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Perpectivas sobre isolamento, contato e resistência dos povos tupi na Amazônia brasileira

Perspectives on isolation, contact and resistance
of Tupi peoples in the Brazilian Amazon

organizado por/

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Foto: Daniel Cangussu, 2018.

Maandéi Juma olhando o pé de castanha que Iporia (seu pai) derrubou.

“Jã ‘ýwa Iporía etýgawéra”. Terra Indígena Juma

From honey to the arch of ashes: about the ecology of bees and the territories of isolated indigenous peoples on the Amazon frontier

Do mel ao arco das cinzas: sobre a ecologia das abelhas e dos territórios dos povos indígenas isolados na fronteira amazônica

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Abstract

The eastern and southwestern borders of the Amazon have been the scene of an intense process of deforestation and land grabbing, where through the use of fire, the systematic conversion of forests into monocultures and pastures for cattle is carried out. In this context, the soil is being poisoned by the (de)regulation of the use of pesticides, and rivers and streams are disappearing more quickly. With the extermination of pollinators, soon all the agricultural production systems of this great region will be directly impacted, and little by little, the arch of fire, as this territory is known, will become an arch of ash and ruins. There are other less obvious but no less worrisome impacts in this dramatic destructive process. This territory corresponds to the home of all the uncontacted Tupi indigenous peoples of the Brazilian Amazon. Communities that, like the Awá-Guajá of Maranhão and Kagwahiva of Mato Grosso, are formed by very small groups that live in the last forest strongholds of these Amazonian frontiers. The extinction of bees in these territories jeopardizes the deep relationship between indigenous peoples and this entomofauna, and the pattern of mobility and itinerancy related to the collection and extraction of honey, a practice of great relevance in this indigenous Tupi context.

Key words: entomology, ethnobiology, logging, environmental management, indigenism, Tupi

Resumo

As fronteiras do leste e sudoeste amazônico têm sido palco de intenso processo de desmatamento e grilagem de terras públicas, onde, via a utilização do fogo, é realizada a conversão sistemática de florestas em monoculturas e pastagens para o gado. Neste contexto, os solos vão sendo envenenados pela (des) regulamentação do uso de agrotóxicos e rios e igarapés vão desaparecendo mais rapidamente. Com o extermínio dos polinizadores, logo todos os sistemas de produção agrícola desta grande região se verão diretamente impactados, e aos poucos, o arco do fogo, como é conhecido esse território, vai se convertendo em um arco de cinzas e ruínas. Há outros impactos menos evidentes, mas não menos preocupantes, neste dramático processo destrutivo. Esse território corresponde ao lar de todos os povos indígenas isolados tupi da Amazônia brasileira. Comunidades que, a exemplo dos Awá-Guajá do Maranhão e Kagwahiva do Mato Grosso, são formados por grupos bastante reduzidos e que vivem nos últimos redutos florestais destas fronteiras amazônicas. A extinção das abelhas nesses territórios coloca em xeque uma profunda relação dos povos indígenas e esta entomofauna, expressa no padrão de mobilidade e itinerância relacionados à coleta e extração do mel, prática de grande relevância neste contexto indígena tupi.

Palavras-chave: Entomologia, etnobiologia, desmatamento, gestão ambiental, indigenismo, Tupi

**In memory of Ari Uru Eu Wau Wau
and “Fernandão” Amaral da Silveira**

*Bees [and honeys] have helped us in the past,
now they need us*
Wera Poty

*Returning to a wild state, honey is nearly lost but it is necessary that it is lost in order to be recovered. Its gastronomical appeal is so powerful that Man would overuse it until depletion if it were exceedingly accessible. 'You would not find me', says Honey to Man, through a myth, 'if you had not looked for me before'.
Lévi-Strauss, *From Honey to Ashes**

1. Introduction

It is known that amerindian peoples cultivate intimate and profound long-lasting relationships with the forests where they reside to the point of being appointed as builders of biodiversity (see, p. ex., Balée 1993, 1994, 2013; Neves 2022; Neves and Heckenberger 2019, Fausto and Neves 2018, Carneiro da Cunha 2017, 2019; Clement 1999; Clement et al. 2010). In their “multinaturalist” perspective (Viveiros de Castro 2002; Lima 1996), they concede agency to other beings, conceptualizing them as potentially “cultured” (Descola 1988). It is diametrically opposed to the relationship adopted by modern western societies, where the majority’s perspective is that of objectification (and control) of others, all at the margin of culture, in the order of “nature” (Lévi-Strauss 2013 [1952]). For the former, no one is ever nobody. Bees, for example, are especially noticed by a great part of indigenous collectives.

Our goal in this article is to highlight some modes of relationship of indigenous collectives and “their” bees, with an emphasis on native stingless bees⁸ (a fundamental difference in the “cultivation” of native honey) and, from that, shine light on other dimensions and perspectives of socioenvironmental impacts caused by the aggravation of destructive processes in the Brazilian Amazon. In this sense, a biological and ecological description of stingless bees⁹ (Silveira, Melo, Almeida 2002) is an important starting point for this argument, mostly when recognizing that there is a “deforestation arch” which has rapidly become an arch of fire (and ashes) in the Brazilian Amazon, an invasive siege that threatens the lives of bees by

⁸ *Apis* bees (stinging bees), known in Brazil as European bees [oropas] were initially introduced by Jesuits in 1839. In the same way, German colonizers introduced these bees in Southern Brazil, in 1845. Later, in 1956, researchers brought African bees to the State of São Paulo, Southeast Brazil, with the intention of increasing honey production. Soon, these bees bred with European species, originating a hybrid which, due to its vitality, is currently the most common in the Americas. It is known as the *Africanized honey bee*.

⁹ <https://sites.icb.ufmg.br/laboteevo/serido/abelhas/tabela.html>

<http://biodiversus.com.br/abelhasbr/>

<https://www.meliponas.com.br/wp-content/uploads/2017/12/Abelhas-Brasileiras-Sistematica-e-Identificacao.pdf>

converting vast regions into an ecological desert composed of pastures and extensive monoculture.

When pointing out the outline of this deforestation arch, we identified that it reaches the east and southeast borders of the forest. Both on its extremities and the region contained within it, this arch coincides with a specific ethnographic area (or a set of contiguous ethnographic areas) in which there is a predominance of collectives of isolated Tupi indigenous peoples.

Based on detailed observations produced through a “*mateira*” indigenist technique (Cangussu 2021; Cangussu et al 2022) (Fig. 01) apprehended among some of the peoples located in this arch, we can verify a highly prominent frequency of vestiges related to the practices of honey collection. Then, we sought to mobilize theoretical aspects of ethnology that approach honey. The connections between such materials urged us, in the first place, to wonder if the well-known Tupi-Guarani mobility, of which the most prominent feature is to join maximum geographical dispersion to minimum linguistic and cultural variation (Viveiros de Castro 1986:106), and even the choice to isolate adopted by some Tupi-Guarani, could be a response to the “praise of honey”.

We wonder if the perception of an economy based on collection (of honey) as a source of abundance and the adoption of a mostly foraging way of living (a consequence of this perception), which is predominant in this region among the collectives probably identified with Tupi groups, could be justified due to observed advantages in following the demands of honey.

