The influence of prestige bias on knowledge and the dynamics of cultural transmission about medicinal plants in local medical systems

Janilo Italo Melo Dantas, André Luiz Borba do Nascimento, Taline Cristina da Silva, Ulysses Paulino Albuquerque, Elcida de Lima Araújo

Correspondence
Janilo Italo Melo Dantas[1,2,4*], André Luiz Borba do Nascimento[3], Taline Cristina da Silva[1,4], Ulysses Paulino Albuquerque[1,2] and Elcida de Lima Araújo[1,5]

[1]Programa de Pós-Graduação em Etnobiologia e Conservação da Natureza, Universidade Federal Rural de Pernambuco, Departamento de Biologia, Rua Dom Manoel de Medeiros, s/n, Dois Irmãos, Recife, Pernambuco, 52171-900, Brazil.
[2]Laboratório de Ecologia e Evolução de Sistemas Socioecológicos (LEA), Universidade Federal de Pernambuco, Centro de Biociências, Departamento de Botânica, Cidade Universitária, Recife, Pernambuco, 50730-120, Brazil.
[3]Laboratório de Estudos Ecológicos e Etnobiológicos (LECET), Universidade Federal do Maranhão, Centro de Ciências de Babacal, Avenida João Alberto 700, Babacal, Maranhão, 65700-000, Brazil.
[4]Laboratório de Etnobiologia e Conservação de Ecossistemas, Universidade Estadual de Alagoas (UNEAL), Campus III, Rod. Eduardo Alves da Silva, km 3 - Graciliano Ramos, Palmeira dos Índios, Alagoas, 57604-595, Brazil
[5]Laboratório de Ecologia Vegetal dos Ecossistemas Nordestinos (LEVEN), Universidade Federal de Pernambuco, Centro de Biociências, Departamento de Botânica, Cidade Universitária, Recife, Pernambuco, 50730-120, Brazil

*Corresponding Author: italojanilo124@gmail.com

Ethnobotany Research and Applications 30:34 (2025) - http://dx.doi.org/10.32859/era.30.34.1-15
Manuscript received: 22/05/2024 - Revised manuscript received: 16/03/2025 - Published: 16/03/2025

Research

Abstract

Background: Cultural transmission is crucial in social-ecological systems like local medical systems. According to the Theory of Cultural Evolution (CE), the information transmitted can change, either through cultural mutations (random) or guided variations (intentional). In local medical systems, this cultural transmission can be selective. For example, individuals tend to replicate information from prestigious social models, who generally have specialized knowledge in the area of interest. This phenomenon is known as "Prestige Bias". This study investigated how prestige bias affects knowledge and cultural transmission dynamics related to medicinal plants in local medical systems. The hypotheses tested were: H1: prestigious individuals have more knowledge about medicinal plants than those less prestigious; H2: information about medicinal plants from prestigious sources is less prone to cultural mutations than information from less prestigious sources; and H3: prestigious individuals promote more guided variation than cultural mutation.

Methods: We examined the local medical system in the community of Lagoa do Junco, in Santana do Ipanema, Alagoas. We collected data through semi-structured interviews with 120 community residents and analyzed them using the Wilcoxon - Mann-Whitney test and a Generalized linear mixed model (GLMM) in the R development environment.

Results: People recognized as prestigious have greater knowledge about medicinal plants. However, we did not observe a significant influence of prestige bias on reducing cultural mutations. Furthermore, it was found that prestigious individuals promote more guided variation than cultural mutation.

Conclusions: This study reveals that prestige directly influences the dynamics of cultural evolution in local medical systems.

Keywords: Cultural evolution, Copy errors, Ethnobotany, Medicinal plants

Background

Local medical systems encompass the knowledge, practices, and resources that communities use to manage disease and promote health (Kleinman 1978). These systems have played a crucial role in human adaptation to various environmental challenges, particularly in responding to disease (Dunn 1976). A clear and recent example is the COVID-19 pandemic, during which different groups utilized and integrated various natural resources to cope with the disease (Benarba & Pandiella 2020; Alami *et al.* 2020).

Within local medical systems, the transmission of cultural information is a fundamental process for their functioning (Dunn 1976), as many of the adaptive strategies used in the treatment of certain illnesses, such as the use of medicinal plants, occur through the transmission of cultural information (Eyssartier *et al.* 2008, Lozada *et al.* 2006, Reyes-García *et al.* 2009, Santoro *et al.* 2020). Furthermore, in local medical systems, it is possible to infer that transmitting cultural information provides social learning and enables the maintenance or advancement of local knowledge (Kleinman 1978).

Despite the important role of cultural transmission in local medical systems, according to the "Theory of Cultural Evolution" (CE), information that is transmitted socially is subject to the occurrence of "copying errors" (Mesoudi 2011). In the "Cultural Evolution Theory" (CE) (a theoretical field that seeks to explain the evolution of culture over time), information that is transmitted culturally is likely to change (Mesoudi 2011). For EC, culture evolves, and this evolution occurs mainly through the dynamics of cultural transmission. Changes may even occur in the information that is transmitted. When the information that is transmitted is randomly changed by people, this process is called "Cultural Mutation" (Mesoudi 2011, Dantas *et al.* 2020). On the other hand, when the transmitted information is intentionally changed, this process is called "Guided Variation" (Mesoudi 2011).

Both cultural mutation and guided variation are processes that have been documented in local medical systems (Dantas *et al.* 2020; Pereira *et al.* 2021; Dantas *et al.* 2024). These processes can be illustrated through the use of medicinal plants in such systems. Cultural mutation occurs when information is unintentionally altered during transmission. For example, an individual who learns that the bark of a particular medicinal plant can treat a specific disease may mistakenly recall or assimilate the information incorrectly, leading them to use the leaves instead of the bark. In contrast, guided variation involves intentional modification. In this case, an individual who correctly remembers that the bark is used medicinally may still choose to use the leaves instead, based on personal preferences such as taste or perceived effectiveness (Dantas *et al.* 2020).

Consequently, these phenomena can generate implications for human beings, an example of this is the establishment of maladapted cultural traits. Maladaptive cultural traits can be defined as information that individuals adopt but does not contribute positively to their adaptation (Mesoudi 2011). In local medical systems, maladaptive cultural traits are defined as "Maladaptive Biocultural Traits" (Albuquerque *et al.* 2022), which can be exemplified by using medicinal plants that do not have the desired medicinal efficiency (Tanaka *et al.* 2009).

In local medical systems, cultural transmission can occur selectively due to the social factors and strategies people use to acquire and transmit information (Wood *et al.* 2012). As an example of this, "Prestige Bias" stands out (Henrich & Gil-White 2001). Prestige bias occurs when people copy information from more successful people in a population (Henrich & Gil-White 2001). Transmission through prestige makes it possible to highlight individuals in a population who are seen as models, as they have considerable social *status* and excel in some specific skills (Reyes-Garcia *et al.* 2008, Mesoudi 2011). An example is copying some information or behaviors from community leaders, famous people, and village elders (Horner *et al.* 2010).

