Diversity of ethnobotanically significant angiospermic weeds in Siang Belt of Arunachal Himalayan Region in India

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Abstract

With objective to investigate the diversity of ethnobotanically significant angiospermic weeds used among the Adi community in the Siang belt of Arunachal Pradesh in their traditional biocultural landscape has recorded a total of 87 weed species. Many of these are economic significant and growing luxuriantly on the roadside, wasteland, jhum land and valleys. Their uses include food, human herbal medicines, veterinary medicines, fish poisoning agent, and use in local customary rituals practices.

Key words: Ethnobotany; Angiosperm Weeds; Utilization, Siang Belt; Arunachal Himalaya

INTRODUCTION

Etymologically, “weed” derives from the old English word for “grass” or “herb,” but during the middle ages the meaning has been changed to indicate an undesirable plant that grows where it is not wanted, especially along the agricultural plots (Rahman 2013). Baker (1965) defines a weed as a plant in any specify geographical area, its populations grow entirely or predominantly in situations markedly in disturbed environments, fast growing and are not always herbaceous (Zimdahl 1992). The notion of weeds as unnecessary plants was originated when man started to intentionally growing plants for food. They invade natural vegetation, usually adversely affecting native biodiversity or ecosystem functioning as well as competing with crop plants for common resources such as water, mineral nutrients, space and light (Heywood 1995; Rahman et al. 2011; Maroyi 2013). Some weeds produce chemical substances which are toxic to crop plants but not all the weeds are unwanted. In the rangeland areas, many annual grasses considered as weeds in crops are useful as animal feed. They also serve as food and shelter for wildlife, reduce soil erosion as good soil binders, and are useful for food and medicinal purposes (Neogi et al. 1989).

India has a wide range of agro-climates and soil types with highly diverse agriculture and farming systems beset with different types of weeds, which are very common, dominant and wide spread in the crop fields (Dhole et al. 2009; Rao & Chauhan 2015). Ethnobotanically important rare, endangered primary forest plant species can be replaced by invasive and exotic weeds, which have higher potential to survive and reproduce in stressed environment (Neogi et al. 1989). In the context of India and Northeast India, no systematic documentation
on weed flora are available to date. Hence, this paper aims to discuss on the diversity, distribution, ecology and economic importance of the ethnobotanically significant weed flora recorded from Adi inhabited Siang Belt of Arunachal Pradesh based on the ethnobotanical survey conducted during 2017 – 2019 and it is expected that this baseline taxonomic data would be useful for the management of weeds flora in Eastern Himalayan region in more productive and sustainable manner.

MATERIALS & METHODS

Study site and local cultural group
Ethnobotanical field study was conducted from 2017 – 2019 in the 8 villages of Siang districts, namely, Geku, Komkar, Yingkyong, Pasighat, Mebo, Riew, Boleng and Kerang which falls under tropical and subtropical climatic zones of East Siang, Upper Siang and Siang districts of Arunachal Pradesh, India. These districts are predominantly inhabited by the indigenous Adi tribal community living in the foot hills and the Bank of Mighty Siang River in the Eastern Himalayan region of India. The Adi people of Siang area still practices their age-old traditional faith and belief system called Donyi-Polo and practice terrace and jhum agriculture for sustenance of livelihood (Tag et al. 2008).

Ethnobotanical documentation of weeds flora
A total of 100 respondents from 50 household covering 8 villages of Adi localities were interviewed following the method suggested by Martin (2008). Prior Inform Consent (PIC) was taken from the potential informants before start of the work. Ethnobotanical uses of weed flora encountered were recorded in the structured questionnaire format and field notebook, and live photos of each species were captured. The voucher specimens were collected, dried, mounted, labelled and preserved following the method suggested by Jain and Rao (1977). Each plant was identified using standard regional and national floras, including Materials for the flora of Arunachal Pradesh (Hajra et al. 1996; Giri et al. 2008; Chowdhery et al. 2009); The Flora of British India (Hooker 1872 – 1897) and e-flora of India. The accepted scientific names were verified in the website www.theplantlist.org hosted by Royal Botanic Garden Kew UK and Missouri Botanical Garden, St. Louis, and Plants of World Online (POWO) hosted by RBG Kew. Voucher specimens were deposited in the Herbarium of Arunachal University (HAU), Department of Botany, Rajiv Gandhi University for future consultation.

