

E-ISSN: 2709-9369

P-ISSN: 2709-9350

www.multisubjectjournal.com

IJMT 2024; 6(4): 76-83

Received: 02-01-2024

Accepted: 03-02-2024

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Traditional food systems of Kumaon region (Uttarakhand): A blend of taste with medicinal attributes

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DOI: <https://dx.doi.org/10.22271/multi.2024.v6.i4b.412>

Abstract

Kumaon region in Uttarakhand, India is famous for its high-altitude mountains, large forest area and famous hill stations frequented by people throughout the year. The region is inhabited by large number of ethnic groups along with migrated population from nearby states thus reflecting cultural integrity of country. A face to face survey was conducted to local housewives in different villages and the traditional healers of that area to gather information about traditional recipes prepared from locally available food grains and other plant species important in Kumaoni culture. The survey confirmed that the plant species used for the preparation of the delicious recipes are also medicinally important and used by natives for the treatment of different ailments. In this review a brief description of few of the famous Kumaoni recipes is presented along with important phytoconstituents present in them. A brief description of the medicinal and pharmacological uses has also been given. This study indicates that the Kumaoni people are not only well verse in utilizing the medicinally important natural flora for treatment of different ailments but also in their daily cuisines also. The native people here are simple, hardworking and very hospitable to tourists, usually serving the local food to them. However as per demand of tourist there has been change in the cuisines also.

Keywords: Traditional Kumaoni recipes, medicinal plants, phytoconstituents, tribal recipes

1. Introduction

Uttarakhand or 'Devbhumi' is 27th state of Republic of India situated in the foothills of Himalayan mountain range and surrounded by both national and international boundaries. It is located between 28° 44' & 31° 28' North latitude and 77° 35' & 81° 01' East longitude and covers 53483 sq km with both plain and hilly areas, with a diverse topography with snow-capped peaks, glaciers, deep canyons, roaring streams, magnificent lakes, and a few regions of dusty plains in the south (Fig 1). The state has rich and diverse floral, faunal and microbial wealth including rare and threatened species of plants and animals. The state has fabulous wealth of medicinal plants, wild edibles, timber and fibre yielding plants. The use of plants for medicinal purpose was first mentioned in Rigveda and Charak Samhita an ancient Indian script. The rural community is largely dependent on them for their livelihood. There exists a close relationship between the religious, socio-cultural beliefs and conventions. The state is divided into two regions: Garhwal and Kumaon, however the polity first emerged in history as a part of the Kuru and Panchal kingdoms during the Vedic period (Mahajanpads). According to Hindu mythology it was a portion of the famous Kedarkhand (Garhwal) and Manaskhand (Kumaon). It is also thought that the Mahabharata epic was written in here by the legendary sage Vyas. Shaivism, Buddhism, and Folk Shamanic religion were all practiced in ancient time along with some other religions. In Uttarakhand people are divided based mainly on regions i.e, Kumaoni and Garhwali. Apart from these, ethnic groups such as the Bhotiyas, Jaunsaries, Tharus, Bhuxas, and Rajis also live here. Hindus make up a large portion of the population however a secular atmosphere, with a sizable population of people who practice various faiths is maintained. There exists a slight variation in the cultural tradition in Kumaon and Garhwal regions due to the politico historical factors ^[1, 2]. The famous temples at Almora, Jageshwar, Dwarhat and other places in Kumaon region reflect the Himadri form of Architecture. The traditional apian art can be found in all Kumaoni homes representing the decorative ritual designs. Bal Mithai, Kaapa, Lesu, Madua roti, Bhatt churkhani, Bhang chutney, Dal vade, Gulgula, Baadi, Aloo Gutkae, etc are few of the popular traditional cuisines of the area. However, few Garhwali recipes like Thechwani, Jhangora ki kheer, Chaunsu are also popular among locals.



