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Culinary practices of the Bidayuh in Sarawak, Malaysia: a qualitative study

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Abstract

The Bidayuh cuisines and culinary practices epitomize an inherent part of the cultural profile of the Sarawak community. This indigenous group (Bidayuh) is the second-largest group contributing to the Sarawak's distinctive identity after the Iban. The distribution of the Bidayuh community is predominantly across the districts of Lundu, Bau, Kuching and Serian in Sarawak. There are concerns that the Bidayuh traditional culinary culture will gradually beset by modernization. Many prefer convenience over the hassle of cooking using the traditional manner, hence diluting the traditional culinary knowledge among the younger generations. Therefore, ethnomethodology, a qualitative research approach, was utilized to explore the traditional culinary practices and the connotation of food among the Bidayuh indigenous group in Sarawak, Malaysia. The data were collected from nine informants [Kampung Gumbang in Bau District ($n=5$) and Kampung Mongkos in Serian District ($n=4$)] who had voluntarily participated in this study. Through the ethnomethodological lens, this study documented eight traditional Bidayuh recipes and the collective development of the gastronomic culture of this community that are still remembered and practiced today.

Keywords Bidayuh cuisines, Traditional food, Traditional culinary practices, Sarawak, Food culture

Introduction

A famous French philosopher, Brillat-Savarin (1925), once said “tell me what you eat, and I’ll tell you who you are.” In the writings of Brillat-Savarin [1], the connections between food, culture and how society and culture are shaped by food were considerably pondered upon for centuries. During prehistoric times, food was fundamentally meant for survival. Today, food is no longer for mere consumption, instead food is appreciated for its inherent history and culture [2].

Analogous to language, food is a form of symbolic non-verbal communication [3]. It is a representation that conveys the culture of a society. In definition, culture encompasses the various forms of norms, beliefs, dogmas and behaviors shared by a group of individuals resulting from dynamic interactions—be it verbal or non-verbal. More specifically, food is, in fact, culture and it is a symbolic representation of a society that attributes meanings and interpretations to the essence of a food system and their eating habits [3–5]. The symbolic representations transpired by food are of multi-layered connotations, both internal and external to the societies that express them. Through time, food transcends into a communication channel in societal networks.

Borneo Island is in the Southeast Asia region of the Malay Peninsula and southwest of the Philippines. It is the world's third largest island shared by three countries: Malaysia, Indonesia, and Brunei which cover a land size that is slightly larger than Texas [6]. This island

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is a diverse and captivating landmass that holds historical, geographical, and cultural significance in the region. Malaysian Borneo comprises the states of Sabah and Sarawak which occupy a significant portion of the island in which about 20% of the country's total population of 32 million reside in these two states [7].

Geographically situated on Borneo Island, Sarawak, also called the Land of Hornbills, is a state with diverse culture besides being a melting pot of gastronomy. It is home to 27 ethnic groups, each group with its own distinctive language, culture and customs [8]. The Bidayuh who are commonly called the 'Land Dayak' is one of the major ethnic groups in Sarawak [8]. Their early history, although scarce in written records, suggests that they inhabited the northwestern part of Borneo (now the Indonesian state of Kalimantan) as part of the Austronesian migration to Southeast Asia [2, 8]. Records indicate that they were among the earliest inhabitants of Borneo [8, 9]. Most Bidayuhs believe that Sengkong, Bugau and Sungai Selakau are the main areas in West Kalimantan from which their ancestors came from. From West Kalimantan, it is widely indicated that they migrated first to Bung Bratak or Bratak Hill in Sarawak, Malaysia, around 700 years ago [9].

Every ethnic group carries a significant identity reflected by its daily cultural practices [3]. However, an identity does not exist spontaneously; the same applies to the Bidayuh community. The Bidayuh culinary practices are an intrinsic character of the Sarawak community's cultural profile, contributing to the state's distinctive identity [2]. Nevertheless, if the cultural aspect of its food is not well preserved and passed on to the younger generations, sooner or later this priceless intangible heritage risks diminishing with time [10].

In a recent opinion article written by Nagraice [11] in the *New Sarawak Tribune*, the author shared a similar trepidation with Goh [10] that a community may risk losing its cultural identity to modernization if its cultural assets are not safeguarded properly. Nagraice [11] also stresses the importance of inter-generational interactions between the older and younger Bidayuhs to enable knowledge and skills transfer to take place. Corresponding to Nagraice [11], Martin Ben, the assemblyman of Kedup, a state constituency of Sarawak opined that continuous efforts are needed to guard and further sustain the Bidayuh culture [12]. It cannot be stressed enough that more needs to be done collectively by all stakeholders, including the community, government and non-government bodies and educational institutions to ensure the continuity of a culture's gastronomical heritage.

Despite the fact that many have seen the importance and urgency of preserving the Bidayuh culinary culture before it is swallowed by time, the empirical research

documenting Bidayuh traditional food is not well established. In the discourse surrounding ethnic food, Malaysians are generally better acquainted to Malay, Chinese and Indian cuisines, the three major ethnic groups in the country. The lesser-known Bidayuh cuisines and culinary practices seem to be confined within the community itself or the Sarawakians in general and remains unknown to many Malaysians and even some of the younger Bidayuhs themselves [2].

