

2. Cultural aspects of meliponiculture

Talk given at Universidad de Los Andes, Mérida, Venezuela, May 2007.

Translation authorized by the Faculty of Pharmacy and Bioanalysis, Universidad de Los Andes.

SOUZA Bruno A, LOPES Maria Teresa R¹, PEREIRA Fábila M

Bee Research Center, Embrapa Mid-North. 5650 Duque de Caxias ave, Buenos Aires, P.O. Box 01, Zip code: 64006-220. Teresina, Piauí, Brazil.

* Corresponding author: Bruno de Almeida Souza, Email basouza@gmail.com

Received: October 2011; Accepted: June 2012

Abstract

Some ancient cultures from Central and South America had close contact with stingless bees. Their representation in decorations, drawings and sculptures is common in various indigenous groups, as part of their cosmology and relationship to the world. This group of social insects also represents an important source of food and income (honey, wax, resin, larvae and pollen). The use of these bees and their products is reviewed in this chapter, mainly regarding Brazilian culture.

Key words:

Culture; indigenous groups; stingless bees; food source; income source; religious expression

Introduction

Insects are nearly ubiquitous among cultures, and a considerable number of superstitions and symbolic adaptations with insect themes are known (Hogue, 1987). Their representation in decorations, drawings and sculptures is common in various indigenous groups (Rodrigues, 2005).

Certain cultures from Central and South America had especially close contact with stingless bees (Apidae: Meliponini). This group of social insects represented an important supply of resources (honey, wax, resin, larvae and pollen), and also formed part of religious cosmology and relationships with the world (Rosso et al., 2001).

In the Americas, especially before the discovery and conquest of this continent, the keeping of these bees was an important part of religious customs, food habits and trade of many native peoples (Zamora and Alvarez, 2004). Keeping colonies of several bees was common in parts of Latin America, in particular the species *Melipona beecheii* in Mexico, and

Tetragonisca angustula, *M. scutellaris* and *M. compressipes* in Brazil.

Despite the presence of several indigenous groups in Mexico when the Spanish conquistadors arrived in the XVI century, the Maya were those with the longest tradition of stingless bee keeping. This activity was an integral part of social and religious life of this people, as well a vital part in the local economy due to the trade of honey for therapeutic and domestic purposes, as a sweetener and in the preparation of fermented beverages, in addition to waxes and resins (Cortopassi-Laurino et al., 2006).

In Brazil, a country with more than 227 indigenous ethnic groups, the Kayapó were the ones that stood out in such activity. Even today they are still considered the greatest experts in traditional keeping of stingless bees. Considering the diversity of indigenous people and the various ecosystems that they inhabit, it is likely that a lot of indigenous knowledge regarding the classification, biology,

ecology and management of bees is still to be discovered (Villas-Bôas, 2008).

2.1 Uses of stingless bees in the Americas

Since ancient times, insects have been used directly or indirectly with various purposes such as in human medicine in different cultures worldwide (entomotherapy). There is the record of the use of insect larvae by the Maya for therapeutic purposes. Those larvae feed on dead tissues where bacteria that can cause gangrene thrive (Zimmer, 1993 apud Costa-Neto, 2002).

Also, the products of bees have great importance in folk and modern medicine as a potential source of drugs. An example of this application was registered in 1989 by Calderon Espina and refers to the notable antiseptic effect of topical application of honey in obstetric surgery. Propolis has been reported to present several pharmacological properties such as anti-inflammatory, antioxidant, antimicrobial, antiviral and antineoplastic activity (Kujungiev et al., 1999; Menezes, 2005; Lustosa et al., 2008). Besides medical applications, bees and their products are still nowadays intensively used by indigenous groups from Central and South America with different purposes (Sommeijer, 1999).

The rediscovery and record of these potential uses, including zootherapeutic, as well as the development of research with these traditional populations—ethnoscience—represent an important contribution to debates on biodiversity, providing new opportunities for cultural and economic valuation of animals previously considered 'useless' (Costa-Neto, 2002; Ballester, 2006).

2.2 Food and applications

In the history of humanity, honey was one of the first sources of sugar, especially in periods prior to the introduction of sugar cane (*Saccharum officinarum*, Poaceae, and the Western hive bee, *A. mellifera*).

In Brazil until the XIX century, honey from stingless bees was used as food by indigenous people and settlers, and its wax by Jesuits for candlemaking. There are also reports on the knowledge of the Kayapó related to the high quality nectar supplied by some flowers. These flowers were visited by stingless bees, and provided honey with good consistency and flavor (Hollanda, 1946; Cortopassi-Laurino, 2002).