Fig 1: Uttarakhand (Area: 53,483 sq.km; Latitude: 28°43' N to 31°27' N Population: 100.86 lakh)

Methodology

The ethnobotanical survey on the use of plants for food and medicine was conducted in Kumaon region using various approaches *viz*, interview by one of the authors (RAJ) and her own observations. A structured dialogue with elderly old men and women and local Vaidya was done seeking information about the traditional agricultural crops, recipes prepared from them along with their medicinal importance. The local and wild crops were purchased from the local shopkeepers in Haldwani, Distt Nainital and Distt Bageshwar and few were collected from adjoining villages of Kaladungi, Ramnagar and Kapkot of these districts in all seasons. The relevant scientific information about the phytochemicals, nutritional values were correlated by review of literature from Google Scholar, Pub Med etc.

Dietary Habits of Kumaoni People

The local people specially the villagers are highly skilled in identifying the wild edible and medicinal plants and also know how to utilize them either for their own medicinal use or for preparations of specific traditional cuisines [3]. The diet is a mixture of modern and traditional cuisines although the ingredients are locally procured. Besides vegetarian diet the people also consume fish, meat, eggs, chicken in their diets. The people living at higher altitudes regularly consume non-vegetarian diets. The diet is the mixture of traditional and modern styles. The dietary habits of Kumaoni people in general is a combination of wild and cultivated seasonal vegetables, fruits, locally grown cereals, dairy products and meat products and can be considered as healthy diet. The meat is usually consumed in all seasons; however elderly people have less liking for it. This blend of different food items maintains the nutrition, taste and reflects their traditional cultural values. The rural community are mostly engaged in farming and require extensive physical labour and hard work. They usually grow

all types of seasonal fruits and vegetables, cereals including pulses required for their family throughout the year. However, they purchase from market also as per the need and availability. The people here usually eat less sweets, more fruits in all seasons, however vitamin C rich fruits like lemon, malta etc are widely consumed more in winters [2, 4]. The common and traditional crops include jhangora (Barynyard millet), mandua (Finger millet), cheena (Proso millet), kauni (Foxtail millet) chaulai (Amaranth), kutu (Buck wheat) gehat (Horse gram), bathua, naurangi (Rice bean), bhatt (Black soyabean) etc. Mostly these are eaten throughout the year but especially the mandua is used during winters due to its hot potency [5]. The wild growing fruits like timla, bedu, ghingaru, hisol, kala hissa are also eaten widely. In rural areas specially, villages as well as outskirts of city people also have usually a cow in their homes to have milk supply and considered cow as “Gou mata” a sacred animal. The people are well aware to utilize all-natural resources to which they are surrounded. The use of flowing water was used to make flour of cereals through ‘pan chakki’ in the villages, similarly the use of certain plants for the treatment of diseases are also well known by the elderly people of villages which is passed from generations to generations. The nomadic people living at higher altitudes possess flocks of goat and sheep helpful to fulfil their daily needs. The watery starch extracted from boiled rice is given to lactating mothers due to high calorific value. The pulses like urad being warm in potency is widely consumed by the people here although also known to increase *pitta* and *kapha* and excessive consumption may cause digestive problems.

Unique features of Kumaoni Cuisine

The food of Kumaon region is heavenly in taste even though is very simple in preparation. The permanent local people here depend upon cereals, vegetables, meat and dairy

products. The traditional meals are prepared using these. Although the traditional cuisines are gradually being replaced by non-traditional food products due to changes in life style as well as more availability of non-traditional food items. The food is usually organic and is cooked on slow flame and the style of cooking exhibits variation as influenced by regional differences, geographical locations and foreign invasions on the land in past centuries. But overall the food here at present is developed in such a way that it maintains a good standard in terms of quality and nutrition and help people to survive in the extreme conditions of cold at high altitude as well as in high heat of Tarai and Bhabhar in summers and is wholesome and nutritious. Somehow the daily preparation of food is different in rural and urban areas. In rural areas where the livelihood mainly depends on farming the day meal starts with mandua roti or wheat roti eaten with garlic chutney or some seasonal green vegetable. The main meal is usually a simple seasoned dal with rice with leafy vegetables commonly called tapkiya in local language with chutney or fried red chillies. The vegetables are commonly seasoned with cumin tempered in mustard oil or mustard like spice called as Jakhiya, giving nutty flavour to the dish. The dinner is served with simple vegetable and roti prepared with wheat flour or even with rice flour. The dishes prepared in festivals are different from routine ones. It mainly includes kheer, singal, pua, vada, along with aloo ka jhol, kaddu ki sabzi, puri etc. To combat winter season urad dal and mung dal are used to prepare badis and mangodi, which are basically sun-dried balls of these soaked dal. Besides the difference in dietary habits of rural and urban citizens a slight variation in the cuisines is also found among the people living at higher altitudes specially the tribals like Bhotiyas.

