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Unconventional food plants: knowledge and consumption in a state in southeastern Brazil

Abstract

Background: Although some previous studies have investigated the nutritional and health properties of unconventional food plants (UFPs), there is limited information regarding their application in the diet. This is the first study that evaluated UFP consumption in the state of Minas Gerais, Brazil.

Objective: This study examined how well the population of Minas Gerais, Brazil knew about UFPs and their use.

Design: This cross-sectional study analyzed data from an online survey (November 2020 to March 2021).

Participants/setting: Participants were 1026 adults resided in the state of Minas Gerais, Brazil.

Main outcome measures: This study collected socioeconomic data, UFP knowledge and consumption from the participants. The sociodemographic influence on UFP knowledge was evaluated.

Statistical analyses performed: The Chi-square test (in category variables) and Mann-Whitney or Kruskal-Wallis (in continuous variables) were used to assess the association between UFP knowledge and sociodemographic data.

Results: Half of the participants were not familiar with the term UFP and 41.4% could not identify UFPs' edible and inedible/toxic parts. UFPs' general knowledge was associated to being a female, as well as living in a city with less than 200,000 inhabitants ($p<0.05$). Most of the participants rarely/never consumed UFPs.

Conclusion: Our study demonstrated that the population evaluated did not know much about UFP and that UFP consumption is low.

Keywords: vegetables, feeding, biodiversity, edible plants, non-conventional food plants

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Introduction

The human diet is basic, monotonous, and globalized.[1] Plants that were cultivated in the past have become unknown as a result of globalization and lifestyle changes. Currently, 90% of the global food supply is comprised of only 130 plant species.[2] Even emerging countries, including Brazil, have adopted the substitution of fresh food with ready-to-eat meals. The consumption of ultra-processed meals grew exponentially in Brazil – a country which harbors 2,000 potentially edible non-conventional plant species.[3,4]

Many of the Brazilian plant species remain unknown or undervalued.[4] These unconventional food plants (UFPs) do not come up on traditional menus and are neglected by conventional systems.[5] UFPs are plant species that may survive soil adversities, water scarcity, and low nutrient availability.[6] UFPs also include the stalks, bark, seeds, and leaves of plant species, given that they are edible but not usually consumed.[7] Such UFPs are nutritional-dense.

UFPs are sources of macronutrients and micronutrients, including A, C, and B complex vitamins and minerals such as calcium, phosphorus, iron, and potassium.[8] UFPs' nutritional value is similar – or even higher- as compared to traditional vegetables and can be consumed in various forms, including fresh, dried, frozen, or canned.[6,8–11] In the past years, the food industry has shed an interest in UFPs as a potential source for food diversification and subsequent economic growth. UFPs do not demand large cultivation areas and may constitute an income source for small producers.[4,7]

Although some previous studies have investigated the nutritional and health properties of UFPs,[10,12] we still understand that there is limited information regarding their application in the diet. The available studies about UFP consumption are limited to municipalities, small regions and communities which may not be generalizable to Brazilian states and to Brazil as a whole.[13–15] Therefore, we aimed to evaluate how well the population of Minas Gerais, Brazil knew about UFPs and their use. Specifically, we aimed at (1) assessing consumer knowledge about UFPs including the edible and inedible (e.g. toxic) parts of them; (2) evaluating sociodemographic influence on UFP knowledge; (3) identifying UFP that were consumed by them (or that they wish to consume); (4) identifying frequency of UFP consumption as well as how they were prepared/consumed; (5) and identifying the main areas in which UFPs were consumed. It was hypothesized that UFP consumption is low and such consumption occurs mainly at home. In addition, the knowledge about UFP was hypothesized to be associated with some sociodemographic statistics, such as older age, female gender, and residency in rural zones and in small cities.

Materials and methods

Study area

The present study was carried out in the state of Minas Gerais, which is located in the southeast region of Brazil. The state's estimated population is over 21 million inhabitants.[16] The state has 586,852,35 km² and is comprised of 853 municipalities. The vegetation of Minas Gerais is mainly composed of Cerrado (50%), followed by the Atlantic Forest, Mata Seca, and Campos de Altitude or Rupestres.[17]

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Study design

This is a cross-sectional study, based on a sample for convenience. Our target population was residents of the state of Minas Gerais, Brazil who were 18 years of age or older. Data related to UFP knowledge and consumption of 24 plants were collected via an anonymous online survey uploaded to Google Forms. The snowball sampling method was employed to recruit participants. The survey's link was shared on social media (Facebook, Instagram, WhatsApp, university webpages, and educational institution e-mails) from November 2020 to March 2021. The survey was accessible to anyone who had access to a Wi-Fi-compatible device. This study was approved by our institution's research committee and dutifully followed the Declaration of Helsinki guidelines. All participants were required to fill out a consent form.

