Chapter 40
Production and Marketing of Pot-Honey

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40.1 Introduction

A light yellow liquid, translucent, sour and slightly sweet. That description characterizes the honey of indigenous stingless bees or native honey-making bees in tropical America (Nunes 2009). The honey has a flavor different from that of Africanized bees used for beekeeping today, and was noticed by the early settlers of America when savoring honey that the native people used as a natural sweetener, medicine, and in religious rituals. Honey in the Neotropics came from stingless bees, before introduction of the Western honey bee, *Apis mellifera* (Kerr et al. 2005). This delicacy, found in different parts of Brazil and elsewhere, is still not well known to urban connoisseurs. Stingless bee honey carries a universe of components that go well beyond the traditional product of beekeeping. Another wealth is revealed when the honey is put in the mouth: an impressive array of flavors. Acidity, floral aromas and earthy notes are provided in honey from bees such as "jataí" and "tiúba," among other stingless bees (Marques 2010).

Although hundreds of bee species are known to make honey in the Americas, the entire consumption of honey in America is focused on exotic *A. mellifera*, considered the most productive per colony. However, this perception is changing, the market is becoming more selective, and now wants information on products it consumes. This means flavor, aroma, bouquet, and composition from bees such as "jataís," "uruçús," "tiúbas," "canudos," and "mandaçaia." Stingless bee honey occupies a niche market with diverse value, added from natural sources of honey production.

A major concern of the world market is the total elimination of waste and toxic antibiotics in honey, and organic farming is the most promising strategy to market

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such honey. The marketing of honey labeled "socially fair" is also known as "fair-trade," with prices paid above the average market value to help poor communities that have a role in conservation (Paula Neto and Almeida Neto 2005). Honey of native species has the right profile for this segment because its production is developed in regions free of pesticide residues and is also free of antibiotics added by the beekeeper. The labor employed is from poor communities with low environmental impact. The product is stored in pots made with propolis and wax (meliponine cerumen). There are species of high productivity well-suited to fill a niche that includes only 3% of world trade (IBCE 2010).

40.2 Stingless Bee Species and Production of Pot-Honey

Among hundreds of native bee species, some produce honey to satisfy the nutritional needs of the colony, others produce an excess available for humans. Only a few of them are excellent honey producers, like *Melipona*, with species of great potential and widely kept in Tropical America.

The best known pot-honeys are produced by "mandaçaia" (*Melipona quadrifasciata*), "jataí" (*Tetragonisca angustula*), "jandaíra" (*Melipona subnitida*), "papaterra" (*Melipona asilvai*), "canudo" (*Scaptotrigona* sp.), "tiúba" (*Melipona compressipes*), "uruçú verdadeira" (*Melipona scutellaris*), "uruçú amarela" (*Melipona rufiventris*), "xunan cab" (*M. beecheii*). Some, like "jataí," are widely distributed. Others—"papaterra" and "jandaíra," are more restricted to some habitats, and live in savannas known as "caatinga" (Lopes et al. 2005).

Few stingless bee species have been explored in all their technical potential, needed to increase pot-honey production. Stingless bee keeping should be optimized by bee management, genetic control and promotion of bee plant cultivars. The evaluation of meliponine honey production (Table 40.1) is difficult due to traditional practice differences. The colonies are mostly kept in logs or boxes (literally "tenements"), without management and inspection, insufficient forage, and rudimentary techniques of honey harvest. Therefore, it is easy to envisage greater honey production with adequate management. Estimated pot-honey annual yields were collected personally visiting meliponaries, and by searching the literature.

Villar (2002) estimates that 4,000 tons of stingless bee honey is produced in Brazil every year, a volume ten times lower than the national production of 42,000 tons of total honey. About 1 ton of pot-honey is "Paulista" (produced in São Paulo), with the remarkable contribution of "jataí." However, during visits to producers, the author estimates that harvests of native bee honey reach 100 tons per year.

Research conducted by Londono (2011) using the internet, with 35 meliponiculturists, found that 40% of the producers were devoted to honey for sale, but only one was a full-time stingless bee keeper. This activity can be promoted by professional efforts. Well-supported stingless bee keeping may lead to high pot-honey yields, reduction of costs and greater benefits for the producer. The practice of migratory meliponiculture apparently increases honey production some 300%.

