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KNOWLEDGE ABOUT SNAKES INFLUENCE THE PREVENTION OF SNAKEBITES

OS SABERES SOBRE AS SERPENTES INFLUENCIAM NA PREVENÇÃO DOS ACIDENTES OFÍDICOS
EL CONOCIMIENTO SOBRE LAS SERPIENTES INFLUYE EN LA PREVENCIÓN DE LAS MORDEDURAS DE SERPIENTE

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ABSTRACT:
Snakes instill fear and disgust in many people due to factors such as beliefs, myths, and legends, primarily because venomous snakebites trigger severe symptoms. These negative perceptions towards snakes contribute to the extermination of these animals. This study aimed to answer whether the rural population's knowledge about snakes influences the prevention of snakebites. We used a qualitative approach, employing semi-structured interviews based on a predefined script. The interviews were recorded, transcribed, and analyzed. We interviewed residents of the rural area of Porto Nacional municipality (Tocantins state). The analysis enabled us to comprehend the residents' knowledge about snakes and how this knowledge contributes to reducing snakebite incidents.

KEYWORDS: Ethnoherpetology; Snakes; Knowledge; Countryside; Tocantins.

Introduction

The knowledge gained by rural residents from their experiences in nature helps them understand the dynamics of coexistent organisms. This coexistence enables rural residents to accumulate a broad knowledge of natural phenomena, ranging from the simplest to the most complex (Posey, 1992; Toledo & Barrera-Bassols, 2009; Vasconcelos-Neto *et al*., 2018). This knowledge is the focus of ethnoscience research, which aims to understand how different human cultures perceive, understand, and interpret the world (Begossi, 1993). Specifically, ethnoherpetological research focuses on studying the interactions between humans and reptiles and amphibians (Santos *et al*., 2012; Portillo, 2012). In this context, this study was conducted through the collaboration of various individuals who shared their perspectives on snakes, drawing from their experiences and knowledge.

To begin our examination of the knowledge rural residents have about snakes, it is important to provide some background information about reptiles. Currently, there are

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over 11,690 reptile species worldwide, 3,619 of which are snakes (Uetz, 2000; Uetz et al., 2020). The biodiversity of reptiles in Brazilian biomes is particularly impressive, making Brazil the third most species-rich country in the world. In Brazil, there are 856 reptile species, 435 of which are snakes (Guedes *et al*., 2023).

There are currently approximately 200 cataloged snake species in the Cerrado. The geomorphological and climatic characteristics of this biome create favorable environments for the proliferation of endemic snake fauna (Parr *et al*., 2014; Pellegrini *et al.,* 2016; Abreu *et al.,* 2017; Lima *et al*., 2018; Munhoz, 2022).

In this sense, encounters between humans and snakes are frequent, especially in rural areas, leading to increased interaction with these animals during field activities. Over time, rural residents gain knowledge about their environment, using nature and understanding the resources, landscapes, and ecosystems on which they rely. They learn to interact with the organisms, assigning names, classifications, and orders based on their own categories (Diegues, 2000; Alves *et al.,* 2009; Toledo & Barrera-Bassols, 2009; Pinto, 2019). From this standpoint, it is important for rural residents to understand the factors, behaviors, and features of their surrounding environment to devise strategies for managing the natural resources at their disposal. Specifically, this includes strategies for dealing with snakes (Martins *et al*., 2002; Vasconcelos-Neto *et al.,* 2018). In essence, this knowledge is ingrained within rural culture, with ancestral roots that have been transmitted orally for generations (Diegues, 2001; Drews, 2002).

Porto Nacional is a municipality located in the central region of the state of Tocantins, 63 km south of the capital, Palmas. It is accessed via the BR-010 highway (Figure 01). Porto Nacional has a territorial area of 4,434.680 km² and an estimated population of 71,101 (IBGE, 2022). The climate is typically tropical, with two well-marked seasons: rainy and dry. The wettest months are January, February, and March, whereas August is the least rainy month. The average annual temperature is 26.1 ºC (Balduino, 2019). The municipality is located on a natural site with a Cenozoic cover that stretches along both banks of the Tocantins River. In the rural area, there are complex metamorphic environments from the Archaean and Lower Proterozoic, as well as fold belts from the Middle and Upper Proterozoic of the Parnaíba Sedimentary Basin (Oliveira, 2009). The physiognomy of the region is Cerrado, characterized by predominantly open xeromorphic vegetation dominated by herbaceous plants. There are some areas of arboreal savannah without gallery forests in the east, southeast, and south, as well as park savannah in the western half of the municipality, particularly concentrated in the Serra da Cordilheira (Oliveira, 2009). Porto Nacional has an anthropogenic area of 2,165.37 km², which accounts for 48.66% of the municipality's

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total area, and a deforested area of 130.978 km² between 2016 and 2021 (DPAT, 2020). This deforestation resulted from the expansion of agricultural plantations and cultivated pastures due to the growth of agribusiness (Balduíno, 2019). Such deforestation has reduced and disturbed the natural habitats of snakes, thus increasing the risks of human-snake contact (Alcântara *et al*., 2018).

To understand the level of knowledge rural residents have about snakes, we conducted nine interviews between November 2021 and September 2022. These interviews were conducted on properties located in the eastern, western, northern, and southern portions of the municipality of Porto Nacional and its surroundings (Figure 01).

The first participant was selected by visiting the Escola Família Agrícola de Porto Nacional, located 7 km east of the municipality, on the TO-255 highway (Figure 01). We contacted the school's management to obtain permission to access information about a student indicated by the school staff, whose family lived in the rural area of the municipality. Initially, we contacted them by phone to request permission for an in-person interview.

The methodology used was the "snowball" non-probabilistic sampling technique (García-Lopez *et al*., 2017), starting with the first interviewee. For the interviews, we employed a semi-structured qualitative approach, using a script to guide the conversations. The interviews were recorded and lasted 60 minutes on average. During our in-person meetings, we explained the research objectives and obtained their consent by asking them to sign the Informed Consent Form. The interviews were conducted individually at the participants' residences. At the end of each interview, we requested recommendations for other potential participants. We sought to ensure a representative spatial distribution across the municipality. Given the extensive municipal boundaries, these recommendations often necessitated additional field visits to locate and contact other potential participants. Consequently, despite the small number of participants, data collection took several months to complete. This research was approved by the Comitê de Ética em Pesquisa (CEP) - CAAE - 45151221.6.0000.5519.