In addition to the prestige bias, other types of biases can act in the selection process in cultural transmission, and these biases are similar to the prestige bias, such as the success bias (Mesoudi 2011). Success bias relates to individuals who are experts in a particular domain of knowledge (Oliveira *et al.* 2023) similarly to prestige bias. However, prestige bias differs

from success bias in that the person with prestige, in addition to mastering knowledge, stands out in other characteristics, such as social *status*, local importance, labor occupation, citation/reference by people (local leader, local representative, healer, etc.), which causes this individual to be perceived differently in the population (Berl *et al.* 2020, Reyes-Garcia *et al.* 2008). Thus, among the characteristics mentioned above, the criteria domain of knowledge and prominence of the informant have been used in some studies that seek to evaluate and understand the role of prestige in learning and cultural evolution (Reyes-Garcia *et al.* 2008, Chudek *et al.* 2012, Berl *et al.* 2020), characteristics also included in our study.

Prestige bias has considerable importance in transmitting cultural information (Henrich & Gil-White 2001, Jiménez & Mesoudi 2020), and there is evidence that the strategy of copying prestigious individuals is not exclusive to the human population, as it also occurs in other populations of animal species, as of the Chimpanzés (Horner *et al.* 2010). In local medical systems, prestige bias plays a crucial role, as individuals tend to place great trust in information provided by prestigious figures, even when these individuals do not possess significant expertise in the domain (Santoro *et al.* 2018; Jiménez & Mesoudi 2020). This is because, in some situations, it is common for people to observe and perceive the success of an individual with prestige in a specific activity or skill and start copying the information of such an individual about other types of skills/activities (Santoro et al., 2018). For example, a prestigious individual who is successful in the use of food plants can be used as a model for people to copy information about other domains of knowledge, such as medicinal plants. Prestigious individuals who have important skills, such as fishing, can be used as models for people to copy information about other crop activities, etc. (Henrich & Broesch 2011).

Considering the importance of prestige bias, studying the influence of this bias in the context of different human cultures is essential, as it provides important insights into the dynamics of cultural transmission/learning (Chudek *et al.* 2012, Oliveira *et al.* 2023) and cultural evolution (Henrich & Gil-White 2001). However, despite its importance, only some studies have sought to evaluate the influence of prestige bias on knowledge and cultural transmission of medicinal plants in the scenario of local medical systems. In addition, no empirical study has sought to investigate the influence of prestige bias in relation to the establishment of cultural mutation and guided variation in the setting of human populations, such as local medical systems.

Therefore, in this study, we propose to investigate the influence of prestige bias on knowledge and the dynamics of cultural transmission about medicinal plants in local medical systems, testing some hypotheses based on the previous knowledge exposed. For example, some studies indicate that people who excel in different social groups, such as local experts, can influence the knowledge (Baldauf *et al.* 2009), access, and cultural transmission of certain cultural practices (Bond & Gaoue 2020, Henrich & Broesch 2011). Furthermore, evidence indicates that prestigious individuals generally have high knowledge and skills in a given subject within a population (Jiménez & Mesoudi 2020). Thus, we tested the following hypothesis: H1: prestigious individuals have more knowledge about medicinal plants than less prestigious. We expect that prestigious individuals will present a greater number of medicinal plants compared to less prestigious individuals.

Additionally, prestige bias can be considered a factor modulator the dynamics of human cultural evolution (Henrich & Gil-White 2001, Berl *et al.* 2021, Oliveira *et al.* 2023). Furthermore, some studies show that prestige emerged from psychological adaptations to improve the quality of the information acquired (Henrich & Gil-White 2001). Other studies indicate that information from prestigious people may be better transmitted and more likely to be memorable than information from non-prestigious sources (Jiménez & Mesoudi 2021, Oliveira *et al.* 2023). However, we do not know whether prestige bias has influenced the establishment of cultural mutations in the context of local medical systems. Furthermore, in local medical systems, due to the experiences that prestigious individuals have, for the person needing the information, the prestige may be perceived as the most important/advantageous when compared to information acquired through other routes of transmission. Consequently, this may be a key factor in making this information more easily memorized and recalled (Nairne & Pandeirada 2008). Based on these arguments, we sought to investigate the following hypothesis: H2: information about medicinal plants from prestigious sources is less prone to cultural mutations than information from less prestigious sources. We expect the frequency of mutated cultural traits to be lower when obtained by prestigious people than through other transmission sources.

We also aimed to test H3: Prestigious individuals promote more guided variation than cultural mutation. We expect that the rate of information change among prestigious individuals will be higher for guided variation than for cultural mutation. We acknowledge that, in some human populations, all individuals can contribute to the spread of guided variation (Mesoudi 2011), including within local medical systems (Dantas *et al.* 2024). However, in the context of local medical systems, guided variation is likely to occur more frequently among individuals with prestige. This may occur because prestigious people have

much knowledge and, perhaps, diverse personal experiences (Henrich & Gil-White 2001, Jiménez & Mesoudi 2020, Henrich & Broesch 2011). Thus, their knowledge and experiences give them the power to shape ideas, behaviors, and practices. Furthermore, the experience that these individuals have with medicinal plants may help them to memorize cultural information better.

With the realization of this study, we hope to contribute to understanding the influence of prestige bias in the cultural transmission of medicinal plants in local medical systems. In addition, we hope that our study's contributions will provide further insight into the role of prestige bias in the spread of guided variation and cultural mutations, something that has not yet been evaluated in the setting of real human populations, such as local medical systems.

Materials and Methods

The Local Medical system

The study was developed based on knowledge about medicinal plants in the local medical system of the community of Lagoa do Junco, located in Santana do Ipanema, Alagoas, Northeast region of Brazil. The municipality of Santana do Ipanema is located in a semiarid environment dominated by caatinga vegetation (IBGE 2018). The Lagoa do Junco Community is considered one of the main local populations in the municipality, with a total of 63 registered families with an average of 188 individuals (Dantas *et al.* 2020, Pereira *et al.* 2021, Dantas *et al.* 2024). The people of the Lagoa do Junco community have direct contact and a strong relationship with the municipality's natural resources, emphasizing a local forest around the community. Its medical system includes several cultural practices, such as the use of medicinal animals, the use of wood resources, and mainly the use of medicinal plants.

The Lagoa do Junco Community is an area rich in biodiversity and has particular climatic and ecological characteristics. It has a large vegetation and fauna with endemic, native, and exotic species adapted to semiarid climates. It has a tropical climate with dry and rainy seasons and variable temperatures between 20°C and 30°C throughout the year (IBGE 2018). In the community, a lake acts as an important water source for the local community and agricultural activities. The main economic source for the people of the community is subsistence agriculture through animal husbandry. In addition, some people in the community obtain their income by selling natural products and jobs in the commercial sector or the city hall of the municipality of Santana do Ipanema, Alagoas, and neighboring municipalities.