The Bidayuhs have a population of approximately two hundred thousand [11], which is about 8% of the total population in Sarawak, making them the second largest indigenous group after the Iban people [13]. Bidayuh is a significant and invaluable indigenous group contributing to the food culture in Sarawak. This study, playing a part in documenting the cultural heritage cuisines of the Bidayuh, also aims to explore the connotation of food and traditional culinary practices within the community in the contemporary setting.

The Bidayuhs settlements: past and present

According to Mullen [14], when James Brooke became the first White Rajah (Royal Highness) of Sarawak in 1841, he gradually brought peace and order to the area. With this, the Bidayuh population increased and as Sarawak became free from rebels and pirates, they moved to lower land in search of more fertile grounds for their paddy and other cash crops. They now occupy the western side of the Sarawak state in present-day divisions of Kuching, Serian, Bau, Penrissen, Padawan and Siburan. They remain friendly with the Bidayuhs living in neighboring Kalimantan, Indonesia, although there may be nuances in their dialects, religious and cultural practices [14].

The Bidayuh typically lived in longhouses, however, authentic and well-preserved longhouses are still standing in some places including Annah Rais and Bunuk in Penrissen as well as Mongkos in Serian. Some of these have been converted into homestays allowing visitors to experience longhouse living. The concept of the longhouse revolves around communal dwelling consisting of families from the same lineage living together in separate 'romins' or family units all lined up with a common patio resulting in an elongated structure, hence the name [15]. Community gatherings and special events would be held in 'Baruks', unique roundhouses often built within the vicinity of the longhouses (Additional files: 1 and 2).

The Bidayuhs are often identified by the mountains and hills in their vicinity or on which they live on. There are at least twenty-nine Bidayuh groups in Sarawak (refer to Additional Table 1: Bidayuh Groups in Sarawak). The word Bidayuh is a combination of two syllables, in which 'Bi' refers to people while 'Dayuh' means mountain or

highlands [15]. There are six main communities who settled on or near the mountains of Bukar, Sadong, Singai, Sentah and Bongoh, hence the Bibukar, Bisadong, Bisin-gai, Bijagi, Biatah and Bibongoh. Hugh Low [16] narrated in his book ‘Sarawak—Its Inhabitants and Production,’ that there were 21 Bidayuh tribes who settled in 29 vil-lages, and this constituted a population of 10,500 [9]. They were spread along the Sarawak River—some on the western branch of it, others on the southern stream of the river [16]. Haddon [17] in his writing indicated the main Bidayuh settlements to be at the Upper Sarawak River, Lundu Territory, left-hand branch of the Sarawak River, upper Samarahan River, upper Sadong River and Kuap River in Sarawak. In 2002, a total of 335 Bidayuh villages were registered at the district office, with most populating the Serian District [9]. According to Chang [9], there were 29 Bidayuh groups in Sarawak, spreading according to districts. Today, most of the Bidayuh popu-lation is concentrated in Kuching, Bau, Lundu and Serian Districts.

The Bidayuh customs

The Bidayuh is one of the sub-groups of the Dayak indig-enous people. This ethnic group practices rituals and cer-emonies that reflect their worldview and way of life. In the past, the Bidayuh worshiped spirits and souls, espe-cially of their ancestors [18]. This worshiping practice is a form of animism. They seek for blessings and protection during the ritual of worshiping to nature and ancestral spirits by offering food [10, 15]. These rituals and cer-emonies that are passed down by the forefathers are com-monly practiced in every Bidayuh village in the believe of getting protection besides preventing misfortune or dis-aster to the community [18].

As an effect of colonization in the past, many Bidayuh have embraced Christianity [19] until today. Many Biday-uhs are no longer practicing animism as it contradicted with religious beliefs besides the traditional way of life is no longer perceived as relevant to the community in the setting where people are getting more informed. How-ever, certain traditional customs are still in practice until today, for example, the Bidayuh harvest festival which is also called as the ‘Bidayuh Gawai’ [20]. The celebration of the festival usually takes place around the end of May or early June. The festival marks the end of the rice harvest-ing season and the beginning of a new agricultural cycle.

In the past, when animism was still practiced, the ancient animistic rituals were an important element of the ‘Bidayuh Gawai’ celebration to show gratitude to the bountiful harvest of the year [20]. At present, the festi-val is celebrated differently although the significance of the festival remains the same. It is an occasion for friends and family members to get together to celebrate a year’s

long effort with joy. Traditional food is the highlight dur-ing this joyous time of the year where the fragrant aroma of familiar and nostalgic cuisines can be smelled from the house of every Bidayuh [20]. Being associated as the highland’s natives [15], this ethnic group has put the natural resources surrounding them in good use denot-ing a deep connection between the community and the nature. Livestock such as poultry is usually brood on a small scale for the meat and eggs, sheltered not far from the longhouse. This is reflected in the ingredients used in their traditional cuisines.

