NATURAL AND ARTIFICIAL BREEDING OF *Heterotrigona itama* AND *Geniotrigona thoracica* FOR ENVIRONMENTAL SUSTAINABILITY

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MALAYSIA MELIPONICULTURE CHALLENGES

Deforestation

- Illigal logging activity (colony hunting)
- Diversity of stingless bee
- Native pollinators population
- Ecological imbalance

Opportunist

Geniotrigona thoracica

Heterotrigona itama

STINGLESS BEE PROPAGATION

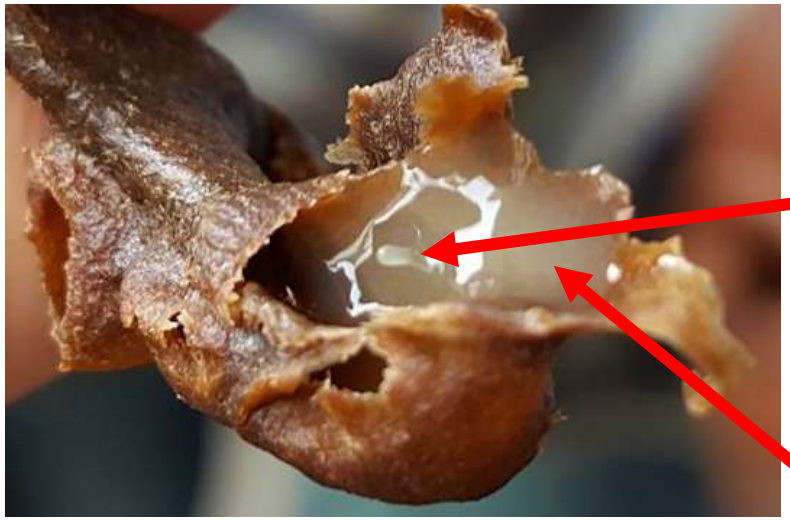
NATURAL PROPAGATION

- Swarming
- Bridging Method
- Baiting Method

ARTIFICIAL PROPAGATION

- In Vitro Queen Rearing
- Brood Transfer Method
- Splitting Method

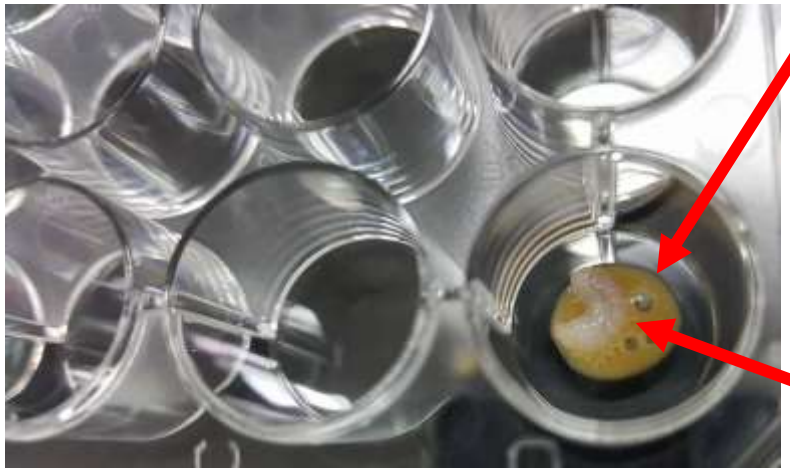
IN VITRO QUEEN REARING OF STINGLESS BEE



Geniotrigona thoracica egg

Queen can be produce artificially by manipulating their larval food sources

The larval food (Beebread)



Queen-rearing techniques for stingless bees are based mainly on the overfeeding of female larvae in vitro.