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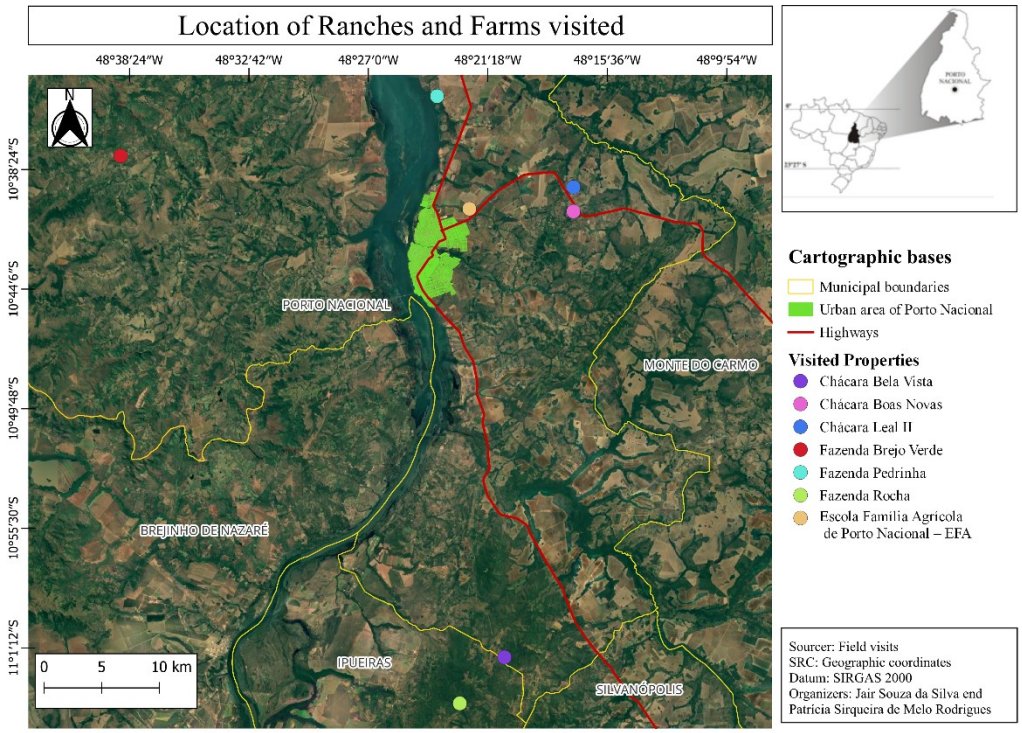
Figure 1 - Map showing the location of the Escola Família Agrícola de Porto Nacional and the farms visited for conducting the interviews



Source: Jair Souza da Silva.

The interviews were conducted using a Sony ICD-SX712 Digital Voice Recorder and transcribed using the online transcription tool Web Captioner (http://webcaptioner.online/). To ensure accuracy, the audio recordings were listened to, and any errors in the transcription were corrected. This process allowed for a better understanding of the content of the interviews, including identifying repetitions and the most important aspects of each dialog, thus taking the first step towards interpreting the data. Next, the transcripts were analyzed to identify common themes in the participants' statements. These themes were then categorized and grouped by patterns of similarity, taking into account the order of the topics in the interview script.

To guide the interviews, we started by asking the residents if they were familiar with any of the snakes that inhabited the region. We then asked them to share any encounters they had with these animals during their daily activities. All residents confirmed the existence of various snake species on their properties. They mentioned the snakes' common names and occasionally provided detailed descriptions. In this manner, the residents shared information on snake species that inhabit the area, whether they are venomous or non-venomous, their habitats, period when snakes are most frequently seen, their dietary preferences, measures taken to prevent snakebites, reactions to the

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presence of snakes, and the use of medicinal plants to treat snake envenomations. All this information was based on their daily experiences, customs, knowledge and beliefs.

We identified seven subject groups that residents addressed during the interviews: (1) knowledge of the diversity of local snake species; (2) knowledge of snake habits and diet; (3) Knowledge of snake habitats, shelters, and the periods when they are most commonly seen; (4) knowledge of the difference between venomous and nonvenomous snakes; (5) experiences in preventing snakebites; (6) reactions upon encountering snakes; and (7) knowledge of medicinal plants used for treating snakebites, including quantity and preparation methods.

Knowledge of the diversity of local snake species

When we asked the residents which snake species they had encountered in their properties, workplaces, and rural areas, it became evident that they coexist with various snake species. Their awareness of the diversity of local snake species is reflected in the following statements:

> *“It's the jararaca, it's the papa pinto [...] there's a little green one that people call cipó, and there's a gray one, there's that flat jararaca, and there's the rattlesnake, there's several kinds of snakes that we find. Because this one, [...] what do you call it? [...] coral, there are different kinds, right, different colors. There are black ones with red, there'are white ones with black and red [...] and there's the angry one called the rattlesnake, the one with the rattle" MPG/Fazenda Brejo Verde.*

> *“Yeah, there are various types of snake here, right [...]. The most venomous snake we have here is the rattlesnake, right, and the malha. We always come across them [...], I've seen some big ones out there" DLS/Chácara Bela Vista.*

The snakes in Brazil are commonly referred to as "*cobras*" by the locals. This term was brought to the country by the Portuguese to refer to African and Asian species of the genus *Naja*, but it is now widespread in Brazil (Freitas, 2003; Oliveira *et al*., 2022).

Residents listed several snake species, mentioning their common names and coloration patterns. They specifically emphasized the species they consider venomous, such as the rattlesnake (*Crotalus durissus*) and the "*malha*", also known as "*jararaca*". The "*malha*" refers to *Bothrops moojeni*, which is the main responsible for snakebites in the study region (Silva, 2017; Queirós, 2020; Rodrigues *et al*., 2023).

The snakes identified by residents as "corals", which they reported exhibit various patterns of colorations, have an evolutionary adaptation called mimicry. This means they imitate the pattern of a model, which can provide advantages in terms of defense,

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reproduction, or predation (Nascimento, 2010; Almeida, 2012). One example of this phenomenon is the genus *Oxyrhopus* found in this region, which mimics the genus *Micrurus* (Melgarejo *et al*., 2016; Silva, 2017).

