

Taxkat, emblem for the conservation of Totonacapan**Taxkat, emblema para la conservación biocultural del Totonacapan**

GARCÍA-FLORES Atzin†*, GARCÍA-RAMOS, Crescencio, GUTIERREZ-PEÑA, Esteban and RENDON-SANDOVAL, Leticia

Tecnológico Nacional de México Campus Instituto Tecnológico Superior de Huatusco. (Calle 25 Ote., Reserva Territorial, 94106 Huatusco, Veracruz), Facultad de Ciencias Administrativas y Sociales. Universidad Veracruzana

ID 1st Author: Atzin, Gracia-Flores

ID 1st Co-author: Crescencio, Garcia-Ramos

ID 2nd Co-author: Esteban, Gutierrez-Peña / ORC ID: 0000-0003-1160-0223, CVU CONACYT ID: 932865

ID 3rd Co-author: Leticia, Rendon-Sandoval / ORC ID: 0000-0002-1316-5491, CVU CONACYT ID: 998588

DOI: 10.35429/EJROP.2022.8.15.24.30

Received April 18, 2021; Accepted June 30, 2021

Abstract

This research is based on a theoretical and methodological effort to design conservation strategies for the *Mexican Scaptotrigona* (Guérin-Meneville, 1845) in Totonac communities in the State of Veracruz, Mexico. From the recovery of the ritual ceremonies related to the conservation of the stingless bee known as Taxkat (*S. mexicana*) and which refer to life, fertility, fidelity and well-being, the recovery of ancestral knowledge and the dissemination of management practices through the consolidation of a Network of meliponiculturists of Totonacapan that includes four indigenous communities belonging to the municipality of Papantla de Olarte Veracruz, which in the region are developing strategies for the recovery of ancestral knowledge and its preservation for future generations .

Conservation, Ancestral, Strategies, Bees**Resumen**

La presente investigación se fundamenta en un esfuerzo teórico y metodológico para diseñar estrategias de conservación de la *Scaptotrigona mexicana* (Guérin-Meneville, 1845) en comunidades Totonacas del Estado de Veracruz, México. A partir de la recuperación de las ceremonias rituales relacionadas con la conservación de la abeja sin aguijón conocida como Taxkat (*S. mexicana*) y que refieren a la vida, fertilidad, fidelidad y bienestar, se plantea la recuperación de conocimientos ancestrales y la difusión de prácticas de manejo a través de la consolidación de una Red de meliponicultores del Totonacapan que incluye cuatro comunidades indígenas pertenecientes al municipio de Papantla de Olarte Veracruz, que en la región están desarrollando estrategias para la recuperación de los saberes ancestrales y su preservación para las futuras generaciones.

Conservación, Ancestrales, Estrategias, Abejas

Citation: GARCÍA-FLORES Atzin, GARCÍA-RAMOS, Crescencio, GUTIERREZ-PEÑA, Esteban and RENDON-SANDOVAL, Leticia. *Taxkat*, emblem for the conservation of Totonacapan. ECORFAN Journal-Republic of Paraguay. 2022. 8-15: 24-30

† Researcher contributing as first author.

Introduction

The stingless bee, *Scaptotrigona mexicana* (UNIBIO, 2009; Guérin-Meneville, 1845), is a native species of Mexico, is a hymenopteran of great importance not only in the biological context but also from the cultural perspective, mainly because of its use and management by pre-Hispanic cultures, particularly by the Totonacs, who know it by the name of taxkat (García *et al.* 2013). According to the bee catalog of Moure (2013), the species *S. mexicana* (Guérin-Meneville, 1845) is distributed from the States of Chiapas, Guerrero, Hidalgo, Morelos, Mexico, Oaxaca, Puebla, San Luis Potosí, Tamaulipas and Veracruz-Llave, in the Neotropical region of Belize(Cayo), Costa Rica (Cartago), and El Salvador; Guatemala (Alta Verapaz).

