Bioremediation, Biodiversity and Bioavailability ©2011 Global Science Books

Ethnobotanical Survey of Wild Food Plants by Rural Communities Surrounding the PARNASI, Sergipe, Brazil

Juliano S. Lima[1] • Paulo Sergio Maroti[2] • Renata Silva-Mann[3] • Laura Jane Gomes[4*]

[1] Program of Postgraduation in Agroecossystem, Universidade Federal de Sergipe, CEP 49100-000, São Cristóvão, Sergipe, Brazil
[2] Departament of Biology, Universidade Federal de Sergipe, CEP 49500-000, Itabaiana, Sergipe, Brazil
[3] Departament of Agronomy, Universidade Federal de Sergipe, CEP 49100-000, São Cristóvão, Sergipe, Brazil
[4] Departament of Forest Sciences, Universidade Federal de Sergipe, CEP 49100-000, São Cristóvão, Sergipe, Brazil

Corresponding author: * **laurabuturi@gmail.com**

ABSTRACT

This study was carried out in the four rural communities (Pedrinhas, Ladeira, Caroba and Cajueiro) surrounding the National Park of Serra de Itabaiana - PARNASI, in order to assess which botanical species are recognized by local specialists as wild food plants. The methodology was based on stages of observation, questionnaires, performance-guided tours, and a floristic inventory. There were 31 specialties divided into three categories of emic wild food plants, those being for human consumption, for domestic animals and for wildlife animals as food. We totaled 86 species, 67% being native and 33% exotic. They were made up of the following families: Myrtaceae (16 spp.), Anacardiaceae (8 spp.), Arecaceae (8 spp.), Fabaceae (7 spp.), Annonaceae (5 spp.), and Malpighiaceae (5 spp.). 59 wild food species were identified for human use. The most cited were: cashew (*Anacardium ocidentale* L.), murici (*Byrsonima sericea* DC.), and jackfruit (*Artocarpus heterophyllus* Lam.). In the category of species for domestic animals, 22 species were cited, those being jackfruit (*A. heterophyllus*), ingá (*Inga* sp.), and mimosa (*Mimosa* sp.). In the category for wildlife animals, 26 species were cited, including angelim (*Andira nitida* Mart. ex Benth.), murici (*B. sericea*) and embaúba (*Cecropia pachystachya* Trécul). It was observed that specialists from the surrounding communities to PARNASI have a vast knowledge of wild food plant resources used for different purposes. As far as human consumption was concerned, the majority of species mentioned were wild flora, because these are the species cultivated and appreciated by specialists.

Keywords: Agrest, biodiversity, local communities, native fruits, popular knowledge
Abbreviations: PARNASI, National Park Serra de Itabaiana

INTRODUCTION

The use of plants, mainly as food, medicine and fuel has always been a part of human history, long before humans became producers of crops and started societies. From this period, humans have been an important floristic and evolutionary changing agent, and have always been dependent on environmental resources for survival, using the flora, not only to supply their basic needs, but also as an integral part of their diet and to support their social order (Albuquerque 2005).

"Primitive" man always named, classified and differentiated useful plants and distinguished them from those that were toxic. The identification of useful plants was characterized by observations aimed at improving the accumulated knowledge about plants, which was then transmitted from generation to generation using a peculiar nomenclature.

Studies have been performed on ethnobotany (Fonseca-Kruel *et al.* 2004; Botrel 2006) in order to record the knowledge, customs and practices of traditional and local societies, contributing to the transmission and preservation of popular culture, and supplying important information for the use of sustainable natural ecosystems (Diegues 2001).

Many food plants contain a strictly regional value, which can only be found through research with local specialists (Martin 1998). In this case, the local communities' knowledge is key to support scientific knowledge, aiming to provide important information for management strategies and biodiversity conservation (Botrel *et al.* 2006). The growth of cities, monoculture and the consequent environmental contamination has been observed in natural resources that are suffering drift and loss due to the result of anthropogenic interference, especially for the difficulties of purchasing food without pesticides, and because of the distances to harvest them (Hawkes *et al.* 1997; Carneiro *et al.* 2005).

Species diversity for conservation is key for food supplies, besides its ecological and economic importance (Prescott-Allen 1990). Innumerous knowledge of rural communities on the use of wild food plants has being missed (Rapoport *et al*. 1998). To explain this biodiversity drift, we can point to verbally transmitted knowledge.

The record about wild food plant resources and their several uses, obtained from communities, contributes to the knowledge of local biodiversity (Posey 1987) and towards its sustainable use (Fonseca-Kruel *et al.* 2004). Ethnobotanical studies carried out in rural communities in high-biodiversity areas can provide important data about multi-propose wild food plant use, with the expansion of possibilities of use to be associated with native resources and conservation biodiversity (Brandão 1981; Lévi-Strauss 1987; Lifschitz 1997; Canesqui 2007).

In Brazil, there are few scientific studies on unconventional wild food plants. There are some compendiums with species descriptions, which present native and cultivated species and their use (Côrrea 1984; Sauer 1987). Brazilian native fruits deserve attention through the Levi-Strauss (1987) and Kerr (1987) records that are important reflections on native fruit values and their evidence-based conservation. The works of Zurlo *et al.* (1990) are described and illustrated with over 50 species of wild food plants, the majority of which are exotic. In addition, the important

Received: 6 May, 2011. Accepted: 31 August, 2011.

Original Research Paper

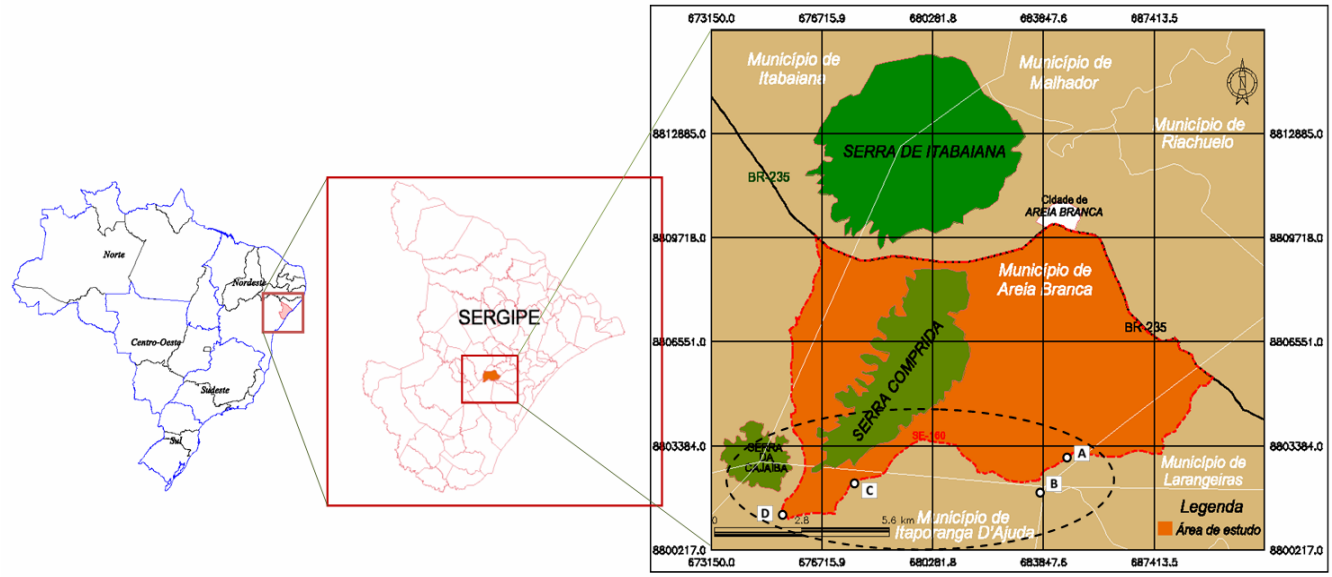

Fig. 1 Rural communities around National Park Serra de Itabaiana: (**A**) Pedrinhas, (**B**) Ladeira, (**C**) Caroba and (**D**) Cajueiro.

works carried out on native fruit uses were developed by Mattos (1978), Brasil (2002) and Carneiro *et al.* (2005).

