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Traditional knowledge and trade of *taioba* (*Xanthosoma taioba* E.G. Gonç.) in open-air markets of Southeastern Brazil

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Abstract

Knowledge gaps in Brazilian Unconventional Food Plants (UFP) can lead to food poisoning. Due to morphological similarity, *taioba* (*Xanthosoma taioba* E.G.Gonç.) has been confused with other species of the Araceae family. Although some species are edible, consuming them without proper preparation can irritate the oral mucosa and the gastrointestinal tract, causing vomiting, etc., due to the presence of calcium oxalate crystals. We interviewed vendors in open-air markets in the Metropolitan Region of Rio de Janeiro to investigate the trade of *taioba*. For that, we used semi-structured and

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checklist interviews, botanical collections, the informant consensus factor (ICF), and descriptive statistical analysis. *Xanthosoma taioba* E.G.Gonç. and *Leucocasia gigantea* (Blume) Schott are the most commonly sold species, the latter known as *taioba-manteiga*. High ICF values correlated with the photograph of *X. taioba* and the ethnospecies *taioba*, indicating a high level of consensus among interviewees. As a community outreach, we produced and distributed material containing fundamental information on *taioba* covering health safety, identification, and proper preparation. We also emphasized the study's role in recognizing local knowledge and the plant's importance to the population.

Keywords: Araceae; ethnobotanical study; market vendors; traditional knowledge; Metropolitan Region of Rio de Janeiro; open-air markets; *taioba*; UFP; *Xanthosoma taioba.*

Introduction

Ethnobotany plays a fundamental role in understanding the relationships between plants and people and is an essential tool for documenting and preserving traditional knowledge related to food crops (Fonseca-Kruel & Peixoto, 2004; Ibrahim *et al.*, 2016; Oliveira & Rodrigues, 2024). In the state of Rio de Janeiro, the unconventional food plant (UFP) *taioba* (*Xanthosoma* spp.) (Kinupp & Lorenzi, 2014) has great cultural and economic significance linked to culinary traditions dating back to colonial times. Although published studies exist on taioba (Lana & Tavares, 2010; Kinupp & Lorenzi, 2014; Boakye *et al.*, 2018; Kato, 2021), further research on its use and cultivation is needed to develop sustainable management strategies for this important unconventional food plant.

Traditionally, *Xanthosoma sagittifolium* (L.) Schott has been considered the main species cultivated under the common name *taioba.* However, Gonçalves (2011) clarified in a taxonomic study that *X. sagittifolium* is restricted to the Caribbean. The author also described *Xanthosoma taioba* E.G.Gonçalves, which corresponds to the species most commonly cultivated as *taioba* in Brazil, especially in the southeast.

The neotropical *Xanthosoma* Schott genus belongs to the family Araceae Juss.,

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which includes around 3,676 species (Grayum, 1990; Croat & Boyce, 2024). Thirty-one species occur in Brazil, of which 14 are endemic (Flora e Funga do Brasil, 2024; Lóz, 2022). *Xanthosoma taioba*, *X. brasiliense*, and *X. violaceum* are edible, and the leaves are most commonly consumed in Brazil (Lima & Krupek, 2016).

Taioba is valued for its resistance, ease of cultivation, and high nutritional value, contributing to food and nutritional sovereignty and security (Brazil, 2010). It is rich in nutrients, especially protein, fiber, calcium, iron, and antioxidants, making it an excellent alternative for vegetarian and vegan diets (Antoine *et al.*, 2017; Boakye *et al.*, 2018). However, plants of the Araceae family, including ethnospecies of *taioba*, contain calcium oxalate crystals (raphides) that can irritate oral mucosa and the gastrointestinal tract, causing vomiting, etc., and are therefore considered toxic plants (Sakai & Hanson, 1974; Bradbury *et al.*, 1995; Lin *et al.*, 1998; Moon *et al.*, 2011; Boakye *et al.*, 2018; Arogundade & Adedeji, 2020; Gallo & Caresana, 2024; Malone *et al.*, 2024).

Nevertheless, once detoxified, which involves removing the main leaf veins (where calcium oxalate crystals are most concentrated) or cooking the leaves to solubilize these compounds, *taioba* can substitute for cabbage or spinach in a variety of dishes, such as soups and pies (Boakye *et al.*, 2018).

Ethnobotanical studies highlight the importance of *taioba* in family farming systems. In communities in Rio Claro, state of São Paulo, *Xanthosoma* was identified among the species cultivated and used daily by family farmers (Oliveira, 2011). In Pernambuco, *X. taioba* (cited as *X. sagittifolium*) is widely used to prevent and treat bone diseases such as osteoporosis. A study in the Muribeca neighborhood of Jaboatão dos Guararapes showed that cooked leaves of this species contain high levels of bioavailable calcium (369.81 mg/100 g), supporting its traditional use as a mineral supplement (Oliveira *et al.*, 2012). The Muribeca Alternative Health Center (CESAM, Brazilian acronym) promotes the use of medicinal plants for health in this low-income urban community. Local knowledge, passed down through generations, has been systematized with the support of community training. The CESAM case illustrates the vital role of community spaces in strengthening health practices based on traditional knowledge, particularly in urban areas facing socioeconomic vulnerability (Oliveira *et al.*, 2015). Together, these studies highlight the dietary and symbolic significance of *taioba* within

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local traditional knowledge systems.

Ethnobotanical studies from other tropical regions, such as Nigeria, emphasize the sociocultural importance of congeneric plants like *cocoyam*, which includes species from the *Xanthosoma* and *Colocasi*a genera. Their corms are boiled, roasted, or fried, and young leaves are added to soups and stews. In addition to their dietary role, *cocoyam* species are used in traditional medicine to treat hypertension and diabetes and have symbolic and ritual significance (Ibrahim *et al.*, 2016). The wide range of common names for *cocoyam* reflects its deep cultural integration and the diversity of lineages and varieties maintained by farmers through empirical selection and cultivation practices adapted to local ecosystems (Osawaru & Ogwu, 2014).