The following statements also describe the number of snakes that occasionally appear in backyards or nearby areas:

> *"Too dangerous here. When I first came here, it was a bit of a wild desert, this was a hell of a snake place [...]" RPS/Fazenda Brejo Verde.*
>
> *"[...] and there's also the rattlesnake malha, there's a lot of malha here, so I think that in the time I've been here we've seen about 5 or 6 malhas of various sizes" CRS/Fazenda Rocha.*
>
> *"I lived there for four years in a little shack [...] Look, lady, two or three snakes would appear at night. During the day we didn't even count them [...] And then my sister, there was a storm of snakes, all kinds of snakes. Then there was the coral snake, the black and yellow striped one, and there was the babies like that, you know? And those other ones, Mr. Zé, how come [...]?" LG/Chácara Leal II.*
>
> *"[...] There's the 'malhinha rabo de osso'. [...] The point was that, at the time we lived in the straw hut, it was a rainy year, like last November. [...] And when it got wet [...] they climbed up onto the straw, dry place, right" JMCS /Chácara Leal II.*

The resident of Chácara Leal II reported an increase in snake presence in the surrounding area during a rainy November. This increase coincides with the breeding season for certain species, such as *Bothrops* (Queirós, 2020), *Micrurus* (Marques et al., 2013), *Crotalus* (Salomão *et al*., 1995; Almeida *et al.,* 2004), and *Oxyrhopus* (false coral snakes) (Mendonça *et al*., 2023). The higher rainfall during this time (which marks the onset of the rainy season) leads to an increase in prey availability. The substantial increase in the amphibian population during these months coincides with the birth/hatching season of snakes (Martins & Oliveira, 1995; Silva, 2017). Moreover, due to the excessively rainy period, some individual snakes seek drier sites, including inside houses, thus raising the probability of contact with humans (Martins & Oliveira, 1995; Alcântara et al., 2018; Rodrigues *et al*., 2020).

The snake known as "*malhadinha rabo de osso*" by residents also belongs to the genus *Bothrops*. In immature individuals of this genus, the color of the tail tip is commonly distinct from the body, resembling an insect larva. This functions as a feeding strategy to attract prey, called caudal luring. When hunting, these snakes move their tails sinuously. As they mature, snakes lose this distinct tail coloration and adopt new feeding habits and hunting strategies (Sazima, 1992; Hartmann *et al*., 2003; Gonzalez *et al*., 2020; Munhoz *et al*., 2022).

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Knowledge of snake habits and diet

Residents also showed their knowledge of the habits and food preferences of snakes, as evident in the following statements:

> *“[...] it's more in the clean, this jararaquinha likes this period of sun like this ohh (the period of the interview was late afternoon), she likes to stay like this, sometimes she passes right there oh, when it's faith, sometimes she comes and stays very close to us, she's the color of the ground, right [...] she curls up in any small place" RPS/Fazenda Brejo Verde.*
>
> *“Yeah [...] animals to eat, she catches everything, it's jia, it's frogs, it's everything" MPG/Fazenda Brejo Verde.*
>
> *"And they usually appear in the morning or late afternoon, which is the coldest time they are moving" IRS/Fazenda Rocha.*
>
> *“Ahhh the ‘malha’ usually feeds on insects, right, small insects, crickets, mice, frogs" IRS/Fazenda Rocha.*
>
> *"The rattlesnake and the ‘malha’, at this time of year, they're crazy about walking (February/22), because until then the rattlesnake eats the blooming grass, right, when it's coming out [...]. Especially when they're grazing, they like it. When it's hungry, it eats the blooming grass, that blade that comes out soft [...]. Another thing, rice fields, she eats the green rice. So when the bunch is coming out and she's getting that little milk from the rice, she eats it." DLS/Chácara Bela Vista.*
>
> *“May is grass seed! It's too dangerous in grass seed., boy So, around eight to nine o'clock it is their time to hunt for things, you know, to feed, you know, rattlesnakes are one, the proper time is six to nine o'clock." RPS/Fazenda Brejo Verde.*

Residents shared information on when they were most likely to encounter active snakes, as well as details about their diet. Both pieces of information align with the existing literature (Bernarde, 2017; Carbajal-Márquez *et al.*, 2022). One intriguing fact they mentioned was that rattlesnakes feed on green rice and the seeds of grass, an unknown behavior for the species. Rattlesnakes are unequivocally carnivorous animals that feed on endothermic prey (Hoyos & Almeida-Santos, 2016). Therefore, the resident accounts are probably a misinterpretation, and those rattlesnakes were likely searching for prey that use this habitat.

The statement below shows a resident understanding of snake feeding and the food chain:

> *"It's [...] one eating the other [...]. Every little animal you see, one is already more than the other, one already swallows the other" MPG/Fazenda Brejo Verde.*

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This account highlights the resident's strong connection to the environment, demonstrating the knowledge she gained from her daily observations of the local wildlife (Diegues, 1996; Posey, 1992; Toledo & Barrera-Bassols, 2009; Vasconcelos-Neto *et al.,* 2018).

Knowledge of snake habitats, shelters, and the periods when they are most commonly seen

The participant properties are located in different areas of Porto Nacional, resulting in variations in topography, lithology, phytophysiognomies, and land uses, including farming and grazing. This is apparent in the following statements, especially when the participants mention the rattlesnake and the "*malha*":

> *“[...] people say that they [rattlesnakes] live more in mountain places, right, on hills, places with rocks, under a rock or something [...]. The jararaca is from down here" MPG/Fazenda Brejo Verde.*
>
> *“[...] where there are those old stones, those old flagstones that we're picking pequi, you can stay alert in those pequi trees that have those stones, those old stones, that gravel place, every rattlesnake I've ever seen here, I've never seen it in a low place, only in these high ones like this." EMC/Chácara Boas Novas.*
>
> *“[...] there's also the rattlesnake malha, there's a lot of malha here. So, it's these snakes that appear the most, there's the rattlesnake because of the rocky area, right, full of rocks, there are rattlesnakes here too" IRS/Fazenda Rocha.*
>
> *“It [jararaca] likes buriti. It gets under the buriti tree and stays there. Then sometimes you go unnoticed, sometimes you pass under the capemba and it's curled up inside" RPS/Fazenda Brejo Verde.*
>
> *“May is grass seed time! In the grass seed time is too dangerous boy So, on the basis of eight to nine hours is the time of them hunting thing right, feed right, rattlesnake itself is one, the proper time is 6 hours and 9 hours " RPS/Fazenda Brejo Verde.*
>
> *“At the end of the rains, when the grass is coming into bloom, that's the time when they [rattlesnakes and malha] walk the most" DLS/Chácara Bela Vista.*

Residents shared information about the habitat of two important venomous snake species, the "*malha*" (also called jararaca) and the rattlesnake. Their observations support existing literature showing that jararacas are mostly found in lower areas of the forest (Borges & Araújo, 1998; Nogueira *et al*., 2003; Queirós, 2020), whereas rattlesnakes are mostly found in higher and rocky areas, that is, in dry environments with open vegetation and a high incidence of sunlight (Campbell & Lamar, 2004).

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The report by the resident of Chácara Bela Vista is consistent with the literature, which indicates that snakes are more active in May. This period coincides with the birth of young, which occurs from March to May for several species (Almeida-Santos & Orsi, 2002; Bernarde, 2014; Queirós, 2020).