We move forward by suggesting that honey, a collected and not cultivated foodstuff, may work as the key to understand the mobility dynamic of these groups, both in terms of annual periodicity, once collectives in isolation (not “isolated”) tend to conceive of honey collection as more advantageous in drought periods, as well as in terms of resistance in face of pressure on their territories, since honey collection pushes territorial movements to the limit, be it towards occupying new grounds or reoccupying old ones. These matters have been detailed by some of us in other spaces, and that is why we will not be recompose this discussion here¹⁰.

¹⁰ However, we must include some premises, even as a footnote. We state elsewhere (Diniz, 2016; 2017 and, particularly in the chapter *Lessons from Honey* in this Dossier) that the theoretical starting point for these questions is in the *Mythologiques* by Lévi-Strauss, especially the second book, *From Honey to Ashes*. It is where the author calls upon the

In the scope of this article, we intend, at last, to contribute with the

myth Ofaié (M-192), Origin of Honey which, in his own words, “constitutes the canon of indigenous doctrine on the matter of honey and thus rules the interpretation of all myths that will be analyzed after it” (2004:65). It is with this myth that the ambiguous quality of honey, vocalized in every volume that includes “honey” in its title, starts to be specified as a “paradox”. That is because the Ofaié myth, such as argued by the author (Lévi-Strauss, 2004:67), “strives to transform an illusory image (as the first possession of honey equaled to its lack) into a lucrative loss (honey is granted to those who agree to renounce it)”. In sum, the Ofaié myth M-192 stated that honey was originally cultivated, however, entirely consumed by its first owner, the Maned Wolf. That is until the Tortoise challenges the Wolf, steals honey from him and, in true epic fashion, leads a group of different animals to implement a way to cultivate enough honey for all to enjoy. At first, they tried to cultivate honey as is done with plants in farming, which was disastrous and ineffective. According to the myth, Lévi-Strauss (2004:66) observes that “cultivated honey has two disadvantages: either Man cannot resist the temptation and devours ‘immature’ honey, or honey grows so well and is so easily collected – much like plants in farms – that an immoderate consumption depletes production capacities”. With the disadvantages of cultivating honey (in its original form) being proven, the myth goes into how the Tortoise established that honey must, therefore, be wild and attained through collection. Lévi-Strauss (2004:66) comments on the advantages of collected honey: “In the first place, bees, which have become wild, will diversify: there will be several honey producing species instead of only one. Then, honey will be more abundant. Finally, the greed of collectors will be limited by the amounts that can be obtained. An excess of honey will remain in the hive, where it will be conserved until someone seeks it again. The benefit will then be maintained in three planes: quality, quantity and duration”. Lévi-Strauss calls attention to the fact that the course of the Ofaié myth draws, therefore, a polar opposite movement to those narratives of the origins of cultivated plants and “advocates in favor of a collection economy, to which it attributes the same virtues of variety, abundance and long preservation that most other myths credit to the opposite perspective which, to humanity, results in the adoption of the arts of civilization” (2004:66). This reversal, however, chosen as an advantage – the lucrative loss – is what consists in the “structural property of myths that have honey as theme”. Identified in the Ofaié myth as a passage from cultivation to collection (instead of, as expected in the myths about fire, a passage from original/natural collection to current/cultural cultivation), this **inversion** introduces, in the words of Lévi-Strauss, the “anti-neolithic perspective” of honey myths. And, to us, it is abundantly clear that the ‘anti-neolithic perspective’, focused more directly on the economic level in the Ofaié myth, must also work on a political level. So, to the possibility of refusing to cultivate (anti-agriculture), there must correspond a possibility to refuse more general “neolithic” political values: concentration, sedentism, hierarchy. In other words, the “anti-neolithic perspective” of honey myths would be situated in the same direction as the inversion or refusal of coercive power, defended by Clastres in *Societies Against the State*. With that, we defend that the praise of honey may be an interpretative key to think the ways of life of collectives in isolation who refuse both agriculture (advocating for the advantages of collecting or foraging) and the concentration and sedentarism, opting for ways that include more foraging and dispersion, more mobility and multiplication in small units. At last, the praise of honey could serve us in refusing any (external) determination on forms of cosmic-political self-determination in each collective, including the refusal of certain relationships with Others.

ethnological debate dedicated to the active and structurally situated character of indigenous historical transformations, which are not just reactive (Carneiro da Cunha 1992), by including research about isolated peoples (Diniz 2016, 2017; Amorim 2022), as well as highlighting those arguments which point to the value attributed, especially by some collectives, to the multiplication of diversity instead of accumulating the same (Carneiro da Cunha 2017).

Figure 01 – Vestige of honey extraction.



Photograph by Joana Cabral de Oliveira/2022

Figure 02 – Orchid bees (*Eufriesea*) – Brazilian Amazon – 2004



Photograph by Rodrigo de Loyola Dias

2. Indigenous societies and their bees

Indigenous populations' handling of stingless bees (Meliponini) in South America – also called “eusocial stingless” bees – is present in several ethnographic accounts. Indigenous knowledge expresses distinctions in their variants¹¹ according to the quality of honey or wax, or even to the possibility of consumption of larvae or pollen. The features used to distinguish types of bees, even if apparently utilitarian, are described in intricate interspecific networks, produced in the experience of indigenous peoples with the ecology of these insects.

As Posey¹² and Camargo (1990) show, to the Kayapó, speakers of the Jê language family, inhabitants of Central Brazil, there is a series of characteristics that mark the difference between 56 bee variants already described by them. Among these differences there are the ecological zones where these variants occur. In their classifications, it is taken into account that some kinds will establish nests anywhere in the landscape, more generalist, while others prefer specific zones, such as flooded or less sunny areas. Besides, they can be identified by taking their usual shelters into consideration: the hollows of trees or palm trees, freestanding nests on branches, underground or in abandoned termites. The smell, texture, architecture and materials used for building nests are also indicators of a difference in types of bees. Another highly relevant aspect is the bees' foraging behavior, which includes their own way of obtaining resources: water, soil, diverse floral sources (including venomous ones, which lead to toxicity in honey) or even aromatic resins (Schwarz 1948; Lévi-Strauss 1986 [1950]; Posey & Camargo 1990). In this aspect, Kayapó knowledge also takes into account the flight pattern, preference for specific flowers, defense behavior and even the sound of their wings batting inside the nest.

The range of Kayapó knowledge about bees is even more evident in the descriptions of honey collection techniques. This activity is directly related to hunting. This occurs because it is during this synergetic activity that

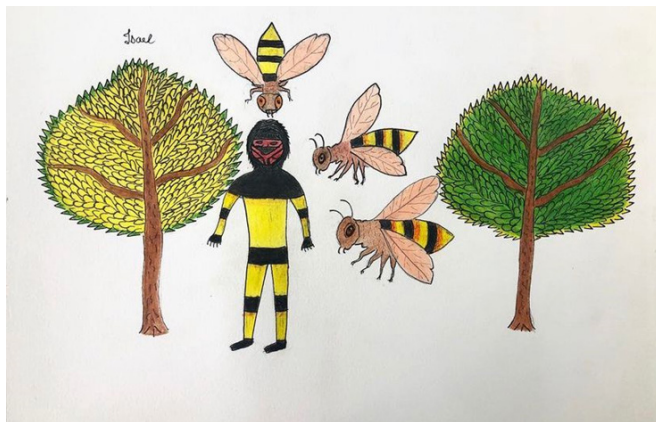
¹¹ Here, we utilize “type” and “variant” over “species” or “variety” such as proposed by Smith and Fausto (2016: 101; cf. also Fausto 2019) in order to distinguish from our scientific notions, the variations perceived by indigenous peoples according to their own classification.

