



# What is the *métier* of ethnobiology or why should this science be busy?

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## Notes on Ethnobotany

\*This text is a revised and modified version of one of the chapters of a book I recently published in Portuguese (Albuquerque, 2022), entitled Learning Ethnobiology. The French word *métier*, which I use in the title of this article, can simply be translated as work. However, I would like to borrow the word in a literary sense in addition to meaning an occupation, that is the related pains and delights.

## Abstract

Ethnobiologists have been guiding their research from different approaches and disciplinary lenses. There are those who defend a scientifically-oriented ethnobiology while others believe in an engaged ethnobiology (or an ethnobiology of action) aimed at learning from ancestral wisdom and, simultaneously, supporting the holders of this wisdom in different demands. But what then would be the job of ethnobiologists? From a narrative, briefly centered on our academic trajectory, I argue how ethnobiology can constitute an epistemological umbrella under which there would be space for epistemic and theoretical diversities.

*Keywords:* Brazilian anthropology, ethnobiology, ethnoscience

In this note, I continue the reflections I started in a previous text (Albuquerque, 2022) on epistemic diversity in ethnobiology. Many neophytes may ask themselves the following questions: what is the occupation of ethnobiology? Or what interests ethnobiologists? This may seem like a trivial question, but it is far from it. When we explain that the ethnobiologist's job is to understand the interrelationship between people and their environment, we hear different opinions: 1. for this, it is necessary to consider the subjectivity of understanding our species when doing research without ignoring the subjectivities of those who investigate; 2. when we talk about the human being, we cannot neglect the different factors that engender our permanence in the world, and it is necessary to consider the games of force and power that shape different societies; 3. understanding our existence on this planet implies understanding our trajectory from the epistemic, theoretical, and methodological resources that guide us on what is "objectively true" to give us the power to predict the phenomena that our species encounter. Although these three possible understandings of scientific doing may seem conflicting, I defend them as being complementary. For example, there are those who argue that ethnobiology without an ethnographic practice is empty of quality and, therefore, lacking any relevant meaning (Albuquerque, 2022). I understand this type of criticism as something much deeper than the defense of a method of data collection; however, in an ethnographic method, this also includes theoretical reflections. Even so, by reducing ethnobiological work to a single perspective, in this case the ethnographic perspective, would we not be limiting the job of ethnobiologists?

I do not remember the exact year. We had just given a lecture at an event on the different academic perspectives of ethnobiology. I defended this plural role of ethnobiology and its facet as an umbrella capable of welcoming

different approaches. A colleague in the auditorium asked for the floor, apparently with the intention of questioning some idea that I had expressed. What followed was a succession of attacks on ethnobiology as a science, what we defended, and how ethnobiology should deal with the rights of the traditional peoples and their territories. However, at no point of time did I say otherwise! I defend an ethnobiology that is inclusive, socially responsible, and able to address human diversity from different disciplinary perspectives (Albuquerque, 2022).

Traditional peoples had a great defender in Dr. Darrell Posey. Unless I am mistaken, I am unaware of modern academic leaders so engaged in debates on property rights over traditional knowledge and territorialities. Posey was not only a theorist on the subject but also a true activist for the indigenous cause. During the debates on the use of the Xingu River basin (1975–1989), Renato Castro (2014) informs that, having

carried out the inventory and plans for the use of the Xingu River, the indigenous populations, together with sectors of the scientific community, civil society organization, among others, began their mobilization. Kayapó leaders Paulinho Paiakan and Kube-I, accompanied by ethnologist Darrel Posey, participated in a symposium on tropical forest management at the University of Florida, in the United States, in 1988. There they reported that the World Bank would finance a project that would evict 13 indigenous groups.

Posey had a formidable quality that his defense was based on research data, some of which he had collected from the Kayapó region over many years. His arguments were strong, powerful, and based, almost always, on the best scientific evidence. I believe it is no exaggeration to say that, in a society that segregated (and still segregates) the traditional peoples by placing them in a position of historical subalternity, it was necessary to be equipped with the best information, even to support the demands of these peoples. I think Posey was one of the pioneers of what would come to be called Political Ethnobiology or Action Ethnobiology (see Armstrong & McAlvay, 2019). Soldati & Barros (2020), reflecting on the effects of the COVID-19 pandemic, consider that

Conserving biodiversity, defending the territories of the traditional peoples and communities, valorizing sociobiodiversity products for the local economies, and global health as a whole are topics of relevant interest that pose major challenges to all, specifically ethnobiology researchers. Thus, the COVID-19 pandemic provokes operational considerations in the field of ethnobiology. Firstly, it is necessary to proceed with a solid framework of theoretical and conceptual construction about the interrelationships between people and biodiversity, which has already started in several research groups around the world. We believe that ethnobiology, which often experiences criticism and self-criticism during its theoretical development, is growing as a scientific field.