The domestication and use of food plants such as *Colocasia esculenta* (yam) have been the subject of studies highlighting complex evolutionary and cultural processes (Matthews *et al.*, 2015). Ethnobotanical research on yams shows that the long human-plant interaction has driven their dispersal, diversification, and selection of varieties adapted to different ecological and cultural contexts. In the case of *Colocasia*, taxonomic challenges persist due to the difficulty of visually distinguishing wild from domesticated populations. A similar situation applies to *X. taioba* (cited as *X. sagittifolium*), whose use and management by traditional populations in Brazil resemble that of yam in other cultures. Both species contribute to food security and help preserve regional cultural practices (Matthews *et al.*, 2015).

Besides *Xanthosoma*, other species from related genera (e.g., *Alocasia* and *Colocasia*), are often referred to as *taioba* due to the morphological similarity of their leaves (Kato, 2021) (Fig. 1). Accurate identification of ethnospecies sold as *taioba* is essential to ensure safe consumption and prevent health risks (Mayo *et al.*, 1997; Pontes *et al.*, 2010). In 2021, at an open-air market in the Glória neighborhood of Rio de Janeiro, misidentification led to the sale and consumption of a toxic species, resulting in adverse health effects for a consumer (CM Sakuragui, personal communication). Such incidents suggest that some UFPs sold as *taioba* may belong to genera and species other than *X. taioba*. Leaf morphology and rhizome traits are essential for distinguishing cultivated species and varieties, which are often confused due to phenotypic plasticity and variation in response to environmental conditions (Croat & De Dijn, 2023).

[Figure 1]

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Recent studies also highlight the need for integrated research combining taxonomic and ethnobotanical knowledge to better understand the evolutionary and cultural history of these plants and promote their sustainable management. In line with this perspective, our work explores the relationship between *taioba* (*Xanthosoma taioba* E.G.Gonç.) and vendors who sell the plant at open-air markets in the Metropolitan Region of Rio de Janeiro. These markets reflect society through the sale of local products and the exchange of traditional knowledge (Freitas *et al.*, 2008). We assess whether market vendors accurately identify the species sold as *taioba*, analyze its local use and classification, evaluate relationships between socioeconomic and ethnobotanical data, discuss how the correct identification of this UFP contributes to advancing food sovereignty and security, and develop informational material material for users with basic information about the plants.

Materials and Methods

Study area and selection of participants

The study was conducted in the Metropolitan Region of Rio de Janeiro, covering 10 open-air markets located in the municipality of Guapimirim and several neighborhoods in the city of Rio de Janeiro (Ilha do Fundão, Catete, Laranjeiras, Glória, Botafogo, Copacabana, Ipanema, and Tijuca) (Fig. 2). For the ethnobotanical research, participants were selected based on their geographic and personal proximity to the researchers.

[Figure 2]

This research involved traditional knowledge associated with genetic heritage and was approved by the Research Ethics Committee of the Faculty of Dentistry at the Federal University of Rio de Janeiro in October 2023 (registration number 6.526.735), following the guidelines of the National Research Ethics Council (CONEP, Brazilian acronym). All participants signed an informed consent form. The study was also registered in the National System of Genetic Resource Management and Associated Traditional Knowledge (SisGen, Brazilian acronym) (registration number A6AD314).

Participants were selected based on the following criteria: being market vendors, family farmers, or collectors and sellers of UFPs, aged over 18 years, and willing to

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participate in the study. A total of 30 people working in open-air markets were included. To validate the questionnaire, a pilot test was carried out with three farmers from Rio Paranaíba, Minas Gerais.

Data collection

After obtaining informed consent, semi-structured interviews were conducted in person between December 2023 and February 2024, using a questionnaire developed in Google Forms based on Bernard (2006).

Ex situ botanical collections were conducted at the selected open-air markets in May 2024. Market vendors were invited to collect the plants they commonly identify as *taioba* for laboratory analysis and herborization. Voucher specimens were deposited in the RB Herbarium under numbers 877714 to 877752. The president of the Association of Rural Producers and Craftsmen of Fojo (AFOJO, Brazilian acronym) based in Guapimirim signed a consent form authorizing the information collection from participants, members of the association.

Ethnobotanical research often employs visual stimuli to obtain information on plant use and identification (Medeiros *et al.*, 2008). In this qualitative-quantitative study, we applied the checklist interview technique (Medeiros *et al.*, 2008), in which nine photographs of species from the genera *Xanthosoma*, *Colocasia*, and *Alocasia* were shown to the participants in both digital and printed formats (Table 2). The aim was to identify the morphotypes and their corresponding common names by recording participants' responses (Alexiades, 1996). Of the nine photographs, six represented different species and were used to assess the market vendors’ knowledge. Morphotypes of the same species can vary widely, while different species may share similar characteristics (Temponi *et al.*, 2005). The botanical nomenclature of the species was validated using the Flora and Funga do Brasil database (Flora e Funga do Brasil, 2024).

Data analysis

The checklist interview and comparative image methodologies were used to calculate the informant consensus factor (ICF) (Trotter & Logan, 1986) and to analyze the different ethnospecies associated with the plant photographs (Table 2). ICF was

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calculated using the following formula:

$$ICF = \frac{Nur - Nt}{Nur - 1}$$

For each photograph, the total number of citations of common names (Nur) and the number of different names mentioned (Nt) were recorded. ICF ranges from 0 (little consensus on the common names used) to 1 (unanimous consensus among the interviewees) (Albuquerque *et al.*, 2010).

After data collection, responses and plant samples were analyzed based on the following criteria: (i) which species market vendors identify as *taioba*; (ii) which species they collected; (iii) which species are sold as *taioba*; and (iv) how they prepare and consume the plant, according to different groups of interviewees. For the qualitative examination of the data collected from the questionnaires, a spreadsheet was created and, from there, a descriptive statistical analysis was conducted. Another assessment was carried out through the calculation of the Informant Consensus Factor, which involved adaptations of quantitative analyses aimed at investigating the level of convergence of traditional knowledge about aroids.

The semi-structured interview format allowed for greater variability and flexibility during data collection, which influenced the statistical analysis. Although market vendors were randomly selected, all interviewees reported some form of relationship with *taioba* (e.g., consumption, trade, or medicinal use). For analytical purposes, however, only responses from participants who sold this UFP were included.

Information material

According to Romanowski *et al.* (2023), feedback is a way of returning part of the research results to the communities. This practice helps value traditional knowledge about biodiversity, promotes cultural respect, and ensures scientific ethics and transparency throughout the interviews (Albuquerque *et al.*, 2010).