Table 40.1 Country of origin and estimated honey production by native stingless bees

Country	Species	Pot-honey annual yield
Australia	*Trigona carbonaria* (*s.l.*) = *Tetragonula carbonaria*	1 kg (Wikipedia 2011)
	Austroplebeia australis	
Brazil	*Melipona asilvai*	1 l (Carvalho et al. 2003)
Brazil	*Melipona fasciculata*	3–4 l (Magalhães and Venturieri 2010)
Brazil	*Melipona flavolineata*	2–3 l (Magalhães and Venturieri 2010)
Brazil	*Melipona mandacaia*	2.0 l (Carvalho et al. 2003)
Brazil	*Melipona quadrifasciata anthidioides*	2.0 l (Carvalho et al. 2003)
	Melipona quadrifasciata quadrifasciata	2.0 l (Carvalho et al. 2003)
Brazil	*Melipona rufiventris*	3.0 l (Carvalho et al. 2003)
Brasil	*Melipona scutellaris*	2–15 kg (Alves, personal observation)
Brazil	*Melipona subnitida*	2.5 kg (Bezerra 2002)
Brazil	*Scaptotrigona*	3.0 l (Carvalho et al. 2003)
Brazil	*Tetragonisca angustula*	1.0 l (Carvalho et al. 2003)
Costa Rica	*Melipona* "*fasciata*" = *M. costaricensis*	2.5 kg (Cortopassi-Laurino et al. 2006)
Costa Rica	*Melipona beecheii*	2.5 kg (Cortopassi-Laurino et al. 2006)
Indonesia	"*Trigona*" (*s.l.*)	1 kg (Soekartiko 2011)
Mexico	*Melipona beecheii*	2.5 kg (Cortopassi-Laurino et al. 2006)
Paraguay	*Scaptotrigona*	3.0 l (Carvalho et al. 2003)

40.3 Marketing of Meliponine Honey

The world production of honey has increased 4.6%, honey export increased 35.6%, and honey import 38.8%, during 2002–2003. This fact means that lucrative external markets caused a decrease of internal honey consumption in several honey producing countries. Brazil doubled the value of honey exports in 2008, with a record of US$ 43.57 million, increasing by 42% the revenue of 2007, US$ 21.2 million. In 2010 Brazil increased its export by 54%. The exported honey volume also increased, from 12,900 to 18,270 tons in 2010 (IEA 2005).

The world market of meliponine honey is still in its infancy and restricted to particular initiatives in Brazil, Mexico, Costa Rica, and Australia, with regional impact. According to the IBCE (2010), current tendencies in developed countries consider consumer attitude and preference toward organic honey and special honey. This interest to consume organic products is caused by consumer awareness of environmental protection, causing an increase in organic honey demand.

Therefore meliponine honey is becoming better known while production increases. Pot-honey is becoming more familiar and consumed for its singular features and is widely appreciated, considered as an artisan bee product with organic origin, produced in natural environments of tropical nature. In Fig. 40.1 some pot-honey packaging in sachets, bottles, and ceramic.

Fig. 40.1 Commercial presentation of pot-honey. (**a**) Sachet presentation of Brazilian honey produced by *M. compressipes*, known as "tiúba" in Maranhão, (**b**) bottled *Scaptotrigona* honey also from Brazil, (**c**) bottled Australian honey produced by "sugarbag" *Tetragonula carbonaria*, (**d**) jar of "urucú," bottle with artisanal cover of "tiúba" from Brazil, jar of "pisilnekmej" *Scaptotrigona mexicana*, from Mexico, and ceramic "puño" to bottle Bolivian honey produced by "suro negro" *Scaptotrigona polysticta*. Photos: (**a-b**) R.M.O. Alves, (**c**) T.A. Heard, (**d**) P. Vit

40.3.1 America

Consumption of pot-honey in Mexico is as old as food, but mainly as medicine (see Chap. 15) and for use in religious rituals. However, due to low productivity of the colonies, the production is consumed mainly by the stingless bee keeper and the local community (Maganã 1998). The growth of beekeeping has caused a disincentive among farmers to raise native bees, but there is a movement now to preserve traditional stingless bee keeping. The bees considered best for honey are *M. beecheii* and *Scaptotrigona* (Quezada-Euán 2005). In Central America there are *M. beecheii* and *M. fasciata* (currently known as *M. costaricensis*, *M. panamica*, *M. melanopleura*, and others, Roubik D, personal communication) primarily in Costa Rica (Wikipedia 2011).

