Indian Journal of Traditional Knowledge
Vol 24(9), September 2025, pp 867-876
DOI: 10.56042/ijtk.v24i9.12173

Traditional knowledge of '*Khardwi*' used by Bodo tribes of Kokrajhar, Assam

Sanjib Baruah*, Bhagyashri Brahma & Priyanka Brahma
Department of Botany, Bodoland University, Bodoland Territorial Region (BTR), Assam 783 370, India
*E-mail: sanjibbaruah9@gmail.com

Received 01 July 2024; revised 29 July 2025; accepted 04 September 2025

The Bodo tribe employs traditional 'Khardwi' and their knowledge and practices vary from region to district and even from home to home. One of the most famous alkalis made by the Bodo people is 'Khardwi', which is used in many of their traditional foods made from the burned remains of plants such as mustard, potato, banana (rhizome, trunk), black gram, papaya, coconut husk, and even jackfruit. The current paper documents traditional Bodo methods for making khardwi from several domesticated plants. Therefore, it must be recorded with accurate information for the future. The community used khardwi not only for the food but also as a medicine to cure different ailments like skin disease, gastric problems, body inflammation etc. The highest use value (UV) has been observed in *Musa balbisiana* (0.98) and *Brassica rapa* (0.98). The present study also determines the Total Dissolved Solid (TDS), Alkalinity and Chloride of the Khardwi. Determination of pH value showed *Musa* × *paradisiaca* L.(rhizome) has the highest pH value (13.63 ± 0.0057). The highest total dissolved solid concentration has been observed in *Cocos nucifera* L. (216023.33±0.58) as compared to the other species. The determination of total alkalinity showedthe highest concentration in the trunk of *Musa* × *paradisiaca* L. (1943.33±1.17) and the lowest in the *Solanum tuberosum* L. (466.67±0.61). The highest concentration of chloride has been observed in the rhizome of *Musa* × *paradisiaca* L. (538.41±0.41). The result of the chemical determination showed good alkalinity and chloride sources.

Keywords: Bodo tribe, Khardwi, Kokrajhar, Traditional knowledge

IPC Code: Int Cl.[25]: A61K 36/00

Traditional knowledge is the information passed down from generation to generation and ingrained in indigenous communities' traditions. Traditional knowledge, which is governed by cultural system provides information, expertise, technology, and common commercial practices of indigenous and local communities exemplifying outdated lifestyles pertinent to the conservation and sustainable use of biological diversity[1]. Any original idea, skill, or way of life possessed by the native people and their communities as a whole is recognized as traditional or indigenous knowledge[2,3]. The traditional knowledge systems that ethnic communities uphold for the cultural, spiritual, religious, and economic worth of biological resources are extremely significant to humanity and the next generation[3].

The Bodo community's traditional knowledge is firmly established in their social dynamics, traditions, culture, worldviews, and religious practices. They employ distinctive practices in a variety of occupations, including farming, healing, weaving traditional garments, and cooking traditional ethnic dishes. Indigenous folklore "The Bodo," an ethnically and linguistically diverse indigenous tribe located in Northeastern India, is known for having a unique knowledge system of subsistence. They are the largest ethnic group in the state of Assam[4]. The customs and practices of food preparation, consumption, and preservation reflect the communal and cultural context of society, and these techniques might differ from location to place[4].

The community of the Bodo tribe employs traditional 'Khardwi' knowledge and practices, which vary from region to district and even from home to home. Khardwi is one of the most famous alkalis made by the Bodo tribes. They use Khardwi in many of their traditional foods made from the burned remains of plants such as mustard, potato, banana (rhizome, trunk), black gram, papaya, coconut, and even jackfruit. In Assam, it is also known as native soda, particularly among indigenous people. In their traditional Bodo dishes like Onla kharwi (rice powder with khardwi), lapag wbab (*Malva purviflora* with khardwi), sobai kharwi (black gram with khardwi),

*Corresponding author

and nazi oma (dry jute leaves and pork with khardwi), they substituted khardwi for commercial baking soda. Without khardwi, these foods lack the extra delightful flavour and softness that it imparts. For the preparation of khardwi (alkali), the parts of the plants are cut into pieces and they are dried under sunlight for 3-5 days. Fully dried plant parts are burnt and ashes are collected and filtered with water which is known as khardwi. In general, 'khar' is alkaline and 'dwi' is water and combined called alkaline water. The Bodo people keep khardwi in large containers that can hold it for up to a year. It is covered with linen or plastic to keep insects out. They added water and stored it in a jar or bottle to filter the powder for daily use.