Following the current botanical classification system [Angiosperm Phylogeny Group APG IV (The Angiosperm Phylogeny Group, 2016), a botanical identification guide

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was developed. The guide includes species identified as *taioba*, detailed morphological descriptions, comparative images, scientific and common names, preparation guidelines for consumption, cooking recipes, and other relevant information.

Results

Categories of informants

Among the market vendors who sell *taioba* (27 interviewees), 90% are farmers and/or collectors, and only 10% work as resellers. They had an age range of 25-73 years old (on average 52 years), and the class with the largest number of vendors was between 49 and 60 years old (Table 1). A similar average age was also reported by Freitas *et al.* (2012) and Pacheco-Porto and Chuquilanque (2021) in ethnobotanical studies conducted in different regions of Brazil, in homegardens and open-air markets, respectively.

[Table 1]

Species identification

Photographs 1, 3, and 7 (Table 2) received the highest number of citations. As shown in Figure 3, 70% of market vendors associated photograph 7 (*X. taioba*) with the name *taioba*, which also had the highest FCI value (0.87) (Table 2). Among the 133 mentions recorded, the most frequent common names were *taioba* (28.6%), *inhame* (22.8%), and *inhame-rosa* (10.5%). *X. taioba* was most strongly associated with the name *taioba*, receiving 22 out of 25 citations. *L. gigantea* was cited 15 times (11.03%), including four mentions as *taioba-manteiga* and three as both *taioba* and *taioba-couve*. The name *taioba-branca* appeared twice for each of the two species.

[Figure 3]

[Table 2]

Photographs 1 (*C. esculenta*) and 7 received the same number of citations (18.4 % of the total mentions), the former being most commonly referred to as *inhame* and

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inhame-rosa, as was photograph 3 (Table 2). Among the most frequently used terms, only photographs 7 and 8 were not identified as *inhame*. In contrast, the name *taioba* was absent only in photographs 2 and 4 (Table 2).

The early middle age category (37-48 years) showed a strong preference for photograph 7 (Table 2), with 77.8% identifying it as *taioba* (Table 3). *Xanthosoma taioba* (photograph 7, Table 2) was the most recognized species among respondents aged 37-60 (early and late middle-aged), accounting for 23.3% each (Fig. 4).

[Table 3]

[Figure 4]

Plant species collected by market vendors

Among the participants, five belonged to the same family group, but only one individual participated in the study as a representative of the family. As a result, 24 interviewees (80% of the total) were considered for analysis, and 21 plant samples were collected in open-air markets. The species collected by participants were limited to *X. taioba* and *L. gigantea*.

One of the vendors was selling *L. gigantea* with the leaves grouped and split at the point where the lobes meet, forming what interviewees referred to as *mole* or *molho* (i.e., a bunch of leaves). Among all participants, 90% (27 market vendors) reported consuming *taioba*, 77.8% eat the leaves of *X. taioba*, and 22% mentioned the appropriate methods of leaf preparation. Regarding the petiole, only one vendor reported removing its outermost layer before consumption.

Of the 30 market vendors interviewed, 17 collected the same plant they had previously identified on the questionnaire, representing 56.7%. In other words, nearly half of the participants showed consistency between visual identification and plant collection. *X. taioba* was the species most frequently recognized as *taioba* (Fig. 5). The subcategory “Both” refers to cases in which vendors collected both *X. taioba* and *L. gigantea*. The “Neither” subcategory includes participants who did not collect any

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specimens or showed partial consistency by collecting more than one species. Among the 24 participants who provided plant material, 79.17% collected *X. taioba*, 12.5% presented *L. gigantea* as *taioba*, and 8.3% collected both species.

[Figure 5]

Comparison between species identified in interviews and those collected revealed three groups: a) consistent vendors: participants who selected and collected the same species, with no discrepancies (56% of interviewees); b) inconsistent vendors: those who identified one species but collected another (20%); and c) none of the options: participants who either did not provide any plant material or showed partial consistency by collecting more than one species. Table 4 shows the number of vendors who showed inconsistencies between the species identified on the questionnaire and the species they collected.

[Table 4]

The "consistent vendors" stood out across all proportions when comparing each group to the total number of interviewees (Fig. 6).

[Figure 6]

Xanthosoma taioba was the most frequently collected species, representing 88.89% of collected samples (Albuquerque *et al.*, 2010; Martins & Costa, 2016) (Fig. 7). In terms of age, the early middle-aged category (37 to 48 years old) contributed to 26.7% of *X. taioba* collections and 3.3% of *L. gigantea*. In contrast, those who did not collect any plant material belonged to the advanced middle-aged (49-60 years) and young seniors (61-73 years) categories.

[Figure 7]

Discussion

Our results show that *X. taioba* is widely recognized and sold as *taioba*, although confusion persists with *L. gigantea*, which is also commonly sold under the same name at open-air markets, as also reported by Kato (2021). From a commercial perspective,

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vendors can distinguish *L. gigantea* from *X. taioba*, often referring to the former as *taioba-manteiga*. However, selling bundled leaves with similar morphology can cause commercial and nutritional issues. While both species are edible, *X. taioba* contains high levels of calcium oxalate, which may pose health risks if the plant is not properly prepared through traditional detoxification methods. Cooking and removal of the main veins ensure safe consumption by reducing toxic compounds (Franceschi & Nakata, 2005; Kato, 2021).

Although this information is essential for consumers, few market vendors mentioned the proper preparation of *X. taioba*. The lack of clear guidance from vendors on appropriate preparation methods is concerning and highlights the need for greater awareness to prevent potential poisoning (Franceschi & Nakata, 2005; Albino *et al.*, 2019). Establishing more consistent identification practices could contribute to standardizing the trade of *taioba* in open-air markets.

Of the 30 interviewees, 27 reported selling *taioba*, and 90% of them are farmers and/or collectors. This is significant, as it suggests that the participants' knowledge derives from traditional practices passed down through generations, thereby enhancing the reliability of the ethnobotanical information collected (Albuquerque & Hanazaki, 2009). The predominance of farmers and collectors also highlights their close connection with the environment and natural cycles.