Medicinal plants are highly prominent in the community, with medicinal plants in isolation and through medicinal preparations (syrup, lickers, bottles), both for individual use and local commercialization (Dantas *et al.* 2020). The community's people have a local medical system characterized by a strong cultural knowledge of medicinal plants, which is why we selected the community for the study.

Ethical and Legal Information

Ethical recommendations for research with human beings were met. Before conducting our study, we contacted local community leaders. In addition, we introduce ourselves and highlight the objectives of our study for community consent. We had approval from the Research Ethics Committee of the University of Pernambuco-UPE CAAE: 97380918.9.0000.5207. We also registered our research with the National System for Management of Genetic Heritage and Associated Traditional Knowledge-SISGEN. We use the Free and Informed Consent Form (TCLE) for people to express their consent to participate in the present work.

Data collection

For data collection, we followed the same methodology used by Dantas *et al.* (2020) and Pereira *et al.* (2021), and the description of the methods partially reproduces its wording. The collection was carried out in two stages. In the first stage, we used the free listing technique (Albuquerque *et al.* 2014), with each participating individual invited to mention the plants that were used or known to them as medicinal plants. Subsequently, we conducted semi-structured interviews (Albuquerque *et al.* 2014) with participants to acquire information regarding the uses of the listed plants. For example, for each plant mentioned by the informants, we asked the following questions: 1)- For which diseases is this plant indicated? 2)- Which part/parts of the plant are used?

Using the guided tour technique (Albuquerque *et al.* 2014), we collected samples of the plants mentioned by the informants. We subsequently consulted botanical experts to identify the collected samples. The species that we were able to collect with reproductive material were deposited in the Dárdano de Andrade Lima Herbarium of the Pernambuco Institute of Agricultural Research (IPA). The species were classified using the taxonomic treatment of APG IV.

Identifying Transmitters, Learners, and Prestigious Individuals

The individuals who acted as transmitters, learners, and prestigious figures were identified through interviews. Each interviewee was asked: 1. From whom did you acquire knowledge about medicinal plants? 2. Did you obtain this information solely from this person within the community? If not, from whom did you learn the most? The individuals identified in response to these questions were considered transmitters of knowledge. These questions were asked for each unit of information (UI) mentioned by the informants. A unit of information (UI) refers to the association between a specific plant species, the plant part used, and the disease or symptom it is believed to treat (Santoro *et al.* 2015). For example, **UI =** *Aloe vera* - leaf - fever.

An important factor to be mentioned is that in our study, all participants remembered from whom they learned certain information about medicinal plants; that is, they remembered the transmitter of the information. Every transmitting individual present in the community was also interviewed. However, when the informant mentioned having learned from a deceased transmitter or that he no longer lived in the community, this transmitter was not interviewed. In this case, the information provided by the apprentice was removed from the analysis, which was only done when the apprentice and transmitter answered the questionnaires.

For identify the individuals with prestige were request the interviewed, to answer the following questions: 1) Who in the community do you consider to be experienced and knowledgeable about medicinal plants? 2) What is the profession/what functions does this person perform in the community? For example: was he/she a local leader, local representative, healer, curator, etc.

We included the second question because previous studies suggest that factors such as an informant's social status, personality, occupation, social influence within the community, position, and the attention or importance attributed to them can influence the identification of prestigious individuals (Berl *et al.* 2021; Henrich & Gil-White 2001; Jiménez & Mesoudi 2019; Reys-Garcia *et al.* 2008).

Although knowledge and social standing alone are limited criteria for classifying someone as prestigious, in this study, we considered the individual whom the interviewee emphasized as a specialist in medicinal plant knowledge to be a person of prestige.

Additionally, through our time in the community, we sought to observe and verify the information provided by interviewees regarding the individuals identified as prestigious in this study.

Checking for Cultural Mutations

The information provided in the interviews of individuals identified as transmitters and learners was analyzed and compared to identify possible cultural mutations among local knowledge (Dantas *et al.* 2020). When analyzing the information, we consider information about the same plant used by the learning individual and the individual transmitting the information. From this, we consider mutation when: 1 - the therapeutic target (disease) indicated by a learning individual was different from that indicated by the individual transmitting the information; 2 - when the part of the plant used by the apprentice was different from the information given by the transmitting individual (Dantas *et al.* 2020). The situation in which a learner recalled only one of the plant parts taught by the transmitter for treating a disease was not considered a cultural mutation, as the remembered part was also originally taught by the transmitter.

Classification of Cultural Mutation or Guided Variation (second stage of data collection)

After checking possible cases of cultural mutation in local knowledge, we carried out a new stage of semi-structured interviews only with individuals who were apprentices and transmitters who presented possible cases of mutation in their information. This stage was carried out at a different time from the first stage, with each individual initially remembering the information they spoke during the first data collection stage. The individual then answered some questions: 1) In the first interview, you mentioned using plant X to cure disease Y. However, can this plant also cure another type of disease? If yes, which one? 2) Have you used this plant to cure another disease? If yes, which one? 3) Have you ever recommended this type of plant to someone to cure another disease other than this? If yes, which one? 4) In the first interview, you mentioned using part X of this plant. However, can other parts of the plant also be used? If yes, which one? From these questions, it was possible to verify whether the information changes in the medical system between transmitting individuals and learning individuals were random (cultural mutation) or intentional (guided variation).

Data analysis

To determine whether prestigious individuals have more knowledge about medicinal plants than those with less prestige (H1), we created a spreadsheet that recorded the names of all participants. Next to each participant's name, we noted the number of medicinal plants mentioned by each participant. In addition, we included a profile for each individual, indicating whether they were recognized as prestigious or not. In this way, we recorded the names of all participating individuals (with and without prestige) and the number of medicinal plants reported by each participant. We then used the Wilcoxon -Mann-Whitney test after checking the non-normality of the data via the Shapiro-Wilk test. The dependent variable was the number of medicinal plants known to each individual, and the independent variable was the presence or absence of prestige for the individuals (prestigious vs. not prestigious). Additionally, we employed a Generalized Linear Model (GLM) with a Poisson distribution to analyze the relationship between the frequency with which individuals were mentioned (predictor) and the number of medicinal plants they knew (response variable).

To verify whether information about medicinal plants from prestigious sources is less prone to cultural mutations than information from less prestigious sources (H2), we created a spreadsheet in which we recorded the names of the individuals and all the cultural traits (plant+part of the plant used in the treatment+disease indicated in the treatment) mentioned by each informant. Next to each piece of information, also treated as a cultural trait, mentioned by individuals, we assigned a value of "1" when the information had undergone mutation or a value of "0" when the information had not undergone mutation. Furthermore, we recorded the transmission mode of cultural traits (prestige bias or other transmission source). Subsequently, we also used a generalized linear mixed model (GLMM) with a logit linkage function and a binomial distribution to test H2. The model included source (prestige) as a fixed effect and individual as a random effect to capture participant variability.