Khar has been made from different plant parts and used traditionally as alkali food in Assam[5]. *Musa balbisiana* Colla is a good source of food and Khar is made from the peel of this plant *i.e.*, kolakhar called by the Assamese people has high economic potential in Assam[6]. *Musa balbisiana i.e.*, kolakhar has been used as an herbal soda by tribal people of Assam to prepare traditional dishes[7]. Besides that, Kolakhar consists of sodium, potassium, chloride and carbonate[5]. The phytochemical and antioxidant properties and the presence of tannin, saponin, carbohydrates, flavonoids and proteins and the absence of fats and steroids was found in kolakhar[8]. Alkali from banana peels (*Musa sapientum*) ash has the potential to remove metals from metal-contaminated water[9]. *Musa balbisiana* is considered as the best kolakhar for their physicochemical properties and having the constituents such as carbonate, calcium, magnesium, and chloride[10].

The Bodo community in Assam is distinct in terms of tradition and culture. The current paper documents indigenous techniques used by the community of the Bodo tribe for making khardwi from several domesticated plants. Their practices and khardwi preparation are extremely distinctive and secretive. Even though many professionals have performed chemical analyses, sufficient documentation is not being done on this subject. From the review of the literature, it has been found that most of the workers studied kolakhar. Therefore, it must be recorded with accurate information for the future. The present study was taken up to explore the traditional knowledge of 'khardwi' (alkali) used by Bodo tribes of Kokrajhar district of Assam with quantitative indices *i.e.*, use value (UV) and informant consensus factor (ICF). As well as to safeguard and maintain their traditional wisdom, the present research also demonstrates the indigenous techniques used for the khardwi and the determination of the TDS, Alkalinity, and Chloride of the khardwi for better knowledge of medicinal value.

Materials and Methods

Study area

The study area lies in the Kokrajhar district, Assam, India. The district is situated in the northeastern part of India, on the north bank of the Brahmaputra River of Western Assam. The district is the gateway of the northeastern region of India which lies between 26°19' N to 26°54' N latitudes and 89°46' E to 90°38' E longitudes holding a total geographical area of 3,169.22 sq. km. The present study was conducted at the village Surjyakhata and nearby villages Bhutiapara and Lawdanga under Dotma Block, Kokrajhar, Assam. Surjyakhata village is located 24.4 km away from Kokrajhar town, and Bhutiapara and Lawdanga are located 23.5 km and 22.5 km distance from Kokrajhar district respectively. The villages are located in between 26.494745° N latitude and 90.117265°E longitude. The villages belong to the Bodo community and they are mainly Hindus. They use a local language called 'Boro language'. They cultivate crops seasonally. The primary crop in these villages is rice. Mustard and jute plants are the major crops followed by rice. Areca nut trees and bamboo surrounded the villages which are planted in each home. A map of the study area was created with Google Earth Pro and QGIS 3.26.3 version (Fig. 1).

Demographic data of the participants

To obtain information about the uses of the different plant species as khardwi, 57 informants including 32 females and 25 males were interviewed. The majority of the informants were female as compared to male as indicated in Table 1.

Collection and identification

The plant samples were collected from February 2023 to May 2023 from the different parts of Dotma block of Kokrajhar district of Assam. The samples (Table 2) were identified with the help of authentic literature such as Flora of BTAD, Flora of Assam, and online database, *i.e.*, POWO[11-13]. Secondary information was concerned with some literature, journals, and eFlora.

Table1 — Sociodemographic variables of participants

Factors	Classes	Number of informants	Percentage (%)
Gender	Female	32	56.14
	Male	25	43.85
Age	≤25	7	12.28
	26–40	15	26.31
	41–55	30	52.63
	56–70	5	8.77
Educational status	Matric (10^{th} standard)	12	21.05
	Higher Secondary (10+2)	9	15.78
	Degree	7	12.28
	University	5	8.77
	Housewives	14	24.56
	Farmers	10	17.54

Survey and records of alkali preparations

The methods used to prepare alkali or *khardwi* by the Bodo people are unique and simple. A short survey was conducted in two to three villages, and the participant observation method was applied to understand the techniques. Information was collected from the villagers, who were also requested to demonstrate the entire process of *khardwi* preparation during the period from February to May 2023. The process was documented through photographs. Prior informed consent was obtained from all informants before collecting the information.

Preparation of Khardwi from Mustard

The Mustard crops were harvested from the field from February to March 2023 at Surjyakhata, Dotma,