In fact, one of the greatest challenges, in my journey of the multifaceted learning of ethnobiology, was when I engaged in discussions on the traditional medical systems—from the year 2007—which, in a way, are still scarce in the context of Brazilian projects on traditional indigenous medicine. The project Studies for the Environmental and Cultural Sustainability of the Fulni-ô Medical System: Workshop on Manipulation of Medicinal Plants, coordinated by one of the local leaders in Fulni-ô, was a milestone in my experience as a researcher.

When discussing ethnobotany, especially bearing in mind the traditional medical practices, it is necessary to start from a temporal perspective and make a historical cut, as this discipline has gone through several different phases. In the first, which covered a period of the 1970s, ethnobotany was characterized by a more descriptive approach of valuing and rescuing the knowledge and practices, mainly from the Brazilian indigenous peoples. This period was marked by the strong collaboration of non-Brazilian researchers, especially the Americans and the English. In the 1980s and 1990s, that is, the second phase, ethnobotanical investigations were concerned with some issues that go beyond cataloging the type of the use of plants and retrieving this information. Ethnobotany began to focus its efforts on knowing the following: how different peoples interact with the plant resources that surround them; how they perceive and classify their plants and landscapes; what are the ways in which these plants are used; what are the biological and cultural implications of these types of uses; how genetic diversity is manipulated; and what are the biological and cultural implications of this manipulation.

This new phase in the thinking of ethnobotany, which discusses the manipulation of biological diversity, was reinforced especially in 1988, when the International Congress of ethnobiology took place in Belém. In this memorable event, the role of the traditional populations as the maintainers and generators of diversity was highlighted in the following sentence recorded in the "Declaration of Belém"<sup>1</sup>: "[...] biological diversity is closely linked with cultural diversity." Hence, maintaining cultural diversity also implies maintaining biological diversity.

In the Fulni-ô project, we were interested in inventorying the local knowledge of the medicinal plants and the local perceptions of the landscape, which requires investigating the following: the species used as a medicinal resource; the types of use attributed to the known plants; the most important or culturally significant species; and the techniques and tools used in the appropriation of nature. The unfolding of these basic objectives required including theoretical and/or methodological components from other disciplines to complement or enrich the approaches used, especially because the Fulni-ô tribe demanded support from our team for their local actions (Albuquerque *et al.*, 2011a,b,c; Soldati & Albuquerque, 2012).

To achieve these goals, we started from the understanding that plants, within a social-ecological system, are also social objects that can be appropriated (intellectual and material), can present meanings, and often become symbolic emblems of a people. Moreover, we recognize that the local knowledge of plants and the landscape is closely related to the ways of managing resources and that strategies for appropriating nature are also related to codes, institutions, organizations, and social relations as well as with a people's worldview. Thus, for our work, we assume that all these spheres are connected. However, it is still necessary to emphasize that, in addition to all these different spheres, there is an ecological context in which a social group is inserted for the appropriation of nature's resources.

In this sense, our investigation integrated two distinct aspects in the Fulni-ô project. One of them was to articulate more strongly with ecology, trying to account for the implications of the use of natural resources, that is, the sustainability of the use of many of these resources, with a conservationist bias. The other was to address medical systems, seeking to understand how they are structured in terms of the plants available in the environment, how knowledge in this regard is distributed in the community, whether there are variations within the Fulni-ô culture itself in relation to knowledge distribution, and how this internal dynamic is organized.

The questions that guided our vision were enriched by the scenario in which the Fulni-ô people are inserted. Brazil encompasses different types of biomes, such as the Atlantic Forest, Cerrado, Caatinga, and Amazon Forest, which results in an extremely high species richness, thus making it a "megabiodiverse" country. It is in this unique ecological context that different human groups inhabit, which present certain strategies to live in a better manner in the midst of the specifics of each environment. Thus, the Fulni-ô present special strategies to live together with these unique characteristics, such as the climatic seasonality, which certainly affects their medical systems, as well as the ways in which nature is used and appropriated.