The Bidayuh culinary practices: back to basics

The development of Bidayuh cuisine in Sarawak, Malay-sia, has been influenced by both geographical and histori-cal factors. Geographically, the Bidayuh people reside in the rugged and mountainous regions of Sarawak, which has shaped their culinary practices [9]. The community have great respect for the land as it is a source of liveli-hood to the community. To this group of people, as recorded in the folktales, the land belongs to the spir-its and they share its bounties with these spirits [21]. It is believed that any sign of disrespect to the land would infuriate the spirits and bring calamity to the family and villagers [18, 21].

Because they rely extensively on the land, they develop a profound agricultural knowledge, exemplified by prac-tices such as rice cultivation. Rice holds a central posi-tion in the diet of the Bidayuh and so it is normal to find rice-based dishes prominently featured in their culinary repertoire [22]. When rice is scarce, sago and tapioca take on the roles as favorite starch substitutes [23]. In addition, the rich rainforests, abundant with diverse flora and fauna, offer a wide array of ingredients that serve as a cornerstone of Bidayuh culinary creations. Traditionally, the Bidayuh has relied on hunting, fishing, and gather-ing from the forests, allowing them to incorporate wild game, freshwater fish, edible plants, and jungle produce into their culinary practices [23, 24].

The Bidayuh culinary heritage includes various approaches to food preparation and uses locally sourced ingredients in distinct styles. It is clearly evident that this community continues to practice back-to-basics cooking techniques and source for edible materials from mother nature [23]. Readily available bamboo tubes have been—and continue to be—used as cooking tools because of their durability and non-toxic properties. The Bidayuh has traditionally harnessed the robust characteristics of bamboo for various purposes including using it as con-tainers for cooking and crafting it into polished utensils such as ladles, spoons and spatulas. Munan [23] men-tioned that using bamboo tubes as cooking tools could be one of the most ancient cooking methods ever.

Traditionally, fish serves a key role in providing protein to the people of Sarawak, a place known to be a 'land of many rivers' [23]. However, fish is a highly perishable food when not stored in the right conditions. In the past, using refrigerators was not common. The old folks innovated by preserving the fish that are in plenty through the process of fermentation [23, 25]. Fermented fish simply means fish that has undergone changes through microbiological or enzymatic activities in the presence or absence of salt and it can be categorized into fish-salt mixtures or fish-salt-carbohydrates combinations [26]. The output of the fermentation can be either fish sauce, fish paste or simply dried salted fish that retains much of its original form with an altered texture [26].

Interestingly, not only are protein-rich foods fermented but fruits and leafy vegetables are also commonly subjected to this life-elongating technique [27]. Some examples include "Jeruk Mangga" (green mango pickle), "Tempoyak" (fermented durian pulp), "Buah Kepayang" (Pangium pickle), "Sawi Pahit" (fermented leaves of white mustard/*Sinapis alba*) [27], to name a few. It is, therefore, hard to ignore the fact that the abundance of natural resources in the community surroundings has played a significant role in shaping the flavors and ingredients used in Bidayuh cuisine. Nevertheless, these unique culinary practices which are a repository of culinary wisdom are gradually disappearing with the elder generation of the Bidayuh people and much of it still remains undocumented. The changing landscape brought about by modernization and technology advancement is influencing the food culture of the younger Bidayuh. As a result, this current study aims to document traditional cuisines that are still being prepared in the age-old traditional manner by the Bidayuh community. The following section discusses on the methodology employed to document several traditional cuisines that are shared by the study informants from two Bidayuh villages.

Methods

Studies on Bidayuh traditional food and its culinary practices are still lacking. More efforts are required to document and safeguard the cultural practices of the Bidayuh community [2, 11, 12]. With that in mind, this study intends to explore the traditional cuisines and culinary practices of the Bidayuh ethnic group using the ethnomethodology approach as the guiding compass. Ethnomethodology is a qualitative research approach that studies the meanings elicited from the actions of the informants at the time of speaking [28, 29]. The construction and interpretation of meanings elicited from the informants of a specific set of practices are in real time. The people or actors in an environment, the subjective orientations or sequence of incidences and immediate

experience in the setting are central to the investigation. Hence, through the ethnomethodological lens, the research focuses less on the individual interpretation of the food practices, instead, more on the collective development of the gastronomic culture of the Bidayuh community that has survived through generations until today.

As the study focuses on exploring the traditional Bidayuh culinary practices, the target population is all Bidayuh people residing in the Bidayuh villages in Sarawak. On the 4th of March 2022, the research team met up with two officers from the Dayak Bidayuh National Association (DBNA) to get a preliminary understanding about the Bidayuh community in Sarawak. According to the officers of DBNA, there are a total of 338 registered villages spreading across the district of Bau (63 villages), Kuching (94 villages), Lundu (36 villages) and Serian (145 villages). Each village is head by a 'Ketua Kampung' (village head). Utilizing the referral sampling method, the village head was recruited through the referral of DBNA and subsequently the villagers through the referral of their village head.

Among the village heads contacted, response of voluntary participation in the study came from Kampong Gumbang (Bau District) and Kampong Mongkos (Serian District) (refer to Fig. 1). All informants were informed of the study's objectives. They were also briefed that their conversations with the researchers would be videotaped. The data collection was conducted on the 12th of February 2023 in Kampong Gumbang. It took approximately nine hours for the research team to conduct the interview cum observations with the informants.