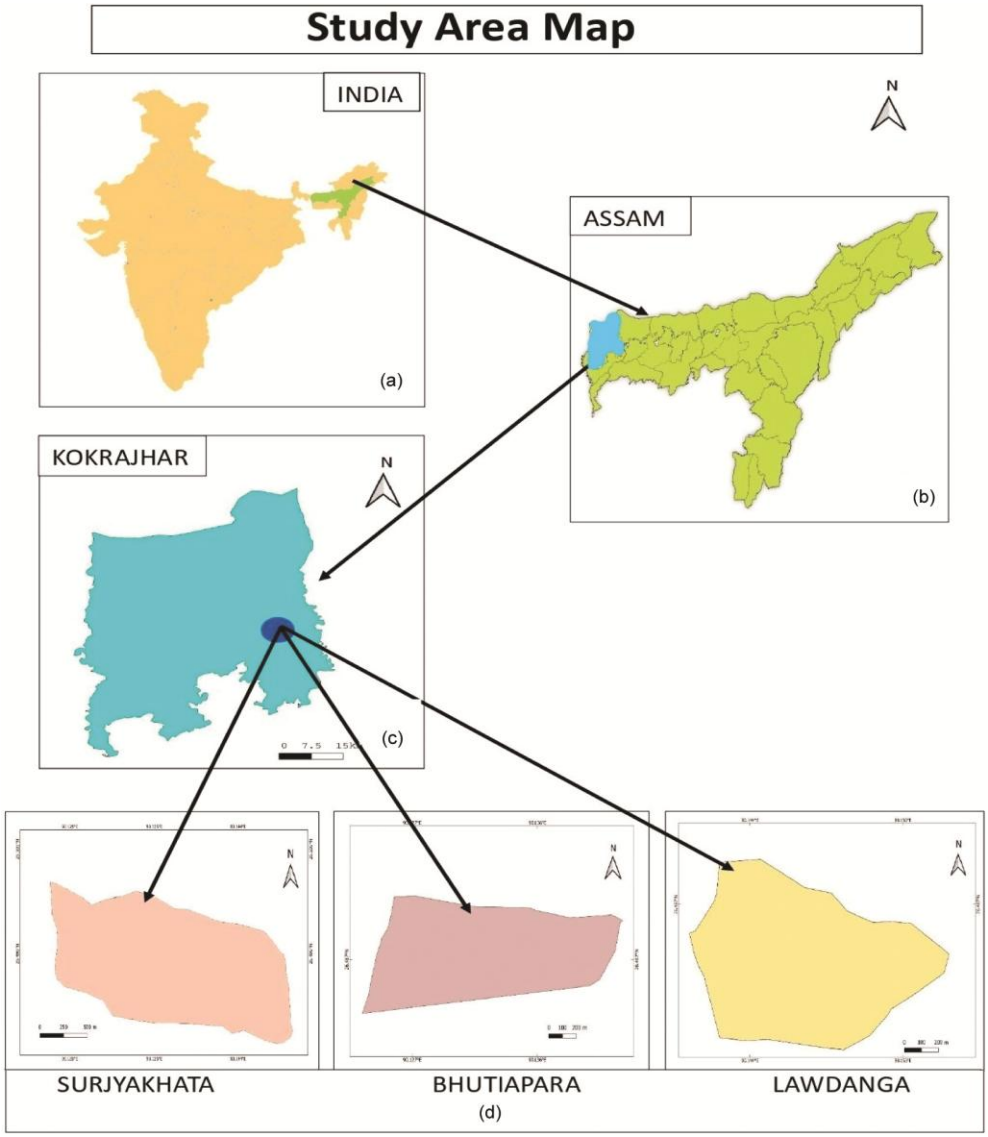

Fig. 1 — Map of the study area (made with Google Earth Pro and QGIS 3.26.3 version)

Kokrajhar. The seeds were harvested from the plant by cutting through machine or by hand. The plants were collected after harvesting the crops and dried them for 3-4 days in proper sunlight. After that, the plant material was burnt to convert into ash. The ash is now collected and to get a fine powder, this can be sieved with bamboo made sieving tool and filtered the ashes by adding water to get extract and hence khardwi is prepared (Fig. 2).

Preparation of Khardwi from Potato

Potato (*Solanum tuberosum* L.) plants are collected from the field after harvesting the tubers in March 2023 at Surjyakhata, Dotma, Kokrajhar. They were allowed to dry in open sunlight for 2-3 days. Then the plants were burnt into ashes. The unburnt debris was sieved out to get fine powdered ash. The ashes were stored by making balls and tightened up in polythene bags. Whenever in need of khardwi, the balls are to be