Knowledge of the difference between venomous and nonvenomous snakes

Residents shared information that is in line with the literature on the presence of the pit organ in venomous snakes as a way of identifying whether a snake is venomous. This can be noted in the following statements:

> *“[...] I look at the head. My dad said, 'Look, if you see four vents, it's venomous. If there are only two, it's not venomous. [...] the two noses and there are two more openings on top that look like a nose too. Then it's called a four-vented snake. Every snake if you see two vents and two vents imitating a venta in the same place plus a little bit on top like that is poisonous." CRS/Fazenda Pedrinha.*

> *“[...] then when I see that I think it's a flattener, I look at their faces to see if they have a nasal pit [...] that thing they have below the eye, looking like another eye without being one" EMC/Chácara Boas Novas.*

Observing the presence of a pit organ is important for residents to decide whether to kill the animal. Residents reported that when they identify nonvenomous snakes, they opt to release them, thus contributing to the preservation of nonvenomous species (Campbell & Lamar, 2004; Fita *et al*., 2010).

One resident mentioned that he determines if a snake is venomous by looking at the shape of its head, as can be seen in the following statement:

> *"Those with round heads have no venom” CRS/Faz Pedrinha.*

The body shape in snakes is not necessarily related to the presence of venom. Instead, it is determined by morphological or behavioral factors (Cosendey and Salomão, 2016).

Another resident mentioned the rattlesnake rattle at the end of the tail:

> *"And there's the big angry one called the rattlesnake, right, the one with the rattle" MPG/Faz. Brejo Verde.*

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This striking feature of the rattlesnake is a bony callus at the end of the tail, which consists of hollow keratinized rings that accumulate with each skin shed. These rings are interconnected, forming a rattle that emits a rattling sound when the snake feels threatened. Additionally, it serves to alert its presence (Alves, 2009; Brandão *et al*., 2019).

The other interviewed residents mentioned no specific characteristic for distinguishing between venomous and nonvenomous snakes.

Reactions upon encountering snakes

When asked about their response to encountering a snake, the residents provided the following answers:

> *“[...] it's letting the little critter go, but there are some that are already trying to get to the living person, right" MPG/Fazenda Brejo Verde.*
>
> *"[...] go, go away. Not when it's an angry one, we have to take it away" RPS/Fazenda Brejo Verde.*
>
> *“[...] but in the rural area there's no way, because she can offend an animal or even another person passing by" DLS/Chácara Bela Vista.*
>
> *“[...] I look at the snake, if it's venomous I usually kill it too, because if it doesn't hurt me, it could hurt something else, right, an animal of mine, coming here to the house. It's always around here, I always do that, I kill it" CRS/Fazenda Pedrinha.*

In general, snakes have a negative reputation among people. The limited knowledge about these reptiles, combined with fear, leads to the killing and consequently decline in the population of both venomous and nonvenomous snakes. This is because snakes are widely regarded as dangerous, without distinguishing between species (Cosendey & Salomão, 2016; Pandey *et al*., 2016; Batista & Volpi, 2020; Moreira *et al*., 2022).

Based on the resident responses regarding their reactions when encountering a venomous snake, it is evident that they do not show exacerbated fear or disgust. Instead, they stated that they kill the snake because of the recognized risk it poses and its potential to harm people or livestock. This finding highlights the importance of acquiring the necessary knowledge and skills to handle snakes safely to return them to the wild without resorting to extermination (Freitas *et al.,* 2020; Batista & Volpi, 2020).

Experiences in preventing snakebites

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Importantly, the residents reported not having suffered any injuries from snakes throughout their lives while working in the field. This is because they always wear boots, pants, and other protective equipment when they go to work, as can be noted in the following statements:

> *"When I walk, I walk with very thick pants, very loose, with boots and socks, sometimes I use gaiters, right" RPS/Fazenda Brejo Verde.*
>
> *"[...] it's because there's PPEs[1], there's safety boots, there's gaiters, there's gloves too, the people who work" IRS/Fazenda Rocha.*
>
> *"[...] it's boots, rubber boots, pants, a long-sleeved shirt [...] You have to be prepared to go to places like this" CRS/Fazenda Pedrinha.*

Regarding snakebite prevention, we observed from the resident statements, particularly the men, that they always wear thick pants to work and some safety equipment, such as boots and gaiters during field activities. These practices align with the recommendations of health agencies and specialized literature (Feitosa et al., 1997, Marques *et al*., 2004; Bernarde, 2014; Silva, 2017; Silva *et al*., 2019; Queirós, 2020 & Rodrigues *et al*., 2023). Residents also reported frequent sightings of snakes on their properties. Despite this, they mentioned that injuries to people have rarely occurred due to their constant vigilance in the potential sites where snakes may hide or their familiarity with their habitats. However, they said that there are many snakebites involving farm animals, especially cattle. This can be seen in the following statements:

> *"It's [...]accident only with animals, they always like to bite animals. This very year one of our cattle was bitten by it, [...] by a snake, right [...]" MPG/Fazenda Brejo Verde.*
>
> *"And then I had some cattle there, and this woman was going to get water up there at the fountain, it is a flagstone there. I had some remanga[2] of oxen, and then the snakes were killing the cattle there." RPS/Fazenda Brejo Verde.*
>
> *"[...] not here in the region. Only animals that were already killed. The neighbor right here last year lost two oxen and two heifers to snakebites. He lost two oxen in less than a month" IRS/Fazenda Rocha.*

One resident also commented on the matter:

[1] Personal protective equipment.
[2] This structure serves to accommodate the animals and is mainly used to connect breeding and handling areas in the corral.

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> *"[...] when the buriti tree starts to fall, you know what I do? I put on rubber boots, I even have my own boots here" [...] EMC/Chácara Boas Novas.*

Most of the women interviewed are not heavily involved in field activities, and due to dress codes, they often wear less protective gear, which leaves them more exposed. One female resident mentioned wearing boots, but she did not make it clear whether other protective accessories, such as pants and leggings, are also used.

Knowledge of medicinal plants used for treating snakebites, including quantity and preparation methods

When asked about home remedies they prepare to treat snakebites, most of the participants mentioned *buriti* oil. They reported ingesting the oil and always keeping some stored for this purpose, as illustrated in the following statements:

> *"[...] people drink buriti oil. Because they say that buriti oil comes out of the cesura[3] , right. A spoon. Grab a spoonful and drink it. That's it. I think you can take it twice a day, right? Two or three because that doesn't kill anyone" MPG/Fazenda Brejo Verde.*
>
> *"The medicine is just buriti oil [...] that other one, the imburuçu shavings. Imburuçu is a wood that gives embira, right [...]. Drink the buriti, and then it comes out in the cesura" RPS/Fazenda Brejo Verde.*
>
> *"[...] you cut it [imburuçu], it gives a little stick, then you take it and peel it, right, fold it and crack the bark and the embira comes out, right, but you cut it whole from the stem [...] that drool comes out and you pass it on." RPS/Faz Brejo Verde.*
>
> *"Drinking buriti oil is going to come out down there in the cesura" LG/Chácara Leal II.*
>
> *"People talk a lot about buriti oil, they say it's very good. It's the only medicine I've seen people talk about" IRS/Fazenda Rocha.*
>
> *"From the bush Iheard of buriti oil f, right, they say it's very good. You can drink buriti oil in your coffee, right, in your tea, something, half a spoonful, right. They say it combats the venom" DLS/Chácara Bela Vista.*
>
> *"To drink [the buriti], and if you know where [the bite] was you can spread over it" EMC/Chácara Boas Novas.*

One resident mentioned using another plant, "*imburuçu*", to treat snakebites. He reported applying the substance obtained from the bark of this plant to the site of the bite.

