Queen rearing : Sustainable the Meliponiculture

MARDI

Introduction

- The queen bee of stingless bees are unable to find new colonies independently.
- They also do not exploit colonies of other species, as do some ants that practice dependent nest foundations.
- Consequently the colonies must multiply by swarming- the queen and a group of workers depart from the mother colony in order to find a new one.

- To date there are more than 600 farmers involved in stingless bee rearing with almost 20,000 colonies in the country.
- Demand for feral (wild) colonies of stingless bee are very high since the price of stingless bee honey catches a premium price.
- Trees being cut down unselectively which in the end resulted to the destruction of the natural ecosystems
- Therefore new and fast multiplication method for stingless bee queen rearing must be established in order to overcome some of the problems indicated before.
- One of the fast techniques is rearing of the queen via *in-vitro* technique

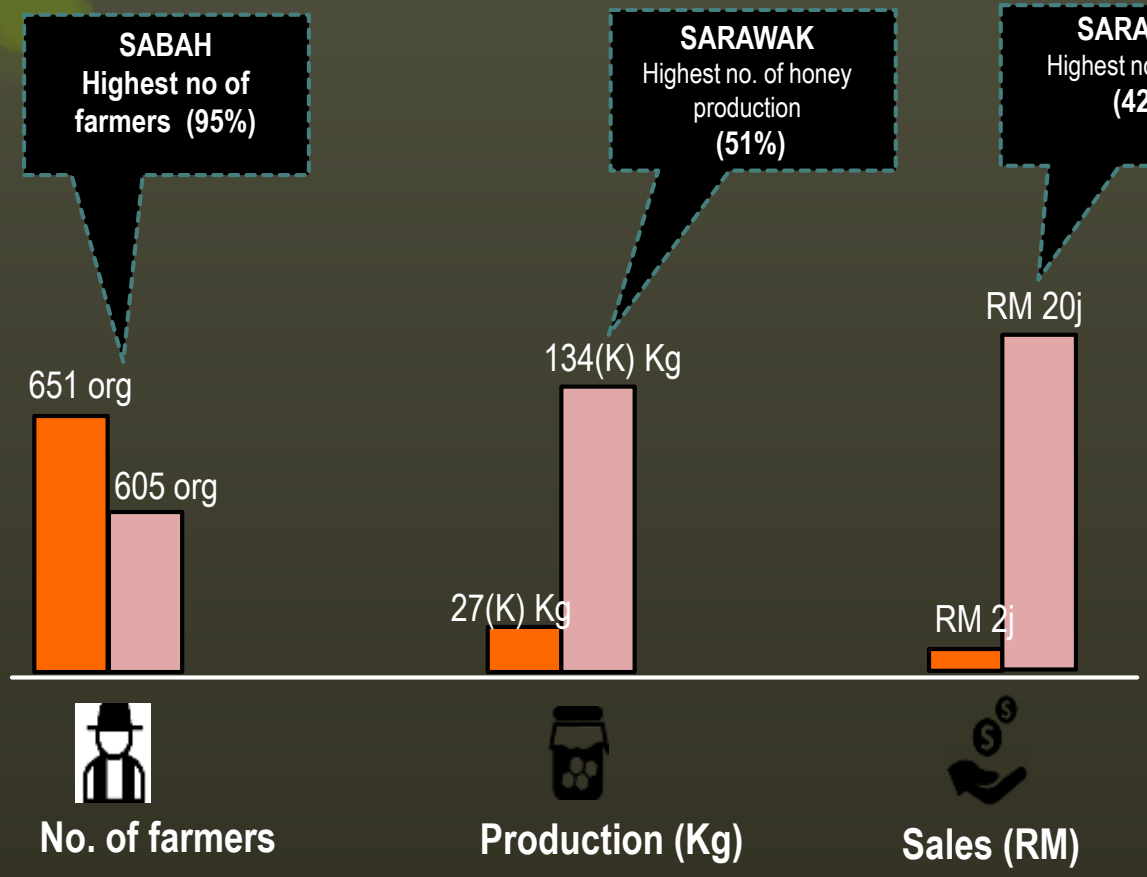
Important of queen rearing

- Reduce price of the colony.
- Sustainable the environment.
- Maintaining the industry.