¹² Darrell Posey was one of the pioneers in the studies of ecology from an interchange with the knowledge of indigenous peoples, especially the Kayapó, a people with whom he lived for a long period of time. His studies revealed the modification of the landscape done by the Kayapó over what they call *apêtê*, or forest islands. But the main element of his research trajectory was the study on Kayapó knowledge relating to insects, especially bees. Kayapó descriptions of the behaviors of different species of bees, the intricate relationship between bees and the landscape, involving relationships with other species and an enormous variety of plants brought great advancements to the studies of ecology in conversation with indigenous knowledge.

Kayapó men observe new nests in the landscape and smell the bees in the same way as they smell their prey (pigs and tapirs) on their trails. Since it is difficult to visually identify nests, which are well hidden in naturally formed gaps, the Kayapó locate them during the day from the flight of the bees, as they usually fly opposite to the wind after visiting flowers on their way back to their nests. During the night, they are located through the batting of their wings inside the nest, which also allows for the identification of the type of bee¹³, according to them.

The relevance of bees ties into human relationships with plants and other animals (Posey and Camargo 1990) and seems to inspire or reflect Kayapó sociology in itself. For example, the name given to the insects' nest, *ūrūkwa*, is also used for the Kayapó houses. In addition to that, the Kayapó describe bee organization inside the nest based on human social organization, drawing attention to the presence of a main chief, a set of secondary chiefs and a series of specific groups such as “warrior bees”, which are responsible for defending the nest, and “scout bees” that routinely go out in search of food. Even mites, which will occasionally populate bees' nests, are called *nhure*, just like dogs are assigned to their Kayapó owners. This goes to show that aspects of the Kayapó social life are used in the description of activities inside nests. From the bees' way of life, the Kayapó reflect on the format of their villages as well as on their itinerant mobility, and hypothesize effective ways to attack and defend in face of others: enemies, predators and prey.

Figure 03 – Drawing of a *Puk Kutok* (Bee boy)



By Isael Maxakali, kindly donated for this article¹⁴

¹³ Among the Guarani M'byá, the main technique for locating bees is by inserting a small feather into the body of a bee, making it possible to follow their flight in the Atlantic Forest (Rodrigues, 2005).

¹⁴ Isael Maxakali is a doctor in Social Communication through recognized erudition (UFMG), filmmaker, professor, and visual artist. He was twice a professor at the UFMG

3. Bees under siege

Unfortunately, the ancient coexistence of many indigenous peoples with bees is in check since the forests where they cohabitate are being surrounded by the advances of industrial agriculture. The environmental degradation that such advances cause goes far beyond the extent of the farms themselves. An example is soybean that is watered using the central-pivot irrigation system, which demands a high consumption of superficial and deep waters, and has been causing the water table to dry up in the trails of the Cerrado, with effects being noticed as far as 50 km away from soy plantations (Silva et al. 2021). In addition to that, the unbounded expansion of agribusiness has devastating effects on bees, a point of interest in this article. Pollution caused by pesticides that are widely used to remove ants and termites, or to stop weeds from growing, also contributes to the local extinction of stingless bees (Nocelli et al. 2014). Toxicological analyses have shown sensory and neuromotor changes, and death among bees a few days after intoxication (Morais et al. 2018; Seide et al. 2018). Deforestation, which opens space for soy plantations, also destroys nidification habitats and foraging areas, both for the bees that live on the ground and those that seek cavities in large trees to form nests (Freitas et al. 2009). In an analysis around the Uru Eu Wau Wau Indigenous Territory in Rondônia, Brown et al. (2001), while covering a transect of 84 km between the Territory and the BR-384 highway, found that the number of *Melipona* species tends to be larger when approaching the Indigenous Territory. This result suggests that the Uru Eu Wau Wau Territory corresponds to a center of nidification for the bees in this region, especially due to the fact that new colonies are established only a few hundred meters away from the main colony (Michener 1979), though the foraging area may extend over 500 to 4,000m in relation to the nest (Roubik and Aluja 1983; Wille 1983; Van Nieuwstadt e Iraheta 1996). In flight activities, stingless bees search for plants that are generally rich in nectar, with abundant inflorescences that grow in a solid manner, that is, in large quantities over the short period of a day, such as described in the Atlantic Forest (Ramalho 2004), or in the interval that precedes the rising waters of rivers in the Amazon (Haugaasen and Peres 2005; Parolin et al. 2011), which conveys an intimate interdependence of environmental conditions. Besides, specific body sizes influence their range of flight. In

Program for Cross-Sectional Education in Traditional Knowledge. In 2020, he won the on-line PIPA Award, one of the main awards in contemporary art in Brazil.

Rondônia, it has been demonstrated that larger bees are capable of flying over great distances to find an environment that is minimally rich in biodiversity, while smaller ones (<1.44mm), such as the species of the *Trigona*, *Plebeia*, *Scaura*, *Tetragonisca* genera, among others, may have been more affected by the deforestation that took place in the region between the 1980s and the 1990s (Mayes et al. 2019) and demand green corridors around their nests.

Paradoxically, agriculture itself may suffer the consequences of the invasion and degradation it causes over bee (and indigenous) territories, since many plant species need bees for pollinating flowers. Bees are responsible for the maintenance of most crops in the world; they work on 35% of global agricultural lands, contributing with the production of 87 of the main food crops in the planet (Freitas 2010; Azevedo, Costa and Oliveira 2014; Gama 2022). In Brazil, the group of Meliponini bees pollinates about 30 economically important species, among which are coffee, tomato, strawberry, melon, mango, avocado and açaí (Imperatriz-Fonseca et al. 2006). Based on the commercial value of the plant, pollination services performed by bees in Brazil has as estimated to be worth 12 billion dollars per year (Giannini et al 2015). It is worth noting that heterogeneity conditions in the landscape that allow these bees to live were not computed, which would include habitats favorable to nidification and the quantity and variety of sustenance for the bees, and that would put the protection of indigenous territories (including groups in isolation) as a crucial “raw material” in the global market, considering that the heterogeneity of the landscape in these indigenous territories, though unfathomable in the market, has been described as essential to the policies for conservation of pollinators (Hill et al. 2019).

The decline in bee populations is a well-known and documented phenomenon (Biesmeijer et al 2006; Potts et al.2010; Caires et al 2017; Arioli 2017). Reviews on the theme (Beringer, Maciel & Tramontina 2019; Hill et al., 2019) indicate that deforestation, fires, disordered urbanization, inadequate handling of species, monoculture, the use of pesticides and global warming are the main culprits in the process of extinction of pollinators all over the world. Apiculture is another drastically impacted activity (Decourtye, Mader and Desneux, 2010) with evident economic implications in certain regions of the world, including what can be seen in the European continent (Potts et al 2010).