[3] According to the Portuguese dictionary, it means a scar from an incision or bite.

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Regarding *buriti* oil, residents recommended consuming half to one tablespoon of the oil twice a day and using it topically on the site of the bite. This practice is in line with the recommendations provided in other articles (Sampaio, 2011; Martins *et al*., 2012; Carrazza *et al*., 2012; Ribeiro *et al*., 2014; Amorim *et al*., 2018; Carvalho & Santos, 2020).

Preparation of *buriti* oil

The following is an account of how buriti oil is prepared, as described by two female residents. They provided the information about the process of extracting the oil, indicating that this is an exclusively female task:

> *"[...] yeah, to make the oil, you take it and put it in a bowl in the sun, like a bucket, in something, and then the oil rises, right. Then you put it on the fire to finish purifying it, because there's a little bit of water in it, right, so it has to be well preserved to last, right" [MPG/Fazenda Brejo Verde.*

> *"[...] I bring Buriti from the swamp. When I get home I put it in a basin, then I wash it, throw it in, don't you have those sieves to strain the dirt? I put it there to drain off the water and any dirt. Then I put it in a covered bucket and leave it there. I let it soak to soften it up. Then, when I see that it's soft, it softens overnight, so if I put it in today, it's soft tomorrow. So what do I do, I take some of that water it's softened in and I hit it in the bucket with the bottle, I hit it, I hit it, I hit it with the bottle and when I see that it's released all that pulp, that thick water, then I use that sieve again, a mason's sieve, right, then I keep the sieve just for that. Then I put it in a basin, strain it, remove all the husks, all the lumps, and then I take that thick liquid to the fire. Then I don't have that thing to take it off, it foams up and I take it off... people say they take it off. No. I leave it there on the fire and as it boils, I pour water in it, I add a lot of water, you know. If I see that it's thick, if it gets too thick, it'll stick to the pot, then you add a lot of water so that it doesn't get too thick right. When it boils like this in the morning, almost until noon, it's boiling there, I put it in the shed because of the wind, so as not to drop any debris in it. When it's the afternoon, you put the lid on, pull the fire up, put the lid on top of the pot, so as not to get any dirt on it at night. Then you go and cover it. When you take the lid off in the morning, the oil is already ready up there. It rises, it rises all the way up. Then you see that most beautiful thing, I think it's so beautiful, then you come with a spoon, with a ladle, a big spoon, then you scoop it there and put it in another small bowl, you scoop it there, then there is that clean water , the pulp is underneath, right the water is clean, you get all the oil out. When you take it out there, there's no way you won't get a little bit of water, right. Then what you are going to get?,you're going to get a bowl, preferably an enameled pot. I even have an enameled pan here. Because to prevent you from scraping aluminum. Because if you put your spoon in an aluminum pan, you're going to get something out of it, right. So an enameled pan, preferably. Then you put it on, then you put it on to finish simmering on the fire, on the gas fire, right, on the stove, a little bit, then you put it there. Then when you see, you know, when iit's sizzling [...]. Then you see it stop sizzling, then you take a spoon like the one you're stirring with, then you pull out the pan and drip a little drop on top of the flame, right, if it doesn't sizzle at all, you've dripped it there, it caught fire,*

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that's the point for you to take it out so it doesn't burn, so it doesn't get sour" EMC/Chácara Boas Novas.

Residents reported that buriti oil is traditionally used to treat snakebites, corroborating reports from several other communities that use medicinal plants to treat people bitten by snakes (Carrazza *et al*., 2012; Silva *et al*., 2010; Barros *et al*., 2015; Amorim *et al*., 2018; Trevisan *et al.,* 2021). In view of this, several studies have demonstrated the efficacy of plant extracts, including *buriti*, in the complementary treatment of snake envenomations. These extracts help reduce the activity of toxins (Fernandes, 2011; Rodrigues, 2020; Trevisan *et al*., 2022; Rodrigues *et al*., 2023).

The two residents have different methods of extracting and preparing the oil from the plant. The first resident places the peeled fruit in a bucket of water under the sun, and only after collecting the oil from the surface of the water, she puts it on the fire. The second resident peels the fruit, removes the pulp, and puts the mass on the fire to refine the oil. This second method is consistent with the traditional extraction method described by Carrazza *et al*. (2012).

Concluding remarks

This study made it possible to analyze and understand the knowledge that the residents of the rural area of Porto Nacional municipality and its surroundings have about snakes. From the interviews, we gathered valuable information about the snake species found in the region, based on the daily experiences, customs, knowledge, and beliefs that rural people have accumulated over the years about the environment in which they live. These individuals have learned to manage the fauna and flora resources in their vicinity.

We found that the residents have extensive knowledge of the ecological and behavioral aspects of snakes in their natural habitats. This includes identifying characteristics that differentiate venomous from nonvenomous snakes, their preferred habitats, peaks of activity periods, dietary preferences, preventive measures against snakebites, appropriate attitudes to take in the presence of snakes, as well as knowledge of medicinal plants and their use in case of a snakebite. The knowledge acquired from living in rural areas enables rural residents to develop effective strategies for dealing with snakes. These strategies enhance safety during rural activities and minimize the risk of harm.

Another important point to highlight is the reports on the use of *buriti* oil, extracted from the pulp of the fruit of the palm tree *Mauritia flexuosa* L. f., to alleviate the effects of

venomous snakebites. This draws attention to the need for more specific scientific research on this oil, focused on evaluating its efficacy as a therapeutic resource for this type of injury, and on validating and strengthening the traditional knowledge of these populations.

This knowledge can serve as a foundation for future research on human-snake interactions, contributing to the conservation of the local herpetofauna and the balance of the surrounding environment. Additionally, this knowledge could be valuable for researching the use of buriti oil in cases of injuries caused by venomous snakes, as well as for environmental education initiatives, the development of strategies to prevent snakebite accidents, and the conservation of these animals.

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References

Abreu, R. C. R., Hoffmann, W. A., Vasconcelos, H. L., Pilon, N. A., Rossatto, D. R., & Durigan, G. (2017). The biodiversity cost of carbon sequestration in tropical savanna. *Science Advances*, *3*(8), e1701284.