From an ecological point of view, stingless bees are considered important pollinators of native flora in tropical and subtropical regions of the world (Slaa *et al.* 2006). It is estimated that between 30 and 50% of wild plant species in the Americas, in the tropics and subtropics, depend on these hymenopterans to transport their pollen, and are also responsible for the pollination of around 200 species of cultivated plants of great importance to human societies (Aguilar, 2001).

The management of native stingless bees in a systematized way seems to have been a practice of the pre-Hispanic cultures of Mesoamerica. The ethnic groups of South America, due to their primitive characteristics of nomadic gatherers and hunters, were exclusively the collectors of nests established in the forest to obtain bee products such as honey, pollen and cerumen (González-Acereto, 2012). Similarly, during pre-Hispanic times, the Totonacs, as well as other peoples of the Mesoamerican area, the Huastec, Maya, Tepehuas, Nahua, among others, have lived together, domesticated and cultivated honey. In Mexico, stingless bees are widely known because they were cultivated in pre-Hispanic times, thanks to their docility, abundance and honey production (Guzmán-Díaz *et al.*, 2006). Currently, *S. mexicana* colonies are mainly conserved to produce honey, appreciated for its exquisite flavor and use in the preparation of traditional remedies, and wax that is used as an insulator and teaching material in schools (Obregón-Hernández and Arzaluz-Gutiérrez, 2002).

In the present context, Totonac culture offers a unique condition of expressions, a *continuum* between nature and culture. It is here where the importance of the wisdom of indigenous peoples to make use of their natural resources arises from the understanding that nature is sacred. Totonaca communities live the link between cultural and natural heritage. Although their worldview obeys the hierarchy structured by deities and owners, their understanding of the world is manifested in an emerging holarchy, in which there is not, as its name indicates, a concept of superiority but of coexistence and cooperation between the various forms of life (García *et al.*, 2013). This encounter between the natural and cultural worlds involves a conservation strategy and implies an effective interpretation of reality in the face of the current world order.

The new world order is nourished by false conceptions, by ways of perceiving the world that conceive humanity as one-dimensional, based on the double Western myth: 1) the conquest of nature-object; and 2) the false infinity towards which economic growth is launched. The prevailing principles are those that feed economic efficiency, which constitute threats to the viability of civilization, such as competitiveness, specialization or the principle of comparative advantage, and the homogenization of systems and production. These principles have indeed made the economy more efficient in terms of cost/benefit ratios, but they undermine cultural and natural diversity, identity, cognitive democracy and inclusion.

In this context, this paper shows the scope of a research project conducted in the community of Gildardo Muñoz, in the municipality of Papantla de Olarte, Veracruz, focused on the conservation of the biocultural heritage of Totonacapan from the recovery of ritual ceremonies related to the conservation and management of the stingless bee, and that refer to life, fertility, fidelity and welfare of the communities.

Objective

To analyze the influence of disturbed landscape elements on the bee-environment system (*Scaptotrigona mexicana*), as a basis for the implementation of conservation strategies for this biocultural resource.

Specific objectives

- Identify the coverage of the main landscape elements and evaluate the potential floristic foraging resources for *S. mexicana*.
- To evaluate the retention capacity of stingless bees in each landscape element.
- Differentiate the effect of each landscape element on nest attributes and configuration, as well as honey production and quality of *S. mexicana*.
- Design a model for the appropriation of ritual ceremonies related to the traditional management of stingless bees.

Theoretical Framework

The stingless bee and its management in Totonaca culture

The management of the stingless bee in Totonaca culture is characterized by a set of symbolic practices that are historically constructed and legitimize a collective identity. The stingless bee has a relevant meaning in the identity and relationship of families and the community. The Totonacs have coexisted with them for generations, providing shelter, making them part of the family and using honey.

