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- RN - Brazil
- 2011

# STINGLESS BEES BEEKEEPING AND RESEARCH FOR USING THESE BEES AS CROP POLLINATORS

# Outline

- What are stingless bees?
- Ecosystem services provided by stingless bees
- Meliponiculture
- Challenges for meliponiculture
  - Climate change
  - deforestation
- Solutions
  - Interactions scientists-citizens
  - Public policies
  - Information

# Stingless bees geographical distribution





# **BIODIVERSITY, COLLECTIONS, DATABASE**



# Stingless bees are important flower visitors and pollinators in tropical areas





# For each species, a typical nest entrance...

*Plebeia remota*



*Partamona*



*Melipona bicolor bicolor*



*M. b. schencki*



*Plebeia*





Photo by Cleiton Geuster



Photo by Dirk Koedam



Photo by Cleiton Geuster



Photo by Dirk Koedam















The background of the slide is a green honeycomb pattern, resembling a beehive or a network of interconnected cells. The pattern is composed of various shades of green, with darker green lines forming the hexagonal cells and lighter green areas in between. The overall effect is a textured, organic background.

# **STINGLESS BEES**

# Stingless bees have special needs:

suitable nesting sites



by M. Cortopassi-Laurino



by G. Venturieri



by G. Venturieri



# Males for mating





# Defense against predators





# Phoridae Flies, the commonest nest parasites







*Hermetia*, parasite of several stingless bees species. Here in a *Melipona scutellaris* colony.

Photos by Bruno Souza Almeida





# Another important bee parasite

*Pyemotes tritici* kills colonies of Brazilian stingless bees



2009

# *Hololepta reichii* (Histeridae)



©D. Koedam



# **STINGLESS BEES AND ECOSYSTEM SERVICES**



# MELLITOCHORY: STINGLESS BEES ARE SEED DISPERSERS FOR URTICACEAE, MIMOSACEAE, MORACEAE , MYRTACEAE

By Marilda Cortopassi Laurino

Absy (1977): *Melipona  
seminigra merrillae*  
dispersed seeds of  
*Coussapoa asperifolia*  
(Urticaceae)





# Several species disperse seeds of *Coussapoa asperifolia*

- *M. rufiventris manaosensis*
- *M. seminigra merrillae*
- *Tetragonisca angustula*
- *Tetragona*
- *Aparatrigona impuctata*
- *Frieseomelitta trichocerata*



Photo by M. Cortopassi Laurino



Photo by M. Cortopassi Laurino



## In Xapuri, Acre

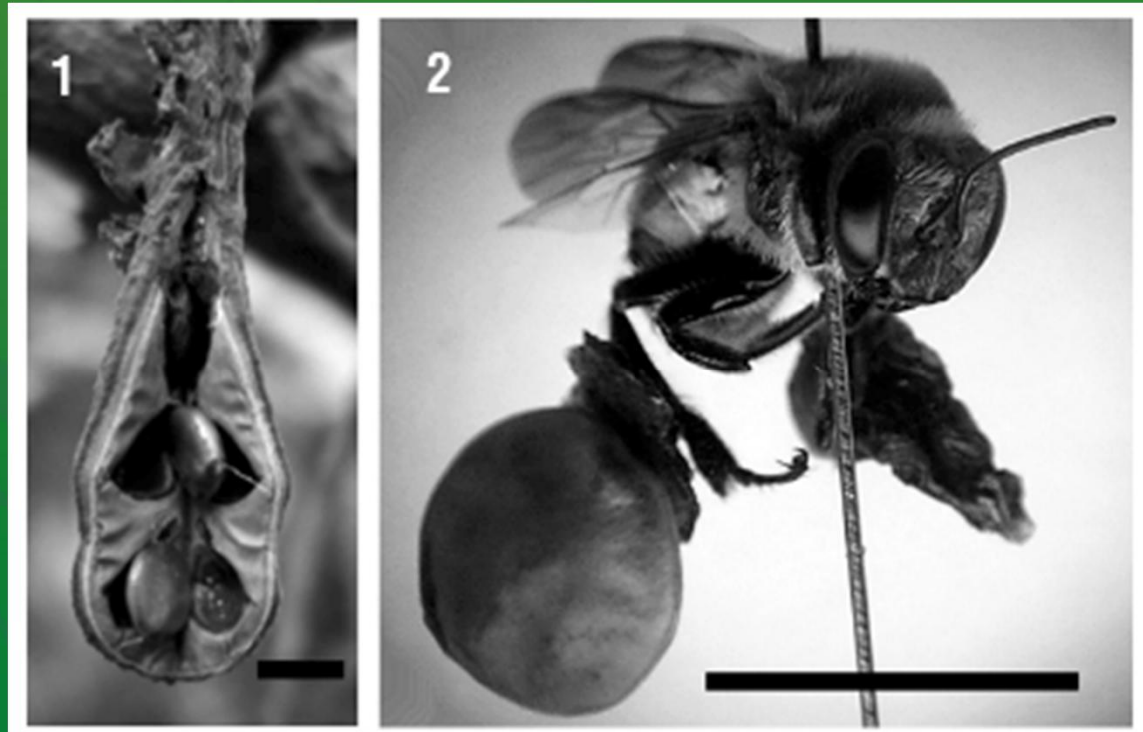
- *M. fuliginosa*
- *M. crinita*
- *M. fuscopilosa*
- *M. grandis*
- *M. flavolineata*





