

Meliponas in Yucatan, Mexico



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Before *A. mellifera* introduction = ethnic groups in the Americas only produces honey from different native stingless bee species.



Stingless bee species used by different ethnic group in the Americas to produce honey

- ✓ *Melipona compressipes* (Tiúba = Maranhão, Brazil)
Timbira, Tupinanmbá, Guajajara, Tremembé, Guajá, Urubu, Gavião.
 - ✓ *Melipona scutellaris* (uruçu = Norwest Brazil)
Potiguara, Kiriri, Xucuru, Pataxo, Paiaku, Tupirucuba, Caete, y Aymore.
 - ✓ *Melipona beecheii* (xunan'cab = Yucatan, Mexico)
Mayas
-

The Meliponiculture (beekeeping with stingless bees) dates from pre-Columbian times and it was an important and ancient activity to the Mayas from the Yucatan peninsula.

The Mayas developed a meliponiculture (*Melipona beecheii* species) to a level similar to that of management of the honey bee *A. mellifera* during Medieval times in Europe.



Each hollow log = 1 stingless bee colony

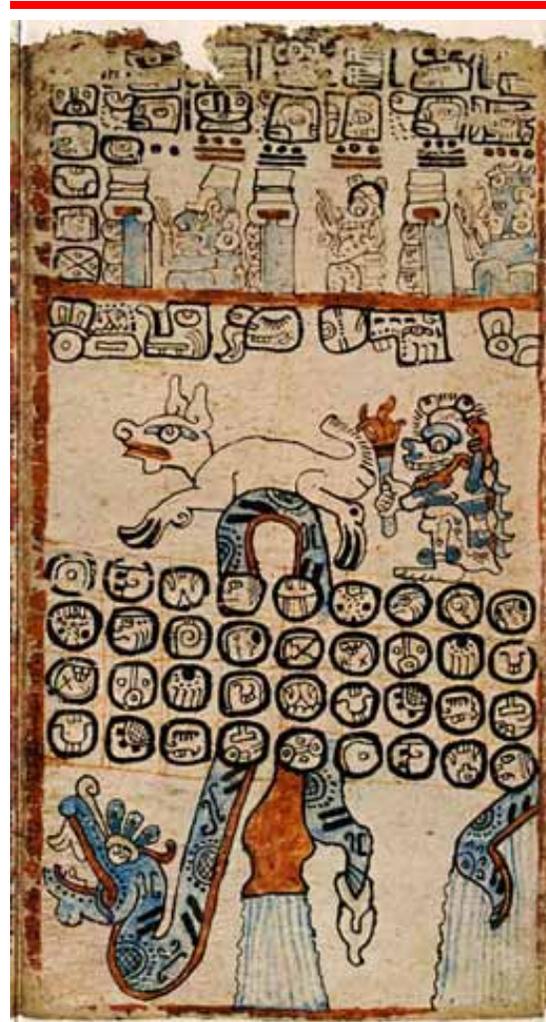
*Codex Cortesiano; Tro-Cortesiano II (Codex de Madrid);
XIV century*

12.2

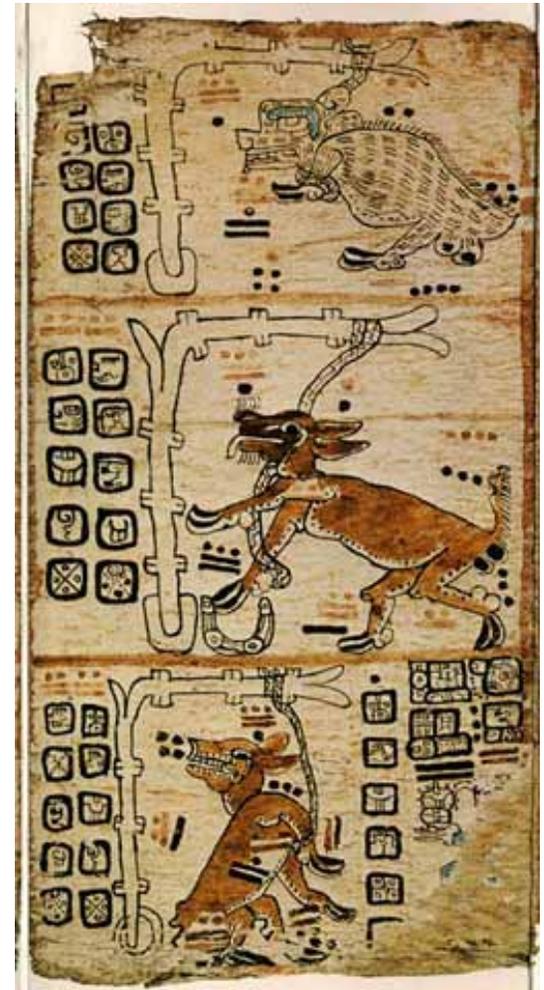


Folding book with
112 pages related
with agriculture and
hunting.