According to their ideology, in order to take honey from the trees, the Totonacs ask permission and show gratitude to 'Kiwíkgolo' and 'Kiwichat', the owners of the forest. Prior to the conquest of Mesaoamerica, the Totonacs already cultivated bush honey known as 'kiwitaxkat', a product that was used as a sweetener before sugarcane was introduced (García-Flores *et al.*, 2013). For honey management, the Totonac express descriptions of ancient rituals and festivals that confirm that honey and bees occupy a very important place in their ceremonial life and religious thought (García-Flores *et al.*, 2013).

Historically, the stingless bee is identified as the natural pollinator in the Totonacapan region, especially of vanilla. Totonacan grandparents mention that this bee contributed to the larger size of the pollinated vanilla pod compared to that which was pollinated manually (García *et al.*, 2013).

This fact is an indicator that vanilla was produced naturally and under ancestral techniques long before colonial times. It has also been documented that its honey was already being used as medicine by healers. From a cultural point of view, the stingless bee has a relevant significance in the identity and integration of families and the community. The Totonacs have lived with them for generations, providing shelter, making them part of the family and using their honey for the wellbeing of the family and the community. The preservation and conservation of Taxkat is a cultural practice that survives in the present time among our ethnic group.

The honey it produces has several uses and contributes to the health of the environment, food and the economy of the families in the indigenous localities. The stingless bee as an element of cultural preservation is justified based on the following dimensions: a) it is an indicator of individual, family and community well-being. There is evidence of its existence for more than four hundred and ninety-five years; b) its integration in Totonac families implies a series of cultural rituals and meanings with respect to the elements of the natural world; c) the use of honey is an indispensable element in traditional Totonacan medicine; and e) the recovery of ceremonies, techniques, knowledge and management of the stingless bee in Totonacapan is urgent.

Taxkat is one of the insects that has provided the most benefits to Totonac communities. At the time of the Spanish Conquest, approximately 495 years ago, the Totonacs were already producers of mountain honey known as kiwitaxkat, since it was the main sweetener for them before the introduction of sugar cane cultivation. Despite its importance, taxkat is currently in danger of extinction. This began because of the intervention of non-native vanilla producers and hoarders; seeing in vanilla the opportunity to make money, but lacking knowledge of the social and cultural aspects and ancestral knowledge, they mistakenly identified the bee as a pest and fought it with agrochemicals and pesticides.

The landscape and prospective of Totonaca meliponiculture

Landscape means more than a scientific instrument useful to describe the world (Hernández, L.; 2011:251). Although it has been understood as a concept, text, pictorial knowledge, aesthetic representation or as a geographical area for the administrative or political delimitation of regions, for the purposes of this research landscape is an analytical tool. It is conceived as an indivisible whole: "The cultural landscape is created by a cultural group from a natural landscape. The culture is the agent, the natural area is the medium, and the cultural landscape is the result" (Sauer, cit. By Hernández, L.; 2011: 253). In this way the landscape is a geographical space and an ideological and political construction.

Since the arrival of the Spanish in Mesoamerica in the sixteenth century, the native cultures underwent a radical change due to the displacement of labor from traditional activities to new forms of commercial and industrial activity. The introduction of extensive cattle ranching caused a gradual deterioration of native forests throughout Mesoamerica.

In the Totonacapan region, severe destruction of tropical forests occurred between the 16th and 20th centuries (Aguilar, 2011), with the latifundia system of large estates dedicated to monoculture cultivation. These monocultures need open spaces to develop. At the same time that the forest was cleared, the resources for nesting and foraging sites for native bees largely disappeared. However, some of the stingless bee species require large tree cavities for nesting (*Scaptotrigona mexicana* (UNIBIO, 2009; Guérin-Meneville, 1845), *Melipona beecheii* (UNIBIO, 2011), *Scaptotrigona pectoralis* (UNIBIO, 2009; Dalla Torre, 1896), for example).

This decline has reached such a point that the wild nests of *Scaptotrigona mexicana*, *Scaptotrigona pectoralis* and *Melipona beecheii* have almost completely disappeared from the Totonacapan Region of the State of Veracruz, where the cultivation of corn, citrus and vanilla, among other crops, are intensive, together with the use of land dedicated to extensive cattle ranching.

