



Examining the Oral Preference on Hedonic Likings and Its Impacts on Sales and Pricing of Different Bamboo Shoots and Their Processed Forms in Arunachal Pradesh, India

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Abstract

An investigation was made to understand the relationship between the sensory perception of residents of Arunachal Pradesh and their preference for bamboo shoots from the following species: *Bambusa balcooa* Roxb., *Bambusa pallida* Munro, *Bambusa tulda* Roxb., *B. vulgaris* Schrad. Ex J.C. Wendl, *Dendrocalamus giganteus* Munro, *Dendrocalamus hamiltonii* Nees & Arn. ex Munro, and *Phyllostachys bambusoides* Siebold and Zucc., and their processed products namely *Hidung*, *Eup* and *Ekung*. Interviews were conducted among 250 participants who were given the freedom of choice to rate hedonic likings on Taste, Flavour and Texture. On this basis, an assessment was also carried out to establish the observed preferences and their influence on sales and prices of the food from the period of 2011-12, 2012-13 and 2013-14. The strongest association, which affects the price and volume of sales of bamboo shoots as well as the processed forms, was found to be related in order of texture, followed by taste and flavour.

Keywords: Arunachal Pradesh, Bamboo shoots, Hedonic likings, Sales, Sensory evaluation

Introduction

Genes, environment, social and cultural influences, as well as food accessibility, all influence how we perceive food (Pieniak *et al.*, 2022). Our sensory perceptions like taste, flavour and textures also greatly influenced the type of food we eat. It adds a great amount of contribution to producing enzymes within our body. It has been demonstrated that visual sensory inputs also significantly influence on our psychology in increasing the fascination and acceptability of foods (Chen and Rosenthal, 2015). Though food craving is often associated with the cognitive and emotional state of an individual, some theory suggested that sometimes through our senses we crave foods that are rich in nutrients that our body needed at the time of deprivation (Meule, 2020). This perhaps could have played a key role in the areas where there is a lack of food but people stay nutritionally balanced through consumption of the wild edibles. In Asia, bamboo shoot is one of the wild edibles that are eaten by

all. Nowadays, people value the newly emerged bamboo shoots for their deliciousness and nutritional value all over the globe. However, there is a huge disadvantage of bamboo shoots as they are seasonal, perishable and short-lived (3-4 days). The light brown sheath begins turning green as soon as the tip of the shoot emerges from the soil and cavities start to form as a result of the growth of photosynthetic activity. The taste then turns bitter, the texture turns more fibrous and the shoot's value as a vegetable is reduced (Su *et al.*, 1965). In a remote and economically backward region like Arunachal Pradesh, wild edibles play an important role in filling the gap in food sources from time immemorial. Inter alia, bamboo shoot is one of the major seasonal wild edibles that are enjoyed by all age and ethnic groups of the state. It can be mentioned that the bamboo resource of the region is one sector where socio-economic development has very large prospects (Basumatary *et al.*, 2015). Nutritious bamboo shoots from a variety of species and different forms of bamboo shoot processed products

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are consumed as a delicacy in the state (Sadananda *et al.*, 2021; 2023). The problem is that all bamboo shoots are not palatable as most of them bear bitterness in taste as some studies directed towards the presence of HCN (Ding and Wang, 2018). Further study established that phenylalanine, L-ornithine, tryptophan, uridine, and adenine appear to contribute significantly to the bitterness of bamboo shoots, with L-phenylalanine being the main contributor (Gao *et al.*, 2019). Throughout the globe, many detailed studies have been done regarding the prospect of food by sensory evaluation on commercial scales but such studies with respect to indigenous food, people and their acceptability are meager. According to Román *et al.* (2017), consumers anticipate natural products to be healthful, pleasant, fresh and environmentally friendly. So, we carried out a study to understand how much the olfactory and mouth-feel senses influenced the consumption and sales of bamboo shoots and their processed products in forms of fermented and dried materials available in the capital district by the tribal communities inhabiting the state.

Materials and Methods

Papumpare district, Arunachal Pradesh, India was considered for the study. It is also the administrative district of Arunachal Pradesh and the state's capital Itanagar also comes under this district. It is centred in latitudes 27°17'19" N and longitude 93°70'29" E. The total geographical area is 3462 sq. km and annually receives rainfall about 3284 mm. As per 2011 census, the total population of the district stands at 1,76,573 and the dominant tribe is *Nyshi*.

