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Ethnobotany of local banana (*Musa* spp.) in Sentani community and its proximate analysis in Jayapura District, Papua, Indonesia

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Abstract. *Zebua LI, Purnamasari V, Suharno. 2025. Ethnobotany of local banana (*Musa *spp.) in Sentani community and its proximate analysis in Jayapura District, Papua, Indonesia. Asian J Ethnobiol 8: 149-157.* The proliferation of banana cultivation spans the entirety of Indonesia, with each distinct area showcasing a diverse array of indigenous variants. The distribution of bananas in Papua is quite extensive, and has significance for local communities who still depend on local foodstuffs. Therefore, this study was conducted to determine the use of local banana varieties based on the knowledge of the Sentani people. The morphological attributes and nutritive composition inherent to native Papuan bananas were analyzed through physical characteristics and proximate analysis (moisture content, ash content, crude fiber, fat content, protein content, and total carbohydrates). Furthermore, descriptive, qualitative, and quantitative methods were used, and the locations were based on purposive sampling in Ayapo, Yahim, Harapan, Doyo, and Netar Villages. The results showed that the Sentani people recognized t10 local banana varieties, namely *Anakhola*, *Aomang*, *Buwakhu*, *Emfofo*, *Hoyombi*, *Keija*, *Molonsi*, *Olowambu*, *Remuhu*, and *Wabulu*. Bananas, beyond their nutritional value, played a significant role in traditional ceremonies, serving as food ingredients, delivery materials during traditional engagement parties and weddings, and gifts for grieving families. The results of the proximate analysis indicated a significant difference ($p < 0.05$) in protein content between the banana varieties. However, there were no significant differences in fat, moisture, ash content, or carbohydrate content ($p < 0.05$). Protein levels in a row from the highest were found in *Buwakhu, Emfofo*, *Hoyombi*, *Keija*, and *Remuhu*.

Keywords: Ethnobotany, local bananas, proximate, Sentani, Sentani community

INTRODUCTION

Bananas are multi-purpose plants, starting from roots, stems (humps), pseudostems (midribs), leaves, flowers, and fruit used for various purposes (Kumari et al. 2023; Suharno et al. 2025). Banana is a tropical plant that grows throughout the year in an environment with an average annual rainfall of 650-750 mm, temperatures ranging from 15 to 35°C, and relative humidity levels between 75-85%. Of the total banana crop in the world, most cultivation is done in India (31.5%), followed by China (11.5%), Indonesia (8.2%), Brazil (6.6%), Ecuador (6.2%), Philippines (6%), Guatemala (4.4%), Angola (4.1%), Tanzania (3.4%), Costa Rica (2.5%), and other tropical countries (15.6%) (Badanayak et al. 2023). In Indonesia, banana is planted by the community as garden plants or plantations on a small scale. The fruits (*Musa* spp.) contain a high source of carbohydrates, minerals, vitamin B6, and vitamin C. The nutritional content contained in ripe bananas includes potassium and vitamin A. Furthermore, carbohydrates are also used to store muscle glycogen reserves (Wulandari et al. 2018; Hapsari et al. 2024).

Bananas are one of the most important fruit commodities in Papua and are identified as *Musa* ×*paradisiaca* L., family Musaceae, and Order Zingiberales. A total of 12 species have been recorded in Indonesia from the 66 species of bananas in the world (Widjaja et al. 2014; Zebua et al. 2023). The plants are suitable for growing in tropical areas and can bear fruit in the year. Bananas have many varieties, including *Ambon*, *Ataka*, jackfruit, *kepok*, milk, plantains, rhinoceros, and sparrow bananas (Poerba et al. 2016; Riandini and Astuti 2020; Riandini et al. 2021).

Ethnobotany studies on bananas have been carried out with different perspectives and objectives. Kasrina and Zulaikha (2013) investigated on diversity and ethnobotany of bananas (*Musa* spp.) in the community of Sri Kuncoro Village, Pondok Kelapa Sub-district, Central Bengkulu District, Indonesia. Furthermore, Hapsari and Lestari (2016) examined an ethnobotanical study of banana diversity in six areas in Java. One of the local wise of agricultural cultivation, specifically food crops, is the development of local knowledge in recognizing and identifying these varieties of plants (Zebua and Waluyo 2016; Amelia et al. 2018). Identification has been carried out by humans to distinguish one plant from another based on certain characteristics (Purnamasari et al. 2020; Riandini and Aastuti 2020; Riandini et al. 2021). Banana is a fruit plant that has high diversity with the ability to grow and adapt to an environment of high rainfall and a variety of habitat types (Sunandar and Kurniasih 2019; Hapsari et al. 2024; Suharno et al. 2025).