To verify whether prestigious individuals promote more guided variation than cultural mutation (H3), we created a spreadsheet with the names of all individuals recognized as prestigious. Next to each individual's name, we recorded the number of guided variations and also cultural mutations. We then used the Wilcoxon -Mann-Whitney test after checking the data's non-normality via the Shapiro-Wilk test. We also performed a negative binomial GLM analysis and compared the amount of guided variation of individuals recognized as holding prestige with those who were not recognized. All analyses were performed in the R development environment, through version 4.3.1 using the "lme4".

Results

Of the people interviewed, 28 were cited as individuals specialized in knowledge about medicinal plants, and referred in this study as prestigious, including local **one** local leader and **four** healers. Of the prestigious individuals, 16 were female, and 12 were male. All prestigious individuals were aged between 60 and 83 years. 39 medicinal plants cited as being used by individuals in the community were identified (supplementary material). We found a significant difference between the knowledge of people recognized as prestigious and those without prestige, with the knowledge of prestigious people being significantly greater $p < 0.001$ (Table 1). In addition, the results indicated a significant association (Table 2) between prestige and the number of people cited (coefficient = 1.8162, standard error = 0.1214, $p < 0.001$). Individuals with prestige were mentioned approximately 6.15 times more than individuals without prestige.

The results indicated that the acquisition of information from prestigious sources did not have a statistically significant effect on the probability of occurrence of cultural mutations (coefficient = 0.028, SE = 0.354, z = 0.08, p = 0.937). The intercept of the model (-2.378, SE = 0.233, $p < 0.001$) suggests a low probability of cultural mutations when the source of information is not prestigious. However, the result of the variation of the random intercept in the value of 0.959 indicates a great variability among the information of the individuals (Table 3). Furthermore, we found a significant difference between the amount of mutation and guided variation in the group of prestigious people, with the amount of guided variation being significantly ($p < 0.022$) greater in this group (Table 4). The results showed a significant positive association (Table 5) between prestige and the guided rate of change (coefficient = 2.1211, standard error = 0.3275, $p < 0.001$). Individuals with prestige had a guided rate of variation approximately 8.34 times higher than those without prestige.

Table 1. Wilcoxon-Mann-Whitney test showing the association between knowledge of prestigious and non-prestigious people.

Source of information	Average	Standard deviation	Median	1st Quartile	3rd Quartile	W	p-value
Prestige	25.23	6.63	26	22	28.75	49.5	<0.001
No prestige	7.09	3.67	7	5	9		

Table 2. Generalized Linear Model, using the Poisson distribution indicating the relationship between the prestige of individuals and the number of times they were mentioned.

Variable	Coefficient	Standard Error	Z value	p-value	Exp(Coeff)
Intercept	0.1153	0.0995	1.159	0.247	1.12
Prestige	1.8162	0.1214	14.964	<0.001	6.15

Table 3. Results of the generalized linear mixed model for the occurrence of cultural mutations in medicinal plants.

Fixed Effect	Estimation	Standard Error	z-value	p-value
Intercept	-2.378	0.233	-10.22	<0.001
Source: prestige	0.028	0.354	0.08	0.937
Random Effect:				
Group/Name	**Standard Variance**		**Standard Deviation**	
Individual/Intercept	0.959		0.979	

Table 4. Wilcoxon -Mann-Whitney test showing the association between the rate of guided variation and cultural mutation of prestigious people.

Type of change	Average	Standard deviation	Median	1st Quartile	3rd Quartile	W	p-value
Mutation	0.55	1	0	0	1	263	<0.02
Guided Variation	1.07	1.02	0	0	two		

Table 5. Negative binomial GLM analysis, comparing the amount of guided variation of individuals recognized as holding prestige with those who are not recognized.

Variable	Coefficient	Standard Error	Z value	p-value	Exp(Coeff)
Intercept	-1.9568	0.2774	-7.055	<0.001	0.14
Prestige	2.1211	0.3275	6.476	<0.001	8.34

Discussion

Do prestigious individuals have more knowledge about medicinal plants than those less prestigious?

The findings of this study confirm the hypothesis that people who are recognized as prestigious have greater knowledge about medicinal plants. Some factors may be contributing to this. One of these factors would be the experience that prestigious individuals have. For example, in this study, we found that individuals recognized as prestigious had a strong history of using medicinal plants, as they have used medicinal plants in different ways for a long time in the community's day-to-day life. Furthermore, they are individuals who have long guided the practice of using medicinal plants for people in the community, whether through the use of isolated medicinal plants or even through the use of more complex preparations, such as vegetable mixtures (bottled, syrups, lickers, etc.) (Dantas *et al.* 2020, Pereira *et al.* 2021). In this sense, the set of experiences that individuals from the group of prestigious people have made them highly knowledgeable; these individuals present above-average information compared to others in the community (Jimenéz & Mesoudi, 2020). It is known that socioeconomic and cultural factors can strongly influence people's knowledge about medicinal plants, both on a global and local scale (Corroto et al., 2022).

Thus, our results regarding prestigious individuals may reflect the influence of some socioeconomic factors. For example, we found that people in the community recognized as prestigious were older (over 60). Thus, we believe that age may favor greater knowledge of prestigious people about medicinal plants, as these people have had more time to diversify their experiences with the use of medicinal plants for the treatment of illnesses (Souza *et al.* 2021), which has already been evidenced in some ethnobotanical studies on local knowledge related to the use of medicinal plants (Nega *et al.* 2019, Sato 2012, Souza *et al.* 2022). Furthermore, older people generally have a greater preference for the use of traditional medicine, leading to greater contact with medicinal plants (Sato 2012, Wiryono *et al.* 2019). Thus, for people in the community, older individuals may be perceived as having more knowledge due to their experiences with medicinal plants, causing people in

the community to consider them as prestigious.
Additionally, some evidence suggests that the roles people play in a community can contribute to their being considered prestigious (Reyes-Garcia *et al.* 2008). Perhaps this interaction deserves a new, more careful evaluation, as in this study, we observed that the women recognized as prestigious were mostly faith healers, healers, local leaders, and large cultivators of medicinal gardens. Therefore, the characteristics of their status in the community may contribute to knowledge about medicinal plants, as already suggested in other studies (Silva *et al.* 2022, Maciel & Neto 2006), and have a bearing on other people in the community identifying the prestigious people. Furthermore, we observed that most men were recognized as prestigious. In addition to being root healers and healers, they also worked selling medicinal plants or traditional herbal products at local fairs, which favors communication and transmission of information to others. People in the community and this complementary work activity can be an important route for the occurrence of guided variation or cultural mutation.
Another interesting factor to highlight is the fact that many of the prestigious people in the community we studied use only the use of medicinal plants as a therapeutic resource, as during the interviews, they mentioned using only "bush medicines" or "homemade medicines." to cure certain diseases, signaling the existence of a preference for the use of medicinal plants to cure diseases, perhaps because they had learned since childhood from their ancestors, such as parents and grandparents, that the use of medicines extracted directly from plants was better for the treatment of illnesses. Thus, preference may contribute to prestigious people's knowledge of medicinal plants.