Alcântara, J. A., Bernarde, P. S., Sachett, J., Silva, A. M., Valente, S. F., Peixoto, H. M., Lacerda, M., Oliveira, M. R., Saraiva, I., Sampaio, V. de S., & Monteiro, W. M. (2018). Stepping into a dangerous quagmire: Macroecological determinants of Bothrops envenomings,Brazilian Amazon. *PloS One*, *13*(12), e0208532.

Almeida, P. C. R. (2012). *Morfologia e taxonomia de Atractus latifrons (Günther, 1868) (Serpentes: Dipsadidae) e seu relacionamento mimético com corais verdadeiras na Amazônia*. 2012. Dissertação de Mestrado, Universidade Federal do Pará], Repositório Museu Emilio Goeldi.

Almeida-Santos, S. M., Laporta-Ferreira, I. L., Antoniazzi, M. M., & Jared, C. (2004). Sperm storage in males of the snake Crotalus durissus terrificus (Crotalinae: Viperidae) In southeastern Brazil. Comparative Biochemistry and Physiology. *Part A, Molecular & Integrative Physiology,* 139(2), 169–174.

Almeida-Santos, S. M. & Orsi, A. M. (2002). Ciclo reprodutivo de Crotalus durissus e Bothrops jararaca (Serpentes Viperidae): morfologia e função dos ovidutos. *Rev. Bras. Reprod. Anim*, 26(2), 09-112.

Alves, R. R. N. (2009). Fauna used in popular medicine in Northeast Brazil. *Journal of Ethnobiology and Ethnomedicine*, *5*(1), 1.

Amorim, W. R. de, Sousa, C. P. de, Martins, G. N., Melo, E. S. de, Silva, I. C. R. da, Corrêa, P. G. do N., Santos, A. R. S. S., Carvalho, S. M. R. de, Pinheiro, R. E. E., & Oliveira, J. M. G. de. (2018). Estudo etnoveterinário de plantas medicinais utilizadas em animais da microrregião do Alto Médio Gurguéia – Piauí. *PubVet*, *12*(10), 1–5.

Balduíno, A. R. (2019). *Análise dos impactos da* agricultura na qualidade da água do reservatório de abastecimento de água no *município de Porto Nacional-Tocantins*.

[Tese de Doutorado, Universidade Federal do Tocantins]. Repositório da Universidade Federal do Tocantins.

Barros, E. M. L., Lira, S. R. de S., Lemos, S. I. A., Barros, T. L. e., & Rizo, M. D. S. (2015). Estudo do creme de buriti (Mauritia flexuosa L.) no processo de cicatrização. *ConScientiae Saúde*, *13*(4), 503–610.

Batista, T. R., & Volpi, A. (2020). Comparação de saberes etnoherpetológicos entre alunos de escola rural e urbana. *Revista Ifes Ciência*, *6*(4), 201–214.

Begossi, A. (1993). Ecologia humana: um enfoque das relações homem-ambiente. *Interciência*, *18*(3), 121-132.

Bernarde, P. S. (2017). Classificação e biologia das Serpentes. In Bernarde, P. S., Turci, L. C. B., & Machado, R. A. (Eds.). *Serpentes do Alto Juruá, Acre-Amazônia Brasileira*. EDUFAC.

Bernarde, P. S. (2014). *Serpentes peçonhentas e acidentes ofídicos no Brasil*. Anolis books.

Bérnils, R. S. & Costa, H. C. (2010). Brazilian reptiles–List of species. *Sociedade Brasileira de Herpetologia*.

Borges, R. C., & Araujo, A. F. B. (1998). Seleção de hábitat em duas espécies de jararaca (Bothrops moojeni Hoge e B. neuwiedi Wagler) (Serpentes, Viperidae). *Revista Brasileira de Biologia*, *58*(4), 591–601.

Brandão, M. F. T., Maciel, L. R., Neves, N. S. N., Carvalho, C. L., & Taques, R. M. (2019). Índice de acidentes ofídicos em Mato Grosso e principais aspectos clínicos dos casos nos anos de 2018 a 2019. In Freitas, G. B. L. *Trauma e Emergência*. Pasteur.

Campbell, J. A., & Lamar, W. W. (2004). *The venomous reptiles of Latin America*. Comstock Editions.

Carbajal-Márquez, R. A., Sigala-Rodríguez, J. J., Hidalgo-García, J. A., Ayala-Rodríguez, J. J., & Cedeño-Vázquez, J. R. (2022). Natural History and Morphology of Crotalus ehecatl (Serpentes: Viperidae). *Diversity*, *14*(4), 242.

Carrazza, L. R., Cruz, J. C., & Silva, M. L. (2012). *Manual tecnológico de aproveitamento integral do fruto e da folha do Babaçu* (2nd ed.). Instituto Sociedade, População e Natureza.

Carvalho, R. S., & Santos, T. T. (2020). Propriedades químicas, medicinais e nutricionais do Buriti (Mauritia flexuosa L.) e de seus derivados. *DESAFIOS-Revista Interdisciplinar Da Universidade Federal Do Tocantins*, *7*(3), 56-70.

Cerrado, D. P. A. T. (2020). *Cerrado Deforestation Polygon Assessment Tool*.

Cosendey, B. N., & Salomão, S. R. (2016). Visões sobre as serpentes: répteis ou monstros. *IX Encontro Nacional de Pesquisa em Educação em Ciência.* Águas de Lindóia, 1-8.

Costa, H. C., Guedes, T. B. & Bérnils, R. S. (2021). Lista de répteis do Brasil: padrões e tendências. *Herpetologia Brasileira*, *10(3)*, 110-279.

Diegues, A. C. (2000). *Os saberes tradicionais e a biodiversidade no Brasil.* NUPAUB-USP, PROBIO-MMA, CNPq.

Diegues, A. C. (2001). *O mito moderno da natureza intocada*. Hucitec.

Drews, C. (2002). Attitudes, knowledge and wild animals as pets in Costa Rica. *Anthrozoos*, *15*(2), 119–138.

Feitosa, R. F. G., Melo, I. M. L. A., & Monteiro, H. S. A. (1997). Epidemiologia dos acidentes por serpentes peçonhentas no Estado do Ceará - Brasil. *Revista Da Sociedade Brasileira de Medicina Tropical*, *30*(4), 295–301.

Fernandes, R. S. (2011). *Avaliação da atividade antiofídica do extrato de Serjania erecta Radlk in natura e in vitro: isolamento e caracterização estrutural de compostos bioativos*. [Tese de Doutorado, Universidade de São Paulo], Biblioteca Digital de Teses e Dissertações da Universidade de São Paulo.

Fita, D. S., Neto, E. C. M., & Schiavetti, A. (2010). 'Offensive'snakes: cultural beliefs and practices related to snakebites in a Brazilian rural settlement. *Journal of ethnobiology and ethnomedicine*, *6*, 1-13.