Cuisines prevalent among Tribals

Uttarakhand tribes represent the ethnic groups residing in the state. Every district has more or less a moderate percentage of tribal population. The land is mainly the home of five major tribes namely Jaunsari, Tharu, Raji, Buksa and Bhotiya. In terms of population Jaunsari tribe is the largest tribal group of the state [6]. These tribals have their own cultures and are well versed with valuable knowledge accumulated through a long period of experience. They interact closely with forest, depend on forests for their livelihood as well as preserve the traditional knowledge about medicinal plants for the treatment of different disease, as well as prepare different cuisines and use these for their livelihood. The Bhotiyas are scattered over the seven main river valleys in the three border districts of Uttarkashi, Chamoli and Pithoragarh. By nature, they were very shy and aloof in past and did not like to talk the people other than their society. Jaunsaris are the people living in the Jaunsar Bawar region, a hilly region in Garhwal division located in north-west of district Dehradun. The Tharu is largest and oldest ethnic group of the Terai lowlands, amid the Shivaliks or lower Himalayas region, living in villages near dense jungles in regions that were isolated over the millennia, allowing them to develop a unique culture. They have deep affiliation with forest and river [7]. The Buxa tribe is a subpart of Tharu tribe however is the lowest clan of it. These are very eco-friendly people and all their cultural activities as other socioeconomic activities are deeply related with nature and thus they keep an ecological balance. In past and in few places even today these tribals

depend on forest and prefers to live near forest, however the modernization of the state has led to motivate the young generation to slightly change and blend with the traditional and modern means. Raji tribe is considered to be socially and economically undeveloped tribal community in state and is on the danger of extinction and requires immediate protection and development. These people are well knowledgeable about the flora and fauna of the area, and they not only use these for the preparation of specific cuisines but also treat diseases with medicinal plants that are abundant in their area [8]. The Bhotiyas use timur fruit in the form of spices, condiments and medicine. The dried fruit commonly called as 'hagi' is used to prepare a soup consumed in winters by entire family. A local liquor is also made from the fruits is palatable only to those who are addicted to it. A chutney prepared from fruits of timur, known as 'Dunkcha' is popularly used as food item [9]. The Bhotiyas also very commonly use sun dried /dehydrated food prepared from different herbs, spices, meat and vegetables like radish and onion in winters. A very popular dish prepared from grated sun-dried radish is 'lafhoo' stew prepared with it and served with rice. Guthain (A type of pancake), roti, jadu (Porridge) is prepared from a type of buckwheat type millet found at higher altitudes and commonly used by Bhotiyas. Jadu is considered as staple food. Phaphar (Kutu) is also used by them to prepare a traditional dish called 'Dulang' offered to god. In the preparations they use different spices and condiments like caraway seeds (Thawe) which possess many health benefits as is rich source of calcium, selenium, manganese, potassium. Sakwa (Kwacho) is also used in vegetables and pulses. The herbs like Chibi, Katki, Timor also possess medicinal attributes and used to cure indigestion, fever, cough and cold respectively. The different kinds of wild fruits locally available are also consumed by them. A white flower 'Shablo' looks like rose bearing red fruit, 'Fantullo' is similar to kaphal another famous fruit in Kumaon region growing in summers, 'Bhayanhhalo' appears to be similar to lychee fruit but is green in colour and after ripening turns black, 'Phalalo' grows as big shrub black in colour and is like timur seeds. Tinglo grows as high as coriander plant however smells pungent and offensive like that of iodex and is white and blue in colour [10]. The Bhotiyas make daru or kacchi (Alcoholic drink) and 'jann' (Local beer) and a fermented food known as 'sez'. Kacchi is prepared by fermentation of boiled barley grains and thereafter its distillation. It contains high concentration of alcohol, however 'Jaan' is a low alcoholic content drink prepared by fermentation of boiled rice using balam as a starter culture. These drinks are considered as pure and offered to relatives and guest, and also drink by women during festivals and celebrations. Besides drink it is also considered as medicinal and usually used to treat cough, cold, dysentery, fever and stomach ailments. The residual rice after fermentation process is used to prepare 'Sej' which is eaten for treatment of mental and physical fatigue. The starter culture 'balam' is used to treat weakness and cholera in cattle [11, 12]. The Bhotiyas prepare a "Namkeen chai" or "Jya" (salted tea) prepared using bark of *Taxus baccata* L., (Birmi) salt, ghee and milk. It is considered to be energetic and nutritive beverage and plays a significant role in depicting the cultural and social life of these people. The scientific validation of the health benefits of this drink were well documented [13]. They also use Chyur or Cheura (*Diploknema butyraceae*) for their food, timber, fuel and