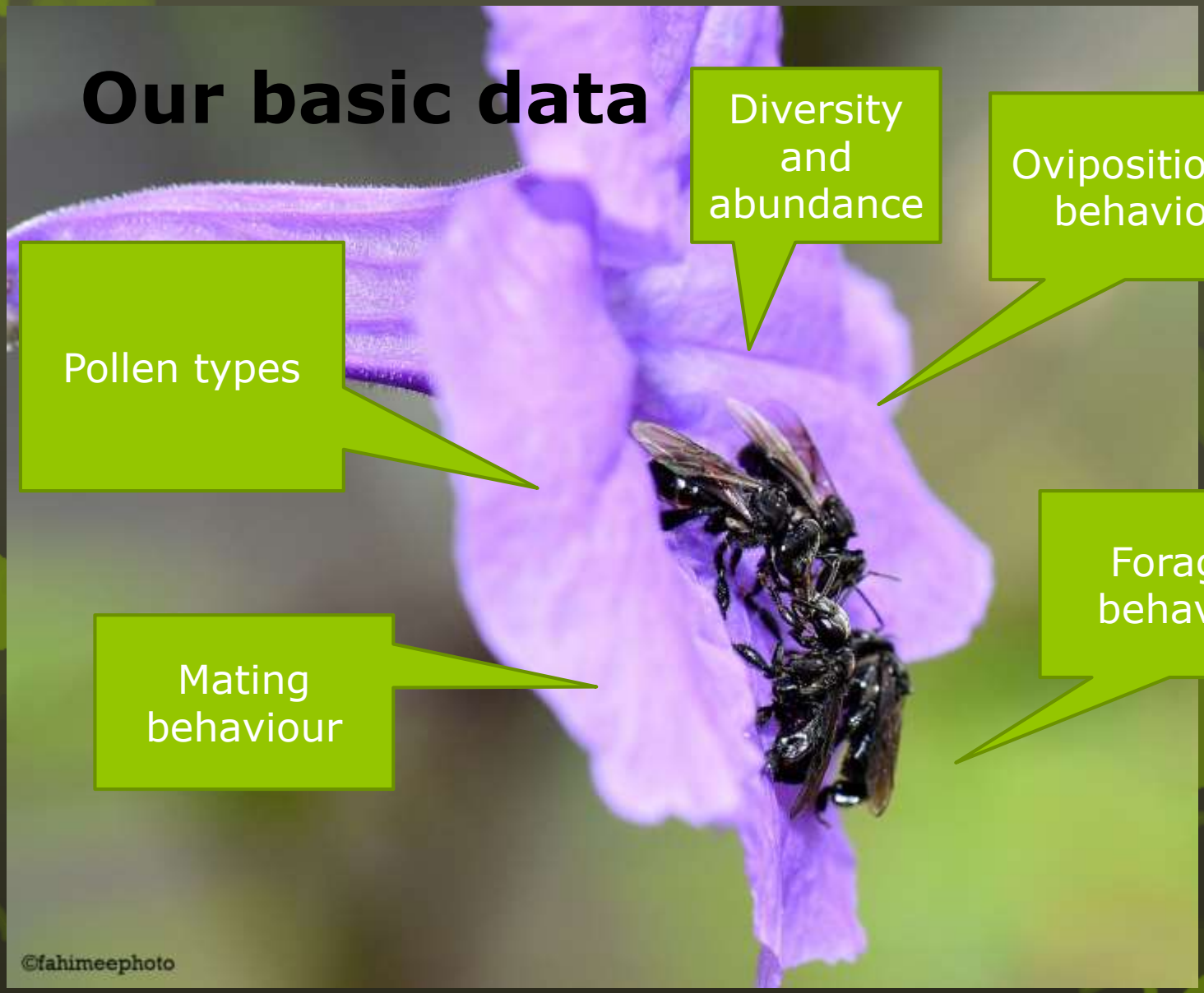
Our focus

- Produce virgin queen
- Enhance meliponicuture with box style
- If got 5 colonies from the project also the best result.
- Mobile Meliponiculture (Mobile Pollination Services)