However, there is no information about the knowledge of rural communities associated with woody and shrub species as wild food plants in Sergipe. This study was carried out aiming to developing further knowledge about native wild food plants and their uses in rural communities sited around the unique National Park founded in Sergipe.

MATERIALS AND METHODS

The study area

The focus of this ethnobotanical survey was the area within the rural communities of Pedrinhas (10° 49′ 464″ S - 37° 19′ 002″ W), Caroba (10° 49′ 983″ S - 37° 22′ 584″ W), Ladeira (10° 50′ 069″ S - 37° 19′ 102″ W) and Cajueiro (10° 50′314″ S - 37° 23′ 747″ W). These communities are located within the limits of the Serra de Itabaiana National Park and are located around the major watersheds, including the springs of the Poxim River.

The distance among between Pedrinhas (A) and Ladeira (B) is 1.06 km, Ladeira (B) and Caroba (C), is 8.6 km, and Caroba and Cajueiro (D) are sited 2 km apart, totaling a distance of 11.66 km from the communities of Pedrinhas (A) and Cajueiro (D) (**Fig. 1**).

The communities are constituted by small farms characterized by the familiar agriculture of cassava, maize and bean cultivation. The surrounding area is comprised of forest fragments; nevertheless, in this scenario, there are extensive farms with a predominance of pasture practices and the cultivation of sugar cane. In the communities, there are dirt roads and precarious transport systems relatively isolated from urban areas. The local economy is based on temporary labor in farms, small commercialization, and the extractability of native species (Aguiar-Netto 2006; Gomes *et al.* 2006).

The communities of Pedrinhas (2,150 habitants) and Caroba (450 habitants) are located in the Areia Branca Municipality. Ladeira (700 habitants) and Cajueiro (550 habitants) are located in the Itaporanga d'Ajuda Municipality. All communities present the same infrastructure with fundamental educational schools, small health centers, churches, bars and small markets. The majority of house sanitation is disposed of in fosse and over the streets. There is no piped water and the water used comes directly from the river (Gomes *et al*. 2006).

The Serra de Itabaiana National Park is set in a zone of the Atlantic Forest that intersects with the semi-arid vegetation area, a transition zone called Agreste, coexisting with species of fauna and flora of both ecosystems, with dense and non-dense vegetation.

The dense area is comprised of secondary trees, mainly on the slopes (Vicente *et al.* 1997; Vicente 1999). In the non-dense areas, which occur on the hillsides and in the highest parts (approximately 670 m in altitude), the land consists of white sand with diverse shrubs and small trees (Vicente *et al*. 1997).

A recent study carried out by Dantas *et al*. (2010) describes the Serra do Cajueiro, in which the studied communities are situated, with forests predominantly consisting of submontane semi-deciduous seasonal forest.

In all of the communities, forest fragments were observed, and which are used to obtain timber as firewood and to provide non-timber products used as food and for medicinal purposes.

Data collection

In this case study, the method presents an advantage for examining the depth of data aimed to develop actions pertaining to their own scenarios (Alencar *et al.* 1998). Data was assessed from a non-probabilistic intentional sampling from the knowledge of various specialists, which was then selected according to the indications of the community members using the snow ball methodology (Baley 1994).

A total of 31 local specialists were surveyed: 14 residents in Pedrinhas, 7 in Ladeira, 5 in Caroba and 5 in Cajueiro, with 18 males and 13 females, aged between 45-92 years old, during the period from March 2009 to February 2010. The main economic activities carried out by the specialists were woodcutters (four individuals), artisans (two individuals), carpenters (three individuals), artisan/carpenters (two individuals), syrup makers (two individuals), prayers (two individuals), prayer/syrup makers (seven individuals), and agriculturists (nine individuals). All were familiar with native wild food plant expertise.

The strategies used for data collection followed the recommendations proposed by Macedos (2006), with the use of interviews and *in-situ* observations. The author asserts that ethnobiological phenomena are not easily observed and measured. However, they can be highlighted and supplemented from the records derived from non-formal situations (daily journals). These records are an important database in ethnobiology, once they are set as memes or groups of identification.

The interview was based on a semi-structured questionnaire, in order to gain general information about the knowledge for gathering, management and the setting into categories by the usage of wild food plants.

The botanical collection was performed using random walking sampling (Begossi *et al.* 1996, Botrel *et al.* 2006), accompanied by local residents from each community that provided the vernacular species' names and their main use. During the tour-guided activities, information about all of the plants was recorded on field sheets (environment, vernacular name, characteristics, use, color, presence or absence of odor). During these samplings, the specialists in each community could point to the use of plants in the environment. The botanical material was herbarized according to

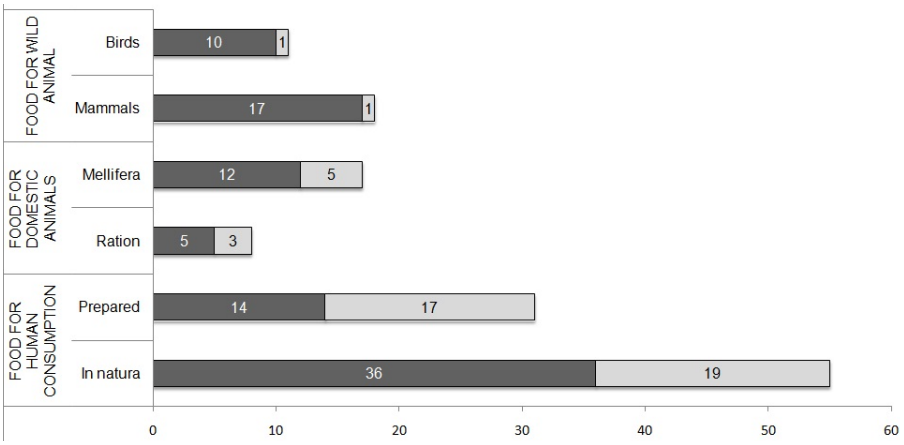

Fig. 2 Distribution of wild food plant species recognized by specialists for various food purposes in the rural communities surrounding the National Park Serra de Itabaiana. Native = dark grey bars; Exotic = light grey bars.

Fidalgo *et al.* (1989) and included in the collection of the Herbarium at the Federal University of Sergipe (UFS).

The taxonomic identification level of the species was performed throughout the clusters and was based on literature data and herbarium collections. The classification system was AGP III (Chase 2009).

