

Wild ethnomedicinal plants used by the *Monpa* community in Arunachal Pradesh, India

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Abstract

This paper describes ethnomedicinal uses of 128 plants found in wild habitat which are mainly used by the local inhabitants, yak herders and herbal healers residing in Tawang and West Kameng Districts in Arunachal Pradesh. Ethnomedicinal uses of each reported plants along with their local names, relative abundance and plant parts used are presented. The study was carried out as a part of Ph.D research of the first author.

Keywords: DAFORE scale, East Himalaya, Healers, Tawang, West Kameng

INTRODUCTION

Arunachal Pradesh is the largest among North Eastern states with total area of 83,743 km². The state is located between 26°28' N – 29°30' N latitude and 91°30' E – 97°30' E longitude. The state is situated in the transition zone between the Himalayan and Indo-Burmese regions and a part of Indo-Burma Biodiversity Hotspot (Mani 1974; Rodgers and Panwar 1988; Myers *et al.*, 2000; Singh *et al.*, 2007). The entire territory forms a complex hill system with altitude ranging from 200 to 7000 m asl, composing varying vegetation types viz. tropical, sub-tropical, pine, temperate mixed, temperate coniferous, sub-alpine and alpine forests. The state is known as hub of medicinal plants with over 800 plant species used in folk medicine (Gajural *et al.*, 2003). The state is inhabited by 26 major tribes and 110 sub-tribes, which has its own traditional way of using forest resources for sustaining livelihood (Tag and Das, 2004).

The *Monpa* tribe is among one of the major tribe with a population of 0.80 lakh approximately (Anonymous, 2011) settled in the hilly areas of Tawang and West Kameng districts situated in the western part of the state. The area shares international borders

with Bhutan in the west and Tibet in the north (figure 1), thus there was direct exchange of ethnomedicinal knowledge among the people of the three countries in the past. Several researchers have studied the ethnomedicine of the *Monpas* (Dam and Hajra, 1981, 1997; Borthakur and Kar, 2008; Tiwari *et al.*, 2009 and Namsa *et al.*, 2011) but their study is limited to just 10 – 50 plants. Therefore, the present article is based on comprehensive study carried out in almost all the *Monpa* inhabited areas in Arunachal Pradesh.

METHODOLOGY

Regular field trips were conducted during the years 2010 – 2015 in the *Monpa* inhabited areas in Tawang and West Kameng districts. Parts of *Sherdukpen* and *Sajolang* inhabitat areas were also covered during the study. 96 villages and 140 forest sites were visited and interviewed 240 informants. The key informants were farmers, village heads, traditional hunters, *Brokpa* and herbal practitioners. *Brokpa* are the people who engaged themselves in herding yak and sheep. *Brokpa* reside far away from the village sites and hence they possess rich ethnic knowledge on locally available resources. The relative

abundance of each species was measured at six levels using modified DAFOR scale called as DAFORE scale (Tsering and Rinya, 2020). Habitat of each species was visited and collected one or two voucher specimens for

reference. Plants were identified using available literatures and by consulting researchers of Botanical Survey of India, Itanagar Regional Centre and State Forest Research Institute, Itanagar.



Figure 1: Map with green dots indicating study area

RESULTS AND DISCUSSION

Species diversity: The *Monpa* community is very rich in ethnic knowledge. They use a wide range of resources including plants, animals and minerals, along with hymns to treat a variety of diseases/ ailments. Due to lack of organized traditional medicinal system in the past, the locals have identified many plants which are useful as both food and

medicine. This study botanically identified 128 ethnomedicinal plants found in wild habitat (table 1). This includes 75 herbs, 25 trees, 22 shrub, 5 climbers and 1 fungus belonging to 61 families and 102 genera. Asteraceae is the largest plant family with 12 species used in ethnomedicine, followed by Ericaceae and Gentianaceae with 8 species each, Polygonaceae and Solanaceae with 5 species

each, Berberidaceae, Ranunculaceae, Rosaceae and Rutaceae with 4 species each, etc. About 96 species were found from higher altitude areas (temperate to alpine regions) with altitude ranging between 1800 – 4000 m, whereas, 42 species (10 species common) were located from tropical to subtropical regions (below 1800 m).

Relative abundance of species: As per the DAFORE scale, 45 species (35 %) were frequently observed in the study area, 30 species (23 %) were found to be abundant, 27 species (21 %) were occasionally observed, 12 species (10 %) were dominant in various locations, 11 species (9 %) were rarely found and only 3 species (2 %) were observed as extremely rare in distribution. Based on these six categories of abundance, a curve is drawn (figure 2) against number of species falls under each categories. A pyramid shaped curve was found which indicates that medicinal plant diversity in the study area is properly distributed with number of Frequently observed species at the top of the pyramid and Extremely Rare at the bottom.