Even today, in many countries from Latin America, as in other regions, stingless bee honey is frequently consumed, often more as a medicine than as a sweetener or food (Cortopassi-Laurino et al., 2006).

Consumption of stingless bees by humans was also observed by Ballester (2006) among the Brazilian indigenous Kaiabi. The larvae of these bees are used in the daily diet of the tribe. Its consumption is usually done in places where the colonies are opened and destroyed, and the surplus taken to the tribe for later consumption.

According to Kerr (1987), there are records of the use of cerumen (a mixture of wax and resin) of these bees by South American natives for waterproofing baskets for the transport of liquids. Similar applications of the wax produced by *A. mellifera* and cerumen of *Frieseomelitta doederleini* were found by Sampaio et al. (2009) among the indigenous Pankararé, from the State of Bahia, Brazil. The cerumen produced by that stingless bee is also used in the making of musical instruments, as glue for fixing parts, as caulk mass to seal vessels and cans, bottles and plastic boxes, for polishing wood, for strengthening and lubrication of ropes used in bows, and candles.

2.3 Cultural and religious expressions

The cultural importance of stingless bee species has been recorded over time by traditional communities. The Maya, for instance, reported in their Codex, through ideographs, knowledge of the "xunan-kab" *M. beecheii* (Cortopassi-Laurino et al., 2006). The information contained in one of these codices, the Codex Madrid (formerly Codex Tro-Cortesian) deposited in the Museum of America in Madrid, describes the close relationship between the Maya and the stingless bees on religious issues and cosmology. Specific ornaments were also developed, representing sacred bees and a bee-God (Cappas e Sousa, 1995).

According to Vail (2006), researchers have found that some codical almanacs in the Maya Codices functioned as real-time instruments to document important astronomical events; others were used to schedule rituals as part of the 52-year calendar that guided civic and religious life in Mesoamerica. Regarding the bees, the Mayan rituals were "fertility rites". This was of major concern in the Maya world, since there is no food without fertility (González, 2009).

Among the Maya and Nahua, the custom of adding honey of *M. beecheii* to drinks, offered to their gods during religious ceremonies, is still maintained, besides its use in folk medicine (Zamora and Cappa e Sousa, 2000).

In Brazil, the the Guarani-m'byá tribe uses honey, wax, cerumen, propolis, geopropolis (the propolis

made only by certain stingless bees), pollen and the bees in larval and other stages. They use them as food or to prepare potions for traditional medicine, spiritual and contemplative activities, as well as in handicrafts (Rodrigues, 2005). Ballester (2006) reports that honey of *Tetragonisca angustula* and *Melipona oblitescens* is used for medicinal purposes by Kaiabi in Brazil. This tribe also recognizes the honey produced by *Lestrimelitta* as hazardous to health, and that *M. oblitescens* has unhygienic habits, being observed on jaguar feces. An approach to the use of honey from stingless bees for medicinal purposes is presented in Molan (1999), Obiols (2004), Cooper (2005), and Jull et al. (2009).

For the State of Bahia, Costa-Neto (2002) recorded application of stingless bee products in traditional medicine. However, this information requires further scientific validation.

2.4 Source of income

Throughout history, honey has been used as a commodity and for tax payment in Yucatán. Historical references suggest that the techniques of beekeeping are still very similar to those used in prehistoric times, except for minor changes (Weaver and Weaver, 1980).

In Costa Rica, honey and cerumen were products sold by indigenous people to pay taxes to the settlers, and the cerumen, known as wax of Campeche, was exported to Spain. The inhabitants of the Nicoya peninsula kept stingless bees. Their honey production had fueled the national market until the early XX century (Ramírez and Ortíz, 1995 apud Zamora and Alvarez, 2004).

In Paria Grande, located in the Venezuelan State of Amazonas, the Asociación Civil Red de Manejo Sostenible de Abejas de Amazonas has supported, through technical assistance, finance and logistics, the development of stingless bee beekeeping. Likewise, the "Asociación Cooperativa de Meliponicultores Warime" has developed activities with stingless bee beekeepers, supporting the handicrafts made with cerumen (Pérez and Salas, 2008) (Figure 1); see also wax secretion by *Melipona scutellaris* (Figure 2), which is mixed with resin to form cerumen.

