

Ethnobotanical notes on significant food and medicinal flora used by the indigenous *Monpa* and *Nyishi* communities of Arunachal Pradesh, India

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Abstract

Present paper discusses ethnobotany of the economically significant food and medicinal plants used among the *Monpa* and *Nyishi* community of West Kameng and Kamle District of Arunachal Pradesh in cross-cultural approaches. The 49 species of both cultivated and wild food and medicinal plants recorded from *Monpa* and *Nyishi* biocultural landscape are frequently harvested and used by the local communities as antioxidant food, anti-inflammatory agent and for treatment of various diseases including prevention of cancer and liver cirrhosis which has the potential to be used as nutraceuticals and capable of sustaining the rural economy and livelihood of the rural community.

Key Words: Ethnobotany, Cross-cultural, Nutraceutical Plants, *Monpa* and *Nyishi* Tribes, Arunachal Pradesh

INTRODUCTION

The state of Arunachal Pradesh is rich in floristic heritage of ethnobotanical, ecological and economic significances distributed along different altitudinal gradient ranging from tropical to snow clad alpine mountains (Tag *et al.* 2008). This Eastern Himalayan State of India is also blessed with 26 major tribes and 110 subtribes rich in ethnocultural knowledge systems contributing towards effective conservation and sustainable utilization of ethnobotanical resources of their traditional biocultural landscape (Tag 2007; Ranjay *et al.* 2007; Omem *et al.* 2016). The forests of Arunachal Pradesh representing most of the characteristics vegetation types of India which receives heavy rainfall from both northeast and southwest monsoon that favours luxuriant growth of vegetation (Kaul & Haridasan 1987). Given the richness of traditional biocultural knowledge prevalent among the local communities, present study aims to document ethnobotanical heritage of significant food and medicinal plants focused on

Monpa and *Nyishi* tribal communities of Arunachal Pradesh. Perusal of literature has revealed few field based reports on ethnobotany of the tribal communities of Arunachal Pradesh since late 1990 focused on rapid ethnobotanical appraisal and documentation of indigenous food and medicinal botanical resources by selected workers including Dam & Hajra (1997), Tag & Das (2003), Gajurel *et al.* (2003), Tag *et al.* (2005), Ranjay *et al.* (2007), Tag *et al.* (2008), Jeri *et al.* (2011), Jambey & Tag 2015), Rinyo *et al.* (2018) and Momang *et al.* (2018). However, there is a shortfall of cross cultural ethnobotanical database on *Monpa* and *Nyishi* communities residing in West Kameng and Kamle Districts of Arunachal Pradesh except the rapid ethnobotanical appraisal report made by Tag & Das (2007), Jeri *et al.* (2011), Namsa *et al.* (2011), Jambey *et al.* (2017) and Deki *et al.* (2018). Thus, this article highlights ethnobotanical heritage of the two local communities (*Monpa* and *Nyishi*) in cross cultural approaches focused on commercially viable food and medicinal plants capable of supporting rural livelihood system.

MATERIALS AND METHODS

Study site and ethnocultural heritage

The West Kameng district of Arunachal Pradesh with population of over 83,947 souls occupies a total geographical area of 7442 sq km which accounts for 8.86 % of the total area of Arunachal Pradesh. It lies within geographical coordinate between 91° 30' to 92° 40' East Longitudes and 26° 54' to 28° 01' North Latitudes with elevation ranging from 100 m to 5000 m from the MSL (Census 2011). The forest types in the district are mixed tropical evergreen forest starting at 100 – 1000 m elevation to subtropical pine forests spreading at 1000 – 2300 m, whereas the temperate forests are between 2400 – 300 m from MSL dominated by *Quercus*, *Rubus*, *Rhododendron*, and *Alnus*. The alpine forests starts at elevation of 3200 and available up to 5000 m AMSL dominated by *Abies*, *Tsuga*, *Juniperus*, *Cupressus*, *Rhododendron* and alpine scrubs. The focussed local tribal communities of West Kameng District of Arunachal Pradesh are rich in local cultural heritage (Dhar 2005). They belong to Mongoloid racial stocks and speaks Tibeto Burman linguistic stock. Yak is their cultural animal whereas Losar is their community festival. Majority *Monpas* are Buddhist by religion and some of them practices Lamaism tradition of healing methods including herbal healing (Norbu 2008; Jambey & Tag 2015).

