation. In the last few decades, the Fortunato inhabitants were strongly dependent on subsistence farming for the production of sugarcane (for sugar, rum, and molasses), beans, maize, peanuts, and manioc (for flour). They also produced soap and raised livestock (cattle and chicken). While these practices have declined, some families continue farming sugarcane and raising cattle.

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Santa Cruz, also called Toca, was recognized as a Quilombola community in March 2007 (Fundação Cultural Palmares 2014). It comprises 128 inhabitants, living in 24 households, along an unpaved road with an approximate length of 1 km in a peripheral neighborhood not far from Paulo Lopes city, and can be considered to be in an intermediate degree of urbanization when compared with the other two studied communities.

Aldeia was recognized as a Quilombola territory in December 2010 (Fundação Cultural Palmares 2014). This community is within the urban zone of Garopaba, with approximately 40 households and 215 people. The road to the center of Garopaba passes through the middle of the community. Carvalho (2011) considers Aldeia as a contemporary Quilombo, where the experiences of the inhabitants are based on collectivity and in the sharing among its members, who are from the same family.

The three communities are not far from each other: approximately 20 km separates Aldeia and Santa Cruz, and Aldeia and Fortunato. The distance between Fortunato and Santa Cruz is approximately 16.5 km. Although the three communities were recognized as Quilombola territories, they are still dependent on the official delimitation of their territories.

Methods

We interviewed all adult inhabitants (over the age of 18 years) from each community who agreed to participate in this study, both men and women. Interviews were based on a semi-structured protocol (questionnaire) that included a free-list of plants known and used and the purposes of their use. We collected samples of the plants that were mentioned by the participants for identification purposes, and photographic registers were used for plants that were not collected. Collected samples were processed following the standards for ethnobotany (Cunningham 2001) and were identified by using relevant resources (Lorenzi 2013, Lorenzi & Matos 2012) and checked by consulting with specialists. Voucher specimens were deposited in the FLOR herbarium (Federal University of Santa Catarina) or were registered in the collection of the Laboratory of Human Ecology and Ethnobotany (Federal University of Santa Catarina). Data collection in the field lasted for approximately 70 days.

We used participatory workshops to build timelines and historic graphs (De Boef & Thijssen 2007) and to collect additional qualitative information about the history of the communities. These workshops occurred in each community, with the voluntary presence of 17 adults in Aldeia, 12 in Fortunato, and 14 in Santa Cruz.

We compared the frequency of citations of local names for plants among the communities. After testing for normality, averages of plant citations per interview in each community were compared through Kruskall-Wallis test. The number of plants that were cultivated, extracted, and purchased in each community and the number of plants categorized according to their main uses were compared with chi-squared test. All tests used α = 5%.

This research adheres to the guidelines of the Ethics Committee for Research with Human Beings of Federal University of Santa Catarina (authorization 18847013.0.0000.0121, 14 August 2013) and was authorized to access traditional knowledge by IPHAN (Brazilian Institute for the Historic and Artistic Heritage) in March 2014 (process 01450.012607/2013-20). All research participants signed prior informed consent terms.

Results

The people and the communities

We interviewed 184 people (63 in Fortunato, 56 in Santa Cruz, and 65 in Aldeia), predominantly women (Table 1). The average age of the interviewees was 45.66 years in Fortunato (SD = 17.34), 39.56 years in Santa Cruz (SD = 16.16), and 46.83 years in Aldeia (SD = 17.67). Most interviewees had studied up to elementary school, yet some of them did not finish school. The predominant economic activities in these communities are related to jobs in urban areas. Most of the interviewees are catholic, but in Santa Cruz a small percentage adopt a religion of African influence.

We observed some similarities between the historic developments of these communities. Until the 1970s, the main economic activities in these communities were related to agriculture for subsistence, with local families planting manioc, maize, beans, peanuts, and sugarcane. At Fortunato, coffee and bananas were produced for commercial use. In each of the three communities, there were mills to produce manioc flour, and in Fortunato there was an additional mill to process sugarcane. Aldeia had three mills for producing manioc flour. Currently, Aldeia is the only community of the three studied that has a remaining mill, but that mill is not active. Principal changes in the local livelihoods in these communities started with the arrival of electricity in the 1970s and the increased access to appliances. During this period, the roads were improved, and access to the cities got better. In Aldeia and Santa Cruz, younger people started to look for work in the growing urban areas. People from Fortunato started to search for urban jobs in the 1990s, when the local production of goods decreased.