The ability of the plants to interact with genetic factors results in an abundance of banana species, specifically in terms of providing food sources (Zulfahmi et al. 2024; Suharno et al. 2025). In some areas, bananas are a source of local food diversification, processed into flour (Zulfahmi et al. 2024). The Sentani community inhabits the entire area of Lake Sentani, and to meet daily needs, the people work

their fields by planting bananas, sweet potatoes, and vegetables (Widjaja et al. 2014). In this community, bananas have important cultural values, and besides being consumed and sold in the market, the plants are often used as payment for dowry. Therefore, several varieties are planted, namely *Aomang*, *Ebulu*, *Habili*, *Rotrowi* bananas, and *Yokholo* (Ondikeleuw et al. 2016).

The exploration of the potential of bananas as viable food sources remains unexplored. This study seeks to identify the indigenous banana cultivars and explore their uses based on the local wisdom of the Sentani community. This research is significant in elucidating the role of local bananas and their potential utilization as a local food source.

MATERIALS AND METHODS

Study area

This study was conducted in June-November 2023 in five observation villages around Lake Sentani, namely: Ayapo, Harapan, Netar (Sentani Timur Sub-District), Doyo (Waibu Sub-District), and Yahim (Sentani Sub-District) (02º30'639"-02º39'194"S 140º27'916"-140º35'237"E) (Figure 1). The locations of the villages were selected based on the presence of local banana varieties planted in the Sentani community gardens. The Sentani people mostly live around Lake Sentani and the buffer zone of the Cycloop Mountains Nature Reserve. Most of this area is open land and secondary forest. According to BPS-Statistics Indonesia of Jayapura (2025), this location is at an altitude of 80-100 masl, average temperature of 26°C, and air humidity of 77%, with rainfall of 2,868 mm/year.

Data collection

Ethnobotanical survey

The designation of informants was conducted using a purposive sampling technique (Martin 2004; Nugraha et al. 2024). Informants were natives of Sentani, with an age range of 25-78, and individuals with knowledge about local banana varieties and their forms. Based on these criteria, 55 informants were obtained, consisting of banana farmers, sellers, and others from the general public around Lake Sentani.

The ethnobotanical survey was conducted through the interview method to obtain data on *Musa* spp. and the use of local bananas (Iskandar et al. 2018). The open-ended interview technique was used based on the interview guide prepared previously. The interview process was carried out at the house of the informant and in the field to show the specimen with the use of local bananas. The questions asked of the respondents were broadly related to community knowledge of local bananas, their use, their role in traditional events, their cultivation, processing, and marketing.

Collection of bananas

The acquisition of banana specimens and pertinent sample data was executed through a comprehensive approach involving both interview and exploratory methodologies (Iskandar et al. 2018). Specifically, this included engaging in structured interviews with a cohort of five distinguished key informants, possessing intricate insights into Sentani banana varieties. Data collection was supplemented through tracing and exploration of the study site's terrain, denoting the precinct of banana cultivation. This locale, intricately situated in the vicinity of domiciles and communal gardens encircling Lake Sentani, was examined to glean pertinent information. Specimens were taken from flowering and fruiting banana plants, and each individual was collected to make 3 to 5 duplicate specimens. The herbarium specimens were kept at the Laboratory of Biological Plant Systematics, Universitas Cenderawasih, Jayapura, Papua.

The banana specimens collected had complete morphological characteristics, including vegetative (pseudostems, leaves, and tillers) and reproductive parts (flowers, fruits, seeds). Morphological identification was carried out using the descriptor guidelines from the International Plant Genetic Resources Institute (IPGRI 1996). Identification included pseudostem, petiole, leaf, flower, and fruit characters.