Another well-known driver for bee species loss is linked to climate

change, due to abrupt shifts in meteorological conditions, which reduces habitat suitability and restricts geographic distribution (Brown and Paxton, 2009), inevitably decreasing bee populations in large scale while favoring generalist bee species, furthering biotic homogenization (Giannini et al 2020).

4. Flight with the bees among the Tupi-Guarani

Among the Tenetehara (Wagley and Galvão 1949), their honey festival is an important ceremony. They claim that it was acquired by the demiurge Aruwé in the village of the Jaguar in primordial times, and later passed on to the Tenetehara, who have been performing it ever since. The honey festival happens at the end of the dry season, between the months of September and October, and large expeditions for honey collection are needed, which happen at the end of the previous season. The collected honey is put in gourd bottles that are tied to the big houses and, before being consumed, the honey must be “sung”. A large festival may include hundreds of gourd bottles filled with honey. The hole festivity is organized by an owner, a man whose main feature is not being the chief or the shaman but knowing the songs and details of the festival. The Tenetehara honey festival is an occasion marked by the distinction between the host village, which collects and offers the honey, and guest villages that receive the honey that has been offered and consume it collectively, while dancing and singing.

To the Akuawá-Asurini, honey is a gift given by demiurges to humans as described, for example, in the *Mahira* sagas (Andrade 1992, 305-306, 309). It can also be an activator of the *karowara* metamorphoses, a “source of healer power” (idem, 84, 145-46). In the ethnography about the Araweté (Viveiros de Castro 1986), the importance of honey can be noticed in the relationships established between beings that share the same cosmic level as humans – the earthly level – and especially between them and the people living in the celestial level (primordial beings, demiurges, gods, the imperishable part of the souls of the dead, spirits). The *Ayaraetã*, “manifestations or hypostases of honey itself, particularly *xupé* honey, the most abundant in the region” (Viveiros de Castro 1986, 246) where the Araweté live, are called the “fathers of honey”. When they arrive with honey, bringing it with them, they cause a dispersion from the village into the woods and people leave to collect honey. “The *Ayaraetã* are [known as] soul extractors” (idem, 248) and, because of that, the village disperses upon their arrival. They differentiate

from the *Mai*, heavenly beings that descend upon Earth to consume the honey collected by the Araweté and are neutralized by their shamans. The Araweté then produce banquets garnished with honey, since they like the *Mai* to come sing their song and tell their stories.

Among the Tapirapé, it is possible to see a wide range of uses for beeswax (Baldus 1970). The black wax (*anainty*) is a material used as a sealer for *buriti* baskets and also in the production of *ypé* ceremonial masks. It works as a fixer for different parts of the mask, as well as the yellow and red macaw feathers. What garners the most attention is the Tapirapé use of wax for making the *Topy* doll, a supernatural being that has elongated limbs and a disproportionate penis in relation to its body.

Wera Poty Thiago Henrique, a young beekeeper at the Jaraguá Indigenous Territory, in the city of São Paulo, brings forth the interesting history of the association between the Guarani and bees in the *Oremba'e Ei Yma Guare – O Mel do passado* (2019) documentary. At the time of the first colonial invasions, the Guarani being ‘hunted’ by the Portuguese went on the run. During this movement of dispersion, they found nests of stingless bees. From consuming honey, the Guarani obtained food/energy and healed from diseases, which allowed them to move ahead, unlike the Portuguese who had to stop to eat and rest. Wera concludes that the bees allowed the Guarani to migrate towards the south and resist. In this particular case, the collection and consumption of honey seems to explain indigenous mobility to escape and form a resistance in the face of invasions.

Sadly, the story told by Wera is repeated in more recent events where honey (its collection and consumption) performs an important role in the escape plans and resistance among indigenous collectives in isolation. By monitoring “vestiges” of collection and handling of beehives, indigenists at FUNAI have been looking to develop protection strategies for the territories of Tupi indigenous groups in isolation (Cangussu 2021; Cangussu et al 2022) and their bees.

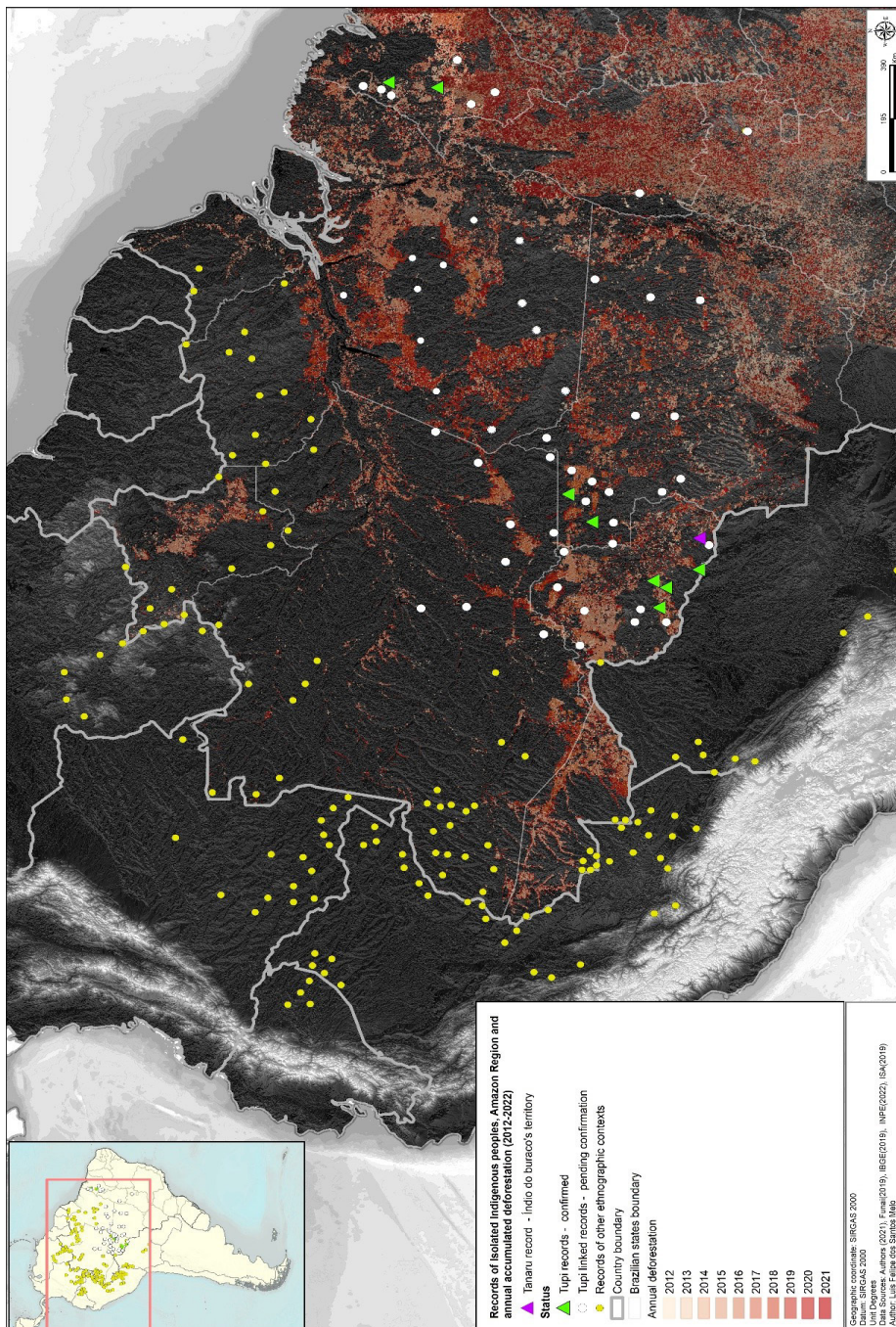
Even if briefly represented, these examples show that whether in the most utilitarian or supernatural way, such as in their parties, it is possible to notice that collecting and consuming honey holds a central role in Tupi indigenous socialities, even for those in isolation, in the lower lands of South America.

