

Inventory of wild food plants in Marat Longri Wildlife Sanctuary in Assam, India

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Abstract

The present study was conducted in Marat Longri Wildlife Sanctuary, Assam to inventor the wild food plant diversity in the sanctuary through ethnobotanical study among different local ethnic groups. Data was collected through group discussions, household survey and survey of local markets. The study recorded 93 wild food plants belonging to 80 genera and 45 families including two fern species. The plants exhibited diverse habit-groups with herbs (36.55 %), trees (31.18 %), climbers (16.12 %), shrubs (15.05 %) and epiphytes (1.07 %). As wild edibles are the constituents of flora, result of the present study will contributes towards biodiversity of the protected area and subsistence practices, food habit and associated traditional knowledge of the people. Further investigations on phytochemical profiles will be able to identify novel compounds and health benefits of wild food plants. Ethnobotanical study of wild food plants can help in assessing conservation status of species and prioritisation of conservation.

Key words: Marat Longri WLS, wild food plants, non-food uses

INTRODUCTION

The use of wild food plants (WFPs) can be traced to antiquity and its role in human well-being has not diminished even today. There is no single definition for wild food plants but these usually refer to species that are neither cultivated nor domesticated, but available from their natural habitat and used as sources of food (Beluhan & Ranogajec 2010). Food and Agricultural Organization define WFPs as 'plant resources that are harvested or collected for human consumption outside agricultural areas in forest, savannah, and other bush land areas' (FAO 2004). Dietary use of wild plants is prevalent throughout the world which are collected not only for consumption but for other purposes as well (Jain 1963; Balemie & Kebebew 2006; Pardo-de-Santayana *et al.* 2006; Kar & Borthakur 2007; Sawain *et al.* 2007; Yesodharan & Sujana 2007; Patiri & Borah 2007; Misra *et al.* 2008; Bharucha & Preety 2010; Salam *et al.* 2010; Paul *et al.* 2011; Devi *et al.*, 2011b; Maroyi 2011; Singh *et al.* 2012; Pegu *et al.* 2013; Ranjana *et al.* 2013; Promod *et al.* 2014). Wild edibles form important component of world flora and enumeration of dietary use of this group of plants among different cultures can be useful in documentation of plant diversity and distribution in an area or region and the associated traditional knowledge. Many WFPs are wild relatives of crop plants and has potentials to replenish genetic erosion of crop plants or for crop improvement and therefore, there is a need for conservation of genetic resources of WFPs (Kala 2007a; Kala 2007b).

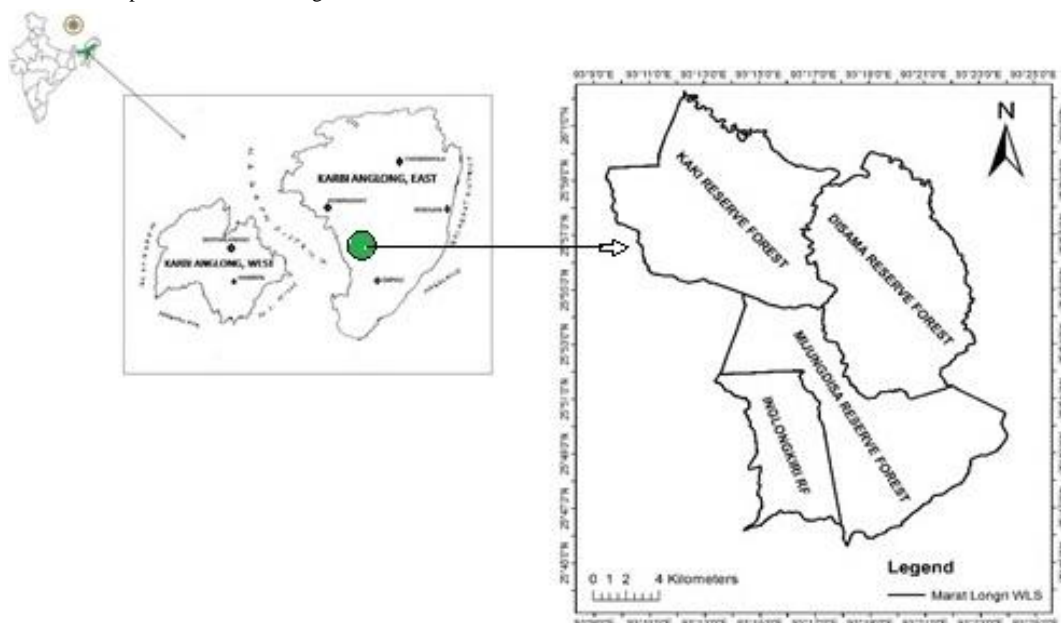


Figure 1. Location map of Marat Longri WLS, Karbi Anglong district, Assam

Marat Longri Wildlife Sanctuary in Karbi Anglong district, Assam contributes towards biodiversity conservation and well-being of local communities. About 46 villages belonging to seven ethnic groups namely Karbi, Dimasa, Hmar, Garo, Chakma, Nepali and Adivasi are located inside and in fringe areas of the sanctuary. They use the protected area for different purposes including food and nutrition. As agricultural land is scarce people practice *jhum* (slash and burn) by clearing forest vegetation (Figure 2). But *jhum* products for most families are not sufficient for the whole year and this demands gathering of wild plant resources to meet their food requirements. Besides many poor families collect wild edibles from the sanctuary and sell them in local markets to earn cash income and livelihoods (Kar & Borthakur 2007). Floristic wealth of Marat Longri WLS has not been assessed earlier. This study presents an inventory of wild food plant diversity in the sanctuary through documentation of dietary use of wild plants among different ethnic groups. As wild edibles are also constituents of flora, the present study will contribute towards biodiversity of the protected area and also help in documentation of food habit, subsistence pattern and traditional knowledge of the people.