In Amazon, *Melipona seminigra merrillae* and *M. compressipes manaosensis* disperse seeds of important wood tree (*Zigia racemosa*)

- *M. seminigra merrillae*
- *M. compressipes manaosensis*





In Atlantic Rainforest, *Melipona capixaba*  
disperses seeds of *Ficus guaranitica*  
Moraceae



photos by de Luis FF Caliman





*Tetragonisca  
angustula* also  
is a seed  
disperser



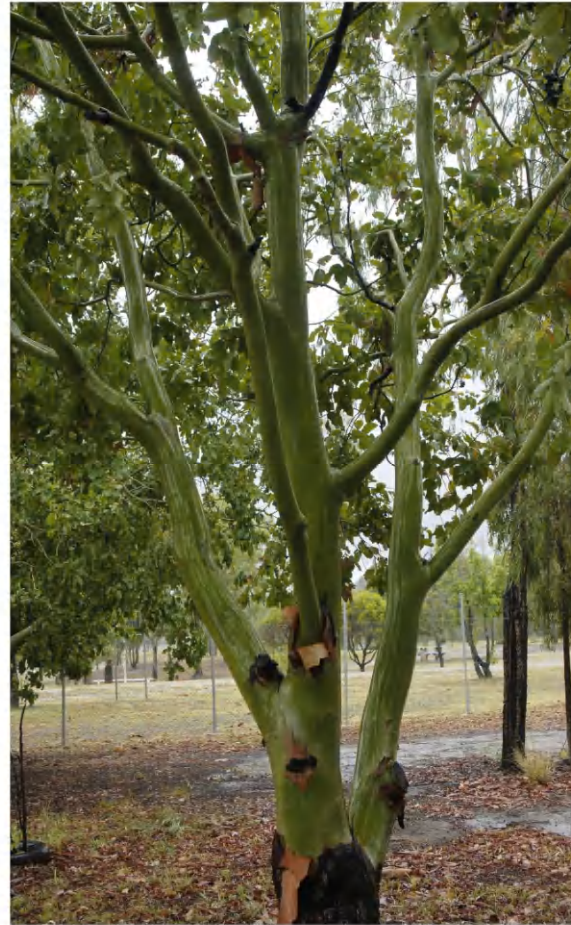
Photos by Cleiton Geuster



# Stingless bees from other continents are also seed dispersers

*Tetragonula carbonaria*  
disperses *Corymbia*  
*torelliana* - Myrtaceae  
in Australia

Photos by  
Robert Luttrell



The cadaghi tree - *Corymbia torelliana*

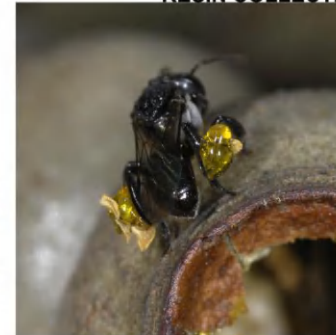
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MELLITOCORY - SEED DISPERSAL



RESIN COLLECTION BY STINGLESS BEE







# **STINGLESS BEES AS POLLINATORS**



# Stingless bees Pollinate

*M. fasciculata* in sunflower



*M. subnitida* in Myrtaceae



M. Hincir







Singer, R. B. 2002. *Annals of Botany*. 89 (2): 157-163.

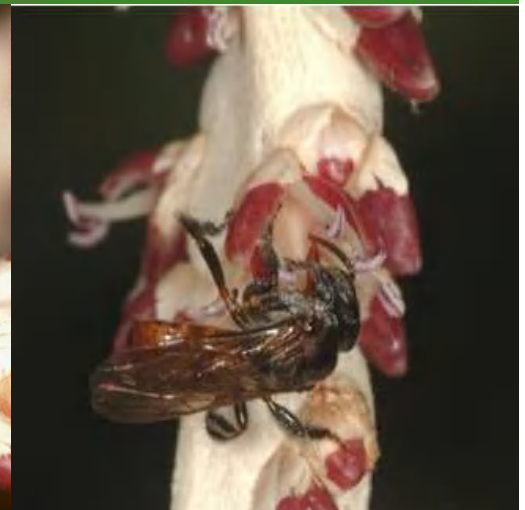


# *Tetragonisca angustula* and other species pollinate strawberries





# Stingless bees and *Apis mellifera* pollinate assaí palm flowers (*Euterpe oleraceae*) (Venturieri, G. VIII Encontro sobre Abelhas de Ribeirão Preto, 2008)



© Glorato Venturieri











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# **STINGLESS BEES BEEKEEPING**



## Mexico: Ah Muzen-Cab





# Meliponiculture in Mexico





# Meliponiculture in Mexico





# Meliponiculture in Mexico





# Meliponiculture in Mexico and ceramic hives





# Stingless bees beekeeping in Brazil

- Traditional
- In logs or ceramic pots
- **In simple boxes**
- **Looking for the best hive**