The interviewees ranged from 25 to 73 years, with an average close to 52. Most participants were between 49 and 60 years old, suggesting a generational gap in open-air market participation. A similar average age was also reported by Freitas *et al.* (2012) and Pacheco-Porto & Chuquilanque (2021) in ethnobotanical studies conducted in different regions of Brazil, in homegardens and open-air markets, respectively. At São Lourenço do Sul, Pacheco-Porto & Chuquilanque (2021) observed that younger individuals appear less involved in open-air market activities, possibly due to reduced interest in continuing family farming, lack of opportunities in rural areas, or limited access to these markets. Further research is needed to confirm these trends.

Environmental education and engagement with manual labor are important for connecting younger generations with agriculture and environmental issues (Jacobi, 2003). Among older adults (over 55 years old), the preference for working at open-air

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markets rather than in the field may be linked to better working conditions and financial stability in this commercial environment (Farina, 2013).

Using the checklist interview, we identified the main common names associated with each morphotype. *Taioba* is used for several species, especially *X. taioba* and *L. gigantea*. However, consensus on these species varies among participants. Photography 7 (Table 2), representing *X. taioba*, had a high ICF (0.87) suggesting a more consolidated knowledge of this species compared to *L. gigantea* (ICF=0) (Table 2). As expected, *X. taioba* was most often identified as *taioba*, while *L. gigantea* was associated with *taioba-manteiga*. The name *taioba-branca* was mentioned for both species. These results suggest ongoing confusion between *X. taioba* and *L. gigantea*, including the use of overlapping common names.

The low number of mentions of *L. gigantea* (11% of all citations) may be explained by the limitations of the visual identification technique used. Other visualization methods could yield higher recognition rates, especially considering the widespread commercialization of this species. One-dimensional photographs make it difficult to perceive the actual proportions and three-dimensional features of the plants. However, this limitation is rarely addressed in the literature (Medeiros *et al.*, 2008). Future studies could explore different visual and morphological identification methods of Araceae species commonly mistaken for *X. taioba* (e.g., fresh material, exsiccates, or life-sized photographs) and invest in the transmission of ethnobotanical knowledge to younger generations.

The early middle-aged category (37-48 years) stood out in the selection of photograph 7 (Table 2), with 77.8% identifying it as *X. taioba* (Table 3 and Fig. 4). Across all age categories, photograph 7 was chosen significantly more often than other photographs (Table 2), reinforcing the association between the common name *taioba* and the scientific species *X. taioba* (Gonçalves, 2011; Kinupp & Lorenzi, 2014).

Several studies have addressed the potential toxicity of certain UFPs, including identifying causes and circumstances of poisoning. These include the book by Wagstaff (2008), the article by Boakye *et al.* (2018), and research on species often mistaken for other UFPs, such as *Alocasia macrorrhizos* (L.) G.Don. (Lin *et al.*, 1998). Lin and colleagues reported cases of intoxication due to the ingestion of calcium oxalate crystals,

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which can cause inflammation of the oral cavity and mucous membranes.

The consistency of the answers across the two phases of the survey (questionnaire and sample collection) revealed that 56.7% of the participants gave consistent answers, indicating a relatively high level of plant knowledge (Table 4). However, the number of inconsistencies (20%) limits the precision of the analysis. Even so, the variability among inconsistent responses suggests gaps in vendors' ability to accurately identify species and highlights the lack of standardization in the plants sold as *taioba* (*X. taioba* and *L. gigantea*). Leaves of *C. esculenta*, a widely cultivated edible aroid in tropical regions, were not found in any of the markets surveyed, although its corms were commercially available (Mayo *et al.*, 1997).

According to Silva & Peixoto (2009), such confusion is common, as observed in the Madureira Market in the North Zone of Rio de Janeiro. The common name *abajurú* is used for two different species: *Eugenia rotundifolia* Casar and *Chrysobalanus icaco* L. However, only *C. icaco* has pharmacologically confirmed hypoglycemic properties. Despite this, market vendors often sell *E. rotundifolia* under the same name and attribute to it the same medicinal properties as *C. icaco*.

In our analyses, collectors were the group that gathered the highest number of *X. taioba* samples, suggesting that they may recognize this species more accurately than other participants (Albuquerque *et al.*, 2016) (Fig. 7). The early middle-aged category (37-48 years old) stood out both in the number of *X. taioba* collections and in associating photograph 7 (Table 2) with the term *taioba*, correctly identifying the species.

Following data analysis, we created information material on *taioba* identification that was printed and distributed (request access to the information material from the corresponding author). A QR code linking to the research and present in the information material was also provided on laminated paper to facilitate customer access. Market vendors were encouraged to display the guide alongside *taioba* at their stalls to enhance credibility, promote sales, and support the cultural transmission of traditional knowledge. The guide also highlighted *taioba*'s nutritional value and versatility. Participants appreciated the feedback, expressing a sense of recognition and value for their contribution. This exchange helped build a relationship of trust between

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researchers and interviewees, laying a foundation for future collaborations (Albuquerque *et al.*, 2010).

In conclusion, market vendors (especially those with field experience) have strong knowledge, highlighting the value of direct contact with the plant. Despite its morphological variability, farmers and collectors use distinct traits to recognize ethnospecies. However, confusion of *X. taioba* with *L. gigantea* remains common in Rio de Janeiro, Minas Gerais, and Bahia (Lana & Tavares, 2010) due to similarities in morphology and common names. Misidentification can lead to health and economic risks, underscoring the need for accurate botanical knowledge. Promoting the use of scientific names at open-air markets could reduce these risks and improve food safety.

Further ethnobotanical studies with larger samples, along with anatomical descriptions of *Xanthosoma*, *Colocasia*, and *Alocasia* species and calcium oxalate quantification, are essential to guide safe consumption practices. In this context, a survey of poisoning cases associated with the consumption of *taioba* purchased at open-air markets in healthcare units is proposed, considering the lack of knowledge regarding proper preparation methods. Finally, the lack of official data on the health risks of UFPs like *taioba* unrelated to pesticides highlights a critical gap in monitoring systems such as the National System of Toxic-Pharmacological Information (SINITOX, Brazilian acronym) (SINITOX, 2025).