The survey was made in the selected marketplaces and random households of the Papumpare district during the bamboo shoot production season, *i.e.*, May-Aug and November-February for the shoot offseason. Data on the number of gross sales as well as prices were gathered from 137 active vendors (Itanagar - 55, Naharlagun - 28, Doimukh - 19, Nirjuli complex - 17, Balijan - 8, Sagalee - 6, Kimin - 4) and 40 proxy markets of big and small scales (Itanagar - 18, Naharlagun - 12, Doimukh - 6, Nirjuli complex - 4) of Papumpare district, Arunachal Pradesh. Proxy vendors are those sellers who occasionally appear for a short few days and sales are restricted only to bamboo shoots and their other processed products. Depending on market flow of frequency and volume of sales they made, they were subdivided into two categories for the convenience of the present study: (a) big-scale proxy vendors and (b) small-scale proxy vendors. The former approximately makes the selling of 40-50 kg day⁻¹ (both fresh and processed combined) and appeared at a frequency of around 4 to 5 times during peak shoot season (June-July) and the latter makes the selling of 10-20 kg day⁻¹ and an appearance of 8-10 times month⁻¹ on the periphery of any major market. Although there are 10 circles within the district, the main commercial hub lies within these mentioned zones and all the important economic activities are also usually carried out in these places.

A suitable questionnaire was designed to gather information on the preference for bamboo shoots and processed form

purely based on olfactory and mouth-feel responses. The sensory evaluation test was made based on the taste, flavour and texture of the succulent shoots and processed products to analyse the impact of each item on their sales and their valuation in the market. The test was done with help of a hedonic scale which credits 9 points, where 1 point is taken as the extremely not preferred and 9 points as extremely preferred. A total of 250 (n=250) random persons were selected based on their understanding of the shoot and processed products to give an unbiased result from year 2011 to 2014. Statistical analyses were carried out using SYSTAT Ver 13.0 software for understanding their significant levels (one-way ANOVA). In order to understand the association and influence between the sensory evaluation test with trades of the bamboo shoots and processed products during three study years, correlation was also calculated.

Proximate analysis of the total amount of sales annum⁻¹ and market value of the shoots of each species and processed products were done for three successive years (2011-12, 2012-13 and 2013-14). Seven bamboo species namely, *Bambusa balcooa* Roxb., *Bambusa pallida* Munro, *Bambusa tulda* Roxb., *B. vulgaris* Schrad. Ex J.C. Wendl, *Dendrocalamus giganteus* Munro, *Dendrocalamus hamiltonii* Nees & Arn. ex Munro, and *Phyllostachys bambusoides* Siebold and Zucc., and processed products of tender bamboo shoots, such as *Hidung*, *Eup* and *Ekung* (Figure 1) were selected were selected for the study. The preparation of three processed forms are traditional and well documented (Sadananda *et al.*, 2023). Each bamboo shoot of the seven selected species and three processed products were weighed in the field as well as in the laboratory and their relative prices tagged in the market were calculated and then expressed in Rs. kg⁻¹.

Results and Discussion

Sensory Evaluation

1. Taste

The relative values obtained for this category from seven selected species namely *B. balcooa*, *B. pallida*, *B. tulda*, *B. vulgaris*, *D. giganteus*, *D. hamiltonii*, and *P. bambusoides*, and three processed products namely *Hidung*, *Eup* and *Ekung* are presented in table 1. There was a significant variation in the taste values among the species (F=22.576, p<0.001), but insignificant among the processed forms (F=3.729, p>0.05). The maximum and lowest scores for the taste of fresh shoots were obtained by *P. bambusoides* (8.5) and *B. vulgaris* (4.7) respectively whereas the highest taste score from the processed product was recorded in *Eup* (8.4) followed by *Hidung* (8.3) and *Ekung* (7.2). Process products scored significantly higher than tender shoots of seven species (F=22.576, p<0.001).

2. Flavour

The evaluation on flavour of tender shoots and processed products yielded a set of results of varying degrees. The respective values are also presented in table 1 (The flavour was enumerated mainly based on the aroma in raw form, *i.e.*, when the item is not cooked). Significant differences in