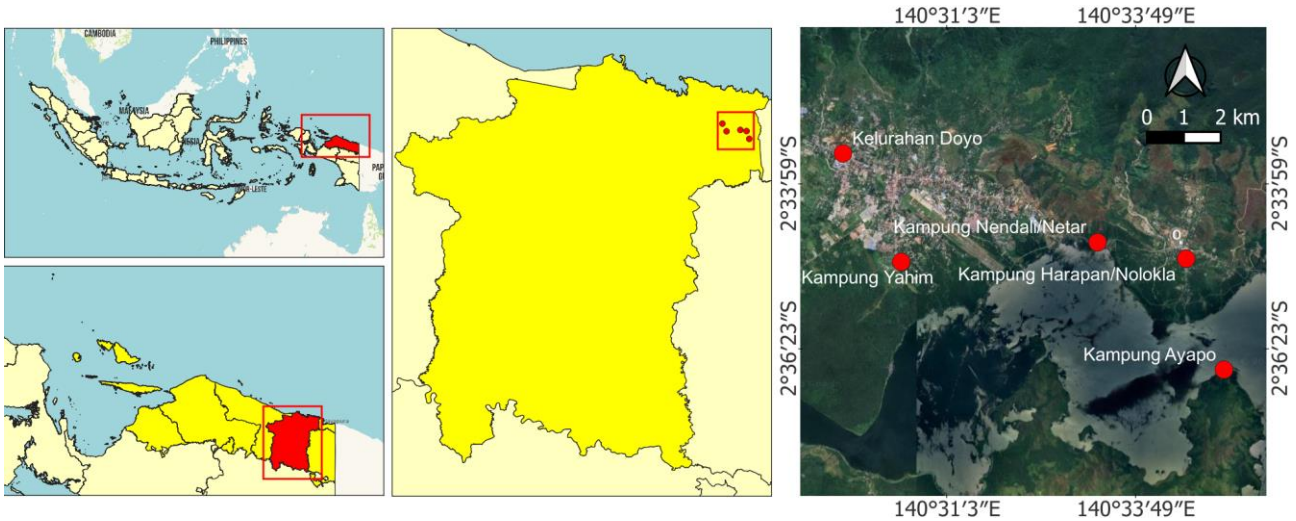

Figure 1. Location of local banana samplings in Sentani Sub-district, Jayapura District, Papua, Indonesia: Ayapo, Harapan, Netar, Yahim, Doyo

Proximate

An in-depth analysis of the chemical content of local bananas was conducted, including the assessment of nutritional components through the application of proximate analysis methodology (Khadijah 2019; Sihmawati and Rosida 2020). The aim was to quantitatively determine the principal constituents of a food ingredient based on their chemical constitution and functional attributes. The key components included water, ash, crude protein, crude fat, and non-nitrogenous mass categorized as carbohydrates.

Proximate test of ash, crude fiber, lipid, and protein was carried out as described by the official methods of the Association of Official Analytical Chemists (AOAC 2016). The analysis was conducted for five varieties of local bananas, Sentani, with three replicates. Moisture content was determined using a hot air oven and expressed as % (percent) (AOAC International 2016). Kjeldhal methods were used to determine the crude protein content (N X 6.25) (AOAC International 2016). Furthermore, total fat content was determined using the Soxhlet method and expressed as % fat on a wet basis. A known weight of the sample was extracted in petroleum ether (boiling point 40-60°C) using a Soxhlet (AOAC International 2016). Alkalinity and the gravimetric method were also used to determine the ash content in the samples and expressed as a % a wet basis (AOAC International 2016). The crude fiber was determined using the digestion method, and a known weight of the fat-free sample was digested with refluxing in 1.25% sulfuric acid and 1.25% sodium hydroxide (AOAC International 2016). The difference method was used for the determination of total carbohydrate content in the samples. The total percentages of ash, crude fiber, crude protein, fat, and moisture were subtracted from 100%.

Data analysis

Qualitative and quantitative analyses were used in this study. The data from the interviews were then recapitulated and transcribed into the qualitative analysis. Quantitative data obtained from interviews were presented in the form of a description of morphological analysis. The morphological analysis of banana varieties was tabulated in a table containing information on the local names, stems, leaves, and fruit morphology (Martin 2004; Iskandar et al. 2018). The results were expressed as mean ± standard deviation, and the significant differences between means were determined by one-way ANOVA with Tukey grouping at a 95% confidence level using SPSS version 15.0 (Landau and Everitt 2004).

RESULTS AND DISCUSSION

Community knowledge of local bananas

The results indicate that the Sentani community living around Lake Sentani is generally familiar with local banana varieties. This recognition is rooted in traditional knowledge, as reflected in the variety of local names for bananas. A majority of respondents (78.18%) are aware of local bananas, while 14.55% are not familiar with them. Furthermore, many understand the cultural significance of bananas: 90.91% acknowledge their role in customary practices, 81.82% recognize their use as part of dowries in marriage ceremonies, and 100% note their presence in mourning rituals and other traditional events. Additionally, 96.36% understand that bananas have economic value and are sold in traditional markets. However, awareness of banana species diversity is lower, only 50.91% of the community can distinguish different species, while 36.36% are unaware of this diversity. Interviews also reveal that 67.27% of community members cultivate local bananas, but others remain unsure or do not engage in cultivation (Table 1). This suggests that while awareness of bananas' cultural and economic roles is high, understanding and practices related to species diversity and cultivation remain limited.

Interview results suggest that knowledge of local banana diversity is mostly retained by traditional elders and older individuals (over 60 years old). At the same time, younger generations tend to have a more limited understanding. According to Suharno et al. (2016) and Zebua et al. (2020), communities in Papua remain highly dependent on natural resources in their environment. The transmission of knowledge to younger generations typically occurs through experiential learning, children are involved in daily activities such as hunting, gathering, and farming alongside their parents. This natural learning process also includes the transfer of cultivation practices. Maintaining this intergenerational transfer of knowledge is essential to ensure that children and their descendants continue to understand and preserve traditional knowledge sustainably.