The Fulni-ô collect plants in different places, especially the native forests near Aldeia do Ouricuri and the forests of Serra do Comunati, and although the Serra is an important source of resources, it is far from the main village, not being as accessible as the adjacent forests. In addition to these two areas, the streets and backyards of the residences in the main village are used as a source of medicinal resources (Albuquerque *et al.*, 2011a,b).

There are highly important native species in the local medical system. As one of the objectives of the project was to assess the environmental sustainability of the collection of medicinal resources, we developed a specific methodology to investigate this extractive practice. To obtain a more reliable estimate of the processes of exploitation of the medicinal resources, our team selected two native species that had high cultural significance and showed signs of exploitation during field observations: "quixaba" (*Sideroxylon obtusifolium* (Roem. & Schult.) TD Penn.) and "aroeira" (*Myracrodruon urundeuva* (Engl.) All.). Thus, all plants of these two species were sampled, and any evidence of extraction was analyzed. Analyzing the extraction of the bark is fundamental as they are one of the parts of the most extracted plants for use in popular medical practices in the Brazilian Northeast. Due to the Caatinga's inherent climatic seasonality, the bark is available throughout the year, unlike the leaves, which are only available for a short time. This reality suggests that the communities were guided by preferentially using the stem bark as a therapeutic resource as an adaptive strategy to the local characteristics (this behavior corresponds to one of the predictions of the climatic seasonality hypothesis, which was proposed by me and on which I will comment in the following sections).

Initial observations showed that the demand for the stem bark of these two species is fairly high. The extraction data collected made it possible to estimate the biomass of this resource available in the forests, which were cross-referenced with the local demand to assess the direct impacts of this collection and the degree of sustainability of such practices. We wanted to sketch the real scenario of the utilization and exploitation of these resources. In this way, we collaborated for the construction of a local proposal that reconciled use with conservation. The first step in this direction was the creation of a booklet, involving the entire project team.

The proposal of our team on the Fulni-ô project is to encourage the sustainable use of biodiversity in the Fulni-ô indigenous land in addition to building a solid interface between ethnobotany and medical anthropology. Therefore, our intention is to collaborate in such a manner that plant wealth can continue to serve the production and reproduction of local practices and so that, simultaneously, this production and reproduction are linked to the social needs as well as nature's ability to meet them.

In 2013, at the invitation of the Fulni-ô people, we returned to the village to study the sustainability and ecology of a species of palm tree of great cultural significance, which resulted in the doctoral thesis of Dr. Juliana Campos (Campos *et al.*, 2018, 2019) and culminated in the construction of return actions coordinated with the local leaders<sup>2</sup>.

The defense for an ethnobiology of the action has been gaining strength since the 1990s in debates inside and outside the area as part of an agenda anchored in the idea of a political ethnobiology (Soldati & Albuquerque, 2016) truly engaged in defending the interests of the indigenous people and local communities. Current discussions involve not only this aspect but also racism, misogyny, and chauvinism inside and outside the academy. This call is for a decolonized academic and scientific practice (McAlvay *et al.*, 2021).

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To paraphrase Tim Ingold (2019), the kind of science I think most of the time is one that seeks to understand our species on this planet. Yes, I want to produce knowledge in this regard! I feel useful and comfortable in this *métier*. More than that, I feel comfortable moving through interdisciplinarity but being firmly anchored in my biological roots.

In fact, without realizing it at the time, my doctorate contained this configuration which was already beginning to settle in my researcher's mind. In the doctorate, we questioned some patterns of use of the natural resources found by the other researchers in tropical forests. We noticed that, in the Caatinga (seasonal dry forest from NE Brazil), differently from what was observed in the other places, the natural vegetation resources are more important for people, although the anthropogenic regions are more diversified. In addition, we began to question the use of some terms in the scientific literature that generated confusion when comparing results. It was this first work that showed me that the relationship between people and plants in the Caatinga seemed to follow a different logic than what was discussed in the extant literature. At the time, I believed that the region's marked seasonality was responsible for the patterns we began to recognize, but I needed to test that claim.

My data started to bother me for several reasons. Why do people prefer to use woody plants, especially the stem bark, when herbaceous plants are more readily available, easily accessible, and reported for the same indications and/or the same uses? Why is there so much redundancy of use, that is, several plants indicated for the same functions? Could this redundancy lead the distribution to a collection pressure between plants that share the same function? What are the criteria that lead people to select a certain set of plants for medicinal use? Why is there a strong predominance of medicinal plants for use as anti-inflammatories? Why do some plants enjoy special attention? What implications might this special attention have for the biology of the plant species?