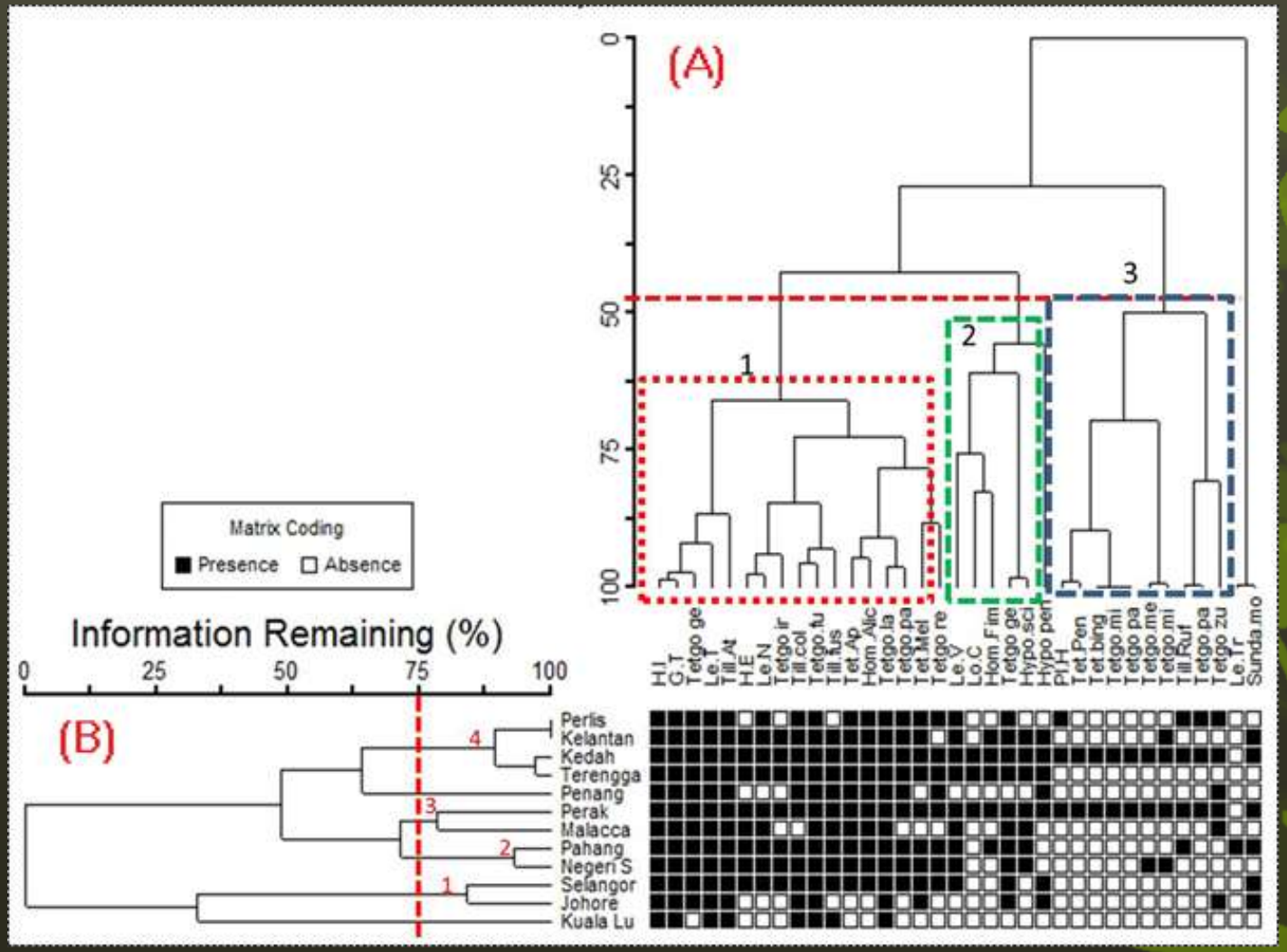
Honey industry



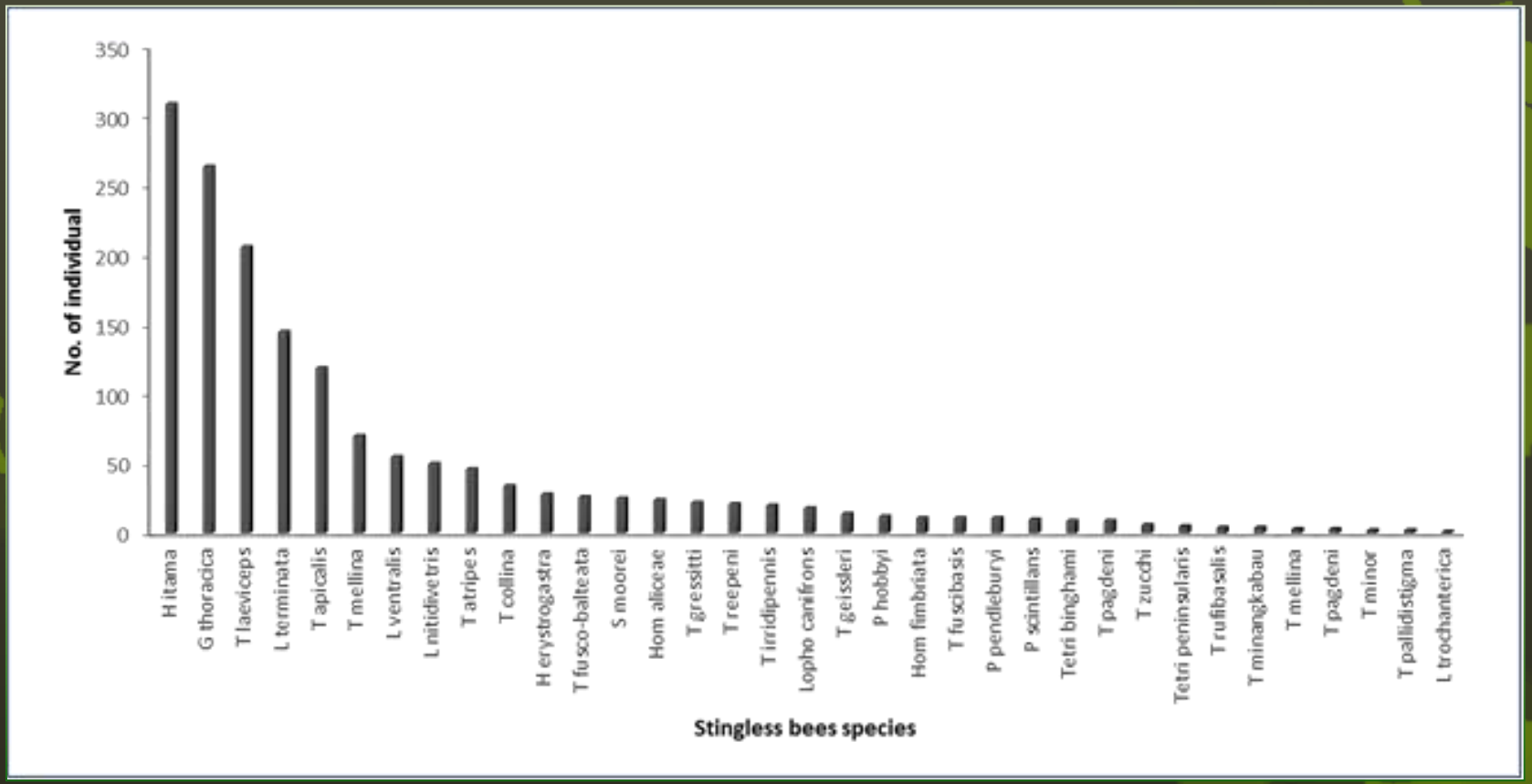
Our basic data



Stingless Bees Mapping