Data analysis

The data was analyzed using the methodology of "Aggregation Uses" (Albuquerque 2005) and the categories were tabulated by an array containing family and scientific names, vernacular names, number of citations, uses (*in natura* or prepared), plant parts (pseudo-fruit, fruit, flower, seed), origin (native or cultivated) and characteristics (oily, sweet, milky, sour or bitter).

The plants were grouped into three categories of emic food use:

a) Human consumption food - Plants grown or gathered in the forest and the *restinga* and used for human consumption; used *in natura* or prepared juice, vitamins, flour, etc.;

b) Domestic animal food - Plants gathered in the forest and the *restinga* and used as rations for domestic-farm-animals (cows, goats, etc.) and Melliferous plants;

c) Wild animal food - Plants *in natura* for the feeding of wild animals (mammals and birds).

In this study, the species of plants were subdivided by use into food emic categories, which are based on the logic categorization established by specialists in rural communities surrounding the PARNASI. According to Posey (1986), emic studies reveal the interpretation of cognitive and linguistic groups of study, with the original concepts of identification and characterization within the refinement of local and traditional knowledge.

Multi-variable analysis and clustering of data aimed to verify the existence of similar uses and knowledge of wild plants by rural communities (Hoft *et al.* 1999; Peroni 2002). Following Valentin (2002), clustering permits one to recognize the similarities among sampling units sufficiently enough to cluster the data into the same group.

The gender average, and occupation, as well as the estimate of the total number of species were identified by their category of use.

RESULTS AND DISCUSSION

The specialists

The education level of the specialists was illiterate (55%), with 13 specialists being literate at the 4th grade in primary school (42%), and only one at high school (3%). The occupations of the specialists were farm workers, maids, bricklayers, carpenters and merchants. However, those interviewed in the region were also known for other skills and occupations, therefore they were further categorized into: woodcutters (3), artisans (2), carpenters (2), artisan/ carpenters (2), garrafeiros (2), prayer-makers (2), prayer/ garrafeiros (7), agrarians (9) and generalists (2).

The origin of the plants varied from 67% native to 33% exotic (**Fig. 2**). In this study, there were 86 listed species divided into 57 genera and 30 botanical families (**Tables 1, 2**). The identified species were counted with 47% gathered in fragments of the tropical rainforest, 21% in areas of tableland (white sand) and 32% in anthropogenic areas.

The number of species by categories of use were divided into sub-groups of wildlife consumption (birds and mammals), domestic animal consumption (Melliferous species and animal feeding) and human consumption (fresh and prepared). In all categories of use, a greater number of native species were cited in comparison to exotic species (**Fig. 2**).

The high number of plants for human consumption was due the higher number of native trees existent in the region, which are culturally important in the local population and in the specialist's diets, such as, mangaba (*Hancornia speciosa* Gomes), araticum (*Annona* sp.); maçaranduba (*Manilkara salzmannii* (A. DC.) H.J. Lam.), and caxindó (*Allagoptera arenaria* (Gomes) Kuntze).

The exotic species are easily cultivated in backyards and home gardens either by specialists or by other residents. In this category, we have, for example, the jackfruit (*Artocarpus heterophyllus* Lam.), banana (*Musa paradisíaca* L.), orange (*Centros* sp.), mango (*Mangifera indica* L.), guava (*Psidium guajava* L.) and jabuticaba (*Mercearia cauliflora* L.). The home gardens are considered as germplasm banks for many crops and other economic plants. They are also key sites for the domestication of wild plants. Current ethnobotanical studies on home gardens focus on their structure, floristic composition, and contribution(s) to their owners (Huai and Hamilton 2009).

There were innumerous uses of wild food plants, directly linked to environmental and fruiting seasonality. Several plant resources (roots, stems, leaves, flowers and fruits) were utilized by the population *in natura* or prepared in some kind of culinary way, such as cakes, juices, candies, flour meals, among others.

The similarities and differences of the specialists' knowledge were used to generate a cluster of two groups. The first group was composed of the communities of Pedrinhas, Caroba and Cajueiro with 75% of knowledge similarity, and 88% similarity for Caroba and Cajueiro. In the second group, only the Ladeira community had a low value of similarity in comparison with other rural communities (70%).

The gender analyses framework identified majority-female citations (52%). There was a higher average of species by specialists aged between 70-79 years (27.2), followed by 60-69 years (25.6), 79 years (21.0) and 50-59 years-old specialists (21.8). The specialists aged below 50 years of age formed the minority of the citations (16.5).

In the analyses of occupations, there was a concentra-

Table 1 Wild food plant species indicated for the local specialists from the region of PARNASI for human consumption. **N.C.** = Number of Citations. **Uses** = I.N. – *In natura*, P – Preparations (1 – Juice, 2 – Tonic, 3 – Dessert, 4 – Cooked, 5 – Mill, 6 – Oil, 7 – Licor, 8 – Maturi). **P.U.** = Part of used (Pf – Pseudofruit, Fr – Fruit, Fl – Flower, S – Seeds). **Origin** = C – Cultivated, E – Spontaneous. **Characteristic** = H – Hot, C – Cold, S – Strong, W – Weak, St – Sweet, Ol – Oil, So – Sour, Bt – Bitter, Ml – Milk.