Therefore, significant populations of *Scaptotrigona mexicana* (UNIBIO, 2009; Guérin-Meneville, 1845), *Melipona beecheii* (UNIBIO, 2011), *Scaptotrigona pectoralis* (UNIBIO, 2009, Dalla Torre, 1896), are distributed in some parts of the State of Veracruz that are currently limited to mostly indigenous meliponiculturists.

The context of this research is located in the municipality of Papantla de Olarte, Veracruz, Mexico, in the indigenous communities of Gildardo Muñoz, Cerro del Carbón, Plan de Hidalgo, La Sabana and Vista Hermosa. In this region, human occupation dates back to 1875 (Cortés, 2007) and it is in this area that meliponiculture or proper management of stingless bees is a traditional activity of great importance for the indigenous Totonaca people.

Methodology

The interest of this research lies in analyzing the cognitive system of the communities, the repertoire of their ecological knowledge that underlies their productive practices and their forms of interaction with biocultural resources. This will make it possible to establish the potential combinations of the practices derived from the knowledge so that they can result in sustainable development modalities (García Flores, 2013). The research was aimed at generating a self-management capacity in the community based on the knowledge of its territory.

An inventory of natural and cultural elements and their link to their quality of life, the analysis of their internal and external economic exchanges with the aim of creating their own organization (Boada, M. and Toledo, V., 2003). From the ethnographic perspective, fieldwork was conducted assuming a specific attitude or "ethnographic posture" (Ortner; 1995, cit. By Good; (2011), which implies an intellectual and moral position. The perceptions and appropriations of social actors are approached as a research tool, local processes and forms of resistance were contextualized. In the meeting with the communities, a map of meanings was constructed.

The project was developed in three stages: 1) Documentation of referential information regarding ritual ceremonies related to the stingless bee through a First meeting of indigenous meliponiculturists of Totonacapan in the community Gildardo Muñoz, municipality of Papantla de Olarte, Veracruz; 2) The conformation of a Network of Meliponicultores for the conservation of the native bee as a biocultural resource; and 3) Design of a model for the appropriation of ritual ceremonies related to the traditional management of stingless bees in Totonacapan.

Results

The activities had a significant scope, the work meetings allowed the foundation and documentation of the memory of the First Meeting of Meliponicultores. Likewise, the documentation that involves the topic of local medicinal plants allows the recovery of ancestral knowledge and can be taught through workshops to members of the community and/or the school. It should be noted that, as a result of this meeting, management strategies were developed with institutions to obtain resources that benefit the community. New forms of intergenerational conversation were constructed, thus visualizing the existence of a new school format that operates under a conception of education that corresponds to its original meaning. Common expectations and interests were organized and community criteria were established for collective decision making and planning, the convites were implemented, a new cooperative was organized and community bonding was strengthened.

As results of this project, the following can be listed: 1) collection of information on the collection and identification of medicinal plants for the establishment of a living pharmacy, 2) three meliponiarías, 3) Memory of the First Meeting of indigenous meliponicultores of Totonacapan, 4) workshops for the proper management of the stingless bee and on traditional medicine, 5) a course with students of basic education on the proper management of the stingless bee and 6) Network of meliponicultores.

With this information, the group developed their perceptiveness in a special way. This not only consisted in the expansion of their attention, observation and integration skills.

It is also experience and knowledge in motion. In the process, it has developed a sensitivity in which emotions are intertwined with reasoning and intuition. The following map (Figure 1) shows the distribution of meliponiculturists that make up the beginning of the Totonacapan Meliponicultores Network in the municipality of Papantla de Olarte, Veracruz.

Acknowledgments

We thank the Instituto Tecnológico Superior de Huatusco, the Facultad de Ciencias Administrativas y Sociales. Universidad Veracruzana and the Instituto de Antropología, Universidad Veracruzana.