RESULT AND DISCUSSION

Weed species diversity and traditional uses
Present investigation has recognized 87 weed species falling under 64 genera and 31 families which belong to Angiosperms which is presented in Table 1. Majority of the species (44%) reported are having local food value while 27 % species are used as medicine, 11% species are used for other purposes, 10% species are used for fodders and only 8% of the total species reported are used for traditional customary rituals. Of the total 87 weed species reported, 42 species are exclusively used as food supplements. These species are widespread in distribution right from road side to invading jhum field, kitchen garden and wasteland in the Eastern Himalaya including the Adi belt of Arunachal Pradesh. The edible and ethnobotanically significant weed species reported from current study sites are: Gynura cosimbua, Fagopyrum esculentum, Houttuynia cordata, Gonostegia hirta, Solanum americanum, Solanum torvum, etc. commonly domesticated in the kitchen garden and found in wild in jhum land.
PLATE - I. A. Persicaria capitata; B. Stellaria media; C. Nasturtium microphyllum; D. Lindenbergia hookeri; E. Portulaca oleracea; F. Rumex maritimus; G. Duchesnia indica; H. Oxalis debilis var. corymbosa; I. Gonostegia hirta; J. Rubus ellipticus; K. Dense uninterrupted population of Impatiens bracteolata; L. Viola betonicifolia; M. Paederia foetida
Table 1. Checklist of ethnoobotanically significant angiospermic weeds in the Siang belt of Arunachal Himalayan Region

*Abbreviation used: F = Food; FD = Fodder; FH = Fishing; RBC = Rituals beliefs and customs; VET = Veterinary; O = Others; TU = Traditional uses*