The researchers acknowledged the possible effect of the filming process on the informants' behaviors. Therefore, in attempts to minimize these effects the researcher spent some time mingling with them prior to the filming to allow them to familiarize themselves with the process and calm any nerves. Once the informants began to naturally get comfortable in the presence of the researcher and the filming hardware, the recording started and the researcher would begin to ask open-ended questions.

Along the conversation, the researcher probed for deeper insights, while the informants showed the preparation methods of the Bidayuh cuisines. Per se, most of the attention between the researcher and the informants were directed to the interaction itself instead of concentrating on the video recording. The data collection process was executed similarly on the 18th of March 2023 in Kampong Mongkos. The video recordings from both Kampong Gumbang and Kampong Mongkos were then transcribed verbatim and analyzed. The transcribed data were sent to the informants via the respective village head for confirmation and validity check. The research team would counter check with

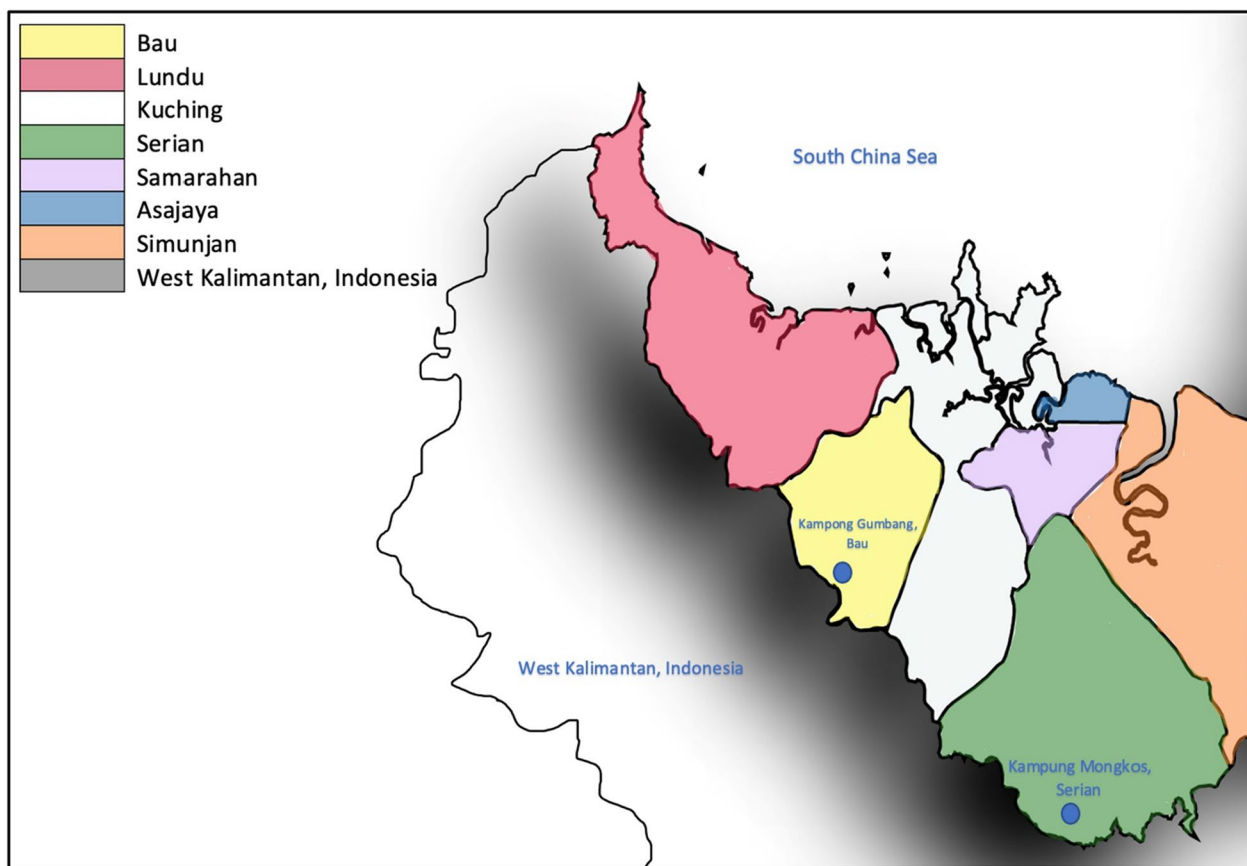


Fig. 1 The location of Kampong Gumbang and Kampong Mongkos in the map of Sarawak, Malaysia. Kampong Gumbang is located in the district of Bau, while Kampong Mongkos is located in the district of Serian. Both villages are situated near to the West Kalimantan, Indonesia–Malaysia border

the informants for any unclear words or unclear meaning of certain sentences until the intended meaning was obtained to avoid misinterpretation of information.

