

Workshop Exposure Assessment Paradigm for *non-Apis* Bees



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US EPA Office of Pesticide
Programs' building - Arlington, VA
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BIOLOGY AND LIFE HISTORY TRAITS OF SOCIAL NON-APIS BEES: STINGLESS BEES

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MELIPONINI AROUND THE WORLD

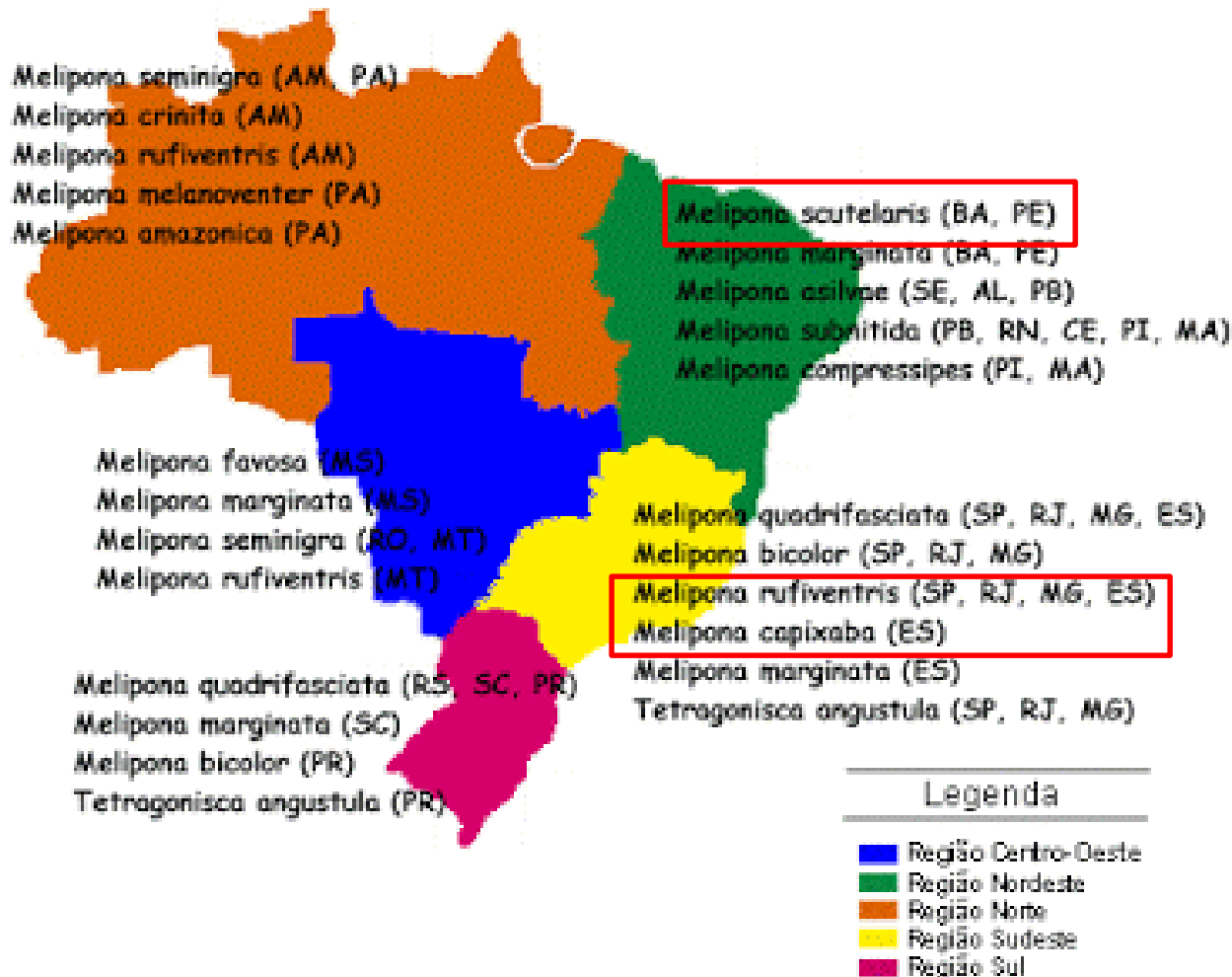
~ 500 species - 50 times more species than Apini,
twice than Bombini



Pantropical distribution (blue color) of stingless bees (Apidae, Meliponini (1982)

Hrncir, Michael, Stefan Jarau, and Friedrich G. Barth. "Stingless bees (Meliponini): senses and behavior." (2016): 597-601.