22.6

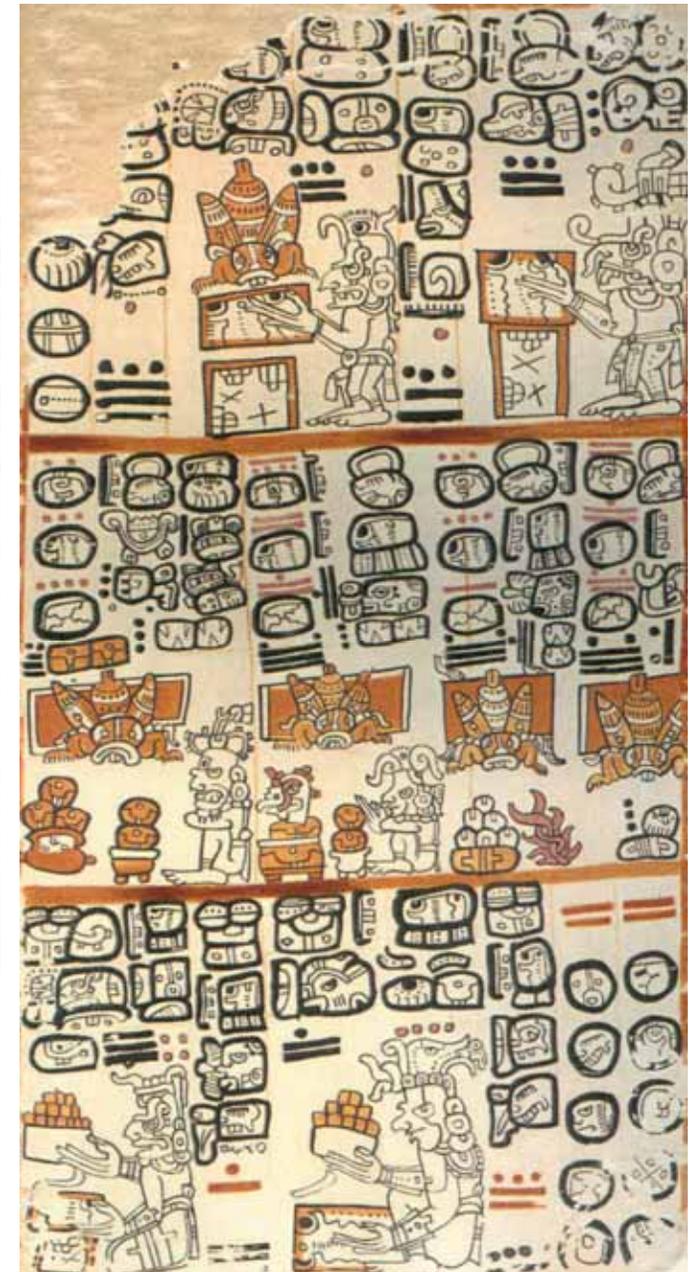