Table 1: Sensory evaluation data of tender shoots of seven selected bamboo species and their processed products (n=250) (Mean ± SD)

| Bamboo Species | Taste | Flavor | Texture |
|---|-----------|-----------|-----------|
| <i>B. balcooa</i> Roxb. | 6.5 ± 1.0 | 5.4 ± 0.7 | 4.8 ± 0.4 |
| <i>B. pallida</i> Munro | 5.6 ± 1.0 | 5.0 ± 0.7 | 4.6 ± 0.5 |
| <i>B. tulda</i> Roxb. | 6.6 ± 1.7 | 5.6 ± 0.7 | 5.2 ± 0.9 |
| <i>B. vulgaris</i> Schrad. Ex J.C. Wendl | 4.7 ± 1.0 | 4.1 ± 0.6 | 3.4 ± 0.5 |
| <i>D. giganteus</i> Munro | 6.8 ± 0.8 | 5.5 ± 0.9 | 5.2 ± 0.6 |
| <i>D. hamiltonii</i> Nees & Arn.ex Munro | 7.8 ± 0.8 | 6.4 ± 0.8 | 6.0 ± 0.8 |
| <i>P. bambusoides</i> Marliac ex Carriere | 8.5 ± 0.7 | 8.3 ± 0.7 | 7.2 ± 0.7 |
| Processed products | | | |
| Hidung | 8.3 ± 0.7 | 8.3 ± 0.5 | 7.5 ± 0.8 |
| Eup | 8.4 ± 1.0 | 8.3 ± 0.7 | 8.4 ± 0.5 |
| Ekung | 7.2 ± 1.5 | 7.3 ± 0.7 | 6.7 ± 0.9 |

(Hedonic scale, 1: extremely not preferred; 9: extremely preferred)

flavour values among the tender shoots (F=31.522, p<0.001) and also among the processed forms (F=8.738, p<0.001) were observed. The greatest score in this category was given to *P. bambusoides* (8.3) for tender shoots and both *Hidung* and *Eup* (8.3 each) for processed products; whereas the lowest point was assigned to *B. vulgaris* (4.1) among tender shoots and *Ekung* (7.3) in processed products by the participants. The points were significantly higher in processed form than those of bamboo shoots (F=47.413, p<0.001).

3. Texture

Table 1 also provides the respective points scored by each tender shoots different species and three different

processed forms. All the bamboo shoots showed significant variation in texture values (F=32.426, p<0.001) and also among the processed forms (F=48.145, p<0.001). The ratings on texture were again given highest to *P. bambusoides* (7.2) and the lowest was assigned to *B. vulgaris* (3.4). Similarly, the significant variation of scores among the processed forms was also recorded (F=11.488, p<0.001) wherein the highest point was obtained by *Eup* (8.4) followed by *Hidung* (7.5) and *Ekung* (6.7). The texture points assigned by the participants also showed significantly higher in processed products than tender shoots of all considered species (F=48.145, p<0.001).

Market Price of Fresh Shoots and Processed Products

The respective prices of bamboo shoots of seven species and three different forms of processed products are listed in table 2. From the given data, it was evident that no sales of fresh tender shoots were made during the shoot off-season (Dec-Feb) irrespective of years. During the first survey year (2011-2012) the highest price from surveyed markets was recorded in *P. bambusoides* (Rs. 45.00 kg⁻¹); whereas, the lowest priced shoot was that of *B. vulgaris* (Rs. 25.00 kg⁻¹) among the tender shoots. Likewise, the higher prices for processed products were tagged from both *Eup* and *Ekung* (Rs. 70.00 kg⁻¹) and followed by *Hidung* (Rs. 50.00 kg⁻¹). The following survey year (2012-13) also showed the highest price assigned to tender shoots of *P. bambusoides* (Rs. 45.00 kg⁻¹) while the lowest price was associated with *B. vulgaris* (Rs. 30.00 kg⁻¹) in the markets of Papumpare district. The highest and lowest priced tender shoot was reported from *P. bambusoides* (Rs. 50.00 kg⁻¹) and *B. vulgaris* (Rs. 30.00 kg⁻¹) respectively during the final survey year (2013-14).

For the three processed products during the shooting season (May-Aug), the first survey year showed the higher prices tagged to both *Eup* and *Ekung* (Rs. 70.00 kg⁻¹) followed by *Hidung* (Rs. 50.00 kg⁻¹). During the second survey year, the same trend was observed but with an increase of Rs. 10.00 kg⁻¹ each for both *Eup* and *Ekung*; however, the price of *Hidung* remained unchanged (Rs. 50.00 kg⁻¹). Highest to