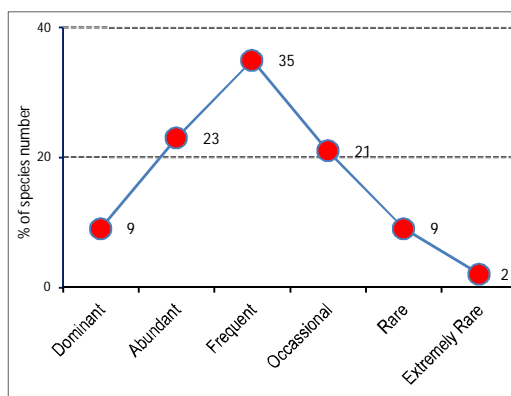


Figure 2: Observance of abundance

Plant parts used: Root is the most common plant parts used in ethnomedicine accounting 36 species. Fruit (31) and leaf (25 species) are

also commonly used by the *Monpa* people in treatment of various ailments. Other plant parts used in ethnomedicine are whole plant (16 sp.), shoot (11 sp.), flower (9 sp.), seed (8 sp.), stem (6 sp.), bark (4 sp.), bulb (1 sp.), tuber (1 sp.) and resin (1 sp.).

Ailment/ disease types and plants used for treatment: About 86 ailments/ disorders/ diseases were recorded in the present study, which are treated by the *Monpa* community using 128 wild medicinal plants. Ailments are grouped into 17 categories. The number of species used to treat each disease category is shown in figure 3. A huge number of plants (63 species) were recorded used in the treatment of stomach related disorders such as stomachache, dysentery, diarrhea, constipation, indigestion, gas expelling and gastritis. 41 species constituting 31 % of the total species recorded were found to use against cuts and wounds, inflammations, sprains and joint pain like ailments. 23 species were reported as antipyretic, whereas, 13 plants used as anti-dote during ingestion of toxic substances, aconite contamination, and insect, snake or scorpion bites.

Among the *Brokpas* and the people living in remote villages, their first choice of treatment is the traditional self-medication using locally available resources. About 68 species are used by them either in the form of raw or crude drug for treatment of minor ailments like cough, common cold, wounds, cuts, skin infections, fever, stomachache, dysentery, diarrhea, toxication, insomnia, body weakness, bone fracture, joint dislocation, muscle pain, etc. About 85 medicinal plants were reported by professional healers, out of which 60 are strictly used by the herbalist only for treatment of more complicated diseases/ disorders.