other purpose. Each part of the tree is utilized by them. It is used to cure many disease including ulcers, itching, tonsils, haemorrhage, rheumatism etc. The seeds produce oil which at lower temperature transform into fat and resembles ghee. It is of great medicinal and nutritional value. The cherua honey is sold at high cost in market as is used for treatment of asthma and diabetes. The nectar of flower is harvested to produce jaggery and flowers are used to prepare alcohol also [14, 15]. Besides using plants Bhotiyas also are fond of meat products. In the higher settlements of the state they eat 'Phasi', wild goat serving as a popular dish among them as different parts of it are sundried and preserved and carried to lower settlements during winters. Apart from this they also prepare cuisines from chicken and wild boar. The Jaunsaries very commonly eat mushrooms, however their range is narrow. The Raji and Buksa tribes are educationally, economically and socially very backward and poor in comparison to other tribes, and are placed in the category of the primitive tribal group. The Ban Raji and Ban Rawat traditionally hunt for a living, especially porcupine and bats, and dig wild yams (*Dioscorea* spp.) and other forest food. The Tharu community commonly are dependent on rice and other locally available plants. 'Dhikri' (Bagiya) is a dish of boiled rice flour, eaten with chutney or Salan [14, 16].

Nutritional attributes of few Kumaoni Cuisines

India is a land of rich diversity and can be clearly seen in its cuisines also. The traditional cuisines of Kumaon region have different flavours, methods of preparation as well as they are nutritionally rich as some are prepared even with the use of medicinally important plants. The food is prepared by using locally available fruits and vegetables considering the seasonal variation of the region as 'Buransh sharbat' is used to combat the summers while 'Mandua ki roti' is prepared in winters to tolerate the extreme cold. Some of the traditionally prepared cuisines of the region are mentioned highlighting their nutritional importance also. Table 1 list the main ingredients i.e., fruits, vegetables, cereals etc., frequently used in Kumaoni cuisines along with their important phytoconstituents, medicinal and pharmacological uses representing the richness of the daily food items consumed by the local inhabitants of the state.

Aloo Ke Gutke: It is a very famous dish in Kumaon and prepared frequently in all seasons. It is simply boiled potatoes (*Solanum tuberosum*) tossed with basic spices like turmeric, red chilli powder, salt garnished with coriander leaves. It is relished for its flavour only however, due to large amount of carbohydrate present in potatoes it is helpful to fulfil the need of calories required to walk in the hilly areas.

Bhang Ki Chutney: The roasted seeds of bhang (*Cannabis sativus*) along with coriander leaves, green chilli, and other spices are used to make chutney, a very favourite among the natives here. The leaves are also mixed with gram flour and chillies and salt to prepare pakode(fritters), frequently eaten during winters.

Bhatt Ke Dubke or Dubuk: It is one of the most traditional recipes in Kumaon region. Bhatt is a variety of *Glycine max* commonly known as black soybean. The seeds are soaked in water, then a coarse paste is made cooked in an iron skillet/kadai, saute with cumin seeds and asafoetida along with minced garlic, onion, chillies etc and cooked well. The

potency of Bhatt is warm so it is the most common recipes specially eaten in winters.