Table 1. Community knowledge of local bananas in Sentani, Jayapura, Papua

Knowledge of communities on bananas	Community responses (%)		
	Understand	Hesitate	Not understand
People recognize Sentani's local banana fruit	78.18	7.27	14.55
People can distinguish species diversity based on local knowledge	50.91	12.73	36.36
People understand the importance of bananas in the customary system	90.91	0.00	9.09
The community knows the use of bananas in traditional ceremonies, such as for a complementary dowry	81.82	5.45	12.73
Knowing the use of bananas in other cultures, such as death ceremonies and other activities	100	0.00	0.00
Do they cultivate local bananas	67.27	14.54	18.18
Does the community also sell local bananas to the general public (in the market)?	96.36	1.82	1.82

The Sentani community considers local banana cultivars to hold great importance within their customary and cultural systems. In marriage traditions, certain banana cultivars, such as *Aomang* and *Keija*, are highly valued. The groom's family customarily offers these varieties to the bride's family during engagement ceremonies. In the event of a death in the community, family members and relatives bring offerings to the grieving family, and bananas are among the primary items shared. All available banana cultivars are given as a gesture of solidarity, aiming to ease the burden on the bereaved family (Figure 2) and ensure they have sufficient food during the mourning period (Figure 3).

However, the continued existence of these local banana varieties is at risk if cultivation practices are not sustained. According to Salas-Pascual and Cáceres-Lorenzo (2022), the spread of banana plants is largely driven by human intervention, especially for commercially popular varieties. This trend may threaten the survival of local cultivars, which often receive less attention and are at risk of being neglected or replaced.

In Papua, bananas remain an important source of food, especially fruit, and are also used in traditional ceremonies (Zebua et al. 2023; Suharno et al. 2025). Despite their cultural and dietary relevance, banana utilization is still relatively limited. Therefore, innovation is needed to develop bananas as a source of functional food and to explore their potential in processed products. In addition, further information on their nutritional content and physicochemical properties is essential to harness their potential fully.

Diversity of Sentani local bananas

Based on the results in five villages and interviews with key informants, it was discovered that the Sentani community utilizes 10 distinct local banana varieties. The community recognizes these bananas, cultivated over a long period, and recognizes local varieties based on fruit morphology (Figure 4; Table 2). The Sentani community's classification of local bananas is based on morphological characteristics, including leaf texture, fruit tip shape, fruit taste, number of combs in one bunch, and how to use the fruit. The plants had important cultural values beyond their consumption and sale at the market. Local bananas are often used as a means of paying dowry, a tradition that underscores the community's rich cultural heritage and traditions. Hence, the community always plants several cultivars in their gardens.

Table 2. The morphological diversity of bananas based on the local knowledge of the Sentani community

Local name	Morphological characters				
	Leaf texture	Fruit tip shape	Fruit taste	Av. no, of bananas in a bunch	How to process fruit
Anakhola	Thick	Acuminate	Sweetness	3	Boiled
Aomang	Thick	Rounded	Soursweet	8	Boiled
Buwakhu	Intermediate	Acuminate	Sour	4	Eaten immediately
Emfofo	Thin	Rounded	Sour	6	Boiled
Hoyombi	Thick	Rounded	Soursweet	4	Boiled
Keija	Intermediate	Acuminate	Sweetness	7	Boiled
Molonsi	Thin	Acuminate	Bittersweet	6	Boiled
Olowambu	Thick	Rounded	Sweetness	7	Eaten immediately
Remuhu	Thin	Acuminate	Sweetness	2	Boiled
Wabulu	Thick	Acuminate	Sour	6	Boiled

Figure 2. Various varieties of local Sentani bananas at the mourning event in Yoboi Village, Sentani

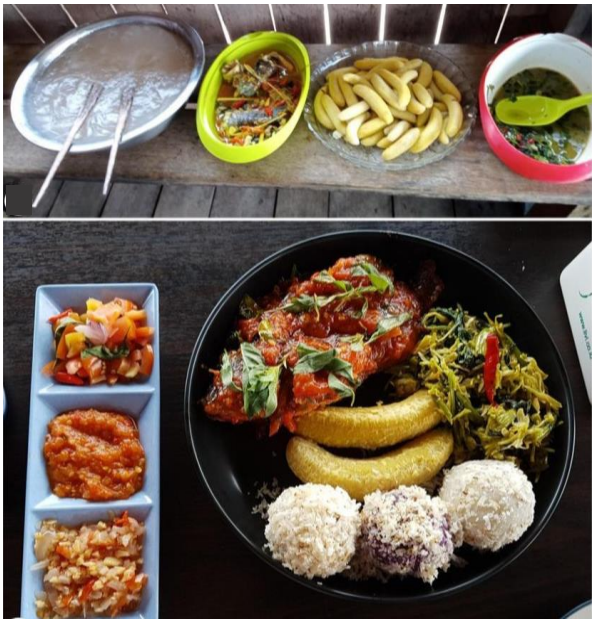

Figure 3. Keija banana, traditionally used as the main food ingredient in traditional events of the Sentani community, is now starting to be used as a food ingredient for the general public with diabetes in one of the Lake Sentani restaurants