Table 2: Approx. market prices (Rs. kg⁻¹) of fresh tender shoots of the seven bamboo species and processed products of tender shoots in Papumpare district of Arunachal Pradesh

| Species/ Category | Shoot season (May-Aug) | | | Shoot off season (Dec-Feb) | | |
|---|------------------------|---------|---------|----------------------------|---------|---------|
| | 2011-12 | 2012-13 | 2013-14 | 2011-12 | 2012-13 | 2013-14 |
| <i>B. balcooa</i> Roxb. | 30 ± 8 | 35 ± 5 | 35 ± 8 | NA | NA | NA |
| <i>B. pallida</i> Munro | 30 ± 4 | 35 ± 5 | 40 ± 7 | NA | NA | NA |
| <i>B. tulda</i> Roxb. | 35 ± 3 | 40 ± 4 | 45 ± 4 | NA | NA | NA |
| <i>B. vulgaris</i> Schrad. Ex J.C. Wendl | 25 ± 5 | 30 ± 3 | 30 ± 5 | NA | NA | NA |
| <i>D. hamiltonii</i> Nees & Arn.ex Munro | 35 ± 5 | 40 ± 3 | 45 ± 5 | NA | NA | NA |
| <i>D. giganteus</i> Munro | 30 ± 5 | 37 ± 5 | 40 ± 4 | NA | NA | NA |
| <i>P. bambusoides</i> Marliac ex Carriere | 45 ± 7 | 45 ± 5 | 50 ± 3 | NA | NA | NA |
| Processed products | | | | | | |
| Hidung | 50 ± 3 | 50 ± 6 | 60 ± 3 | NA | NA | NA |
| Eup | 70 ± 5 | 80 ± 5 | 90 ± 7 | 70 ± 5 | 80 ± 4 | 100 ± 6 |
| Ekung | 70 ± 5 | 80 ± 5 | 90 ± 4 | 80 ± 5 | 90 ± 6 | 100 ± 5 |

lowest prices of products were seen as *Eup* and *Ekung* (both Rs. 90.00 kg⁻¹) and followed by *Hidung* (Rs. 60.00 kg⁻¹) during the final survey year.

During the shoot-off seasons (Dec-Feb), only two products namely *Eup* and *Ekung* were seen doing business in all the aforesaid markets for all the survey years. The prices ranged between Rs. 70.00-90.00 kg⁻¹ for *Ekung* and Rs. 80.00-100.00 kg⁻¹ for *Eup* during the three successive survey years 2011-2012, 2012-2013 and 2013-2014, respectively.

Annual Sale of Fresh shoots and Processed Bamboo Shoots

The total annual sales of selected bamboo shoots namely *B. balcooa*, *B. pallida*, *B. tulda*, *B. vulgaris*, *D. giganteus*, *D. hamiltonii* and *P. bambusoides* along with the other three processed products, viz., *Hidung*, *Eup* and *Ekung* in terms of tonnes per annum is presented in table 3. There were no sales of the fresh tender shoot during the shoot-off seasons due to non-availability. During the first survey year (2011-12), there was the highest sale of fresh shoots of *P. bambusoides* (115.3 tonnes year⁻¹) and the lowest by *B. vulgaris* and *B. balcooa* (34.3 tonnes year⁻¹) with a total sell of tender shoots of all seven species with 512.4 tonnes year⁻¹. Whereas, the second study year (2012-13) recorded the highest sales by *D. hamiltonii* with 139 tonnes year⁻¹ and the lowest sale was observed in *B. vulgaris* (34 tonnes year⁻¹). The total sales of fresh bamboo shoots during this study year increased from the first study year (607.6 tonnes year⁻¹). Similarly, for the third study year (2013-14), the highest sales were recorded in *D. hamiltonii* (165.6 tonnes year⁻¹) and the lowest sale was observed in *B. vulgaris* (35.6 tonnes year⁻¹), with a total sales of seven fresh bamboo shoots to the tune of 674.3 tonnes year⁻¹.

In the case of processed products, roasted bamboo shoot namely *Hidung* was sold during shoot season, where the

rate of sales increased dramatically during the three studied years. While for *Eup*, the highest sale was recorded during shoot season than the shoot offseason, whereas the greatest sale of *Ekung* was observed during shoot off season than the shooting season. The sale of *Hidung* and *Eup* during the shooting season was higher than *Ekung* during the year 2011-12; whereas, the highest sale of *Eup* was recorded (45 tonnes year⁻¹) followed by *Hidung* and *Ekung* during 2012-13 with 30.0 and 16.3 tonnes year⁻¹, respectively. During the third study year (2013-14), the highest sale was recorded in *Hidung* (49.3 tonnes year⁻¹) followed by *Eup* (44.3 tonnes year⁻¹) and the least sale was recorded in *Ekung* (16.3 tonnes year⁻¹).

