In August 2022 the Biodiversity and Ecosystem Services Network Trinidad and Tobago project (BES-Net TT) hosted a free workshop series in Trinidad on various aspects of pollinator management. This workshop series will soon kick off in the sister isle. Three of the sessions in the series were focused on stingless bees. In this article, some specific aspects of the biology and habits of stingless bees that were shared in the series are highlighted.

The Biodiversity and Ecosystem Services Network Trinidad and Tobago project includes among its key objectives, a focus on the practice of pollinator management. With pollinators facing major threats to their populations worldwide, Trinidad and Tobago must do its part in managing this important component of its biodiversity. Small and often overlooked, pollinators hold the key to unlocking the bounty of potential food production, and the horticultural and ecotourism industries through the simple act of pollination, by ensuring the sustainability of our flowering plants and plant reproduction.

While most persons attribute the hard work of honeybees to pollinate and also supply the golden product of sweet honey, the equally hard work of other pollinators, specifically that of native stingless bees, should not be overlooked nor discounted.

Stingless bees in T&T

Many persons, when the term 'stingless bee' is mentioned, ask the question "There are *stingless* bees?" The answer is yes, there are stingless bees and we have species of those bees in Trinidad and Tobago. There are (presently known and recorded) some eleven local species of stingless bees. These are as follows:

Scientific name of bee	**Common name**
Cephalotrigona capitata	Mombucão
Frieseomelitta paupera	Petit Angel
Lestrimelitta limao	Lemon Cab
Lestrimelitta spinosa	
Melipona favosa	Erik, Moko Chiquita
Melipona trinitatis	Guanot
Nannotrigona testaceicornis	Irai
Partamona nigrior	Petit Pegone
Plebeia tobagoensis (recorded only in Tobago, thus far)	Mirim
Plebeia sp.	
Trigona amalthea	Pegone

Persons may have encountered our stingless bees, but may not have recognized them as such, as the bees are easily mistaken for flies, wasps or other insects. The bee species demonstrate a range of sizes and physical characteristics. *Melipona trinitatis* (or Guanot) is about the size of a honeybee and is cinnamon-brown in colour. *Nannotrigona testaceicornis* (or Irai) is much smaller, about 3-5 millimeters in length; it pollinates a wide range of flowers and is prized as a pollinator in greenhouses in temperate countries. *Frieseomelitta paupera*, or Petit Angel, has a slender 'waist' and can be mistaken for a wasp; it is a main pollinator of Avocado flowers.

Nannotrigona testaceicornis bee collecting pollen from *Cosmos sp*

"Honey" from stingless bees

Quite often, another question asked is “Do stingless bees produce honey?” The answer is that they produce ‘a type of honey’. The answer seems strange, however, in understanding that honey *as we know it* is a food product which has specific standards (for example 60% minimum sugar content, 20% maximum moisture content, pH 3.4 – 6.1), the ‘type of honey’ produced by stingless bees does not fit specific criteria for honey standards, so technically, it cannot be referred to as *honey*.

The ‘type of honey’ produced by these stingless bees looks different from honeybee honey, being less viscous owing to a higher moisture content. Here and in other parts of the world, this stingless bee hive product has been used for medicinal purposes, perpetuated by traditional knowledge exchange. There is a need, however, to caution the uninitiated; while this honey-like extract from *Melipona* species is consumed, that from the hives of *Lestrimelitta limao* (Lemon Cab), should not be consumed as it is poisonous.

The BES-Net TT project will conduct an analysis of this hive extract from selected stingless bee hives, to investigate the product’s antimicrobial properties, heavy metal content and whether any pesticide residues are noted in the samples.

Inside the homes of stingless bees

Stingless bees build hives in a variety of locations, including hollowed-out cavities of trees, and in man-made structures, such as walls, roofs, or cavities created by overturned containers. The entrance to these hives is usually a singular hole, the width of which is one bee’s width and leads to a chamber in which the brood and food storage cells are built. The entrance generally includes a tubular structure, which is distinct in appearance for each species.

Frieseomelitta paupera (Petit Angel) bee approaching hive entrance in a brick wall

Unlike honeybees, brood chambers of some stingless bee species are arranged in combs of horizontal discs, while for other species the chambers are grouped in bunches like grapes. Stingless bees mix wax with resins (mainly from plants) into a substance known as cerumen and this is used in constructing the hive chamber. The hive is vulnerable to pests and is therefore defended by the bees which guard the single entrance; this may be sealed nightly by the bees in some species.

Conserving stingless bees

Due to the usefulness of stingless bees as pollinators and the added benefit of the medicinal value of some species’ hive products, persons are gaining interest in managing stingless bees. This assists bee conservation, as natural habitats are threatened by destruction through advancing development and a lack of valuing of these bees.

An artificial hive box which was occupied by *Partamona nigrior* bees (Petit pegone).

Keepers of stingless bees mimic the arrangement of the hive when constructing artificial habitats. For species such as *Frieseomelitta paupera* (Petit Angel), a hive box which is longer than it is wide is used, with a subdivision for a brood chamber and food storage pots. For

Melipona trinitatis (Guanot), a square-shaped box is used, with additional modifications (adding an upper box with special design elements) if the hive needs to be expanded for production of the 'honey-like' product. Additional steps are followed to manage hives, including key actions for pest control.

Other considerations for conservation

In Trinidad, it is noted that persons encountering bees at their homes, schools, workplaces and in forests have a natural fear, not knowing whether bees are Africanised (*Apis mellifera*) Honeybees. The BES-Net TT team is advising that the normal procedure be followed for bee removal: contact the Apiaries Division of the Ministry of Agriculture, Land and Fisheries to alert technical officers on the location of the bees or the Trinidad and Tobago Beekeepers Association hotline. If the bees are stingless, however, BES-Net TT is in contact with some stingless bee keepers who may assist in removal of the bees to boxes to secure the broods.

The hope is that beyond the life of the project a network of stingless bee keepers will have an active public presence so that these types of assistance can be sustained. BES-Net TT is exercising efforts to sustain a fledgling stingless bee network of stakeholders which can maintain interest, share information and assist in the conservation of local stingless bees. Similar actions can be taken in other parts of the Caribbean region to help and maintain our rich, indigenous bee diversity. Your assistance is greatly needed to help all pollinators!

For more information on the BES-Net TT project, follow us:

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