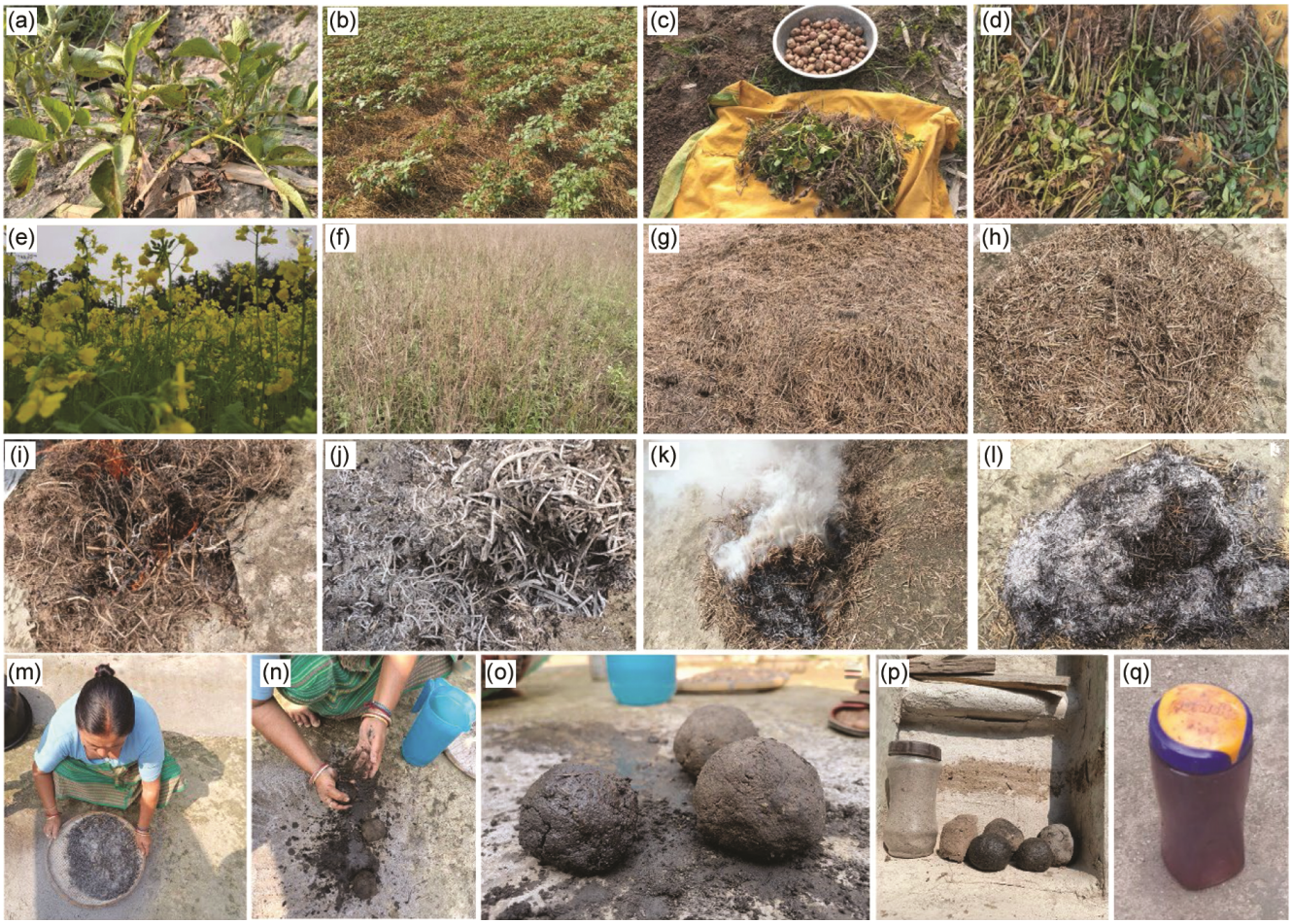

Fig. 2 — Preparation method of khardwi from Mustard and Potato

Table 2 — List of the collected species for the study

Sl. No.	Name of the species	Family	Common name	Parts used for khardwi	Month of preparation	Coll. No.
1	*Artocarpus heterophyllus* Lam.	Moraceae	Jackfruit (Khantal)	Male fruit	February-April	05
2	*Brassica rapa* L.	Brassicaceae	Mustard (Besor)	Whole plant body	December-March	02
3	*Carica papaya* L.	Caricaceae	Papaya (Mwdwmpul)	Stem	February-May	04
4	*Cocos nucifera* L.	Arecaceae	Coconut (Nalengkhor)	Husk	December-May	03
5	*Musa acuminata* Colla	Musaceae	Banana (Monohar)	Underground stem	March-April	06
6	*Musa balbisiana* Colla	Musaceae	Banana (Aathiya)	Apparent trunk, underground stem	March-April	07
7	*Musa* × *paradisiaca* L.	Musaceae	Banana (Chenichampa)	Apparent trunk, underground stem	March-April	08
8	*Solanum tuberosum* L.	Solanaceae	Potato (Aalu)	Whole plant body	February-March	01

crushed and a small amount of water should be added hence the filtrate alkaline water is obtained (Fig. 2).

Preparation of Khardwi from jackfruit

The male flowers of the jackfruit tree (*Artocarpus heterophyllus* Lam.) were collected in April 2023 from two or three plants. The male flowers of the plant generally fall off and decay that's why local people collect male flowers instead of female as it has no further use. The collected male flowers were dried under the sun for 6-7 days. Then after 7 days the dried parts were burnt and allowed to cool down for 4-5 h. The ashes were crushed to get powder since the dried male parts are like woody stems and sieved with bamboo made sieving tools. Thus, the preparation of khardwi from jackfruit is completed (Fig. 3).

Preparation of Khardwi from coconut husk

The first three or five coconuts were taken then the husks were peeled off and dried for 3-4 days. When husks were fully dried, they were burnt to obtain ashes. The ashes were then filtered by adding water and keeping that filtrate alkaline for further use.