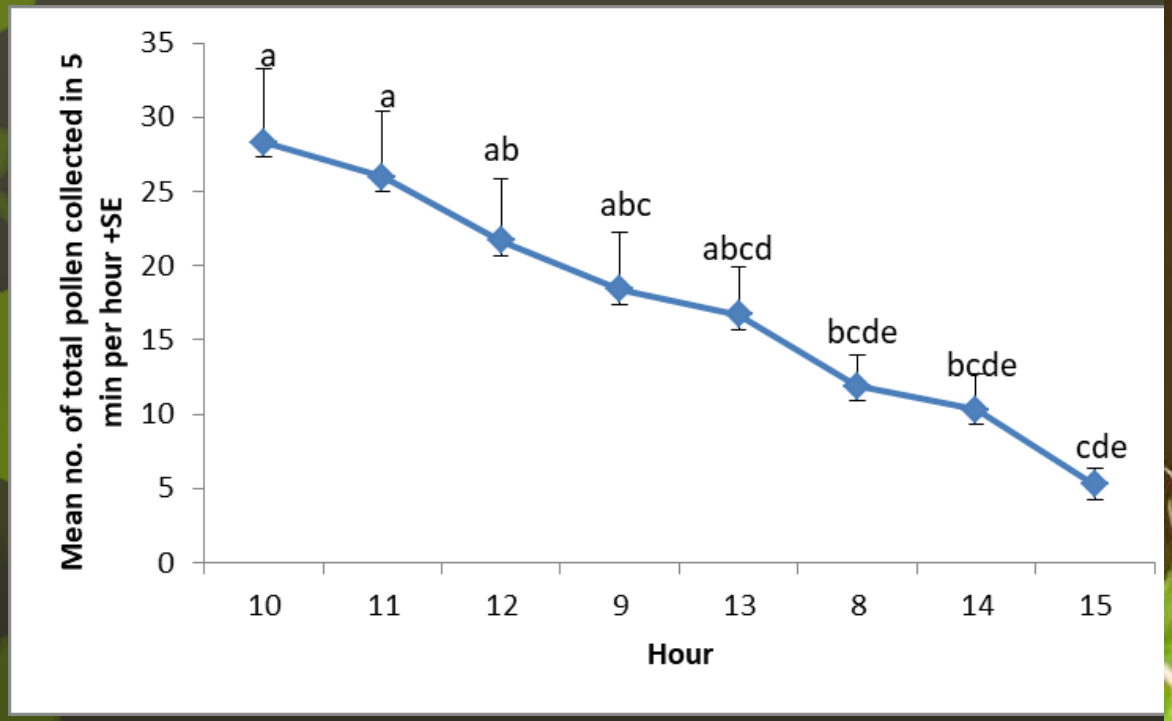


Abundance of stingless bee species in Peninsular Malaysia from June 2013 to June 2015