The *Nyishi* dominated Kamle district of Arunachal Pradesh, with 22,256 souls, occupies a total geographical area of 850 sq km which accounts for only 1 % of the total geographical area of Arunachal Pradesh. It lies within a geographical coordinate between 26°55" and 28°21' North Latitudes and 92°80' and 94°30' East Longitudes (Census 2011). Physical features of the Kamle district are rich and diverse. The altitude of the district is ranging between 200 m and 400 m in the low altitude River Valleys of Kamle and Siniek and extending upto 3800 m from the MSL in Talley range while the highest peak is the snowclad *Dicho Kato* which is about 5700 m high. Due to the altitudinal variation, the district experiences all short of agro-climatic zones that is, tropical low land including major river valleys (200 – 1000 m), subtropical zone of middle elevation hills (1000 – 2000 m), temperate (2000 – 2800 m), subalpine and alpine zone of higher elevation mountain range (2800 – 3800 m). The *Nyishi* community living in the Kamle district of Arunachal Pradesh belonging to Mongoloid racial stock and speaks Tibeto Burman dialectical groups. They trace their genealogy from mythical father *Abotani* whom they revered as progenitor of first human being. Their traditional religion is *Donyi-Polo*, and they celebrate *Boori Boot* and *Nyokum Yullo* as their community festival dedicated to entire forces of nature for the blessings (Tag 2017).

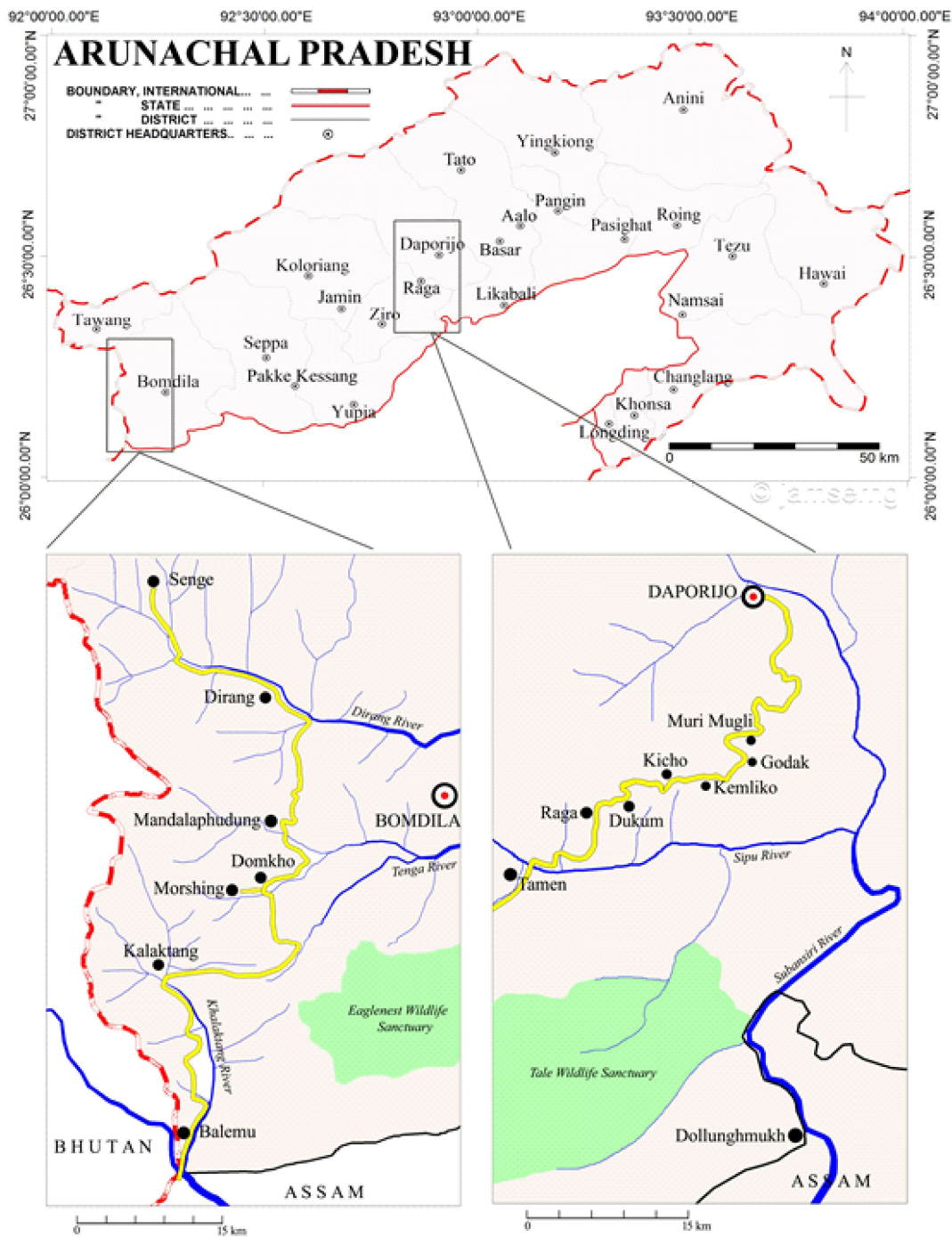


Figure 1. Map of Arunachal Pradesh showing study sites - West Kameng and Kamle Districts showing villages surveyed for gathering ethnobotanical information with GPS tracking points.