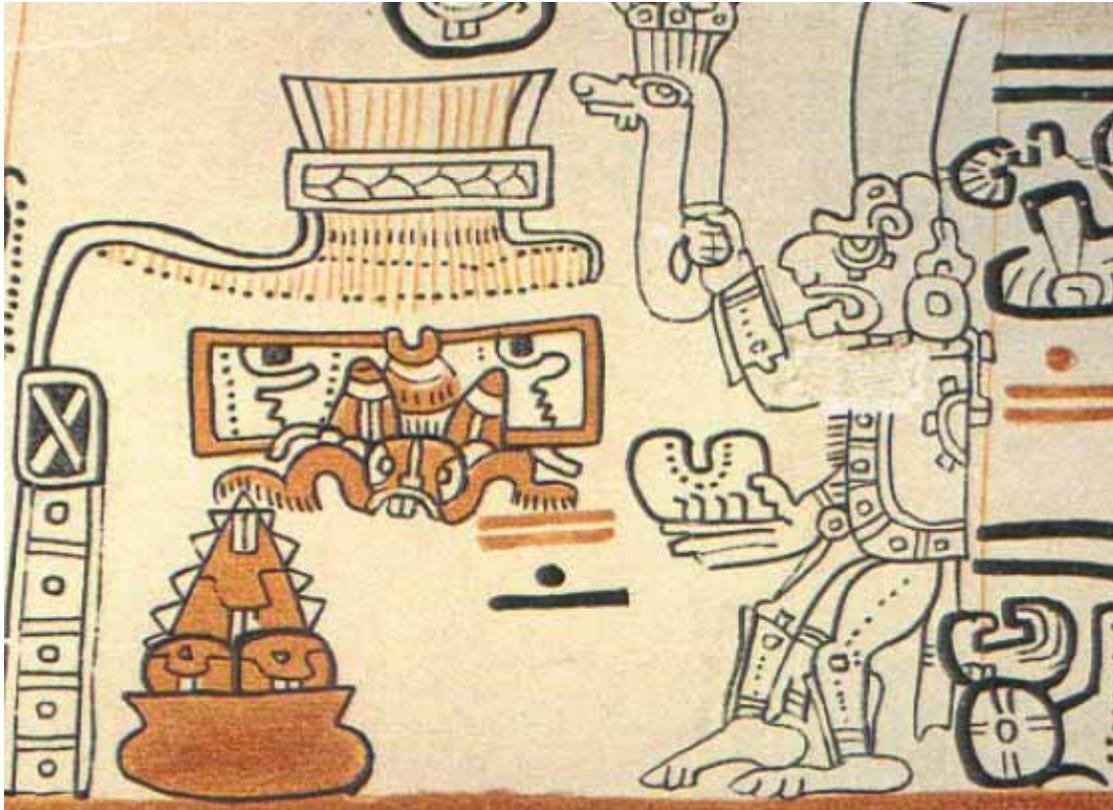