Observation colony

Total pollen collected from 8am to 3pm



Pollen

Ovipositioning process

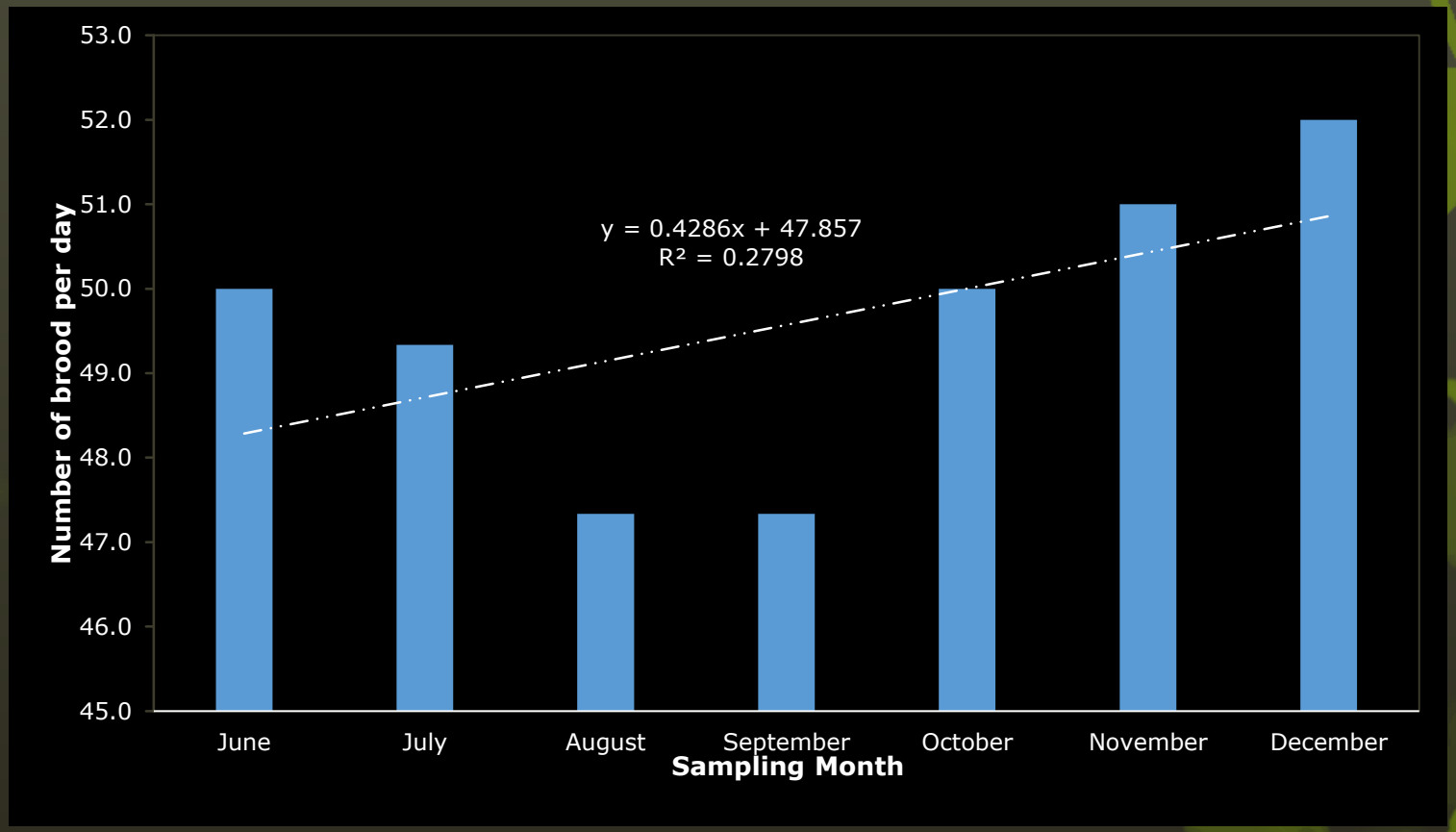
Fastest oviposition was 4 second

Ovipositioning process start from 7 am and happen once every two hours

Mean no. egg laid by queen per day was 45±

Brood cell built every 2 hours and takes 2 hours to complete