Ethnobotanical field survey

Cross-cultural ethnobotanical field survey was conducted during the years 2017 – 2018 in the *Monpa* and the *Nyishi* dominated biocultural landscape of West Kameng and Tawang District of Arunachal Pradesh following Jain & Rao (1977) and Martin (2008) methods. A total of 60 potential informants covering 30 household from 15 villages (7 villages from *Monpa* area and 8 villages from *Nyishi* area) were surveyed, interviewed and ethnobotanical information on medicinal and food plants, parts harvested, distribution and their application against various ailments were recorded using structured questionnaire format. Prior Inform Consent (PIC) was taken from the potential informants before start of the work. The taxonomically authenticated herbarium specimen of all the reported species was deposited with collection and accession number in the Herbarium of Arunachal University (HAU), Department of Botany, Rajiv Gandhi University, Rono Hills, Arunachal Pradesh, India for future reference. Voucher specimens were identified with the help of standard regional floras including *Flora of Assam* (Kanjilal *et al.* 1934 – '40), *The Flora of British India* (Hooker 1872 – 1897), *Material for the Flora of Arunachal* (Hajra *et al.* 1996; Giri *et al.* 2008; Chowdhery *et al.* 2009), and *Flora of Lower Subansiri* (Pal 1993). The accepted scientific names were verified in the website www.theplantlist.org and www.worldfloraonline.org, hosted by Royal Botanic Garden, Kew, UK and Missouri Botanical Garden, St. Louis, USA, and Plants of World Online (POWO) hosted by RBG, Kew.

RESULT AND DISCUSSION

Taxonomic diversity and distribution of food and medicinal plants

Present investigation has revealed potential 49 species of traditional food and medicinal plants belonging to 40 genera and clubbed into 37 plant families (Figure 2) used by the *Monpa* and *Nyishi* communities of West Kameng and Kamle district of Arunachal Pradesh which is presented in Table 1. Herbs represent highest number of species (23 spp.), which is followed by shrubs (12 spp.), climbers (2 spp.) and trees (12 spp.) (Figure 3). Majority of the plants used by the two local communities are found in wild while few species are found to be cultivated in home gardens and agricultural fields. The significant ethnobotanical species reported from *Monpa* belt of West Kameng district are from subtropical to temperate ecosystem with elevation ranging from 1000 – 3500 m AMSL and includes *Aconitum heterophyllum*, *Fragaria vesca*, *Gaultheria fragrantissima*, *Illicium griffithii*, *Lindernia neesiana*, *Magnolia campbelli*, *Meconopsis paniculata*, *Nasturtium officinale*, *Ophiocordyceps sinensis*, *Panax bipinnatifidus*, *Quercus semecarpifolia*, *Rheum nobile*, *Rhododendron arboreum*, *Swertia chirayita* and *Vaccinium glaucoalbum*. The majority of the species reported by the *Nyishi* tribal community of Kamle district are mostly tropical and subtropical ecosystems with elevation ranging 100 – 2000 m AMSL, which include *Allium hookeri*, *Centella asiatica*, *Clerodendrum glandulosum*, *Dillenia indica*, *Diplazium esculentum*, *Lindernia neesiana*, *Litsea cubeba*, *Panax arunachalensis*, *Paris polyphylla*, *Phytolacca acinosa*, *Plantago major*, *Smilax glabra*, *Zanthoxylum armatum*, and *Zanthoxylum rhetsa*.

Of the total 49 species reported, 6 species are exclusively harvested for food, 16 species are exclusively harvested for medicinal uses whereas 27 species reported as used as both food and medicinal purposes (Figure 5).

Cross-cultural ethnobotanical uses

Of the total 49 species, 7 species are exclusively used by the *Nyishi* tribal community, 24 species are exclusively used by the *Monpa* tribal community whereas 18 species are used by

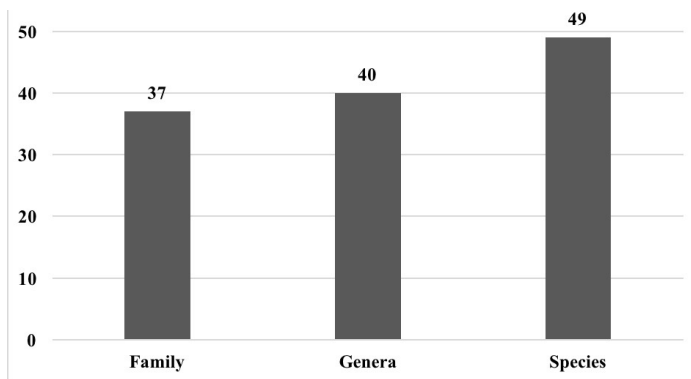


Figure 2. Taxonomic diversity of food and medicinal plant species (49 spp.) used by Monpa and Nyishi communities of West Kameng and Kamle districts of Arunachal Pradesh