5. The deforestation arch and Tupi peoples in isolation

Led by soy monoculture and in association with the use of pesticides, industrial agriculture advances over the Brazilian Amazon region, forming a “deforestation arch”. As can be seen on the map (Fig. 04), the invasion of industrial agriculture over the Brazilian Amazon leaves “islands” that are more or less preserved, which we know to be protected areas, mostly indigenous territories. However, we call attention to this destructive process that advances over eastern and southeastern Amazon and is highly consolidated over forests in the states of Maranhão, Tocantins, Pará, northern Mato Grosso, Rondônia and southern Amazonas, where there are Tupi indigenous peoples in isolation. For now, we emphasize an obvious point: the fact that, due to the increasing flexibility in land and environmental laws that favor deforestation, the appropriation of land and water, and (de)regulation of pesticides (Silva et al. 2019) have pushed indigenous, *quilombola* and small farmer territories to become “islands” (Viveiros de Castro 2019; Eloy et al. 2020) in the interstices of soy plantations. An example of this recent expansion caused by (de)regulation can be seen in Fig.04 in the state of Pará, Rondônia and Mato Grosso as deforestation at an alarming rate. In 2012 4,430 km² were deforested this scenario changed at alarming rates reaching its peak throughout 2021 (INPE, 2021), when 12,417 km² of primary forests were converted to pasture, soybean monocultures and other anthropogenic land uses. Such rapid expansion is spatially related to indigenous lands closely linked to Tupi records (confirmed and pending confirmation), encroaching and in some instances affecting large swaths of land inside conservation Units and Indigenous lands markedly in the 2018-2021 period.

Regarding the bee species inhabiting this region, it seems reasonable to suggest that such impacts will result in a decline of the populations, which will intensify the threats over the Amazon, Cerrado and Caatinga biomes even further, as well as in places where transitional forests occur directly and indirectly impacting ecosystem services provided by bee species. In this case, however, the impacts are not restricted to predictable and invaluable economic losses. There are less evident impacts that are no less disturbing. The decline in bee populations in these areas will cause a fracture on an important network between isolated indigenous peoples and their native bees, which are crucial to their ways of life, as will be further discussed next.

Figure 04 – Distribution of records of indigenous peoples in isolation from east to southwest Amazon, and accumulated deforestation from 2012 to 2022



6. Protection methodologies for the territories of indigenous peoples in isolation (and their bees)

The Brazilian government has been using RPIIs (Records of Isolated Indigenous Peoples) as base units in the process of data systematization related to the existence and spatial location of isolated indigenous peoples in their territories. This developed indigenist methodology branches out to three categories in order to group such records into investigative steps. One of these categories is described as “confirmed reference” and refers to collectives of peoples where monitoring work has come to prove their existence and territorial location. The other record categories for isolated indigenous peoples are “reference in study” and “information”, which encompasses data on isolated indigenous peoples that have not yet been monitored and checked to the point of being precisely described.

Until the publication of this article, the Brazilian government recognizes the existence of 120 (one hundred and twenty) records of isolated peoples, of which around 28 (twenty-eight) have been confirmed. Among the latter, 9 (nine) are located in the eastern and southwestern Brazilian Amazon, all residing on the right bank of the Amazon River (Fig 06).

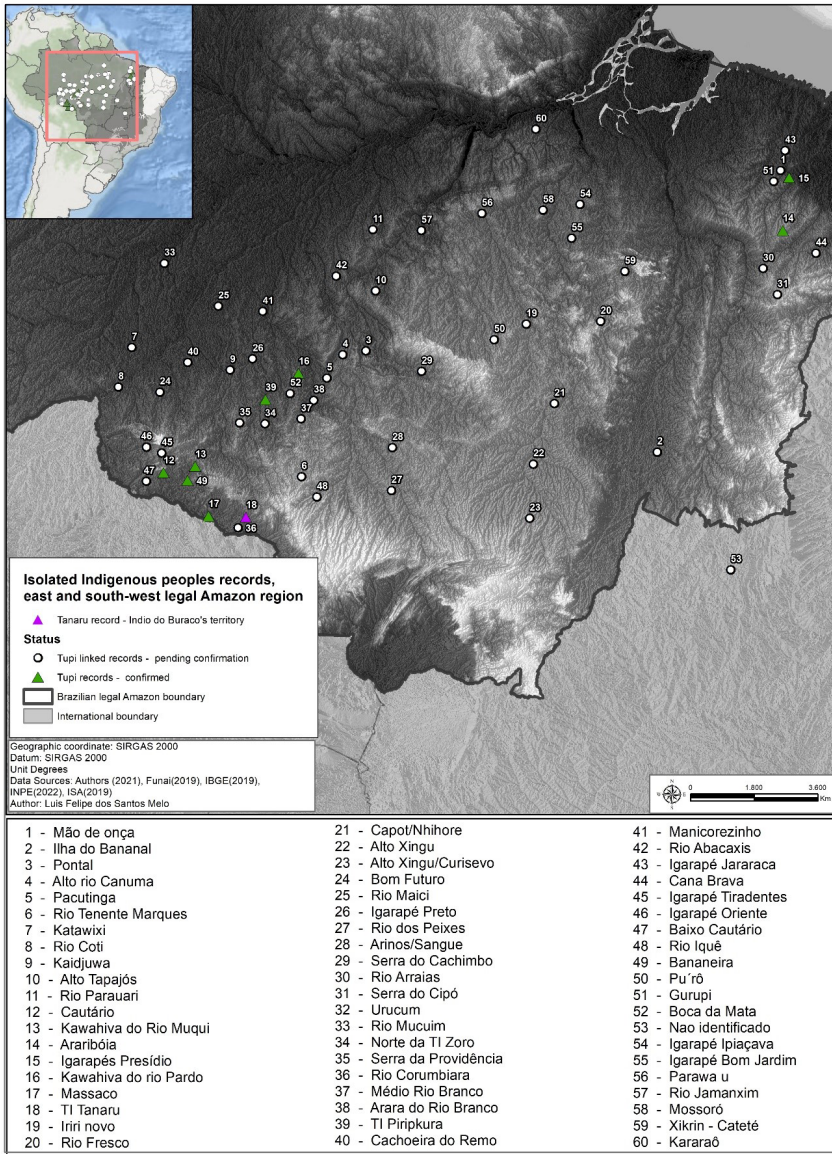
Of these nine records, two fall upon the Amazon far east region – a region situated in what ethnologic and archeological bibliography generally¹⁵ designates as “Eastern Amazon” (cf. Melatti 2021, Almeida 2008). Both records (14 and 13 on Fig. 06) are identified as isolated collectives related to the “recently contacted” Awá-Guajá, residents of the Caru, Awá and Alto Turiaçu Indigenous Lands in Maranhão. The other seven records fall upon the region located on the opposite side of the forest, recognized as southwest Amazon by researchers (Walter Neves 2011; Vander Velden, Lolli, 2020; Almeida and Neves 2015)¹⁶. As proposed by Melatti (2021), this region would approximately coincide with a set of two “ethnographic areas”: “Mamoré-Guaporé” and “Aripuanã”.