2.5 Songs and poems

The stingless bees are also important constituents of ethnobiology of Brazilian indigenous people. The Kayapó, for instance, have named and classified about 34 species



Photograph: B.A. Souza

Figure 1. Handcraft of Asociación Cooperativa de Meliponicultores Warime, Paria Grande, Venezuela, (a,b) using stingless bees cerumen and natural fibers by Mr. Alfonso Pérez, from Professor Patricia Vit office.



Photograph: B.A. Souza

Figure 2. Secretion of wax by *Melipona scutellaris* worker, Camaçari, Bahia, Brazil

of bees, in which nine were considered managed or semi-domesticated (Cortopassi-Laurino et al., 2006). Similarly, the Kaiabi tribe studied by Ballester (2006) recognizes a total of 27 ethnospecies of stingless bees. They know about their preference for an environment with greater diversity of plants and animals, the plant species preferred by bees for nest building and food, besides the defense strategies and the amount, density, color and taste of their honey.

Much of this tradition persists to identify bees in Brazilian popular culture, using names like jataí, uruçú, tiúba, mombuca, irapuá, tataira, jandaíra, guarupu and manduri (Kerr et al., 1996).

Texts of the song "Mel" (which means honey in Portuguese) by Caetano Veloso and Waly Salomão, and the poetry of Francisco Romano, are transcribed below. In these texts are some common names of stingless bees, which may refer to the following species: *Leurotrigona muelleri* "lambe-olhos", *Scaptotrigona depilis* "torce cabelos", *Lestrimelitta limao* "vamo-nos embora", *Frieseomelitta varia*

"moça-branca" and *Oxytrigona tataira* "tataira", among others.

"Mel"

(Caetano Veloso / Waly Salomão)

“(…) *É meio-dia, é meia-noite, é toda hora
Lambe olhos, torce cabelos, feiticeira vamo-nos
embora
É meio-dia, é meia-noite, faz zumzum na testa
Na janela, na fresta da telha
Pela escada, pela porta, pela estrada toda a fora
Anima de vida o seio da floresta
O amor empresta a praia deserta zumba na orelha,
concha do mar
Ó abelha, boca de mel, carmin, carnuda, vermelha
(…)”.*

Poem written by Francisco Romano (1840-1891)

Source: Nogueira-Neto (1997)

*“Quando chove as abelhas
Começam a trabalhar:
Moça branca e a pimenta,
Mandaçaia e mangangá;
Canudo, Mané-de-Abreu,
Tubiba e irapuá*

*Ronca a tataira,
Faz boca o limão,
Zoa o sanharão,
Trabalha a jandaira,
Busca flor a cupira
Faz mel o enxú,
Zoa o capuchú,
Vai a fonte a jataí,
Campeia o enxuí,
Faz mel a uruçú.”*

In the following texts, the song "Minha Fulô" by Luiz Gonzaga and Dantas, and "Morena Tropicana" by Alceu Valença, some common names of Brazilian stingless bees also appear, evidently *Melipona mandaçaia* "mandassaia", *Oxytrigona tataira* "tataira", *Trigona spinipes* "sanharó", and *Melipona scutellaris* "uruçú". Additionally, in "Minha Fulô"

information is provided on plants known by the author and visited by the bees that produce quality honey "Faz mel que admira", apparently *Tabebuia* sp. "pau d'arco", *Aspidosperma* sp. "pau pereiro", *Senna* sp. "canañistula" and *Cleome* sp. "mussambê".

"Minha Fulô"

(Luiz Gonzaga / Dantas)

*“(…) As fulô do meu sertão são bonitas são
cheirosas,
O pau d'arco e o pau pereiro faz inveja a qualquer
rosa
Canafista e mussambê eu nem sei qual mais formosa.
É por isso que as abelha mandassaia, tataira,
sanharó e uruçú
Faz o mel que admira (…)”*

"Morena tropicana"

(Alceu Valença)

*“(…) Da manga rosa quero gosto e o sumo
Melão maduro sapoti jóá
Jaboticaba seu olhar noturno
Beijo travoso de umbú cajá
Pele macia, é carne de cajú
Saliva doce, doce mel, mel de uruçú (…)”.*

2.6 The rediscovery of pot-honey

There is also a trend of using common names to designate the honey produced by stingless bees, like "Melipona honey", "Trigona honey", "jataí honey" and "uruçú honey"— as a way of identifying the entomological origin of the product.