Meliponini in Brazil



- >244 species

- 4 threat of extinction

Meliponini (according Moure, 1961)

<http://moure.cria.org.br/>



Melipona scutellaris



M. quadrifasciata



M. mondury



M. fasciculata



M. flavolineata



M. becheei

Meliponini (according Moure, 1961)



*Tetragonisca
angustula*



Scaptotrigona depilis



Frieseomelitta varia



*Nanotrigonna
testaceicornis*

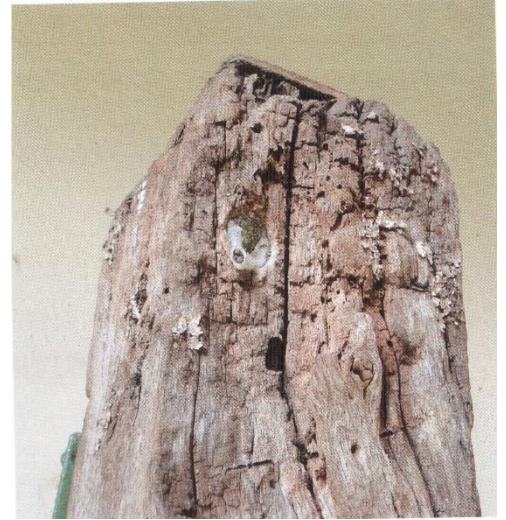


Trigona spinipes



Geotrigona mombuca

Nests Location



Nests Structure - entrance



Nests Structure - brood



Nests Structure - storage of food



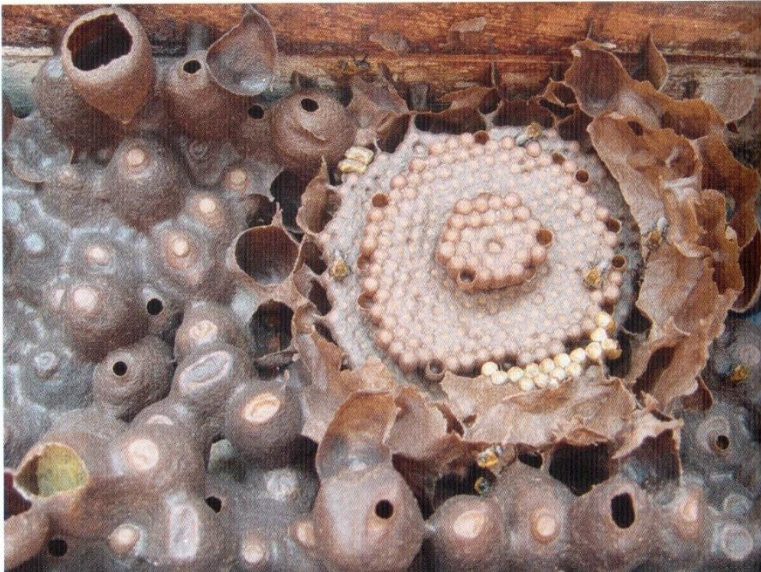
Development

	<i>Apis mellifera</i>	<i>Melipona quadrifasciata</i>	<i>Melipona scutellaris</i>	<i>Trigona angustula</i>	<i>Trigona postica</i>
Egg	3 (14%)	5,5 (18%)	9 (19%)	6 (14%)	2 (4,3%)
Larvae	6 (29%)	12,5 (40%)	16 (33%)	10 (27,8%)	13 (27,6%)
Pupae	12 (57%)	16,7 (42%)	24 (48%)	20 (55,6%)	31-33 (65-70%)
Total	21	31	49	36	46-48

Comparative developmental cycle (in days) until emergence between *Apis mellifera* and some species of stingless bees. Based on: Nates, G., abejas corbiculadas de Colombia. 2006 (http://datateca.unad.edu.co/contenidos/201518/contLinea/leccin_9_tribu_meliponini.html)