There was a total of nine informants ($n=9$; male=5; female=4) who participated in this study, where five ($n=5$) were from Kampong Gumbang and four ($n=4$) from Kampong Mongkos (refer to Additional Table 2: Informants' Demographic Profile). Two informants aged between 50 and 59, four informants aged between 60 and 69, while the remaining three were aged between 70 and 79. The oldest informant (G4) among all had no formal education, five studied until Grade 11 while the remaining three were 9th Graders. All informants are pure Bidayuh by the sub-groups into which they were born—the Bidayuh Gumbang (Kampong Gumbang) and Bidayuh Bukar-Sadong (Kampong Mongkos)—respectively. The informants are currently still residing in the villages where they were born decades ago making a living in a familiar environment since childhood within a close-knit community.

Results and Discussion

By distance from the city center of Sarawak (Kuching), Kampong Gumbang is nearer (60 km) than Kampong Mongkos (104 km). Although these two villages are 135 km apart, Kampong Gumbang and Kampong Mongkos are both located at the border of Malaysia and Indonesia.

The field visit to the respective villages has allowed the researchers to observe and learn how the traditional food is prepared in these villages. It is interesting to note that although both villages are of the Bidayuh descendants, the language spoken in these villages has subtle nuances and is a unique dialect to the sub-group itself. The communities are said to have been there at the respective geographical location for more than a hundred years forming a close-knit community. The information was provided by the informant of the respective village in a conversation captured as follows during the fieldwork.

G1, an informant from Kampong Gumbang mentioned “If you look back into the history of Kampong Gumbang, we have been here since 1842... 1845. That’s more than 170 years ago we are here.”

M6, an informant from Kampung Mongkos said “... since 1879 with 100 years over we exist Kampung Mongkos with just a few families we settle here in this area until now we have now population grow to 1220 people who settle in Kampung Mongkos now registered. Since last time, 1879, I think there’s only a few families here but now [it has] come [to] 203 doors [of] families stay[ing] in Mongkos.”

Traditional food is a cultural expression

Ethnic food, in general, is usually connected with the past of an ethnic group. When it travels through time, it represents sustainability of the intangible identity that is tangibly expressed in the form of food. The unique preparation methods using common ingredients in the local setting enhance the localized Bidayuh identity that has been passed down from generation to generation. Traditional ethnic food is a mirror to community’s food culture, heritage, history or civilization in a particular geographical setting [30].

In the present days, it is through festivals or ceremonies that the younger Bidayuh gets to learn their culinary culture. Contradictorily in the past, home is where learning starts and mothers are the great teachers. Food preparation is a daily affair in every house, as both informant

G1 and M6 expressed that food has always been a family affair that everyone in the family has a role to play in food preparation. This has eventually kept the family bonding strong and traditional food has become a love language between the elder and younger Bidayuh.

The informants in both Kampong Gumbang and Kampung Mongkos shared several traditional cuisines that are of significance to the Bidayuh community in the respective villages. Table 1 summarizes the natural cookware, wrapper, topper and flavor enhancer used by the Bidayuh in the preparation of the traditional cuisines documented in this study besides listing the ingredients for the specific dishes.

The traditional cuisines of Kampong Gumbang

(a) Siok Tribuh (chicken cooked in bamboo)

Siok Tribuh (Fig. 2) is marinated chicken cooked in bamboo. The word “Teribuh Tribuh” means bamboo, while “Siok” means chicken in the Bidayuh Gumbang dialect. The ingredients of the dish are lemongrass, long coriander leaves (*Eryngium foetidum*; “teput tuan” in the Bidayuh Gumbang language), ginger, onion, shallot, grounded pepper and salt.

Firstly, chicken is mixed evenly with all the ingredients and then put inside the bamboo until three

Table 1 The Bidayuh Gumbang and Bidayuh Mongkos traditional cuisines

Items	Bidayuh Gumbang	Bidayuh Mongkos
Natural cookware	(1) Bamboo tubes	
Natural wrapper	(1) Daun Manah (<i>Phacelophrynium maximum</i>) (Fig. 4B) (2) Daun Sang (<i>Johannesteijsmannia altifrons</i>) (Fig. 6B)	
Natural topper/lid	(1) Pandan or screwpine leaves (<i>Pandanus amaryllifolius</i>) (2) Tapioca leaves (<i>Manihot esculenta</i>)	
Natural flavor enhancer	(1) Daun Sisong (<i>Pycnarrhena cauliflora</i>) (Fig. 3) (2) Pandan or screwpine leaves (<i>Pandanus amaryllifolius</i>)	
<i>Traditional cuisines belonging to the respective village</i>		
Cuisines	(a) Siok Tribuh (Chicken cooked in bamboo) (Fig. 2) <i>Ingredients:</i> chicken cut into pieces, lemongrass, long coriander leaves, ginger, onion, shallot, grounded pepper and salt. Daun Sisong is optional (b) Nasi Sum (Traditional chicken rice) (Fig. 4) <i>Ingredients:</i> rice, chicken fats, chicken and salt (c) Kasom l’kien (Fermented River fish/freshwater fish) (Fig. 5) <i>Ingredients:</i> river fish, salt and rice flour (d) Lepok Durian (Durian sweet cake) (Fig. 6) <i>Ingredients:</i> fresh durian pulp	(a) Pangkang (Glutinous rice cooked in bamboo) (Fig. 7 and Fig. 8) <i>Ingredients:</i> glutinous rice, salt and coconut milk (b) Saam (Twice-cooked chicken rice in bamboo) (Fig. 9) <i>Ingredients:</i> rice, chicken cutlets, ginger, garlic, shallot, lemongrass, and salt (c) Gires Ikan (Fermented River fish/freshwater fish) (Fig. 10) <i>Ingredients:</i> river fish, salt and cooked glutinous rice (d) Nyior (Sago-based sweet cake) (Fig. 11) <i>Ingredients:</i> sago flour, coconut milk and sugarcane syrup
Usual consumption occasion	(1) Bidayuh Gawai (Harvest Festival)	