However, with the colonization process in the Americas, the introduction of the Western honey bee and crops like sugar cane, man became separated from his cultural environment, promoting discontinuity in transmission of traditional knowledge, including that relating to stingless bees. Currently the *Congreso Mesoamericano sobre Abejas Nativas* has a session in its program devoted to reports and studies on the cultural aspects of beekeeping in Mesoamerican communities.

In 1799, Vicente Coelho de Seabra made among the first records of Brazilian stingless bees. In that time the tendency to give greater value to that which

was exotic had already emerged. Considering the stingless bees and their products, the author states that: “(...) Brazil is so fertile in these useful insects, however their people do not take care of their keeping. The hives are unknown there: and when necessity obliges them, they make use of colonies, sparsely build by bees, where nature offers them comfortable place. The wax is very abundant in some of them, but first wants to buy an expensive price the European and African products, than to cultivate that nature so freely gives. (...) Its honey is superior to some from Portugal”.

Currently meliponiculture has undergone rediscovery, leading to high demand for information on the keeping of these bees and the nature of their products. Thus, training in stingless bee keeping has increased, as well as the study of the biology of these insects, the development of rational boxes and handling techniques, besides the study of characterization of their products, especially of their honey stored in cerumen pots. This generation of scientific knowledge, associated with knowledge of rural populations, has contributed to the conservation of these bees, to the knowledge and the valuation of their products, and to their services given to nature.

Acknowledgements

The authors thank stingless bee beekeepers for sharing their knowledge and practices related to these magnificent insects, and also researchers seeking the conservation and enhancement of these bees. Thanks are given to the reviewers for their consideration of this chapter.

References

- Ballester WC. 2006. Conhecimento dos índios Kaiabi sobre as abelhas sem ferrão no Parque Indígena do Xingu, Mato Grosso, Brasil. Dissertação de Mestrado, Universidade Federal do Mato Grosso; Mato Grosso, Brasil. 34 pp.
- Calderon Espina LE. 1989. Uso de miel de abeja en heridas operatorias dehiscentes en pacientes post-cirurgia obstétrica. Facultad de Ciencias Medicas, Universidad de San Carlos de Guatemala, Guatemala. 47 pp.
- Cappas e Sousa JP. 1995. Os Maias e a Meliponicultura. pp.146. In Jornadas de La Asociación Española de Entomología; Cuenca, España.
- Cooper R. 2005. The modern use of honey in the treatment of wounds. *Bee World* 86: 110-113.
- Cortopassi-Laurino M. 2002. Relatos de viagem II: Meliponicultura no México. *Mensagem Doce* 66: 6-15.
- Cortopassi-Laurino M, Imperatriz-Fonseca VL, Roubik DW, Dollin A, Heard T, Aguilar I, Venturieri GC, Eardley C, Nogueira-Neto P. 2006. Global meliponiculture: challenges and opportunities. *Apidologie* 37: 275-292.
- Costa Neto EM. 2002. The use of insects in folk medicine in the State of Bahia, Northeastern Brazil, with notes on insects reported elsewhere in Brazilian folk medicine. *Human Ecology* 30: 245-263.
- González ANL. 2009. Rituales de abejas entre los Mayas. pp. 33-38. In *Memorias VI Congreso Mesoamericano sobre Abejas Nativas*. Antigua Guatemala, Guatemala.
- Hogue C. 1987. Cultural Entomology. *Annual Review Entomology* 32: 181-199.
- Hollanda SB. 1946. Mel e cera no Brasil colonial. *Província de São Pedro* 2: 48-56.
- Jull AB, Rodgers A, Walker N. 2009. Honey as a topical treatment for wounds. *Cochrane Database of Systematic Reviews* 2008. 41pp.
- Kerr WE. 1987. Abelhas indígenas brasileiras (meliponíneas) na polinização e na produção de mel, pólen, geoprópolis e cera. *Informe Agropecuário* 13: 15-22.
- Kerr WE, Carvalho GA, Nascimento VA. 1996. *Abelha Uruçu: Biologia, Manejo e Conservação*. Acangaú; Belo Horizonte, Brasil. 144 pp.
- Kujumgiev A, Tsvetkova I, Serkedjieva Y, Bankova V, Christov, R.; Popov, S. 1999. Antibacterial, antifungal and antiviral activity of propolis of different geographic origin. *Journal of Ethnopharmacology* 64: 235-240.
- Menezes H. 2005. Própolis: uma revisão dos recentes estudos de suas propriedades farmacológicas. *Arquivos do Instituto Biológico* 72: 405-411.
- Lustosa SR, Galindo AB, Nunes LCC, Randau KP, Rolim Neto PJ. 2008. Própolis: atualizações sobre a química e a farmacologia. *Revista Brasileira de Farmacognosia* 18:447-454.
- Molan PC. 1999. Why honey is effective as a medicine. I. Its use in modern medicine. *Bee World* 80: 80-92.
- Nogueira Neto P. 1997. Vida e criação de abelhas indígenas sem ferrão. Editora Nogueirapís; São Paulo, Brasil. 446p.
- Obiols CLY. 2004. Meliponicultura e conocimientos tradicionales. pp.18-20. In *Memorias Seminario Situación de la Meliponicultura y Aprovechamiento de sus Productos*. Ciudad de Guatemala, Guatemala.
- Pérez A, Salas E. 2008. Meliponicultura en Paria Grande, Estado Amazonas. pp. 42. In Vit P, ed. *Abejas sin aguijón y valorización sensorial de su miel* Universidade de Los Andes; Mérida, Venezuela. 91pp.
- Rodrigues AS. 2005. Etnoconhecimento sobre abelhas sem ferrão: saberes e práticas dos índios Guarani-m'byá na mata atlântica. Dissertação de Mestrado, Escola Superior de Agricultura “Luiz de Queiroz”; São Paulo, Brasil. 236pp.
- Rosso JML, Imperatriz-Fonseca VL, Cortopassi-Laurino M. 2001. Meliponicultura en Brasil I: situación en 2001 y perspectivas. pp.28-35. In *Memorias II Seminario Mexicano sobre Abejas sin Aguijón*. Mérida, Yucatán, México.
- Sampaio JA, Castro MS, Silva FO. 2009. Uso da cera de abelhas pelos índios Pankararé no Raso da Catarina, Bahia, Brasil. *Arquivos do Museu Nacional* 67: 3-12.