| Botanical name [Family]; Voucher specimen | Adi Names | T U | Mode of use | Endemism range | Markability |
|------------------------------------------|-----------|-----|-------------|-----------------|-------------|
| Actephila excelsa (Dalzell) Mull. Arg. [Phyllanthaceae]; LG-134 | Kamsar-oying | F | Tender shoots taken as vegetable | - | Yes |
| Ageratum conyzoides (L.) L. [Asteraceae]; MT-906 | Namsing eeing/ Migom Dumpu/ Bongar/ Yahum | M; RCB | Leaf paste applied on cuts and bruises as haemostat; leaf juice taken orally for headache and shivering; Facing of inflorescence direction signify dusk/ dawn | Tropical America and Mexico | No |
| Ageratum houstonianum Mill. [Asteraceae]; MT-908 | Namsing eeing/ Migom Dumpu | M; RCB | Leaf paste used as haemostat on cuts and bruises; movement of inflorescence direction signifies dusk / dawn | Central America, Mexico | No |
| Amaranthus spinosus L. [Amaranthaceae]; GM-142 | Tapi-Pilee / Gabor | F | Tender shoots taken as vegetable | Trop. America, Mexico | Yes |
| Amaranthus viridis L. [Amaranthaceae]; GM-143 | Tapi-pilee/ Gabor | F | Tender shoots taken as vegetable | Trop. America, Mexico | Yes |
| Ardisia solanacea Roxb. [Primulaceae]; LG-122 | Go-yakpin | F | Tender shoots taken as vegetable | Pakistan, India, Sri Lanka, SE Asia, W China | No |
| Artemisia indica Willd. [Asteraceae]; LG- 116 | Eetki-Daali/ fagi Reti/ Laglin | M; RBC | Leaves paste taken orally stomach disorder; twigs used in funerals | East Asia, China, Japan, India | No |
| Bidens pilosa L. [Asteraceae]; GM-145 | Tasso-Lepyo/ Ejar | F | Tender shoots taken as vegetable | America, Eurasia, Africa, Australia, Pacific Island | Yes |
| Blumea balsamifera DC. [Asteraceae]; LG-119 | Eyok aain/ Mine geyin | M | Crushed leaves mixed with Mithun dung and freshly collected stream-water is applied on the forehead to treat malaria | Asia, China, Indo-China, Malaysia | No |
| Brachiaria eruciformis (Sm.) Griseb. [Poaceae]; MT-932 | Taami | FD | Fodder for cattle | Mediterranean to Indo-China, Africa | No |
| Brachiaria ramosa (L.) Stapf [Poaceae]; MT-937 | Taami/ Tarum majit | FD | Fodder for cattle | Africa, Asia | No |
| Brachiaria reptans (L.) C.A. Gardener & C.E.Hubb. [Poaceae]; MT-933 | Taami | FD | Fodder for cattle | Arab peninsula, Afghanistan to Pacific | No |
| Brachystemma calycinum D.Don [Caryophyllaceae]; MT-912 | Okin-Parin | F; M | Leaves are warmed after packing with Phrynium pubinerve leaves and then applied to cure cracked sole | SW China, Nepal | No |
| Bryophyllum pinnatum (Lam.) Oken [Crassulaceae]; MT-909 | Nevi nelaum, Eme kaserang | M | Plant extract applied on affected body part to cure burn and inflammation; leaves eaten raw to clean stomach | S Africa, Madagascar, Asia | No |
| Cardamine hirsuta L. [Brassicaceae]; MT-917 | Oram-Petsik/ Loram patta | F | Whole plants edible | Europe, N Africa | No |
| Carex baccans Nees [Cyperaceae]; LG-120 | Gemin-Taabeng/ Tapok/ Tabeng | RBC | They belief that Carex baccans and Saccharum arundinaceum came from the same ancestor so both are used together in funeral rituals | India, Sri Lanka, China | No |
| Botanical name [Family]; Voucher specimen | Adi Names | T U | Mode of use | Endemism range | Marketability |
|------------------------------------------|-----------|-----|-------------|----------------|---------------|
| Centella asiatica (L.) Urb. [Apiaceae]; LG-139 | Kiling Kipum, Golgi-Sipum, Dolgi/Jorgang taek | M | Paste of whole plants taken orally to treat gastritis | Asia | Yes |
| Chenopodium album L. [Amaranthaceae]; LG-129 | Jili-Mili/ Taye | F | Tender shoots taken as vegetable | Europe, Eurasia to India | Yes |
| Chenopodium giganteum D.Don [Amaranthaceae]; LG-103 | Amateng | F | Tender shoots taken as vegetable | Himalayas to Korea | Yes |
| Chromolaena odorata (L.) R.M.King & H.Rob. [Asteraceae]; LG-126 | Ingkir | M | Leaf paste applied on cuts for blood clotting | America | No |