MATERIAL AND METHODS

Study area and the people

Marat Longri WLS with a geographical area of 451sq km in Karbi Anglong district, Assam was established in 17th April 2003 by the Govt. of Assam; the sanctuary is located between 25°47'2" - 25°59'2" N and 93°08'2" - 93°21'2" E. The sanctuary comprises of four reserved forests (RF) namely Mijungdisa RF, Disama RF, Kaki RF and Inglongkiri RF (Figure 1). The protected area is also an integral part of Dhansiri-Lumding elephant reserve. The sanctuary is natural habitat of seven ethnic communities *viz.* Karbi, Dimasa, Hmar, Garo, Chakma, Nepali and Adivasi since many years and agriculture (slash and burn) is their main livelihood practices.

Data collection and analysis

Field study was undertaken during September 2012 to June 2014 in Marat Longri Wildlife Sanctuary among the Karbi, Dimasa, Hmar, Garo, Chakma, Nepali and Adivasi ethnic groups. Data on the use of WFPs was collected through group discussions and household surveys. Consent of informants was obtained after disclosing the purpose and objectives for the study. Semi-structured interview was followed to record dietary as well as non-dietary use of WFPs. Sixty households from randomly selected 20 villages (5 villages from each Reserved Forest) were visited to record wild plants used; list of wild edibles was prepared through free listing. The informants were mostly women (65%) of age groups 20 to 55 years; women are more active in collecting and trading WFPs than their male counterpart. We conducted forest walks with key informants to study the distribution, diversity and ecology of edible plants. We also made regular market surveys and interviewed 45 vendors from Marat Longri WLS and recorded WFPs collected from the sanctuary and their economic value. Plants collected during field study were identified with the help of Kanjilal *et al.* (1934-1940), Rao & Verma (1972, 1973, 1974, 1982), Prain (1903), Balakrishnan (1981, 1983), Hajra *et al.* (1995) and Shukla (1996); identity of some species were authenticated at Assam Herbarium, Botanical Survey of India, Shillong. Nomenclature and family delimitation for the recorded plants were updated using online database *The Plant List* (www.theplantlist.org) and conservation status were updated using *The IUCN Red List of Threatened species 2014* (<http://www.iucnredlist.org>). The specimens were processed according to Jain & Rao (1977) and preserved in the Department of Life Science and Bioinformatics, Assam University, Diphu Campus for future reference. Data on wild food plants, habit and habitat is presented in tables while non-food uses of wild edibles are expressed in bar graph.

RESULT AND DISCUSSION

Diversity and utilization of wild food plants:

Wild plants form the main component of food basket of tribal communities in Marat Longri WLS. The present inventory study documented 93 WFPs belonging to 80 botanical genera distributed under 45 families (Table 1). The list also included 2 ferns namely *Amblovenatum opulentum* and *Diplazium esculentum*. The family Cucurbitaceae (6) had the highest representation of edible plants followed by Araceae (5), Asteraceae (5), Fabaceae (5), Phyllanthaceae (5), Rutaceae (5), Dioscoreaceae (4), Solanaceae (4), Amaranthaceae (3), Clusiaceae (3), Dilleniaceae (3), Lamiaceae (3), and Zingiberaceae (3); the remaining families were represented by 1 or 2 plants each. Most wild edibles are herbs (36.55 %) followed by trees (31.18 %), climbers (16.12 %), shrubs (15.05 %) and epiphytes (1.07 %). The habitat distribution of recorded wild edibles included terrestrial (84.94 %), aquatic (9.67 %) and marshy system (5.37 %). All parts are consumed by the forest people: leaves (39), tender shoot (25), fruits (32), tuber (9), bark (6), root (3), whole plant (2), seed (2), stem (1) and stolon (1). During scarcity of staple foods, (i.e., rice) tubers of *Dioscorea* species is the most extensively collected wild tubers both for food and livelihood (Figure 4). Wild plants are consumed in different ways following diverse methods of preparation but selection of food is governed primarily by availability of the plants in the local environment. The general method of preparation of food items is by boiling, baking, frying, cooking in bamboo tube and roasting. Delicacies are often flavoured with sesame powder and other herbs. Among the locally important and underutilized edibles include *Gnetum gnemon*, *Rhynchochum ellipticum*, *Dillenia indica*, *Tabernaemontana divaricata*, *Gymnopetalum chinense*, *Momordica charantia*, *Hodgsonia macrocarpa*, *Artocarpus lacucha*, *Bambusa* sp., *Parabaena sagittata* and *Rhaphidophora calophylla* (Figure 5-11). The species of wild edibles recorded

Table 1. Inventory of wild food plants in Marat Longri WLS [Abbreviations used: NE - Not Evaluated; LC - Least Concerned; LS - Lower Risk; NT - Near Threatened].