The Quilombolas have noticed the reduction of farming areas in these communities, and in Aldeia this reduction is related to the growth of urban areas. The Quilombolas also share the general perception that, in the past, more

Table 1. Socioeconomic characteristics of the 184 interviewees in the Quilombola communities of Fortunato (n = 63), Santa Cruz (n = 56), and Aldeia (n = 65), Santa Catarina, Brazil. Data are given in percentages. *Completed or incomplete.

		Fortunato	Santa Cruz	Aldeia
Sex	Men	46	41	43
	Women	54	59	57
Age	18–41 years	38	63	42
	42–65 years	46	29	36
	66–89 years	16	9	19
Schooling	Illiterate	14	9	3
	Elementary school*	68	79	51
	High school*	14	9	34
	University*	2	4	13
Sources of income	Farming, fishing, livestock	16	2	6
	Jobs in the city	48	50	66
	Pensions, retirements, scholarships, governmental aid	25	21	25
	No income	16	25	3
Religion	Catholic	63	70	69
	Evangelic	13	14	27
	Umbandist	0	11	0
	Other	17	7	1

plants were known and used, due to the major dependence on them for homemade medicines, as well as for wood, and raw materials for crafts, tool-making, and other uses. At Fortunato, local people reported that, after their legal recognition as a Quilombola community in 2006, agricultural practices are becoming valued again, and that they can sell their harvests and some locally processed products, such as candies, jams, biscuits, and cakes. Part of these processed products use raw materials from their own territory, such as oranges, bananas, peanuts, and guava.

Plant knowledge and use

We registered 2921 citations of plants in the free-listings (1203 by men and 1718 by women), resulting in 322 local names from the three communities. The average number of cited plants per collaborator was higher for Aldeia (19.87, SD = 13.96) when compared to Fortunato (13.40, SD = 9.09) and Santa Cruz (9.28, SD = 8.15). These differences were significant (Kruskall-Wallis H = 14.28, p = 0.0096), with Aldeia differing from Fortunato and Santa Cruz ($p < 0.05$), and with no significant differences between the last two communities.

Plants can be purchased in markets, cultivated, or directly harvested from the environment (extracted). Almost half of the plants cited in this study were cultivated (48%), with no differences in the proportions of plants that were cultivated, extracted (25%), or purchased (27%) among the three communities (χ^2 = 4.98, p = 0.29). Of the 322 plants registered, some could be mentioned in more than one of these categories; thus, we considered a total of 474 occurrences (Figure 1A). However, when considering the total number of citations of cultivated, extracted, and purchased plants (Figure 1B), we observed a significant difference in the distributions of these categories among the three communities (χ^2 = 77.83, $p < 0.0001$). Extracted plants were less frequently cited in the communities, while cultivated plants were more heavily cited at Aldeia. Extracted and purchased plants had a similar number of citations at Santa Cruz, while at Fortunato there was a smaller proportion of purchased plants when compared to the other two communities.

The most cited food plants are presented in Table 2. Manioc (*Manihot esculenta* Crantz), maize (*Zea mays* L.), and bananas (*Musa* sp.) are plants that have been historically present in these communities for individual consumption,

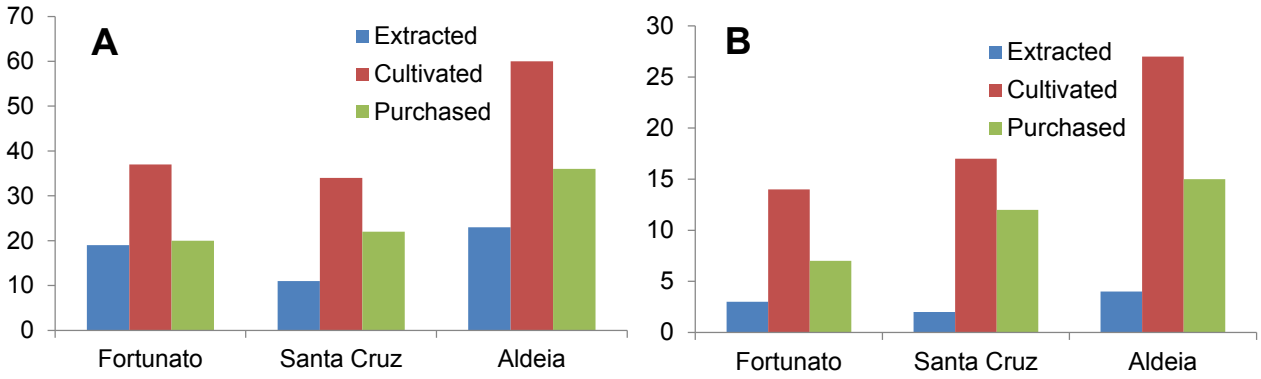

Figure 1. Extracted, cultivated, and purchased plants from 184 interviews in the three communities studied in Santa Catarina, Brazil. (**A**) Percentages of plants cited in each category (n = 474 occurrences). (**B**) Percentages of citations in each category (n = 3132 citations).