Bhatt Ki Chutney: The seeds are dry roasted and mixed with salt, coriander etc to prepare a chutney. The aroma of roasted seeds provides relief in cold.

Bhatt Ki Churkani: It is a very protentious dish and is considered as one of the iconic dish of Uttarakhand. The seeds are soaked in water for 4-5 hours, thereafter fried in hot mustard oil then blended with rice flour, turmeric, ginger garlic paste, salt, chili powder and water as desired and cooked well in an iron skillet at low flame for 1-2 hours if using coal burner.

Chainsa: This is a popular dish prepared from powdered urad daal i.e., *Vigna mungo*. It is prepared in an iron skillet, in mustard oil usually with garlic chilli and turmeric powder similar to that of churkani and is easy and simple dish. It is hot in potency and sweet to taste.

Gaderi Ki Sabzi: The corms (*Colocasia esculenta*) are usually used for preparing vegetable, however people also eat leaf stalk, petiole and rolled leaf blade as vegetables. The corms are chopped into thick pieces, cooked in mustard oil with crushed onion, garlic, green chillies, fresh fenugreek leaves, curd can also be added as per tasted.

Gehot Ki Daal: Gehot or *Macrotylome uniflorum* also finds important place in Ayurvedic cuisine due to its rich protein and vitamin A content. The preparation of it is simple which includes seasoning with black cumin or jakhiya and then pre-soaked seeds are cooked well in an iron skillet on low flame.

Genthi Ki Sabzi: Genthi or wild yam (*Dioscorea bulbifera*) is a nutritious tuberous vegetable. The underground tuber is either roasted or boiled first then deskinning and chopped, and used to prepare vegetable like that of potato. It is warm in potency and is widely cooked in winter season in the region.

Jhangora Ki Kheer: Jhangora or barnyard millet *Echinochloa frumentacea* is used as an alternate of rice during fasting or 'vrat' and a sweet dish is usually prepared using milk and sugar added with some dry fruits.

Kandalee Ki Sabzi or Sisunaak ka sag: It is also known as bichoo ghass (*Urtica dioica*) and is warm in potency and its leaves are eaten as vegetable. The stems and leaves contain needles that secrete acetylcholine and other substances and thus produces sting like sensation when touched [17]. The leaves are plucked with the help of plucker and then washed with boiling water or sometimes kept in boiling water to remove the fine needles and its harmful effect. Then are chopped, seasoned with spices and cooked well.

Kaapa or Kafuli: It is prepared using spinach (*Spinacia oleracea*) and fenugreek leaves (*Trigonella foenum-graecum*). The leaves are washed and chopped and cooked with crushed garlic, green chillies, cumin, turmeric and salt on low flame in an iron skillet and the curry is thickened with rice or wheat flour.

Kheerae Ka Raita: It is mouth-watering side dish prepared

in almost all Kumaoni homes. It is prepared using grated cucumber (*Cucumis sativus*), curd, green chillies and mustard seeds. The crushed mustard seeds produce a pungent taste and smell, locally known to cure dizziness during travelling in hilly areas specially in motor vehicle. It is usually served with 'Aloo ke gutke' or pakode (Fritters) at local dhabas all across Kumaon region and is relished by all. It is usually prepared almost every day in Kumaoni homes.

Lingora Ki Sabzi: It is a natural growing fern (*Matteuccia struthiopteris*) commonly called as 'fiddlehead fern' or 'ostrich fern', found in jungles during rainy seasons and not cultivated. The soft ferns are collected from the local areas, soft whitish hairs on rachis are first removed and then ferns are finely chopped. It is simply cooked as like other vegetables using crushed garlic, onion, even tomatoes can be added as per taste, green chillies, turmeric and salt on low flame using iron skillet. It can be garnished with lemon juice if needed.