Botanical name [Family]; Exsiccatae	Habit	Habitat	Conse- rvation status	Parts used	Other uses
<i>Acacia pennata</i> (Linnaeus) Willdenow [Fabaceae]; AUDC-890, dtd. 10.03.2013	Tree	Terrestrial	LC	Bark	Fuel, cash income
<i>Aegle marmelos</i> (Linnaeus) Correa [Rutaceae]; AUDC-942, dtd. 03.05.2013	Tree	Terrestrial	NE	Fruit	Fodder, medicine, fuel, cash income
<i>Alpinia nigra</i> (Gaertner) Burt [Zingiberaceae]; AUDC-820, dtd. 15.07.2012	Herb	Aquatic	NE	Tender shoot	Cash income
<i>Alternanthera philoxeroides</i> (Martius) Grisebach [Amaranthaceae]; AUDC-976, dtd. 15.05.2013	Herb	Aquatic	NE	Tender shoot	Ethnoveterinary medicine
<i>Alternanthera sessilis</i> (Linnaeus) R. Brown ex de Candolle [Amaranthaceae]; AUDC-973, dtd. 15.05.2013	Herb	Terrestrial	LC	Tender shoot	Medicine
<i>Amblovenatum opulentum</i> J.P. Roux [Thelypteridaceae]; AUDC-969, dtd, 15.05.2013	Herb	Marshy	NE	Leaves	Insecticides
<i>Amorphophallus sylvaticus</i> (Roxburgh) Kunth [Araceae]; AUDC-935, dtd. 21.04.2013	Herb	Terrestrial	NE	Tuber	Pig feed
<i>Antidesma acidum</i> Retzius [Phyllanthaceae]; AUDC-887, dtd. 21.02.2013	Tree	Terrestrial	NE	Leaves	-
<i>Artocarpus lacucha</i> Buchanan- Hamilton [Moraceae]; AUDC-1061, dtd. 05.04.2014	Tree	Terrestrial	NE	Bark, leaves	Fodder, fuel
<i>Azadirachta indica</i> A. Jussieu [Meliaceae]; AUDC-940, dtd. 03.05.2013	Tree	Terrestrial	NE	Leaves	Medicine, fuel
<i>Baccaurea ramiflora</i> Loureiro [Phyllanthaceae]; AUDC-1003, dtd. 10.06.1013	Tree	Terrestrial	NE	Fruit, leaves	Fodder, fuel, cash income
<i>Bambusa sp.</i> [Poaceae]; AUDC- 1020, dtd. 14.08.2013	Herb	Terrestrial	NE	Shoot, leaves	Worship, fodder, cash income
<i>Bauhinia racemosa</i> Lamarck [Fabaceae : Caesalpinioideae]; AUDC-858, dtd. 25.10. 2012	Tree	Terrestrial	NE	Leaves, shoot	Fodder, fuel
<i>Bauhinia variegata</i> Linnaeus [Fabaceae : Caesalpinioideae]; AUDC-859, dtd. 25.10. 2012	Tree	Terrestrial	LC	Leaves	Fodder, fuel, cash income
<i>Blumea lanceolaria</i> (Roxburgh) Druce [Asteraceae]; AUDC-1060, dtd. 05.04.2014	Shrub	Terrestrial	NE	Leaves	Medicine, cash income
<i>Callicarpa arborea</i> Roxburgh [Lamiaceae]; AUDC-891, dtd. 10.03.2013	Tree	Terrestrial	NE	Bark	Worship, fuel

