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First Steps in the Construction of Stingless Beekeeping Principles

In Mesoamerica, an increasing number of organizations and individuals are developing an interest in meliponiculture, or stingless beekeeping, which involves the care and management of stingless bee colonies.

These bees are native to the region; they are a legacy of the indigenous people who have, since prehispanic times, grown to know these bees and to work with them. They are a boon from nature in regions with a tropical climate. These bees also offer the opportunity to produce and sell honey, give it as a gift, indulge in a sweet treat, use it as a medicine, and generate a supplementary income in rural communities. Stingless beekeeping is therefore triply beneficial due to its cultural, natural, and economic richness.

The ECOSUR Bee Team, after almost 30 years of working with native bees and stingless beekeepers, has been inspired by the recent meliponiculture renaissance, and we are committed to seeing it through. At the same time, we recognize that as enthusiasm grows, certain management practices can be rushed, and this could endanger the bees and all the richness they represent.

For these reasons, we feel that it is important to share our reflections in this document. First, we want to recognize the lessons we that have learned in our beekeeping work that have helped us to understand certain practices that should be prevented in stingless beekeeping. This reflection brings us to several key questions:

1. Is it acceptable to cut down trees in order to obtain bee colonies?
2. Is it acceptable to move bee colonies from one region to another?
3. It is acceptable to feed bees artificially?
4. It is acceptable to purchase colonies?

Finally: why do we want to be stingless beekeepers?

These principles are a work in progress. We present them for discussion, and welcome any and all feedback.

Lessons learned from honey bee beekeepers (*Apis mellifera)* for stingless bee beekeepers

Honey bee beekeepers work with a species called *Apis mellifera*, a hardy, generalist bee more tolerant of management: bee colonies can be fed, moved, split, and handled in a variety of conditions without affecting the colonies. However, in recent decades, honey bees

have not been doing well. In many countries, particularly in Europe and in the United States, colony losses now range from 30 to 50% annually. Why? The scientists and beekeepers who have studied this problem agree that some of the main causes of colony loss include the loss of forage (due to deforestation and urbanization) and exposure to pesticides (increasingly common in agriculture).

Another fundamental reason for the decline of *Apis mellifera* is the intensive management of these bees. When colonies or queen bees are moved long distances, they can introduce pathogens (parasites and diseases) into otherwise unexposed local populations. Additionally, when bees are fed extensively, they gradually lose their ability to prepare themselves for periods of resource scarcity, such as the rainy season. In a similar fashion, when medicines are applied to treat bee diseases, the bees lose their natural ability to protect themselves from pathogens.

Intensive beekeeping with *Apis mellifera* serves as a cautionary tale: if intensive management practices are used in stingless beekeeping, it is likely that stingless bees will begin to decline in the next 10 or 20 years. The lesson is, everything in moderation. A measured, thoughtful management strategy helps stingless bees and their keepers; intensive management that seeks only to produce and commercialize honey is harmful for bees, and, by extension, for beekeepers.

Let's analyze a few different possible scenarios…

1. Is it acceptable to cut down trees to obtain bee colonies?

Context

When someone wants to start keeping stingless bees, the first step is to obtain a colony. One option is to search for wild colonies in trees, but this could lead to deforestation. In some instances, there are other strategies that allow beekeepers to obtain colonies without cutting down trees. In other cases, there are no alternatives, and if we don't want to cut down trees, we won't be able to start stingless beekeeping. So: is it acceptable to cut down trees? We can consider taking this action if the following conditions are met.

Conditions:

- If the beekeeper is starting from scratch
- If colonies cannot be obtained from locally managed hives
- The beekeeper is certain that the stingless bee species can be managed and is appropriate for beekeeping
- If the tree is dead or damaged
- If the tree is not old or rare
- If the tree is abundant and easy to reproduce
- If the beekeeper has received permission from the community to cut the tree down
- If the tree was going to be cut down anyway (for example, to plant corn or for firewood)

If these conditions are met, then one or two trees can be cut down, but certain actions should be taken into consideration:

- Find an experienced beekeeper to help extract the colony from the tree to ensure that the transfer is successful

- Make sure all necessary resources are available (materials, adequate space for colonies, follow-up management strategy)
- Understand the factors that threaten bee colonies (i.e. diseases)
- Consider "paying it forward" in the future, providing splits to other stingless beekeepers interested in getting started
- Plant other native trees

2. Is it acceptable to move colonies from one region to another?

Context

Another option for obtaining managed hives is to bring them in from another region, but this option also involves significant risks.