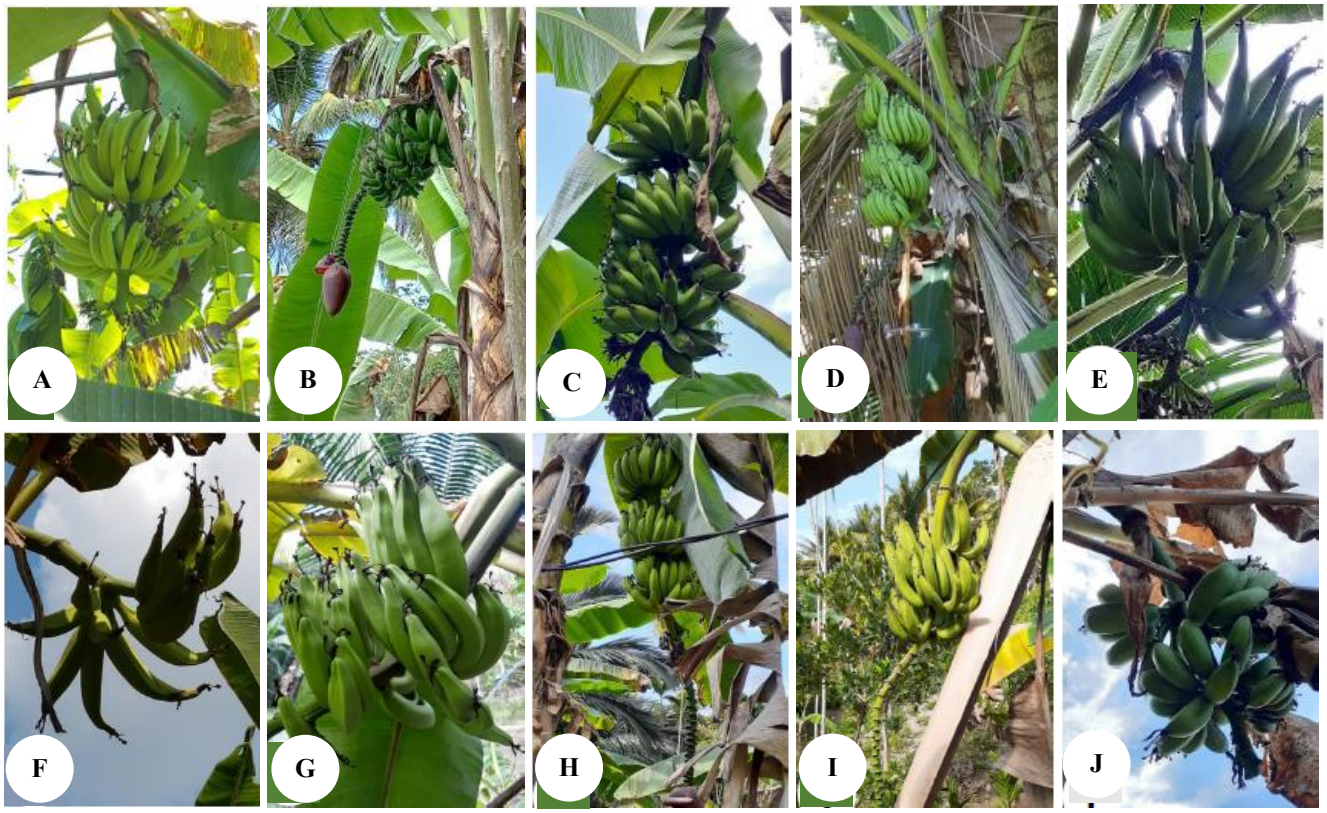

Figure 4. The Sentani community uses local banana varieties. A. *Keija*, B. *Aomang*, C. *Emfofo*, D. *Buwakhu*, E. *Anakhola*, F. *Remuhu*, G. *Molonsi*, H. *Olowambu*, I. *Wabulu*, J. *Hoyombi*

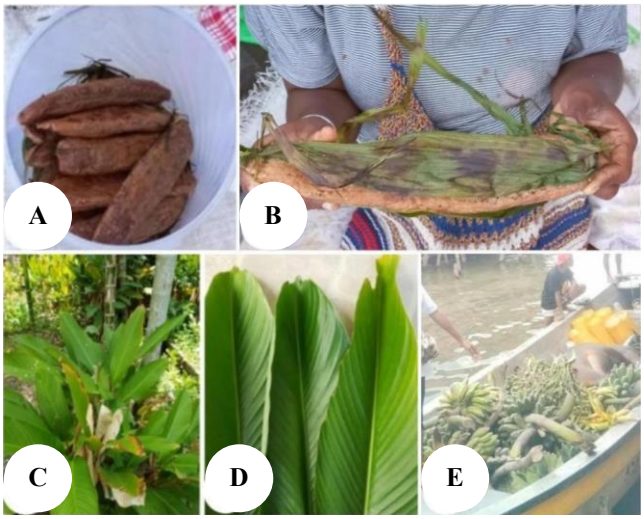

Figure 5. The use of Sentani local banana varieties. A. Grilled sago with *Aomang* bananas mixture, B. Grilled sago wrapped in wrapping leaves, C-D. Habitus and leaf blade of *Marantaceae*, E. Various varieties of local Sentani bananas in the mourning event