Botanical name [Family]; Exsiccatae	Habit	Habitat	Conse- rvation status	Parts used	Other uses
<i>Calotropis gigantea</i> (Linnaeus) Dryander [Apocynaceae]; Asclepiadoideae; AUDC-1019, dtd. 06.08.2013	Shrub	Terrestrial	NE	Leaves	-
<i>Capsicum annuum</i> Linnaeus [Solanaceae]; AUDC-812, dtd. 15.07.2012	Herb	Terrestrial	NE	Fruit, leaves	Medicine, cash income
<i>Centella asiatica</i> (Linnaeus) Urban [Apiaceae]; AUDC-1001, dtd. 20.05.2013	Herb	Terrestrial	LC	Leaves	Medicine, cash income
<i>Cheilocostus speciosus</i> (J. Koenig) C.D. Specht [Costaceae]; AUDC- 855, dtd. 25.10. 2012	Herb	Terrestrial	NE	Whole plant	Medicine
<i>Chionachne gigantea</i> (J. Koenig) Veldkamp [Poaceae]; AUDC-883, dtd. 04.02.2013	Herb	Marshy	LC	Whole plant	Fodder
<i>Cinnamomum verum</i> J. Presl [Lauraceae]; AUDC-907, dtd. 07.04.2013	Tree	Terrestrial	NE	Bark	Cash income, fuel
<i>Citrus maxima</i> (Burman) Merrill [Rutaceae]; AUDC-841, dtd. 06.09.2012	Tree	Terrestrial	NE	Fruit	-
<i>Citrus sp.</i> [Rutaceae]; AUDC-840, dtd. 06.09.2012	Shrub	Terrestrial	NE	Fruit	Cash income
<i>Clerodendrum glandulosum</i> Lindley [Lamiaceae]; AUDC-860, dtd. 28.10.2012	Shrub	Terrestrial	NE	Tender shoot	Medicine
<i>Coccinia grandis</i> (Linnaeus) Voigt [Cucurbitaceae]; AUDC-899, dtd. 07.04.2013	Clim ber	Terrestrial	NE	Fruit	Fodder
<i>Colocasia esculenta</i> (Linnaeus) Schott [Araceae]; AUDC-921, dtd. 08.04.2013	Herb	Aquatic	LC	Whole plant	Pig feed, cash income
<i>Combretum album</i> Persoon [Combretaceae]; AUDC-1064, dtd. 24.04.2014	Clim ber	Terrestrial	NE	Bark	-
<i>Commelina benghalensis</i> Linnaeus [Commelinaceae]; AUDC-978, dtd. 15.05.2013	Herb	Marshy	LC	Tender shoot	Fodder
<i>Croton joufra</i> Roxburgh [Euphorbiaceae]; AUDC-1065, dtd. 24.04.2014	Tree	Terrestrial	NE	Leaves	Fuel
<i>Cucumis melo</i> Linnaeus [Cucurbitaceae]; AUDC-915, dtd. 07.04.2013	Clim ber	Terrestrial	NE	Fruit	-
<i>Cyanthillium cinereum</i> (Linnaeus) H. Robinson [Asteraceae]; AUDC- 977, dtd. 15.05.2013	Herb	Terrestrial	NE	Tender shoot	Cash income
<i>Deeringia amaranthoides</i> (Lamarck) Merrill [Amaranthaceae]; AUDC- 1062, dtd. 24.04.2014	Herb	Terrestrial	NE	Tender shoot	-
<i>Dendrocnide sinuata</i> (Blume) Chew [Urticaceae]; AUDC-905, dtd. 07.04.2013	Shrub	Terrestrial	NE	Leaves, root	Medicine, fodder

Botanical name [Family]; Exsiccatae	Habit	Habitat	Conse- rvation status	Parts used	Other uses
<i>Dillenia indica</i> Linnaeus [Dilleniaceae]; AUDC-813, dtd. 15.07.2012	Tree	Terrestrial	NE	Fruit	Medicine, fuel, detergent, cash income
<i>Dillenia pentagyna</i> Roxburgh [Dilleniaceae]; AUDC-1075, dtd. 18.07.2014	Tree	Terrestrial	NE	Fruit	Fuel
<i>Dillenia scabrella</i> (D. Don) Roxburgh ex Wallich [Dilleniaceae]; AUDC-816, dtd. 15.07.2012	Tree	Terrestrial	NE	Fruit	-
<i>Dimocarpus longan</i> Loureiro [Sapindaceae]; AUDC-1077, dtd. 18.07.2014	Tree	Terrestrial	LR/NT	Fruit	Fuel, cash income
<i>Dioscorea alata</i> Linnaeus [Dioscoreaceae]; AUDC-1028, dtd. 27.08.2013	Clim ber	Terrestrial	NE	Tuber, leaves	Fodder
<i>Dioscorea esculenta</i> (Loureiro) Burkill [Dioscoreaceae]; AUDC- 1044, dtd. 23.09.2013	Clim ber	Terrestrial	NE	Tuber, leaves	Fodder, cash income
<i>Dioscorea glabra</i> Roxburgh [Dioscoreaceae]; AUDC-1029, dtd. 27.08.2013	Clim ber	Terrestrial	NE	Tuber, leaves	Fodder
<i>Dioscorea pentaphylla</i> Linnaeus [Dioscoreaceae]; AUDC-1032, dtd. 27.08.2013	Clim ber	Terrestrial	NE	Tuber, leaves	Fodder
<i>Diplazium esculentum</i> (Retzius) Swartz [Athyriaceae]; AUDC-980, dtd. 15.05.2013	Herb	Marshy	LC	Leaves	Cash income
<i>Enydra fluctuans</i> Loureiro [Asteraceae]; AUDC-882, dtd. 04.02.2013	Herb	Aquatic	NE	Shoot	Medicine
<i>Etilingera elatior</i> (Jack) R.M. Smith [Zingiberaceae]; AUDC-925, dtd. 14.04.2013	Herb	Terrestrial	NE	Roots	-
<i>Ficus hispida</i> Linnaeus f. [Moraceae]; AUDC-1039, dtd. 28.08.2013	Shrub	Terrestrial	NE	Leaves	-
<i>Garcinia lanceifolia</i> Roxburgh [Clusiaceae]; AUDC-943, dtd. 03.05.2013	Tree	Terrestrial	NE	Fruit	Fuel
<i>Garcinia pedunculata</i> Roxburgh ex Buchanan-Hamilton [Clusiaceae]; AUDC-947, dtd. 03.05.2013	Tree	Terrestrial	NE	Fruit	Fuel
<i>Garcinia xanthochymus</i> Hooker f. ex T. Anderson [Clusiaceae]; AUDC- 954, dtd. 03.05.2013]	Tree	Terrestrial	NE	Fruit	Fuel
<i>Gnetum gnemon</i> Linnaeus [Gnetaceae]; AUDC-926, dtd. 14.04.2013	Herb	Terrestrial	LC	Seeds, leaves	Worship, cash income
<i>Gymnopetalum chinense</i> (Loureiro) Merrill [Cucurbitaceae]; AUDC-952, dtd. 08.05.2013	Clim ber	Terrestrial	NE	Fruit, leaves	Medicine
<i>Hodgsonia macrocarpa</i> (Blume) Cogniaux [Cucurbitaceae]; AUDC- 950, dtd. 08.05.2013	Clim ber	Terrestrial	NE	Seed	-