# Stingless bees beekeeping



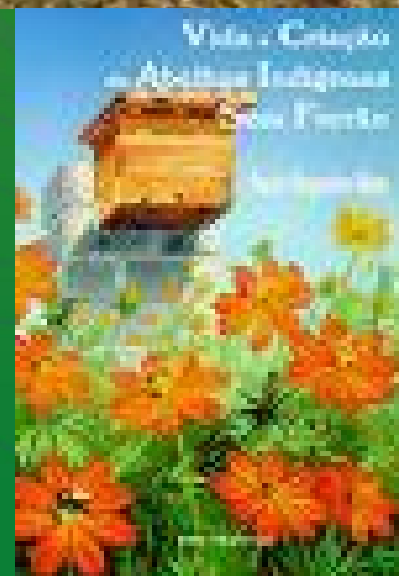






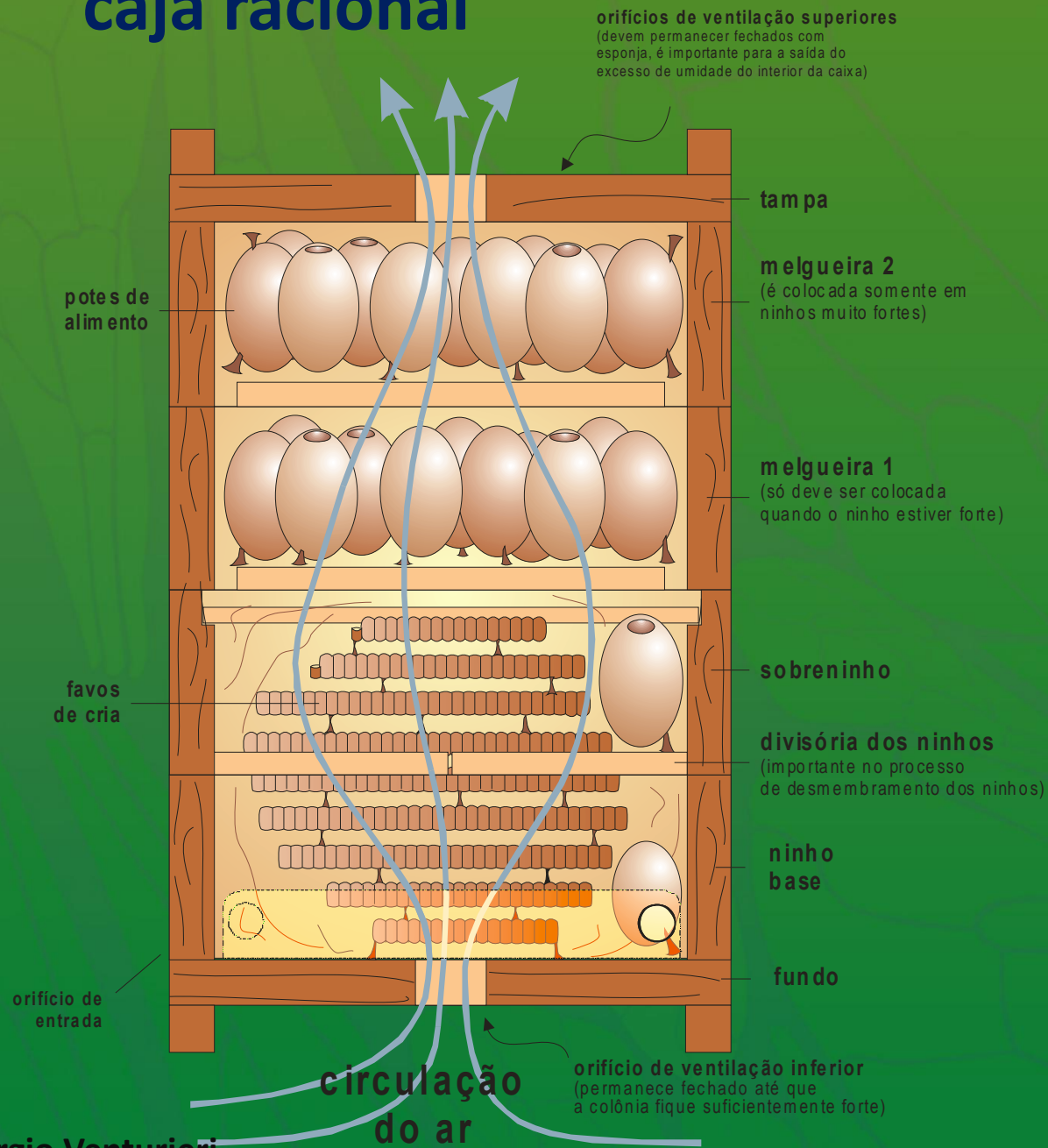


## Rational Hives- Nogueira-Neto





# caja racional



Giorgio Venturieri

## alza



## sobrenido



## nido





# Una caja para cada grupo de especies

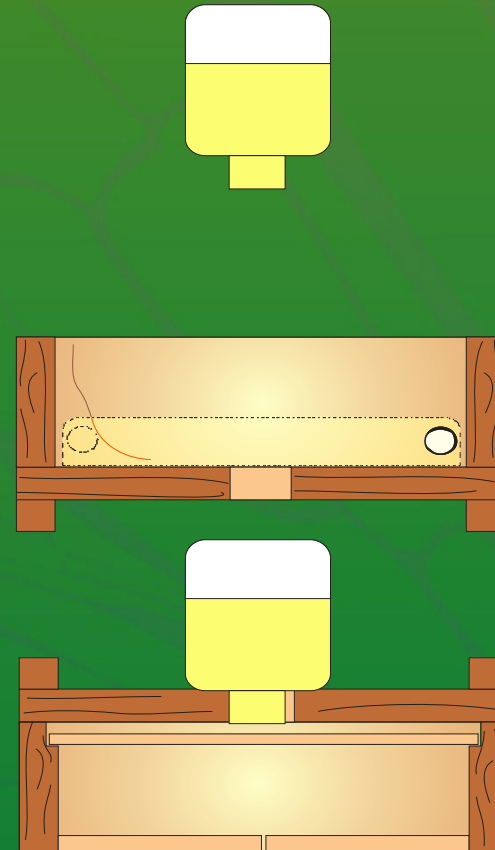
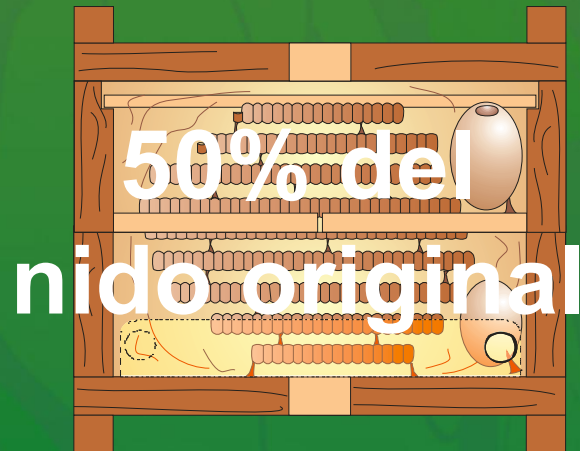


Giorgio Venturieri



# multiplicación de las colonias

Método Fernando Oliveira



manejo

Giorgio Venturieri



## Meliponário de la Embrapa, Belém, PA











# **CHALLENGES FOR MELIPONICULTURE**



however...  
anthropogenic changes  
have been contributing  
to reduction or extinction  
of bee populations