Family/Scientific name	Vernacular name	N.C.	Uses	P.U.	O	Property
ANACARDIACEAE						
Anacardium ocidentale L.	Cajueiro	31	IN, P1	Pf	C	H, W, St
		25	P4, P8	Fr	C	H, S, Ol
Anacardium sp.	Cajuí	12	IN, P3	Pf	E	H, S, So
Mangifera indica L.	Mangueira	20	IN, P1	Fr	C	C, W, St
Spondias purpurea L.	Seriguela	9	P1	Fr	C	C, W, St
Spondias sp.	Cajazeira	7	IN, P1	Fr	C	C, S, St
ANNONACEAE						
Annona coriacea Mart.	Pinha	6	IN	Fr	C	C, W, Ml
Annona muricata L.	Graviola	5	IN, P1	Fr	E	C, S, Ml
Annona sp.	Araticum apê	21	IN, P1	Fr	E	C, S, Ml
Guatteria sp.	Araticum cagão	5	IN	Fr	E	C, W, Ml
Xylopia frutescens Aubl.	Pindaíba	8	IN	Fr	E	H, W, So
APOCYNACEAE						
Hancornia speciosa Gomes	Mangabeira	21	IN, P1	Fr	E	H, S, Ml
ARECACEAE						
Allagoptera arenaria (Gomes) Kuntze	Caxindó	10	IN	Fr	E	C, W, Ol
Allagoptera sp.	Burizeiro	6	IN, P5	Fr	E	C, W, Ol
Arecaceae sp.	Patizeiro	10	IN	Fr	E	C, W, Ol
Astrocaryum sp.	Tucun	12	IN	Fr	E	C, W, Ol
Attalea funifera Mart. ex Spreng.	Piaçaba	13	IN, P5	Fr	E	C, W, Ol
Cocos nucifera L.	Coqueiro	10	IN, P7	Fr	C	C, S, Ol
Elaeis guineensis Jacq.	Dendê	11	IN, P6	Fr	E	C, S, Ol
Syagrus schizophylla (Mart.) Glassman	Dicuri	15	IN, P5	Fr	C	C, S, Ol
BORAGINACEAE						
Cordia nodosa Lam.	Grão de galo	2	IN	Fr	E	C, W, Bt
CARICEAE						
Carica papaya L.	Mamoeiro	7	IN, P2	Fr	C	C, S, St
CHRYSOBALANACEAE						
Couepia sp.	Oiticoró	2	IN	Fr	E	C, W, Bt
FABACAEA						
Fabaceae sp.	Paraíba	3	IN	Fr	E	H, W, So
Inga sp.	Ingá Branco	3	IN	Fr	E	H, W, So
LAURACEAE						
Persea americana Mill.	Abacate	9	IN, P2	Fr	C	C, S, Ol
MALPIGHIACEAE						
Byrsonima coccolobifolia Kunth	Murici de tabuleiro	13	P7	Fr	E	H, S, So
MALPIGHIACEAE						
Byrsonima sericea DC.	Murici da mata	26	P5, P7	Fr	E	C, W, So
Byrsonima sp.	Murici branco	10	P7	Fr	E	C, W, So
Malpighia glabra L.	Acerola	12	IN, P1	Fr	C	C, S, So
MORACEAE						
Artocarpus altilis (Parkinson) Fosberg	Fruta Pão	7	P4	Fr	C	C, S, Ml
Artocarpus heterophyllus Lam.	Jaqueira	25	IN, P2	Fr, S	C	C, S, Ml
MUSACEAE						
Musa paradisiaca L.	Bananeira	7	IN, P2	Fr	C	C, S, St
MYRTACEAE						
Calyptranthes clusiifolia (Miq.) O. Berg	Murta Branca	5	IN	Fr	E	H, W, Bt
Campomanesia guaviroba (DC.) Kiaersk.	Guabiraba	8	IN	Fr	E	H, W, So
Eugenia sp.	Murtinha de Tabuleiro	5	IN	Fr	E	H, W, Bt
Eugenia uniflora L.	Pitanga	5	IN, P1	Fr	C	C, W, So
Myrcia fallax (Rich.) DC.	Murta de Tabuleiro	10	IN	Fr	E	H, W, Bt
Myrcia sp. 2	Cambuí	6	IN	Fr	E	C, W, So
Myrtaceae sp. 2	Mananpuçá	7	IN	Fr	E	C, W, Sw
Plinia edulis (Vell.) Sobral	Cambucá	6	IN	Fr	E	C, W, Sw
Psidium guajava L.	Goiabeira	23	IN, P1	Fr	C	C, W, Sw
Psidium guianense L.	Araçá goiaba	19	IN	Fr	E	C, W, Sw
Psidium sp. 1	Araça de porco	6	IN	Fr	E	H, W, Bt
Psidium sp. 2	Araça de moça	6	IN	Fr	E	H, W, Bt
Syzygium cumini (L.) Skeels	Manjelão	20	IN	Fr	E	C, W, Sw
Syzygium jambolanum DC.	Jambo	5	IN	Fr	E	C, W, Sw
OXALIDACEAE						
Averrhoa carambola L.	Carambola	9	IN, P1	Fr	C	C, W, So
PUNICACEAE						
Punica granatum L.	Romã/Rumã	10	IN	S	C	C, W, So
RUBIACEAE						
Genipa americana L.	Jenipapeiro	18	P2	Fr	C	C, S, Bt
Guettarda sp.	Angélica	3	IN	Fr	E	C, W, So

Table 1 (Cont.)

Family/Scientific name	Vernacular name	N.C.	Uses	P.U.	O	Property
RUTACEAE						
Citrus limon (L.) Osbeck	Limoeiro	8	IN, P1	Fr	C	C, W, So
Citrus reticulata Blanco	Tangerina	6	IN, P1	Fr	C	C, W, So
Citrus sinensis (L.) Osbeck	Laranjeira	16	IN, P1	Fr	C	C, W, So
Citrus sp.	Lima	4	IN, P1	Fr	C	C, W, So
SAPINDACEAE						
Cupania revoluta Rolfe	Cambotá	3	IN	Fr	E	C, W, So
Talisia sp.	Pitomba	10	IN	Fr	C	C, W, So
SAPOTACEAE						
Manilkara salzmannii (A. DC.) H.J. Lam	Massaranduba	24	IN	Fr	E	C, W, Ml
SOLANACEAE						
Solanum paludosum Moric.	Jurubeba	6	IN	Fr	E	C, S, Bt

Table 2 Wild food plant species indicated for the local specialist from the region of PARNASI, about the use of domestic animal feed. **N.C.** = Number of Citations. **Uses** = (AF – animal feed, H – honey). **P.U.** = Part of plant used (Pf – Pseudofruit, Fr – Fruit, Fl – Flower, S – Seeds, L – Leaves, Rh – Rhizome). **Origin** = C – Cultivated, E – Spontaneous **Property** = Fl – Flowering, Sg – Sugar, Av – Availability, Nu – Nutrition (1 – little, 2 – medium, 3 – very).

Family/Scientific name	Vernacular name	N.C.	Uses	P. U.	O	Property
ANACARDIACEAE						
Schinus molle L.	Aroeira	4	H	Fl	C	Fl (2), Sg (1)
ASTERACEAE						
Acritopappus confertus (Gardner) R.M. King & H. Rob.	Fumo Brabo	3	H	Fl	E	Fl (2), Sg (1)
Eremanthus incanus (Less.) Less.	Candeia	7	H	Fl	E	Fl (2), Sg (2)
BURSERACEAE						
Protium heptaphyllum (Aubl.) Marchand	Amescla	4	AF	L	E	Av (2), Nu (3)
EUPHORBIACEAE						
Croton heliotropiifolius Kunth	Velande	3	AF	L	E	Av (1), Nu (3)
		1	H	Fl	E	Fl (1), Sg (2)
Euphorbiaceae sp.	Marmeleiro	7	H	Fl	E	Fl (2), Sg (3)
FABACEAE						
Anadenanthera falcata (Benth.) Speg.	Angico	4	H	Fl	E	Fl (1), Su (2)
Inga sp.	Ingá Branco	9	AF	L	E	Av (2), Nu (2)
*Mimosa caesalpiniifolia*Benth.	Sabiá	8	H	Fl	C	Fl (3), Sg (2)
Mimosa sp. 1	Arranhento	5	H	Fl	E	Fl (3), Sg (2)
		5	AF	L	E	Av (3), Nu (1)
Mimosa sp. 2	Jurema	6	AF	L	C	Av (3), Nu (2)
		9	H	Fl	C	Fl (3), Sg (2)
MORACEAE						
Artocarpus heterophyllus Lam.	Jaqueira	10	AF	Fr, S	C	Av (3), Nu (3)
MUSACEAE						
Musa paradisiaca L.	Bananeira	3	AF	L, Rh	C	Av (2), Nu (3)
MYRTACEAE						
Eugenia sp.	Murtinha de Tabuleiro	2	H	Fl	E	Fl (2), Sg (1)
Myrcia fallax (Rich.) DC.	Murta de tabuleiro	5	H	Fl	E	Fl (2), Sg (2)
Syzygium cumini (L.) Skeels	Manjelão	6	H	Fl	E	Fl (1), Sg (3)
Syzygium jambolanum (Lam.) DC.	Jambo	2	H	Fl	E	Fl (1), Su (3)
RHAMNACEAE						
Ziziphus sp.	Juá de bode	7	AF	L	E	Av (3), Nu (2)
RUTACEAE						
Citrus limon (L.) Osbeck	Limoeiro	1	H	Fl	C	Fl (2), Sg (2)
Citrus reticulata Blanco	Tangerina	2	H	Fl	C	Fl (1), Sg (2)
Citrus sinensis (L.) Osbeck	Laranjeira	2	H	Fl	C	Fl (2), Sg (2)
Citrus sp.	Lima	1	H	Fl	C	Fl (1), Sg (2)

tion of knowledge for specialist types such as generalists (about 48 species), woodcutters (about 37.2 species), prayer-makers (32.2), glass-makers (30.2), artisans (32.4), and carpenters (33.0). The ruralists were the specialists that presented the least knowledge about wild food plants (18.3).