These questions began to guide my thinking and, consequently, my scientific production. I want to believe that some of my contributions to science consist in having presented precise ideas to explain concepts that apparently seemed obvious and resolved and that some research groups are finally questioning today. I focused my efforts on testing three hypotheses—that of ecological appearance, climatic seasonality, and diversification of uses—the last two of which were proposed by me (Albuquerque, 2006) and later developed into a broader theoretical context (Albuquerque *et al.*, 2019).

The relationships between people and plants are complex, often involving adaptive responses to ecological and evolutionary forces, something that seems clear to me today. This perspective of ours does not exclude culture as a powerful force that can shape such relationships. Considering this, our research group has often asked itself: how could ecology and evolution have shaped the relationship between people and plants throughout the development of different societies and cultures? In this sense, I believe that the principles of evolution and ecology constitute an interesting theoretical framework for understanding the phenomena involving people and plants. Although the documentation collected over the last 100 years indicates that the relationships between people and plants are highly complex processes and may differ from culture to culture, evidence also suggests that some processes may be reflected in general patterns and, therefore, are susceptible to transformation.

The climatic seasonality hypothesis predicts adjustments that, evolutionarily, selected a behavior that privileges foraging strategies (of medicinal resources) focused on woody plants and/or those whose organs are perennially offered in nature in environments that suffer a strong and marked seasonality, such as the Caatinga in Northeast Brazil. There are two types of evidence that support this idea, namely ethnobotany and chemistry. Ethnobotany encompasses studies that indicate people's preference for plants and plant organs permanently offered, even in the face of a set of other species that may have apparently identical functions. At first, we might think that this is an obvious prediction, but, considering the scenario of seasonal forests, such as the Caatinga, in which, at certain times of the year, herbs become a highly abundant resource, we can question why in this period such resources are not as intensively used as the arboreal ones. It is possible that this same scenario is also configured as a reality for the other seasonal forests.

People tend to use native and perennial resources, whether herbs or woody plants, which, at certain times of the year, are more abundant, more accessible, and considered locally to be of equal efficiency. The herbaceous layer of the Caatinga is dynamic, variable in time and space, and limited by the availability of rainfall, which is restricted (two to four months). The herbaceous flora in the same area can vary over the years and in the same year. This strong local pressure, which does not allow people to predict whether a given resource will be available for use, may have allowed the evolution of a specialized behavior in foraging woody plants and perennial structures. Some findings from our group show, for example, that people in the Caatinga region prefer to use the stem bark of an important medicinal plant, the "aroeira" (*Myracrodruon urundeuva* Allemão), even when its leaves are available. We found that the leaves contain considerably greater amounts of tannins than the stem bark. Thus, what appears to be a cultural decision based on and perpetuated by tradition may be justified in the local ecological scenario. Our findings allow us to hypothesize that not only the perception of a plant's efficacy, its availability, and its accessibility determine its medicinal use throughout the construction of a pharmacopeia but also the "notion of security" that the resource will always be available. If, in fact, this premise is true, it has an important implication for seasonal environments; it is more important to ensure that people have access to the resource than to have a more efficient resource from a biological point of view (therapeutic activity). If such trends are confirmed with well-designed studies in various seasonal forests, it will be possible to understand much of the ecological and evolutionary dynamics behind people's decisions when appropriating natural resources.

From a chemical perspective, the findings of our group were also interesting in revealing that there seems to be a tendency for people to include exotic plants in their pharmacopoeias as a strategy to diversify their repertoire. We observed that the exotic plants used locally in a pharmacopoeia show some exclusivity in certain classes of chemical compounds or are more diversified in the occurrence of different classes of these compounds. From an ethnobotanical point of view, our findings indicate that exotic plants are often indicated to treat conditions for which there are no indications of use among native plants, or these are less preferred. In other words, exotic plants can enter a pharmacopoeia to fill gaps never occupied by the native plants.

In studies directed toward the pharmacological activities of the Caatinga plants, the predominance of phenolic compounds (especially tannins) in expressive percentages in the studied plants was evident as well as the fact that the presence of these compounds seems to respond strongly to some biological activities, reported by the people in these studies. If, in fact, due to the ecogeographic conditions that characterize the Caatinga, there is a tendency toward the specialization of the metabolic pathways to produce phenolic compounds, it is reasonable to assume that the introduction of exotic plants constitutes a possible strategy for diversifying this chemical scenario<sup>3</sup>.