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Authors' Contributions

VJRG: Methodology; Investigation; Data curation; Formal analysis; Visualization; Writing – Original Draft; MVCS: Conceptualization; Methodology; Formal analysis; Resources; Validation; Visualization; Writing – Review & Editing; DRO: Funding acquisition; Conceptualization; Methodology; Formal analysis; Resources; Validation; Visualization; Writing – Review & Editing; CMS: Funding acquisition; Conceptualization; Methodology; Investigation; Project administration; Resources; Supervision; Validation; Visualization; Writing – Review & Editing.

Conflict of Interest

The authors declare no conflict of interest.

Data Availability Statement

Datasets related to this article will be available upon request to the corresponding author.

AI Usage Statement

The artificial intelligence tool ChatGPT was used to assist in the grammatical review of the text and standardization of references.

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Table and Figure Captions

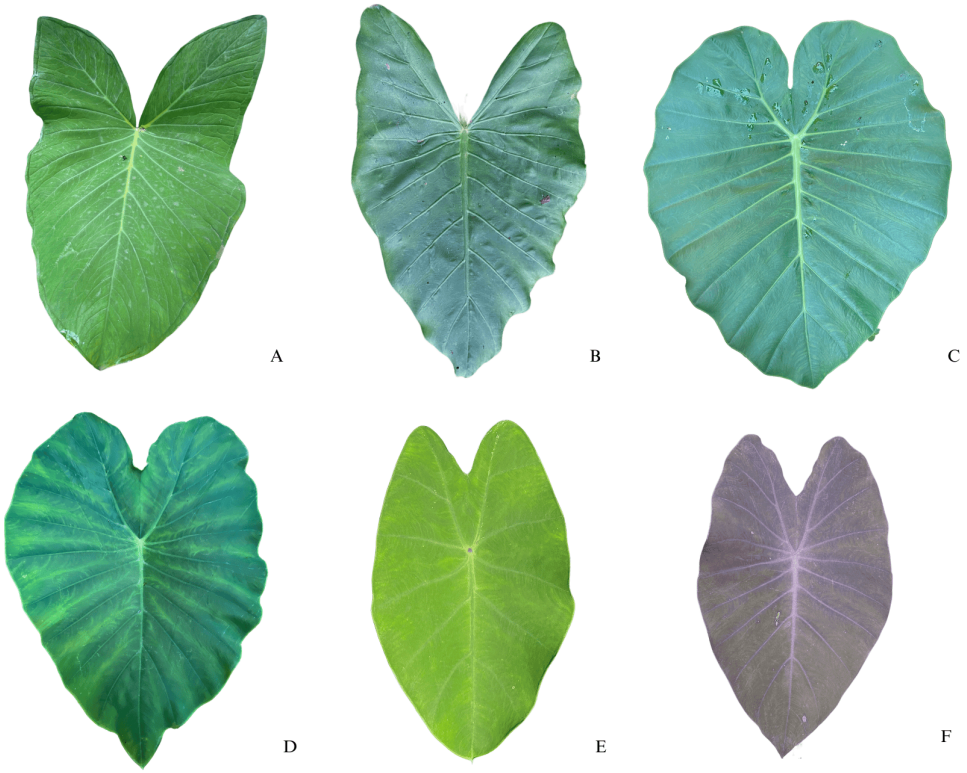


Figure 1. Photographs of leaf blades from Araceae species and their respective morphotypes. A) *Xanthosoma taioba* E. G. Gonç.; B) *Alocasia macrorrhizos* (L.) G. Don; C) *Leucocasia gigantea* (Blume) Schott; D) and E) *Colocasia esculenta* (L.) Schott; and F) *Colocasia antiquorum* Schott.

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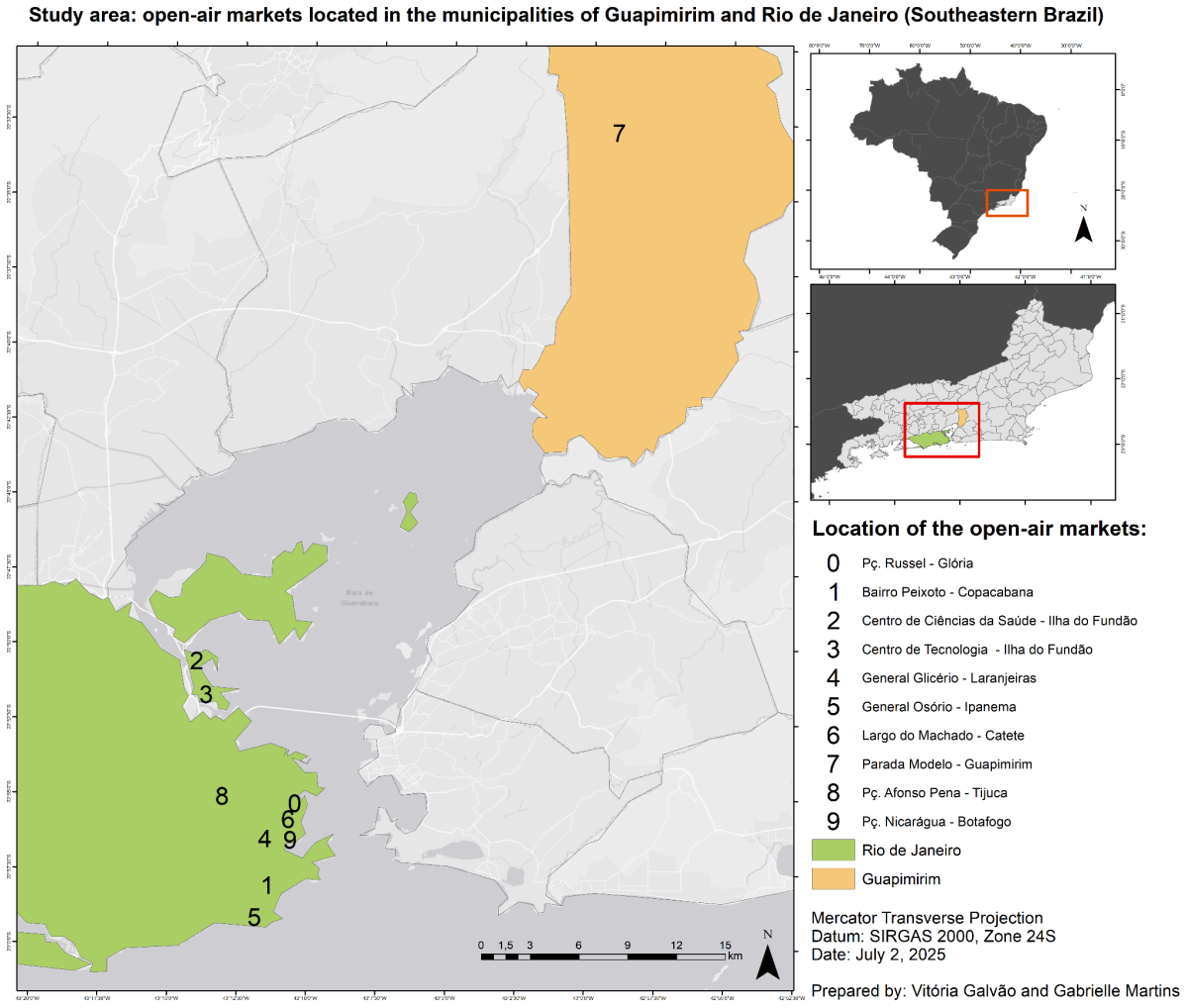