Table 2. Plants cited by at least 25% of the collaborators interviewed in each community in Santa Catarina, Brazil (Fortunato: n = 63; Santa Cruz: n = 56; Aldeia: n = 65 interviews). Data are given in percentages.

Local name	Species	Fortunato	Santa Cruz	Aldeia
laranja	*Citrus sinensis* (L.) Osbeck	48	71	63
banana	*Musa* sp.	48	50	49
alface	*Lactuca sativa* L.	25	46	51
milho	*Zea mays* L.	43	23	43
goiaba	*Psidium guajava* L.	31	34	44
limão	*Citrus limon* (L.) Osbeck	20	32	41
erva-cidreira	*Melissa officinalis* L.	32	32	22
hortelã	*Mentha* sp.	14	23	56
mandioca	*Manihot esculenta* Crantz	32	23	35
aipim	*Manihot esculenta* Crantz	23	25	37
cenoura	*Daucus carota* L.	20	41	25
beterraba	*Beta vulgaris* L.	12	38	30
tomate	*Lycopersicon esculentum* Mill.	14	32	33
erva-doce	*Ocimum selloi* Benth. or *Pimpinella anisum* L.	15	25	32
cebolinha	*Allium fistulosum* L.	11	23	33
repolho	*Brassica oleracea* L.	17	29	22
boldo	*Plectranthus barbatus* Andrews or *Plectranthus ornatus* Codd	8	23	41
capim-limão	*Andropogon citratus* DC.	32	20	13
cana	*Saccharum* sp.	32	16	14
feijão	*Phaseolus vulgaris* L.	35	14	13
salsa	*Petroselinum crispum* (Mill.) Fuss	12	13	33
bergamota	*Citrus* sp.	17	38	8
abacate	*Persea americana* Mill.	9	16	27
batata-doce	*Ipomoea batatas* (L.) Lam.	9	11	29
batata	*Solanum tuberosum* L.	8	25	16
louro	*Laurus nobilis* L.	12	6	27
maçã	*Malus communis* Desf.	8	30	10