Freitas, D. C. de, Gomes, W. P. B. de S., Silva, R. C. C. da, & Seibert, C. S. (2020). Serpentes: é possível conviver com elas? *Revista Brasileira de Ecoturismo (RBEcotur)*, *13*(3).

Freitas, M. A. (2003). *Serpentes brasileiras*. EditoraLauro de Freitas.

García-López, R., Villegas, A., Pacheco-Coronel, N., & Gómez-Álvarez, G. (2017). Traditional use and perception of snakes by the Nahuas from Cuetzalan del Progreso, Puebla, Mexico. *Journal of Ethnobiology and Ethnomedicine*, *13*(1), 6.

Gonzalez, R. C., Abegg, A. D., de Mello Mendes, D. M., da Silva, M. B., Machado-Filho, P. R., Mario-da-Rosa, C., ... & Oliveira10, J. C. (2020). Lista dos Nomes Populares dos Répteis no Brasil–Primeira Versão. *Herpetologia Brasileira*, *9*(2), 121-214.

Hartmann, P. A., Hartmann, M. T., & Giasson, L. O. M. (2003). Uso do hábitat e alimentação em juvenis de Bothrops jararaca (Serpentes, Viperidae) na Mata Atlântica do sudeste do Brasil. *Phyllomedusa*, *2*(1), 35-41.

Hoyos, M. A., & Almeida-Santos, S. M. (2016). The South-American rattlesnake Crotalus durissus: feeding ecology in the central region of Brazil. *Biota Neotropica*, *16*(3).

Instituto Brasileiro de Geografia e Estatística (2023). *Prévia da População dos Municípios com base nos dados do Censo Demográfico de 2022 coletados até o dia 25/12/2022*.https://ftp.ibge.gov.br/Censos/Censo_Demografico_2022/Previa_da_Populacao/POP2022_Municipios.pdf

Lima, N. E. de, Carvalho, A. A., Lima-Ribeiro, M. S., & Manfrin, M. H. (2018). Caracterização e história biogeográfica dos ecossistemas secos neotropicais. *Rodriguésia*, *69*(4), 2209–2222.

Marques, O. A. V., Eterovic, A., & Sazima, I. (2004). Snakes of the Brazilian Atlantic Forest: an illustrated field guide for the Serra do Mar range. In *Snakes of the Brazilian Atlantic Forest:* an illustrated field guide for the Serra do Mar range (pp. 205-p).

Marques, O. A. V., Pizzatto L., Santos S. M. A. (2013). Reproductive Strategies of New World Coral Snakes, Genus Micrurus. *Herpetologica*, *69*(1), 58–66.

Martins, M. & Oliveira, M. E. (1995). Biologia e Identificação de Serpentes. In Santos, M. C., Martins, M., Boechat, A. L., Sá-Neto, R. P., & Oliveira, M. E. *Serpentes de Interesse Médico da Amazônia*. UA/SESU.

Martins, M. A. R. C. I. O., Marques, O. A., & Sazima, I. V. A. N. (2002). Ecological and phylogenetic correlates of feeding habits in Neotropical pitvipers of the genus Bothrops. *Biology of the Vipers*, *307*, 328.

Martins, R. C., Filgueiras, T. S., & de Albuquerque, U. P. (2012). Ethnobotany of Mauritia flexuosa (Arecaceae) in a Maroon Community in Central Brazil. *Economic Botany*, *66*(1), 91–98.

Melgarejo, A. R., Puorto, G., Buononato, M. A., & Silva Jr, N. J. (2016). Cobras corais de interesse médico no Brasil. In Silva, N. Jr. (Ed.) *As cobras-corais do Brasil: biologia, taxonomia, venenos e envenenamentos*. Editora da Pontifícia Universidade Católica de Goiás (PUC-Goiás), Goiânia, 331-345.

Mendonça, L. R. Dias, M. A. P., Lucas, D. D., Figueiredo, C. V. P., Matta, S. L. P. & Feio, R. N. Insights on the reproductive biology of Oxyrhopus petolarius(Linnaeus, 1758) (Dipsadidae: Pseudoboini) from Southeastern Brazil. *Cuadernos de Herpetologia*, *38*(1). 10.31017/CdH. 2024. (2023-030).

Moreira, M. P., Souza, D. F., & Angelo, E. A. (2020). Conhecimento etnobiológico de uma comunidade rural como fonte de informação para material informativo-educativo. *Ethnoscientia-Brazilian Journal of Ethnobiology and Ethnoecology*, *5*(1).

Munhoz J. L. D., Bianchini, M., & Nacib K. K. (2022). História Natural da Jararaca, Bothrops jararaca: uma revisão bibliográfica. *Ciências Biológicas*.

Nascimento, E. A. do. (2010). *Estudos do mimetismo em Lycidae* (Insecta: Coleoptera) [Tese de Doutorado, Universidade de São Paulo]. Repositório da Produção USP.

Nogueira, C., Sawaya, R. J., & Martins, M. (2003). Ecology of the pitviper, *Bothrops moojeni*, in the Brazilian Cerrado. *Journal of Herpetology*, *37*(4), 653-659.

Oliveira, F. L. G., Lunguinho Leite, R., & Freire Pinto, M. (2022). Conhecimentos e percepções dos estudantes do ensino médio sobre serpentes. *Revista Electrónica de Enseñanza de las Ciencias*, *21*(2).

Oliveira, S. S. (2009). *Porto Nacional: De Porto Real a Espaço Periférico de Palmas (TO).* [Dissertação de Mestrado, Universidade Federal de Goiás], Biblioteca Digital Brasileira de Teses e Dissertações.

Pandey, D. P., Pandey, S. G., Devkota, K., & Goode, M. (2016). Public perceptions of snakes and snakebite management: implications for conservation and human health in southern Nepal. *Journal of Ethnobiology and Ethnomedicine*, *12*(1), 22.

Parr, C. L., Lehmann, C. E. R., Bond, W. J., Hoffmann, W. A., & Andersen, A. N. (2014). Tropical grassy biomes: misunderstood, neglected, and under threat. *Trends in Ecology & Evolution*, *29*(4), 205–213.

Pellegrini, A. F. A., Socolar, J. B., Elsen, P. R., & Giam, X. (2016). Trade-offs between savanna woody plant diversity and carbon storage in the Brazilian Cerrado. *Global Change Biology*, *22*(10), 3373–3382.

Pinto, A. L. A., Sousa, F. J. F. de, & Moura Rufino, M. do S. (2019). Conhecimento etnobotânico dos Tremembé da Barra do Mundaú sobre as frutas da sociobiodiversidade. *Interações (Campo Grande)*, *20*(1), 327–339.