Agriculture



Hunting

10 pages are related with stingless bees and their management

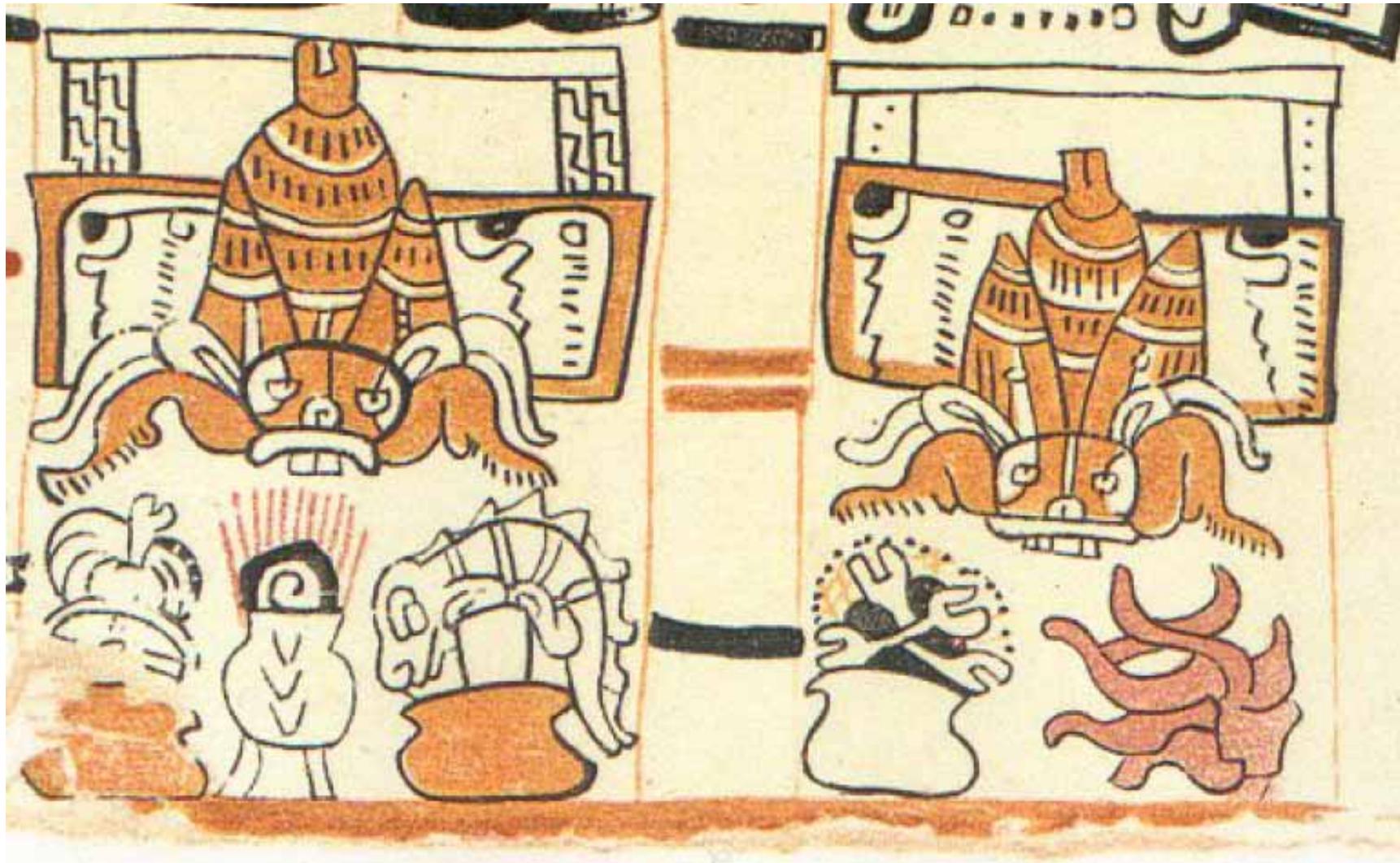


Stingless bee enemies?



Nine-Banded Armadillo (*Dasyus novemcinctus*)

Knowledge about queen physiogastric condition



≥ 250 stingless bee colonies keeping in hollow log hives

± 80 years old

"*najil kab*" = bee house



©Felipe Martinez, 1958

≥ 15 stingless bee colonies keeping in hollow log hives

± 15 years old



©Jonathan Ott, 1998

Stingless bee species in Yucatan, Mexico

Melipona genera

- 1) *Melipona beecheii* (Xuna' an Kab; Kolel Kab)
- 2) *Melipona yucatanica* (Ts'ets')