use of agrochemicals



cattle breeding



Agricultural intensification



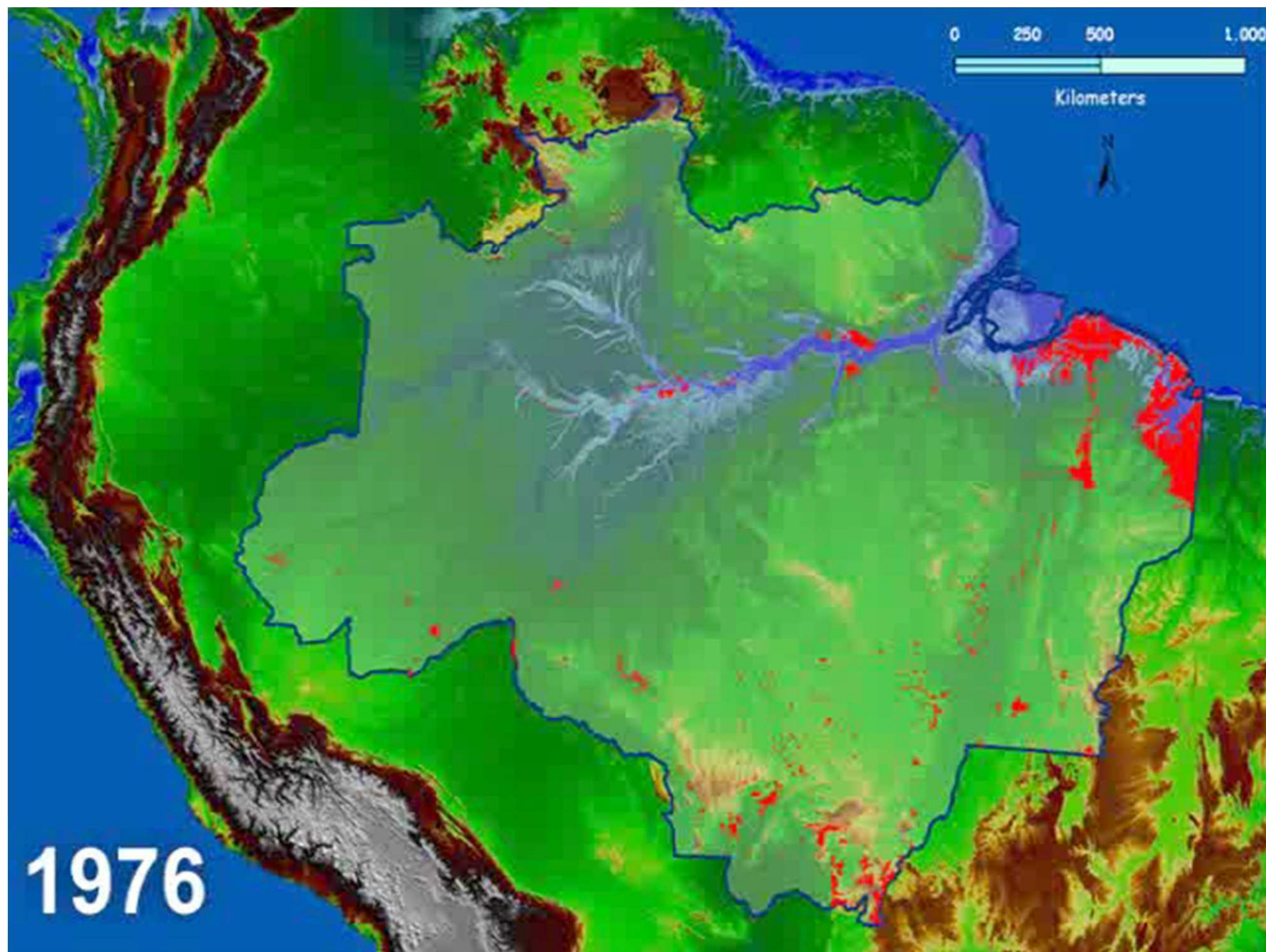
deforestation



# Deforestation and coal







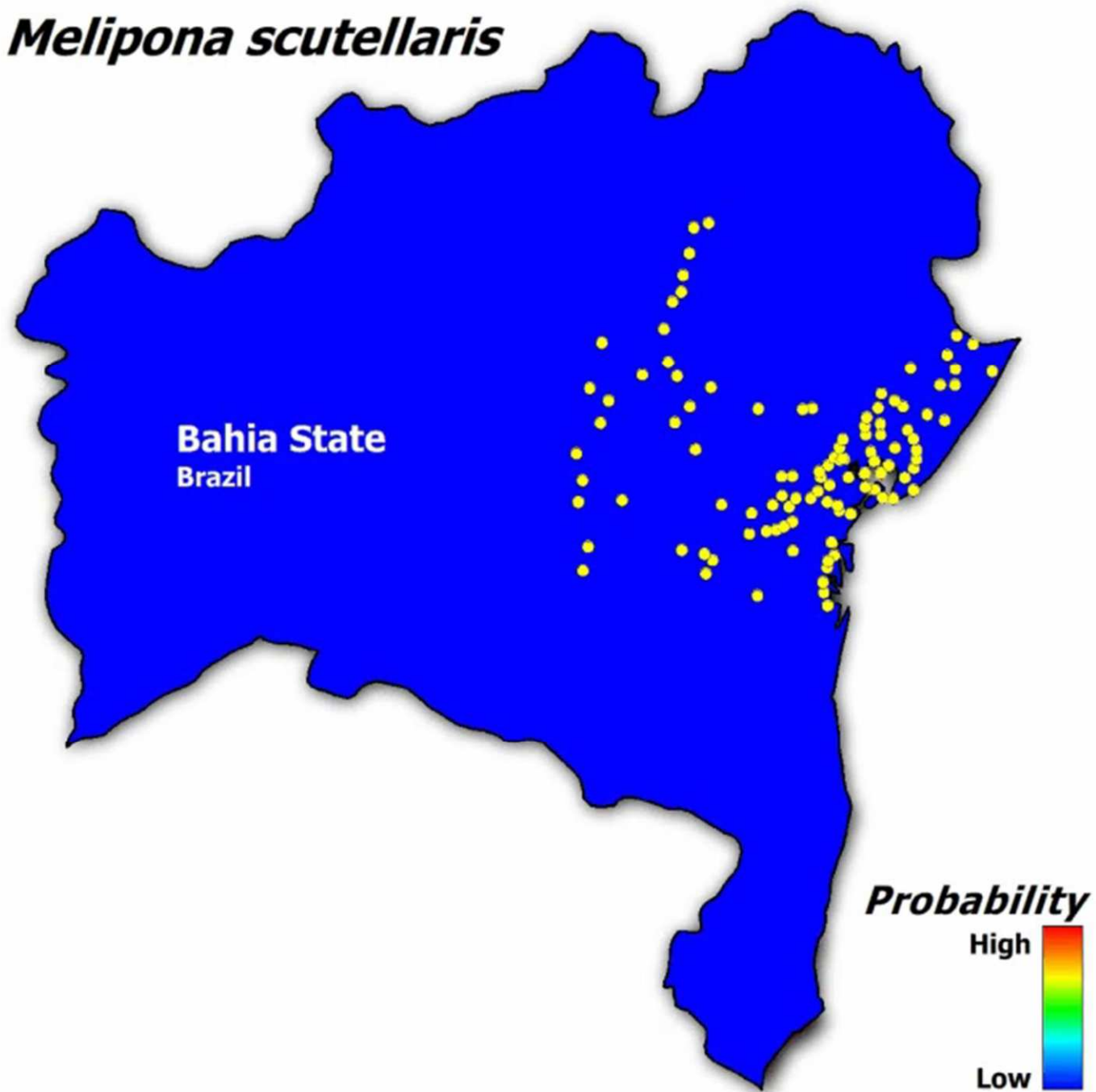




# **CLIMATE CHANGE AND POLLINATORS DISTRIBUTION**

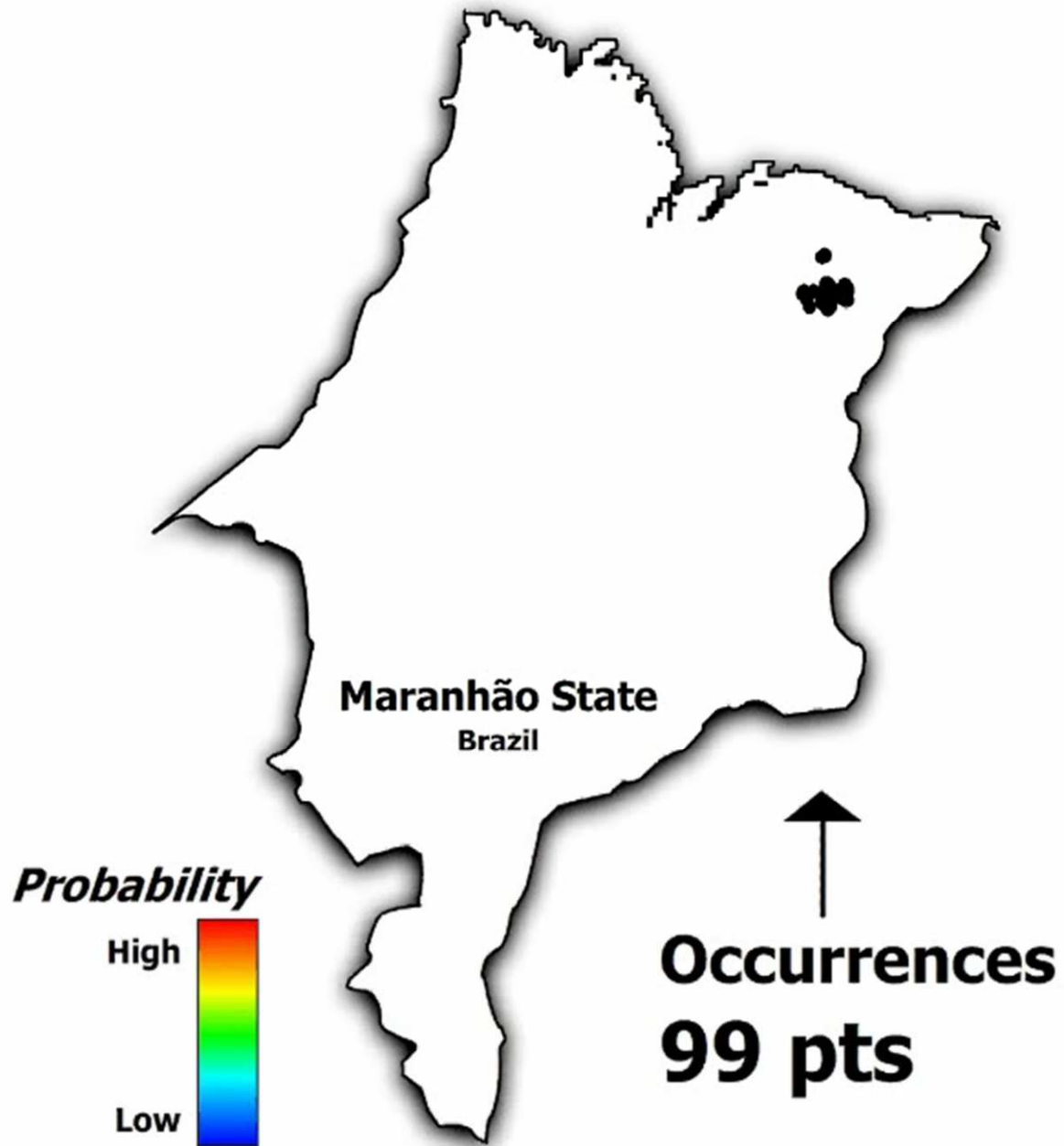


***Melipona scutellaris***





***Melipona fasciculata***





# Pollinators shifting?

- Some bee species have shifted their ranges in response to climate change. It has recently gained momentum. They need:
- Assisted migration
- Assisted colonization
- Managed relocation



# The meliponiculture under the climate change scenario

- New paradigms concerning conservation and stingless bees species displacement must be considered
- A strong research on the consequences of global change on bees survival is needed since now
- Academic research framework must be improved and adapted to the new scientific challenge
- Small populations studies play the central role in this new context