The cultivation of bananas is considered a longstanding tradition within the Sentani community. Local bananas are recognized and named based on their morphological characteristics (Figure 4). According to Purnamasari et al. (2020), Weihan et al. (2020), and Trimanto et al. (2022), when genetic factors exert a greater influence than environmental factors, variations in morphological characteristics among plants across diverse locations are constrained. However, plants cultivated under disparate environmental conditions exhibit a broader spectrum of morphological traits when environmental factors hold a more prominent sway than genetic factors. The extensive diversity observed in bananas exacerbates the challenge of encountering instances where distinct genomes share identical nomenclature.

The genus *Musa* has 66 species worldwide and is native to Southeast Asia, considered the main center of banana diversity. The species was originally domesticated in this region. Furthermore, 12 species were recorded with various cultivars, and only 20 varieties (landraces) were registered in Indonesia (Widjaja et al. 2014; Mukhoyyaroh and Hakim 2020).

The genus *Musa* is divided into five sections, namely *Australimusa* (2n=20), *Callimusa* (2n=20), *Ingentimusa* (2n=14), *Musa*/*Eumusa* (2n=22), and *Rhodochlamys* (2n=22). Wild and cultivated bananas (edible bananas) originated from the *Eumusa* section. Cultivated bananas are devoid of seeds, while their wild counterparts typically possess seeds with a modest quantity of fruit flesh and tend to thrive within forested areas or at the fringes of such environments. The wild banana species include *Musa acuminata* Colla (genome A) and *Musa balbisiana* Colla. Currently, the B genome is the ancestor of cultivated bananas (Ortiz and Swennen 2014; Poerba et al. 2016).

There are at least 15 varieties of *M. acuminata* in Indonesia, which are distributed from the western part to the eastern part. Bananas have developed into various varieties (diploid AA and triploid AAA) and hybridized with *M. balbisiana* to become AAB and ABB. Among the myriad cultivars documented worldwide, Indonesia contains an impressive assemblage of over 200 indigenous varieties cultivated across its expansive territory. These cultivars remain in their pristine state, untouched by deliberate enhancement or selective breeding processes (Notanubun and Karuwal 2014; Poerba et al. 2016; Trimanto et al. 2022; Zebua et al. 2023).

The Sentani community recognizes 10 local banana varieties based on fruit characteristics. As food, local bananas are sold in traditional markets around Jayapura between 20,000-50,000 IDR per pile (1 USD = 16,500 IDR), while a bunch is sold for 10,000-30,000 IDR. Based on the local wisdom of the Sentani community, local bananas are used as food, a delivery tool in a marriage proposal ceremony, a delivery tool at a mourning event, and the first plant when farmers want to start a new garden (Figure 5). In traditional restaurants, *Keija* bananas are processed by boiling, then served together with fried tilapia fish (*Oreochromis mossambicus* (Peters, 1852)) covered with tomato sauce (*Solanum lycopersicum* L.) and chili (*Capsicum frutescens* L.), boiled taro (*Colocasia esculenta* (L.) Schott) finely ground and mixed with grated coconut (*Cocos nucifera* L.), and sauteed papaya flowers (*Carica papaya* L.) and water spinach (*Ipomoea aquatica* Forssk.).

Keija is served using unripe bananas (*mengkal*), and according to the Sentani community, the half-ripe fruit has a better taste and is not too sweet, while the ripe *Keija* tastes sour. *Keija's* dish emerges as highly compatible with individuals harboring an aversion to rice consumption. This compatibility is attributed to the harmonious amalgamation of *Keija* bananas and taro (*C. esculenta*), which is a viable surrogate for the conventional rice offering. According to Putri et al. (2015), bananas, consumed ripe or unripe, are one of the most significant sources of calories. Bananas with yellow and orange flesh are also rich in provitamin A and other carotenoids. The fruits have the potential to overcome muscle fatigue due to the simple and complex carbohydrates as an energy source. Bananas contain carbohydrates in the form of sucrose, fructose, glucose, and fiber (Wulandari 2014; Putri et al. 2015). Furthermore, bananas garner recommendations as a favored fruit amongst athletes due to their substantial carbohydrate content and a rich complement of B vitamins. This unique nutritional profile facilitates the expeditious provision of energy, catering to the swift demands of athletic endeavors (Syarif et al. 2017).