Botanical name [Family]; Exsiccatae	Habit	Habitat	Conse- rvation status	Parts used	Other uses
<i>Homalomena aromatica</i> (Sprengel) Schott [Araceae]; AUDC-983, dtd. 15.05.2013	Herb	Terrestrial	NE	Leaf, tuber	Pig feed
<i>Houttuynia cordata</i> Thunberg [Saururaceae]; AUDC-919, dtd. 14.04.2013	Shrub	Terrestrial	NE	Leaves	-
<i>Ipomoea aquatica</i> Forsskål [Convolvulaceae]; AUDC-993, dtd. 15.05.2013	Herb	Aquatic	LC	Tender shoot, leaves	Medicine, fodder, cash income
<i>Lasia spinosa</i> (Linnaeus) Thwaites [Araceae]; AUDC-988, dtd. 15.05.2013	Herb	Aquatic	LC	Leaves	Cash income
<i>Mangifera sylvatica</i> Roxburgh [Anacardiaceae]; AUDC-1073, dtd. 14.05.2014	Tree	Terrestrial	LR/ LC	Fruits	Fodder
<i>Maranta arundinacea</i> Linnaeus [Marantaceae]; AUDC-1036, dtd. 27.08.2013	Herb	Terrestrial	NE	Tuber	Medicine
<i>Momordica charantia</i> Linnaeus [Cucurbitaceae]; AUDC-902, dtd. 07.04.2013	Climber	Terrestrial	NE	Leaves, fruit	Medicine, cash income
<i>Momordica cochinchinensis</i> (Loureiro) Sprengel [Cucurbitaceae]; AUDC-897, dtd. 07.04.2013	Climber	Terrestrial	NE	Fruit, shoot	Cash income
<i>Monochoria hastata</i> (Linnaeus) Solms [Pontederiaceae]; AUDC-1051, dtd. 15.10.2013	Herb	Aquatic	LC	Shoot, leaves	Vegetable, fodder, cash income
<i>Murraya koenigii</i> (Linnaeus) Sprengel [Rutaceae]; AUDC-801, dtd. 21.6.2012	Shrub	Terrestrial	NE	Leaves	Medicine
<i>Musa × paradisiaca</i> Linnaeus [Musaceae]; AUDC-906, dtd. 07.04.2013	Herb	Terrestrial	NE	Shoot, spathe, fruit	Medicine, worship, pig feed, cash income
<i>Nymphaea lotus</i> Linnaeus [Nymphaeaceae]; AUDC-864, dtd. 21.11.2012	Herb	Aquatic	NE	Root, seed	Worship, cash income
<i>Oenanthe javanica</i> (Blume) de Candolle [Apiaceae]; AUDC-995, dtd. 15.05.2013	Herb	Aquatic	LC	Tender shoot	-
<i>Olax acuminata</i> Wallich ex Bentham [Olacaceae]; AUDC-805, dtd. 21.06.2012	Shrub	Terrestrial	NE	Tender shoots	Cash income
<i>Oroxylum indicum</i> (Linnaeus) Kurz [Bignoniaceae]; AUDC-965, dtd. 12.05.2013	Tree	Terrestrial	NE	Shoot, fruit, bark.	Medicine, ethno veterinary medicine, fuel
<i>Oxalis corniculata</i> Linnaeus [Oxalidaceae]; AUDC-866, dtd. 21.11.2012	Herb	Terrestrial	NE	Whole plant	Medicine, fodder
<i>Paederia foetida</i> Linnaeus [Rubiaceae]; AUDC-806, dtd. 21.06.2012	Climber	Terrestrial	NE	Tender shoot, leaves	Medicine, fodder, rope
<i>Parabaena sagittata</i> Miers [Menispermaceae]; AUDC-1072, dtd. 14.05.2014	Climber	Terrestrial	NE	Leaves, shoots	Cash income