Questionnaire

The survey had four subsections. The first subsection included research objectives, information regarding the researchers, and the consent form. Individuals who agreed to partake in the study were required to sign the consent form. The second subsection included questions regarding individuals' sociodemographic data, including age, sex, education level (incomplete or complete basic education, complete or incomplete undergraduate, incomplete or incomplete graduate), income, residency (urban or rural area; less than 200,000 inhabitants or more than 200,000 inhabitants), and place where they purchased fruits and/or vegetables. The third subsection evaluated participants' UFP knowledge, including whether they were capable of identifying UFPs and UFPs' edible and non-edible parts. The fourth subsection included questions regarding UFP consumption, including the UFPs they have consumed, the frequency of consumption (never; rarely; once a week; 2-3 times/week; 4-6 times/week; once a day and more than once a day), and reasons that hindered/facilitated the consumption. The latter subsection included the following 24 UFPs: Canada lettuce (*Lactuca canadensis*), arrowroot (*Maranta arundinacea*.), sorrel (*Rumex acetosa L.*), common purslane (*Portulaca oleracea*), malabar spinach (*Basella alba L.*), tropical burnweed (*Erechtites valerianifolius*), Garden nasturtium (*Tropaeolum majus L*), chicory (*Cichorium intybus*), pariparoba (*Piper umbellatum L.*), dandelion (*Taraxacum officinale*), cutleaf groundcherry (*Physalis angulata L*), sweet potato leaves (*Ipomoea batatas L.*), roselle (*Hibiscus sabdariffa L.*), Yam bean (*Pachyrhizus tuberosus Spreng*), papaya trunk core (*Carica papaya L.*), India mustard (*Brassica juncea*), leaf cactus (*Pereskia aculeata Mill*), German Hedgenettle (*Stachys germanica L.*), gallant soldier (*Galinsoga parviflora Cav.*), sow thistle (*Sonchus oleraceus L.*), arrowleaf elephant ear (*Xanthosoma sagittifolium*), taro (*Colocasia esculenta L. Schott*), white mouth dayflower (*Commelina erecta L.*), banana plant flower (*Musa paradisiaca*).

Our research questions were developed based on previous studies that investigated UFP knowledge, use, and consumption.[18–22] The questionnaire had been tested on 10 individuals to ensure the questions' accuracy and precision.

UFPs were chosen based on previous studies that evaluated the popularity of certain plants.[7,23] Participants were free to exit the survey at any time point. The survey took approximately 16 minutes to be completed.

Data analyses

Data were presented as frequency, as well as median, minimum and maximum. To evaluate the association between UFP knowledge and sociodemographic data, Chi-square test (in category variables) and Mann-Whitney or Kruskal-Wallis (in continuous variables) were used. Data were analyzed using the Statistical Package for Social Science version 22.0 (SPSS Inc.). The significance level was 0.05.

Results

Our initial cohort included 1061 completed surveys. Thirty-five surveys were excluded because one of them was duplicated. The remaining 34 surveys were from participants who lived outside of Minas Gerais, Brazil. Thus, we ended with 1026 valid surveys.

Our sample was mostly comprised of females (65.6%), students (52.5%), individuals who had incomplete or complete undergraduate careers (64.9%), lived in an urban area (9.0%), and lived in cities with less than 200,000 inhabitants (72.4%). The median age of participants was 27 years old (18-71) (Table 1). Most participants purchased fruits and vegetables in growers' markets (77.8%) and supermarkets (75.5%), followed by fairs/community garden (46.7%), home garden (30.7%) and others (10.1%).

Table 1 Participants' general characteristics

Characteristics	n	%
Age (years)		
≥ 27 years	516	50.3
<27 years	510	49.7
Gender (n = 1026)		
Male	353	34.4
Female	673	65.6
Education level (n = 1026)		
Basic education	57	5.6
Undergraduate (Complete or Incomplete)	666	64.9
Graduate (Complete or Incomplete)	303	29.5
City (n = 1000)		
Less than 200,000 inhabitants	724	72.4
More than 200,000 inhabitants	276	27.6
Residency (n = 1026)		
Urban	975	95
Rural	51	5

Half of the participants (50.5%) did not know about the term UFP. Regarding the identification of edible and inedible/toxic parts of plants, 41.4% reported not knowing how to identify them. Fifty-two point four percent of the participants knew how to identify the edible parts of some of the given UFPs and only 6.1% knew how to identify these parts of all of the UFPs.