In South America, economic growth led to increased purchasing power and providing better education, which also increased the consumption of honey, no longer an unusual product in daily diet. Currently the market for bee products experiences tremendous growth, fueled mainly by exports and improvement in the internal market (Koshiyama et al. 2011). In Brazil, the consumption of honey from stingless bees is still small mainly due to availability constraints rather than ignorance about the product. In the north and northeast, despite low availability the honey is very popular and consumed often. However, the increase in consumption is subject to quality improvement and increased honey production. Meliponiculture is less developed in the south and southeast of the country; initiatives there are aimed at conserving colonies, except for the State of Paraná with the keeping of "jataí" (*T. angustula*) and "mandaçaia" (*M. quadrifasciata*) whose objective is the production of pot-honey (Laginsky 2011).

40.3.2 Africa, Asia and Australia

No quantitative information is available for most of Asia. However, like Asia, Australia has no large bee like *Melipona*. In Australia, *T. carbonaria* and *Austroplebeia australis* are the main native honey sources (see chapter in present book). According to Klumpp (2007) a hive of Australian stingless bees produces <1 kg per year. The product is sold in jars of 50 ml at a price of AU$ 30.00 for consumers in urban centers, where it is appreciated for its taste and strong acidity.

There is certainly a growing interest in meliponiculture in Africa (Kwapong et al. 2010). As Kajobe indicates (see chapter in present book) there is information being gathered on the biology of stingless bees, and the management techniques, many of them gleaned from work in the Neotorpics; there will soon be much more data on practices and commercial preference in pot-honey consumption.

40.3.3 Production and Consumption of Pot-Honey

The market for native honey experienced an increase in recent years, accompanying the increase in consumption and insufficient production of honey of *A. mellifera*, especially in the greatest traditional Brazilian beekeeping areas (North–Northeastern Brazil).

Traditionally known as the greatest producer of native honey, the Northeast serves as the development center, with the largest pot-honey producers located in the states of Maranhão, Bahia, Rio Grande do Norte, Pernambuco, and Piauí. This large region has highlighted the technical aspects of meliponiculture specialists who obtain the highest productivity per colony. Meanwhile the Northern Brazil states of Amazonas and Pará have outstanding potential, both in number of species and

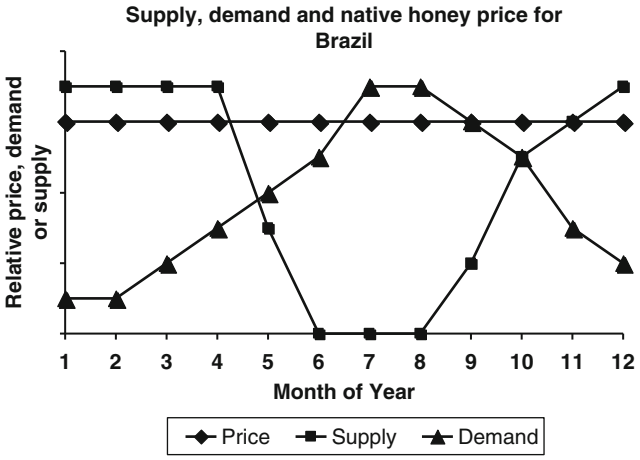

Fig. 40.2 Market behavior, variation in supply, demand, and price of pot-honey

production. The investments made by government and the private sector foster studies and projects that expand the number of species and honey production.

Honey is marketed regionally and considered a seasonal, handcrafted or "artesinal" product. The statistics on colony productivity are estimates, mainly due to lack of product regulation and mode of regional marketing, without official records. Data collected on trips to interview beekeepers allows one to sketch a graph of market behavior of honey from stingless bees in the main producing regions of Brazil (Fig. 40.2).

The consumption of honey from native bees is expanding, driven by the appeal health, social "fairness" and product appearance. With the range of color from white to light amber, honey from native species has a very strong appeal in consumer preference. Other factors that enhance value in production are a pollution-free environment and income, observing principles of sustainable environment.

Oliveira et al. (2005), based on data analysis and research conducted in the State of Pernambuco (Brazil) observed that 86% of respondents said they had consumed honey. Of those, about 70% claim to eat honey from bees of the genus *Apis* while 30% consumed honey from native bees. In Bogotá (Colombia), a recent survey revealed that almost 70% of consumers would not buy pot-honey produced by *Tetragonisca angustula* because it is unknown. Indeed, consumers of "angelita" honey in this capital city are some 80% middle class of socioeconomic strata 3 and 4 (Rodríguez Reyes 2007).