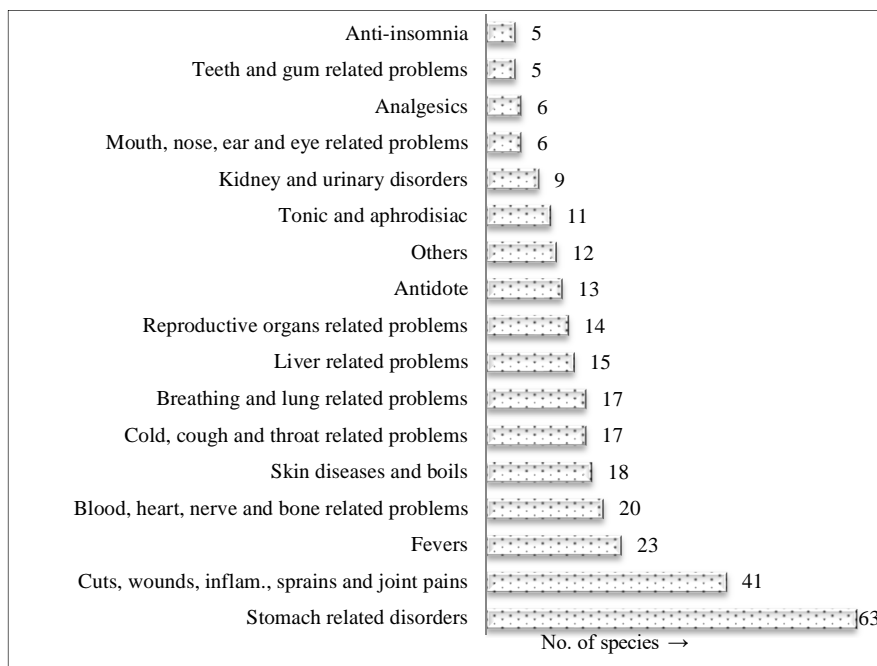


Figure 3: Number of plants used in different ailments/ diseases types

Table 1: Wild ethnomedicinal plants used by the *Monpa* community

Sl.	Plant	Family	Local name	OA	Part used	Uses
1.	<i>Aconitum ferox</i> Wall. ex Ser.	Ranunculaceae	Tsando, Nging	R	Rt	The plant is highly poisonous and a very small part is used to treat high fever, stomachache, tonsillitis, throat pain and cheilitis
2.	<i>Aconitum heterophyllum</i> Wall. ex Royle	Ranunculaceae	Gonga-karpu	E	Rt	Decoction consumed during toxicities, stomachache and high fever
3.	<i>Aconitum hookeri</i> Stapf	Ranunculaceae	Zsa-tsando	R	Rt	Used as substitute of <i>Aconitum ferox</i>
4.	<i>Acorus calamus</i> L.	Acoraceae	Shueta	A	Rt	Paste applied to skin infection. Water decoction used to treat scabies and respiratory related disease
5.	<i>Ajania tibetica</i> (Hook.f. & Thomson) Tzvelev	Asteraceae	Otung-karpo	F	Wh	Aromatic; Used in respiratory related ailment including clogged nose
6.	<i>Allium cepa</i> L.	Amaryllidaceae	Tschong	R	Bl	Consumed cooked during common cold to treat cough, bronchitis and flu
7.	<i>Allium hookeri</i> Thwaites	Amaryllidaceae	Maan	O	Wh	Consumed cooked to overcome insomnia and fatigue

8.	<i>Anaphalis busua</i> (Buch.-Ham.) DC.	Asteraceae	Tayong	A	Sh	Used by healer to treat intoxication, body inflammation, blood discharge and viral infection
9.	<i>Anaphalis triplinervis</i> (Sims) Sims ex C.B. Clarke	Asteraceae	Dhakoi	F	Sh	Used as substitute of <i>Anaphalis busua</i>
10.	<i>Andrographis paniculata</i> (Burm.f.) Nees	Acanthaceae	Tserpa	O	Wh	Decoction used to treat chronic constipation, indigestion, stomachache, jaundice and liver disorders
11.	<i>Angelica cyclocarpa</i> (C.Norman) M.Hiroe	Apiaceae	Tsawa	R	Rt	Low concentration of decoction used during post-menstruation disorders
12.	<i>Arisaema utile</i> Hook.f. ex Schott	Araceae	Dawa	F	Rt, Fr	Tuber used in reproductive and bone related disease. Fruit improves blood circulation and removes poison from body
13.	<i>Artemisia nilagirica</i> (C.B. Clarke) Pamp.	Asteraceae	Ngulhum	A	Lf, Fr	Leaf used to during nosebleed, fractured bone and muscle pain. Fruit used to treat fever, headache and inflammation
14.	<i>Asparagus racemosus</i> Willd.	Asparagaceae	Ngalangma	O	Rt	Infusion taken during food poisoning, edema and reproductive disorders
15.	<i>Aster sikkimensis</i> Hook.f. & Thomson	Asteraceae	Yugu-shing lung	O	Sh	Used to heal wound, skin infection and as antipyretic during intoxication
16.	<i>Aster thomsonii</i> C.B. Clarke	Asteraceae	Yugu-shing	O	Sh	Used to heal wound, skin infection and as antipyretic during intoxication
17.	<i>Astilbe rivularis</i> Buch.-Ham. ex D. Don	Saxifragaceae	Akungma	A	Rt	Decoction taken during diarrhea, dysentery and menstrual disorder
18.	<i>Berberis angulosa</i> Wall. ex Hook.f. & Thomson	Berberidaceae	Lae-kanchan	F	Fl	Decoction used against eye infection, diarrhea and food poisoning
19.	<i>Berberis asiatica</i> DC.	Berberidaceae	Kanchan	F	Rt	Decoction consumed during body inflammation and stomachache
20.	<i>Bergenia ciliata</i> (Haw.) Sternb.	Saxifragaceae	Bra-mento	F	Rt	Infusion used to treat skin boil and edema. Also used as aphrodisiac
21.	<i>Bombax ceiba</i> L.	Malvaceae	Tsanglum, Pemagesar	F	Fl	Used by healer in treatment of liver, cardiac and gall bladder related disorders
22.	<i>Cannabis sativa</i> L.	Cannabaceae	Nam-khuye, Makchangmu	A	Lf, Sd	Paste used in rheumatism, insomnia, menstrual pain and as analgesic drugs
23.	<i>Capsella bursa-pastoris</i> (L.) Medik.	Brassicaceae	Sog-karpu	F	Wh	Consumed cooked during dysentery and vomiting. Also used in edema, kidney, lung and nerve