Preparation of Khardwi from banana

The plant parts were cleaned with normal water or cut out outer parts to remove unwanted materials, such as soil. Then sliced the different parts

Fig. 3 — Preparation method of khardwi from jackfruit

(underground stems) into smaller sizes, in the case of the trunk they are torn into thin pieces by removing layers one by one. They were then ready to keep in proper sunlight upto 5-7 days. After 7 days the plant materials are subjected to ignition in open air to convert it to ash. The ash is locally called khardwi. The ashes can be kept in powder form called 'aalua' and kept as a ball by adding a little water called 'khardwi pitor'. To use khardwi in preparing traditional dishes or some other purposes, the ash is mixed with a sufficient amount of water and filtered through a clean dried thin cotton fabric and hence the filtrated alkaline water is collected.

Preparation of Khardwi from papaya

The stems of the plants were cut out and sliced into smaller sizes. They were then ready to keep in proper sunlight upto 4-5 days. After 5 days, the plant materials were burnt to convert into ash. The ash is locally called 'khardwi'. It is mixed with water before filtering through clean cloth and used in the preparation of traditional food. It gives a salty taste to the food and a slimy texture to vegetables.

Data analysis

***Use value* (*UV*)**

Use value was calculated using the given formula.[14]

$$\text{UV} = \frac{\Sigma Ui}{N}$$

Where, ΣUi is the total number of citations by informants for a particular species, and N is the total number of informants. Use value refers to the relative status or significance of plant species, which governs the number of use reports stated by informants of the study area.

Informant Consensus Factor (ICF)

The informant consensus factor was calculated using the given formula

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

Where, Nur is the total number of use reports from informers for each ailment, and Nt is the total number of plant taxa used for a specific ailment.ICF was used to evaluate the consistency of the informant's knowledge about the use of plant species to cure particular ailments. The ICF value ranges from 0 to 1. Where 1 represents the highest value of informants and 0 indicates the lowest value[14].

Chemical determination

To know the basicity of khardwi, pH was determined through a standard pH meter and a few chemical analyses were also performed such as total dissolve solid determination, determination of total alkalinity, and determination of chloride.

Sample preparation

For determination of the chemical composition in plants, each prepared ashes of the samples was weighed 50 g and moistened with 100 mL of double distilled water in a clean beaker. Then the samples were allowed to soak for 1 day for better adsorption. After 1 day the samples were filtered through Whatman No. 1 filter paper till upto 100 mL. The filtrate solutions were then kept in a clean bottle which would be used for the experiments.

Determination of pH

pH is the indicator of the acidity and basicity of the given sample. To determine the pH, the previous filtered solutions were taken 20 mL in each bottle or beaker. Then the solutions were tested one by one with a digital pH meter. The experiments were done thrice and readings were recorded. The pH value of the samples may vary based on the dilution of the sample[10].

Determination of Total Dissolved Solids (TDS)

The Total Dissolve Solids are the measurement of the residues left in the beaker after evaporating the samples. For the experiment, 100 mL beakers were measured first then 100 mL of alkaline solution was added to them. The samples were allowed to evaporate in a hot plate till dry at 100°C temperature. The final weight was measured after cooling down the beaker[10].

Total Dissolved Solid (mg/L) = Final weight – initial weight × 10^6 / volume of the sample.

Determination of total alkalinity

Alkalinity is the measurement of the ability of water to absorb H+ ions without changing its P^H. This experiment can be done by titrating the sample keeping the standard pH at 4.5 by adding a few drops of methyl orange indicator. For that, 2 mL of the samples were diluted with 8 mL of distilled water to make 10 mL of the solution. The samples were taken in a beaker and titrated with 0.02 N HCL solution by adding 4-5 drops of methyl orange indicator to the sample and stopped titrating when it turned red colour[10].

The formula to determine the alkalinity is given

Total alkalinity (mg/mL) = Volume of titrant × 50 × 500 × 0.02/ volume of sample

Since, 50 is the constant value for the sample (weighed previously), and 500 is the volume of HCL in the solution used for the experiment.

Determination of chloride

The salinities of the samples can be determined by detecting chloride ions. For the experiment, the chloride concentration of the collected plants was obtained by applying Mohr's method. For that, 1 mL of the samples were taken in a conical flask and 19 mL of distilled water was added to it to get 20 mL. Then 2-4 drops of Potassium Chromate indicator were added to the solution and titrated against 0.2 N $AgNo_3$ till the colour changed to brick red. The processes were repeated three times to obtain an accurate value of the sample and recorded all the readings for calculation. The blank titration was also performed with 20 mL of distilled water by adding a few drops of Potassium Chromate indicator against $AgNO_3$. Blank titration was done to reduce the titration errors for titration of another experiment having samples. After the colour of the sample turns brick red precipitation occurs and hence the chloride concentration for the samples was determined by using Mohr's method[10].

Chloride (mg/l) = (vol. of $AgNO_3$ for sample – vol. of $AgNO_3$ for blank) × 0.2 × 35.45 × 250 / volume of sample.