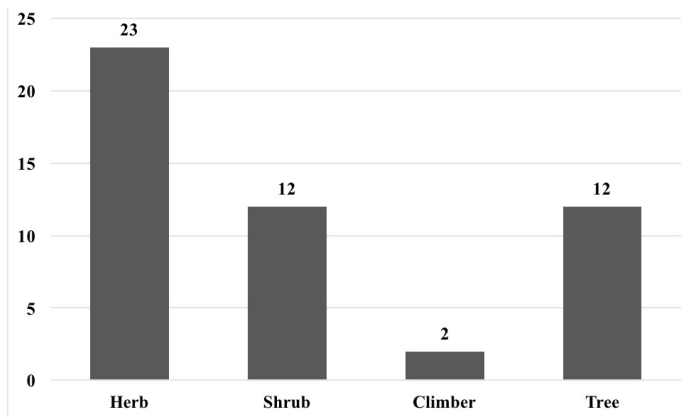


Figure 3. Diversity of habit of the food and medicinal plant species (49 spp.) used by Monpa and Nyishi communities of West Kameng and Kamle districts of Arunachal Pradesh

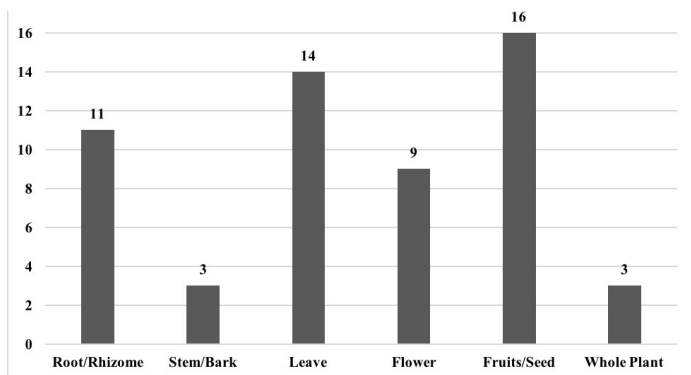


Figure 4. Statistics of plant parts harvested as food and medicinal agents (49 spp.; 56 plant parts) used by Monpa and Nyishi communities of West Kameng and Kamle districts of Arunachal Pradesh

both the tribal community, namely, *Monpa* and *Nyishi* as food and medicinal purposes (Figure 6). The 18 species which are used by both the communities are mostly reported from tropical and subtropical climatic regimes. These consensus species are commercially viable and frequently harvested species having high food and medicinal values found in the traditional biocultural landscape of *Monpa* and *Nyishi* communities. Some of the significant species reported to be commonly used by both the community are *Aconitum heterophyllum*, *Aconogonum molle*, *Allium hookeri*, *Colocasia esculenta*, *Diplazium esculentum*, *Houttuynia cordata*, *Litsea cubeba*, *Paris polyphylla*, *Rubia manjith* and *Zanthoxylum rhetsa*. These species are capable of enhancing rural food security, employment opportunities and livelihood security.

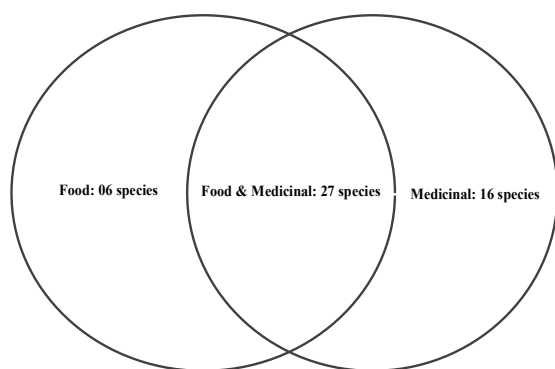


Figure 5. Diversity of plant species (49 spp.) used as food, medicinal, both food and medicinal agents by the Monpa and Nyishi tribal community of West Kameng and Kamle district of Arunachal Pradesh.

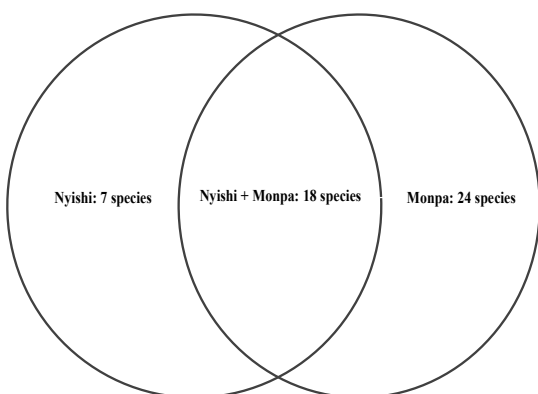


Figure 6. Cross-cultural uses of food and medicinal plant species (49 spp.) used by the Monpa and Nyishi tribal community of West Kameng and Kamle district of Arunachal Pradesh.