First, beehives can contain a diverse array of mites, insects, and bacteria. These often do not represent a problem to the colony because over the course of millions of years the bees have learned to defend themselves against the particular species found in their place of origin. However, when a beehive is moved from one region to another, it may transmit foreign organisms to the local colonies which may not be prepared to defend against them. When this occurs, the likelihood that these foreign organisms would become pathogens is very high.

Second, just because two bee colonies belong to the same species does not mean they are the same. There is variation between colonies in different areas, though these differences may exist on the genetic level, and sometimes be too small to for us to observe. These differences are important: thanks to them, we know that there will always be different types of bees that are able to adapt to diverse habitats or changes in the environment. However, when beehives are transported to different regions, different bees mix together. Their unique characteristics are gradually lost, and with them the bees' ability to adapt.

So, is it acceptable to move colonies from one region to another? We can consider taking this action if the following conditions are met.

Conditions

- If it is impossible to find managed colonies locally
- If the beehive is moved to a place where bees of the same species can be found (within range of distribution)
- If the movement is not very far from the colony's place of origin (no more than 50 km as the bird flies)

If these conditions are met, then one or two beehives can be moved, but certain actions should be taken into consideration:

- Movement to a new location should not put colonies at risk
- Only stable, established colonies (in a tree trunk or hive box) should be moved
- Very few colonies should be moved, and these should serve as breeder colonies (for reproduction)
- The movement should occur in the dry season when the nectar flow is strong
- The beekeeper moving the hives should be prepared to split his or her hives in the future, to provide for other local beekeepers

3. Is it acceptable to feed bees?

Context

Some stingless beekeepers feed their colonies to strengthen them or to split them more frequently. However, this practice causes a few different problems.

First, we feed bees without really knowing what the optimal food for them is. We can use honey from other bees like honey bees, but this honey contains different sugars that are not found in the bees' own natural honey. If we use processed sugar, we may be introducing chemical residuals into the hive, the long-term effects of which are currently unknown.

Second, over time bees grow accustomed to artificial feeding, and they lose their natural ability to prepare for times of scarcity by storing the necessary amounts of food or reducing the brood nest.

So, is it acceptable to feed bees? We can consider taking this action if the following conditions are met.

Conditions

- If all measures have been taken to ensure that bees have food reserves, particularly by not harvesting all of the colony's honey or by not harvesting too close to the rainy season.
- If a split is made that needs to be reinforced
- If a colony is weak and at the point of collapse (low population, few honey and pollen reserves)

If these conditions are met, then feeding bees is acceptable, but certain measures should be taken into consideration:

- Understand the implications of feeding with products other than the bees' own honey
- Feed colonies with their own honey, or if this is not an option, feed with honey from the same bee species; or if this is not available, feed with *Apis mellifera* honey
- As a last resort to be avoided if at all possible, feed with sugar syrup made with organic sugar
- Maintain a clean and tidy environment during feeding (avoid spills), to prevent robbing behavior and avoid attracting parasitic flies
- Avoid feeding for extended periods of time
- Plant trees that provide bees with nectar and pollen

4. Is it acceptable to purchase colonies?

Context

It is also possible to get started as a stingless beekeeper by purchasing colonies. There are two main problems with this strategy. First, there are risks associated with moving beehives from one place to another (see above). Second, as the demand for colonies increases, prices could also increase, and that would make it more difficult for people interested in learning to keep stingless bees. Additionally, the increasing demand for colonies increases

could incentivize the unmodulated extraction of wild bee colonies, putting them at risk. We can consider taking this action if the following conditions are met.

Conditions

- If an individual does not have colonies to divide
- If no one in the region is willing to provide a beehive as a gift
- If no one in the region is willing to lend a beehive in a tree trunk hive, with the understanding that the hive will be returned in a box after the extraction is completed.

If these conditions are met, then purchasing beehives is acceptable, but certain measures should be taken into consideration:

- Purchase only the beehives necessary to establish a small stingless bee apiary (3 or 4 colonies of the selected species)
- Guarantee that the bee species is present in the region where the hives will be installed, and that the colony does not come from over 50 km away.
- Avoid encouraging deforestation (do not purchase colonies nesting in recently cut trees)
- Be open to the possibility of giving splits to other stingless beekeepers interested in getting started that face the same difficulties

In the end…

Why become a stingless beekeeper?

- Because we have the time, space, and conditions necessary to keep stingless bees
- Because we want to promote stingless beekeeping among children, youth, men, and women in our communities
- Because we are committed to the responsible, integrative management of our hives

For what?

- To conserve and reinforce local species
- To supplement the health and diets of our families with bee products
- To allow our descendants to know native bees as we do
- To bring back and/or maintain the traditions and ancestral knowledge associated with stingless beekeeping
- To conserve the environment and biodiversity
- To guarantee the pollination of local crops
- To diversify the farming activities in our families