Since,
Normality of $AgNO_3$= 0.2N.
equivalent weight of chloride = 35.45 g
$AgNO_3$ solution used for titration = 250 mL

Statistical analysis

Quantitative data were examined in triplicate and denoted as Mean±SD. Significant tests were done at $p<0.05$ in GraphPad Prism 10.

Results and Discussion

A list of the collected species was presented in Table 2. To know the significant value of different plant species which are used for making khardwi, the use value (UV), informant consensus factor (ICF) analysis was studied, including different chemical analyses carried out, which is represented in Table 3-5. Comparison of pH value, alkalinity, TDS, and chloride concentration of the samples were determined in (Fig. 4 & Fig. 5).

Alkali preparation among the Bodo community has been practiced from the very beginning. The majority of the people from these communities used to prepare khardwi from *Musa balbisiana* (aathiya) followed by

Table 3 — Use value of the studied plant taxa

Name of the species	Total no. of respondents (N)	No. of uses mentioned for species (ΣUi)	Use value (UV)
Artocarpus heterophyllus Lam.	57	14	0.24
Brassica rapa L.	57	56	0.98
Carica papaya L.	57	18	0.31
Cocos nucifera L.	57	34	0.59
Musa acuminata Colla	57	54	0.94
Musa balbisiana Colla	57	56	0.98
Musa × *paradisiaca* L.	57	55	0.96
Solanum tuberosum L.	57	25	0.43

Table 4 — Different disorders treated by plant species

Category of disorder	No. of use reports (Nur)	No. of species (Nt)	ICF
Indigestion, gastric	42	6	0.87
Stomach ulcer	12	3	0.81
Insect bite	50	7	0.87
Body inflammation	34	4	0.90
Itching, skin disease, allergy	53	8	0.86

Table 5 — Chemical analysis of collected plant samples for alkali preparation

Name of the species	pH	Total dissolve solid (mg/L)	Alkalinity (mg/mL)	Chloride concentration (mg/L)
Artocarpus heterophyllus Lam.	11.67±0	75430±1.07	1046.67±1.01	420.08±0.30
Brassica rapa L.	10.81±0.0057	65863.33±0.52	823.33±0.83	426±0.4
Carica papaya L.	11.58±0.0057	143866.67±1.61	1900±2.27	479.25±0.2
Cocos nucifera L.	11.80±0.0057	216023.33±0.58	1783.33±0.61	319.5±0.2
Musa acuminata Colla (rhizome)	12.79±0	210196.67±1.08	1310±2.11	248.5±0.4
Musa balbisiana Colla (trunk)	11.33±0.0057	75660±0.95	1650±1.56	245.54±0.40
Musa balbisiana Colla (rhizome)	13.08±0.01	173510±3.28	1633.33±1.67	378.67±0.30
Musa × *paradisiaca* L. (trunk)	13.12±0.0057	212150±1.85	1943.33±1.17	479.25±0.2
Musa × *paradisiaca* L. (rhizome)	13.63±0.0057	214496.67±0.84	1453.33±5.67	538.41±0.41
Solanum tuberosum L.	10.65±0.0057	64503.33±0.75	466.67±0.61	426±0.2

The above data were significantly different at $p<0.05$ significant level

Brassica rapa (mustard), *Cocos nucifera* (coconut), *Solanum tuberosum* (potato), *Carica papaya* (papaya) and *Artocarpus heterophyllus* (jackfruit). The 'khardwi' has great potential uses for various purposes besides being used in traditional cuisine for consumption. Earlier they used these as shampoo to wash up their head, remove dandruff and lice, and wash cloths, utensils, etc. The community used khardwi as medicine for gastric problems, allergies, itching, insect bites, etc. The young trunk of bananas called posla and inflorescence are eaten as vegetables in daily life. During festivals like 'Bwisagu' a large festival of the Bodo community in Assam and also during weddings posla are being used.

The use value ranged from 0.24 to 0.98 (Table 3). The highest use value (UV) has been observed in *Musa balbisiana* (0.98) and *Brassica rapa* (0.98). Also, *Musa* × *paradisiacal* (0.96) and *Musa acuminata* (0.94) showed great use value because of the large number of reports used in the study. To understand the various disorders reported by the informants, the data were categorized into five classes for the calculation of the Informant Consensus Factor (ICF) (Table 4). The ICF values ranged from 0.81 to 0.90, with the highest value observed for body inflammation (0.90).