(Baptistella et al. 2012; Menezes et al. 2013)

Geniotrigona thoracica larvae

IN VITRO QUEEN REARING OF STINGLESS BEE

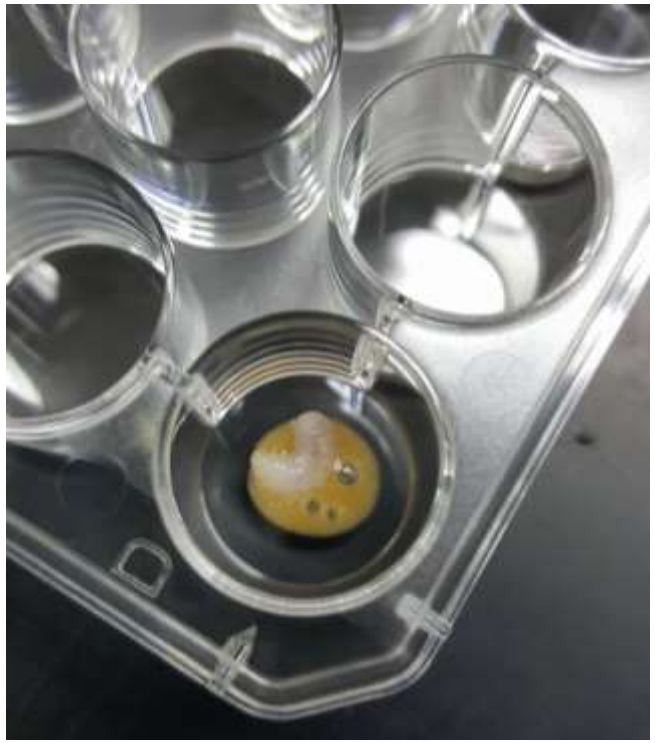
Further observation and research:

1. In Vitro Queen rearing procedure? (Larval food produced by workers)

2. Acceptance of queen in the new colony?

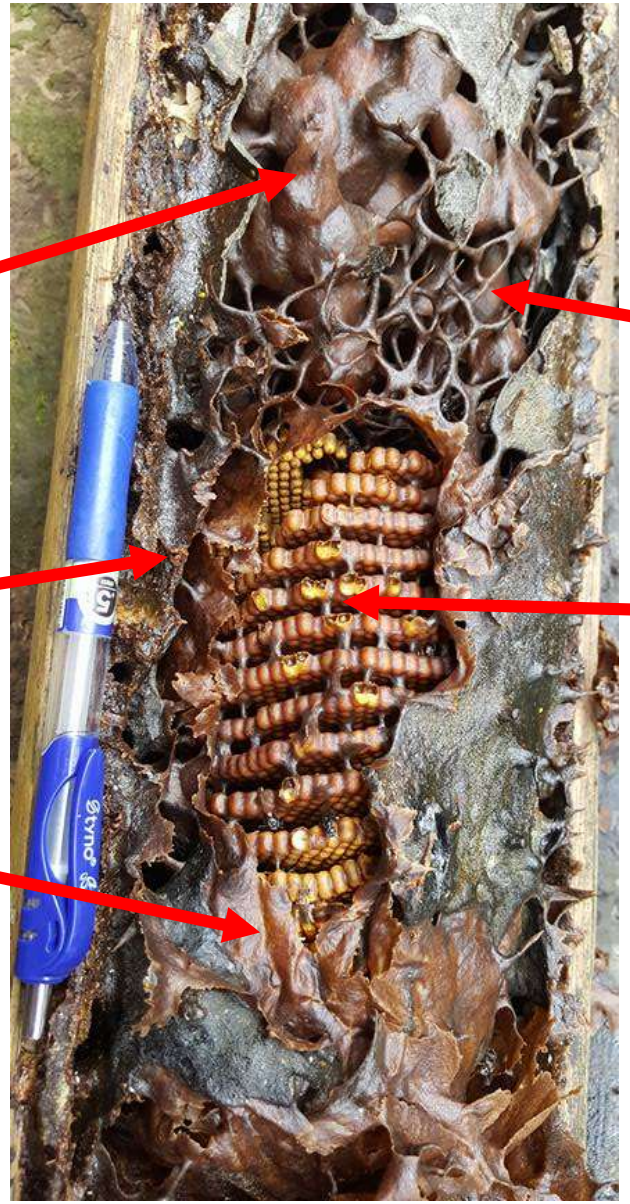
3. The fertility of the in vitro queen (Fertile or sterile queen?)