Figure 2. Map of the study area showing the Metropolitan Region of Rio de Janeiro, highlighting the open-air markets visited in the municipalities of Guapimirim and Rio de Janeiro.

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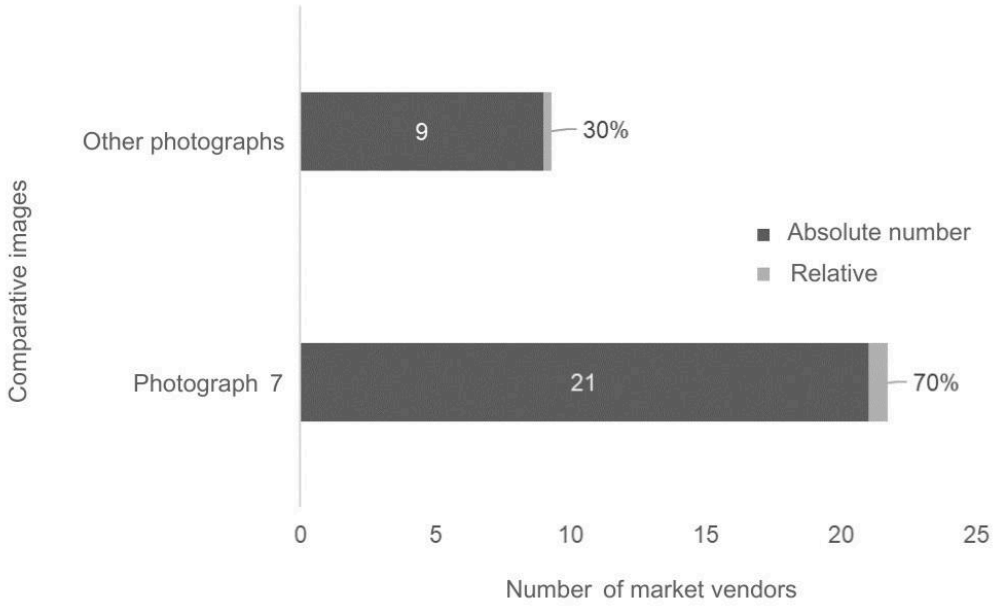
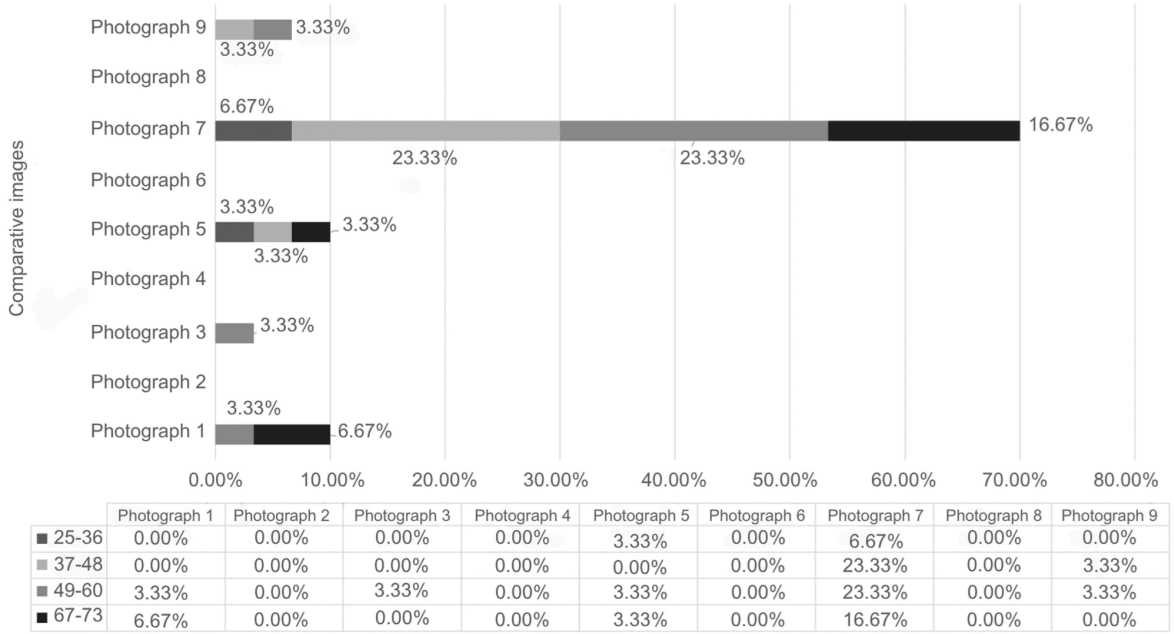


Figure 3. Identification of *taioba* (*X. taioba* = photograph 7) by all the market vendors based on photograph selections (numbered 1 to 9, Table 2).



	Photograph 1	Photograph 2	Photograph 3	Photograph 4	Photograph 5	Photograph 6	Photograph 7	Photograph 8	Photograph 9
25-36	0.00%	0.00%	0.00%	0.00%	3.33%	0.00%	6.67%	0.00%	0.00%
37-48	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	23.33%	0.00%	3.33%
49-60	3.33%	0.00%	3.33%	0.00%	3.33%	0.00%	23.33%	0.00%	3.33%
67-73	6.67%	0.00%	0.00%	0.00%	3.33%	0.00%	16.67%	0.00%	0.00%

Figure 4. Percentage of photograph selections (numbered 1 to 9, Table 2) made by market vendors during interviews grouped by age category.