| Crassocephalum crepidioides (Benth.) S.Moore [Asteraceae]; LG-115 | Eedi/Jogenei/ Teimbabo/ Gendeh | F | Tender shoots taken as vegetable | Africa | Yes |
| Chenopodium album L. [Amaranthaceae]; LG-129 | Jili-Mili/ Taye | F | Tender shoots taken as vegetable | Europe, Eurasia to India | Yes |
| Chenopodium giganteum D.Don [Amaranthaceae]; LG-103 | Amateng | F | Tender shoots taken as vegetable | Himalayas to Korea | Yes |
| Chromolaena odorata (L.) R.M.King & H.Rob. [Asteraceae]; LG-126 | Ingkir | M | Leaf paste applied on cuts for blood clotting | America | No |
| Crassocephalum crepidioides (Benth.) S.Moore [Asteraceae]; LG-115 | Eedi/Jogenei/ Teimbabo/ Gendeh | F | Tender shoots taken as vegetable | Africa | Yes |
| Cyanodon dactylon (L.) Pers. [Poaceae]; MT-936 | Taami/Tarum majut | FD | Fodder for cattle | E Africa, Australia | No |
| Dinebra retroflexa (Vahl) Panz. [Poaceae]; MT-934 | Taami | FD | Fodder for cattle | Africa | No |
| Droyaria cordata (L.) Willd. ex Schult. [Caryophyllaceae]; MT-29 | Pipi, Perok taller/ Kaming karlor | M | Paste of whole plant used locally to cure ringworm | Mexico, West Indies, S Africa, C & S America | No |
| Duchesnea indica (Jaccks.) Focke [Rosaceae]; LG 118 | Eki-Tangkin/ Panik taang | F | Ripe fruits edible (watery) | E & S Asia, Afghanistan to Russian Far East, Malaysia | No |
| Eclipta prostrata (L.) L. [Asteraceae]; LG-137 | Keharaj/ Donyi Hangkang | M | Plant decoction taken orally to cure dysentery | America, India, Nepal, China, Thailand, Brazil | No |
| Eragrostis minor Host [Poaceae]; MT-935 | Taami | FD | Fodder for cattle | Eurasia, Africa | No |
| Erigeron canadensis L. [Asteraceae]; LG-127 | Ingkobodong/ Eedong | F | Tender shoots taken as vegetable | N & C America | No |
| Euphorbia hirta L. [Asteraceae]; MT-902 | Korek oying | FD; M | Whole plant used as pig-fodder; leaves taken orally against flies | Trop. America | No |
| Fagopyrum esculentum Moench [Polygonaceae] | Okung, Lompuk | F | Tender shoot taken as vegetable | Native to C & N Asia | Yes |
| Gnaphalium polycaulon Pers. [Asteraceae]; MT-923 | Paaput | F | Leaves edible | Mesoamerica, S America, West Indies | No |
| Gynura cusimbua (D.Don) S.Moore [Asteraceae]; MT-910 | Ogen | F | Leaves edible | China, Tibet, India, Myanmar, Nepal, Thailand, Bangladesh, Bhutan | Yes |
| Houttuynia cordata Thumb. [Saururaceae]; MT-930 | Roram | F; M | Whole plant made into chutney; use in stomachache | SE Asia | Yes |
| Hydrocotyle javanica Thunb. [Araliaceae]; LG-140 | Kiling-Kipum | O | Whole plants used to stupify fishes | NE India, SE Asia, Fiji | No |
| Impatiens bracteolata Hook.f. [Balsaminaceae]; MT-907 | Nanor–Tangkor | F | Tender shoots edible | E Himalaya to Myanmar | No |
| Laphangium affine (D.Don) Tzvelev [Asteraceae]; MT-922 | Paaput | F | Leaves edible | Temperate region of China, Korea, Japan, Taiwan, high altitude tropical region of India, Nepal, Thailand | No |
| Botanical name [Family]; Voucher specimen | Adi Names | T U | Mode of use | Endemism range | Marketability |
|------------------------------------------|-----------|-----|-------------|----------------|---------------|
| Leucas aspera (Willd.) Link [Lamiaceae]; LG-117 | Eki sipak | M | Leaf-paste used externally on nose to cure sinus problems | India, Mauritius, Philippines, Java | No |
| Lindenhergia hookeri C.B.Clarke ex Hook.f. [Orobanchaceae]; MT-925 | Pepit namdung | F | Flowers are edible (sour) | E. Himalaya | No |
| Melastoma malabathricum L. [Melastomataceae]; LG-136 | Kassi Rai/ Joger | F; RBC | Fruits edible; its blooming signals that the high time for paddy-seeds broadcasting | Indo-Malaya, Japan, Australia | No |
| Mikania micrantha Kunth [Asteraceae]; LG-114 | Eeli/ Eeing mamang | M | Leave used to cure stomachache and dysentery | Subtrop. N, C & S America | No |