Fig. 2 Siok Tribuh. This is a popular dish among Bidayuh. It is usually served during festivals celebrated by the community. **A** The bamboo with chicken is put resting on the wooden rack at a slanting position of 30 to 40 degrees over the firewood. **B** The thoroughly cooked chicken meat is poured on a pan and ready to be served

quarters of the bamboo's length. A bunch of tapioca leaves (*Manihot esculenta*) is then inserted on top of the chicken acting as a cover to retain the heat of the boiling chicken juices and maintain a constant pressure inside the bamboo. The bamboo stalk with chicken is cooked over firewood for about 30 to 40 min before it is ready to serve. The bamboo emits a special flavor to the dish besides being a good tool that is safe for cooking.

According to informant G5, "Daun Sisong" or *Pycnarrhena cauliflora* (Fig. 3) is sometimes, by preference, may be added to provide a natural umami flavor to the dish besides functioning as a natural preservative to prevent the dish from turning bad at room temperature for up to two days. The plant is also called "Pokok Ajinomoto" or Ajinomoto tree by the locals in Sarawak due to its natural properties as a flavor enhancer [31].



Fig. 3 *Pycnarrhena cauliflora*. This plant grows in the wild. The leaves of the plant are called Daun Sisong by the locals in Borneo. It is usually used as a flavor enhancer by the Bidayuh



Fig. 4 Nasi Sum. **A** The Bidayuh version of chicken rice wrapped and served in Daun Manah. It is a traditional staple food to the Bidayuh community besides being an important dish during the harvest festival. **B** The local name of the leaves for this plant is Daun Manah (*Phacelophrynium maximum*). Due to the size and durability of the leaves, it is commonly used as a food wrapper by the Bidayuh

(b) Nasi Sum (traditional chicken rice)

“Nasi” basically means rice, while “Sum” is the name given to the dish (Fig. 4A). “Nasi Sum” is an important dish to be prepared for the harvest festival ritual. The rice is cooked with chicken fats and salt. The chicken fats act as a natural coloring that gives

the rice a yellow tinge besides giving it the nice fragrance.

Once the ritual for the harvest festival is over, the rice is given to all guests who attended the celebration. By tradition, the rice is wrapped with a piece of chicken put on top using the leaf of the *Phacelophrynium maximum* plant (Fig. 4B) which is called ‘Daun Manah’ in the local dialect. These leaves are grown naturally in the wild and utilized by the locals for their nice smelling aroma [32].

(c) Kasom I’kien (fermented fish)

“Kasom I’kien” means fermented fish (Fig. 5). It is not any type of fish that can be used to prepare the dish but only river fish or freshwater fish. In the past, there were no fridges or freezers to keep the highly perishable fish fresh. Fermentation is one of the principal methods of fish preservation practiced by the Bidayuhs to extend the shelf life of the fishes they catch from nearby rivers, explained informant G1.

The fish has to be cleaned thoroughly with the guts and scales removed. Then, it is soaked in salt water for two nights before draining all the access moisture in the fish. Pounded rice flour is then mixed evenly with the fish. Once mixing is done, the fish coated with the rice flour is kept in a clean empty jar for fermentation to take place. The dish is ready for consumption after a month of fermentation process and the shelf life can extend up to several months long.

(d) Lepok Durian (durian sweet cake)

“Lepok Durian” (Fig. 6) is another traditional delicacy among the Bidayuh Gumbang. It is a dessert made of durian pulp (lepok). The flesh of the durian has to be stirred consistently in a dry wok above low heat for approximately two hours or until the moisture



Fig. 5 Kasom I’kien is fermented fish. The dish can be eaten raw with glutinous rice once the fermentation process is completed. The texture of the fermented fish is firm with a hint of sourish taste



Fig. 6 Lepok Durian. **A** This is a sweet delicacy made using pure durian pulp. The durian that has been deseeded is cooked on low heat firewood. Informant G3 was stirring the durian pulp over the fire to reduce the moisture content until it becomes light golden brown and sticky in texture. **B** The durian pulp is wrapped using Daun Sang after the moisture content has been reduced. It is then roasted over low heat firewood. The process is to further reduce the moisture content of the durian pulp to prolong the shelf life of the delicacy besides getting a firmer durian cake-like texture

of the durian pulp dries up and turns into a brownish durian paste (Fig. 6A).