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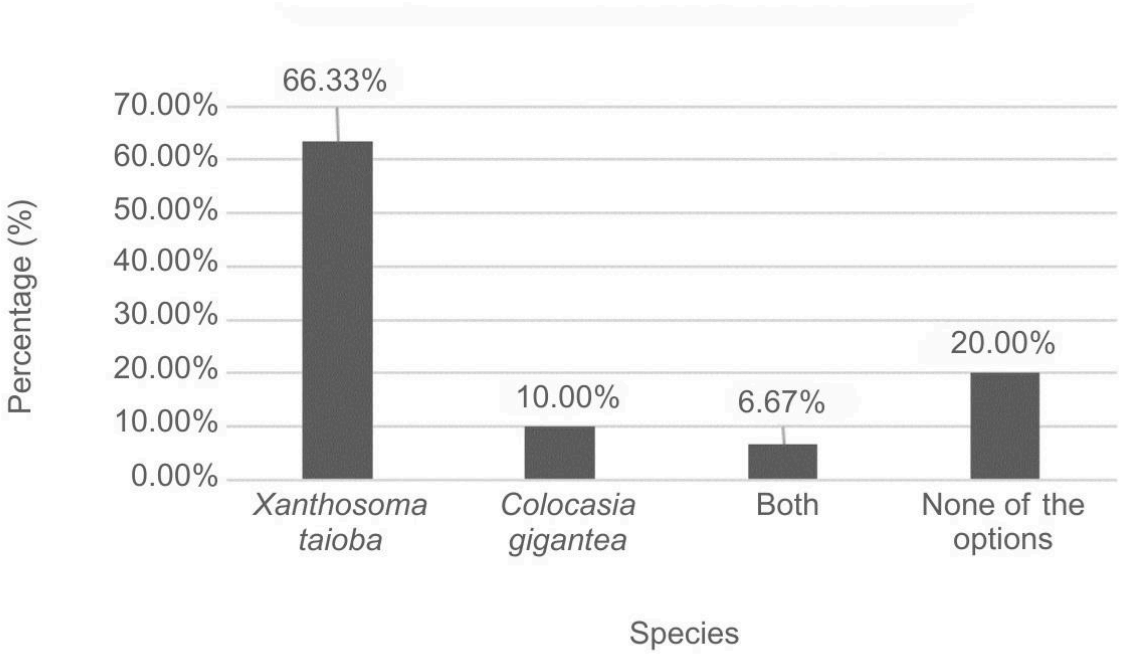


Figure 5. Percentage of plant species collected by the interviewees.

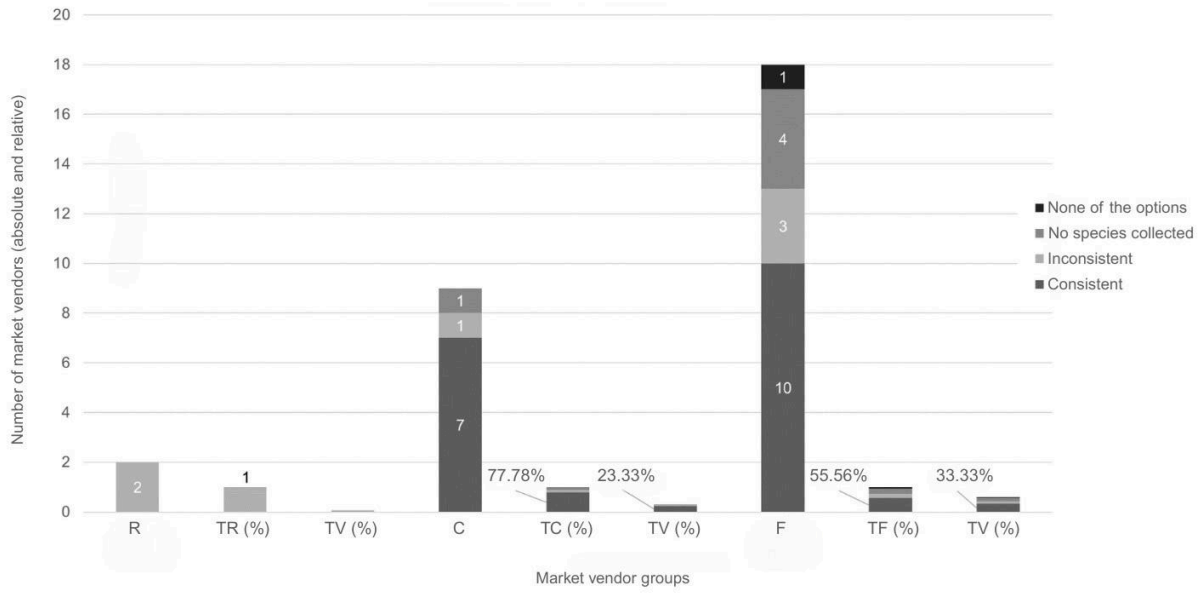


Figure 6. Consistency and inconsistency in *taioba* identification among market vendor groups (resellers, collectors, and farmers) during the interview and sample collection stages. Percentages are shown for each group relative to its total and the overall number of interviewees. R= resellers, C= collectors, F= farmers, TR= percentage of total resellers,

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TC= percentage of total collectors, TF= percentage of total farmers, TV= percentage of total market vendors.