The presentation of bananas with papaya flowers in the Sentani community is a traditional vegetable preparation. The flowers of *C. papaya* are used as fresh vegetables to complement the diet of society and support higher levels of individual growth. They have medicinal properties and can prevent cancer, improve digestion and appetite, and treat heart disorders (Yogiraj et al. 2014; Bergonio and Perez 2015; Abhishek et al. 2020; Zhang et al. 2022). The tannins and flavonoids in papaya flowers can act as antioxidants that scavenge free radicals from the body. The consumption helps the body neutralize free radicals and modulate the immune system. Papaya flowers and leaves are consumed as fresh vegetables in most parts of Indonesia (Putri et al. 2015).

Besides *Keija*, the Sentani community also uses *Aomang* and *Hoyombi*, which taste better when processed together with sago flour (*Metroxylon* sago), known as *Ouw* (grilled banana sago). The process involves the preparation of dried sago flour, which is sifted before being skillfully combined with either *Aomang* or *Hoyombi*, accompanied by grated coconut. Thorough mixing ensues to ensure proper integration, and the resulting dough is thoughtfully enveloped within a leaf wrapper, completing the procedure. In the Sentani language, the wrapping leaves are called *phothofhe* (Marantaceae) (Figure 3). Subsequently, the dough is steamed until cooked, then dried over coals, and served with tea or coffee. This food is often found in the Sentani traditional market in the morning with *Remuhu*. The culinary process entails steaming the ingredients, which are combined with freshly grated coconut and ultimately served alongside a steaming cup of tea or coffee. This indigenous leaf, used for wrapping food, is cultivated predominantly within the premises of residential compounds. The Sentani community utilizes these leaves as a primary medium for packaging victuals, often engaging in their commercial exchange within traditional markets. According to Ng (2015), in rural Sarawak, leaves from the Marantaceae are used to wrap rice.

Bananas play a significant role in various traditional cultural events, including proposals, weddings, and funerals. In the proposal ceremony, the woman's family will bring delivery materials in the form of their garden crops, such as bananas (Figure 3). Various varieties are brought to the male family, and the local Sentani varieties have a very important value compared to the introduced varieties. Local Sentani bananas are served to distinguished guests, for example, *ondofolo* (tribal chief) (Zebua et al. 2023).

Proximate analysis

The results of the proximate analysis of five samples of bananas based on the local name are shown in Table 3. The protein levels in the varieties showed significant differences ($p < 0.05$) with the local names *Buwakhu*, *Emfofo*, *Hoyombi*, *Keija*, and *Remuhu*. Protein levels from the highest to the lowest were found in bananas with local names *Hoyombi*, *Keija*, *Remuhu*, *Emfofo,* and *Uwakhu*. Hapsari and Lestari (2016) and Hasanah et al. (2017) showed that the protein content of bananas varied among cultivars. Banana protein content is generally in the range of 1.22-3.4% (Annor et al. 2016; Hapsari and Lestari 2016; Oyeyinka and Afolayan 2019). Vegetable protein is known to replace meat due to its higher nutritional and environmental benefits. Studies showed that consuming a diet rich in plant-based protein could improve kidney function (Bernier-Jean et al. 2021), prevent metabolic dysfunction (Chalvon-Demersay et al. 2017), improve physical performance (Gazzani et al. 2019), and reduce the risk of developing various chronic diseases (Lynch et al. 2018). Additionally, the production of vegetable

protein saves resources and does not damage the environment, with lower greenhouse gas emissions compared to raising animals (Bryant 2022).

The fat content among three of the five local Sentani banana cultivars tested (*Uwakhu*, *Keija*, and *Emfofo*) showed no significant difference ($p > 0.05$), with values of 0.11, 0.16, and 0.22%, respectively. In contrast, significant differences in fat content were observed in *Hoyombi* (3.06%) and *Remuhu* (1.86%). These findings align with previous research by Annor et al. (2016), Hapsari and Lestari (2016), Hasanah et al. (2017), and Oyeyinka and Afolayan (2019), who consistently report that fat content is influenced by cultivar. Specifically, Oyeyinka and Afolayan (2019) reported banana fat content ranging from 0.15-1.24%, while Annor et al. (2016) and Hasanah et al. (2017) found lower ranges of 0.0-0.3% and 0.33-0.34 g/100 g, respectively. Notably, the fat content of the *Uwakhu*, *Keija*, and *Emfofo* cultivars in this study was lower than the values reported by Annor et al. (2016) and Hasanah et al. (2017).

The results of the moisture test (Table 1) showed that the local banana cultivars *Sentani Keija* and *Emfofo* did not show a significant difference ($p < 0.05$). However, Keija and Emfofo showed significant differences ($p > 0.05$) with *Uwakhu*, *Remuhu,* and *Hoyombi*. Successively starting from the highest moisture content, local banana cultivars Sentani are *Uwakhu*, *Remuhu*, *Keija, Emfofo*, and *Hoyombi*. Banana cultivars affect the water content. According to Hasanah et al. (2017), significant differences in water content exist among the *Barangan, Masak Hijau*, and *Singapore* cultivars. Moisture content in food greatly influences the quality of food products.