4. Any impact on genetic polymorphisme of the stingless bee? (Sexual propagation? Extinct ?)



BROOD TRANSFER METHOD

Physically split the brood chamber into two or more parts

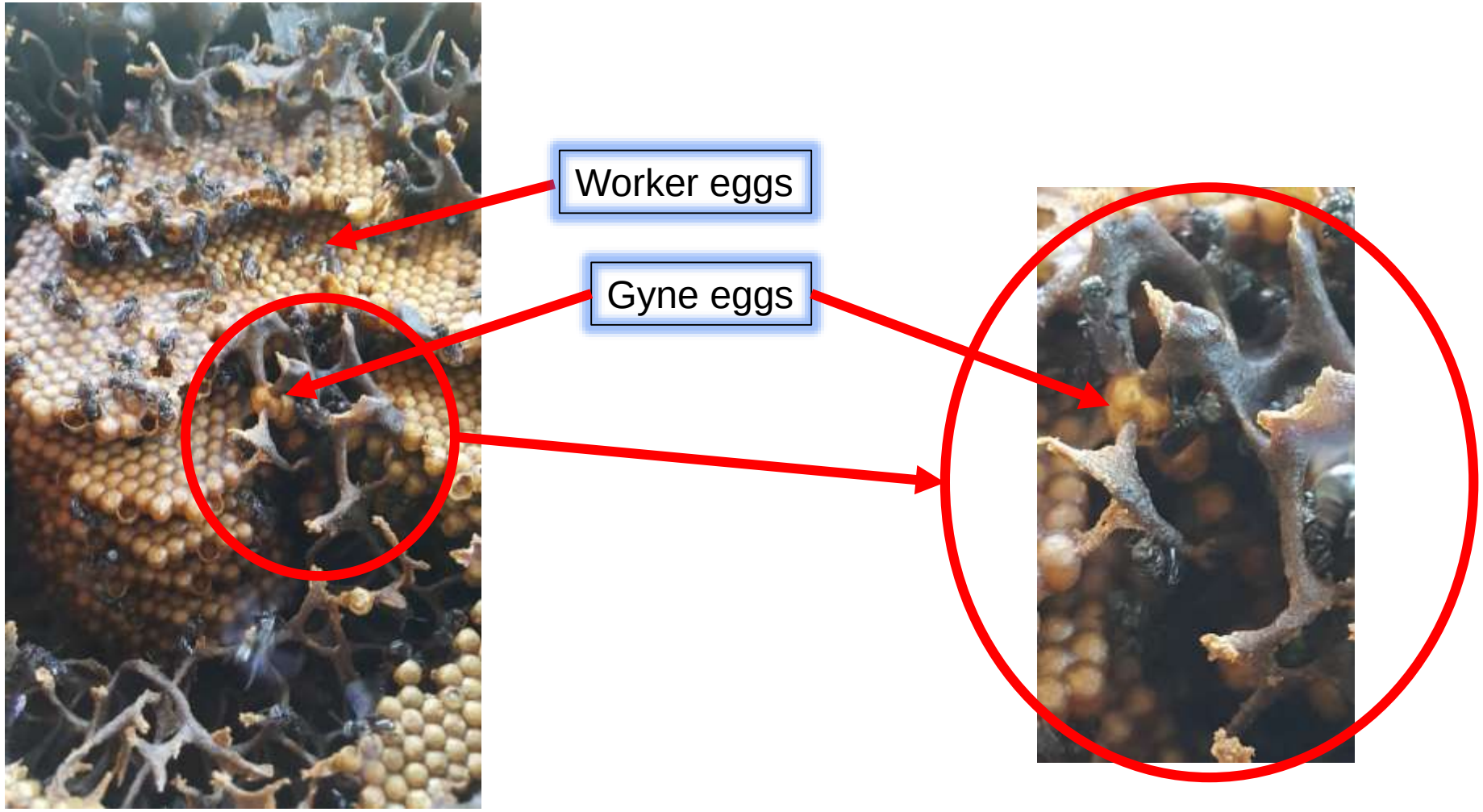


Heterotrigona itama nest in an opened log

BROOD TRANSFER METHOD

- Colony is strong and active
- Layers of brood cells (with queen cells)
- Transfer when the weather is good
- Adequate of resin, nectar and pollen sources from surrounding areas
- Proper shelter with a good air circulation
- Do not stress the colony!