						related disorder by herbalist
24.	<i>Centella asiatica</i> (L.) Urb.	Apiaceae	Tselagorgor, Shetafay, Sin-mnar	O	Wh	Paste used in cut and wound. Water decoction consumed during stomachache and indigestion. Consumed raw during gastritis
25.	<i>Cinnamomum tamala</i> (Buch.-Ham.) T.Nees & Eberm.	Lauraceae	Shing-tsa	O	Br	Decoction used as digestive and to reduce body-shivering causing from common cold
26.	<i>Cirsium verutum</i> (D.Don) Spreng.	Asteraceae	Brongzom	F	Fl	Chewed during severe stomachache. Decoction consumed during stomachache
27.	<i>Clerodendrum glandulosum</i> Lindl.	Lamiaceae	Khangjela-shing, Jyloin	O	Lf	Water decoction given to hypertension patient. Also consumed as vegetable to treat headache and stomach ailments
28.	<i>Crawfurdia speciosa</i> C.B.Clarke	Gentianaceae	Ludeu	F	Fl	Flower used against lung disorder including lung inflammation and dry cough by healers
29.	<i>Cupressus torulosa</i> D.Don	Cupressaceae	Lhashuk	F	Fr	Oil extracted from fruit used in inflammatory wound
30.	<i>Cymbopogon citratus</i> (DC.) Stapf	Poaceae	Chu-ngon	D	Lf	Few drops of infusion used to reduce fever and severe stomachache
31.	<i>Cynoglossum lanceolatum</i> Forssk.	Boraginaceae	Nat, Sancharik, Neama-jarma	A	Rt	Paste applied to wound, fractured bone, bone inflammation and boil
32.	<i>Cyperus rotundus</i> L.	Cyperaceae	Leelang	A	Rt	Anthelmintic; Used to treat leprosy and skin disease
33.	<i>Datura stramonium</i> L.	Solanaceae	Du-shing	F	Sd	Seed used as analgesic, anti-appetite and toothache. Infusion of seed pulp used in bone related ailment
34.	<i>Debregeasia longifolia</i> (Burm.f.) Wedd.	Urticaceae	Yangyangpa	A	Lf	Crushed leaf used against scabies like infection
35.	<i>Dioscorea deltoidea</i> Wall. ex Griseb.	Dioscoreaceae	Peng-khe, Sumchen	F	Tb	Cooked tuber eaten during gastritis and stomachache
36.	<i>Diploknema butyracea</i> (Roxb.) H.J.Lam	Sapotaceae	Finsheng	R	Sd	Oil extracted from seed used in various herbal formulations. Oil used in skin infection, head, chest and muscle pain and wound
37.	<i>Drosera peltata</i> Thunb.	Droseraceae	Szampa-khaslung	F	Wh	Water decoction taken orally to treat dysentery and fever. Poultice used against rheumatism, bruise and blister
38.	<i>Drynaria propinqua</i> (Wall. ex Mett.) Bedd.	Polypodiaceae	Soh	D	Rt	Decoction taken orally to treat cold and fever arising from intoxication. Extract used as antidote caused due to meat

						consumption and to treat kidney related problems
39.	<i>Elaeagnus umbellata</i> Thunb.	Elaeagnaceae	Da-mrep, Damrang-gong, Majelamalang	D	Fr	Eaten during diarrhea and dysentery
40.	<i>Equisetum diffusum</i> D. Don	Equisetaceae	Tsajam	O	Sh	Used to treat nosebleed and menopause disorder
41.	<i>Erythrina arborescens</i> Roxb.	Fabaceae	Nyang-shing	F	Sd, Br	Decoction taken orally to treat cholera and jaundice like disease
42.	<i>Euphorbia wallichii</i> Hook.f.	Euphorbiaceae	Tharnu	F	Rt	Used to treat boil and skin infection
43.	<i>Ficus racemosa</i> L.	Moraceae	Koknang-shing	O	Fr	Ripen fig eaten to treat diarrhea
44.	<i>Fragaria nubicola</i> (Lindl. ex Hook.f.) Lacaita	Rosaceae	Sa-mrep, Sagogong, Khoyumalang, Pongsur	A	Wh	Decoction used to clean lung and vein by healer. Leaf applied to remove skin pus
45.	<i>Fritillaria cirrhosa</i> D. Don	Liliaceae	Lae-loshu, Abishamenpa	E	Rt	Cooked bulb eaten as general tonic and aphrodisiac. Also eaten during asthma, bronchitis and tuberculosis
46.	<i>Galeola lindleyana</i> (Hook.f. & Thomson) Rchb.f	Orchidaceae	Ser-chang	R	Rt	Paste applied externally to treat sexually transmitted infection
47.	<i>Galium aparine</i> L.	Rubiaceae	Sangtse-karpo	F	Wh	Poultice made of plant applies on skin irritation and burn. Decoction consumed during rheumatism and excess bile secretion
48.	<i>Gaultheria fragrantissima</i> Wall.	Ericaceae	Sheshing-mrep, Shagshingma, Laza Seu	A	Fr	Ripen fruit eaten anthelmintic
49.	<i>Gaultheria trichophylla</i> Royle	Ericaceae	Aak-mrep	F	Fr	Raw or infusion of fruit taken orally during asthma like ailment
50.	<i>Gentiana kurroo</i> Royle	Gentianaceae	Pang-gyenmento	A	Wh	Decoction or infusion of flower taken orally to treat cough and backbone related ailment
51.	<i>Gentiana ornata</i> (D. Don) Wall. ex Griseb.	Gentianaceae	Pang-gyengonpo	F	Wh	Flower used as substitute of <i>Gentiana kurroo</i>
52.	<i>Gentiana stylophora</i> C.B. Clarke	Gentianaceae	Pang-gyenserpo	A	Rt	Root paste applied as poultice to wound and swelling
53.	<i>Gentiana urnula</i> Harry Sm.	Gentianaceae	Pang-gyentheno	O	Wh	Water decoction of flower taken orally to treat cold, cough and fever