Analysis of ash content in five local banana cultivars of Sentani showed that bananas with local names *Emfofo*, *Uwakhu*, and *Remuhu* were not significantly different, as well as Uwakhu, Remuhu, Keija, and *Hoyombi* did not show significant differences. However, *Emfofo* was significantly different from *Keija* and *Hoyombi*. Ash content is known to affect mineral content such as Mn and Zn in fruit (Milošević and Milošević 2012).

The crude fiber content of bananas with local names *Emfofo* and *Hoyombi* did not show a significant difference. At the same time, the two cultivars showed significant differences with banana cultivars *Uwakhu, Remuhu,* and *Keija*. The highest to lowest fiber content of Sentani banana cultivars was *Hoyombi, Emfofo, Keija, Remuhu*, and *Uwakhu*, respectively (Table 1). Compared to other banana cultivars, such as *Barangan*, *Masak Hijau,* and *Singapore* (Hasanah et al. 2017), the crude fiber content of local banana cultivars *Sentani Hoyombi, Emfofo,* and *Keija* showed higher values. Fiber, as a supplement, is known to alter the texture, consistency, rheological properties, and sensory characteristics of food products (Collar et al. 2009).

There was no significant difference in total carbohydrate content in local banana cultivars *Sentani Uwakhu*, *Keija*, and *Emfofo*. Meanwhile, the three banana cultivars were significantly different from the *Remuhu* and *Hoyombi* cultivars (Table 1). The carbohydrate composition of bananas changes greatly during ripening. Starch is the main component of unripe bananas (Aquino et al. 2016). There was also no significant difference in total carbohydrate content between *Buwakhu*, *Emfofo,* and *Keija*, which were significantly different from *Hoyombi* and *Remuhu*. The carbohydrate composition changes greatly during ripening, and starch is the main component of unripe bananas (Phillips et al. 2021). Sufficient energy reserves after consuming bananas during exercise, specifically long-duration exercise, can prevent fatigue (Dewantari et al. 2022). Complex carbohydrates such as glucose, fructose, and sucrose will be converted into glucose in the body. The glucose is then stored in the form of glycogen in the liver by 18-22% and in the muscles by ± 80% (Wulandari et al. 2018).

In general, this study shows that the Sentani community has planted local varieties of bananas recognized based on the morphological characteristics, pseudo stem, and leaves. However, the prevalence of indigenous Sentani bananas is presently dwindling, largely attributed to the transformation of land for residential purposes. This decline in cultivation among the populace is a cause for concern, as these bananas hold dietary significance and possess a profound cultural essence. They assume a pivotal role in ceremonial contexts such as proposals, marriages, and commemorations of deceased individuals. Within these significant cultural junctures, the indigenous Sentani bananas take precedence, symbolizing a gesture of honor and respect towards esteemed individuals. Based on the proximate analysis of local Sentani bananas, five samples had significant differences in protein content. Meanwhile, the discerned distinctions were not deemed statistically significant concerning fat, water, ash, and carbohydrate content.

Table 3. Results of proximate analysis of five samples of Sentani local bananas

Local name (Sentani)	Protein (%)	Fat (%)	Moisture (%)	Ash (%)	Crude fiber (%)	Total Carbohydrate (%)
Buwakhu	0.58 ± 0.02^{e}	0.11 ± 0.01^{c}	71.69 ± 0.29^{a}	0.88 ± 0.07^{abc}	0.14 ± 0.01^{d}	26.74 ± 0.29^{a}
Emfofo	1.52 ± 0.00^{d}	0.16 ± 0.01^{c}	68.16 ± 0.01^{c}	0.92 ± 0.01^{ab}	2.83 ± 0.01^{a}	26.41 ± 0.03^{a}
Hoyombi	3.06 ± 0.00^{a}	0.81 ± 0.01^{a}	67.66 ± 0.03^{d}	0.82 ± 0.01^{c}	2.90 ± 0.01^{a}	24.75 ± 0.04^{c}
Keija	2.03 ± 0.00^{b}	0.22 ± 0.05^{c}	68.22 ± 0.02^{c}	0.82 ± 0.01^{c}	2.19 ± 0.01^{b}	26.53 ± 0.07^{a}
Remuhu	1.86 ± 0.00^{c}	0.50 ± 0.01^{b}	69.53 ± 0.01^{b}	0.91 ± 0.01^{abc}	1.13 ± 0.01^{c}	26.07 ± 0.02^{b}

Note: The measurement results of the proximate analysis were the mean of 3 replications ± standard deviation. Values with different letters in the same column differ significantly at $p < 0.05$

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