Diversity of plant parts harvested and ailment treated

Of the total 56 plant parts harvested from 49 species of food and medicinal plants for food and medicinal applications, fruits and seeds represent highest number (16 spp.), leaves (14 spp.), root or rhizome and flowers represented by 11 species each whereas stem or bark and whole plant represent 3 species each which is presented in Figure 4. The 56 plant parts harvested are either consumed as food and used for treatment of 27 diseases and ailments ranging from sexual debility to liver cirrhosis, cancer, high blood pressure, skin inflammation, chest and lung inflammation, cardio tonic to viral fever, cough, dysentery, and diarrhea. The healers of the *Nyishi* community of *Abotani* descendant residing in Kamle district is either known as *Nyub* or *Nwn Pon Nwn Bo* who is well versed in *Donyi-Polo* healing tradition of the community. The *Nwn Pon Nwn Bo* is frequently invited by the villagers to heal the ailments of the patient using different parts of the medicinal plants with invocation of spiritual hymns in certain case for effective healing. In the *Monpa* localities of West Kameng district, local villagers are dependent on local traditional healing practices called *Bon* medicine. The knowledgeable local healers of the *Monpa* community is called *Bonpo* who are professional in healing ailments of the villagers using different types of medicinal herbs and animal products. Apart from local *Bon* medicine and allopathic medicine, they (*Monpa*) also take the support of the service of *Swa-Rigpa*, the Tibetan Buddhist medical system for alternative healthcare.

Frequently harvested food and nutraceutical plants

The commercially viable food and nutraceutical species frequently harvested and sold in the market are *Allium hookeri*, *Bergenia ciliata*, *Centella asiatica*, *Clerodendrum*



PLATE - I. Some ethnomedicinal plants used by *Monpa* and *Nyishi* tribes of Arunachal Pradesh: **A.** *Berginia ciliata*; **B.** *Panax arunachalensis*; **C.** *Centella asiatica*; **D.** *Zanthoxylum rhetsa*; **E.** *Juglans regia*; **F.** *Rhododendrom arboreum*; **G.** *Paris polyphylla*; **H.** *Plantago major*; **I.** *Houttuynia cordata*; **J.** *Rubia manjith*; **K.** *Quercus griffithii*

glandulosum, *Colocasia esculenta*, *Dillenia indica*, *Diplazium esculentum*, *Houttuynia cordata*, *Litsea cubeba*, *Paris polyphylla*, *Zanthoxylum armatum*, and *Zanthoxylum rhetsa*. These plants are frequently harvested and popularly consumed as food, medicinal, spice and condiments in the *Monpa* and *Nyishi* belt of West Kameng and Kamle District of Arunachal Pradesh which is potential to ensure rural food, nutritional and nutraceutical security.

Table 1. Checklist of significant food and medicinal plants used by the *Monpa* and *Nyishi* tribes of Arunachal Pradesh

Name	Local Name (Monpa/Nyishi)	Habit	Part harvests	Traditional Uses/Ailment cured
<i>Aconitum heterophyllum</i> Wall. ex Royle [Ranunculaceae]; SK/HT/HAU/1520/2017	<i>Gonga Karpu</i> (M), <i>Omlu</i> (N)	Herb	Root	Powder of dried roots are used as arrow poison. Small quantity of powder is used for treatment of malarial fever.
<i>Acorus calamus</i> L. [Acoraceae]; SK/HT/HAU/1575/2018	<i>Shueta</i> (M)	Herb	Rhizome	The paste of rhizome is used for curing skin infection such as scabies.
<i>Allium hookeri</i> Thwaites [Amaryllidaceae]; HT/SK/HAU/1540/2017	<i>Tschong</i> (M) <i>Mud Talap</i> (N)	Herb	Bulb, Leaf	Bulb and leaves are used eaten raw as salad. Leaves are used for curing debility, fatigue and insomnia.
<i>Berberis aristata</i> DC [Berberidaceae]; HT/SK/HAU/1556/2017	<i>Kanchan</i> (M)	Shrub	Root, Flower, Fruit	Tender shoot, flowers and fruits are eaten raw
<i>Berberis asiatica</i> Roxb. ex DC [Berberidaceae]; HT/SK/HAU/1534/2018	<i>Kanchan</i> (M)	Shrub	Leaf, Flower, berry	Leaf, flower and berry are edible. Water decoction are used for curing inflammation and stomach.
<i>Bergenia ciliata</i> (Haw.) Sternb. [Saxifragaceae]; HT/SK/HAU/1596/2018	<i>Bra-mento</i> (M)	Herb	Roots, Tuber	Infusion of roots and rhizome is used for treating inflammation of hand, legs, boils and sores. Decoction of rhizome is also used as aphrodisiac agent.
<i>Centella asiatica</i> (L.) Urb. [Apiaceae]; HT/DT/HAU/1526/2018	<i>Buri Kük</i> (N)	Herb	Leaf, stem	Raw or powdered leaves are consumed as salad. The powdered leaves are used against lung infection, tissue inflammation, liver cirrhosis, stomach ulcer and diarrhoea and brain stimulant.
<i>Clerodendrum glandulosum</i> Lindl. [Lamiaceae]; HT/SK/HAU/1533/2018	<i>Khangjela-Shing</i> (M), <i>Poto oh</i> (N)	Shrub	Leaf	Young leaves are cooked and consumed as vegetable. It is also consumed to cure high blood pressure, liver complaint and insomnia.
<i>Colocasia esculenta</i> (L.) Schott [Araceae]; HT/SK/HAU/1548/2018	<i>Ngaglin</i> (M) <i>Enge</i> (N)	Herb	Corm	The corm (tuber) is cooked and eaten as food supplement and help to cure constipation.
<i>Cynoglossum lanceolatum</i> Forssk. [Boraginaceae]; HT/SK/HAU/1529/2018	<i>Nat Sancharik</i> (M), <i>Sibin Taglam</i> (N)	Herb	Leaf, root	Root-paste cures inflammation, cuts & wounds, fractured bone, boil and sores. Leaves are cooked and eaten raw. Roots are chewed as mouth freshner.
<i>Daphne papyracea</i> Wall. ex G. Don [Thymelaeaceae]; HT/SK/HAU/1518/2018	<i>Shugu-sheng</i> (M)	Shrub	Bark	Bark fiber is used for making local handmade paper among by <i>Monpas</i> .