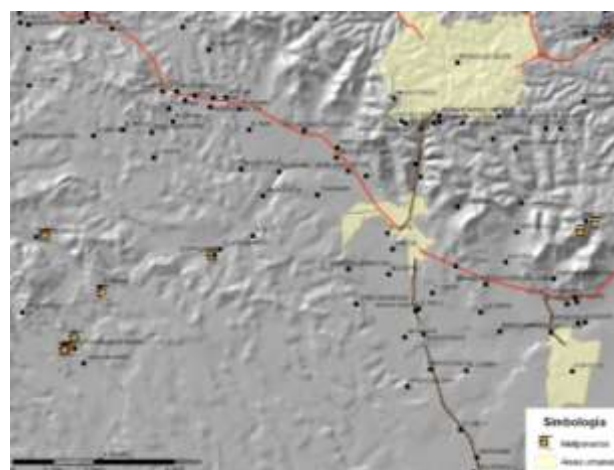


Figure 1 Distribution of the Melipon Farmers' Network

It is precisely in this municipality that a diagnosis of the traditional melipon farmers was carried out, the establishment of linkage mechanisms between communities was initiated and the creation of the Totonacapan Melipon Farmers Network was generated (Table 1).

Community	Meliponarios	Beehives
Gildardo Muñoz	4	250
Cerro del Carbón	2	89
Plan de Hidalgo	1	35
La Sabana	1	17
Vista Hermosa de Madero	3	92

Table 1 Inventory of meliponiarías and beehives in indigenous communities in the study área

Evidently, this effort is just one example of what is being done with the indigenous rural communities of the Totonacapan region around the management of a natural resource with cultural and religious value.

This example shows a way to recover Totonacan ritual ceremonies to conserve nature and ancestral knowledge through the traditional management of the stingless bee, which was shared during the first Meeting of Meliponicultores del Totonacapan.

The Network of meliponicultores that has been established has the following characteristics: a) They have the capacity of congregation, that is, they meet face to face and maintain a face to face concentration that strengthens their interiority; b) They have binding ties by virtue of their histories, traditions and rituals, their commitment is ethical; c) their organization is voluntary, by affinity and ideology with common actions and this gives them empowerment.

In this sense, as a consolidation strategy for the conservation of bees and to achieve the sustainable use of natural resources, it is proposed that management should not reduce or affect the potential future use of the species or other species, or the habitat that supports them, because this should be concomitant with the long-term maintenance of the viability of the ecosystem that depends on or maintains the species used (Leal, A., Sánchez L. E., Izquierdo S. J., & Demedio, 2008). Therefore, it is proposed to implement an institutional reservoir that impacts bee communities in a scientific research park based on the strategic program of the Universidad Veracruzana that allows interaction with different actors inside and outside the university (Figure 2).

References

Aguilar Sánchez M. 2011. "Historia General de Veracruz". Universidad Veracruzana- SEV, México.

Aguilar, I. 2001. Potencial de las abejas nativas sin aguijón (Apidae: Meliponinae) en los sistemas agroforestales. Centro de Investigaciones Apícolas Tropicales, Universidad Nacional Heredia. Costa Rica. Pp 1-5.

Ayala, R. 1999. Revisión de las abejas sin aguijón de México (Hymenoptera, Apoidea). *Folia Entomológica Mexicana*. Xalapa, Veracruz, México, (106): 1–123.

Byung-Chul Han. (2016). En el enjambre. Herder. España.

Boada, M. y Toledo, V. M. (2003). El planeta, nuestro cuerpo. La ecología, el ambientalismo y la crisis de la modernidad. La ciencia para todos. SEP, CONACYT, Fondo de Cultura Económica. México.

García Flores, A. 2013. T'axkat, la abeja nativa de Mesoamérica: una Propuesta de educación comunitaria sustentable. Tesis Doctoral. Centro de Estudios Superiores de Veracruz, Secretaría de Educación de Veracruz. México.

García-Flores, A., Del Amo-Rodríguez S., Hernández-Colorado M. R. 2013. Taxkat la abeja nativa de Mesoamérica. La Ciencia y el Hombre. Universidad Veracruzana. Xalapa, Veracruz, 19-24.