Frequency of native bee honey consumption showed around 8% on a monthly basis and 92% annually. When questioned as to use, the predominant response was that this was primarily used as a sweetener and folk remedy (Oliveira et al. 2005). Seasonality and unfamiliarity of the consumer with product characteristics constitute obstacles to increasing the consumption of pot-honey, as visualized in Table 40.2.

Table 40.2 Periods and causes guiding consumption according to pot-honey supply in north and northeast Brazil

Month	Supply	Causes
January to March	Production and high supply	Hottest time of year Habit of low traditional use Economic factors, school and other costs, fairs, festivals Lack of information on benefits of honey
April to June	Little supply	Cool and rainy weather High honey consumption (folk remedy use) Honey crystalization, difficult to consume
July to September	Lack of supply	Very cool and rainy weather High folk remedy consumption
October to December	Little supply	Beginning of the hot season Reduced consumption related to heat

From: Alves, personal observations during 30 years

It is important that price remain stable throughout the year. The large difference between supply and demand causes disincentive to the farmer, who needs guidance on how to reduce the effects of factors that create this relationship.

40.3.4 Cultural Aspects of Pot-Honey Consumption

Vilckas et al. (2001) reports that the frequency of honey consumption decreases in lower social strata. In the case of low-frequency, they argue that it is lack of custom, it is fattening, or they do not care for it, while some believe it increases their blood cholesterol, is too expensive a product, or is superfluous. Individuals in higher strata can be more knowledgeable and look for special honey types, such as unifloral and organic honey. However, pot-honey is better understood, from direct experience, in rural and forest villages.

Native honey is well known to consumers in rural areas, usually people with lower incomes and little education, but for whom cultural factors are of great importance. Families generally maintain colonies in the yard for use in remedies as needed.

In Bolivia, the honey of stingless bees, in addition to food characteristics, is widely used in traditional medicine to treat eye diseases, and respiratory and digestive maladies (IBCE 2010). Honey is characterized as a remedy, is consumed only in times of onset of colds and respiratory infections, yet in these times the production is lower.

Attempts at honey processing using dehumidification caused an unusual situation. Accustomed to native bee honey as very fluid (less viscous) and sour, processed honey was initially refused because of similarities with the honey of *A. mellifera* (dense and sweet). Whereas honey of *Apis* might be eaten with a spoon, that of stingless bees is often drunk as though a liquor.

Another important feature that restricts consumption is the crystallization of some honey that leads consumers to not accept the product, claiming it has been adulterated by addition of sugar. However, in southern Brazil the crystallized honey of *T. angustula* and *M. rufiventris* is usually consumed.

40.3.5 Low Production and Seasonality of Pot-Honey

The low productivity of colonies is a significant consideration in the marketing of honey from stingless bees. Due to lack of technology to get the most of the colonies the producer realizes an average of 1 l per hive per year in species that have potential for 10 l per hive per year, as in *M. scutellaris*. In Manaus, *M. fasciculata* productivity reaches 3 kg per hive per year. In the state of Rio Grande do Norte meliponines produce about 2.5 l (Vollet Neto et al. 2011). A group of 30 native bee hives produces on average (depending on the flower) 5 pounds of honey per hive, totaling 150 pounds of honey from native bees in a year (CESMAG/COIMP 2007). The lack of product is a factor discouraging both the grower and the consumer and causes disruption in the consumption process.

The major producing regions and greatest number of stingless bee species are in the humid forest biome with a dry season during the months at the end and beginning of the year. In the savanna biome (arid) and in the cerrado, production is greater in mid year, when the rains are reduced. Production of pot-honey is fundamentally different in its timing in the two regions. However, when human discomfort and virus-incuded colds are most frequent—leading to a consistently high demand for pot-honey as a remedy for sore throats and colds, tends to be seasonal and often associated with the beginning or end of the rainy season. Thus, the cerrado and the moist forest somewhat complement each other in the timing of honey production or demand.