54.	<i>Gonostegia hirta</i> (Blume ex Hassk.) Miq.	Urticaceae	Pinrapa, Chapsingmu	F	Lf	Tender leaf consumed as vegetable during stomachache
55.	<i>Gymnadenia orchidis</i> Lindl.	Orchidaceae	Wombalakra	E	Rt	Decoction consumed as health tonic. Powdered root is used to treat urinary and kidney problem
56.	<i>Hedyotis scandens</i> Roxb.	Rubiaceae	Pham-shing	O	Sh	Used against gastritis and ulcer
57.	<i>Herpetospermum pedunculatum</i> (Ser.) C.B. Clarke	Cucurbitaceae	Prola-augun	A	Fr	Fruit used against piles, fistula and inflammation of stomach and intestine
58.	<i>Houttuynia cordata</i> Thunb.	Saururaceae	Mreptang, Mompharang, Aai-changmu-pau, Tufo	A	Rt	Consumed as salad to treat stomachache, diarrhea and insomnia
59.	<i>Illicium griffithii</i> Hook.f. & Thomson	Schisandraceae	Mun-shing	D	Br	Decoction taken during severe stomachache
60.	<i>Inula racemosa</i> Hook.f.	Asteraceae	Manu	F	Rt	Decoction taken to treat viral fever
61.	<i>Juglans regia</i> L.	Juglandaceae	Kae, Mukhu, Taku	F	Lf, Fr, St	Infusion of leaf used against limb inflammation. Oil extracted from unripe fruit used to treat hypertension and paralysis of limb-joint
62.	<i>Leucas aspera</i> (Willd.) Link	Lamiaceae	Ngon-shing, Neachetse	F	Lf, Sh	Poultice used in cut, wound and limb inflammation
63.	<i>Ligularia amplexicaulis</i> DC.	Asteraceae	Rihu	A	Rt, Lf, Sh	Infusion of root consumed as antidote and to treat jaundice, liver and lung disease. Leaf and tender shoot applied to open wound for quick healing
64.	<i>Lindera neesiana</i> (Wall. ex Nees) Kurz	Lauraceae	Lungkarma-shing	O	Fr, Sd	Used to treat diarrhea and scabies; Anthelmintic
65.	<i>Litsea cubeba</i> (Lour.) Pers.	Lauraceae	Nge, Nyang-shing, Neachetse	A	Fr	Used in heart, liver, lungs, stomach and intestine related disease. Decoction taken orally to treat stomachache and eczema
66.	<i>Mahonia napaulensis</i> DC.	Berberidaceae	Tsot-sheng	F	Fr	Berry eaten as diuretic agent and demulcent during dysentery
67.	<i>Malva parviflora</i> L.	Malvaceae	Bodcham	F	Rt, Lf,	Root decoction used to treat body weakness. Leaf paste applied to reduce pus formation in wound
68.	<i>Melastoma malabathricum</i> L.	Melastomataceae	Kyar-shing	F	Lf	Applied to wound as coagulant
69.	<i>Nardostachys jatamansi</i> (D.Don)	Caprifoliaceae	Pangpos	O	Rt	Used in respiratory and menstruation related problems.