Informant G1 mentioned that the leaf that is used to wrap the durian paste (Fig. 6B) is called “Daun Sang” (*Johannesteijsmannia altifrons*). The leaves can be easily found in the wild. Once the moisture content of the durian pulp has been reduced using heat treatment, these sweet delicacies can have a shelf life of five to six months even without any preservatives added. No sugar is required to be added as the durian itself is high in sugar content.

The traditional cuisines of Kampung Mongkos

(a) Pangkang (glutinous rice cooked in bamboo)

“Pangkang” (Fig. 7) is a Bidayuh staple made of glutinous rice, salt and coconut milk. First, the glutinous rice needs to be soaked overnight to soften it. Then, it is mixed with salt for taste and coconut



Fig. 7 Pangkang is a traditional staple food among the Bidayuh in Kampung Mongkos made of glutinous rice. The taste of Pangkang is relatively similar to the Malay community Lemang, except Pangkang is cooked without the banana leaves lining the inner part of the bamboo

milk for the creamy milky flavor. The rice mixture with liquid is then poured into a bamboo until three quarters full to allow room for the glutinous rice to expand when it is fully cooked.

The tough nature of the bamboo makes it a good cooking tool that is durable in direct fire. *Pandanus amaryllifolius* or as the locals call it the Pandan or screwpine leaves are used as a cover to the bamboo opening to maintain the pressure that builds up once the liquid in the bamboo has started boiling. The Pandan leaves also act as a natural aromatic enhancer adding a distinct fragrance to the glutinous rice. The bamboo needs to be turned every 5 to 10 min to prevent burning and even cooking of the glutinous rice (Fig. 7).

Once fully cooked, the green outer layer of the bamboo is peeled, leaving the white inner layer that is softer and easier to be cut or peeled for consumption (Fig. 8). The thoroughly cooked glutinous rice will form a sticky mass molded to the shape of the bamboo.

(b) Saam (twice cooked chicken rice in bamboo)

The main ingredients for “Saam” (Fig. 9) are rice, chicken cutlets, ginger, garlic, shallot, lemongrass and salt. The rice that is used in this dish is pre-cooked before mixing it with all the raw ingredients and stuffing the mixture into the bamboo. Approximately 30 to 45 min (depending on the size of the bamboo) of slow cooking over firewood is required to ensure the chicken cutlets are fully cooked and the flavor from all the ingredients are blended well. Like “Pangkang,” the bamboo needs to be turned



Fig. 8 Pangkang. **A** Informants peeling the green outer layer of the bamboo. **B** Ready to eat Pangkang cut into bite size for easy consumption. It is usually eaten on its own or with chicken or vegetable dishes



Fig. 9 Saam is the Bidayuh Mongkos version of chicken rice with elaborated cooking methods to enhance the flavor of the dish



Fig. 10 Gires Ikan. In the past, when there was no fridge available, the Bidayuh Mongkos used the traditional technique to preserve the freshly caught fish from the river with salt and glutinous rice. The intention was to extend the shelf life of the fish and not wasting food. Today, with the advancement of technology, the dish is still prepared in the traditional way encapsulating the flavor and taste of the dish from the forefather's era

frequently to prevent the uneven cooking of the food. This Bidayuh version of chicken rice is usually eaten as it is or served with vegetables.

(c) Gires Ikan (fermented fresh water fish)

As in the Bidayuh Mongkos dialect, “Gires” means ferment, while “Ikan” stands for fish. According to M6, this dish is a compulsory food item to be prepared during any rituals performed by the cultural

leader of the village. “Gires Ikan” (Fig. 10) is similar to Kasom I'kien by the Gumbang Bidayuh that is made from river fish. The only ingredient that is different in Gires Ikan is glutinous rice, which is needed to soften the fish texture.

First, the freshly cleaned fish is mixed with salt. While mixing, the flesh of the fish needs to be pressed and slightly massaged to ensure the salt penetrates

properly into the flesh, mentioned informant M6. Then, glutinous rice is added into the salted fish before putting it into an airtight container for the fermentation process to happen. The fermented fish is ready for consumption after a week. Alike preparing Kasom I'kien, this dish also suggests the traditional way of preserving protein sources using one of the oldest food processing methods in the past. It was an ingenious way to ensure a sustainable source of protein among the Bidayuh as the finished output of the fermented fish usually have an improved microbial stability, hence extending the shelf-life [26]. Furthermore, the process of fermentation is also claimed to be able to increase the palatability, nutritional value or digestibility of the fermented product [33, 34].

(d) Nyior (sago based sweet cake)

Nyior is a Bidayuh dessert (Fig. 11). The main ingredients of this traditional food are finely pounded sago flour, coconut milk and sugarcane syrup. Fresh sugarcane is pressed for its juice and cooked on low heat until the texture becomes thick and brownish in color. All the three ingredients are then mixed well to form a sweet milky liquid to be poured into a narrow bamboo.