Name	Local Name (Monpa/Nyishi)	Habit	Part harvests	Traditional Uses/Ailment cured
<i>Dillenia indica</i> L. [Dilleniaceae]; HT/SK/HAU/1512/2018	<i>Soot Aas</i> (N)	Tree	Fruit	Pulp of fruit is cooked is edible as vegetable and chutney. It is also taken to cure liver inflammation and cancer.
<i>Diplazium esculentum</i> (Retz.) Sw. [Athyriaceae]; HT/DT/HAU/1516/2017	<i>Dangsum</i> (M) <i>Tak Peya</i> (N)	Herb	Young frond	The young fronds are cooked and consumed as vegetable. The fresh juice of young frond is also used for healing freshly cut wound. Decoction are used to cure insomnia, liver inflammation.
<i>Fragaria vesca</i> L. [Rosaceae]; HT/DT/HAU/1558/2018	<i>Sa-merp</i> (M) <i>Suji hench</i> (N)	Herb	Fruit	Beery are sweet and edible. It is also consumed to clear chest inflammation.
<i>Gaultheria fragrantissima</i> Wall. [Ericaceae]; HT/DT/HAU/1522/2018	<i>Shegshing mrep</i> (M)	Shrub	Fruit	Fruits are sweet eaten raw and also used for curing hookworm.
<i>Houttuynia cordata</i> Thunb. [Saururaceae]; HT/SK/HAU/1524/2018	<i>Mreptang</i> (M) <i>Hiya oh</i> (N)	Herb	Whole plant	Roots, stem and leaves are used for curing typhoid fever, and insomnia, boil and sores, lung and liver inflammation. Paste of aromatic whole plant is also used as salad and appetizer.
<i>Illicium griffithii</i> Hook.f. & Thomson [Schisandraceae]; HT/DT/1533/2018	<i>Lisi</i> (M)	Tree	Flower, fruit	Flower and fruits are used as spice and condiment. Dried fruits and bark are used for curing stomach and asthma.
<i>Juglans regia</i> L. [Juglandaceae]; HT/JT/HAU/1519/2018	<i>Kae</i> (M)	Tree	Fruit	Nut of the fruit are rich in fat and edible, sold in the market in high price.
<i>Lindera neesiana</i> (Wall. ex Nees) Kurz [Lauraceae]; HT/DT/1523/2018	<i>Langkarma-sing</i> (M), <i>Kusuk Siin</i> (N)	Tree	Fruit, seed	Seeds used against diarrhea, scabies, anthelmintic; fruits used as condiments.
<i>Litsea cubeba</i> (Lour.) Pers. [Lauraceae]; HT/DT/1536/2018	<i>Nge</i> , <i>Nyangshing</i> (M), <i>Siin tir</i> (N)	Tree	Fruit	Fruit is used to cure viral fever, stomach ache insomnia. Raw fruits are consumed as spice and condiment along with rice.
<i>Magnolia campbellii</i> Hook.f. & Thomson [Magnoliaceae]; HT/HAU/1539/2017		Shrub	Flower	Flower is boiled and consumed as food supplement.
<i>Meconopsis paniculata</i> (D.Don) Prain [Papaveraceae]; HT/SK/HAU/1553/2017	<i>Upal</i> (M)	Herb	Leaves, flower	Tender shoot, leaves and flower are edible as vegetable.
<i>Nasturtium officinale</i> R. Br. [Brassicaceae]; HT/SK/HAU/1547/2017	<i>Silang Sag</i> (M)	Herb	Shoot part	Tender shoots are edible after cooking. It is also cooked to feed swine.