¹⁵ “Generally” is used here because a consensus around the boundaries, and even the usage of the concept of ethnographic areas, has not been completely reached. As highlighted by Melatti himself, who seminally proposed it: “instead of talking about ‘cultural areas’, it is better to say ‘ethnographic areas’ in order to underscore that they do not exist entirely by themselves, but it is the researcher who ultimately outlines it”.

¹⁶ Almeida and Neves (2015) were cited: “Linguistic data (e.g. Migliazza 1982; Rodrigues 1964; Walker et al. 2012) resulting from lexical and statistical analyses are unanimous in pointing to southwestern Amazon, at the basin of the upper Madeira River, as the center of dispersion of Tupi peoples (emphasis added).

research points to the existence of a close link between the Wyrapara‘ekwara (the most populous isolated groups in the Uru Eu Wau Wau IT, represented by the Cautário and Bananeiras records) and the Isolated of the Massaco IT with Sirionó indigenous peoples of the Bolivian territory (speakers of a Tupi-Guarani, subgroup II language).

Figure 6 – Spatial distribution of records of Tupi linked records and confirmed Tupi records in eastern and southwestern within the Brazilian Legal Amazon. Below, a list of records and corresponding names



As can be seen in the above map, in addition to “confirmed records”, there are still other 53 “records in study” occurring in these same territories¹⁹ but also surpassing them, spreading around the entire region of the southern channel of the Amazon River, almost totally present in the “Amazon east to the Madeira” according to what was proposed by Melatti. Since further investigation and field expeditions are needed, also to try to confirm linguistic and cultural belonging, the information on these “records in study” only suggests that they may be related to the area of influence of “confirmed records”, therefore, probably linked to previously described groups; or they are associated to the history of violence and dissidence suffered by other Tupi groups: the more central ones, like the Avá-Canoeiro in the states of Tocantins and Goiás, or the Kaiabi, Apiaká, Araweté, Tapirapé and Mundurucu, in the states of Mato Grosso and Pará, or the Tupi Kagwahiva, like the Juruei, Karipuna, Juma, Amondawa and Katawixi located in areas of the state of Rondônia and southern Amazonas.

Figure 07 – Items of the Awá-Guajá material culture in Araribóia IT. A beeswax tool wrapped in a net (*maqueira*) made from plant fibers. – 2013.



Photograph by Clóvis Guajajara.

¹⁹ These are located in transition zones to Cerrado or Caatinga (see e.g. https://www.wwf.org.br/natureza_brasileira/questoes_ambientais/biomas/bioma_transicao/).

Figure 08 –Wyrapara’ekwara campsite - 2013.



Photograph by Daniel Cangussu, photo archive of the Uru Eu Wau Wau Front for Ethno-Environmental Protection (or FEP)

We must point out that, when drawing these maps and cutting these regions, picturing an arch of deforestation from east to southwest Amazon (or Eastern Amazon to Southwestern Amazon), in no way are we considering that this entire area covered by the arch may configure an ethnographic territory, neither is it a single, internally homogenous environmental area. On the contrary, we know that it encompasses transition areas between biomes or different ecological environments, and diverse indigenous populations. Notwithstanding, it is important to draw attention to the phenomenon of indigenous isolation in this large region which is predominantly expressed through the collectives related to the Tupi, especially speakers of Tupi-Guarani languages. In this manner, for the analysis, we will take data from the two extremities of the arch (of deforestation and ashes), which we consider exemplary of this context. They were collected during monitoring expeditions looking for vestiges in the territories of isolated Wyrapara’ekwara collectives, in the Uru Eu Wau Wau IT (located far west, that is, Southwestern Amazon, nos. 12 and

49, Cautário and Bananeira, in the map above), and of the Awá-Guajá of the Araribóia IT (to the east, that is, Eastern Amazon, no. 14 on the map above). We will discuss how the relationship between these indigenous peoples and honey has shown to be fundamental to their way of life, and how observing this relationship can help with proposals for public policy specific to their territories. We will approach the challenges of this task as the data demonstrates that forests (of bees and indigenous peoples) are being systematically destroyed. Before that, we will briefly clear up the aspects of the indigenist methodology for the protection and promotion of the rights of isolated indigenous peoples.

7. Vestiges and honey collections

In Brazil, the investigative process coordinated by FUNAI, which aims to confirm the location of isolated indigenous groups and monitor territories with confirmed locations, is performed essentially through field expeditions. The non-contact methodology, officially adopted in 1987, defined protocols for these actions to guarantee that isolated peoples have the right to their territories without infringing the principle of their self-determination, which is the refusal of contact or the political right to remain in isolation (Loebens and Neves 2011; Vaz 2011, 2019; Villa 2018; Ricardo and Gongora 2019; Octavio, Coelho and Alcântara and Silva 2021; Alzza et al 2021; Jabur 2021; Amorim 2022; Cangussu et al 2022).

Therefore, expeditions are planned in order to only look for vestiges of presence and not to directly contact these groups. Vestiges are elements of interaction between indigenous peoples and their environment, for example, the “varadouros” (or forest paths), plant marks, temporary campsites or remains thereof, and footprints (Cangussu 2021). Overall, vestiges reveal aspects of the relationship that these peoples establish with their territories. Small breaks on shrubs arranged in sequence along the forest, for instance, are widespread vestiges through all indigenous territories in the Amazon, and are generally related to the creation and revival of indigenous paths (Virtanen 2016), produced to connect several previously used areas inside a forest.

Through a detailed analysis it is possible to suggest that a certain group may belong to an ethnographic context, estimate demographic data or the age of an event, reveal ways of handling plants (Mendes dos Santos et al 2021; Cangussu, Shiratori and Furquim 2021), and recognize

mobility and itinerance patterns of a group. Some of these vestiges can reveal cultural aspects of those who produced them, which makes them extremely valuable elements for the investigative methodology pertaining indigenist policy.

Among the vestiges, those recognized as honey collections are quite important. Honey collections in the context of a search for vestiges are defined by cuts and incisions found in the trunks and branches of trees (Fig. 4) which result in the practice of honey collection by indigenous peoples. The carvings, made with steel tools²⁰ or stone axes, are produced in order to facilitate the access and total or partial extraction of honeycombs or honey cups in cracks or barks of the trees. The species that show these incisions, generally adult trees, are called honey sticks.

Figure 09 - Rieli Franciscato (*in memoriam*) beside a Wyrapara'ekwara honey collection/2013. Uru Eu Wau Wau IT, record no. 48 Bananeira.



Photograph by Daniel Cangussu – photo archive of the Uru Eu Wau Wau FEP

²⁰ Indigenous peoples in isolation sometimes have access to tools and other industrialized items through small thefts on campsites belonging to invaders in their territories, or neighboring groups.