	DC					Low concentrated infusion consumed to overcome insomnia. Also used as incense to treat insomnia
70.	<i>Neopicrorhiza scrophulariiflora</i> (Pennell) D. Y. Hong	Plantaginaceae	Khongleng	F	Rt	Decoction consumed to treat intestinal worms, fever and constipation. Also used to treat liver, anemia, jaundice and respiratory tract disorders
71.	<i>Oenanthe javanica</i> (Blume) DC.	Apiaceae	Szhing-hru, Shi-mom, Szhing-mom, Dangkhomu	D	St	Chewed to treat cough
72.	<i>Onosma hookeri</i> C.B. Clarke	Boraginaceae	Grimakpa, Demok	O	Rt	Used to treat blood cough, nosebleed, liver and all type of blood related disease
73.	<i>Ophiocordyceps sinensis</i> (Berk.) G.H. Sung, J.M. Sung, Hywel-Jones & Spatafora	Ophiocordycipitaceae	Yrar-tsa-gunbu	O	Wh	Consumed to treat cold, cough, respiratory problems, stress, chronic fever, cardiac disease and as reproductive tonic
74.	<i>Oroxylum indicum</i> (L.) Kurz	Bignoniaceae	Salsali, Tsambakha	F	Sd	Used as purgative agent
75.	<i>Oxalis corniculata</i> L.	Oxalidaceae	Pulung sukhu, Jansemubung	F	Lf	Leaf juice applied to burn and insect bite
76.	<i>Oxyria digyna</i> (Lehm.) Mansf. ex K. Hammer	Polygonaceae	Lugsho	F	Lf, Sh	Paste of leaf and tender shoot used to treat wound and cut. Decoction of leaf used as purgative, diuretic, digestive and anti-inflammatory
77.	<i>Panax bipinnatifidus</i> Seem.	Araliaceae	Naak-kaah	R	Rt	Decoction consumed as general health tonic
78.	<i>Pedicularis rhinanthoides</i> Schrenke	Orobanchaceae	Thadin	O	Lf, Fl	Decoction of leaf and flower given to treat gastritis and edema
79.	<i>Phyllanthus emblica</i> L.	Phyllanthaceae	Kyurba	O	Fr	Roasted fruit eaten as febrifuge. Also eaten raw to treat dysentery, cholera and diarrhea
80.	<i>Pinus merkusii</i> Jungh. & de Vriese	Pinaceae	Hro-sheng	D	St	Juicy layer of sap wood just internal to bark eaten as anthelmintic
81.	<i>Pinus roxburghii</i> Sarg.	Pinaceae	Hro-sheng, Doeng-shing	A	St, Re	Resin is used as antiseptic and to treat tuberculosis, hypertension and boil
82.	<i>Pinus wallichiana</i> A.B. Jacks.	Pinaceae	Hro-sheng	D	St	Juicy layer of sap wood just internal to bark eaten as anthelmintic
83.	<i>Piper longum</i> L.	Piperaceae	Pipiling	A	Fr	Decoction consumed during cough, cold and insomnia. Infusion taken during epilepsy and leprosy

84.	<i>Plantago major</i> L.	Plantaginaceae	Tharam, Tsashing, Pulungnyang	A	Lf	Leaf used as bandage on cut and wound
85.	<i>Polygonatum verticillatum</i> (L.) All.	Asparagaceae	Ra-angi	O	Rt	Infusion given to weak body as appetizer
86.	<i>Polygonum affine</i> D. Don	Polygonaceae	Lagangmenpa	D	Rt	Infusion used against intestine disorder and high fever
87.	<i>Potentilla peduncularis</i> D. Don	Rosaceae	Penma	A	Rt	Used in treatment of diarrhea and pre-menstruation disorder
88.	<i>Primula sikkimensis</i> J.D. Hooker	Primulaceae	Shendelserpo	A	Fl	Infusion given to control fever arising from blood vein disorder
89.	<i>Punica granatum</i> L.	Lythraceae	Sindu, Dalem-shing	R	Fr	Eaten raw during stomachache and diarrhea
90.	<i>Rheum acuminatum</i> Hook.f. & Thomson	Polygonaceae	Chutsa	F	Rt, Fr	Pounded fruit used to treat herpes like disease. Root used as digestive and diuretic
91.	<i>Rheum nobile</i> Hook.f. & Thomson	Polygonaceae	Chumattsumkar	R	Rt	Decoction consumed during common cold, cough, throat pain, tonsillitis, jaundice and reproductive related disorder
92.	<i>Rhododendron anthopogon</i> D. Don	Ericaceae	Bolu, Dalae	D	Lf, Fl	Infusion used as appetite stimulant and gastric analgesia. Extract applied on skin infection. Flower used in reproductive related disease by herbalist
93.	<i>Rhododendron arboretum</i> Sm.	Ericaceae	Woodungsheng, Samu, Khamdak	D	Fl	Decoction taken orally to treat dysentery, diarrhea and mild headache
94.	<i>Rhododendron fulgens</i> Hook.f.	Ericaceae	Tame-mentomarpu	A	Fl	Decoction taken orally to check nosebleed, blood dysentery and other blood related disease
95.	<i>Rhododendron hodgsonii</i> Hook.f.	Ericaceae	Laah	F	Lf	Tender leaf eaten raw to make forceful vomiting during poison ingestion
96.	<i>Rhododendron lepidotum</i> Wall. ex G. Don	Ericaceae	Solu	D	Lf	Extract used in chest and back pain, gastritis and liver problem
97.	<i>Ribes orientale</i> Desf.	Grossulariaceae	Saekod	O	Fr	Eaten as laxative
98.	<i>Ricinus communis</i> L.	Euphorbiaceae	Dantha	A	Fr	Fat extracted from fruit used to treat skin inflammation
99.	<i>Rosa sericea</i> Wall. ex Lindl.	Rosaceae	Sae, Sewadedan, Jamkhuyu	A	Fr	Eaten as digestive. Infusion used to treat jaundice, headache, hypertension, fatigue and menstrual disorder
100.	<i>Rubia manjith</i> Roxb. ex Fleming	Rubiaceae	Tsot-sheng	A	Rt	Paste used against chest pain, ulcer, skin inflammation and skin disease