With this in mind, some questions arise, such as, whether this "metabolic specialization," focused on the compounds of a phenolic nature, may have caused a specialization of possible therapeutic applications of native plants in this region, thereby leading people to introduce new plants as a strategy of diversification. Evidence of this apparent specialization is the fact that the indication of use as anti-inflammatories is predominant among the native plants of the Caatinga, an activity that is also strongly related to phenolic compounds, mainly tannins. An alternative explanation indicates that, due to the ability of the phenols to bind to different types of proteins, the spectrum of biological activity of these compounds is much wider than we believe, since the wide range of biological activities of a plant is not always due to a greater diversity of the compounds present in it. These ideas need to be tested as they have strong implications not only for understanding the dynamics of the strategies developed by people but also for directing bioprospecting investigations.

Another hypothesis we tested, that of apparency, failed from a chemical point of view in trying to explain the criteria that led people to select plants for their traditional pharmacopoeia (see Gonçalves *et al.*, 2016). The apparency hypothesis was developed around the 1970s for studies of herbivory and was later suggested as a possible explanation for the selection of certain plants in the medical systems of some cultures. The basic prediction is that short-lived herbs and plants would develop a defense strategy based on highly toxic, low-molecular-weight compounds (such as alkaloids). Now, if this was correct, we would expect to find these tendencies in the medicinal plants used by a certain group of people. However, our findings in the Caatinga do not support these predictions and further suggest that these compounds are more likely to occur in arboreal and long-lived plants.

Such data reinforce the findings mentioned above, which show, at least for semi-arid regions, the possibility of finding well-defined trends. Thus, it would be opportune to test these ideas in the other regions, since this would have interesting implications for the search for new drug candidates, providing logistical, scientific, and economic gains—this last gain is explained by the reduction of costs due to studies directed with a greater probability of success.

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This initial scenario has guided my interests over time, forcing me to increasingly view our species as one more species on the planet, rich in challenges and subject to the same laws and natural rules that govern the other forms of life. The difference, if I can say that there is any, in relation to the other species, lies in our ability to produce culture and in how that same culture can alter our ecological-evolutionary history. This is an ethnobiology project that develops from a naturalistic and invariably evolutionary understanding of what it is to be human. Although I am inclined to say that this focus enters the ethnobiology scene from the 2000s onwards, it is necessary to go back to the beginning of the 1990s and credit Phillips & Gentry (1993) with the first provocations for an ethnobiology guided by hypothetical constructions supported by an ecological benchmark. Therefore, the project is not new and, I reinforce, is not opposed to any other academic endeavor. We talk about the same things with different perspectives, and this plurality of thoughts that presents itself in modern ethnobiology is, above all, an advantage. Evolutionary ethnobiology is essentially committed to advancing the theoretical immersion to trace not just the origins of what we are but also the way in which, from these origins, we have been transforming ourselves. This intellectual enterprise, which I consider ambitious, needs to be free to articulate with the other academic endeavors so that interdisciplinarity is an essential and impregnable part of its nature. Evidently, any researcher can disagree with the way I work as an ethnobiologist, that is, with my scientific work. However, I wonder if a genuinely academic view can be used to invalidate another genuine one? At times, I feel that we ethnobiologists lack a continued process of theoretical and epistemological reflection, for which a philosophy of ethnobiology is undoubtedly essential (Ludwig & El-Hani, 2020). I believe that there is a genuine academic interest in the dialogue of the different scientific and academic views on the phenomena studied by ethnobiology (see Furlan *et al.*, 2020), but I think that we have not yet found the path of conciliation.

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What, then, should the ethnobiologist's job be? In my view, this work would be to understand the formidable human adventure on this planet and the way that adventure connects and transforms your own journey and the journey of those who interacted with humans. As a multifaceted adventure, there are different viewers at different moments of this journey, each one capturing a moment and a portrait.

### Notes

<sup>1</sup>see at: <https://www.ethnobiology.net/what-we-do/core-programs/global-coalition-2/declaration-of-belem/>

<sup>2</sup>The team, among other things, produced a booklet on the subject: Sá, JC; Campos, JLA; Silva, TLL; Albuquerque, UP 2022. Plants used to produce handicrafts by the Fulni-ô people: ecological information and a manual of good management practices for the Ouricuri coconut palm. Bauru, SP: Canal 6. The material, only in Portuguese, can be downloaded here: <https://1drv.ms/u/s!AgalRxn8YcFVmFygJGyAkCAZpAYM?e=bxFFlr>

<sup>2</sup>This idea, called the diversification hypothesis, has been receiving attention from different researchers. See, for example, Hart *et al.* (2017).

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