BROOD TRANSFER METHOD



Brood cells of *Heterotrigona itama* in horizontal arrangement

BROOD TRANSFER METHOD

Gyne eggs

BROOD TRANSFER METHOD

Replaced the original location with a dummy box

Propolis from the original entrance will attract the foragers

BROOD TRANSFER METHOD

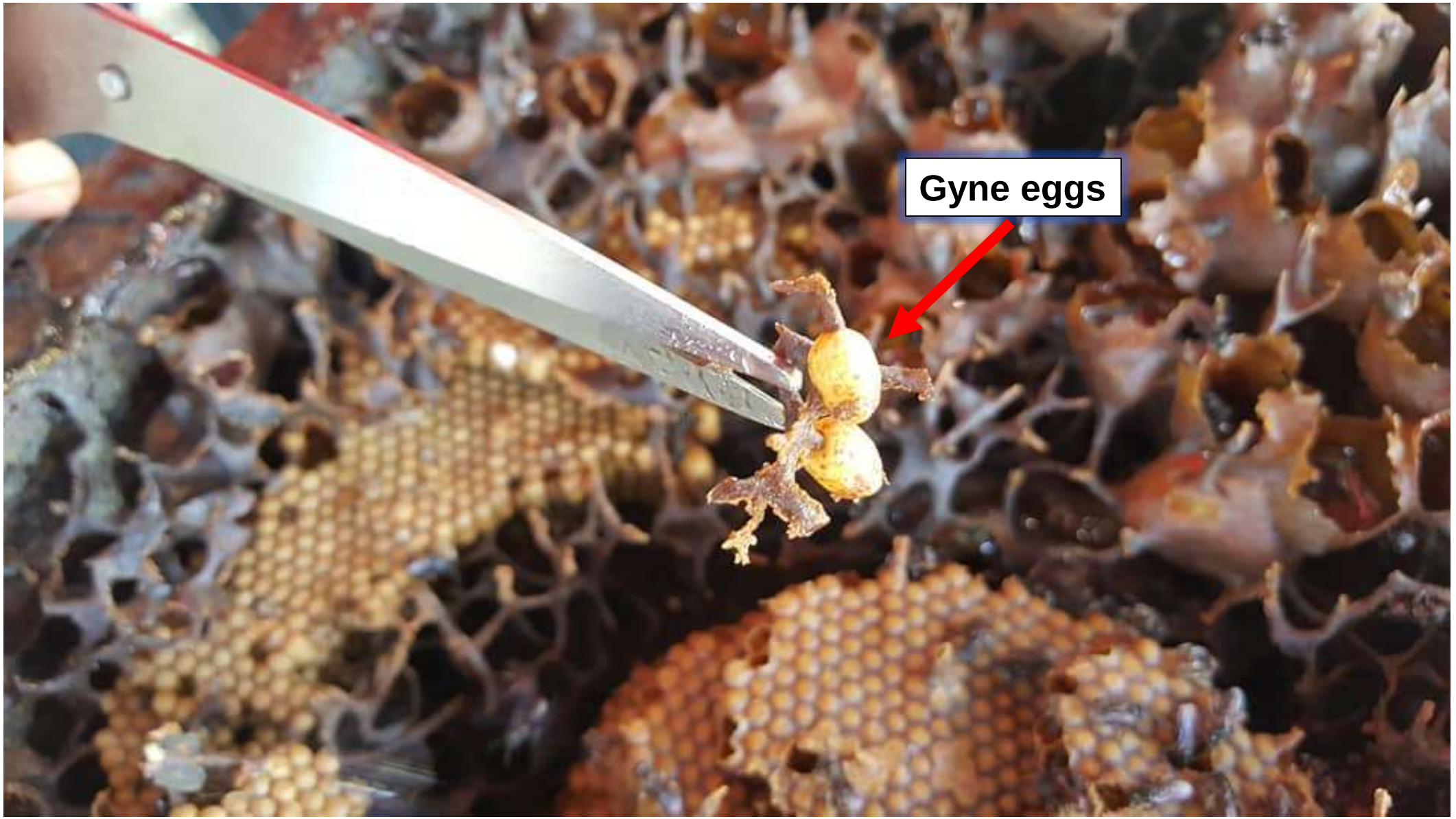
BROOD TRANSFER METHOD

Take a section of brood cells from a strong colony

BROOD TRANSFER METHOD

Part of *Heterotrigona itama* brood chamber removed from original cluster