| Murdannia nudiflora (L.) Brenan [Commelinaceae]; LG-124 | Hodog/ Golgi/ Gorgi roksok | RBC | flowering of the plant signals villagers that it is time to broadcast paddy-seeds; the plant is grown in field as demarcation line | Trop. & subtrop. Asia | No |
| Nasturtium microphyllum (Boenn.) Rchb. [Brassicaceae]; MT-919 | Orgyam/ Patang oying | F | Leaves edible | Middle-east, parts of N Africa, Europe | Yes |
| Oenanthe javanica (Blame) DC. [Apiaceae]; LG-101 | - | F | Tender shoots served as vegetable | Temp. Asia, Trop. Asia, Queensland, Australia | Yes |
| Oxalis corniculata L. [Oxalidaceae]; MT-926 | Piag-Hiya, Piak lip | M | Fruit-juice used to cure eye infection | S America | No |
| Oxalis debilis var. corymbosa (DC.) Lourteig [Oxalidaceae]; MT-927 | Piag-Hiyub, Piak lip | F | Flowers and rhizome edible | C America to Guyana, Paraguay | No |
| Paederia foetida L. [Rubiaceae]; GM-146 | Yape Taari/ Riki Ringkom/ Yepe ribung | M | Leaves taken orally to cure gastritis | Temp. & trop. Asia | No |
| Persicaria barbata (L.) H.Hara [Polygonaceae]; LG-107 | Diko-Taama | O | Crushed plants used to stupefy fish | India, Myanmar, China, Pegu | No |
| Persicaria capitata (Buch.-Ham. ex D.Don) H.Gross [Polygonaceae]; LG-104 | Babing-kaling, Mijing kaling, Tasum momi/ Kibu nanung | F | Ripe fruits edible | Asia | Yes |
| Persicaria chinensis (L.) H. Gross [Polygonaceae]; LG-102 | Babing-kaling, Mijing kaling, Tasum momi/ Kibu nanung | O | Crushed plants used to wash hands in the field; plant-paste applied on cuts and wound | Native to trop. to temp. Asia | No |
| Persicaria hydropiper (L.) Delarbre [Polygonaceae]; LG-108 | Diko-Taama/ eeing killing | O | Crushed leaves used to stupefy fishes | Australia, New Zealand, temp. Asia, Europe, N America, Africa | No |
| Persicaria nepalensis (Meisn.) H.Gross [Polygonaceae]; LG-105 | Babing-kaling, Mijing kaling, Tasum momi/ Rungkung | O | Crushed plant used to wash hands in the field | E Africa, including Madagascar, parts of Asia | No |
| Phyllanthus amarus Schumach. &Thonn. [Phyllanthaceae]; MT-901 | Kobelang/ Eeyup | M | Plant-paste taken orally against jaundice | Mexico to Trop. America. | No |
| Physalis minima L. [Solanaceae]; LG 131 | Jajing belang | F | Ripe fruits edible | Trop. & Subtrop. America. | No |
| Pilea insolens Wedd. [Urticaceae]; MT-940 | Tango-Lisak | F | Leaves used in fermentation of Perilla ocymoides seeds | S-E Xizang, China, Bhutan, N India, Nepal | No |
| Pilea umbrosa Wedd. ex Blume [Urticaceae]; MT-915 | Oko-Robo | F | Tender shoots edible | Pakistan, China, N Vietnam | No |
| Botanical name [Family]; Voucher specimen | Adi Names | T U | Mode of use | Endemism range | Marketable |
|------------------------------------------|-----------|----|-------------|----------------|------------|
| Plantago asiatica L. [Plantaginaceae]; LG-111 | Donyi-Borkor Donyi hakneng, Donyi sokang | F | Leaves edible | E China | No |
| Polygonum molle D.Don [Polygonaceae]; LG-138 | Kibbu- Namung | F | Tender shoots edible | Indian Subcontinent to S. China, W. Malaysia. | No |
| Portulaca oleracea L. [Portulacaceae]; LG-123 | Gubor-Oying | F | Whole plants edible | Australia | No |
| Gonostegia hirta (Blume ex Hassk.) Miq. [Urticaceae]; MT-920 | Oyik | F; M | Tender shoots edible; leaf-paste used on cuts and wounds | Trop. & subtrop. Asia to Australia | Yes |
| Puszoltzia zeylenica (L.) Benn. [Urticaceae]; MT-921 | Oyik | M | Leaf paste used on cuts and wounds | Trop. & subtrop. Asia. | No |
| Ricinus communis L. [Euphorbiaceae]; LG-121 | Gopo-Golo / Perok aki/ Aki rongnik | M | Leaves warm on fire placed paining joints and muscle. Petiole bark used as bandage to cure fractured bone of chicks | N-E Africa | No |
| Rosippa dubia (Pers.) H.Hara [Brassicaceae]; MT-918 | Orgyam, sitong pettu | F | Leaves edible | Indian subcontinent, S China, Malay peninsula | No |