Food for human consumption

The number of species known as wild food plants for human consumption by the residents were 59 (38 native and 21 exotic), with only 42 species indicated for this use and 19 species for other uses (**Table 1**).

In this subcategory, the species most frequently mentioned were: cashew (*Anacardium ocidentale* L. N.C. = 31); murici (*Byrsonima sericea* DC. N.C. = 26), jackfruit (*Artocarpus heterophyllus* Lam. N.C. = 25), maçaranduba (*Manilkara salzmannii* (A. DC.) H.J. Lam. N.C. = 23) and guava (*Psidium guajava* L. N.C. = 23). The cashew is very common in the region and represents an important food source. Cashew is used *in natura* or is prepared as juice and pulp. The cashew nut is prepared roasted and cooked.

The high number of plants for human consumption in this study probably exists because of the native fruit trees that are frequent and important in the diet appreciated by specialists and the local residents. Some of these include mangaba (*Hancornia speciosa* Gomes), araticum (*Annona* sp.); maçaranduba (*Manilkara salzmannii* (A. DC.) H.J. Lam) and caxindó (*Allagoptera arenaria* (Gomes) Kuntze). Another explanation for the high number of species for human consumption is due to the cultivation of various exotic plants in the residents' backyards by both specialists and other residents.

In the group of cultivated plants, we can highlight jackfruit (*Artocarpus heterophyllus* Lam.), banana (*Musa paradisíaca* L.), orange (*Centros* sp. 1), mango (*Mangifera indica* L.), guava (*Psidium guajava* L.), and jabuticaba

(*Myrciaria cauliflora* L.). The various uses of wild food plants are directly linked to environmental and seasonal conditions. Several plant sources (roots, stems, leaves, flowers and fruits) are used by the population *in natura* or prepared in diverse types of culinary ways, such as cakes, juices, jams, and flour.

A. ocidentale was the species most often mentioned, due to the high availability of this plant in the region as an important food source by local specialists. The cashew (pseudo fruit) is used fresh or as a juice and pulp. The nut (seed) can also be roasted (flour) and baked ("maturi"). The flour is usually used in the region as a dessert or as a complement with meat. However, in the cashew fructification period, the meal is used mainly as "maturi", as a substitute for beans or meat.

B. sericea is used mainly as an alcoholic therapeutic tonic and is associated with magic and healing proprieties. It is common in the semi-arid region of Sergipe. The use of alcoholic solutions by farmers, prepared with *B. sericea*, is used as a supplement before work, or as a medicine for body ailments. The murici provides the vitamins and essential nutrients throughout the day for the hard-working farmer.

Other species are also used as natural tonics, for example, the avocado (*Persea americana* Mill.), banana (*Musa paradisiacal* L.), coconut (*Cocos nucifera* L.), jenipapo (*Genipa americana* L.) and papaya (*Carica papaya* L.). These species are considered to be "strong" food, capable of maintaining the worker fed and able to produce and conserve more energy for manual activity. However, there are some restrictions on its use for humans with digestive problems.

The traditional and local communities usually classify foods based on flavor and curative properties. A study carried out by Brandão (1981) in a rural community in the Goiás classified wild food plants according to their nature and their effects. The criteria used to categorize the food were "strong" or "weak", and "hot" or "cold".

The fruits found in forest fragments are considered to be "cool" and those found in the area of restinga are considered to be "hot". For specialists around the PARNASI, the consumption of foods considered to be "hot" can increase kidney problems, whereas the consumption of cold foods can avoid problems with the urinary system.

The use of the nomenclature of hot or cold food is different; each population tends to nominate the following pattern, considering restrictions, alimentary prohibitions and the effects on the body's systems (Canesqui 2007).

The therapeutic effects are important for wild food plant classification because the traditional and local communities believe foods, besides nurturing the individual, also establish a balance or imbalance in the body. This perspective is observed in the wild region of Sergipe. Other criteria to classify wild food plants can be by using fruit morphology and flavor. The specialists usually classify the plants into five principal types: milky, oily, sour, bitter and sweet.

(1) The milky species are those rich in latex and their fruits are recommended for stomach pains and heartburn. The species are mangaba (*Hancornia speciosa* Gomes), massaranduba (*Manilkara salzmannii* (A. DC.) H.J. Lam), jackfruit (*Artocarpus heterophyllus* Lam.), among others. Excessive consumption of these species can cause intestinal illnesses.

(2) The oily plants are species with oil fruits indicated for "blood treatment", especially anemia, such as avocado (*Persea americana* Mill.), palm (*Elaeis guineensis* Jacq.), cashew nut (*Anacardium ocidentale* L.), among others. Excessive consumption of these species can cause intestinal illnesses.

(3) The bitter species are plants with a strong flavor and are present in fragments of a dense humid forest. The use of these species is indicated for liver pains and headaches. The species jenipapo (*Genipa americana* L.), grão de galo (*Cordia nodosa* Lam.) and oiticoró (*Couepia* sp.) are in this category. Excessive consumption can cause blood illnesses.

(4) The sour plants also have strong flavors and are usually found in the sandy region. They are indicated for the treatment of respiratory problems and flu. In this category, we can cite murici-de-tabuleiro (*Byrsonima coccolobifolia* Kunth), pindaíba (*Xylopia frutescens* Aubl.) and guabiraba (*Campomanesia guaviroba* (DC.) Kiaersk.). The sour plants may still be considered wild (high acidity) and domesticated (low acidity). In this case, the wild plants should be avoided by people with stomach illnesses.

(5) The sweet plants are the species appreciated by specialists, probably because of their sweet taste, with few consumer restrictions. For example, banana (*Musa paradisiaca* L.), jabuticaba (*Myrciaria cauliflora* L.), manjelão (*Syzygium cumini* (L.) Skeels) and others. Consumption is indicated for intestinal illness treatment, including worms.

Given in context, the information of the specialists in the region of Sergipe is not only based on the proprieties of the species, but is also based on the relationship of the plant/individual. This relationship shows the strong affinity between humans and their surrounding environment, and this classification becomes an important criterion and is used by specialists to classify biodiversity. This classification and criteria are often related to different environmental conditions, or are associated with the body's effects. According to Canesqui (2007), this can be explained by the relationship established between the community and the natural resources, which is very complex and interferes directly in the food customs, based on traditional knowledge, accumulated and transferred across generations or different cultures.