Trend of brood produced by *H.itama* from Jun to December

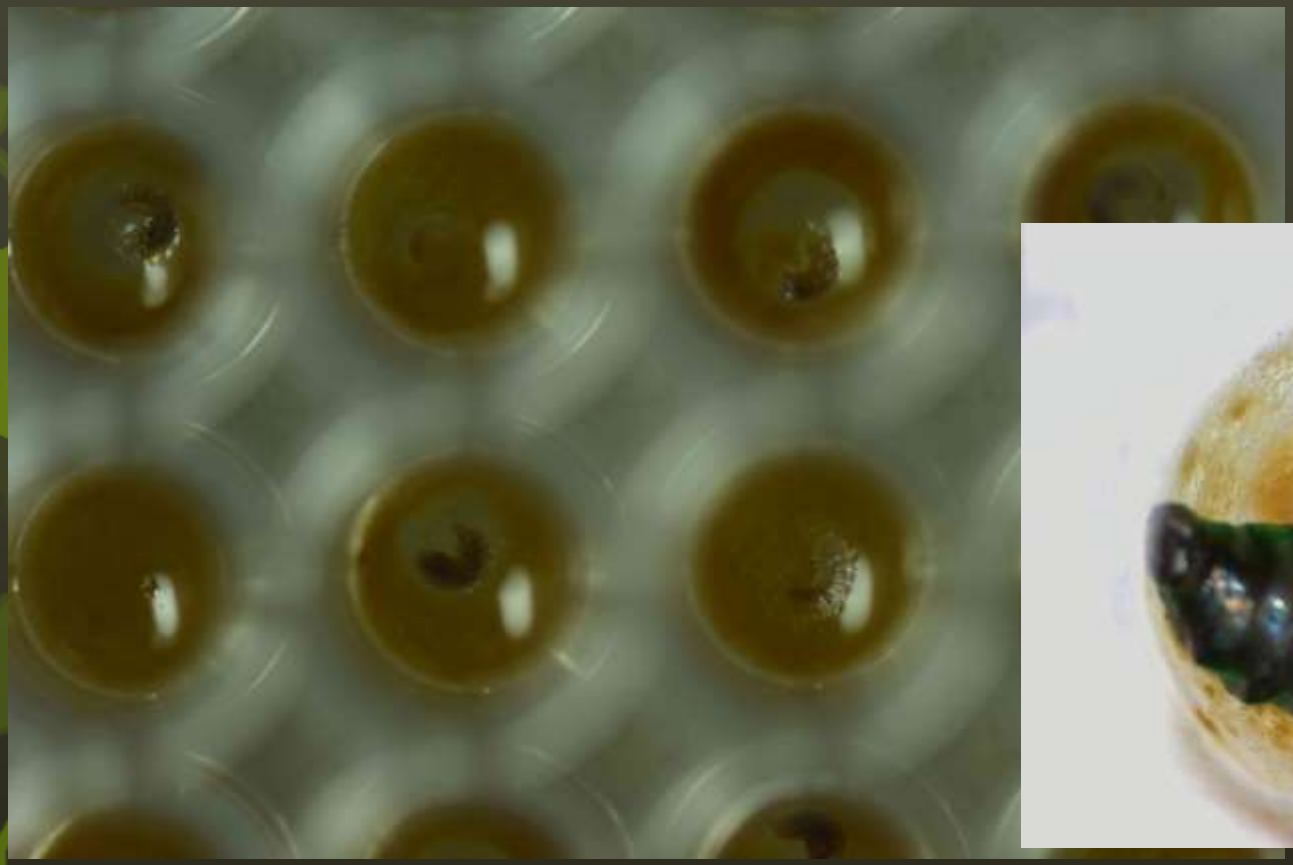


Queen rearing started

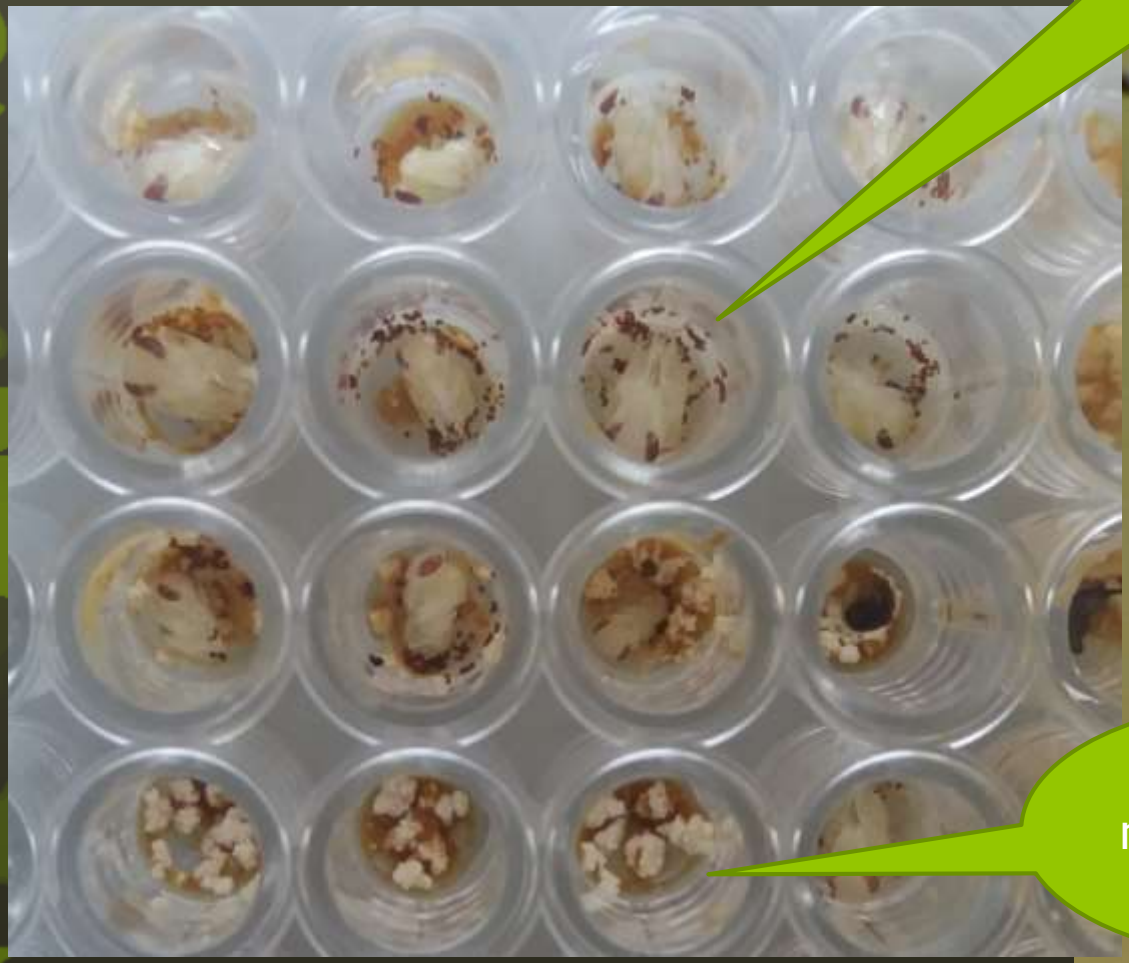
- 2014 First study
- 2015 failed
- 2016 give up when no attention
- 2017 grant from MARDI
- 2018 method established
- 2019 farm test

- 156 trial since 2014.
- Sacrifice about 312 layer of brood which is similar to 30 colonies.