| Rubia manjith Roxb. ex Fleming [Rubiacae]; MT-938 | Taman | O | Roots boiled with cotton (for thread) turns red | Africa to trop. Asia, China, Japan, Australia | No |
| Rubus ellipticus Sm. [Rosaceae]; MT-939 | Tangkin / Pakkom Tayin/ Pakkom tasing | F | Sweet ripe fruits edible | China, Nepal, Indian subcontinent, Indochina, Philippines | No |
| Rumex maritimus L. [Polygonaceae]; MT-916 | Okung | F | Young leaves edible | Ireland | Yes |
| Saccharum arundineaceum Retz. [Poaceae]; GM-141 | Tapii | RBC | Believed that it is the elder brother of Carex sp. and both are use in rituals during funeral | India | No |
| Saccharum spontaneum L. [Poaceae]; MT-928 | Piko-Pimur/ Aasi-Pimur | F | Roasted young inflorescences edible | Sicilia, Africa, Asia to N. & NE. Australia. | No |
| Scoparia dulcis L. [Plantaginaceae]; GM-147 | Yongin | M | Taken orally against rabies | C & S America | No |
| Senna alata (L.) Roxb. [Fabaceae]; LG-109 | Donyi Sori | M | Leaf-paste used as antimicrobial medicine for old wounds | N-S & C America | No |
| Senna tora (L.) Roxb. [Fabaceae]; LG-110 | Donyi Sori | M | Leaf-paste used against Ring worm | C America | No |
| Sida acuta Burm.f. [Malvaceae]; LG-128 | Jara Ane | O | Dried whole plants used as hard broom | C America | No |
| Solanum americanum Mill. [Solanaceae]; MT-914 | Okomamang/Ma ali/ Yanga | F | Tender shoots taken as vegetable | America, Melanesia, New Guinea, Australia | Yes |
| Solanum torvum Sw. [Solanaceae]; MT-905 | Migmom kopi, Kodu/ Taleng koe | F | Young fruits tastes bitter, made into chutney | Florida, S Alabama, Brazil, Mexico | Yes |
| Solanum viarum Dunal [Solanaceae]; MT-924 | Peeli-Taang | M | Warmed fruits used in toothache | Brazil, Argentina | No |
| Solanum villosum Mill. [Solanaceae]; MT-913 | Okomamang/Ma ali/ koieer | F | Tender shoots taken as vegetable | Europe, W Asia, N Africa, N America | No |
| Sonchus oleraceus L. [Asteraceae]; MT-911 | Ogon | F | Tender leaves eaten as vegetable | Europe, W Asia | No |
| Botanical name [Family]; Voucher specimen | Adi Names | T U | Mode of use | Endemism range | Marketability |
|------------------------------------------|-----------|----|-------------|----------------|---------------|
| Spermacoce alata Aubl. [Rubiaceae]; LG-113 | Eeing / Tagin mikki | FD | Whole plant used as pig-fodder | S Mexico, C America, Caribbean | No |
| Spermacoce ocymoidea Burm.f. [Rubiaceae]; LG-112 | Eeing | FD | Whole plant used as pig-fodder | Trop. to SW Pacific | No |
| Spilanthes acmella (L.) L. [Asteraceae]; MT-903 | Marshang Haali, Aying Marshang | F | Leaves edible | Trop. & S countries mainly India, S America | Yes |
| Stellaria media (L.) Vill. [Caryophyllaceae]; LG-125 | Hosir Oying | F | Whole plants edible | Europe, Africa | Yes |
| Themeda villosa (Lam.) A.Camas [Poaceae]; LG-144 | Tase | O | Dried leaves use for roofing | Trop. & subtrop. Asia | No |
| Thysanolaena latifolia (Roxb. ex Hornem.) Honda [Poaceae]; LG-135 | Kanggam/ Jara Ane/ Kamgang | RBC, O | Believe that in course of evolution the tail of Bos frontalis was originated from plant inflorescence; mature inflorescence use as soft broom | Trop. & subtrop. Asia | Yes |
| Urtica ardens Link [Urticaceae]; LG-130 | Jimang/ Matpe Pereng | M | Infected wounds of Bos frontalis is beaten with nettle leaf to kill the infectious organisms | Himalayas to SE Tibet | No |
| Urtica dioica L. [Urticaceae]; MT-904 | Matpe pereng/ Peji pamang | M | As in U. ardens | Europe, temp. Asia, W-N Africa | No |
| Viola betonicifolia Sm. [Violaceae]; LG-133 | Jortung / Japjor | F | Whole plants edible | S Asia, E Australia, Tasmania | No |
| Viola pilosa Blume [Violaceae]; LG-132 | Jorsing/ Japjor Peaak sangar | F | Whole plants edible | Trop. & temp. Asia | No |
| Youngia japonica (L.) DC. [Asteraceae]; MT-931 | Rundum/ Rundum/ Rukjub mikki | O | Dried leaves are smoked as substitute to tobacco | E Asia | No |