Table 2 shows the association between UFP knowledge and sociodemographic characteristics. Females, individuals who were older than 27 years of age, and those who had a complete or incomplete graduate careers knew about the term UFP ($p<0.05$). Also, these same groups of individuals also knew about a wider range of UFPs. Females, individuals who were older than >27 years, and those who lived in cities whose populations were less than 200 inhabitants reported knowing how to identify the edible and non-edible/toxic parts of UFPs ($p<0.05$).

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Table 2 Sociodemographic data associated with UFP knowledge among Brazilian individual who resided in the state of Minas Gerais

	Know what are UFP (%)*		Know how to identify edible and inedible or toxic parts (%)*			Number of plants that can be used as food ** (Median (Min-Max))
	No	Yes	No	Yes, some	Yes, all	
Gender						
Male	61.2a	38.8a	45.9a	45.9a	8.2a	8 (1-25)
Female	44.9b	55.1b	39.1b	55.9b	5.1b	9 (1-25)
p	0.001		0.005			p<0.01
Age						
≤27 years	53.6	46.4	46.0a	50.1a	3.9a	8 (1-25)
>27 years	47	53	36.2b	55.1a	8.7b	10 (1-25)
p	0.03		<0.01			<0.01
Education Level						
Basic education	63.2a	36.8a	43.9	49.1	7	8 (1-25)ab
Undergraduate career (complete or incomplete)	55.1a	44.9a	44	50.9	5.1	8 (1-25)a
Graduate career (complete or incomplete)	38.0b	62.0b	35.3	56.4	8.3	10 (1-25)b
p	0.001		0.07			<0.01
City						
< 200,000 inhabitants	50.1	49.9	38.0a	55.0a	7.0a	9 (1-25)
> 200,000 inhabitants	50.4	49.6	49.6b	46.0¨b	4.3a	9 (1-25)
p	0.503			0.03		0.44
Place of residence						
Urban	51	49	42.6a	51.4 a	6.1 a	9 (1-25)
Rural	41.2	58.8	19.6b	72.5 b	7.8 a	10 (1-23)
p	0.111		0.005			0.06

Different letters represent significant differences between variables from the same columns (p<0.05) *Chi Square Test; **Mann-Whitney or Kruskal-Wallis

Most participants knew that *Xanthosoma sagittifolium* (91.2%), *Brassica juncea* (90.8%), *Pereskia aculeata Mill* (90.4%), *Lactuca canadensis* (70.5%), *Musa paradisiaca* (70.3%), *Hibiscus sabdariffa L* (68.6%), *Cichorium intybus* (65.6%), and *Rumex acetosa L*. (59.6%) were potential food products. Only a few participants reported knowing that *Commelina erecta L.* (3.9%), *Colocasia esculenta (L.) Schott* (5.2%) and *Piper umbellatum L.* (6.0%) were potential food products (Table 3). When the participants were asked about the UFPs that they had eaten at least once, they not only reported the examples from the prior sentence but also included *Pachyrhizus tuberosus Spreng*. More than 70% of participants have already eaten *Brassica juncea, Pereskia aculeata Mill e Xanthosoma sagittifolium*. The UFP that they would choose to consume regularly were *Pereskia aculeata Mill* (57.3%), *Brassica juncea* (48.4%), and *Xanthosoma sagittifolium* (48.3%) (Table 3).

Table 3 Brazilians individuals' knowledge regarding potential UFP plants and which ones they have eaten at least once and would wish to consume more often