Food for domestic animals

In this category 22 wild food plants were mentioned (**Table 2**), with 8 used for animals such as cows (*Bos taurus* L.), goats (*Capra aegagrus hircus* L.) and sheep (*Ovis aries* L.). Seventeen Melliferous species were associated with food (pollen and nectar) for exotic bees (*Apis mellifera* L.) and native bees known as jataí (*Tetragonisca angustula* Holmberg), arapuá (*Trigona spinipes* Fabricius) and uruçu (*Melipona scutellaris* Latreille).

In the selection of species used as animal rations, there were two dominant issues for the choice by specialists; the availability of these natural resources in the region and their nutritional potential. In this sense, they categorized the wild food plants into three levels - low, medium and high potential (1 = low, 2 = medium and 3 = high).

In this case, it was observed that especially with the availability of abundant floral resources that have been decisive in the selection for animal feeding, the geographic isolation of the communities forces the use of forest resources. This evidence corroborates the ideas of Diegues *et al.* (2001), asserting that both traditional communities, such as local communities, live with their own system of species classification and selection, which is influenced by geographic isolation, leading the community to use plants for various uses in accordance with their needs. These different uses of plant resources depend upon food supply for the animals' family members, and manufacturing for house construction and folk medicinal practices.

Among the species recognized by specialists, mellifera, the jurema (*Mimosa* sp. N.C. = 9), sabiá (*Mimosa caesalpiniifolia* Benth. N.C. = 8), apple quince (Euphorbiaceae sp. N.C. = 7), candeia (*Eremanthus incanus* (Less.) Less. N.C. = 7) and manjelão (*Syzygium cumini* (L.) Skeels N.C. = 6) were the main ones mentioned.

For the specialist to understand which plants are the best suppliers of pollen and nectar in the region, it is essential to observe the status of beehives and consequently the increase in honey production. In this case, the emic classification performed by the specialists was based on criteria involving the flowering of plants (period and number of flowers) and the quality of the nectar available in flowers.

The knowledge of specialists was essential not only for supplying bees in the hives, but also for differentiating

Table 3 Wild food plants indicated for the local specialist from the region of PARNASI, about the use of wild animal feed. [**N.C.** = Number of Citations. **Uses** = M – mammals (1 – *Agouti paca*, 2 – *Dasyprocta aguti*, 3 – *Mazama americana*, 4 – *Bradypus torquatus*, 5 – Cricetidae sp., 6 – *Tolypentis tricinctus*, 7 – *Euphractus sexcintus*, 8 – *Cebus apella*, 9 – *Stenodermatinae* sp.) B – birds (1 – *Columbina* sp. 1, 2 – *Thraupis sayaca*, 3 – *Penelope* sp., 4 – *Leptotila verreauxi*, 5 – *Crypturellus noctivagus zabelê*, 6 – *Rhynchotus rufescens*, 7 - *Crypturellus soui albigularis*, 8 – *Pseudoseisura cristata*, 9 – *Columbina* sp. 2, 10 – *Molothrus bonariensis*, 11 – *Ortalis* sp., 12 – *Columba trocaz*). **P.U.** = Part of plant used, Fr – Fruit, Fl – Flower. **Origin** = C – Cultivated, E – Spontaneous. **Property** = St – Sweet, So – Sour, Bt – Bitter, Dried – Dr.

Family/ScientificName	Vernacularname	N.C.	Uses	P.U.	O	Property
ANACARDIACEAE						
Astronium fraxinifolium Schott ex Spreng.	Patizeiro	2	M1, M2	Fr	E	St
Schinus terebinthifolius Raddi	Aroeira	2	B2, B8, B10	Fr	C	So
Spondias sp.	Cajazeira	2	M1, M2	Fr	C	St,So
Tapirira guianensis Aubl.	Pau-pombo	7	B4, B5, B7	Fr	E	So
ANNONACEAE						
Xylopia frutescens Aubl.	Pindaíba	2	B6, B7	Fr	E	So
APOCYNACEAE						
Himathantus bracteatus (A. DC.) Woodson	Bumba-boi	7	B5, B9	Fr	E	Dr
ARECACEAE						
Allagoptera arenaria (Gomes) Kuntze	Caxindó	3	M1, M2	Fr	E	Dr,St
Allagoptera sp.	Burizeiro	2	M1, M2	Fr	E	Dr, St
Astrocaryum sp.	Tucun	4	M5, M9	Fr	E	St
Attalea funifera Mart. ex Spreng.	Piaçaba	3	M1, M2	Fr	E	Dr, St
Syagrus schizophylla (Mart.) Glassman	Oricuri	6	M1, M2	Fr	E	St
CELASTRACEAE						
Mayetnus sp.	Bom nome	5	B4, B9	Fr	E	Bt
CHRYSOBALANACEAEA						
Couepia sp.	Oiticoró	2	B3, B11	Fr	E	St
		2	M8	Fr	E	St
Hirtella ciliata Mart & Zucc.	Bula cinza	5	B3, B11	Fr	E	Dr, Bt
EUPHORBIACEAE						
Croton heliotropiifolius Kunth	Velande	1	B7, B9	Fr	E	So
Pera glabrata (Schott) Poepp. ex Baill.	Ganhador	3	B7, B12	Fr	E	So
FABACEAE						
Andira nitida Mart. ex Benth.	Angelim	12	M9	Fr	E	St
Fabaceae sp. 1	Paraíba	1	B6, B11, B12	Fr	E	So
LECYTIDACEAE						
Escweleira ovata (Cambess) Miers	Biriba	3	M6, M7,M8	Fr	E	Dr
Lecythis pisonis Cambess.	Sapucaia de coco	4	M1, M2	Fr	E	St
		1	M3	flower	E	St
MALPIGHIACEAE						
Byrsonima sericea DC.	Murici da mata	10	B9, B12	Fr	E	So
		2	M7	Fr	E	So
Malpighiaceae sp.	Cocão	4	M1, M6	Fr	E	Bt
MYRTACEAE						
Campomanesia sp.	Banheira	3	M1, M7	Fr	E	St
SALICACEAE						
Casearia grandiflora Cambess.	Sapucaia	2	M1, M2	Fr	E	St
		1	M3	Fl	E	St
SAPOTACEAE						
Manilkara sp.	Mirinduba	2	M1, M2	Fr	E	St
URTICACEAE						
Cecropia pachystachya Trécul	Embaúba	8	M4	Fr	E	Dr
VOCHYSIACEAE						
Vochysia lucida Klotzschex M.R. Schomb.	Mangue doce	7	M2	Fr	E	Dr

honey types produced by exotic and native species. This characteristic is important for honey selection, indicating which is for medicinal use and which is for food purposes. This data corroborates the work performed in the Brazilian northeastern region (Marques *et al.* 1997; Costa Neto 2004) with similar evidence of the local etnofaunal knowledge associated with plant species. In this sense, there is an idea among specialists that the quality of honey depends on the species and the flowering period. Thus, this knowledge about the botanical species and wildlife in the region can be translated into a valuable resource, which should be considered in future studies of fauna inventory.