During the shoot offseason, the sale of both *Eup* and *Ekung* increased from the first study year to the third study year. The sale of *Eup* was to the tune of 16.3, 16.7 and 23.7 tonnes year⁻¹ during the year 2011-2012, 2012-2013 and 2013-2014, respectively. In case of *Ekung*, there was a sale of 42.7, 47.7 and 56.3 tonnes year⁻¹ for three respective studied years (2011-12, 2012-13 and 2013-14). There was a significantly high sale of fresh tender shoots than the processed products during all three study years.

Influence of Olfactory and Mouth-Feel Senses on Prices and Sales

For consecutive study years, i.e., 2011-2012, 2012-2013 and 2013-2014, the strongest correlation between prices can be established with texture ($r = 0.95, 0.97$ and 0.92 , respectively) followed by flavour ($r = 0.95, 0.94$ and 0.86 , respectively) and lastly by taste ($r = 0.64, 0.55$ and 0.59 , respectively) of the fresh shoots. However, no positive correlation could be established between the sensory tests and pricing of three processed products.

Moderate levels of positive correlation were seen in sales

Table 3: Total sale of fresh (approx.) of seven bamboo species and processed products of tender shoots in Papumpare district of Arunachal Pradesh (tonnes year⁻¹)

| Species/ Products | Shoot season (May-Aug) | | | Shoot-off season (Dec-Feb) | | |
|---|------------------------|---------|---------|----------------------------|---------|---------|
| | 2011-12 | 2012-13 | 2013-14 | 2011-12 | 2012-13 | 2013-14 |
| <i>B. balcooa</i> Roxb. | 34.3 | 50.7 | 53.9 | NA | NA | NA |
| <i>B. pallida</i> Munro | 99.1 | 88.9 | 106.1 | NA | NA | NA |
| <i>B. tulda</i> Roxb. | 80.6 | 70.0 | 90.0 | NA | NA | NA |
| <i>B. vulgaris</i> Schrad. Ex J.C. Wendl | 34.3 | 34.0 | 35.6 | NA | NA | NA |
| <i>D. giganteus</i> Munro | 95.2 | 103.9 | 104.2 | NA | NA | NA |
| <i>D. hamiltonii</i> Nees & Arn. ex Munro | 54.0 | 139.0 | 165.6 | NA | NA | NA |
| <i>P. bambusoides</i> Marliac ex Carriere | 115.3 | 121.1 | 118.9 | NA | NA | NA |
| Sub-total | 512.8 | 607.6 | 674.3 | | | |
| Processed products | | | | | | |
| Hidung | 24.7 | 30.0 | 49.3 | NA | NA | NA |
| Eup | 27.7 | 45.0 | 44.3 | 16.3 | 16.7 | 23.7 |
| Ekung | 14.7 | 16.3 | 16.3 | 42.7 | 47.7 | 56.3 |
| Sub-total | 67.1 | 91.3 | 109.9 | 59.0 | 64.4 | 80.0 |
| Grand total | 579.3 | 698.9 | 784.2 | 59.0 | 64.4 | 80.0 |



(a) Bamboo-processed products



(b) Hidung



(c) Eup



(d) Ekung

Figure 1: Showing the different processed products prepare from bamboo shoots: (b) Hidung, (c) Eup and (d) Ekung

with sensory factors in all three years. Not surprisingly, the strongest deciding factor was texture, followed by the taste and flavour. For all studied years, positive correlation was observed between Texture ($r = 0.6, 0.81$ and 0.72 , respectively), taste ($r = 0.45, 0.8$ and 0.72 , respectively) and flavour ($r = 0.56, 0.72$ and 0.61 , respectively).

Unlike the case in price, a very strong influence on the amount of sales can be seen affected by the sensory evaluation inputs received from the processed products as provided by the participants. A little to no difference were observed in all three studied years. On an average the strongest correlation was shown by taste ($r = 0.98, 0.88$ and 0.97 , respective to three study years) followed by flavour ($r = 0.97, 0.85$ and 0.99 , respectively) and lastly by texture (r

$= 0.94, 0.99$ and 0.75 , respectively).

According to the present study, processing greatly improved the taste, flavour, and texture of bamboo shoots, which is consistent with the findings of Chongtham *et al.* (2011) that again is supported by observation made by other researchers (Choudhury *et al.*, 2012; Nongdam and Tikendra, 2014). It may be explained due to the reduction in the concentration of cyanogenic glycoside “taxiphyllin” while processing the bamboo shoots for a long time. Additionally, the tenderness of shoots is also increased during fermentation due to the breakdown of tissues by microorganisms involved in the fermentation process.