Botanical name [Family]; Exsiccatae	Habit	Habitat	Conse- rvation status	Parts used	Other uses
<i>Parkia timoriana</i> (de Candolle) Merrill [Fabaceae]; AUDC-825, dtd. 17.07.2012	Tree	Terrestrial	NE	Fruit	Cash income
<i>Phlogacanthus thyrsoiflorus</i> Nees [Acanthaceae]; AUDC-874, dtd. 13.12.2012	Shrub	Terrestrial	NE	Shoots, inflorescence	Medicine; cash income
<i>Phyllanthus emblica</i> Linnaeus [Phyllanthaceae]; AUDC-924, dtd. 14.04.2013	Tree	Terrestrial	NE	Fruit	Medicine, cash income, fuel
<i>Phyllanthus sikkimensis</i> Müller Agroviensis [Phyllanthaceae]; AUDC-1071, dtd. 14.05.2014	Shrub	Terrestrial	NE	Shoots, fruit.	-
<i>Physalis peruviana</i> Linnaeus [Solanaceae]; AUDC-830, dtd. 17.07.2012	Herb	Terrestrial	NE	Fruits, shoots	-
<i>Piper thomsonii</i> (C. de Candolle) Hooker f. [Piperaceae]; AUDC-1004, dtd. 10.06.2013	Climber	Terrestrial	NE	Leaves	-
<i>Pogostemon parviflorus</i> Benth [Lamiaceae]; AUDC-985, dtd. dtd. 12.05.2013	Shrub	Terrestrial	NE	Tender shoots	-
<i>Rhaphidophora calophylla</i> Schott [Araceae]; AUDC-1069, dtd. 24.04.2014	climber	Epiphyte	NE	Leaves	Cash income
<i>Rhynchosyche ellipticum</i> (Wallich ex D. Dietrich) de Candolle [Gesneriaceae]; AUDC-1056, dtd. 28.10.2013	Herb	Terrestrial	NE	Leaves	Worship, cash income
<i>Sapindus mukorossi</i> Gaertner [Sapindaceae]; AUDC-1014, dtd. 16.06.2013	Tree	Terrestrial	NE	Fruit	Fuel, cash income
<i>Sauropus androgynus</i> (Linnaeus) Merrill [Phyllanthaceae]; AUDC-930, dtd. 21.04.2013	Herb	Terrestrial	NE	Leaves	-
<i>Smilax glabra</i> Roxburgh [Smilacaceae]; AUDC-1035, dtd. 27.08.2013	Climber	Terrestrial	NE	Tuber	-
<i>Solanum americanum</i> Miller [Solanaceae]; AUDC-829, dtd. 17.07.2012	Herb	Terrestrial	NE	Tender shoot	Cash income
<i>Solanum torvum</i> Swartz [Solanaceae]; AUDC-822, dtd. 17.07.2012	Shrub	Terrestrial	NE	Fruit	Cash income
<i>Spilanthes acmella</i> (Linnaeus) Linnaeus [Asteraceae]; AUDC-932, dtd. 21.04.2013	Herb	Marshy	NE	Inflorescence, shoots	Medicine
<i>Spondias pinnata</i> (Linnaeus f.) Kurz [Anacardiaceae]; AUDC-1009, dtd. 16.06.2013	Tree	Terrestrial	NE	Fruit	Cash income, fuel wood
<i>Tabernaemontana divaricata</i> (Linnaeus) R. Brown ex Roemer & Schultes [Apocynaceae]; AUDC-850, dtd. 14.10.2012	Shrub	Terrestrial	NE	Fruits	-

Botanical name [Family]; Exsiccatae	Habit	Habitat	Conse- rvation status	Parts used	Other uses
<i>Tamarindus indica</i> Linnaeus [Fabaceae]; AUDC-1058, dtd. 03.03.2014	Tree	Terrestrial	NE	Fruit, leaves	Fodder, cash income
<i>Terminalia chebula</i> Retzius [Combretaceae]; AUDC-998, dtd. 16.05.2013	Tree	Terrestrial	NE	Fruit	Medicine, fuel, cash income
<i>Xanthium strumarium</i> Linnaeus [Asteraceae]; AUDC-870, dtd. 21.11.2012	Tree	Terrestrial	NE	Leaves	Cash income
<i>Zanthoxylum oxyphyllum</i> Edgeworth [Rutaceae]; AUDC-846, dtd. 12.09.2012	Herb	Terrestrial	NE	Tender shoots	Cash income
<i>Zingiber zerumbet</i> (Linnaeus) Roscoe <i>ex</i> Smith [Zingiberaceae]; AUDC-835, dtd. 07.08.2012	Herb	Terrestrial	NE	Infloresce nce	-
<i>Ziziphus jujuba</i> Miller [Rhamnaceae]; AUDC-875, dtd. 19.12.2012	Tree	Terrestrial	LC	Fruit	Fuel, cash income

fall into various conservation categories though most species fall under ‘least concern’ category. However, a few species are of significant for example *Dimocarpus longam* is Near Threatened while *Gnetum gnemon* (within India) and *Rhaphidophora calophylla* is endemic to Northeastern region of India.