Melipona beecheii



Melipona yucatanica

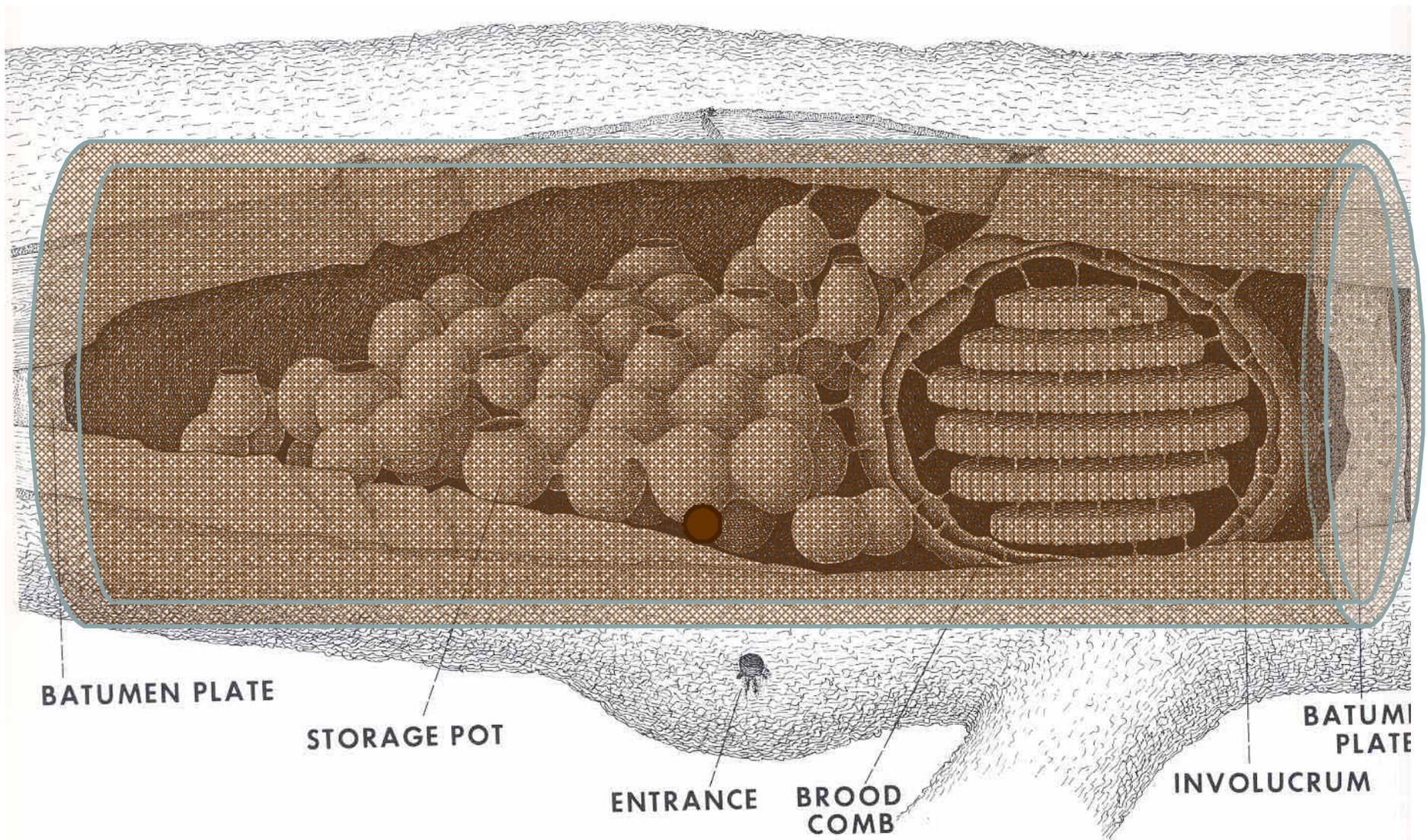
Trigona genera

- 1) *Scaptotrigona pectoralis* (Kan-Tzac)
- 2) *Trigona (Frieseomelitta) nigra nigra* (Sak-Xic)
- 3) *Trigona (Trigona) fulviventris* (Mu'ul-Kab)
- 4) *Trigona (Trigona) fuscipennis* (Kuris-kab)
- 5) *Nannotrigona perilampoides* (Bo'ol; Yaxich)
- 6) *Cephalotrigona zexmeniae* (E'hol; Ta'a kab)
- 7) *Trigonisca maya* (Ch'ache'm; Pu'up)
- 8) *Plebeia frontalis* (Us-Kab)
- 9) *Plebeia moureana* (Us-Kab)
- 10) *Plebeia pulchra* (Yaax'ich)
- 11) *Partamona bilineata* (Xnuk; Ch'o'och)
- 12) *Lestrimelitta niitkib* (Niit-kib; Limon-Kab)

Mayas produce honey and wax (cerumen) only *M. beecheii*
= keeping in hollow log hives.

- ✓ Worker population (400 a > 1,200 bees).
- ✓ Honey production (20 to more than 200 honey pots).
- ✓ Easy adaptability in artificial nests (log hives).
- ✓ No aggressive behavior.
- ✓ Honey quality (flavor).
- ✓ Frequent in the nature.