Furthermore it provided insights into the relationship between the sensory parameters and the prices of fresh

tender shoots and processed products. The lowest points for three considered sensory parameters were assigned to shoots of *B. vulgaris* which was reflected with less in the gross sales. Among the bamboo shoots, *P. bambusoides* and *D. hamiltonii* were ranked first and second respectively for three consecutive study years in a hedonic scale chart made based on their taste, flavour and texture which again resulted in their higher sales compared to other species. It is not surprising that texture was more of the dominant deciding factor than taste and flavour in terms of acceptability of shoots and processed forms. It may be brought to the notice towards the well-established fact that as bamboo shoots have low fat content, its taste and flavour might diminished greatly as they are only consumed by boiling as the major diet habit of the tribes residing in the state preferred this way. The acceptance on shoot on the basis of textural preferences can be explained as per Chen and Rosenthal (2015), also opined that consumer acceptance and commercial value are significantly influenced by the texture of food products. This is particularly true with respect to the North-eastern India, where little to no value addition on bamboo shoot products take place (Choudhury *et al.*, 2012). One important aspect of the texture in foodstuff is that it may amplify the perception of acceptability as it can be perceived from the optical cues also (Escobar *et al.*, 2022). The typical food habit and culture of tribal of the state also come into play a bigger role as their preference may not simply overlooked by their simple living. Texture of a food is not only the mouth-feel perception. As Wood (2023) described that textural preference vary from a region to another and also greatly influenced by the respective cultures of a geographical area.

The sudden increase in the sales of *D. hamiltonii* during the year 2011-12 to 2013-14 was mainly due to the gregarious flowering of the said species in previous years 2008-2010 (Dilip *et al.*, 2017). Thus the sales recorded in the first survey year (2011-12) were very low compared to the second and third study years. This is a well-known phenomenon and also a proven fact that there is no shooting during and aftermath of gregarious flowering as the mother plant dies after flowering. It is when mysterious pockets or groups of clumps of *D. hamiltonii* that did not flower during that period could subsidize little resources as tender shoots were available for sale in limited quantity. This particular phenomenon was also reported in *M. baccifera* and those patches were documented as “*Mauhak*” in Mizoram (Sadananda *et al.*, 2010). The following survey years observed the business of *D. hamiltonii* resuming normal trade. This might be because of the new shooting from the completely new cohorts of the species that died and regenerated during the first wave of the flowering year in 2008. Another reason that may affect the sales is the sizes and availability of shoots. The number of sales for *Eup* was reportedly higher than that of *Ekung* during the shoot on season; whereas the case was the opposite during shoot offseason. The only possible explanation for it would be the choice of diet by the tribal communities of the Papumpare district with an assemblage of other seasonal foods. The higher price tagged for the processed products

were due to the simple fact that it was processed and a large amount labour went onto preparation. The novel methods has also advantaged as Dabas and Kumar (2018) added that the primary benefit of this method is that the shoot can be preserved near the harvest location without requiring maintenance of low storage temperatures or the use of chemicals. This shields the tender shoots from potential deterioration that may happen if they were left outside in an unclean environment.

The pricing and purchase volume could be determined more precisely with a systematic approach if it were in a well establish market chain system as Halagundegowda *et al.* (2022) asserted that a region’s level of price transmission for a given good is influenced by several variables, such as trade volume, transaction costs, trade regulations, pricing information accessibility, and market infrastructure.

Conclusion

Our study closes the knowledge gap about how tribal communities in Arunachal Pradesh perceive and prefer eating bamboo shoots and its processed forms. From the study, it can be inferred that, out of the three sensory evaluation tests used to create the connection in attracting locals’ attention, texture plays the most significant function. However, the other two crucial qualities, *i.e.*, taste and flavour also cannot be ruled out as much lesser influencing factor. According to the participants, *P. bambusoides* is ranked at the highest level since it bears little sweetness in taste. From a naturalist standpoint, bamboo shoot has enormous potential for supplying nourishment where food supplies are scarce as they are nutritious and emerged as a potential food that can fill the gap of food as well as nutritional security of our globe in general and our country in particular. It has the upper hand as they are great carbon sequester as they tend to grow at a very fast rate and require minimum managements. The shoots can be widely traded and can generate enormous profits with value addition and good packaging. The rich nutritional profile can be highlighted that can greatly boost on the sales of bamboo shoot in today’s ginormous competitive market.

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