UFP	Which plants can be used as food? (%)	What plants have you eaten? (%)	Which plants would you like to consume often? (%)
Basella alba L.	31.6	10.3	8.4
Brassica juncea	90.8	78.3	48.4
Carica papaya L.	20.7	11.5	4.5
Cichorium intybus	65.6	38.2	20.1
Colocasia esculenta (L.) Schott	5.2	1.4	1.3
Commelina erecta L.	3.9	0.9	0.8
Erechtites valerianifolius	9.3	4.3	2.5
Galinsoga parviflora Cav.	11.4	3.6	2
Hibiscus sabdariffa L.	68.6	49.4	25
Ipomoea batatas L.	30.3	10	11.7
Lactuca canadensis	70.5	42	29.9
Maranta arundinacea	12.7	4.1	1.9
Musa paradisiaca	70.3	40.3	22.3
Pachyrhizus tuberosus Spreng	8.9	1.1	1.5
Pereskia aculeata Mill	90.4	77.8	57.3
Physalis angulata L	19.3	13.1	7.4
Piper umbellatum L.	6	1.9	0.8
Portulaca oleracea	20.6	10	4.1
Rumex acetosa L.	59.6	45.5	26.1
Sonchus oleraceus L.	45.6	33.2	14.2
Stachys germanica L	46.2	27.6	22.5
Taraxacum officinale	25.4	7.5	7.3
Tropaeolum majus L	19.2	10.4	6.4
Xanthosoma sagittifolium	91.2	75.1	48.3

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UFP consumption was low. Most participants reported to consume UFPs rarely or that they had never consumed any of them. Individuals mostly consumed raw or sauteed plants (Supplementary Table S1). Also, most participants reported to consume UFPs at home (data not shown).

Supplementary Table S1 UFP consumption frequency and modes by Brazilian individual who resided in the state of Minas Gerais

	Consumption frequency (%)			Consumption mode (%) *						
UFP	**Never**	**Rarely**	**Once a week or more**	**Raw**	**Braised**	**Juice/tea**	**Seasoning/ sauce**	**Canned**	**Sweet**	**Other**
Basella alba L.	85.9	12.6	1.6	55.6	53.7	3.7	3.7	0.9	1.9	14.8
Brassica juncea	20.2	57.5	22.4	20.3	49.3	3.6	3.6	5.8	24.6	13
Cichorium intybus	60.6	33.7	5.7	77.2	11.8	9.4	4.7	1.6	1.6	9.4
Colocasia esculenta (L.) Schott	97.2	2.2	0.6	13.3	89.8	0.3	1.7	0.4	0.3	1.2
Commelina erecta L.	97.1	2.6	0.3	43.5	39.1	4.3	4.3	2.2	6.5	28.3
Erechtites valerianifolius	93.7	5.7	0.7	37.7	71.5	0.8	4.6	0.8	0.8	9.2
Galinsoga parviflora Cav.	94.2	5.5	0.5	15.7	59.4	0.7	2.7	0.3	2	32.8
Hibiscus sabdariffa L.	50.2	40.5	9.3	24.8	76	3.9	4.7	0.8	1.6	8.5
Ipomoea batatas L.	87.6	11.1	1.3	74.8	8.6	4	3.3	1.3	14.6	9.9
Mamoeiro	85.5	12.9	1.7	31	42.9	2.4	11.9	2.4	2.4	40.5
Maranta arundinacea	93.1	6.7	0.2	35.5	80.6	0.2	3.1	0.7	0.2	2.2
Musa paradisiaca	60.4	36.6	2.9	44.7	47.4	5.3	7.9	2.6	2.6	31.6
Pachyrhizus tuberosus Spreng	96.4	3.5	0.1	12.4	8.2	80.7	2.9	2.1	2.1	3.8
Pereskia aculeata Mill	21.6	59.2	19.2	28.7	78.2	0.5	9.5	0.7	0.2	1.2
Physalis angulata L	85.1	13.6	1.3	33.3	34.3	33.3	1	1.9	2.9	10.5
Piper umbellatum L.	95.7	4	0.3	46	64.7	4	3.7	0.2	0.5	2.7
Portulaca oleracea	88.2	10.3	1.5	86.4	15	2.1	4.9	0.2	0.2	3
Rumex acetosa L.	55.5	40.6	3.9	14.3	32.1	3.6	7.1	1.8	12.5	57.1
Sonchus oleraceus L.	64.4	29.2	6.4	30	28.8	38.8	5	1.3	1.3	13.8
Stachys germanica L	70.4	25.1	4.5	18.4	86.9	1.5	5.4	0.1	0.5	1.8
Taraxacum officinale	90	8.9	1.2	24.4	43.9	24.4	7.3	2.4	2.4	36.6
Tropaeolum majus L	87.8	10.2	2	22.7	75.8	1.5	4.5	1.5	1.5	24.2
Xanthosoma sagittifolium	26.7	52.4	20.8	24.6	82.4	0.5	1.9	0.3	0.3	2.1

*Considering only participants that reported consumption of these UFP in these question

When asked about reasons that hindered/facilitated UFP consumption, most participants reported not knowing about these plants (except for *Brassica juncea, Pereskia aculeata Mill e Xanthosoma sagittifolium*) (Supplementary Table S2).