40.3.6 Quality of Pot-Honey

Methods of destroying the pots when turning the hive or box supers over to allow drainage into a sieve produce honey of lower quality, constituting a barrier to consumption in larger population centers. The honey harvest is done by piercing or squeezing the pots of honey and pollen, without the need for personal hygiene preparation, now required for the SIF (Federal Inspection Seal), i.e., requirement that harvest is done in a sterile place that is clean and has well ventilated facilities, and includes a sink (Melo 2010).

Use of modern technology for honey extraction—such as a suction device—is frequent in Brazil. This allows improvement of product quality, as regulatory governmental bodies have been aiming to increase honey consumption. A major obstacle to honey of native bees in world trade is that the Codex Alimentarius Commission

Table 40.3 Price of honey according to the bee species and location of production

Bee species	Price (USD/kg)	Price (BR$/L)	Locality
Melipona asilvai	7.00–10.00	20–30	Bahia
Melipona compressipes	10.00–18.00	30.00–50.00	Maranhão
Melipona fasciculata	7.00–9.00	20.00–25.00	Pará
	7.00	20.00	Manaus
Melipona flavolineata	10.00–13.00	30.00–40.00	Piauí
	9.00–12.00	25.00–35.00	Amazonas and Pará
Melipona mandacaia	7.00–12.00	20.00–35.00	São Paulo
Melipona mondury	10.00–18.00	30.00–50.00	Bahia
Melipona quadrifasciata	9.00–21.00	25.00–60.00	Bahia
Melipona scutellaris	10.00–18.00	30.00–50.00	Bahia
	25.00	70.00	Alagoas
	35.00	100.00	Pernambuco
Melipona subnitida	7.00–10.00	20.00–30.00	Bahia
	12.00–18.00	35.00–50.00	Rio Grande do Norte
Tetragonisca angustula	21.00–32.00	60–90	Bahia/Paraná
Scaptotrigona sp.	7.00–10.00	20–30	Bahia/Pará

From: Alves et al. 2005 (updated 2011)

only recognizes honey produced by *Apis* (Vit et al. 2004; Quezada-Euán 2005; Souza et al. 2006), and pot-honey chapters in the present book (Vit, Almeida-Muradian, Fuenmayor et al., Dardón et al., Ferrufino and Vit).

40.3.7 Cost-Value-Price

The value of honey in the market is a function of quality, presentation, and more recently, certification as organic produce, which adds value and may raise the price by 50%. The price of honey varies according to the site and producing species (Table 40.3).

The price of honey produced by stingless bees can reach a value up to 1,100% higher than the common honey, ranging between BR$40 and BR$100 a pound, against BR$3 a pound of honey from the traditional *A. mellifera* (Villar 2002).

When asked about the value of a liter of honey, consumers shopping at "Garanhuns" in the State of Pernambuco indicated an average of BR$ 15.00 per kg as the ideal price for genuine honey of *A. mellifera* (Oliveira et al. 2005). The short supply of native honey places the product on the market with values that may exceed BR$ 30.00 per kg. In Manaus, 1 kg of honey costs BR$ 20.00 and production is 3 kg per hive per year (Portal Extraction 2011). In Maranhão prices range from BR$ 6.00 to BR$ 18.00 for packages of 200 g (INVESTENE 2011). On the west coast of the Yucatán Peninsula the price of honey from *M. beecheii* ranges from USD 2.00 to USD 15.00 per liter (Maganã 1998).

Alves et al. (2005) reports that the difficulty in calculating the price of honey stems from the lack of standardization of protocols, which prevents establishment of basic pricing. Although stingless bee keepers sustain no losses by not marketing their product, the expansion of production could force down the price. As costs for maintaining the bees are low, the activity allows the production of a relatively inexpensive food with a strong commercial appeal (CESMAG/COIMP 2007).

40.3.8 Vending Locations of Pot-Honey

The low yield associated with lack of regulation affects consumption of the product. Currently the production is sold "directly from the hive" or as on-site production, usually in the home, place or establishment of the producer, leading to a special relationship where trust in the product is more important than the amount paid. Another factor is the lack of registration by the government, which otherwise would allow honey to be sold at all pharmacies and supermarkets, considered by Magalhães et al. (2007) to be places of greater access to the product by buyers.