Is information about medicinal plants from prestigious sources less prone to cultural mutations than information from less prestigious sources?
The findings of this study lead us to falsify our hypothesis, considering that we found no difference in the occurrence of mutations in the information transmitted by individuals with or without prestige. In general, some studies (Henrich & Gil-White 2001, Jiménez & Mesoudi 2021, Oliveira *et al.* 2023) show that information acquired from prestigious people may be more likely to be memorable when compared to other sources of information. Thus, we expected that this fact would make information transmitted by prestigious people less susceptible to changes during the process of cultural transmission. However, our findings show that the transmission of information about medicinal plants is susceptible to cultural mutations, even if obtained from people with great knowledge and personal experiences (prestige bias). This may be due to the randomness of cultural mutations (Mesoudi, 2011). In other words, cultural mutations are an unintentional process. They are likely to occur for everyone in the community, as the chances of them occurring are random, regardless of the source of cultural transmission.

One factor contributing to the prestige bias not reducing the chances of cultural mutations occurring is the role that the transmission of information by "vertical route" (transmission from parents to children) plays in the local medical system. For example, evidence from some ethnobiological studies indicates that in local medical systems children's knowledge of medicinal plants often resembles their parents' knowledge more than the knowledge of others in the community (Brito *et al.* 2019, Santoro *et al.* 2020). Furthermore, some studies on cultural evolution show that vertical transmission can function as a more conservative route for cultural information compared to information transmitted by other forms of transmission (Hewlett & Cavali-Sforza 1986, Cavalli-Sforza & Feldman 1981). Furthermore, (Dantas *et al.* 2024) found a lower occurrence of cultural mutations in information transmitted vertically than through oblique and horizontal routes. Thus, in the community we investigated, the prestigious person mentioned by the interviewee did not always represent the father or mother figure. The interviewees may remember more faithfully the information acquired from their parents (perhaps judged as more reliable people) than from information acquired by prestigious individuals other than their parents. It is also important to mention that over time, human memory systems have evolved, allowing information to be perceived as more relevant from an adaptive point of view and better memorized (Nairne & Pandeirada 2008, Nairne *et al.* 2007). In this sense, for people in the community, information acquired vertically may be perceived as more relevant than information acquired through prestigious sources.

Another factor that may contribute to prestige bias is that it does not reduce the chances of cultural mutations occurring. This may be because people acquire information about medicinal plants through different sources of information at the same time (Dantas *et al.* 2004). For example, although prestigious people are important to individuals in the community, an individual in the community when needing to acquire information about a plant "X," may turn to a prestigious person, a family member in the community, and also a local friend. Consequently, despite the information being about the same medicinal plant (plant), this can generate confusion information (Arkes 1991) regarding plant X for the individual in the community, which may also contribute to cultural mutations.

The prestige bias may also not contribute to the reduction in cultural mutations due to the variation in information made

available by prestigious individuals. Prestigious people generally have diverse experiences and have great knowledge about medicinal plants. Therefore, when transmitting information to another person in the community, a large volume/variation in the information made available can be passed on. Consequently, this large volume/variation of information may be causing "Information Confusion" (Arkes 1991) or a "Causal Mismatch" (Henrich & Mcelreath, 2003), making the minds of individuals who receive information about medicinal plants confusing, thus affecting the memorization of such information. Similarly, there may be an "incomplete transmission of information" (Eerkens & Lipo, 2005). In other words, due to the variation in information, individuals learning from prestigious people when interacting with others in the community may be passing on information with copy errors. The influence of the large volume of information on the occurrence of cultural mutations is evidenced by some authors, and there is a record that this fact can significantly influence the fidelity of cultural information [38].

Another factor contributing to the prestige bias not resulting in a reduction in the occurrence of cultural mutations is the frequency with which individuals acquire information about medicinal plants from prestigious people compared to acquiring information from other people in the community. For example, due to residential proximity or better local coexistence, when needing to acquire information about medicinal plants, individuals may prefer to turn more frequently to people closer to their homes and who do not have prestige, such as family, friends, or neighbors. Consequently, the frequency with which people in the community acquire information from people closer to them may make it more memorable than information acquired by prestigious people. Therefore, the frequency of information sharing can significantly influence the fidelity of cultural information (Acerbi & Tennie 2016).

The results we found in this study, in a certain way, are similar to the results of some studies that sought to evaluate the influence of prestige bias on the cultural transmission of information. For example, Jiménez & Mesoudi (2020) conducted an experiment on information transmission and investigated whether information attributed to prestigious sources would be culturally transmitted with greater fidelity than information attributed to non-prestigious sources. Contrary to their predictions, the authors did not find a reliable effect of prestige on the fidelity of information transmission. The authors discuss that the scenario they used may have generated a lack of a reliable effect of prestige on people's recall of certain information. As the authors' study was carried out through a transmission chain experiment, the authors suggest that such results may be different from studies that investigate the influence of prestige bias in everyday life scenarios of local populations. However, our findings are similar to those found by the authors, showing that even in the scenario of human populations, prestige bias may also not influence the occurrence of cultural mutations. Therefore, the empirical results of our study suggest that although prestige bias plays an important role in the scenario of local medical systems, considering the use of medicinal plants, the occurrence of cultural mutations was shown to be a completely random process, as suggested in cultural evolution (Mesoudi 2011).

The present study's findings contribute to increased studies on cultural mutations in the scenario of human populations and strengthen the need for new developments. For example, our data complements evidence from (Dantas *et al.* 2020, Pereira *et al.* 2021, Dantas *et al.* 2024) on cultural mutations in local medical systems. The authors provide evidence of factors that can influence the accumulation of cultural mutations. In turn, the authors indicate prestige bias as an important factor that would need to be investigated in future studies on cultural mutations, suggesting that prestige bias could have an important role in controlling cultural mutations in medicinal plants. However, our results showed that in the Lagoa do Junco community, prestige bias was not a factor that contributed to reducing the emergence of cultural mutations in the local medical system but points to the need to evaluate communities immersed in other social-ecological systems to confirm the fact that mutations occur randomly, as detected in this research.

Do prestigious individuals promote more guided variation than cultural mutation?

Our results confirm the hypothesis that people recognized as prestigious generate more guided variation than cultural mutation. This occurred because prestigious individuals have vast knowledge and diverse personal experiences in the Lagoa do Junco community. This fact has already been highlighted in other studies on human groups (Henrich & Gil-White 2001, Jiménez & Mesoudi 2020). Having high knowledge makes the informant more able to change information intentionally without the changed information losing its meaning/effect. Furthermore, the extensive knowledge and experience that prestigious individuals have with medicinal plants may be contributing to such individuals having a good recall of cultural information, generating low cultural mutation.