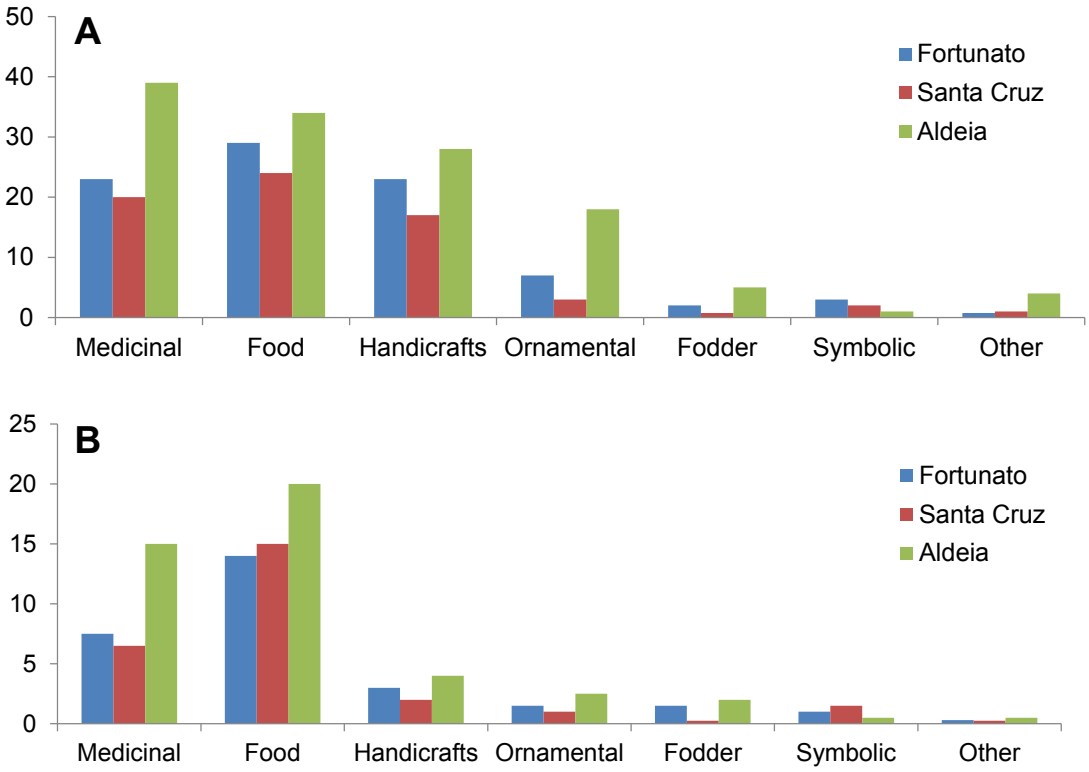

Figure 2. Main uses of the plants cited in 184 interviews in three communities in Santa Catarina, Brazil. (**A**) Percentages of plants cited in each category (n = 322 plants). (**B**) Percentages of citations in each category (n = 3531 citations).

as well as for local commercialization, especially bananas (for Fortunato) and manioc flour. Guajava (*Psidium guajava* L.) grows as a spontaneous tree near the houses. Oranges (*Citrus sinensis* (L.) Osbeck) are also present in home gardens, and they have both food and medicinal uses. Important medicinal plants were **erva-cidreira** (*Melissa officinalis* L.), **hortelã** (*Mentha* sp.), **erva-doce** (*Ocimum selloi* Benth. or *Pimpinella anisum* L.), **boldo** (*Plectranthus barbatus* Andrews or *Plectranthus ornatus* Codd), and **capim-limão** (*Andropogon citratus* DC.) (Table 2). These medicinal plants are exotic and common in the home gardens, except for *P. anisum,* which is purchased.

Some native species were less cited, such as the fruits of **pitanga** (*Eugenia uniflora* L.), which are used for medicinal purposes; **butiá** (*Butia catarinensis* Noblick & Lorenzi) for making handicrafts; **garapuvu** (*Schizolobium parahyba* (Vell.) S.F.Blake) for canoe-making; and **camboatá** (*Cupania vernalis* Cambess.) for firewood, among other uses.

Within the three communities, medicinal plants account for 31% of the 322 plants that were cited by the study participants, representing one of the main uses for known plants, along with plants that are used for food (28%). Plants that are used for firewood, tool-making, and crafts (grouped here as handicrafts) account for 15% of the total number of plants cited. Ornamental plants account for 13% of the plants cited, and fewer citations were observed for plants that are used as fodder, for symbolic or ritualistic purposes, or for any other purposes. Analyzing the results by community, a higher percentage of food plants were mentioned both in Fortunato and Santa Cruz (Figure 2A), and medicinal plants remains the most cited category only in Aldeia. Analyzing the number of citations for each plant in each use category, we observed a higher percentage of citations for food plants than for medicinal plants (Figure 2B). While people more frequently mentioned plants for food than for medicine, the set of medicinal plants cited is richer than that of the food plants.

Further comparing the communities, we observed a higher percentage of plants cited in almost all use categories for Aldeia (the most urbanized community). This was followed by Fortunato (the least urbanized community), and the lowest percentage of plants was cited in Santa Cruz (Figure 3A, B). Differences in the number of plants per community and per type of use were found to be significant ($\chi^2 = 26.28$, $p = 0.0098$).

Discussion and Conclusions

In this study of the Quilombola's ethnobotanical knowledge, we observed that different geographic settings and different degrees of urbanization did not influence the composition of plants that were listed by participants. De Medeiros *et al.* (2013) observed that the relative importance of native wild edible plants was not explained by the urbanization degree. In our case, the current role of introduced and exotic plants is preponderant over the native resources. In the study of a different Afro-descendant community from Santa Catarina, Cruz and Hanazaki (2008) observed that native plants were not as well known when compared to exotic plants and that the knowledge of plants was strongly associated with the rural identity of this community. In contrast, we observed that the most urbanized community (Aldeia), fully enclosed within an urban area, has the greatest knowledge of plants, when compared to the two other communities studied. Fortunato and Santa Cruz are rural, but Fortunato has more forested areas nearby, while Santa Cruz is surrounded by pastures and is closer to an urban area. Saslis-Lagoudakis *et al.* (2014) pointed out that the traditional knowledge is influenced by ancestry, inter-cultural diffusion, and interaction with the natural environment; in this way the socio-environmental factors may be influencing the local knowledge about plants.