**SOLUTIONS**







# New methods for capturing swarms

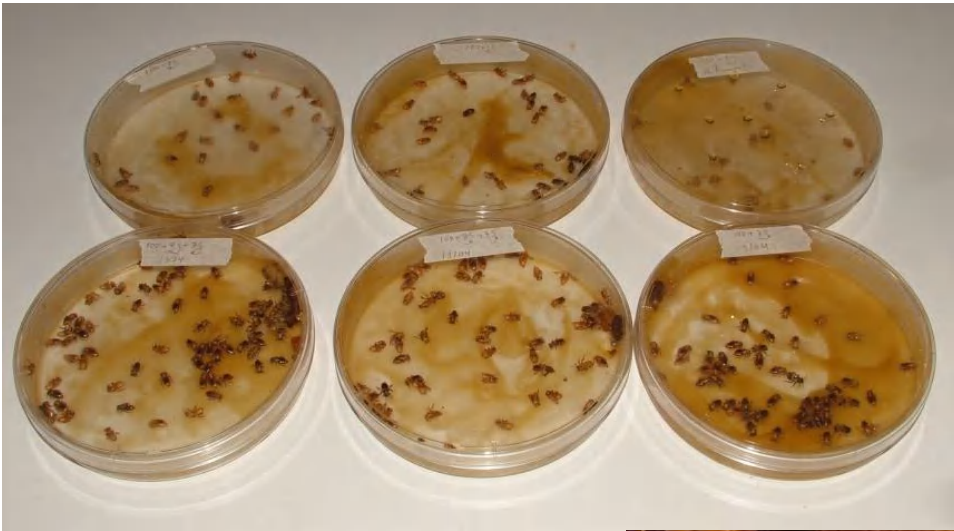




# Queen rearing : in vitro techniques

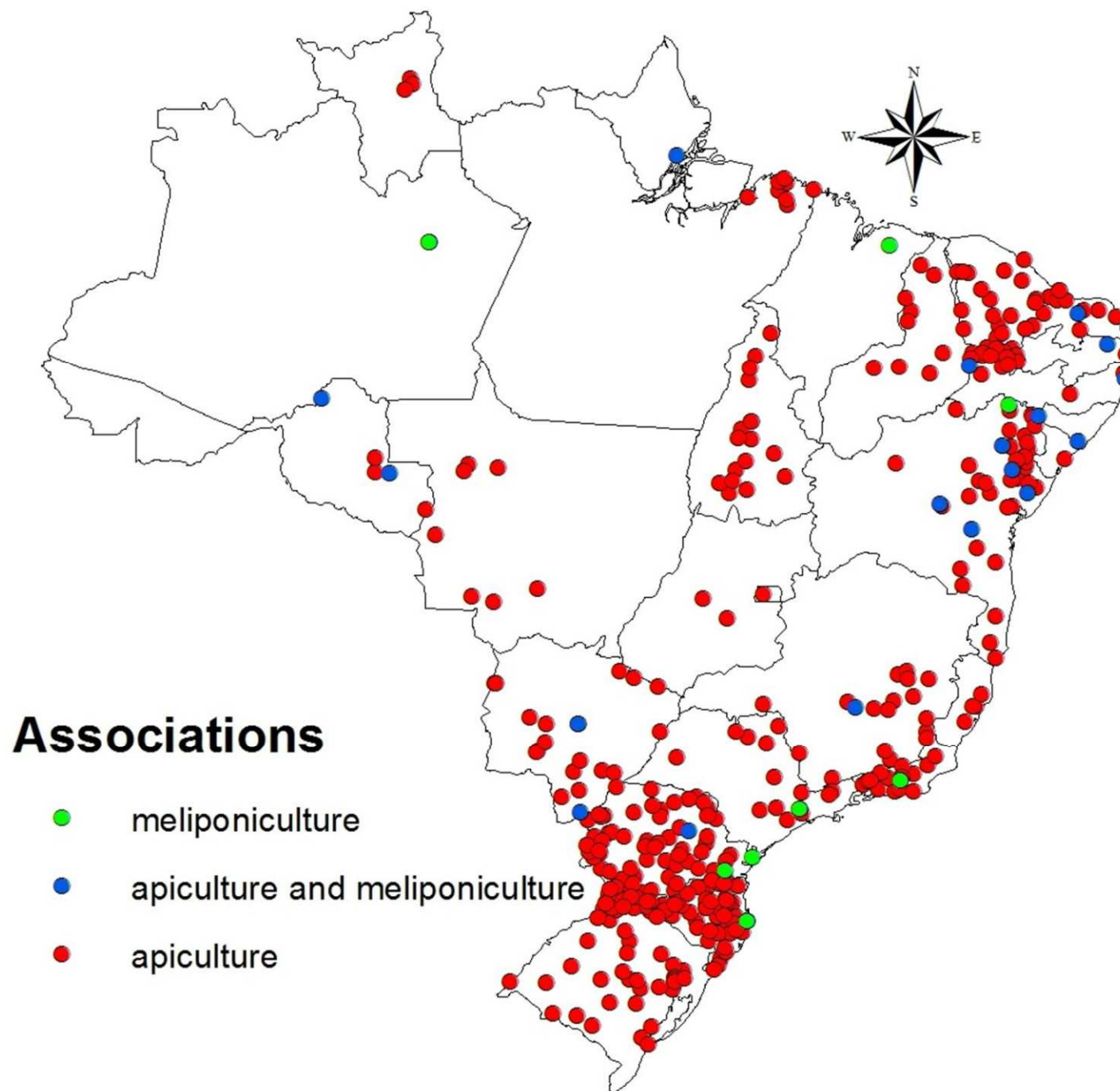






Photos by Cristiano Menezes







Let's Wardsipat W  
S. 700





# AME RIO and Electronic discussion list





# Citizen scientists



Cleiton Geuster, biologist, AME SC



# Meliponiculture in Rio Grande do Sul: Citizen-scientist



Foto de Fernando Dias





# Meliponiculture in Ceará: Citizen-scientist







Meliponicultu  
re in Rio  
Grande do  
Norte:  
Citizen-  
scientist –  
Paulo  
Menezes