**Ethnomedicinal uses**

Of the total 87 weed species reported, 27% of them are being used in traditional ethnomedicinal practices of the Adi community for the treatment of different ailments such as Gastrointestinal disorder, cuts and wound, burns and inflammation, malaria, toothache, jaundice, files, sinus, crack sole, ringworm, sprain and rabies. Majority of the total species reported are used for treatment of Gastro-intestinal disorder, cuts and wound, burns and inflammation and malaria, whereas few species such as *Urtica dioica* and *Urtica parviflora* were found to be used in ethno-veterinary medicinal practices for the treatment of infected wound of their livestock population.

**Animal fodder and forage**

Domestication of animal is the primary occupation in the rural localities to sustain the economy and human livelihood. Present investigations have revealed a total of 9 weedy species exclusively used by the rural farmers as livestock fodder for the ruminant cattle, such as Mithun, Cow, and Goat. Some of the species are luxuriantly growing in the wild without any agronomic care and are non-toxic, but rather nutritious which are mostly foraged by the ruminant animals.

**Weed plant in traditional rituals**

Adi community being the followers of indigenous Donyi-Polo religious group uses several plant species while worshiping Gods and Goddesses like Kine Nane, Doying Bote, Gumin...
Soyin, Pedong Nane, and Dadi bote, which is performed with invocation of hymns as per their existing ritual traditions. Present investigation have revealed a total of 8 weedy species which are widely used in traditional rituals, and also associated with local folk belief systems. Weeds species namely, *Thysanolaena latifolia* and *Chenopodium giganteum* are mentioned in folklores since time immemorial which are deeply associated with indigenous faith and belief systems of the Adi community.

Commercially important weeds

A good share of 20% of the recorded 87 species are commercially important, which are frequently harvested and sold in markets as food and medicinal items. These sellers are mostly the marginal farmers, mainly women to sustain their livelihood. These species are also extensively harvested in some places for vermicomposting to produce organic manure in Kitchen Gardens for ensuring organic crop production.

CONCLUSION

It is concluded that Adi people of Siang district are rich in traditional knowledge and local skills related to wise use of weed flora available in their bio cultural landscape. The weed flora luxuriantly growing almost everywhere in Siang Districts of Arunachal Pradesh are being converted into economically productive and livelihood based support items by the local residents by employing them in diverse uses such as food, human medicine, veterinary medicine, organic manure, rituals and belief systems.

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