Mandwa Ki Roti: Mandwa or finger millet (*Eleusine coracana*) seed flour is either used alone or in combination with wheat flour to prepare roti (chapati) consumed with ghee, jaggery (gur) or special salt prepared with mint/coriander leaves, salt, cumin seeds, garlic and green chillies.

Metha Bhaat: It is usually prepared with lal chawal (Red rice-*Oryza sativa*) cooked and mixed with jaggery (Gur). The blend of rice with jaggery make it a rich source of iron as a food supplement.

Muli Ka Theucha or Thechwani: Muli or radish (*Raphanus sativus*) is used as main ingredient, crushing it with garlic, ginger asafoetida and other spices, then cooking with potato as per choice, or alone with spices in a pressure cooker thereafter adding curd to it as per choice.

Phanu: It is prepared using three pulses commonly used in Kumaon region –moong (*Vigna radiata*) Arhar (*Cajanus cajan*) and urad (*Vigna mungo*). These are soaked overnight in water and thereafter a clear soup is prepared, cooking the pulses on low flame in an iron skillet. The soaking process

provides a unique taste to dish.

Ras: It is a mixture of pulses like baht, rajma (*Phaseolus vulgaris*), chana (*Cicer arietinum*), gehat cooked in an iron pot on low flame. Then the boiled pulses are separated from the liquid, mixed with rice flour to get it thickened and seasoned with cumin seeds, red chilli powder and salt.

Timla ki sabzi: The fruits of Timla (*Ficus auriculata*) are boiled first and then cooked with crushed onion, garlic, cumin, salt, turmeric green/red chillies.

Urad Vada: It is prepared by grinding soaked urad daal (*Vigna mungo*) and then frying small flat balls with holes made from finger. These are essentially prepared on all festivals and ceremonies. Some people also mix cumin seeds, chopped green chillies, salt and little turmeric as per taste in the mixture, this is when want to use it as snacks only and not with curd and sweet chutney.

Sane hue Muli aur Nimbu: It is mouth-watering dish prepared in winters using nimbu (*Lemon, Citrus × limon*) and muli. The bhanga seeds, curd and salt add a tangy flavour to the prepared snack. It is mostly enjoyed during winters as help to combat cold due to is high vitamin C content.

Sweets: The sweets are prepared using milk as the main ingredient. A local sweet 'singori' is made from condensed milk called as khoya and wrapped in the leaves of a commonly available tree Maalu (*Bauhinia variegata*). The leaves are rich in flavonoids, gallic acid, betulinic acid, triterpenes, lipids proteins and fibres. Bal mithai is another such important sweet known for its chocolate flavour. It is basically a chocolate fudge coated with small white sugar balls. The singal are compulsory to make at every festival here. These are spirals prepared from semolina, banana, milk, curd sugar and cardamom powder. Arsa is sometimes regarded as Garwahli cuisine but is also famous sweet prepared in Kumaoni homes. It is prepared from rice and sugar, a lot of practice is required to prepare Singal and arsa as each constituent play an important role in binding the ingredients together.

Table 1: Nutritional attributes and important phytoconstituents of few commonly used plants used in traditional Kumaoni recipes.

S. No.	Plant Name	Category	Common Name	Local Name	Part Used	Nutrients and Phytoconstituents [References]		Medicinal /Therapeutic Use	Name of Traditional Kumaoni recipes
1	<i>Bauhinia variegata</i> L.	Vegetable	Kachnar	Kwairal	Leaf	Alkaloids, fat glycoside, carbohydrates	Phenolics, tannins, lignin, saponins, flavonoids, terpenoids, kaempferol [18].	Diarrhea, dysentery, stomachic.	Leaves are used to wrap Singori sweets.
2	<i>Cajanus cajan</i> (L.) Huth	Pulse	Pigeon pea	Arhar	Seed	Carbohydrate, proteins, fats	Phenolic compounds, steroids, glycosides, alkaloids [19].	Ulcer, wounds, hepatoprotective, anti-asthmatic.	Phanu.
3	<i>Cannabis sativa</i> L.	Spices and condiments	Hemp	Bhang	Seed	Carbohydrates, essential oils,	Flavonoids, alkaloids, glycosides, tannins, saponins [20].	Constipation, stomach ache and warm effect	Bhang Ki Chutney.
4	<i>Cicer arietinum</i> L.	Pulse	Bengal gram	Chana dal	Seed	Carbohydrate, proteins, dietary fibre, amino acids, fixed oils.	Phytosterols, flavonoids, phenolic compounds, tannins [21, 22].	Anti-oxidant, inhibitory potential.	Ras.
5	<i>Citrus × limon</i> (L.) Osbeck	Fruit	Lemon	Nimbu	Fruit extract	Vitamin-C	Alkaloid, saponin, phenolic content [23].	Vomiting, gastric disorder	Sane hue Muli aur Nimbu
6	<i>Colocasia esculenta</i> (L.) Schott	Vegetable	Taro	Gaderi/Pinalu	Corns, petiole	Carbohydrates, vitamin A, B, C.	Flavones, luteolin, apigenin [24].	Arthritis, asthma, diarrhea, internal haemorrhage,	Gaderi Ki Sabzi