BROOD TRANSFER METHOD



BROOD TRANSFER METHOD

Transfer the *Heterotrigona itama* brood chamber to the new hive

BROOD TRANSFER METHOD

SPLITTING METHOD

Physically split the brood chamber into two or more parts

10 layers of brood cells

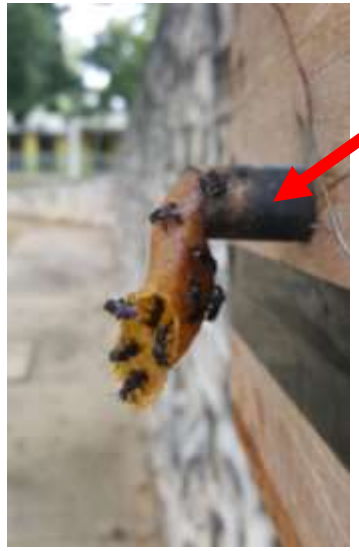
Strong and active colony

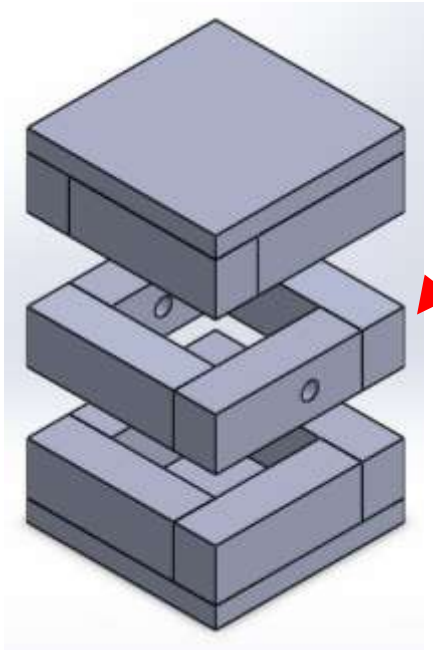
BRIDGING / EDUCTION METHOD

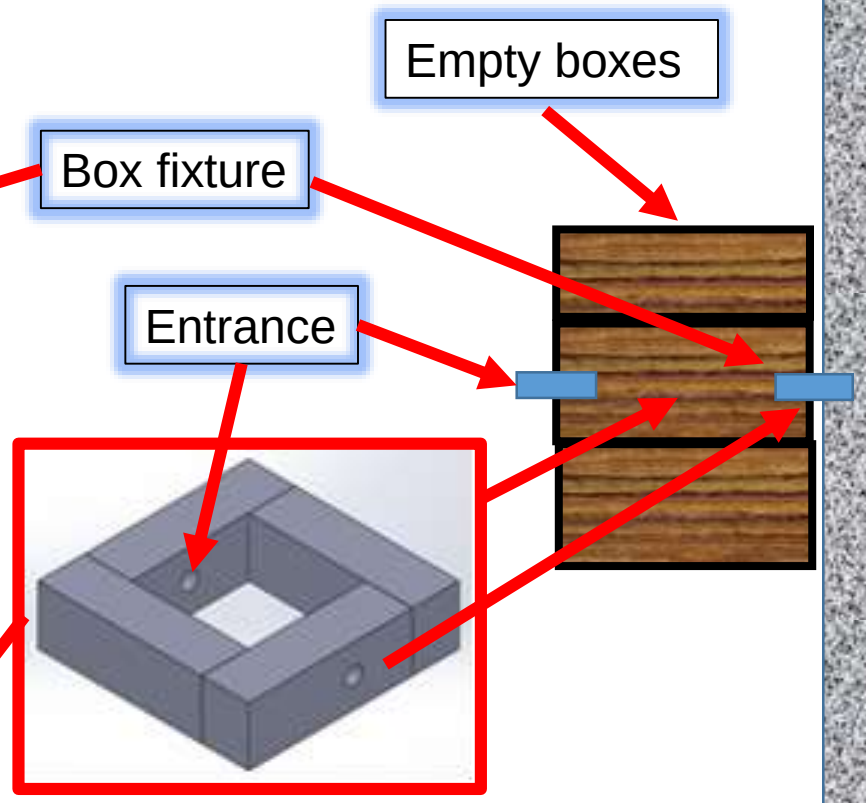
To coax stingless bees into a box from a natural nest site in a large tree or an inaccessible cavity.