Portillo, J. T. M. (2012). *Composição, etnoecologia e etnotaxonomia de serpentes no Vale do Paraíba, Estado de São Paulo.* [Dissertação de Mestrado, Universidade Federal de Ouro Preto]. Repositório Institucional da Universidade Federal de Ouro Preto.

Posey, D. A. (1992). *Os povos tradicionais e a conservação de biodiversidade*. Editora Seman, Brasília.

Queirós, D. C. (2020). *O Acidente botrópico no* Tocantins: perfil epidemiológico dos acidentados, fatores ambientais *facilitadores dos acidentes, toxicidade e neutralização do veneno*. [Dissertação de Mestrado, Universidade Federal do Tocantins]. Repositório da Universidade Federal do Tocantins.

Ribeiro, E. M. G. A., Baptistel, A. C., Neto, E. M. F. L., & Monteiro, J. M. (2014). Conhecimento etnobotânico sobre o buriti (*Mauritia flexuosa* L.f.) em comunidades rurais do município de Currais, Sul do Piauí, Brasil. *Gaia Scientia. Especial Populações Tradicionais*, 8(2).

Rodrigues, P. S. de M., Cirqueira Martins, H., Falcão, M. S., Trevisan, M., Portaro, F. C. V., da Silva, L. G., Sano-Martins, I. S., Gonçalves, L. R. de C., & Seibert, C. S. (2023). Effects of Mauritia flexuosa L. f. buriti oil on symptoms induced by Bothrops moojeni snake envenomation. *Journal of Ethnopharmacology*, *313*(116612), 116612.

Rodrigues, S. C. F. (2020). *Estudo da propriedade antiofídica de Jatropha Elliptica (pohl.) mull arg*. [Tese de Doutorado, Universidade Federal do Tocantins]. Repositório da Universidade Federal do Tocantins.

Sampaio, M. B. (2011). *Boas práticas de manejo para o extrativismo sustentável do buriti.* Instituto Sociedade, População e Natureza.

e-ISSN nº 2447-4266
Palmas, v. 10, n. 1, 2024
http://dx.doi.org/10.20873/uft.2447-4266.2024v10n1a20en

Salomão, M. G., Santons, S. M. A & Puorto, G. (1995). Activity Pattern of Crotalus durissus (Viperidae, Crotalinae): Feeding, Reproduction and Snakebite. *Studies on Neotropical Fauna and Environment, 30*(2), 101-106.

Santos, D. B., Pereira, E. N., Teles, M. J., & Santos, E. M. (2012). *Os saberes populares* como informação valiosa para conservação da herpetofauna: uma experiência na floresta nacional de negreiros, Serrita/PE. In: *64ª Reunião Anual da SBPC. Anais eletrônicos de Sociedade Brasileira para o Progresso da Ciência*, São Luís.

Sazima, I. (1992). Natural history of the jararaca pitviper, Bothrops jararaca, In southeastern Brazil. *Biology of the Pitvipers*.

Silva, D. B., Martins, R. C., & Agostini-Costa, T. S. (2010). *Buriti.* Série Frutas Nativas, Edição Comemorativa dos 40 anos da SBF. 21cm (Série Frutas Nativas, 3). Funep.

Silva, R. C. C., Freitas, M. A, Sant'Anna, S. S., & Seibert, C. S. (2019). *Serpentes no Tocantins*: *guia ilustrado*. Ekos Editora.

Silva, R. C. C. (2017). *O ambiente e a diversidade das serpentes no estado do Tocantins–Brasil*. [Dissertação de Mestrado, Universidade Federal do Tocantins]. Repositório da Universidade Federal do Tocantins.

Toledo, V. M. M., & Barrera-Bassols, N. (2009). A etnoecologia: uma ciência pós-normal que estuda as sabedorias tradicionais. *Desenvolvimento e Meio Ambiente*, *20*.

Trevisan, M., Seibert, C. S., & dos Santos, M. G. (2021). O emprego da medicina tradicional no SUS em uma cidade da Amazônia Legal. *DESAFIOS Revista Interdisciplinar Da Universidade Federal Do Tocantins*, *8*(2), 93–109.

Trevisan, M., Seibert, C. S., & Santos, M. G. (2022). Avaliação da atividade repelente do extrato etanólico da erva tipi frente a serpentes Bothrops moojeni. *Brazilian Journal of Biology, v. 84,* p. e258041, 2024.

Uetz, P. (2000). The reptile database: How Many Species? *Herpetological Review 31(1),* 13-15.

Uetz, P. (2020). *The Reptile Database*.

Vasconcelos Neto, L. B., Chalkidis, H. D. M., Brito, I. A. D. S., & Garcia da Silva, A. S. (2018). O conhecimento tradicional sobre as serpentes em uma comunidade ribeirinha no centro-leste da amazônia. *Ethnoscientia - Brazilian Journal of Ethnobiology and Ethnoecology*, *3*.

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RESUMO:
As serpentes causam medo e repugnância em grande parte da população em vista a vários fatores, dentre eles, crenças, mitos, lendas, mas principalmente aos relacionados a acidentes com serpentes peçonhentas que desencadeiam sintomas graves contribuindo para o extermínio desses animais. Portanto, o objetivo deste estudo foi verificar se os saberes da população rural influenciam na prevenção dos acidentes ofídicos. A pesquisa foi qualitativa do tipo semiestruturada, realizada a partir de um roteiro para a condução das interlocuções, que foram gravadas, transcritas e efetuadas a análise das falas. As entrevistas foram realizadas com moradores da zona rural do município de Porto Nacional – TO. A análise permitiu compreender os saberes dos moradores a respeito das serpentes e que esses conhecimentos contribuem para a diminuição desses acidentes.

PALAVRAS-CHAVE: Etnoherpetologia; Serpentes; Saberes; Zona rural; Tocantins.

RESUMEN:
Las serpientes provocan miedo y aversión en muchas personas debido a factores como creencias, mitos y leyendas, sobre todo porque los accidentes con serpientes venenosas desencadenan síntomas graves. Estas percepciones negativas de las serpientes contribuyen a su exterminio. El objetivo de este estudio fue determinar si el conocimiento de la población rural sobre las serpientes influye en la prevención de accidentes por mordedura de serpiente. Se utilizó un enfoque cualitativo, con entrevistas semiestructuradas basadas en un guion predefinido. Las entrevistas fueron grabadas, transcritas y analizadas. Entrevistamos a residentes de la zona rural del municipio de Porto Nacional (estado de Tocantins). El análisis nos permitió comprender el conocimiento de los residentes sobre las serpientes y cómo este conocimiento contribuye a reducir los accidentes por mordedura de serpiente.

PALABRAS CLAVE: Etnoherpetología; Serpientes; Conocimiento; Zona rural; Tocantins.