								neurological disorder, kidney disorder.	
7	<i>Cucumis sativus</i> L.	Vegetable	Cucumber	Kakari	Fruit	Carbohydrates.	Glycosides, tannins, saponins, flavonoids, terpenoids [25].	Sun stroke, malaria, headache, bleeding, dizziness, pale skin.	Kheerae Ka Raita
8	<i>Dioscorea bulbifera</i> L.	Vegetable	<i>Dioscorea</i> , Yam	Genthi	Aerial tuber	Carbohydrates, amino acids.	Alkaloids, flavonoids, glycosides, resins, saponins, tannins, volatile oils [26].	Pile, diarrhoea, dysentery.	Genthi Ki Sabzi
9	<i>Echinochloa frumentacea</i> Link	Millet	Indian barnyard millet or sawa millet	Jhingora	Fruit	Protein, fat, carbohydrate, minerals as Ca, P, Fe.	Phenolic acids, tannins, flavonoids [27, 28].	Constipation, ascites, obesity, diabetes.	Jhingora Ki Kheer
10	<i>Eleusine coracana</i> (L.) Gaertn.	Millet	Finger millet	Madua	Seed Grain	Carbohydrates, vitamin B1, B6, B12, E, minerals as Ca, amino acid lysine.	Linoleic acid, linolenic acid, flavonoids [29].	Cold, cough, high blood pressure.	Mandwa Ki Roti
11	<i>Ficus auriculata</i> Lour.	Fruit	Edible fig	Timla	Fruit	Carbohydrates, proteins, amino acids.	Flavonoids, terpenes, phyosterols [30].	Cancer cure properties, antioxidant, antibacterial, hepatoprotective, hyperlipidemic.	Timla ki sabzi
12	<i>Glycine max</i> (L.) Merr.	Pulse	Soya bean	Bhatt	Seed	Carbohydrate, Protein, amino acids, fats, fixed oils.	Phenolic compounds, Glucosides, alkaloids, phytosterols [31, 32, 33].	Antibacterial activity.	Bhatt ki churkani, Bhatt ke Dubke, Bhatt ki Chutney.
13	<i>Macrotyloma uniflorum</i> (Lam.) Verdc.	Pulse	Horse gram	Gahat	Seed	Carbohydrate, protein, fat, vitamin B1, B6, minerals as Cu, Mn, Fe, Ni	Alkaloids, flavonoids, saponins, terpenoids, tannins [34, 35].	Kidney stone, cold, cough, heart diseases, piles, asthma, bronchitis, leucoderma.	Gehot Ki Daal
14	<i>Matteuccia struthiopteris</i> (L.) Tod. Syn <i>Onoclea struthiopteris</i> (L.) Roth	Vegetable	Ostrich fern	Lingora	Young Shoot	Proteins, fatty acids, polysaccharides, linoleic acid vitamin C.	Dolichols, chlorogenic acid [36, 37, 38].	Uterine hemorrhage, influenza, diarrhea, hematochezia, anti-inflammatory, antidiabetic, antiviral, antioxidant.	Lingora Ki Sabzi
15	<i>Oryza sativa</i> L.	Cereal	Paddy	Dhan	Seed	Carbohydrates.	Glycerol-1, 3-dioleoyl-2-linoleate, n-octadecanoyl oleate, n-hexacosanyl oleate, n-nonacosanyl linoleate, n-hexacosanyl stearate [39].	Leucorrhea.	Metha Bhaat
16	<i>Phaseolus vulgaris</i> L.	Pulse	French bean	Rajma	Seed	Vitamin-B1, Carbohydrates.	Alkaloids, flavonoids, glycosides, polyphenols, saponins, steroid tannins, terpenoids [40].	Protein rich energy booster.	Ras
17	<i>Raphanus sativus</i> L. syn <i>Raphanus raphanistrum</i> subsp. <i>sativus</i> (L.) Domin	Vegetable	Radish	Mooli	Whole plant	Vitamin-C, fatty acids.	Glucosinolates, alkaloids, flavonoids, sinapoyl derivatives, volatile oils [5].	Jaundice.	Sane hue Muli aur Nimbu
18	<i>Solanum tuberosum</i> L.	Vegetable	Potato	Aalu	Tuber	Carbohydrates vitamin C, minerals as Mg, K, P, Fe, vitamin B1, B6, B3, dietary fibre.	Flavanols, anthocyanins, phenolic acids, folic acid, phytic acid [41, 42].	Disease related to ageing, antioxidant.	Aloo Ke Gutke
19	<i>Spinacia oleracea</i> L.	Vegetable	Palak	Kafuli	Leaf	Vitamin E, K, C, minerals as Mn, Fe, Mg, Fe.	Flavonoids, carotenoids, polyphenols [43].	Sore throat, inflammation of lungs, pain in joints, biliousness, flatulence, ring worm, scabies, leukodermas, hepatoprotective, anthelmintic, antioxidant.	Kaapa or Kafuli
20	<i>Trigonella foenum-graecum</i> L.	Spices and condiments	Trigonella	Methi	Seed and Leaf	Protein, amino acids, fatty acids.	Saponins, steroids, alkaloids, flavonoids, terpenes, phenolic	Cold and cough, constipation, diabetes, indigestion, joint pain,	Kaapa or Kafuli