Failed again



Failed again



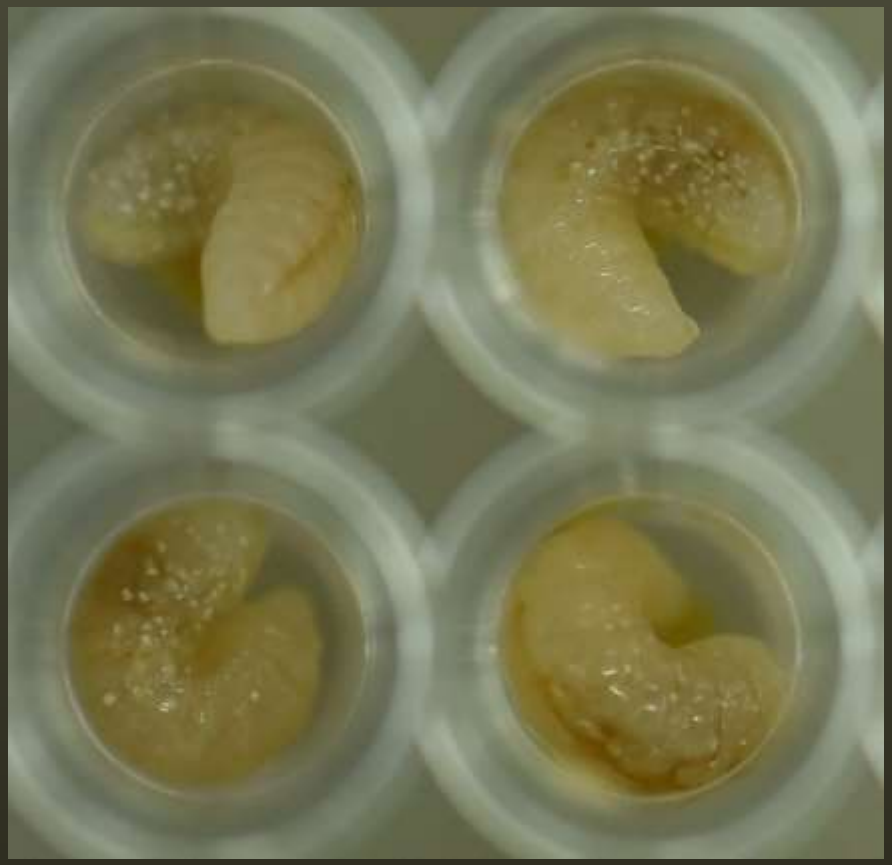
Worker

The eggs not turn into larva

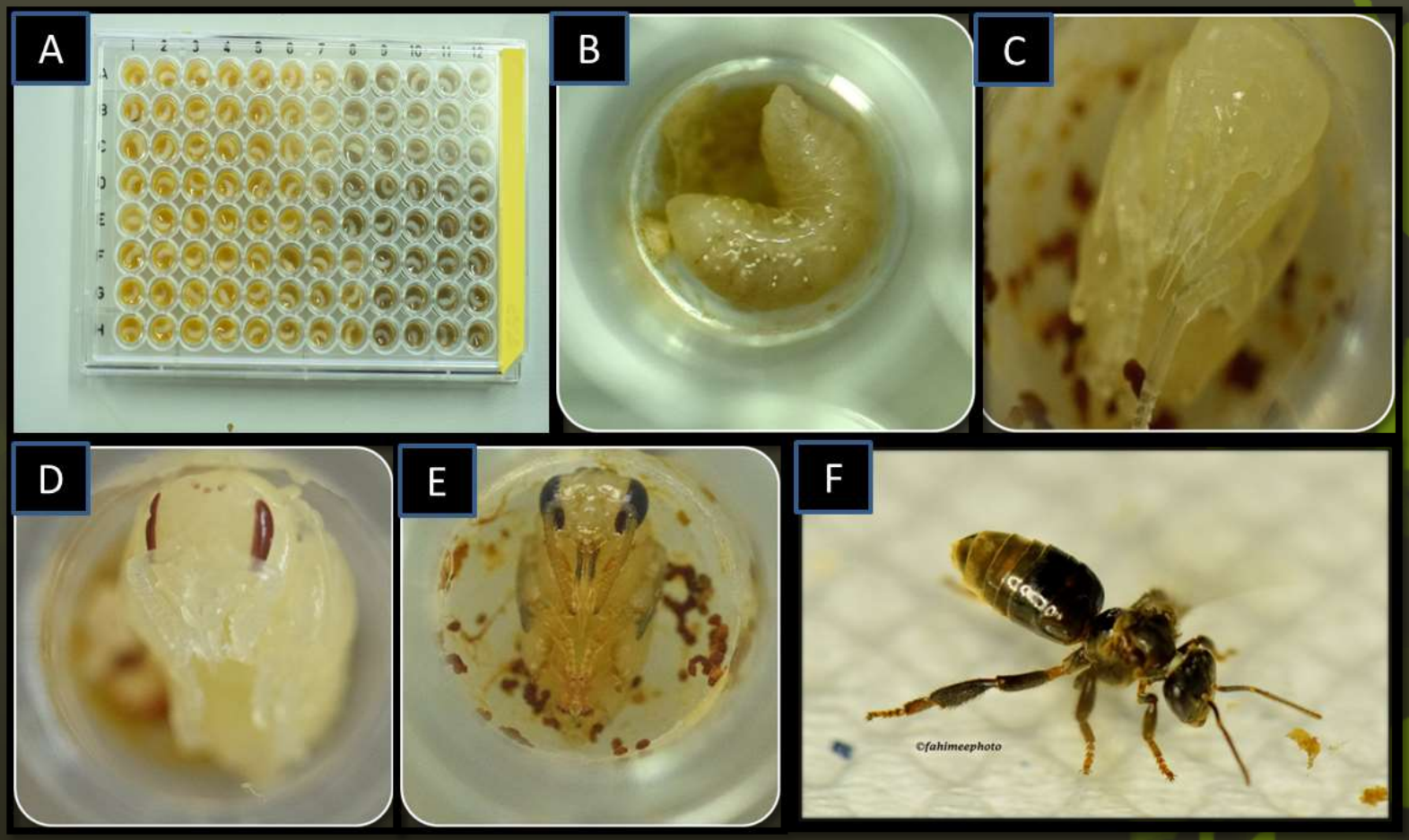
Larval food test

No	Larval food test	Observation
1	60 µl	The eggs transform to larva stage in 3 days and become worker in 30± days.
2	80 µl	The eggs transform to larva stage in 3 days and become worker in 45± days.
3	100 µl	The eggs transform to larva stage in 3 days. 50% of sample change into queen in 75± days.
4	120 µl	The eggs transform to larva stage in 3 days. 50% of sample change into queen in 85± days.

Healthy larval



Here the successful story



Our improvement (come the headache)

Here the queen

- The queen from the plate

Field test

6 inchi

6 inchi

Challenge

- Uneven hatching
- Humidity
- The eggs (which eggs u must choose)or it will turn into drone

The technique

1. Collect the larval food, store at fridge.
2. Prepare 96 well Elisa Plate
3. Harvest the young brood cell (Egg)
4. Insert the liquid food into ELISA well
5. Insert the egg vertically
6. Close the ELISA Plate than put in incubator.
7. Control the humidity and wait
8. Good Luck

Special thank to

KETENGAH for funding the basic study(KG0007410).

MARDI for funding preliminary study

MOA for mass scale (KG002910).

Farmers that I took the brood for samples