- Seabra VC. 1799. Em que se dá noticia de diversas espécies de abelhas, que dão mel, proprias do Brasil, e desconhecidas na Europa. Memorias de Mathematica e Phisica da Academia Real das Sciencias de Lisboa, tomo II, pp. 99-104. Available at http://www.culturaapicola.com.ar/wiki/index.php/Las_primeras_obras_de_apicultura_de_Brasil
- Sommeijer M. 1999. Beekeeping with stingless bees: a new type of hive. *Bee World* 80: 70-79.
- Souza B, Roubik D, Barth O, Heard T, Enríquez E, Carvalho C, Villas-Bôas J, Locateli J, Persano-Oddo L, Almeida-Muradian L, Bogdanov S, Vit P. 2006. Composition of stingless bee honey: setting quality standards. *Interciencia* 31: 867-875.
- Vail G. 2006. The Maya Codices. *Annual Review of Anthropology* 35:497-519.
- Villas-Bôas JK. 2008. Meliponicultura e povos indígenas no Brasil. pp.31-33. In Vit P, ed. *Abejas sin aguijón y valorización sensorial de su miel* Universidad de Los Andes; Mérida, Venezuela. 91pp.
- Weaver N, Weaver E. 1980. Beekeeping with the Stingless bee *Melipona beecheii*, by the Yucatecan Maya. *Bee World*, Hojas Sueltas.
- Zamora DMB, Alvarez JM. 2004. Clasificación etnobiológica de las abejas sin aguijón (Hymenoptera, Apidae, Meliponinae): estudio de caso en Villa Canales, Guatemala. Available at <http://entomologia.net/abeja.htm>
- Zamora AR, Cappas e Sousa JP. 2000. Las Abejas y la Miel en los Códices Mayas (Código Madrid o Tro-Corteresiano). *La Colmena*, N°2. Available at <http://www.laneta.apc.org/lacolmena>

Editors' note: This is an expanded version of a publication in Portuguese by BA Souza. 2008. Meliponicultura tradicional e racional. 34-37 pp. In. Vit P (editora). Abejas sin aguijón y valorización sensorial de su miel. Apiterapia y Bioactividad, Facultad de Farmacia y Bioanálisis, Dirección de Cultura y Extensión, Universidad de Los Andes; Mérida, Venezuela. 146 pp.

How to cite this chapter?

Souza BA, Lopes MTR, Pereira FM. 2013. Cultural aspects of meliponiculture. pp. 1-6. In Vit P & Roubik DW, eds. *Stingless bees process honey and pollen in cerumen pots*. SABER-ULA, Universidad de Los Andes; Mérida, Venezuela. <http://www.saber.ula.ve/handle/123456789/35292>