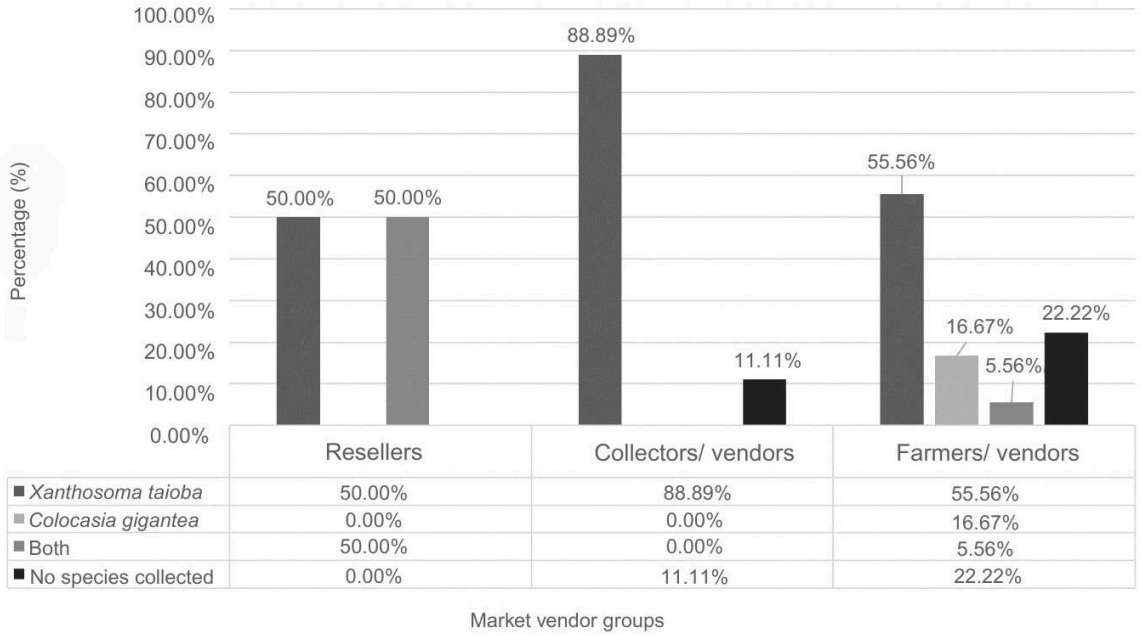


Figure 7. Plant collections identified as *taioba* by different groups of market vendors.

Table 1. Age distribution and classification of interviewed market vendors. AG = age groups; ANMV = absolute number of market vendors; RNMV= relative number of market vendors.

Table 1 - Age distribution and classification of interviewed market vendors.

Age categories	**Age range**	**ANMV**	**RNMV**
Young adults	25-36	3	10%
Early middle age group	37-48	9	30%
Late middle age group	49-60	10	33.33%
Young seniors	61-73	8	26.67%

ANMV = absolute number of market vendors; RNMV= relative number of market vendors.

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Table 2. Observations reported by market vendors regarding ethnospecies, including their corresponding common and scientific names listed by informant consensus factor (ICF) values in descending order. CI= comparative images, NQ= numbering on the questionnaire, SN= scientific names, TNC= total number of citations, NCFE= number of citations for the most frequently mentioned ethnospecies.

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Table 2 - Ethnospecies reported by market vendors, along with their common and scientific names, listed in descending order of informant consensus factor (ICF) values.

CI	SN	NQ	Etnospecies (NCTp)	TNC	FCI
	*Xanthosoma taioba* E. G. Gonç.	Photograph 7 (this study)	"taioba" (22) "taioba-branca" (2) "inhame-selvagem" (1)	25	0.87
	*Colocasia esculenta* (L.) Schott	Photograph 3 (Kato, 2021)	"inhame" (13) "inhame-rosa" (4) "inhame-chinês" (3)	24	0.78
	*Colocasia esculenta* (L.) Schott	Photograph 1 (unknown author)	"inhame" (8) "inhame-rosa" (7) "taioba" (4)	25	0.66
	*Colocasia antiquorum* Schott	Photograph 4 (Instituto Inhotim)	"taioba-roxa" (4) "inhame" (3) "inhame-roxo" (2)	12	0.64
	*Leucocasia gigantea* (Blume) Schott	Photograph 5 (Matos de comer, 2014)	"taioba-manteiga" (4) "taioba" (3) "taioba-couve" (3)	15	0.57
	*Alocasia macrorrhizos* (L.) G. Don.	Photograph 8 (Kato, 2021)	"taioba" (3) "inhame-bravo" (1) "orelha-de-elefante" (1)	5	0.50
	*Colocasia esculenta* (L.) Schott	Photograph 9 (Kato, 2021)	"taioba" (3) "inhame" (3) "inhame-rosa" (1)	14	0.46
	*Xanthosoma violaceum* Schott	Photograph 6 (Kinupp e Lorenzi, 2014)	"taioba-roxa" (3) "taioba" (2) "inhame" (1)	8	0.29
	*Alocasia macrorrhizos* (L.) G. Don.	Photograph 2 (this study)	"inhame" (1) "inhame-chinês" (1) "orelha-de-elefante" (1)	8	0.00

CI= comparative images; SN= scientific names; NQ= numbering on the questionnaire; TNC= total number of citations; NCTp= number of citations for the most frequently mentioned ethnospecies.

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Table 3 - Photograph selections made by market vendors during interviews, categorized by age group.

Age categories	AR	NV	NV7	PP7	NVo	PVo
Young adults	25-36	3	2	66.67%	1	33.33%
Early middle age group	37-48	9	7	77.78%	2	22.22%
Late middle age group	49-60	10	7	70.00%	3	30.00%
Young seniors	61-73	8	5	62.50%	3	37.50%
Total	-	30	21	-	9	-

AR= age range, NV= Number of vendors, NV7= Number of vendors who selected photograph 7, PP7= percentage of vendors who selected photograph 7, NVo= Number of vendors who selected other photographs, PVo= percentage of vendors who selected other photographs.

Table 3. Photograph selections made by market vendors during interviews (Table 2), categorized by age group. AR= age range, NV= Number of vendors, NV7= Number of vendors who selected photograph 7, PP7= percentage of vendors who selected photograph 7, NVo= Number of vendors who selected other photographs, PVo= percentage of vendors selected other photographs.

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Table 4 - Inconsistencies in "taioba" identification by market vendors during the interview and subsequent plant collection.

Species selected in the questionnaire	Species collected	Number of market vendors	Percentage of market vendors
C. esculenta	*X. taioba*	1	16.67%
C. esculenta	*L. gigantea*	1	16.67%
L. gigantea	*X. taioba*	1	16.67%
X. taioba	*L. gigantea*	1	16.67%
C. esculenta	Both	1	16.67%
L. gigantea	Both	1	16.67%

Table 4. Inconsistencies in *taioba* identification by market vendors during the interview and subsequent plant collection

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