An excellent method of producing a new colony without disturbing the original nest cavity

BRIDGING / EDUCTION METHOD

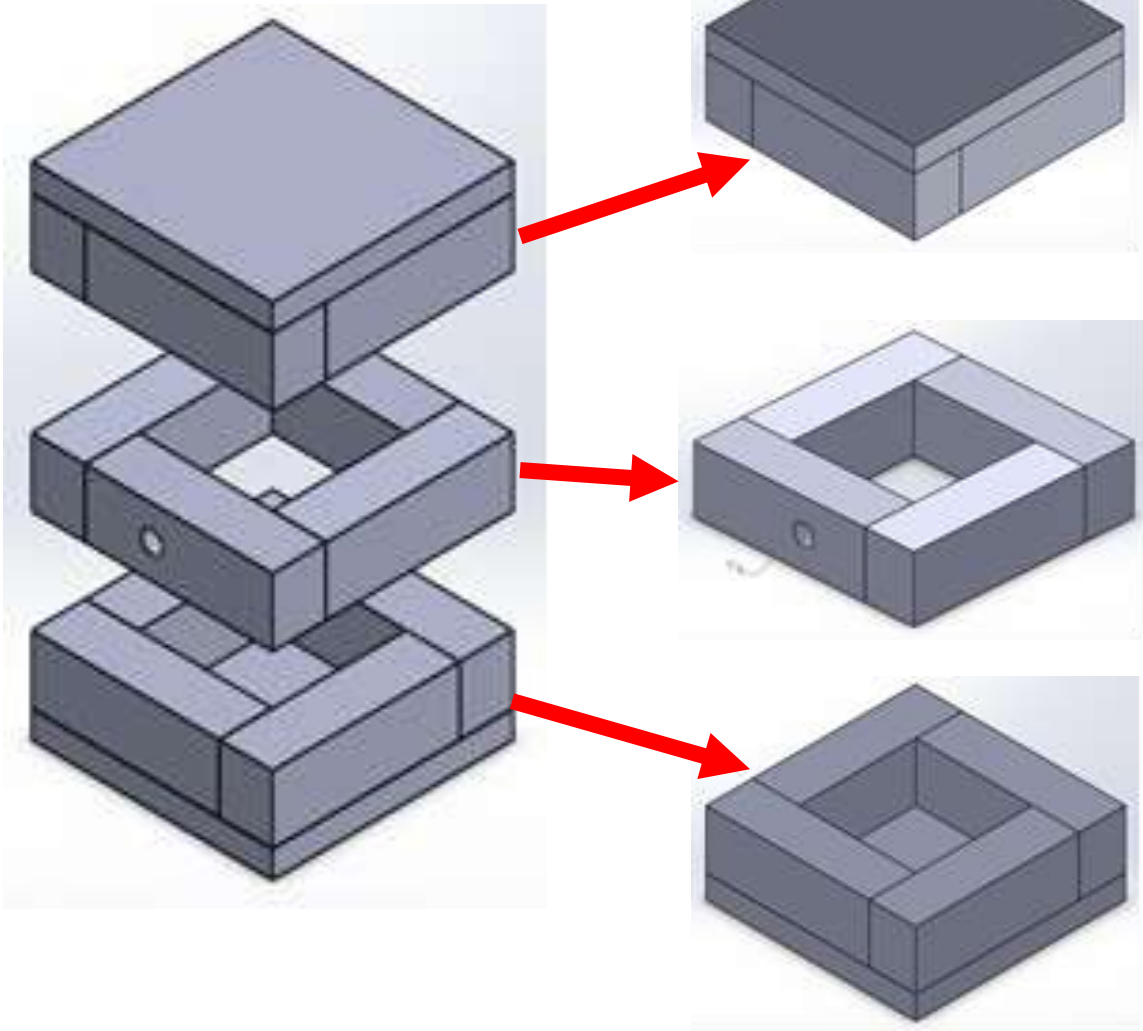






BRIDGING / EDUCTION METHOD