Supplementary Table S2 Reasons that interferes with UFP consumption by Brazilian individual who resided in the state of Minas Gerais

UFP	**I do not know (%)**	**I can easily find it (%)**	**I cannot easily find it (%)**	**The taste is pleasant (%)**	**Taste is not pleasant (%)**	**Preparation is easy (%)**	**Needs preparation (%)**	**The price is cheap (%)**	**The price is expensive (%)**
Basella alba L.	77.7	4.1	15.1	3	2.2	1.1	0.8	0	0
Brassica juncea	14.8	36	22.5	22.7	10	8.2	2.6	2	0
Carica papaya L.	73	7.1	13.5	3.1	3.2	1	2.3	0	0
Cichorium intybus	46.9	14	26.1	9.2	7.4	3.2	1.7	0.9	0
Colocasia esculenta (L.) Schott	88.2	2	9.2	0	1.6	0	0	0	0
Commelina erecta L.	88.1	2	9.1	0	1.8	0	0	0	0
Erechtites valerianifolius	85	1.9	11.5	0.9	2.2	0	0	0	0
Galinsoga parviflora Cav.	83.1	3.5	11	1.1	2.3	0	0.9	0	0
Hibiscus sabdariffa L.	33.4	21.8	18.8	13.5	11.4	6.1	3.4	0.9	0
Ipomoea batatas L.	69.3	6.2	19.2	2.3	3.2	1.2	1.4	0	0
Lactuca canadensis	48.7	11.2	27.6	9.9	5.9	3.6	1.3	1.9	0
Maranta arundinacea	83.9	1.3	14	1	1.7	0	0.8	0	0
Musa paradisiaca	46.1	14.4	24.1	11.1	4.9	2.1	7.7	1.4	0
Pachyrhizus tuberosus Spreng	88.1	1.8	9.7	0	1.8	0	0	0	0
Pereskia aculeata Mill	15.4	31.6	28	23.5	6.5	7.5	3.6	2.4	0

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Table S2 is continued...

UFP	I do not know (%)	I can easily find it (%)	I cannot easily find it (%)	The taste is pleasant (%)	Taste is not pleasant (%)	Preparation is easy (%)	Needs preparation (%)	The price is cheap (%)	The price is expensive (%)
Physalis angulata L.	75.9	2.9	16.7	4.1	2.2	0	0	0	1.9
Piper umbellatum L.	86.9	1.7	11	0	1.9	0	0	0	0
Portulaca oleracea	79.1	4.7	14.9	2.6	1.9	1	0	0.9	0
Rumex acetosa L.	47.6	12.3	28.9	13	3.9	4.8	0.8	0.8	0
Sonchus oleraceus L.	56.1	13.7	18.3	9.6	5.6	2.9	0.9	1.2	0
Stachys germanica L.	59	11.2	21.6	9.2	2.5	2.3	2.3	0.8	0
Taraxacum officinale	72.3	5.8	18.2	1.6	2.7	1	1.8	0	0
Tropaeolum majus L.	77.3	4.3	15.8	3.1	1.9	1	0	0	0
Xanthosoma sagittifolium	19.7	30.3	25.8	22.4	7.8	6.8	3.1	1.8	0

Discussion

In the present study, we evaluated UFP knowledge, use, and consumption in a Brazilian population from the state of Minas Gerais. Our results demonstrated that our participants did not know the meaning of UFP and that, most of them, did not recognize many of the UFPs as potential food sources. Females, individuals aged 27 years or older, and those who lived in cities whose population was 200,000 inhabitants or lower were more knowledgeable regarding the identification of the edible and non-edible/toxic parts of the UFPs. To the best of our knowledge, our study is the first to evaluate such parameters in a population from Minas Gerais, Brazil.

Additional studies also reported that their participants were unaware of the term UFP. Narcisa-Oliveira et al.,[19] observed that 55.0% of their sample from Campo Grande (state of Mato Grosso do Sul, Brazil) was not familiar with the term UFP. Additional studies conducted in Pato Branco (state of Paraná, Brazil) and Brasília (Federal District, Brazil) revealed that 37.0% and 53.5% of their samples did not know the meaning of the term UFP, respectively.[14,22] In the present study, individuals who had been admitted to a graduate program were familiar with the term UFP. We account such a finding to the fact that scientific conferences have implemented the term UFP lately, which led people admitted to graduate schools to become familiar with it. Interestingly, Polesi et al.[24] demonstrated that participants knew about the plants but were not aware of the term UFP.