Figure 10 – Awá-Guajá honey extraction in the Araribóia Indigenous Territory/2017, record no. 13.



Photograph by Daniel Cangussu – photo archive of the Awá FEP

Considering that incisions to the xylem – the woody tissue located on the innermost regions of tree trunks – never fully heal (Cangussu 2021), these vestiges can be kept in a forest for decades or even centuries, given that their existence is solely conditioned by the lifetime of the trees that display this vestige and to their own rotting time when honey sticks are cut down. Therefore, they become witnesses of the important practice of collection even after these peoples have disappeared, such as the old honey collections found in southern Amazonas.

In many cases, to reach the hives found high up on the trunks and branches, natives will build large scaffolds on the trees, structures made from rods, vines and *Enviras* (*Daphnopsis*) (Figs. 06, 07 and 09). When building

these scaffolds is not possible or the height of the hive shows high risks, tree species may be brought to the ground (Ballester et al. 2010) with the goal of having safe access to the honey. There are contexts in which the scaffolds are built to reach the narrower parts of the trunks, to avoid cutting close to the ground where these trees generally have a wider diameter or tubular roots, the *Sacopemas*. Honey collection also involves other techniques. The use of fire and smoke is frequent, especially when the bees are angry or have stings.

If they are too small or high up on tall trees, some honey collections can only be adequately observed with the aid of camera lenses or binoculars and, at times, only identified in the field by tied cables left on the trees. It is the case, for instance, of honey collections from *arapuá* (*Trigona spinipes*) bees, which are identified only by a dark stain on the tops of trees, where the external hive used to be secured (Figs. 06 and 07).

Figure 11 – Vestige of a collection of *Arapuá* (*Trigona spinipes*) bee honey, identified by the darker stain on the tree trunk where the hive was previously located. Araribóia IT, record no. 13.



Photograph by Daniel Cangussu/2017 – photo archive of the Awá FEP

Figure 12 – Honey collection site close to the ground being analyzed by Renato Guajajara/2013. Araribóia IT, record no. 13.



Photograph by Daniel Cangussu – Awá FEP

In some cases, honey collection is performed so as to keep the nest going, while in others, the whole nest structure is taken to the villages, thus carrying out the domestication of the insects. Examples of this domestication have been described for the Kayapó (Posey and Camargo, 1990) and also the Guaraní M'byá (Rodrigues, 2005). The M'byá usually choose stronger nests of specific species, usually those located in an area of great biodiversity and low levels of sunlight to take to the village, where they make adaptations and take care of the hives. They also generally collect plants and grow them close to their houses or villages in order to attract bees and their nests. This landscape-altering technique is also commonly described among the Kayapó, who usually leave flowers consumed by specific types of bees in paths close to their villages (Posey and Camargo 1990). This landscape modification from the cultivation of a diversity of plants accessed by the bees corroborates the Kayabi statement that bees prefer areas with a great diversity of plants (Ballester et al. 2010)

Some vestiges have a restricted spatial distribution and are related to quite unique ethnographic contexts, such as the potato processing workshops (a place where there is a concentration of tools involved in the chain of extraction of *Casimirella* potato starch), or the extensive cut-down of palm

trees, both typical vestiges of Arawá peoples at the Juruá/Purus interfluve. This also seems to be the case of honey collection that represents one of the main vestiges left by isolated collectives residing in the states do Maranhão, Mato Grosso and Rondônia, identified as belonging to the Tupi. Although other isolated indigenous peoples also practiced restricted cut-downs through their territories, or even honey collection, exemplified by the groups in the Javari Valley and the isolated groups of Paraguay²¹, speakers of the Zamaco language, or even in the traditionally Macro-Jê territory (such as in fig. 13), vestiges of honey collections seem to be crucial in order to understand their ways of living and their relationship with their territory, among the ones in isolation identified as belonging to Tupi peoples, as we will see next.

Figure 13 – Honey collection by pajé Arnaldo²² in the Jequitinhonha Valley-MG, southeast Brazil – 2022.



Photograph by Daniel Cangussu.

²¹ “Huecos de miel En la misma oportunidad, Enrique Bragairac, quien lideraba al grupo de guardaparques, registró la presencia de varios huecos nuevos de extracción de miel en el área en donde se encontró la choza citada antes. Los aislados permanecían en esa zona aún durante el invierno”. <https://www.iniciativa-amotocodie.org/wp-content/uploads/2019/08/InformeAisladosZonaFronteraPY-BO.pdf>

²² Arnaldo, better known as Pajé (Shaman), was born in Coronel Murta, Minas Gerais. His memory has been marked by the violent imposition of forgetting his indigenous roots. Mr. Arnaldo is a craftsman, farmer and expert in plants and animals that live in the dry woods of the Middle Jequitinhonha Valley.

8. Monitoring vestiges I: honey among the Wyrapara'ekwara (western Tupi-Guarani)

In 2013, indigenist Rieli Franciscato²³ organized an expedition through the southeast sector of the Uru Eu Wau Wau Indigenous Territory that aimed to monitor vestiges of groups in isolation in this sector. For two weeks, having travelled over a total of 115 kilometers, the indigenist team mapped *varadouros* (indigenous paths), abandoned campsites, hunting and gathering places, and registered the -material culture of the Wyrapara'ekwara, one of the indigenous peoples in isolation residing in the Uru Eu Wau Wau IT (records nº 12, 13 and 49). In this expedition, honey collections were the most abundant and dispersed through the territory that was covered, with a total of 17 honey collections mapped. Analyses subsidized by the *mateiro* methodology of event dating (Cangussu 2021) allowed that the vestiges to be dated. With that, some honey collections were recorded to have an estimated age of a few months, while others were 25 to 30 years old. At the time, through a detailed analysis of more recent vestiges, it was possible to identify some of the species that built the handled hives, which were bees with stings (*Apis mellifera*), stingless honey bees (*Melipona sp*) and *arapuás*²⁴ (*Trigona spinipes*).

When a large scaffold was found inside the Uru Eu Wau Wau Indigenous Territory during the expedition, Rieli did not only do a specific analysis of the incisions and an evaluation of the construction techniques being used by the natives. The experienced indigenist called his team's attention to the great number of other vestiges probably produced by women, children and other members of the Wyrapara'ekwara community. With a sharp *mateiro* eye, Rieli precisely described the vestiges that revealed the involvement of the

²³ Rieli Franciscato passed away in 2020 after being wounded in the chest with an arrow shot by the Wyrapara'ekwara, an isolated indigenous people, during a field activity in the borders of the Uru Eu Wau Wau IT. It was a dramatic episode in Brazilian Indigenism since Rieli had dedicated his whole life to the protection of indigenous groups in isolation, having even been a member of the expedition that confirmed the location of the Wyrapara'ekwara two decades ago. Rieli actively participated in the process that culminated in the ratification of the Massaco IT in 1998, in the state of Rondônia, the first indigenous territory exclusively destined to an indigenous people in isolation with a demarcation being established without need for contact; for that, this territory has become a symbol of indigenist policy.