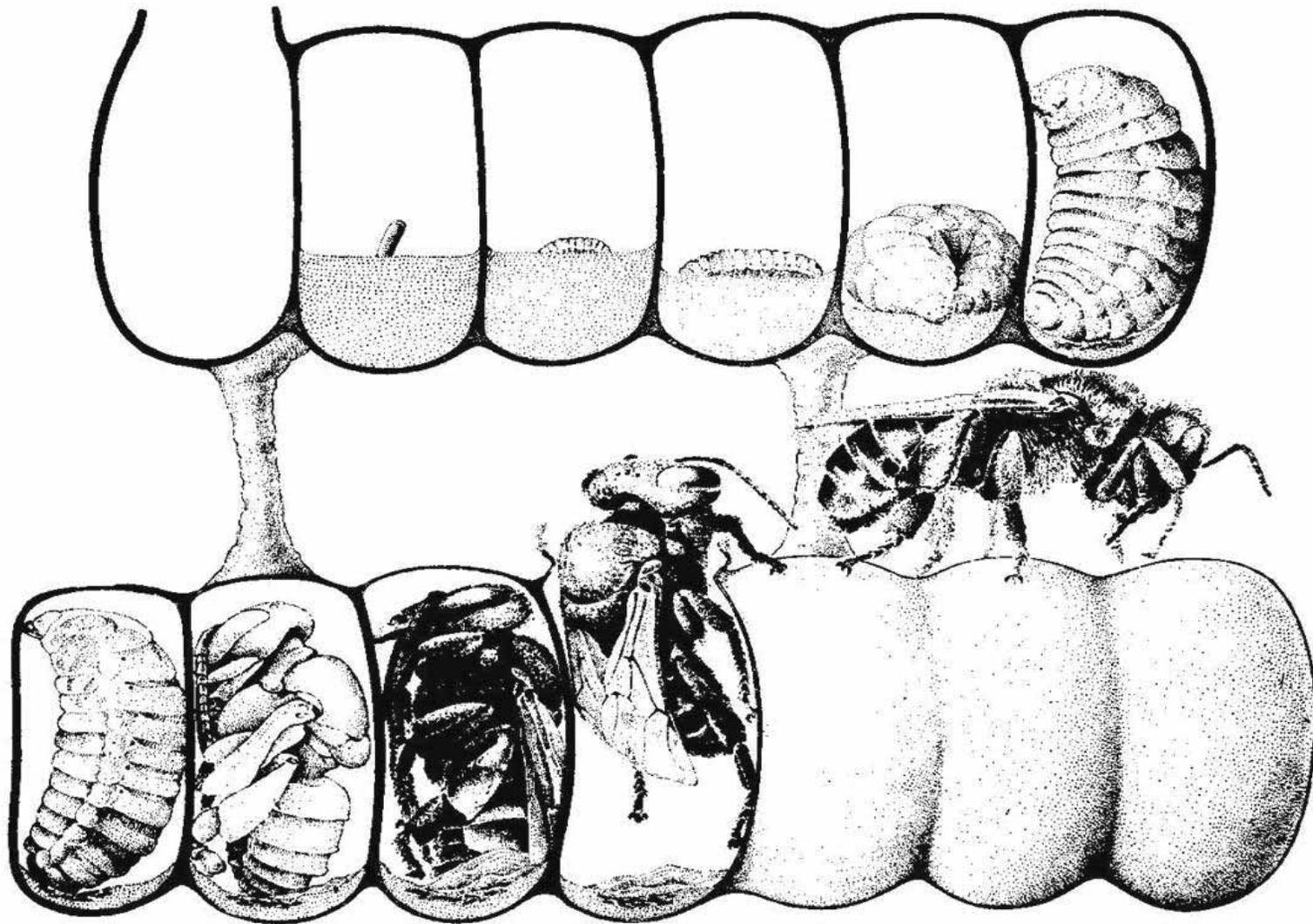
Inside a natural *Melipona* Nest



Splitting *Melipona* Hives



Inside a natural *Melipona* Nest: Brood Combs



Camargo & Posey, 1990

The hive or *Hobon*



The hive or *Hobon*





Honey extraction







Splitting *Melipona* colonies





Extinction of *Melipona beecheii* and traditional beekeeping in the Yucatán peninsula

ROGEL VILLANUEVA-G. DAVID W ROUBIK AND WILBERTO COLLI-UCÁN

Bee World 86(2): 35-41 (2005) | June 2005 | *Bee World* | 35

Rearing of the 'xunan-kab' bee (*Melipona beecheii*) had been practised widely by the Mayans of the Yucatán peninsula long before arrival of the Spanish in the New World, and had been a culturally and economically important activity in that region. *Melipona beecheii* is kept almost exclusively in traditional log hives. Beekeepers using this bee, from the Mayan zone in Quintana Roo state, Mexico, testify to a 93% decrease in hives during the past one-quarter century. Despite concern that stingless bee keeping is going extinct, there were scant data to examine direct impact of competition from feral African *Apis mellifera*, deforestation, hurricane damage and lack of instruction and incentive for new stingless bee keepers. We therefore made a survey of beekeepers constituting 20% of the largest traditional beekeeping group in the Americas. These data combined with our field studies, taken over 24 years, suggest that bees are threatened both by environmental changes and by inappropriate management and conservation efforts. Overharvest and failure to transfer colonies to hives or divide them are serious impediments. The major tactics to confront these problems are presented.

Decline of Meliponiculture

- 1) Forest clearing for towns and agriculture
- 2) Extensive forest clearing for Sisal and Henequen (*Agave spp*)
- 3) Decline of native population
- 4) Urbanization of native population
- 5) Growth of sugar cane
- 6) The coming of *Apis mellifera*

Little economic interest in the Meliponiculture by new generations..