Name	Local Name (Monpa/Nyishi)	Habit	Part harvests	Traditional Uses/Ailment cured
<i>Ophiocordyceps sinensis</i> (Berk.) G.H Sung, J.M Sung, Hywel-Jones & Spatafora [Ophiocordycipitaceae]; HT/HAU/1541/2018	<i>Yrar-tsa-gunbu</i> (M)	Herb	Whole plant	The powdered whole plant part is eaten raw as cardiogenic and reproductive tonic. It is also used for curing cough, respiratory trouble, skin inflammation, analgesic and chronic fever.
<i>Panax arunachalensis</i> M.Taram, A.P. Das & H.Tag [Araliaceae];MT/HT/1505/2018	<i>Mokam Pigri</i> (N)	Herb	Rhizome	Decoction of dried or raw tuber is taken orally to cure sexual debility, boost immunity, vigor and vitality. Rhizome power is also used for curing chest liver inflammation, joint pain, stomach flatulence.
<i>Panax bipinnatifidus</i> Seem. [Araliaceae]; HT/SK/HAU/1542/2017	<i>Mud Pigri</i> (N)	Herb	Tuber, fruit	Tubers used in all medicinal formulation to use for lung, liver inflammation, skin ulcer, stomach ulcer. Tuber decoction consumed as aphrodisiac and health tonic. Mature fruits eaten raw.
<i>Panax bipinnatifidus var. angustifolius</i> (Burkill) J.Wen [Araliaceae]; HT/SK/HAU/1597/2018	<i>Mud Siw Pigri</i> (N)	Herb	Rhizome/tuber	Rhizome are harvested after 5 year and used in for formulation of food and anti-inflammatory, boil and sores, ulcer herbal medicine. Decoction of tuber consumed as health tonic. Ripen fruits eaten raw.
<i>Paris polyphylla</i> Sm.[Melanthiaceae]; HT/HAU/1557/2017	<i>Mungong</i> (M) <i>Mutum Enge</i> (N)	Herb	Tuber	Dried tuber is used for treatment of debility and boil and sores, skin inflammation, chest inflammation. The leaves and fruits are edible.
<i>Phytolacca acinosa</i> Roxb. [Phytolaccaceae]; HT/SK/HAU/1559/2017	<i>Holap oh</i> (N)	Herb	Leaf	Tender shoot is cooked and consumed as vegetable, also consume to cure constipation and indigestion.
<i>Piper pedicellatum</i> C. DC. [Piperaceae]; HY/HT/HAU/1646/2019	<i>Riir Oh</i> (N)	Herb	Leaf	Leaf are boiled and consumed as vegetable; also consume to regulate high blood pressure and insomnia.
<i>Plantago major</i> L.[Plantaginaceae]; HT/DT/HAU/1561/2017	<i>Tsa Shing</i> (M) <i>Sob Nyuru</i> (N)	Herb	Stem, leaf	The leaves are used for preventing bleeding in freshly cut wound. It is also consumed as vegetable.
<i>Polygonum molle</i> D. Don [Polygonaceae]; SK/HT/HAU/1590/2017	<i>Chomcha</i> (M) <i>Buku</i> (N)	Shrub	Root, young shoot	Young shoots are taken as vegetable. Young stem is chewed to quench thirst and enhance appetite.