							acid derivatives ^[44]	obesity	
21	<i>Urtica dioica</i> L.	Vegetable	Urtica	Bikchhu buti	Leaf	Vitamin C, polysaccharides, fatty acids.	Terpenoid, flavonoid, sphingolipid, sterol, lignan, sesquiterpenoids ^[45, 46] .	Improve premenstrual symptoms like bloating and cramping, reduce skin irritation, alleviates allergy symptoms.	Kandalee Ki Sabzi, Sisunaak ka sag
22	<i>Vigna mungo</i> (L.) Hepper	Pulse	Black gram/Urad	Maas	Seed	Vitamin B1, Vitamin-D	Phenols, flavonoids tannins ^[47] .	Energy booster and for fracture.	Chainsa, Phanu, Urad Vada
23	<i>Vigna radiata</i> (L.) R. Wilczek	Pulse	Green gram	Mung dal	Seed	Proteins, essential amino acids, vitamin C, minerals.	Flavonoids, quercetin ^[48, 49] .	Acne, eczema, dermatitis, itchiness, paralysis, fever, cough, liver diseases.	Phanu

Conclusion

The Kumaoni food has many health benefits as the overall diet is rich in proteins comprising of pulses, cereals, lentils, vegetables. Mostly the food is prepared in mustard oil and seasoned with spices and condiments mostly having important phytoconstituents helpful in improving he immunity as well as helps in prevention of diseases to some extent. The vegetables like Linguda, kandali etc are rich source of iron, proteins, carbohydrate making them nutritionally important. The Kumoani people are utilizing their natural resources in preparing nutritious food for them in daily life. It would be even better if to a great extent this Kumoani food is served to every tourist also so that they can deeply understand the rich cultural heritage of the region passed from one generation to another.

Acknowledgment

Authors are grateful to Param Pujya Swami Ramdev Ji for his extreme support and guidance.

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