Sex and castes

- Meliponini – queen + genetic factor + food
- Trogonini – queen = food



Both tribes – males are parthenogenetic

Sex and castes

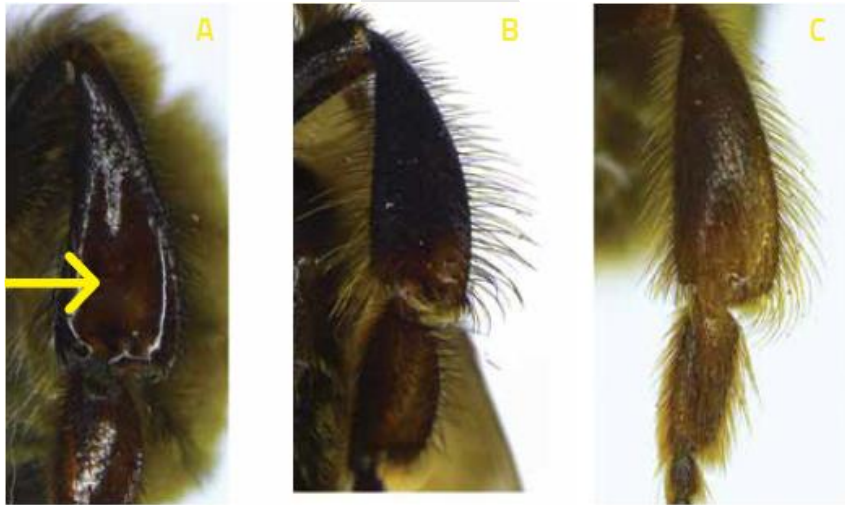


Figura 2 – Perna de meliponíneo *Melipona bicolor schencki*: A) Operária mostrando a corbícula; B) Macho sem corbícula; C) Rainha sem corbícula. Foto: Favízia Freitas de Oliveira.

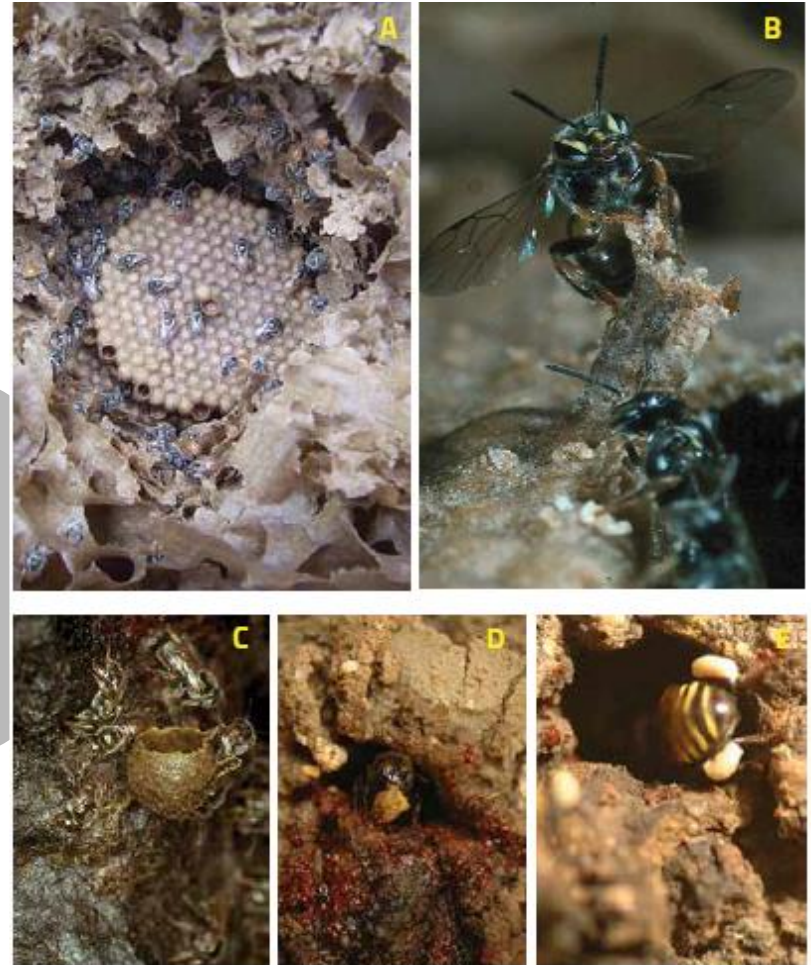


Figura 22 – Atividades realizadas pelas operárias de meliponíneos nas colônias: A) Nos favos; B) Construção das estruturas do ninho; C) Construção de potes de alimentos; D) Lixeiras; E) Campeiras. Fotos: Juliana Teixeira, Fernando Dias, Dieter Wittmann.

Meliponiculture



Traditional meliponiculture



Commercial meliponiculture

The next challenge: review and collect data about Solitary bees

More than 1.500 species just in Brazil!!!!



Agapostemon sp; *Centris* sp; *Augochrolera* sp; *Epicharis* sp; *Dialictus* sp; *Temnosomoa* sp;
Melissodes sp; *Oxaea* sp.



Thank you for your
attention!!!!

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