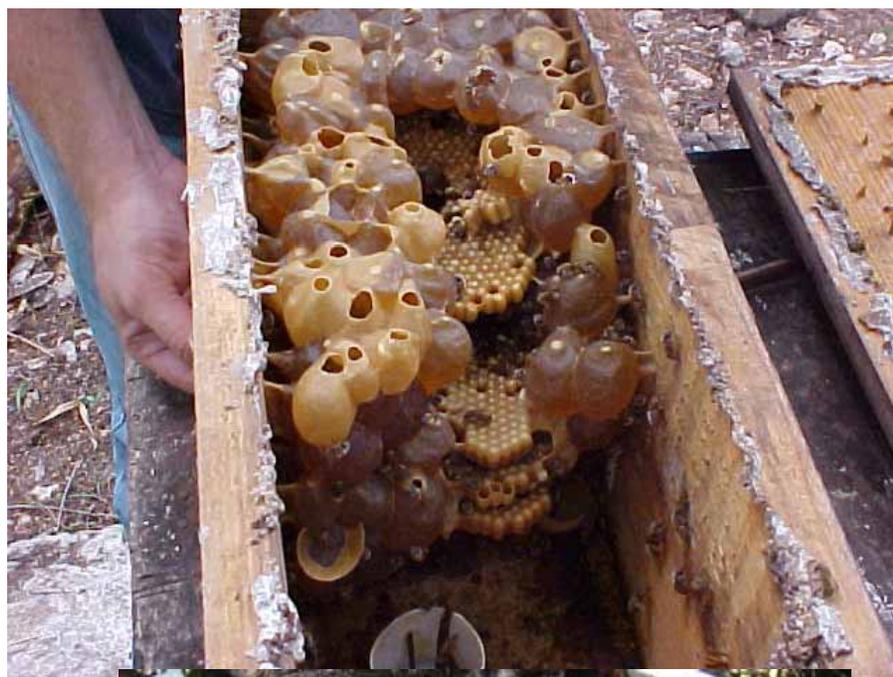
Courses based on practical work for better management, colony reproduction, feeding during dearth and harvesting of colonies.



New meliponicultores



New meliponicultores



The use of native stingless bee species for crop pollination in greenhouses in Yucatan, Mexico.

In the last 12 years the use of greenhouses for some crops has significantly increased in Yucatan.



Crops in greenhouses need a pollinating agent. In Yucatan, Bumblebees are imported from the US and Canada at a cost of c.150 USD per colony, however, colonies are not perennial and need to be replaced every 3 months.



Native stingless bees have the potential to pollinate some crops (tomato and habanero pepper) and need to be tested.



Behavior and Pollination Efficiency of *Nannotrigona perilampoides* (Hymenoptera: Meliponini) on Greenhouse Tomatoes (*Lycopersicon esculentum*) in Subtropical México

ORLANDO CAUCH,¹ JOSÉ JAVIER G. QUEZADA-EUÁN,^{1,2} JOSÉ OCTAVIO MACIAS-MACIAS,³ VICENTE REYES-OREGÓN,⁴ SALVADOR MEDINA-PERALTA⁵ AND VÍCTOR PARRA-TABLA¹

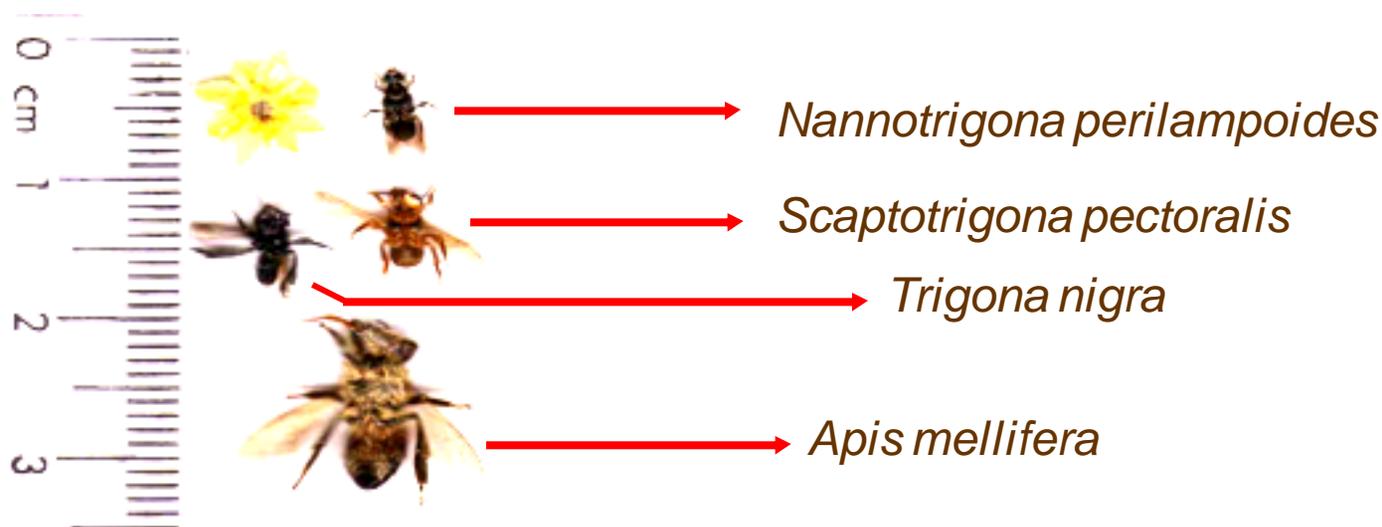
J. Econ. Entomol. 97(2): 475–481 (2004)