40.3.9 Packaging

In producing regions honey is sold in glass or plastic containers with a capacity of 700–1,000 ml. Glass jars are the best and most suitable, but plastic predominates because it costs less. Modern beekeepers use narrow or wide mouth jars with a capacity of 50, 150, 200 or 500 ml, allowing higher consumption, better product presentation and higher added value. In Maranhão, Vilckas et al. (2001) found honey of "tiúba" (*M. compressipes*) sold in glass containers with a capacity of 205, 315 and 460 g.

40.3.10 Legislation

The lack of regulation of native bee honey makes it impossible to trade efficiently, hindering consumer access to the product and discouraging activity. In Brazil there are initiatives for the characterization of honey in order to provide benefits for its regulation. In the state of Bahia, Brazil the legislation for pot-honey marketing is already in the planning design stage. To my knowledge, as informed by Vit P (see her chapter on *M. favosa* honey in this book), the information provided by Nates-Parra G during the regulation process for honey in Colombia included pot-honey produced by native bees in the annex (ICONTEC 2007) after the publication of their suggested standards (Souza et al. 2006).

40.4 Strategies to Increase the Production and the Consumption of Pot-Honey

40.4.1 Production

The production process in animal husbandry obeys the equality of the variables feeding-management-genetics. This implies that nourishment is provided in times of shortage of flowers, using deployment and improvement of "bee pastures," performing management operations periodically, and performing selection of the best queens so that the producer is able to get the maximum possible production, and with lower costs.

The deployment of meliponicultural "grazing" contributes to increased production and also to improving honey quality. The supply of trophic resources (nectar, pollen and resin) comes from existing plants, and maintenance of native species should encourage the beekeeper to introduce flowering plants recognized for increasing nectar production potential of the pasture. Unlike the honey bees, stingless bees have not such an extensive foraging area (Roubik 1989) thus improvement of available floral resources is a possibility that can be pursued profitably by an individual beekeeper. Otherwise, spreading plants that are profitable has a minimal impact on bee forage within foraging range.

The utilization of efficient, timely and low-cost, hive inspection, calendars of beekeeping activities, control of enemies, colony division, equipment for harvesting and processing of honey allow for increased production through organization of time and less waste of product. The choice of the best queens allows better development of the colonies for more efficient storage of honey.

The supplementation of nectar and pollen through the use of artificial food allows maintenance of colonies to be standardized, reducing losses and allowing more efficient management of colonies.

40.4.2 Consumption

The current trend in developed countries, especially in the European Union includes consumers seeking organic and other special honey. For such consumers honey is a natural product, pure and healthy. It is a natural product that has several properties which improve health and has always been valued for its therapeutic qualities (IBCE 2010).

There are several strategies to expand markets for honey of stingless bees, such as apitherapy, to stimulate consumption in various areas, greater media coverage, and reducing the price to the consumer (Paula Neto and Almeida Neto 2005). In addition, the use of standardized packaging—with labels and information—participation in fairs, exhibitions, and publicity in schools all are excellent tools for effective marketing and merchandising.

40.4.3 Cooperative Marketing of Pot-Honey

Established in regions distant from the consumer centers, perishable and seasonal native bee honey production forces the producer to seek other markets through trade shows and exhibitions. Marketing honey in smaller packages can increase income and encourages consumption with greater frequency.

In the state of Rio Grande do Norte, a stingless bee keeper sells about 300 gallons of honey within the state only in packages of 200 ml (Lopes et al. 2005). In a survey conducted by the author, the honey sold in packs of 1 l is consumed within a year by family of three. The pack split into small sachets of honey is the best method for stimulating consumption and reaching mainly children—future consumers of honey.

A strategy to increase consumption is to form associations or cooperatives of producers, making it easier and less costly to disseminate information and increase consumer confidence in the product. For an individual to produce and market a product is extremely difficult, even if they are a great producer. It may be that small producers, associating with each other, will accomplish the task. It may be an association or a group that shares the same interest (Melo 2010).

40.4.4 Processing and Storage of Pot-Honey

The use of effective preservation methods provides honey quality insurance and allows longer shelf life. Currently used methods are refrigeration, maturation, pasteurization, and dehumidification (see Chap. 10), which conserve physicochemical and organoleptic properties (Alves et al. 2007). This activity could facilitate regulation by government agencies.

40.5 Major Initiatives of Pot-Honey Production in Brazilian States

Maranhão—Commonly found in the State of Maranhão, the culture of tiúba proved viable commercial and socially. Each year, a colony can produce up to 300 kg of honey. In each community there are about ten families of "meliponicultors" as stingless bee keepers are called (INVESTENE 2011).