Individuals exhibited limited knowledge about UFPs. In our sample, most participants did not recognize the majority of the given plants as edible products. Although these plants are nutrient-dense, they are still neglected by many people who often consider them to be disposable "weeds".[25] UFPs can generate economic growth and constitute potential food sources.[4]

Individuals who were older than 27 years of age and who were females were more familiar with the term UFP and plants' edible and non-edible/toxic parts. The reduced exposure to UFPs due to globalization probably resulted in unaware younger individuals11. Additional evidence demonstrates that UFP knowledge increases with age, possibly as a result of life experience. [18,26–29] However, the association between the female gender and UFP knowledge remains unclear, as there are studies that corroborates our findings while many others do not.[30–34] Participants who lived in cities with less than 200 inhabitants reported to being able to identify the edible and inedible/toxic parts of UFPs, which can be explained by the fact that they are frequently exposed to rural zones and a subsequent greater diversity of plant species.[35]

Most of our participants rarely or never consumed the given UFPs. Silva et al.[22] observed that 29.7% of their sample consumed UFPs rarely while 53.0% never even consumed UFPs. Dias et. al[36] observed that residents in the municipality of Diamantina, state of Minas Gerais (Brazil) consumed low quantities *Xanthosoma Sagittifolium*, and *Pereskia aculeata*. Such low consumption is possibly due to the lack of UFP knowledge.[14,19,20] Cruz et al.[18] demonstrated that many of their interviewees were unaware that many of their given edible plants could be employed for human consumption.

Our participants have eaten a small number of the listed UFPs. The main reasons that hinder/facilitate UFP consumption were not knowing about them, followed by not easily finding them (except for *Hibiscus sabdariffa L., Brassica juncea, Xanthosoma sagittifolium* and *Pereskia aculeata Mill*). A previous study showed that participants would consume UFPs if UFPs were easier to find.[14] Fairs seem to be the easiest place to find UFPs.[22] Still, UFPs remain uncommon because they are not made available in large establishments.[35] Participants from the present study reported buying fruits and vegetables at supermarkets, which may have contributed to low UFP consumption. Most participants also lived in urban areas – places where UFPs are deemed not cost-effective and that do not favor local producers.[37] Urban areas are the main places where the consumption of industrialized foods has increased.[38]

The marked decrease in UFP consumption has reached all Brazilian regions and social classes, leading to changes in the dietary pattern of Brazilians and a loss of cultural identity.[11] Those from our sample, who consumed UFPs, reported consuming such products mostly sautéed followed by their raw form. Although UFPs can be prepared in several ways and may integrate salads, stews, sauces, soups, and even cakes and pies, not all of them may be consumed raw.[11,22]

Our results can be used for future actions that stimulate knowledge about UPF and contribute to their inclusion in culinary preparations, increasing the nutritional value, enriching and diversifying daily food, encouraging the appreciation of local culture and biodiversity and contributing to sustainability. In addition, strategies can also be developed to favor commercialization of these species, as well as encourage their use in restaurants.

Future studies evaluating methods to include UFP in meal preparations are needed. UFPs are rich nutrient sources that may enrich the flavor, encourage local markets' commercial transactions and stimulate biodiversity. Also, there must be studies evaluating UFP consumption in different geographical regions, also including a greater list of edible plant species alongside different data collection methods.

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Limitations

The present study has limitations. This research was restricted to people who had access to Wi-Fi-compatible devices – thus, some people from extremely rural areas could not complete the survey. We also did not provide illustrations that could have helped people identify the UFPs. However, to the best of our knowledge, this is the first study that evaluated UFP consumption in the state of Minas Gerais, Brazil. The present study included over 1000 individuals, which is a large sample size.

Conclusion

About half of the participants were not aware of term UFP and did not know how to identify the edible and inedible/toxic parts of plants. We observed a significantly association between knowledge about UFP term and some sociodemographic statistics (gender, age, and level education). We also found that gender, city size, and age were associated to identifying the edible and inedible/toxic parts of some UFPs. Participants have mostly consumed or wished to consume *Brassica juncea, Pereskia aculeata Mill e Xanthosoma sagittifolium*. Lastly, UFP consumption occurred mainly at home but such consumption was low.

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Conflicts of interests

Author declares there are no conflicts of interests.

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