The bamboo tip is then stuffed with Pandan leaves as a lid to the natural cooking tool. Instead of cooking the sago dessert in the narrow bamboo on direct fire, it is inserted into a wider bamboo filled with water until half the length of the bamboo which acts as a double boiler. After 30 to 45 min of double boiling the sago liquid in the narrow bamboo, the jelly-like texture of the sago based sweet cake is ready to be cut into small pieces for consumption after letting to cool. Being rich in carbohydrates,



Fig. 11 Nyior is a sweet delicacy made using sago. This delicacy is a favored sweet treat among the Bidayuh in Mongkos village. Sago is usually consumed as a substitute source of carbohydrates in case of shortage of rice in the village

this sago dessert was an alternative to rice in the past among the Bidayuh [23].

Conclusion

Back in the olden days, the forest was literally a school, kitchen and playground to the Bornean indigenous groups who lived a nomadic life. Accessible edible ingredients in the nature were incorporated into their ancestors' food system for survival. Knowledge on edible plants and traditional food processing methods is part of the important book chapters in the lives of the Bidayuh. Along the way, virtues on the 'hidden gems' in the forests and nature are being passed down by the older generations to the younger ones. Therefore, it is not surprising that the Bidayuh people in Sarawak have their own cultural identity which is greatly influenced by natural factors.

The present study documented eight traditional recipes from the Bidayuh community of two different districts in Sarawak, namely the Bidayuh Gumbang and the Bidayuh Bukar-Sadong. The preparation method for these dishes (i.e., Siok Tribuh, Nasi Sum, Kasom I'kien and Lepok Durian, Pangkang, Saam, Gires Ikan and Nyior) shown by the informants from the respective villages of Kampung Gumbang and Kampung Mongkos reflected the inherited culinary culture among the Bidayuh from their forefathers. Through these culinary practices, it is evident that nature is inextricably interwoven with the lives of the Bidayuh community. Food is not only to prevent hunger but also a symbol of love in the family.

In a broader perspective, traditional food plays an important role in contributing to the ethno-cultural value of Sarawak and Borneo as a whole. The cultural values that are held on up till today by the locals are a result of the interaction between belief systems and the external environment. Although many of the indigenous dishes may seem simple, however, through the preparation methods, plenty of wisdom about the nature for livelihood sustainability can be found. The cultural inheritance of these traditional ways of preparing the food by the younger generations is extremely crucial and significant to keeping these dishes alive and meaningful. In addition, inheriting the traditional Bidayuh culinary practices using original ingredients used by their ancestors does also provide a sense of belongingness to the people besides the sense of identity.

According to United Nations, an estimated 5 percent of the world's population consists of indigenous people with approximately 476 million living across 90 countries [35]. With the advancement of technology, many of the traditional ways of living life have been replaced for convenience. Yet, modernization does not

promise sustainability. In 2021, The Food and Agriculture Organization of the United Nations reported that the world is facing food security and safety crisis, with nearly 800 million people going hungry in 2020 [36]. No thanks to the COVID-19, the pandemic has intensified the inadequacies of global food systems besides being subjected to vulnerable climate change [37]. The light toward achieving the Sustainable Development Goal to End Hunger (SDG2) in the near future looks dim. High food costs make the journey to reach SDG2 even tougher.

The International Day of the World's Indigenous Peoples is celebrated on 9th of August every year. This year, the theme is focusing on youth. The Secretary General of the United Nation António Guterres mentioned in his 2023 message that the indigenous people ensure culture, wisdom and identity continuity into the future by learning from their elders. The Indigenous people's knowledge and traditions are deeply rooted in sustainable development which may help in solving many common challenges faced by humanity [35]. From the data collected in this study, living sustainably using natural resources responsibly is evident in the culinary practices among the Bidayus. Echoing this sentiment, it is time for us reflect on how much we have done to learn the culinary wisdom from our fellow indigenous communities. More studies are needed to capture the culinary essence of not only the Bidayuh people but also other indigenous groups in Malaysia to form well-rounded knowledge on their culinary practices.

Similar to any other research, this study is not without its limitation. The data collected were solely from Kampong Gumbang, Bau and Kampung Mongkos, Serian. The preparation method of the traditional cuisines might vary by the location of the Bidayuh villages. Hence, the data documented in this study cannot be generalized to the whole Bidayuh community. Nevertheless, these are significant culinary culture evidence that forms part of the Bidayuh community. Future research is recommended to document the traditional Bidayuh cuisines from the district of Lundu and Kuching. This will allow a comprehensive view of the Bidayuh cuisines variation from the four districts that are home to the Bidayuh.

Supplementary Information

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Additional file 1. Table 1. Bidayuh Groups in Sarawak. *Source* Chang (2002).

Additional file 2. Table 2. Informants' demographic profile.

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Author contributions

LQL and CWS contributed to conceptualization. LQL and CWS contributed to methodology. CWS, IIM, JMP and MFU conducted the data collection. LQL performed formal analysis. MS performed manuscript review and proofreading. IIM coordinated for project administration. MFU performed photography shooting. All authors contributed in manuscript writing, reads and approved the final manuscript.

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Availability of data and materials

All data generated or analyzed during this study are included in this published article. All photographs are owned by the authors.

Declarations

Ethics approval and Consent to participate

All informants gave their consent before starting the study.

Consent for publication

All authors agree for this publication.

Competing interests

The authors declare that they have no competing interests.

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