The documentation and chemical analysis were done on ten different parts of plant species resulting in different values in P^H, alkalinity, chloride concentration, and dissolved solid (Table 5). *Musa* × *paradisiaca* L. (rhizome) was found to be highest in P^H *i.e.*, 13.63, followed by the trunk of *Musa* × *paradisiaca* L., *Musa balbisiana* Colla (rhizome),

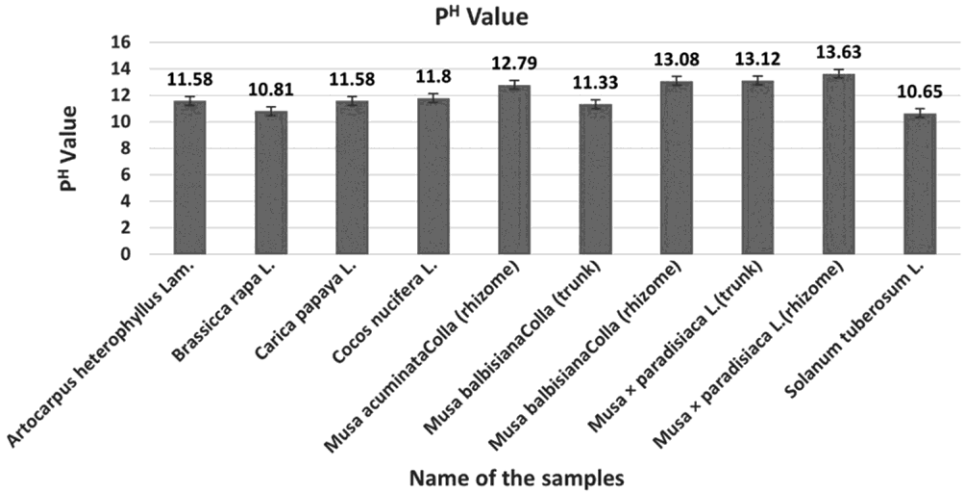

Fig. 4 — pH values of the collected plant samples

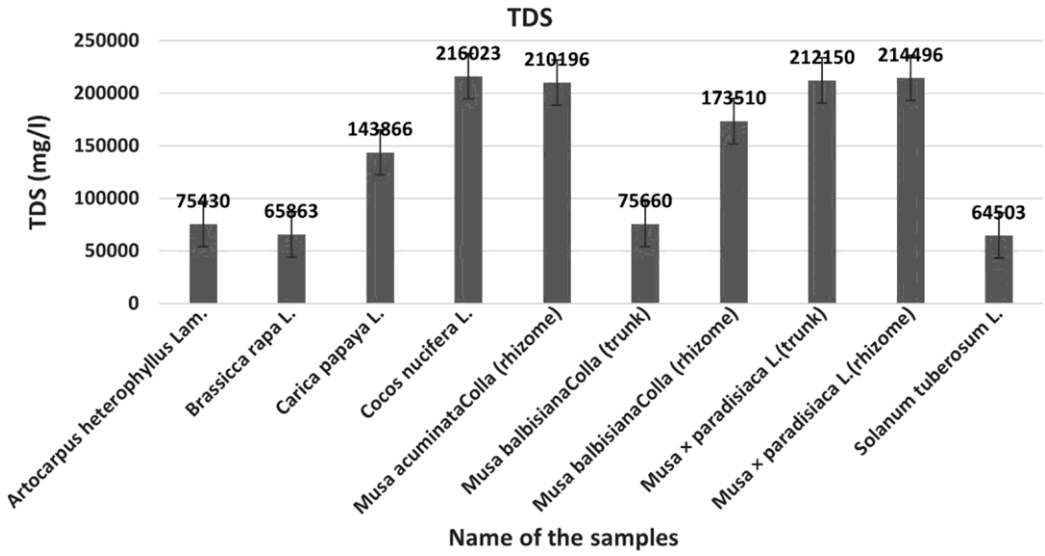

Fig. 5 — The total dissolved solid of the collected plant sample

Musa acuminata Colla (rhizome), *Cocos nucifera* L., *Artocarpus heterophyllus* Lam., *Carica papaya* L., *Musa balbisiana* Colla (trunk), *Brassica rapa* L. and *Solanum tuberosum* L. found as lowest P^H value (Fig. 4). The most widely used alkali from *Musa balbisiana* rhizome and trunk have a P^H of 13.08 and 11.33 respectively (Fig. 4). The concentration of chemicals may vary due to the dissolving and diluting process. The maximum concentration of total dissolved solid has been observed in *Cocos nucifera* L. (216023.33±0.58) followed by rhizome of *Musa* × *paradisiaca* L. (214496.67±0.84), trunk of *Musa* × *paradisiaca* L. (212150±1.85), rhizome of *Musa acuminata* Colla (210196.67±1.08), rhizome of *Musa balbisiana* Colla (173510±3.28), *Carica papaya* L. (143866.67±1.61), trunk of *Musa balbisiana* Colla (75660±0.95), *Artocarpus heterophyllus* Lam. (75430±1.07), *Brassica rapa* L. (65863.33±0.52) and lowest concentration has been observed in *Solanum tuberosum* L. (64503.33±0.75) (Fig. 5). The maximum concentration of alkalinity has been observed in the trunk of *Musa* × *paradisiaca* L. (1943.33±1.17) and lowest in the *Solanum tuberosum* L. (466.67±0.61). The maximum concentration of chloride has been observed in the rhizome of *Musa* × *paradisiaca* L. (538.41±0.41) and the lowest concentration has been observed in the trunk of *Musa balbisiana* Colla.