In the selection of botanical species used as animal rations, two issues dominated the choice of species by specialists: the availability of these natural resources in the region and their nutritive botanic potential. In this sense, they categorized the wild food plants into three levels (1 = low, 2 = medium and 3 = high), dependent upon the availability and the nutritional potential.

In this case, especially the availability of floral resources, would have been decisive in the selection for animal feeding, since the geographic isolation of communities forces the use of forest resources. This evidence corroborates that provided by Diegues *et al.* (2001), asserting that both traditional communities, such as local communities, live with their own systems of botanical classification and selection, which are influenced by geographic isolation leading the community to use plants for various uses in accordance with their needs. These different forms of use of wild food plants depend on the kind of food supplying the family members or animals, and the manufacturing of objects and for medicinal use.

Among the species recognized by specialists are mellifera, the jurema (*Mimosa* sp. N.C. = 9), sabiá (*Mimosa caesalpiniifolia* Benth. N.C. = 8), apple quince (Euphorbiaceae sp. N.C. = 7), candeia (*Eremanthus incanus* (Less.) Less. N.C. = 7) and manjelão (*Syzygium cumini* (L.) Skeels N.C. = 6) and they were the majority mentioned.

For a specialist to understand which plants are the best suppliers of pollen and nectar in the region, it is essential to provide the beehives and consequently to increase honey production. In this case, the emic classification is performed by a specialist based upon the criteria involving flowering (time and number of flowers) and the quality of the nectar available in flowers (quality of nectar).

Food for wild animals

In the category of food plants for wildlife, 26 species were mentioned (**Table 3**). Eighteen species were used by mammals, such as agouti (*Dasyprocta aguti* Carleton), paca (*Agouti paca* L.), deer (*Mazama americana* Erxleben), sloth bears (*Bradypus torquatus* L.), bush rats (Cricetidae), armadillos (*Tolypeutes tricinctus* L.)**,** armadillo peba (*Euphractus sexcintus* L.), capuchin monkeys (*Cebus paella* L.) and bats (Stenodermatinae).

Ten species formed the diets of birds such as turtledoves (*Columbina* sp. 1), assanhaço (*Thraupis sayaca*), jacu (*Penelope* sp.), juriti (*Leptotila verreauxi*), zabelê (*Crypturellus noctivagus zabele*), nanbu-pé (*Rhynchotus rufescens*), nanbú (*Crypturellus soui albigularis)*, casaco-de-couro (*Pseudoseisura cristata*), puncaçu (*Columbina* sp.), brió (*Molothrus bonariensis*), araquã (*Ortalis* sp.) and trocaz (*Columba trocaz*).

The majority of species cited for this category are: angelim (*Andira nitida* Mart. ex Benth. N.C. = 12) as food for bats (Stenodermatinae), murici (*Byrsonima sericea* DC. N.C. = 10) food for birds, puncaçu (*Columbina* sp.) and trocaz (*Columba trocaz*), embaúba (*Cecropia pachhystachya* Trécul N = 8), food for sloth bears; (*Bradypus torquatus*), the pau-pombo (*Tapirira guianensis* Aubl. N.C. = 7) used by birds, juriti (*Leptotila verreauxi*), zabelê (*Crypturellus noctivagus zabele*), nanbu-pé (*Rhynchotus rufescens*) and the bumba-boi (*Himathantus bracteatus* (A. DC.) Woodson N = 7) which is used as food by nanbú (*Crypturellus soui albigularis*) and puncaçu (*Columbina* sp.).

The specialists' knowledge on the flora as food for wild animals is fundamental for hunting, because the traps to capture them are set close to those types of plants.

There are criteria for the classification of this group of plants. The specialists link the diet of the animals to two classification criteria: fruit shape (hard, soft, dry and milky) and flavors (sweet, bitter, sour and salty). According to specialists, the hard and sweet fruits are appreciated by mammals, preferably the families of Arecaceae such as dicuri (*Syagrus schiziphylla* (Mart.) Glassman), buri (*Allogoptera* sp.), tucun (*Astrcaryum* sp.), and caxindó (*Allogoptera arenaria* (Gomes) Kuntze). These species have hard fruits with a sweet flavor when ripped.

The local bird population (juriti, puncaçú, araquã, jacú, trocaz, sabelê, asanhaço, brió, casaco de couro, nabú and nabupé) has a preference for dry bitter or sour fruits such as *Schinus* fruits (*Schinus terebinthifolius* Raddi), bula cinza (*Hirtella ciliata* Mart & Zucc.), ganhador (*Pera glabrata* (Schott) Poepp. Ex Baill.) and murici-da-mata (*Byrsonima sericea* DC.). In addition, for the region's wildlife diet, we can find plants such as murici (*B. sericea*) and oiticoró (*Couepia* sp.) which are used by birds and mammals.

This study could provide an important contribution for future studies aimed at the characterization of the flora in the region of PARNASI. However, the logic of understanding shared by the specialists in the agrest of Sergipe follows patterns of evolutionary theories and indicates the availability of fruits, and physiological and morphological characteristics of the floral organs that are chosen as the criteria for food selection.

A vast amount of specialists' knowledge regarding plants as animal feed is important to establish future studies on ecological relationships in order to understand the process of plant dispersion and colonization in the PARNASI region.

CONCLUSIONS

The data from this survey makes it possible to link the theoretical and ethnobotanical principles of reality in the rural communities of Pedrinhas, Ladeira, Caroba and Cajueiro. The involvement of these communities in this survey not only provides information and biological material of the plants, but reinforces the interaction of man and the environment as goals for ethnobiological investigation.

In this research, we observed that specialists from the surrounding communities of PARNASI have a vast knowledge of food plant resources used for many different purposes. For human consumption, the majority of species mentioned were wild flora because of the diversity in the specialist's backyards or home gardens.

In other categories, the specialists maintained an extensive knowledge of wild food plants present in the diet of wild and domestic animals, which contributes to the ecological relationships and studies of wild animals and flora, as well as to the selection of flora appreciated by bees – essential for providing data about pollination and plant species dispersion.

Despite this, there is still a need to investigate the information obtained from local specialists about the relationship of wild food plants associated with fauna.

ACKNOWLEDGEMENTS

The authors are grateful to all residents who agreed to participate in this discussion record; to the Foundation for Support Research and Technological Innovation of the State of Sergipe (FAPITEC) for a scholarship to the first author, and to the biologist José do Nascimento Júnior Elvino for botanical identification of the specimens gathered. The authors thank Dr. Jaime A. Teixeira da Silva for improving the grammar.