²⁴ According to the website <http://portrasdonome.blogspot.com/2016/05/irapua.html>, *éirapu'a* ("round honey"), a name of Tupi origin, makes a reference to the shape of the hive.

entire community around that honey collection. It was possible to identify, for example, the likely place where people sat in order to accompany their children and partners during the construction of the scaffold – in this case, a safe place with a vantage point. A small rope of a delicate weave was secured to a trunk nearby, suggesting that maybe a *xerimbabo* (a small pet), or even a child was tied there (for their own safety). Several plants were broken a few hands above the ground and the presence of twigs reinforce this theory. The vestiges in this location suggested that a group near the honey collection site was fed during a few days. They ate Brazil nuts (*Bertholletia excelsa*), armadillo (*Dasyplus sp.*), agouti (*Dasyprocta sp.*) and lots of honey. It was possible to see several braids and weaves made from vines and straws, such as those in basketry that was discarded early on – likely a pastime activity during the banquets and long, spirited conversations.

Figure 14 – Indigenist on a scaffold made by a group in isolation inside the Uru Eu Wau Wau IT; record nº 12, 13 and 49.



Photograph by Daniel Cangussu. Photo archive of the Awá FEP /2013. In this case, the tree was cut down with a cut above the *Sacopemas*, which are the tubular basal roots.

9. Monitoring vestiges II: the history of honey converted into ashes among the Awá-Guajá (Eastern Tupi-Guarani)

In 2017, FUNAI put an emergency action plan into practice that aimed to organize several expeditions inside the Araribóia IT, in the state of Maranhão. This activity sought recent evidence of the presence of isolated Awá-Guajá collectives. According to the indigenist institution and with observations reported by anthropologists, and especially by the *Forest Guardians*²⁵ movement, spearheaded by the Guajajara leadership, the central portions of the IT have become the last refuge of the largest Awá-Guajá collective currently in isolation, estimated to be a little over 15 people. The IT had been gravely harmed by the enormous forest fires that occurred in previous years (IBAMA 2015; INPE 2015), which consumed a great part of the little remaining forest in the region. Due to that, the isolated Awá resistance was at risk. In spite of all the destruction caused by fires in the Araribóia IT, indigenist expeditions found vestiges that demonstrated recent occupation by Awá-Guajá in isolation. But that does not mean that they will no longer be considered one of the most vulnerable isolated indigenous peoples throughout the Amazon.

Information obtained over the implementation of the emergency plan was used to create and qualify new methods for remote monitoring of the Araribóia IT (Cangussu 2017), which allowed for associations using data about deforestation and forest fires in the region and the mobility patterns of the indigenous group to be made. The record of building and handling methods of *cacimbas* (fresh water reservoirs) among the Awá-Guajá (Otto and Cangussu 2019) and the relevance of this practice for their way of life in such a degraded environment was one of the contributions of the 2017 expedition.

In the Araribóia IT, exemplified by what is applied to other contexts of isolated Tupi peoples, vestiges of honey collection recorded by indigenist teams were the most abundant and widespread.

²⁵ The *Forest Guardians* is an organized Guajajara indigenous guard that performs a series of activities for the protection of the Indigenous Territories where they live. One of the main activities is the monitoring of trails opened by illegal loggers.

Figure 15 – Awá-Guajá honey collection in Araribóia Indigenous Territory/2017; record no. 13.



Photograph by Daniel Cangussu – Photo archive of the Awá FEP

Like the Wyrapara'ekwara, the Awá-Guajá of the Araribóia IT make use of different techniques in the search for honey in their territory. Using ingenious ties made with vines and *enviras* (*Daphnopsis*), they build small bridges, footbridges and handrails in order to connect a honey stick to other thinner trees and make climbing the desired tree easier. The great scaffolds are less common in this context due to the scarcity of raw materials available in their forests, which are already largely degraded.

In many instances, the scaffolds and other vestiges associated with the collection of honey were found in that expedition almost completely carbonized due to the fires that devastate the region year after year. The pressure put on the forest of the Araribóia IT represents an obstacle even to the methodology of recognition and dating of vestiges. With the destruction of the forests, passage signs, small breaks and cuts made by the natives while moving are also destroyed. During the 2017 expeditions, there were quite a

few situations where indigenists found recent honey collections, which still had the scent of honey, without having access to any previous vestiges that suggested that the territory was used days prior by the Awá-Guajá. Dating paths and breaks is essential to the “non-contact” methodology (Villa 2018; Cangussu 2021) since it is mainly through this data that indigenists monitor the distance of campsites inhabited by isolated groups.

Figure 16 – Awá-Guajá honey collection estimated to be 40 years old, located along illegal logger paths inside the Araribóia Indigenous Territory; record no. 13.



Photograph by Daniel Cangussu/2017 – Photo archive of the Awá FEP

We emphasize that the monitoring of Araribóia IT showed that honey collections were predominant vestiges of the occupation by isolated Awá-Guajá in the same way that monitoring the Uru Eu Wau Wau IT showed them to be predominant in Wyrapara’ekwara isolated collectives, likely to be Turi-Guarani living in the extreme opposite area of the Brazilian Amazon Forest. This regularity leads to the thinking of honey collection as an expression of a “preference” – that is, an update on the shared cultural, logical and historical perspective among these peoples (more than a function of some strictly environmental determination). We do not overlook

the fact that the environments where these collectives reside are invaded and degraded forests in which bees and honey may become a valuable “resource”. Still, we would like to stress that honey vestiges, especially abundant in the context of isolated Tupi-Guarani territories, deserve to be jointly investigated (check developments on this matter in Diniz’s article in this volume).

According to what is offered to us in current research, we can only affirm that the domestication or cultivation of honey has shown to be favored among them. From this apparent predominance, we are led to speculate about the reasons why bees seem to have been so essential to the Tupi in isolation: would such preference derive from isolation? In other words, can we ask ourselves if, at the core of the Tupi in isolation, there could be a policy founded on the “praise of honey”? Could we think that the predominance of honey among them is more widely and deeply linked to the appreciation of (honey) collection and foraging as an important direction for their current way of making (and conceiving of) their society, including their more intense mobility, which is less dependent on crops, and even the refusal to build relationships with other societies?

Final Thoughts

As we would like to have made clear, honey collection constitutes one of the millenary strategies in the relationship of amerindian peoples and their environment. The patterns of nidification and honey production are central to mobility and collection patterns of indigenous peoples in general. We note that this happens especially among Tupi populations with which we have intensely surrounded ourselves.

However, as we have seen that the ITs referred to in this article have been a constant target in the actions of illegal loggers and forest arson, in addition to being surrounded by large agricultural monoculture estates that release enormous quantities of pesticides on the border of these indigenous lands every year. The decline in biodiversity and populations of pollinators related to the entomofauna puts at risk not only the food security, but also the way of life in the forest.

As reported by various indigenous peoples, honey is becoming increasingly rare. As observed by indigenists during expeditions, fire and deforestation destroy not only their trails and campsite, but also their vestiges. Honey collection sites are burnt. With them, the history of Awá-

Guajá and Wyrapara'ekwara mobility is being converted into ashes over the years. Fortunately, some vestiges still resist but also demonstrate the risk that these isolated peoples go through in face of increasingly frequent illegal activities.

At last, we highlight that indigenous peoples dedicate themselves to honey collection preferably in periods of drought. Tending to reach the limits of their territories in search of honey, they end up exposing themselves even more in these periods to the action of hostile invaders and neighbors. This information should influence the planning of monitoring and territorial protection actions.

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