Conclusion

Traditionally khardwi has been used by the Bodo tribe since ancient times and not only as a source of food but also as a medicine to cure different ailments that appear in the human body. The Bodo people preserve or store khardwi in a container or bottle that can hold it for up to a year. These days, they offer alkali or khardwi in the market for 10 rupees per ball and 40 rupees for a half-liter of filtrate water khardwi. Thus, there is a great chance that the plants and their by products will be employed for business purposes and to help the local rural population flourish economically. The local methods are inexpensive and simple to use; however, for the commercialization of the product, further standardization is required. Chemical analyses of all the plants showed promising potential for alkali production, and evaluation of additional chemical constituents will be valuable for future applications in the pharmaceutical and medicinal industries.

Acknowledgments

The authors acknowledge the local people of Kokrajhar district for their help and for sharing knowledge during the present study. Authors declare that Prior Informed Consent (PIC) was taken from the Knowledge Providers as per the CBD guidelines. The authors are thankful to the Department of Botany and Department of Zoology of Bodoland University, Kokrajhar for giving the requirements to do the present work. The authors acknowledge Mr. Dwimalu Brahma for his help in making the study area map.

Conflict of Interest

The authors declare that they have no conflict of interest.

Author Contributions

SB: Conceptualization, data collection, supervision, and revision. BB: Data collection, formal analysis, conceptualization, and writing the original draft. PB: Conceptualization, writing the original draft, software, and statistical analysis. The final manuscript was scrutinized and approved by all the authors.

Informed Consent

Following the participants' prior informed consent, the authors held group conversations with them to gather data.

Data Availability

The authors declare that they do not have any additional data to provide

References

1 Kothari A, *Traditional Knowledge and Sustainable Development*, (International Institute of Sustainable Development, 2002). http://www.iisd.org/

2 Jasmine B, Singh Y, Onial M & Mathur V B, Traditional knowledge systems in India for biodiversity conservation, *Indian J Tradit Know*, 15 (2) (2016) 304-312.

3 Singh, H B, Yaipharembi N, Huidrom E & Chingsubam A, Traditional knowledge, beliefs, and practices associated with ethnic people of Manipur, North East India in conservation of biodiversity, In: *Traditional Ecological Knowledge of Resource Management in Asia*, (Springer), (2023) 61-75. http://dx.doi.org/10.1007/978-3-031-16840-6_5

4 Boro F & Bhattacharjee S, Glimpses of traditional food habits, dress and ornaments: A study among the Bodos of Udalguri district in Assam, *Man Environ Soc*, 1 (1) (2020) 69-86.

5 Deka D C & Talukdar N, Chemical and spectroscopic investigation of Kolakhar and its commercial importance, *Indian J Tradit Know*, 6 (1) (2007) 72-78.

6 Borborah K, Borthakur S K & Tanti B, *Musa balbisiana* Colla– taxonomy, traditional knowledge, and economic potentialities of the plant in Assam, India, *Indian J Tradit Know*, 15 (1) (2016) 116-120.

7 Kalita P, Sen S & Kandar C C, Traditional believes and scientific experiment on Kolakhar: A short review, *Res J Pharm Biol Chem Sci*, 8 (5) (2017) 186-188.
8 Kalita P, Dey B K, Kandar C C, Chakraborty A, Talukdar A, *et al*., Phytochemical and *in vitro* antioxidant activities of Kolakhar: A locally used Herbal Soda of Assam, India, *Res J Pharm Biol Chem Sci*, 6 (3) (2015) 1117-1122.
9 Jedidiah J, Alkali extracts from banana peel ash used in removing metals from metals polluted water from Abakaliki, Ebonyi State, *IOSR J Appl Chem*, 12 (11) (2019) 63-68. DOI: 10.9790/5736-1211016368
10 Sarma A, Das M & Dutta T, Traditional alkaline food additives 'Kola-khar' extracted from banana rhizome with reference to *Musa balbisiana* from Assam the state of India, *Int J Bio-Pharm Res*, 9 (6) (2020) 2671-2677. http://dx.doi.org/10.21746/ijbpr.2020.9.6.1
11 Borthakur S K, Bawri A, Baro D & Boro A, *Flora of BTAD*, Vol 3, (EBH publishers, India), 2018.
12 Kanjilal U N, Kanjilal P C, Dey R N & Das A, *Flora of Assam*, Vol 4, (Prabasi Press, Upper circular road, Calcutta), 1940.
13 POWO (Plants of the World Online), Facilitated by the Royal Botanic Gardens, Kew, Available online: https://powo.science.kew.orgaccessed on 01-07-2023).
14 Baruah S, Gowala A, Brahma P & Bhuyan B, Quantitative approach to unveiling indigenous knowledge on medicinal plants of tea tribes of Dhubri district, Assam, India, *Proc Indian Natl Sci Acad*, (2025). https://doi.org/10.1007/s43538-025-00444-9