Another factor contributing to prestigious people generating more guided variation than cultural mutation is that many prestigious individuals are local farmers and market traders who produce and commercialize medicinal preparations, such as lickers, bottles, and medicinal syrups (Dantas *et al.* 2020). Because of this, prestigious people intentionally change

information to make using plants and medicinal preparations more attractive to community members. For example, a prestigious individual may have learned information about the bark of a plant from a person in the community. However, the individual who received the information, intentionally and preferentially, can use the leaves of a plant for medicinal licker, giving rise to a guided variation. Changes of this type may occur when other plants are used to prepare other types of medicinal preparations, increasing the amount of guided variation in the local medical system.

In addition, it is possible that the amount of guided variation is greater than the number of cultural mutations in the group of prestigious people due to social factors, such as the age and education of prestigious people, as in the community we investigated Prestigious people were older and had less education. Such factors may contribute to increased guided variation, as other studies have shown that older age associated with lower education generates fewer cultural mutations in local medical systems (Pereira *et al.* 2021).

Conclusions

This study shows that prestige bias plays an important role in the knowledge and dynamics of cultural transmission of medicinal plants in local medical systems. In addition, it highlights the occurrence of cultural mutation and guided variation in knowledge about medicinal plants in structuring local medical systems.

Despite the importance of prestige bias in cultural transmission, our findings demonstrate that in local medical systems, learning from prestigious people is not a factor that reduces the emergence of cultural mutations, contradicting evidence suggested in previous studies. Furthermore, this study showed that experience and extensive knowledge of medicinal plants may be associated with the emergence of guided variation in the context of human cultures. Thus, it is clear that prestige bias is a factor that, by generating cultural mutation or guided variation, directly influences the dynamics of cultural evolution in local medical systems.

Although most studies on cultural mutations are based on local knowledge about medicinal plants for treating human illnesses, we noticed that people from the Lagoa do Junco community also use medicinal plants to treat domestic animals or medicinal products of animal origin for treating illnesses. Therefore, we suggest that future studies evaluate the role of the prestige pathway and other pathways in inducing cultural mutations and guided variations, also considering the use of medicinal animals or plants to treat animal diseases. Considering that the social-ecological context in which human populations are inserted is relevant in inducing cultural mutations and guided variations, we indicate the need to expand the number of studies to cover different social-ecological contexts aiming for greater generalizations about the role of these phenomena in systems local doctors.

Limitations

Studies carried out on cultural mutations and guided variation in the scenario of human populations, considering the use of medicinal plants in local medical systems, are still pioneering. There are only three previous studies (Dantas *et al.* 2020, Pereira *et al.* 2021, Dantas *et al.* 2024). The only methodology used to collect data has been semi-structured interviews and free listing. However, as the investigation of cultural mutations and guided variations depends greatly on the recall of information from participating individuals, there is a limitation related to memory, as the interviewee may not remember the person from whom he acquired knowledge about the medicinal plant used while carrying out the interview. Although the informant was asked how he learned the use of each species mentioned in order to be sure about the source of knowledge of all the information units, it is still possible that there were limitations in the study related to the memory of the interviewee, who may not have remembered precisely who he learned about certain plants.

For example, the individuals interviewed may have acquired information from multiple people within the local medical system. However, during the interviews, they might have made generalizations and primarily recalled the most frequently mentioned transmitters, such as their parents. Memory limitations may have been more common among older individuals, as studies indicate that aging can affect the ability to recall the origin of certain information (Wegesin *et al.* 2000). Therefore, given these memory constraints, we suggest that future studies incorporate additional methods or refined questioning techniques to minimize the impact of such limitations.

Furthermore, studies in cultural evolution have not yet evidenced the existence of methods that differentiate the occurrence of cultural mutations from the occurrence of guided variations in the scenario of human populations. We also used semi-structured interviews to differentiate the occurrence of these processes in local knowledge in an embryonic way. However,

it is important to develop other methods that can be used to differentiate the occurrence of these phenomena and reduce the risk of bias.

To identify individuals with prestige, we employed methods and strategies commonly used in previous studies (Reyes-Garcia *et al.* 2008; Chudek *et al.* 2012; Berl *et al.* 2020; Jiménez & Mesoudi 2019), which assess individuals' outstanding knowledge and social status. However, even when asking informants about the knowledge domain of the information transmitters and their status within the community—factors typically associated with prestige—the identification of prestigious individuals was limited, primarily highlighting those specialized in medicinal plant knowledge. We suggest that future studies on prestige bias take this limitation into account and explore alternative approaches to better capture the nuances of prestige within local medical systems.

Declarations

List of abbreviations: EC: Cultural evolution; IBGE: Brazilian Institute of Geography and Statistics; TCLE: Informed consent form; GLM: Generalized linear model; IPA: Agronomic Research Institute of Pernambuco; CEP: Research Ethics Committee; SISGEN: National System for Management of Genetic Heritage and Associated Traditional Knowledge

Ethical Approval and Participant Consent: Ethical recommendations for research with human beings were met. We had approval from the Research Ethics Committee of the University of Pernambuco-UPE CAAE: 97380918.9.0000.5207. We also registered our research with the National System for Management of Genetic Heritage and Associated Traditional Knowledge-SISGEN. We use the Free and Informed Consent Form (TCLE) for people to express their consent to participate in the present work.

Consent for Publication: Not applicable.

Availability of Data and Materials: The data generated by this study are available upon request.

Competing interests: The authors declare no conflicts of interest.

Funding: Coordination for the Improvement of Higher Education Personnel (CAPES), National Institute of Science and Technology- Ethnobiology, Bioprospecting, and Nature Conservation, Foundation for the Support of Science and Technology of the State of Pernambuco (FACEPE), and the National Council for Scientific and Technological Development (CNPq).

Author Contributions: Janilo Italo Melo Dantas conducted the fieldwork, statistical analysis, and manuscript writing. André Luiz Borba do Nascimento contributed to the statistical analysis and manuscript writing. Taline Cristina da Silva contributed to the writing of the manuscript. Ulysses Paulino Albuquerque and Elcida de Lima Araújo participated in the study's conception, analysis, and manuscript writing.

Acknowledgments

We want to thank the individuals from the Lagoa do Junco Community who agreed to collaborate in collecting data for the study. The Coordination for the Improvement of Higher Education Personnel (CAPES) grants the scholarship. To the Laboratories of Ecology and Evolution of Socioecological Systems and Plant Ecology of Northeastern Ecosystems at the Federal University of Pernambuco for logistical support. To the Postgraduate Program in Ethnobiology and Nature Conservation at the Federal Rural University of Pernambuco for institutional support. To the National Institute of Science and Technology - Ethnobiology, Bioprospecting and Nature Conservation and the Foundation for Support to Science and Technology of the State of Pernambuco for financial support and to the National Council for Scientific and Technological Development (CNPq) for productivity grants in research ELA and UPA.

Literature cited

Acerbi A, Tennie C. 2016. The role of redundant information in cultural transmission and cultural stabilization. Journal of Comparative Psychology 130:62-70.

Alami AEL, Fattah A, Chait A. 2020. Medicinal plants used for the prevention purposes during the Covid-19 pandemic in Morocco. Journal of Analytical Sciences and Applied Biotechnology 2:1-8.