Table 1. Comparison of fruit set, weight per fruit, production per square meter, and seed number among the three treatments (see text for abbreviations used for treatments)

Treatment	Fruit set (%)	Weight of fruit (g)	Production/m ² (kg)	Seed no.
SB	83 ± 4.24a	67.3 ± 12.6a	5.72 ± 0.61a	200.4 ± 15.30a
NP	52.6 ± 8.6b	61.17 ± 9.1a	3.34 ± 0.72b	120.5 ± 16.61b
HV	78.5 ± 6.4a	69.7 ± 7.7a	5.66 ± 0.58a	232 ± 21.48a

Different letters within a column denote statistical differences at $P < 0.05$.

The treatments used in each section were stingless bees (SB), not pollinated (NP), and mechanical vibration (MV).



Production of greenhouse tomatoes (*Lycopersicon esculentum*) using *Nannotrigona perilampoides*, *Bombus impatiens* and mechanical vibration (Hym.: Apoidea)

G. Palma¹, J. J. G. Quezada-Euán¹, V. Reyes-Oregel², V. Meléndez¹ & H. Moo-Valle¹
J. Appl. Entomol. **132** (2008) 79–85 © 2008

Table 1 Fruit set, weight and number of seed per fruit in *Lycopersicon esculentum* using three pollination methods

Treatment	Fruit set (%)	Weight (g)	Seed number
<i>Nannotrigona perilampoides</i> (n = 187)	80.1 a	197.75 ± 56.3 a	74.48 ± 22.2 a
<i>Bombus impatiens</i> (n = 125)	89.5 b	233.07 ± 67.6 b	83.81 ± 31.6 b
Mechanical vibration (n = 173)	76.4 a	158 ± 13.8 c	42.03 ± 19.6 c

Different letters in the same column reflect significant differences between means at $P < 0.05$.



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Journal of Apicultural Research 45(3): 234–239 (2006)

REVIEW ARTICLE

New perspectives for stingless beekeeping in the yucatan: results of an integral program to rescue and promote the activity.



J A González-Acereto, J J G Quezada-Euán* and L A Medina-Medina

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Table 1. Summary of stingless beekeepers and the number of colonies in the state of Yucatán.

Region	No. of bee keepers	No. of colonies
North-Center	44	566
West Coast	52	448
North Coast	1	6
Orient	28	473
Metropolitan	11	111
South	30	303
TOTAL	166	1,907

Probably reflects 25% of total colonies

Other *Melipona* products

Pollen, propolis, honey mixes, wax (cera de Campeche), tinctures, supplements, antimicrobial properties + pollination services.



CONCLUSIONS

- ✓ Beekeeping is not always *A. mellifera* keeping.
- ✓ Meliponiculture still important activity in rural areas.
- ✓ Meliponiculture currently has not uncertain future.
- ✓ New *meliponicultores* are engaging in this activity.
- ✓ Meliponiculture has a lucrative niche marketing and potential use for crop pollination.

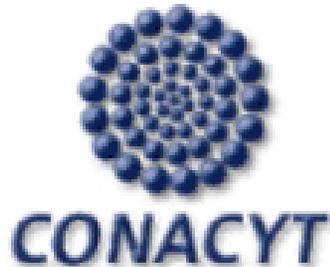
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Sistema Regional de Investigación
Justo Sierra Méndez



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