A positive association between age and traditional ethnobotanical knowledge can be expected (Cruz *et al.* 2014, Lepofsky 2009). People from Aldeia reported the importance of some community elders for the valorization of plant knowledge, and we observed a higher proportion of elders in this community, when compared with the other two. One of these elders is a blesser, the current matriarch of the community, and is widely recognized for her knowledge of medicinal plants. The role of traditional healers is recognized in the ethnobotanical literature, both in Brazil (e.g., Rodrigues 2006, Zank & Hanazaki 2012) and elsewhere (e.g., Bruschi *et al.* 2011, Napoli 2008). In a broader geographic scale, Pirker *et al.* (2012) showed that the traditional knowledge about medicinal plants can be influenced by urbanization and ongoing globalization processes and is challenged by shifts from traditional healing practices to modern healthcare facilities. Healers and healthcare providers have a central role in the integration of traditional medicine and biomedicine, especially in minority and underserved communities (Vandebroek 2013).

Some authors suggested that in certain situations the ethnobotanical knowledge decreases with the increase of education (Benz *et al.* 2000, Martínez-Ballesté *et al.* 2006, Saynes-Vásquez *et al.* 2013, Zent 2001) or the education levels were not statistically significant associated to ethnobotanical knowledge (Beltrán-Rodríguez *et al.* 2014), but we observed that higher levels of schooling in Aldeia may also have some influence in the recognition of the importance of local plant knowledge, especially in the context of the self-valorization of traditional characteristics and of their own identity. This attitude may reflect a greater interest in maintaining their knowledge of plants, suggesting that this factor is very particular for each community. In this community, we also observed the presence of many cultivated plants in home gardens, suggesting a further investigation on how the home gardens differ between communities, and the influence of these environments on the maintenance of local knowledge, as suggested by Calvet-Mir *et al.* (2012) and Pulido *et al.* (2008).

At Fortunato, plants have importance as a source of income, both historically and also at the present time; this was not observed in the other communities. At Fortunato, the plants most often cited are those related to some source of income. Thus, even with no significant difference in the average number of plants cited in each community, their dependence on plant resources vary when considering the relevance of these resources for sustaining local livelihoods. The plants most often cited in Fortunato are cultivated for such purposes.

The relative proximity among the communities studied allows for the exchange of information and plants, contributing to a shared knowledge. Quilombolas from the three communities also used to attend the same traditional parties and festivities, which were opportunities to share local knowledge and plants. Currently, the plant linkages among the communities are maintained because the Fortunato community partially supplies the other communities with vegetables, greens, and jams. This supply is associated with a government program that promotes the insertion of local foods into school meals, although the government does not guarantee its continuation.

Along with urbanization, it is important to consider the effects of modernization, which are more apparent after the 1970s. In a study of Quilombola communities in the Atlantic forest of São Paulo State, Adams *et al.* (2013) showed that the local livelihoods were influenced by environmental and social policies, which had benefits on health, education, and income, but decreased the agrobiodiversity and increased the dependence of the local people on markets to obtain food. The habit of collecting and consuming such plants is being abandoned, partly because people prefer to consume cultivated species or foods that can be locally purchased (Nascimento *et al.* 2013). This same process can be observed in the Quilombola communities of Santa Catarina, where there is a high dependence on purchased plants.

In this sense, Quilombola people have less access to locally produced foods, which have historically been produced in their own territories. The major exception to this is the vegetables and greens produced and distributed by the Fortunato community. Other important exceptions to

these changes can be seen with the current role of backyards and home gardens as areas for plant growth in the three communities. Another point that can influence the actual scenario is the markets, which are relatively close to the communities. Godoy *et al.* (2005) observed that the markets' influence on the knowledge of indigenous people leads to the erosion of knowledge about both plants and animals.

Although the studied communities are different in terms of levels of urbanization, they maintain similar ethnobotanical repertoires, relying on several introduced plants. In spite of the recent changes that are due to urbanization and modernization, we were still able to register less frequent knowledge about native plant resources, and a deeper focus on the native resources is expected in further studies. However, we cannot assume that Quilombolas from these three communities did not differ in their relationships with plants: further topics to be investigated include the identification of the cultural and ecological significance of some plants; a deeper analysis about medicinal plants and medicinal practices; and the linkage among the plants and the environments used to obtain them, especially in the case of home gardens. The systematization and appropriation of this knowledge by the Quilombola communities collaborate to strengthen and enhance their own identity and assist in the process of assuring for their legal rights.

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