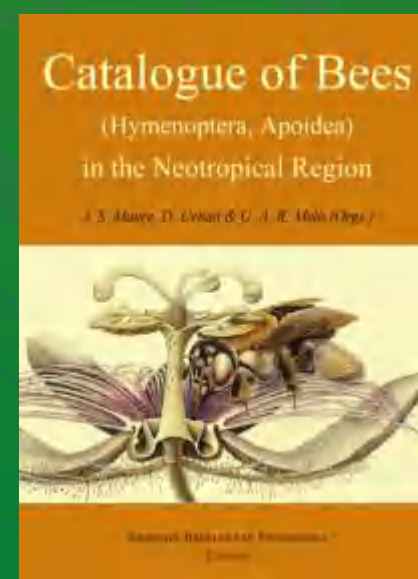
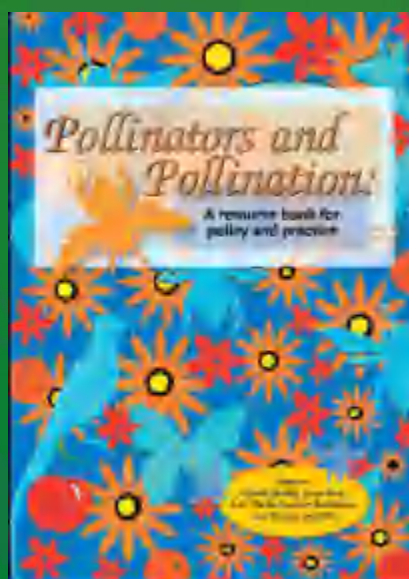
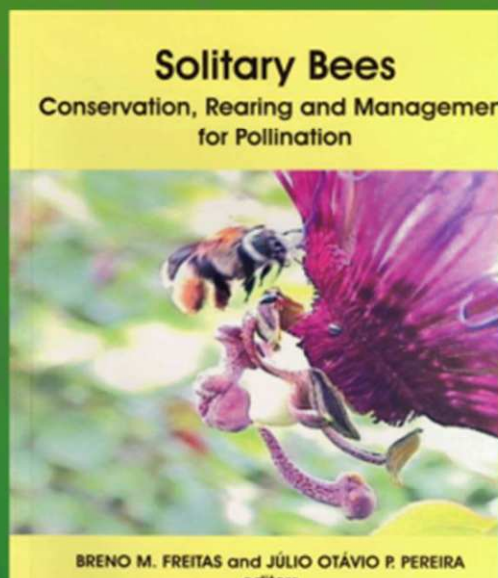
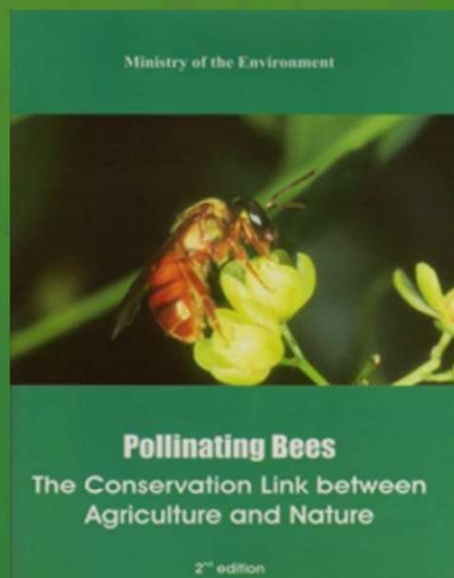


# Marcos: Reuniões e publicações

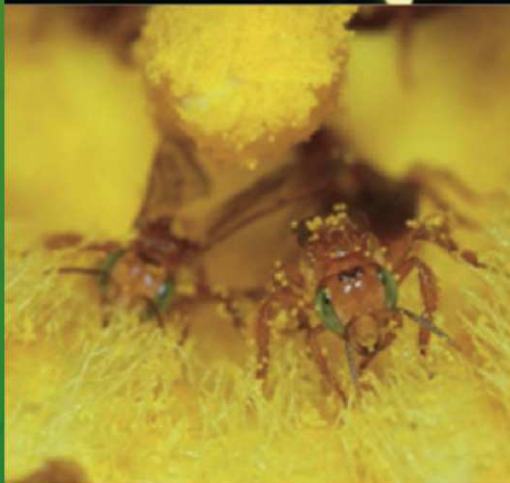




# Atividades: reuniões e publicações







# Polinizadores no Brasil

Contribuição e perspectivas  
para a biodiversidade, uso  
sustentável, conservação  
e serviços ambientais

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