Albuquerque UP, Nascimento ALB, Neto EMFL 2022. Brief Introduction to Evolutionary Ethnobiology. Nupeea, Recife, Pernambuco.

Albuquerque UP, Ramos MA, Lucena RFP. 2014. Methods and techniques used to collect ethnobiological data. In: Cunha LVFC, Lucena RFP. (orgs). Methods and techniques in ethnobiology and ethnoecology. New York, NY, pp. 15-37.

Arkes HR. 1991. Costs and benefits of judgment errors: implications for debiasing. Psychological Bulletin 110:486-498.

Baravalle L. 2012. A função adaptativa da transmissão cultural. Scientia e Studia 10: 269-295.

Baldauf C, Kubo RR, Silva F, Irgang BE. 2009. “Ferveu, queimou o ser da erva”: conhecimentos de especialistas locais sobre plantas medicinais na região Sul do Brasil. Revista Brasileira de Plantas Medicinais 11:282-291.

Berl REW, Samarasingh AN, Jordan FM, Gavin MC. 2020. The Position-Reputation-Information (PRI) scale of individual prestige. Plos One 15:1-14.

Berl REW, Samarasingh AN, Roberts SG, Jordan FM, Gavin MC. 2021. Prestige and content biases together shape the cultural transmission of narratives. Evolutionary Human Sciences 3:1-22.

Benarba B, Pandiella A. 2020. Medicinal Plants as Sources of Active Molecules Against COVID-19. Frontiers in Pharmacology 11:1-16.

Bond MO, Gaoue OG. 2020. Prestige and homophily predict network structure for social learning of medicinal plant knowledge. Plos One 15:1-27.

Brito CC, Ferreira-Júnior WS, Albuquerque UP, Ramos MA, Silva TC, Costa-Neto EM, Medeiros PM. 2019. The role of kinship in knowledge about medicinal plants: evidence for context-dependent model-based biases in cultural transmission?. Acta Botanica Brasilica 33:370-375.

Cavalli-Sforza LL,Feldman MW. 1981. Cultural transmission and evolution: a quantitative approach. Princeton, Nova Jérsei, Estados Unidos.

Chudek M, Heller S, Birch S, Henrich J. 2012. Prestige-biased cultural learning: bystander's differential attention to potential models influences children's learning. Evolution and Human Behavior 33:46-56.

Corroto F, Torres OAG, Macía MJ. 2022. Understanding the Influence of Socioeconomic Variables on Medicinal Plant Knowledge in the Peruvian Andes. Plants 11:1-17.

Dantas JIM, Nascimento ALB, Silva TC, Albuquerque UP. 2020. Mutation of Cultural Information on the Use of Plant Complexes in Local Medical Systems. Evidence-Based Complementary and Alternative Medicine 4:1-11, 2020.

Dantas JIM, Nascimento ALB, Silva TC, Albuquerque UP, Araújo EL. 2024. Investigating the dynamics of cultural mutations in local medicinal plant use in NE Brazil. Ethnobotany Research and Application 28:1-14.

Dunn F. 1976. Traditional Asian medicine and cosmopolitan medicine as adaptive systems. University California Press, California.

Asian medical systems: a comparative study. University California Press, California, p.133-158,1976.

Eerkens JW, Lipo CP. 2005. Cultural transmission, copying errors, and the generation of variation in material culture and the archaeological record. Journal of Anthropological Archaeology 24:316-334.

Eyssartier C, Ladio AH, Lozada M. 2008. Cultural Transmission of Traditional Knowledge in two populations of North-western Patagonia. Journal of Ethnobiology and Ethnomedicine 4:1-8.

Henrich J, Broesch J. 2011. On the nature of cultural transmission networks: evidence from Fijian villages for adaptive learning biases. Philosophical Transactions of the Royal Society B: Biological Sciences 366:1139-1148.

Henrich J, Gil-White FJ. 2001. The evolution of prestige: freely conferred deference as a mechanism for enhancing the benefits of cultural transmission. Evolution and Human Behavior 22:165-196.

Henrich, J, Mcelreath R. 2003. The evolution of cultural evolution. Evolutionary Anthropology 12:123-135.

Hewlett BS, Cavali-Sforza LL. 1986. Cultural transmission among Aka Pygmies. American Anthropologist 88:922-934.

Horner V, Proctor D, Bonnie KE, Whiten A, Waal FBM. Prestige Affects Cultural Learning in Chimpanzees. 2010. Plos One 5:1-5.

Instituto Brasileiro de Geografia e Estatística. Censo Brasileiro de 2018. 2021. https://www.ibge.gov.br/estatisticas/sociais/populacao.html (Acesso em 27/04/2024).

Jiménez ÁV, Mesoudi A. 2019. Prestige-biased social learning: current evidence and outstanding questions. Palgrave Communications 5:1-12.

Jiménez ÁV, Mesoudi A. 2020. Prestige does not affect the cultural transmission of novel controversial arguments in an online transmission chain experiment. Journal of Cognition and Culture 20:238-261.

Jiménez AV, Mesoudi A. 2021. The cultural transmission of prestige and dominance social rank cues: an experimental simulation. Evolutionary Psychological Science 7:189-199.

Kleinman A. 1978. Concepts and a model for the comparison of medical systems as cultural systems. Social Science & Medicine. Part B: Medical Anthropology 12:85-93.

Lozada M, Ladio A, Weigandt M. 2006. Cultural transmission of ethnobotanical knowledge in a rural community of northwestern Patagonia, Argentina. Economic Botany 60: 374-385.

Maciel MRA, Neto GG. 2006. Um olhar sobre as benzedeiras de Juruena (Mato Grosso, Brasil) e as plantas usadas para benzer e curar. Boletim do Museu Paraense Emílio Goeldi, Ciências Humanas, Belém 1:61-77.

Mesoudi A. 2011. Cultural evolution: how Darwinian theory can explain human culture & sinthesize the social sciences. Chicago, Estados Unidos.

Nairne JS, Pandeirada JNS. 2008. Adaptive memory: Is survival processing special? Journal of Memory and Languag 59:377-385.

Nairne JS, Thompson SR, Pandeirada JNS. 2007. Adaptive memory: survival processing enhances retention. Journal of experimental psychology: learning, memory, and cognition 33:263-273.

Nascimento ALB, Lozano A, Melo JG, Alves RRN, Albuquerque UP. 2016. Functional aspects of the use of plants and animals in local medical systems and their implications for resilience. Journal of Ethnopharmacology 194:348-357.

Nega SS, Bekele HM, Meles GG, Nordeng H. 2019. Medicinal plants and concomitant use with pharmaceutical drugs among pregnant women. Journal of Alternative & Complementary Medicine 25: 427-434.

Oliveira ES, Nascimento ALB, Ferreira-Junior WS, Albuquerque UP. 2023. Does prestige bias influence the recall and transmission of COVID-19-related information? Protocol registration for an experimental study conducted online. Plos One 18: 1-13.