Name	Local Name (Monpa/ Nyishi)	Habit	Part harvests	Traditional Uses/ Ailment cured
<i>Quercus griffithii</i> Hook.f & Thomson ex Miq. [Fagaceae]; HT/HAU/1563/2017	<i>Pa-sheng</i> (M) <i>Sikek</i> (N)	Tree	Fruits	Nut are crushed into floor and eaten as source of reserved fat. Also taken as famine food when food stock run out.
<i>Quercus semecarpifolia</i> Sm. [Fagaceae]; HT/HAU/1568/2018	<i>Khatchang</i> (M) <i>Sikek</i> (N)	Tree	Fruit/ timber	Nut is crushed into floor, mixed with rice and maize, eaten as nutritious foodstuff.
<i>Rheum nobile</i> Hook.f & Thomson [Polygonaceae]; HT/HAU/1566/2018	<i>Chumatsema-tsumkar</i> (M)	Herb	Root	Decoction of roots are orally consumed to cure reproductive problem, jaundice, cough, tonsillitis and tuberculosis and common cold.
<i>Rhododendron anthopogon</i> D. Don [Ericaceae]; HT/HAU/1569/2018	<i>Bolu</i> (M)	Shrub	Leaf, Flower	Leaves infusion are used to enhance appetite and stimulant, and leaf juice is used for curing skin infection. Flowers are used against reproductive diseases and correction of vocal cord.
<i>Rhododendron arboreum</i> Sm. [Ericaceae]; HT/SK/HAU/1575/2017	<i>Woodungsheng, Somu</i> (M)	Tree	Leaf, Flower	Decoction of flower is taken to cure dysentery, headache, diarrhea. Flowers are eaten raw or cooked. Squash made of corolla extracts rich in carbohydrates and vitamins. Tender leaves are used as vegetable.
<i>Rhododendron fulgens</i> Hook.f. [Ericaceae]; HT/SK/HAU/1578/2018	<i>Tamentomarpu</i> (M)	Shrub	Flower	Decoction of flower is taken orally to prevent nose bleeding and blood dysentery.
<i>Rhododendron hodgsonii</i> Hook.f. [Ericaceae]; HT/SK/HAU/1574/2018	<i>Laah</i> (M)	Shrub	Leaf	Young leaves are eaten raw to induce emetic tendency to remove food poisoning inside stomach.
<i>Rubia manjith</i> Roxb. ex Fleming [Rubiaceae]; HT/DT/HAU/1575/2017	<i>Tsotsheng</i> (M) <i>Tamen</i> (N)	Climber	Root	Root paste is used for curing chest pain, ulcer, skin itching and skin inflammation.
<i>Smilax glabra</i> Roxb. [Smilacaceae]; HT/HAU/1584/2017	<i>Pipik</i> (N)	Climber	Root, fruit	The decoction of roots and fruits are used for curing liver cirrhosis, lung problem, chronic ulcer and chest and joint inflammation.
<i>Solanum betaceum</i> Cav. [Solanaceae]; HT/HAU/1580/2018	<i>Pahari Tomato</i> (M)	Shrub	Fruit	Ripen fruit is cooked and consumed as food along with rice.
<i>Swertia chirayita</i> (Roxb.) Buch.-Ham. ex C.B. Clarke [Gentianaceae]; HT/SK/HAU/1587/2017	<i>Tiktah</i> (M)	Herbs	Whole plant	Decoction of root is used for curing fever, malarial fever, cough and high blood pressure.

Name	Local Name (Monpa/ Nyishi)	Habit	Part harvests	Traditional Uses/ Ailment cured
<i>Taxus wallichiana</i> Zucc. [Taxaceae]; HT/SK/HAU/1588/2017	<i>Tae-sheng</i> (M)	Tree	Flower	Flower are edible. Leave are used for curing ovarian and breast cancer.
<i>Urtica dioica</i> L. [Urticaceae], HT/SK/HAU/1589/2017	<i>Shouzhe</i> (M)	Herb	Leaf	The leaves are cooked and consumed as vegetable.
<i>Vaccinium glaucoalbum</i> Hook.f. ex C.B Clarke [Ericaceae]; HT/SK/HAU/1592/2017	<i>Shakshima</i> (M)	Shrub	Fruit	Fruit are eaten to prevent diarrhea, fever and throat inflammation. Fruits are sweet and consumable
<i>Vaccinium retusum</i> (Griff.) Hook.f. ex C.B Clarke [Ericaceae]; HT/SK/HAU/1591/2017	<i>Seu Kyum</i> (M)	Shrub	Fruit	Fruit is sweet and edible and used as substitute for <i>Vaccinium glaucoalbum</i> .
<i>Zanthoxylum armatum</i> DC. [Rutaceae]; HT/SK/HAU/1595/2017	<i>Yer, Zabrang</i> (M) <i>Honam</i> (N)	Tree	Leaf, seed	Fruits are taken as stimulant, spice and condiment. The powdered fruit is also taken to cure cough and viral fever.
<i>Zanthoxylum rhetsa</i> DC. [Rutaceae]; HT/SK/HAU/1593/2018	<i>Mechme</i> (M) <i>Honyor</i> (N)	Tree	Leaf	The leaves consumed to treat diarrhea and also consumed as spice and condiment by boiling with other vegetable items.

CONCLUSION

From the present ethnobotanical investigation, it is concluded that *Monpa* and *Nyishi* community of West Kameng and Kamle district of Arunachal Pradesh is rich in traditional knowledge related to effective utilization of significant food and medicinal plants of their traditional biocultural landscape. *Bonpo*, the traditional healers of the *Bon* medical tradition of *Monpa* community, and *Nyub* and *Nwn Pon Nwn Bo* of the *Nyishi* community of the *Abotani* descendant who follow *Donyi-Polo* healing traditions were found to be the main custodian of the traditional healing practices of the two community under investigation. The food and medicinal species reported to be popularly used by both the community have indicated the nutritional and medicinal potential as well as economic value and commercial viability of the species reported. These consensus significant species frequently harvested and used by both the communities, and popularly sold in the market by them for economic, medicinal and nutritional security of their traditional biocultural landscape may be promoted for effective conservation and sustainable utilization.

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