BAITING METHOD



Top cover

Baiting entrance

Bottom cover

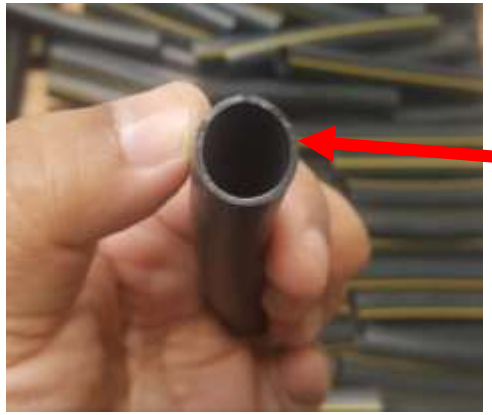
After the rain season

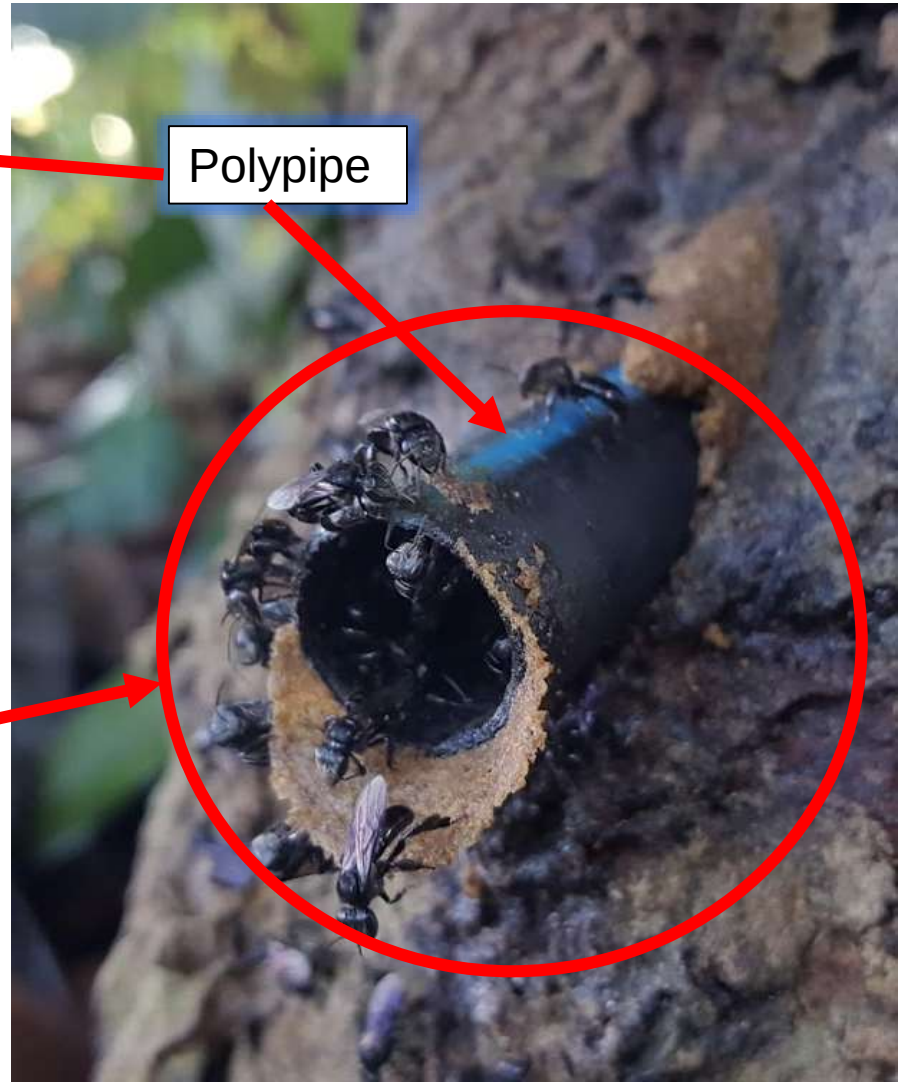
Secret recipe:

1. Propolis with ethanol

2. Fresh Propolis

BAITING METHOD





BAITING METHOD

BAITING METHOD

BAITING METHOD

4th April 2019

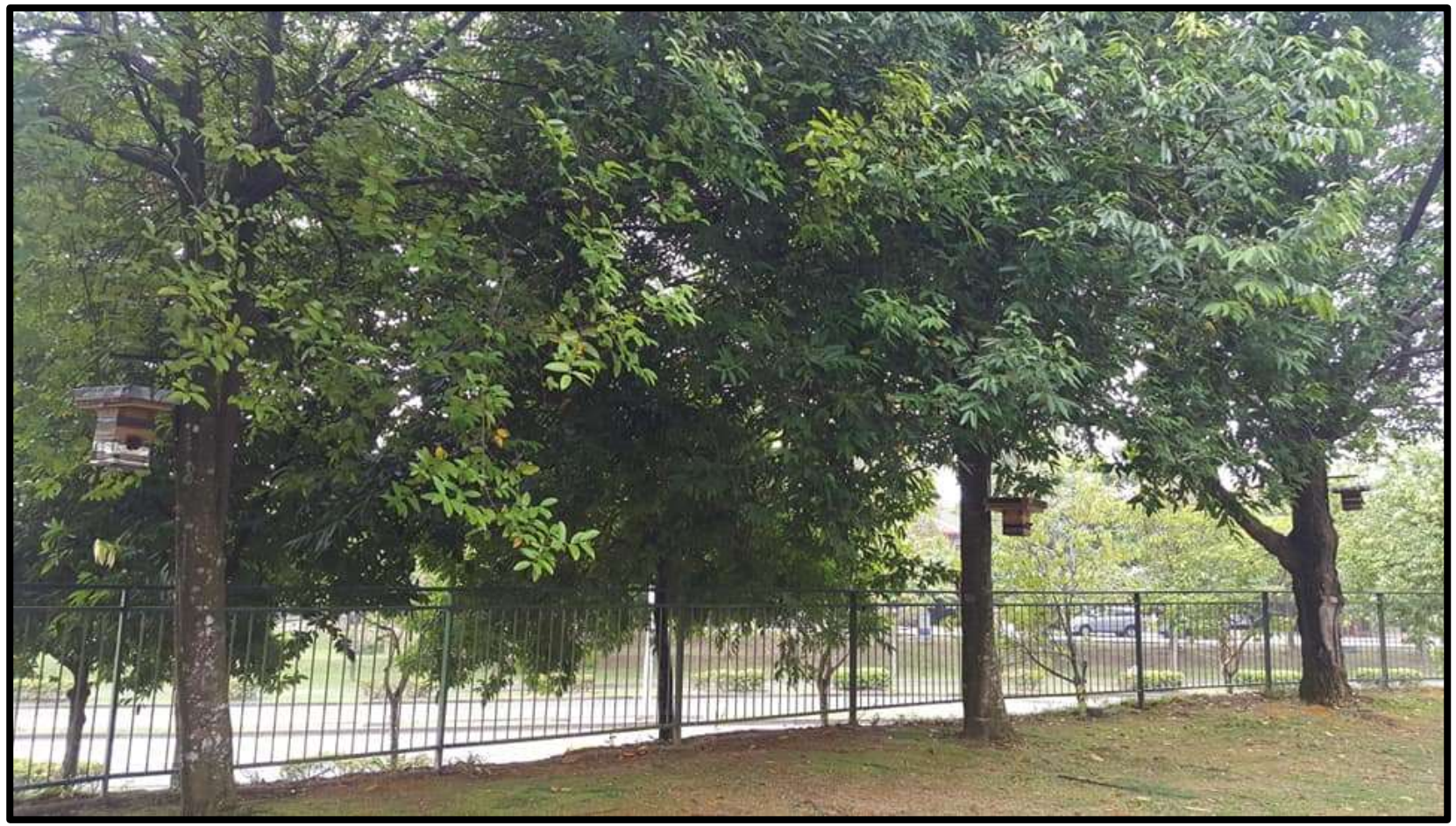
17th April 2019

MELIPONINI URBAN YARD

MELIPONINI URBAN YARD

MELIPONINI URBAN YARD

MELIPONINI URBAN YARD



Pokok Bunga Tanjung
(*Mimusops elengi*)

THANK YOU