Generating income, promoting social inclusion and preserving native species, meliponiculture with the tiúba bee (*Melipona compressipes*) has changed the lives of 18 communities in the semiarid region of Maranhão. The project was called "Native Bees," developed by Maranhão for natural conservation and the Federal University of Maranhão since 2001 (INVESTENE 2011).

The commercial manager of the Cooperative Agroecological Meliponary "Baixada Maranhaense," Luis Pedro, reports that since 2005 a project was implemented aimed at increasing production and quality of honey from *M. compressipes*.

In 2011 there were 12,000 colonies in honey production. They produce 15 tons annually, sold in the regional market and in part in fairs, exhibitions and events across the country.

Amazon—Honey production is quite impressive, though very large distances and logistic difficulties hinder the flow of the product and marketing. The number of colonies is about 80 colonies per individual stingless bee keeper, with a production of 2 kg annually per colony. Projects involving government agencies and associations have the objective of significantly increasing production and selling abroad as well as helping residents to find sustainable income. A liter of pot-honey produced by the community has a value of BR$ 40, but can reach BR$ 80. In each village 150 hives are maintained and each produces an average of 3 l of honey, which is little. This is because, apart from being marketed, it is also consumed by the indigenous people (INOVABRASIL 2011).

Bahia—In the State of Bahia honey production is sourced from producers possessing few colonies, focused on productivity and honey quality. The largest producers are in the central, north, and northeast part of the state, with a mean of 30 colonies per producer and 2–5 l per hive per year. The bee species used are *M. mandacaia*, *M. quadrifasciata*, *M. scutellaris*, and *M. mondury*.

Paraná—In 2007 the Breeders Association of Native Bee Conservation Area Guaraqueçaba (Acriapa) was created. We are already in the third honey harvest. The first two occurred in the summer of 2007–2008 and in late 2008 they were very modest, 30 and 40 pounds, respectively. The last harvest, in February, was 130 pounds, considered very good. The product is currently being sold in bottles of 65 g, priced at BR$ 7.00. According to our calculations, it is estimated that the stingless bee-keeper with the highest production should earn BR$ 1,200 annually (Laginsky 2011).

Rio Grande do Norte—Paulo Menezes is one of the largest suppliers of pot-honey to supermarkets and retail chains in the region. The stingless bee product is sold for up to BR$ 60.00 a gallon, compared to an average of BR$ 5.00 for *A. mellifera* honey. In 2004, Menezes produced 300 l of honey, an average of 1 l per hive. The entire product was sold to supermarkets in Rio Grande do Norte and Fortaleza, and to buyers from Brasilia and Rio de Janeiro. The sales yielded no less than BR$ 18,000 a year. “If you divide by 12 months, it was an income of BR$ 1,500 per month,” says the producer, satisfied with the result (SEBRAE 2005).

Rio Grande do Sul—Stingless bee keeping for pot-honey production is already a reality for family farmers in the Sun Valley Center for the Support of Small Farmers. The bee leading the way is *Tetragonisca angustula*, which is popularly called “jataí.” Beekeeping there allows diversification and can be integrated into forest plantations, fruit and food crops, also contributing to the increase of agricultural production. Recently 1.5 pounds of honey has been harvested per colony (Mezziga 2011).

The stingless bee keeper João Batista Ferreira, in the municipality of Belterra, Pará, is testimony to traditional knowledge and the conservation of Meliponini. Currently, “Mr. John” manages 23 species of stingless bees with an average production, among them, ranging from 0.5 to 5 kg per hive per year. The main producing species are *M. fasciculata* and *Scaptotrigona*. Beekeeping contributes a significant part of family income (Ferreira and Rebello 2005; Lopes et al. 2005).

Sergipe—Bee keeping is encouraged in communities throughout the state. Courses and meliponary community building are the means used to organize and improve food quality, and generate income for residents in rural areas. The honey produced is totally consumed by the regional community and marketed in the same establishment.

40.6 Concluding Remarks

Meliponiculture is a fundamental activity that maintains communities by revenues and improvement in quality of local products. Joint public and private strategies are needed for channel marketing to get pot-honey into the customer's hands. Increased pot-honey demand will benefit meliponiculture. Integrating modern technology with traditional methods, and merchandising of native bee honey, promotes native species use and socially fair policies with a consumer product.

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