Good-Eshelman, C., y Corona-de la peña, Laura M. 2013. Introducción: estudiando la comida y la cultura mesoamericana frente a la modernidad. En Good-Eshelman, C., y Corona-de la peña, Laura M. (Coords). Comida, cultura y modernidad en México. CONACYT-CONACULTA, INAH. México. 11-38.

González-Acereto, J.A. 2012. La importancia de la meliponicultura en México, con énfasis en la Península de Yucatán. Cuerpo Académico de Apicultura Tropical, Campes de Ciencias Biológicas y Agropecuarias. *Bioagrociencias* 5(1):34-41.

Guzmán-Díaz, M., Mérida-Rivas, J., Balboa-Aguilar, C., y Vandame, R. 2006. Manejo y conservación de *Scaptotrigona mexicana* (Apidae: Meliponini) en la región del Soconusco. Memorias del X Congreso Internacional de Manejo Integrado de Plagas y Agroecología. 206 pp.

Hernández López, José de Jesús. El paisaje agavero, patrimonio cultural de la humanidad 2011: 248-304, en De la Peña, Guillermo. 2011. La antropología y el patrimonio cultural de México. Consejo Nacional para la Cultura y las Artes.

Instituto de Biología. "*Scaptotrigona mexicana* Guérin-Meneville, 1845 - IBUNAM: CNIN: HYMCH325227". UNIBIO: Colecciones Biológicas. 2009-05-27. Universidad Nacional Autónoma de México. Consultada en: 2018-4-30. Disponible en: <<http://unibio.unam.mx/collections/specimens/urn/IBUNAM:CNIN:HYMCH325227>

GARCÍA-FLORES Atzin, GARCÍA-RAMOS, Crescencio, GUTIERREZ-PEÑA, Esteban and RENDON-SANDOVAL, Leticia. *Taxkat*, emblem for the conservation of Totonacapan. ECORFAN Journal-Republic of Paraguay. 2022

Instituto de Biología. "Melipona beechei - IBUNAM: CNIN: IC_03116". UNIBIO: Colecciones Biológicas. 2011-08-12. Universidad Nacional Autónoma de México. Consultada en: 2018-5-31. Disponible en: http://unibio.unam.mx/collections/specimens/urn/IBUNAM:CNIN:IC_03116

Instituto de Biología. "*Scaptotrigona pectoralis* Dalla Torre, 1896 - IBUNAM: CNIN: HYMCH325237". UNIBIO: Colecciones Biológicas. 2009-05-27. Universidad Nacional Autónoma de México. Consultada en: 2018-5-31. Disponible en: <http://unibio.unam.mx/collections/specimens/urn/IBUNAM:CNIN:HYMCH325237>

J. M. F. Camargo & S. R. M. Pedro, 2013. Meliponini Lepeletier, 1836. In Moure, J. S., Urban, D. & Melo, G. A. R. (Orgs). Catalogue of Bees (Hymenoptera, Apoidea) in the Neotropical Region. Disponible en <http://www.moure.cria.org.br/catalogue>. Consultado en: Apr/30/2018

Leal Ramos A., León Sánchez L. E., Izquierdo Lamas S. J., Demedio Lorenzo C. J. 2008. Estrategia para el manejo sustentable de la abeja melipona beecheii en la polinización de los cultivos en la agricultura urbana. Ciencia, Tecnología y Medio Ambiente. Vol. 10, No. 4

Obregón-Hernández F. y Arzaluz-Gutiérrez, A. 2002. Influencia del cerumen en la propagación de la abeja sin aguijón *Scaptotrigona mexicana* Guérin (Hymenoptera: Apidae, Meliponinae). Folia Entomológica Mexicana 41(1): 7-13.

Slaa, E.J., Sanchez Chaves, L.A., Malagodi-Braga, K.S., Hofstede, F.E. (2006) Stingless bees in applied pollination: practice and perspectives. Apidologie 37, 293–315