Non-food uses of wild edibles:

Apart from being source of food and nutrition, wild food plants are also the basis of survival and well-being for ethnic groups of Marat Longri WLS. One strategy is optimal use of resources through utilization of the same plant for multiple purposes. Besides food value, 73 (78.49 %) plants were reported to have additional uses (Figure 2). Non-food uses of WFPs include 25 (26.88 %) plants in local pharmacopoeia, 25 plants (26.88 %) as animal feed and

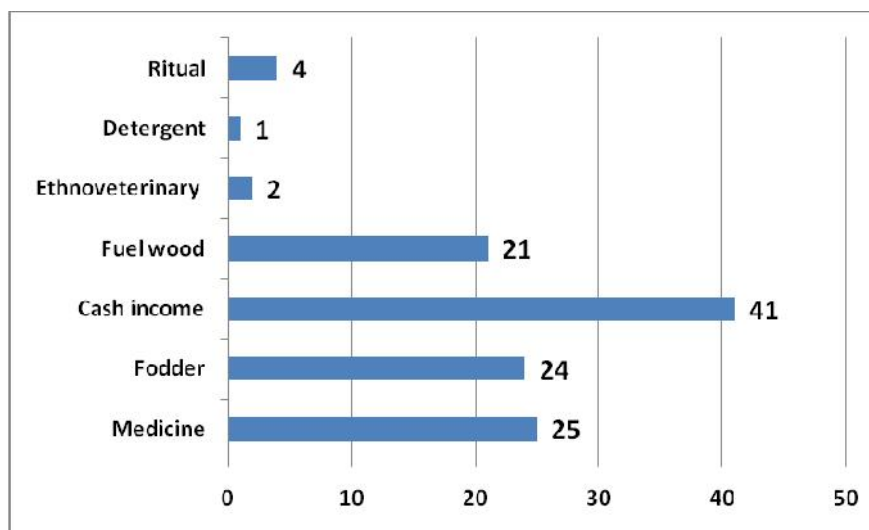


Figure 2. Non-food use categories of wild edibles in Marat Longri WLS, Assam

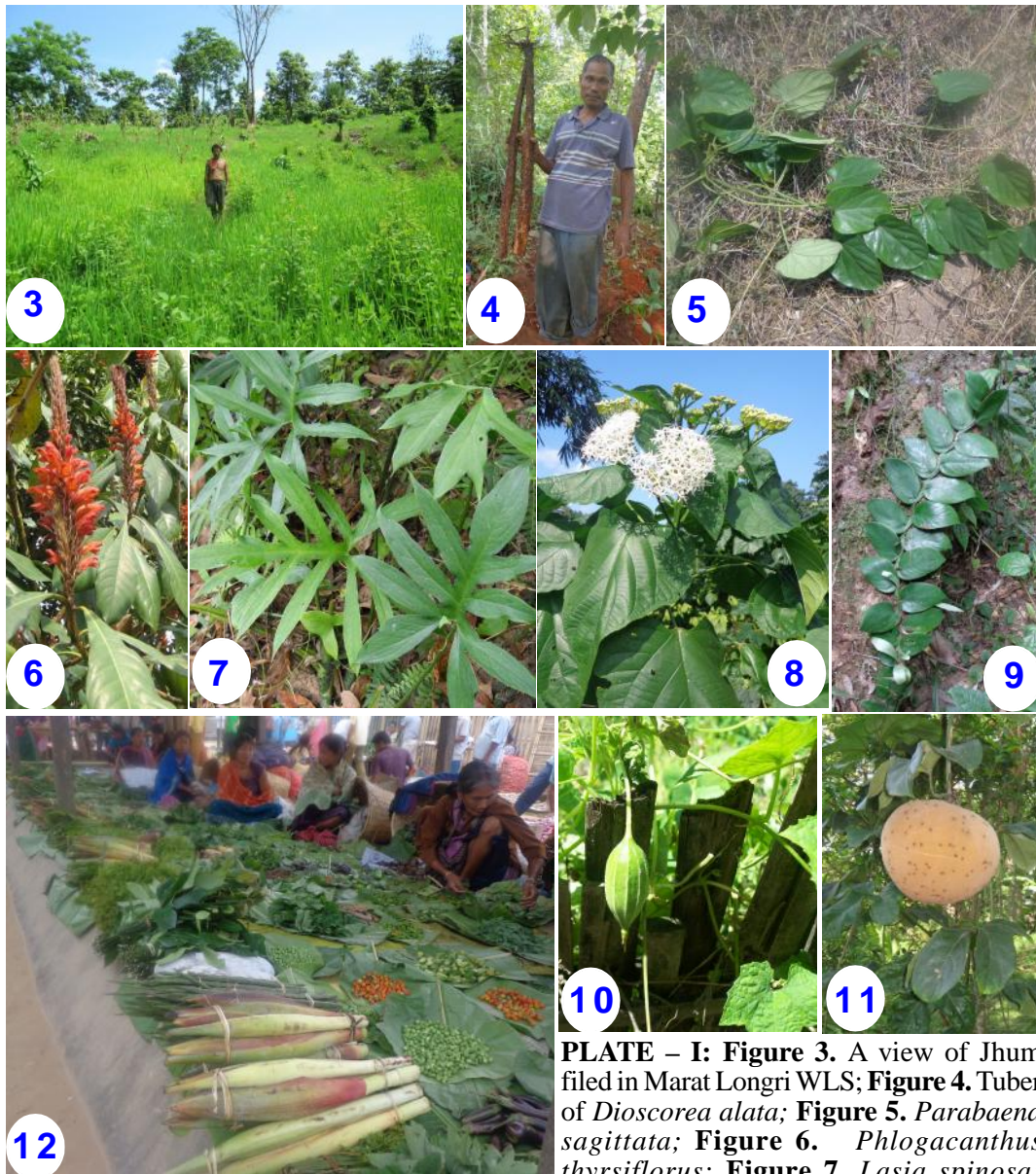


PLATE – I: **Figure 3.** A view of Jhum filed in Marat Longri WLS; **Figure 4.** Tuber of *Dioscorea alata*; **Figure 5.** *Parabaena sagittata*; **Figure 6.** *Phlogacanthus thyrsoiflorus*; **Figure 7.** *Lasia spinosa*;

Figure 8. *Clerodendrum glandulosum*; **Figure 9.** *Rhabdophora calophylla*; **Figure 10.** *Gymnopetalum chinense*; **Figure 11.** *Hodgsonia macrocarpa*; **Figure 12.** Wild edibles being sold in local market of Diphu

2 (2.15 %) species (*Oroxylum indicum* and *Alternanthera philoxeroides*) in ethnoveterinary practice. Ethnomedicines are prescribed in different forms such as juice, maceration, decoction, paste, ash, poultice, fumes or vapours, oil, gum, resin, etc against common diseases such as ear and eye sores, fever, cough and cold, rheumatism, diarrhoea, dysentery, burns, cuts, wounds, skin diseases, jaundice, etc. Some edible plants are used in aroma therapy and as baths. About 41 (44.08 %) WFPs recorded during the study are traded in local markets by resource poor families to generate cash income (Figure 12). Poverty and lower returns from farm products compelled people to diversify source of income particularly for poor

households who must supplement food production with cash in order to meet basic needs besides household food security. Market value of WFPs however, is not regulated instead vendors generally charge Rs.10-20 (depending on availability) for visually measured quantity of plants. Other uses of WFPs in the study area are fuel (21.50 %), cordage (*Paederia foetida*) and in worship (*Bambusa* sp., *Nymphaea lotus*, *Musa x paradisiaca*). Plants like *Gnetum gnemon* and *Rhynchotechum ellipticum* have cultural significance among the Karbis which are customarily used as ritual offerings (Reena *et al.* 2013). The edible fruit of *Dillenia indica* is used as detergent. Chemical investigations can throw more insights on the health benefits of WFPs consumption.

Commercial potentials of wild food plants:

Local markets in the study area are replete with wild edible plants and their products from Marat Longri WLS and adjoining areas. Thus, WFPs have commercial potentials and can contribute towards rural development. Consumers have positive attitude towards wild edibles for being organic and reasonable price. Some consumers also reported social, cultural and economic factors for consumption of wild plants. The present study observed 41 plants are widely traded in local markets and most of the species are underutilized. The chain of marketing involves collection of wild edibles by village folks from different habitats and either directly sells them in markets or sold to permanent vendors who in turn sell the products to consumers. The present system of wild edible trading is not organised and folks, who actually collect the plants, do not get proper cash benefits. Monetary value of wild edibles have however, led to overexploitation of many species (for example *Parabaena sagittata*, *Raphidophora calophylla*, *Dillenia indica*, *Gymnopetalum chinense* and *Momordica charantia*) due to destructive or unscientific harvesting techniques. This is compounded by destruction of natural habitats through *jhum*, grazing, illegal felling and agricultural expansion. For better functioning and equitable profit trading of wild edibles there is a need for establishment of proper market chain, storage facility to preserve plant foods and its products, implementation of sustainable harvesting techniques, encouragement of agroforestry and domestication for more food production and preservation of natural habitats of wild edibles.

CONCLUSION

Ethnobotany-directed inventerisation of plant resources in protected area helps in documentation of distribution and plant diversity of a region; it is useful for study of subsistence practices, pattern of utilization and management practices of bioresources by ethnic groups. Because balanced interactions between people and forest is key for success of biodiversity conservation in protected areas. Study on wild edible plants is highly multidisciplinary involving disciplines like anthropology, food science and nutrition, agriculture, ethnomedicine or ethnopharmacology, biotechnology, conservation and other related fields. Like ethnobotany-based study have provided leads for the discovery of currently used drugs, investigations on wild foods can contribute towards identification of promising food plants and therapeutic plants for management of major human diseases like diabetes, cancer, high blood pressure and heart diseases. Further investigations on phytochemical profiles will be able to identify novel compounds and health benefits of wild food plants. Ethnobotanical study of wild food plants is useful for assessing conservation status of species and prioritisation of conservation.

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