Pereira MRS, Dantas JIM, Nascimento ALB, Silva TC. 2021. Can socioeconomic factors influence the establishment of information mutation in local medical systems? A case study on the use of plant complexes. Ethnobiology and Conservation 10:1-12.

Reyes-García V, Broesch J, Calvet-Mir L, Fuentes-Peláez N, McDade WT, Parsa S, Tanner S, Huanca T, Leonard WR, Martínez-Rodríguez MR. 2009. Cultural transmission of ethnobotanical knowledge and skills: an empirical analysis from an Amerindian society. Evolution and Human Behavior 30: 274-285.

Reyes-García V, Molina JL, Broesch J, Calvet L, Huanca T, Sausc J, Tanner S, Leonard WR, McDade TW. 2008. Do the aged and knowledgeable men enjoy more prestige? A test of predictions from the prestige-bias model of cultural transmission. Evolution and Human Behavior 29:275-281.

Santoro FR, Chaves LS, Albuquerque UP. 2020. Evolutionary aspects that guide the cultural transmission pathways in a local medical system in Northeast Brazil. Heliyon 6:01-09.

Santoro FR, Ferreira-Júnior WS, Araújo TAS, Ladio AH, Albuquerque UP. 2015. Does plant species richness guarantee the resilience of local medical systems? A perspective from utilitarian redundancy. Plos One 10:1-18.

Santoro FR, Nascimento ALB, Soldati GT, Ferreira-Júnior WS, Albuquerque UP. 2018. Evolutionary ethnobiology and cultural evolution: opportunities for research and dialog. Journal of Ethnobiology and Ethnomedicine 14:1-14.

Sato A. 2012. Does socioeconomic status explain use of modern and traditional health care services. Social Science & Medicine 75:1450-1459.

Silva CF, Zank S. 2022. Entre a tradição e a modernidade: a relação entre as benzedeiras e as plantas medicinais em um centro urbano no sul do Brasil. Ethnobotany Research and Applications 23:1-12.

Soldati GT, Albuquerque UP. 2012. Ethnobotany in intermedical spaces: the case of the Fulni-ô Indians (Northeastern Brazil). Evidence-Based Complementary and Alternative Medicine 12:1-14.

Souza AL, Nascimento ALB, Silva TC. 2021. Do socioeconomic variables explain medicinal plant knowledge and the diseases they treat? A case study in the Boa Vista community, Alagoas, Northeastern Brazil. Rodriguésia 72, 1-9.

Souza BM, Albuquerque UP, Araújo EL. 2022. Easy Access to Biomedicine and Knowledge about Medicinal Plants: A Case Study in a Semiarid Region of Brazil. Evidence-Based Complementary Alternative Medicine 22:1-8.

Wegesin DJ, Jacobs DM, Zubin NR, Ventura PR, Sternm Y. 2000. Source memory and encoding strategy in normal aging. Journal of Clinical and Experimental Neuropsychology 22:455-464.

Wiryono W, Wanandi Y, Ilahi AK, Deselina D, Senoaji G, Siswahyono S. 2019. The local knowledge of the plant names and uses by semende tribe people in Kaur district, Bengkulu province, Indonesia. Biodiversitas Journal of Biological Diversity 20:754-761.

Wood LA, Kendal RL, Flynn EG. 2012. Context-dependent model-based biases in cultural transmission: children's imitation is affected by model age over model knowledge state. Evolution and Human Behavior 33: 387-394.

Supplementary Material: List of medicinal plants used by the Lagoa do Junco community. in the Municipality of Santana do Ipanema-Alagoas.

Popular name	Scientific name	Botanical Family
Aroeira	*Myracrodruon urundeuva* (M.Allemão) Engl.	Anacardiaceae
Seriguela	*Spondias purpurea L.*	Anacardiaceae
Babosa	*Aloe vera* (L.) Burm. f.	Asparagaceae
Grajaú	*Fridericia chica* (Bonpl.) L.G.Lohmann	Bignoneaceae
Umburana	*Commiphora leptophloeos* (Mart.) J.B.Gillett	Burseraceae
Rabo deRaposa	*Harrisia adscendens* (Gurke)Britton e Rose	Cactaceae
Muçambê	*Tarenaya spinosa* (Jacq.) Raf.	Cleomaceae
Pratudo	*Kalanchoe crenata* (Andrews) Haw.	Crassulaceae
Bom Nome	*Monteverdia rigida* (Mart.) Biral	Celastraceae
Melão de São Caetano	*Momordica charantia* L.	Cucurbitaceae
Pião Roxo	*Jatropha gossypiifolia* L.	Euphorbiaceae
Quebra Pedra	*Phyllanthus amarus* Schumach. & Thonn.	Euphorbiaceae
Carrapateira (Mamona)	*Ricinus communis* L.	Euphorbiaceae
Hortelã da Folha Pequena	*Mentha villosa* Huds.	Lamiaceae
Sambacaitá	*Mesosphaerum pectinatum* (L.) Kuntze	Lamiaceae
Manjericão	*Ocimum americanum* L.	Lamiaceae
Hortelã da Folha Grande	*Plectranthus amboinicus* (Lour.) Spreng.	Lamiaceae
Boldo	*Plectranthus ornatos* Codd.	Lamiaceae
Alecrim	*Rosmarinus officinalis* L.	Lamiaceae
Mororó	*Bauhinia cheilantha* (Bong.) Steud.	Fabaceae
Jatobá	*Hymenaea courbaril* L.	Fabaceae
Catingueira	*Poincianella pyramidalis* (Tul.) L.P.Queiroz	Fabaceae
Angico	*Anadenanthera colubrina* var. *cebil* (Griseb.) Altschul	Fabaceae
Tamarindo	*Tamarindus indica* L.	Fabaceae
Mulungú	*Erythrina velutina* Willd.	Fabaceae
Romã	*Punica granatum* L.	Lythraceae
Acerola	*Malpighia emarginata* Dc.	Malpighiaceae
Hibisco	*Hibiscus rosa-sinensis* L.	Malvaceae
Pitanga	*Eugenia pitanga* L.	Myrtaceae
Goiabeira	*Psidium guajava* L.	Myrtaceae
Capim Santo	*Cymbopogon citratus* (DC.)Stapf	Poaceae
Juazeiro	*Sarcomphalus joazeiro* (Mart.)	Rhamnaceae
None	Hauenschild *Morindacitrifolia* L.	Rubiaceae
Pé de Limão	*Citrus* sp.	Rutaceae
Laranjeira	*Citrus aurantium* L.	Rutaceae
Quixabeira	*Sideroxylon obtusifolium* (Roem. & Schult.) T.D.Penn	Sapotaceae
Pimenta	*Capsicum frutescens* L.	Solanaceae
Erva Cidreira	*Lippia alba* (Mill.) N.E.Br. ex Britton & P.Wilson	Verbenaceae
Testa deTouro	*Kallstroemia tribuloides* (Mart.) Steud.	Zygophyllaceae