101.	<i>Rubus ellipticus</i> Sm.	Rosaceae	Kong-mrep, Shergong, Feham-malang	F	Fr	Consumed during dysentery
102.	<i>Rumex nepalensis</i> Spreng.	Polygonaceae	Shomang, Pholanpu-daho, Tsawa	A	Lf	Poultice applied to wound as antiseptic
103.	<i>Sambucus adnata</i> Wall. ex DC.	Adoxaceae	Wamdong, Yugushing-nagpo	A	Lf, Fr	Leaf paste applied on sore and wound for effective healing and to reduce swelling. Fruit consumed as anti-inflammatory and antipyretic during poison ingestion and to clear vein blockage
104.	<i>Saussurea obvallata</i> (DC.) Edgew.	Asteraceae	Zhadue	O	Lf, St	Leaf paste applied to sore. Stem extract used during epilepsy
105.	<i>Schima wallichii</i> Choisy	Theaceae	Khrom-sheng	F	Br	Infusion used as antipyretic and anthelmintic
106.	<i>Senna obtusifolia</i> (L.) H.S.Irwin & Barneby	Fabaceae	Palakarpotoche	F	Sd	Used as laxative
107.	<i>Silene himalayensis</i> (Rohrb.) Majumdar	Caryophyllaceae	Lugsho	R	Wh	Paste used against constipation, skin disease and other infectious disease
108.	<i>Sinopodophyllum hexandrum</i> (Royle) T.S.Ying	Berberidaceae	Womose	R	Wh	Extract used by healers in various reproductive related disease such as irregular menstruation, birth difficulty, fluid discharge, urinary track problem, etc.
109.	<i>Solanum torvum</i> Sw.	Solanaceae	Borang-kharangjeh	F	Fr	Used as anthelmintic
110.	<i>Solanum viarum</i> Dunal	Solanaceae	Tagtsa	F	Rt, Lf, Fr	Root infusion used as antidote against scorpion bites. Leaf used as diuretic. Fruit used as contraceptive. Fruit (heated over fire) used as analgesic by crushing between the infected teeth
111.	<i>Solanum violaceum</i> Ortega	Solanaceae	Kharange	F	Fr	Used as anthelmintic
112.	<i>Solanum virginianum</i> L.	Solanaceae	Taktser	O	Sd	Used to treat dental infection
113.	<i>Spilanthes acmella</i> (L.) L.	Asteraceae	Namlangmar ching	F	Sh	Consumed as vegetable to lower gastritis problem, stomach and intestine inflammation
114.	<i>Swertia chirayita</i> (Roxburgh) H. Karst.	Gentianaceae	Tiktah	F	Wh	Decoction used to treat high fever, cough and high blood pressure
115.	<i>Swertia hookeri</i> C.B. Clarke	Gentianaceae	Gudue-serp	D	Rt	Decoction is considered as effective antidote
116.	<i>Swertia nervosa</i> (Wall. ex G. Don)	Gentianaceae	Ae-sok-sok, Chakthik	F	Wh	Water decoction drunk during stomachache and constipation