REFERENCES

Aguiar Netto A de O (2006) Descrição geral da sub-bacia hidrográfica do rio Poxim. In: Alves J do PH, Garcia CAB, Agruiar Netto A de O, Ferreira RA (Eds) *Diagnóstico e Avaliação da Sub-bacia Hidrográfica do Rio Poxim*, EDUFS/FAPESE, Sergipe, pp 11-28

Albuquerque UP (2005) *Introdução á Etnobotânica* (2nd Edn), Interciência, Recife, 80 pp

Alencar E, Gomes MAO (1998) *Metodologia de Pesquisa Social e Diagnóstico Participativo*, UFLA/FAEPE, Lavras, 212 pp

Bailey K (1994) *Methods of Social Research* (4th Edn), The Free Press, New York, 588 pp

Begossi A (1996) Use of ecological methods in ethnobotany: Diversity indices. *Economic Botany* **50 (3)**, 280-289

Botrel RT, Rodrigues LA, Gomes LJ, Carvalho DA, Fontes MAL (2006) Uso da vegetação nativa pela população local no município de Ingaí, MG, Brasil. *Acta Botânica Brasílica* **20 (1)**, 143-156

Brasil (Ministério da Saúde) (2002) Secretaria de Políticas de Saúde. Coordenação Geral de política de alimentação e nutrição. *Alimentos Regionais Brasileiros*. Brasília, Comunicação e Educação em Saúde, 140 pp

Brandão CR (1981) *Plantar, Colher, Comer*, Graal, Rio de Janeiro, 181 pp

Canesqui AM (2007) A qualidade dos alimentos: análise de algumas categorias da dietética popular. *Revista Nutrição* **20 (2)**, 203-216

Carneiro AM, Irgang BE (2005) Origem e distribuição geográfica das espécies ruderais da Vila de Santo Amaro, General Câmara, Rio Grande do Sul. Porto Alegre, RS. *IHERINGIA* **60 (2)**, 175-188

Chase MW (2009) An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG III. *Botanical Journal of the Linnean Society* **161**, 105-121

Combessie JC (2004) *O Método em Sociologia o que é, como se Faz*, Loyola, São Paulo, 191 pp

Corrêa MP (1984) *Dicionário das Plantas Úteis do Brasil e das Exóticas Cultivadas*, Imprensa Nacional, Rio de Janeiro, 747 pp

Costa Neto EM (2004) Estudos etnoentomológicos no estado da Bahia, Brasil: uma homenagem aos 50 anos do campo de pesquisa. *Biotemas* **17 (1)**, 117-149

Dantas TVP, Ribeiro A de S (2010) Caracterização da vegetação do Parque Nacional Serra de Itabaiana, Sergipe Brasil. *Biotemas* **23 (4)**, 9-18

Diegues ACS, Arruda RSV (2001) *Saberes Tradicionais e Biodiversidade no Brasil* (4th Edn, Vol 4), Ministério do Meio Ambiente, Brasília, DF, 176 pp

Fidalgo O, Bononi VLR (1982) *Técnicas de Coleta, Preservação e Herborização de Material Botânico*, Instituto de Botânica, São Paulo, 62 pp

Fonseca-Kruel VS, Peixoto AL (2004) Etnobotânica na reserva extrativista

marinha de Arraial do Cabo, RJ, Brasil. *Acta Botanica Brasilica* **18 (1)**, 177-190

Gomes LJ, Maroti PS (2006) Estudo socioambiental nos povoados cajueiro e caroba, visando estratégias pra uso sustentável dos recursos naturais In: Alves J do PH, Garcia CAB, Agruiar Netto A de O, Ferreira RA (Eds) *Diagnóstico e Avaliação da Sub-bacia Hidrográfica do Rio Poxim*, EDUFS/FAPESE, Sergipe, pp 199-225

Hawkes K, O'Connell JF, Rogers L (1997) The behavioral ecology of modern hunter-gatherers, and human evolution. London, *Trends in Ecology and Evolution* **12 (1)**, 29-32

Hoft MK, Barik SK, Lykke AM (1997) Quantitative ethnobotany: Applications of multivariate and statistical analyses in ethonobotany. Paris, People and Plants Working Paper

Holmes CM (2003) Assessing the perceived utility of wood resources in a protected área of Western Tanzania. *Biological Conservation* **11**, 179-189

Huai H, Hamilton A (2009) Characteristics and functions of traditional home gardens: A review. *Frontiers of Biology in China* **4 (2)**, 151-157

Kerr WE (1987) Agricultura e seleção genética de plantas. In: Ribeiro D, Ribeiro B (Eds) *Suma Etológica Brasileira* **1** (2nd Edn), FINEP/Vozes, Petrópolis, pp 159-171

Lévi-Strauss CO (1987) Uso das plantas silvestres da América do Sul tropical. In: Ribeiro D, Ribeiro B (Eds) *Suma Etológica Brasileira* **1** (2nd Edn), FINEP/Vozes, Petrópolis, pp 29-46

Lifschitz J (1997) Alimentação e cultura: Em torno ao natural. *Physis – Revista Saúde Coletiva* **7 (2)**, 69-83

Macedo RS (2006) *Etnopesquisa Crítica, Etnopesquisa-Formação*, Líber Livro, Brasília, DF, 179 pp

Marques JGW, Costa Neto EM (1997) Insects as folk medicines in the State of Alagoas. *The Food Insects Newsletter* **10 (1)**, 7-10

Martin FW, Ruberté RM, Meitzner LS (1998) *Edible Leaves of the Tropics* (3rd Edn) Educational Concerns for Hungers Organization (ECHO), North Fort Myers, 194 pp

Martin GJ (1995) *Ethnobotany. A Methods Manual*. *People and Plants Conservation Manual*, Chapman and Hall, London, 292 pp

Mattos JR (1978) *Frutos Indigenas Comestíveis do Rio Grande do Sul* (2nd Edn), Porto Alegre. Publicação IPRNR, 37 pp

Peroni N (2002) Coleta e análise de dados quantitativos em etnobiologia: introdução ao uso de métodos multivariados. In: Amarozo MCM, Ming LC, Silva SMP (Orgs.) *Método de Coleta e Análise de Dados em Etnobiologia e Disciplinas Correlatas – I Seminário de Etnobiologia e Etnoecologia do Sudeste*, CNPq/UNESP, Rio Claro, pp 155-180

Posey DA (1986) Topics and issues in ethnoentomology with some suggestions for the development of hypothesis-generation and testing in ethnobiology. *Journal of Ethnobiology* **6 (1)**, 99-120

Posey DA (1987) Introdução: Etnobiologia – Teoria e prática. In: Ribeiro D, Ribeiro B (Eds *Suma Etnológica Brasileira* **1** (2nd Edn), FINEP/Vozes, Petrópolis, pp 15-25

Prescott-Allen R, Prescott-Allen C (1990) How many plants feed the world? *Conservation Biology* **4 (4)**, 365-374

Rapoport EH, Margutti L, Sanz EH (1998) Mazelas comestibles – Hay yuyos y yuyuos. *Ciencia Hoy* **9 (49)**, 30-43

Sauer CO (1987) As plantas cultivadas na América do Sul Tropical. In: Ribeiro D, Ribeiro B (Eds) *Suma Etnológica Brasileira* **1** (2nd Edn), FINEP/Vozes, Petrópolis, pp 59-93

Vicente A, Araújo GMM, Lírio GP, Santos SC (1997) Descrição parcial e preliminar dos hábitats da Serra de Itabaiana, Sergipe. *Publicações Avulsas do Centro Acadêmico Livre de Biologia, Universidade Federal de Sergipe* **1**, 7-21

Vicente A (1999) Levantamento florístico de um fragmento florestal na Serra de Itabaiana-Sergipe. MSc thesis, Universidade Federal Rural de Pernambuco, 113 pp

Zurlo C, Brandão M (1990) *As Ervas Comestíveis: Descrição, Ilustração e Receitas* (2nd Edn), Globo, São Paulo, 167 pp