	C.B. Clarke					
117.	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae	Baru	O	Fr	Fruit chewed during fever, diarrhea, severe stomachache and abdominal pain. Also used in various traditional medicine formulation
118.	<i>Terminalia chebula</i> Retz.	Combretaceae	Aru	O	Fr	Chewed during severe fever and jaundice. Also used in various traditional medicine formulation
119.	<i>Thalictrum chelidonii</i> DC.	Ranunculaceae	Krekpa, Grikpa	O	Lf	Used to heal wound
120.	<i>Triplostegia glandulifera</i> Wall. ex DC.	Caprifoliaceae	Gonga-karpu	O	Rt	Tuber used as substitute of <i>A. heterophyllum</i> . Tuber eaten raw during blood dysentery
121.	<i>Vaccinium glaucoalbum</i> Hook.f. ex C.B. Clarke	Ericaceae	Shakshima, Seu-kyum	A	Fr	Eaten to prevent diarrhea. Extract used to treat mouth and throat inflammation, cardiovascular disease and high fever
122.	<i>Valeriana jatamansi</i> Jones	Caprifoliaceae	Lung-poes	A	Rt	Infusion used as diuretic, antiseptic, to treat epilepsy and liver disease
123.	<i>Verbascum thapsus</i> L.	Scrophulariaceae	Jyugpaserji	O	Fr	Extract used during liver enlargement, blood discharge from reproductive organ and excessive antidote medication
124.	<i>Xanthium strumarium</i> L.	Asteraceae	Jetser	F	Sh	Infusion used as antidote and effective against cough caused due to common cold
125.	<i>Zanthoxylum acanthopodium</i> DC.	Rutaceae	Yerchengma	F	Lf, Fr	Leaf extract used in treatment of liver and stomach inflammation. Pounded fruit prescribed orally during dysentery and stomachache
126.	<i>Zanthoxylum armatum</i> DC.	Rutaceae	Yer, Khagi, Sae, Erma	A	Fr	Eaten raw to control gastritis, cold, cough and fever. Decoction used to treat stomach related disorder
127.	<i>Zanthoxylum oxyphyllum</i> Edgew.	Rutaceae	Prayer	F	Fr	Used to treat dyspepsia, asthma, bronchitis and rheumatism
128.	<i>Zanthoxylum rhetsa</i> DC.	Rutaceae	Mechme	F	Lf	Consumed as vegetable to treat diarrhea

[Legends: OA: Observance of abundance; Br: Bark; Bl: Bulb; Fl: Flower; Fr: Fruit; Lf: Leaf; Nt: Nut; Re: Resin; Sd: Seed; Sh: Shoot; St: Stem; Tw: Twig; Tb: Tuber; Wh: Whole plant]

CONCLUSION

This study could able to identify only 128 wild ethnomedicinal plants used by the *Monpa* community of Arunachal Pradesh. Due to rich ethnic knowledge among the *Monpa* people especially Brokpas, village heads and healers,

it is expected that more than 150 wild plants are used by them. They also use large number of cultivated medicinal plants along with minerals and hymns. The people living in remote villages and the *Brokpas* still rely on ethnomedicinal plants for treatment of minor

to mild ailments. Some major ailments like bone fracture, jaundice, asthenia, etc. are still treated by local healers in the *Monpa* community.

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Photo plate – I



Aconitum ferox



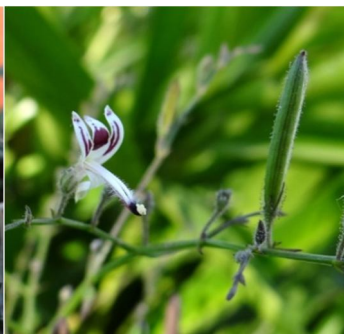
Aconitum heterophyllum



Aconitum hookeri



Ajania tibetica



Andrographis paniculata



Angelica cyclocarpa



Asparagus racemosus



Bergenia ciliata



Cannabis sativa



Clerodendrum glandulosum



Datura stramonium



Diploknema butyracea

Photo plate – II



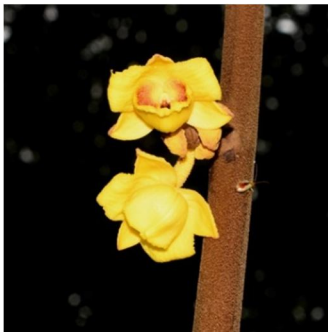
Drynaria propinqua



Elaeagnus umbellata



Fritillaria cirrhosa



Galeola lindleyana



Gaultheria fragrantissima



Gaultheria trichophylla



Gentiana ornata



Gentiana stylophora



Gentiana urnula



Gymnadenia orchidis



Houttuynia cordata



Illicium griffithii

Photo plate – III



Ligularia amplexicaulis



Leucas aspera



Mahonia napaulensis



Nardostachys jatamansi



Neopicrorhiza scrophulariiflora



Onosma hookeri



Panax bipinnatifidus



Polygonatum verticillatum



Polygonum affine



Potentilla peduncularis



Rheum nobile



Rhododendron arboretum

Photo plate – IV



Rhododendron hodgsonii



Rhododendron lepidotum



Rosa sericea



Rubia manjith



Saussurea obvallata



Sinopodophyllum hexandrum



Swertia hookeri



Vaccinium glaucoalbum



Valeriana jatamansi



Verbascum thapsus



Zanthoxylum armatum



Zanthoxylum oxyphyllum