The traditional knowledge on edible wild leafy vegetables of *Rabha* Tribe in Duars of North Bengal: a potential reinforcement to food security

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Abstracts

Northern part of West Bengal is home to diverse group of tribal people coming from different roots of origin. These people have rich tradition and cultural backgrounds. Among them *Rabha* is one of the primitive tribes. This paper primarily deals with the recording of their traditional knowledge about the edible leafy vegetables and analyzing various preparations. As per the latest Nagoya Protocol, open ended questionnaires were used to obtain information from the resource persons with prior written permissions. In total 100 informants were interviewed that yielded the names of 40 vegetable plants belonging to 26 families. Among all Amaranthaceae recorded the maximum of eight species, followed by Rubiaceae with four species. For rest of the family either two or at least one species could be recorded. In almost all cases, tender shoots or leaves were cooked and consumed, whereas only in case of vegetable plants like *Alternanthera paronichioides*, *Oldenlandia corymbosa*, *Polycarpon prostratum* and *Portulaca oleracea* were reported to be cooked wholly. Some of these species also has reported medicinal values and are often eaten as part of traditional system of treatment for different ailments. The database of such plants can help in solving problems of food securities by utilizing traditional knowledge of *Rabha* people or in larger perspective any other tribes.

Key words: Rabha, Wild leafy vegetables, Tribes, West Bengal

INTRODUCTION

North Bengal, the northernmost part of West Bengal, is known for its vast resources of flora and fauna. This part of West Bengal is surrounded by Indian states like Assam on East, Sikkim on North and Bihar on West and at the same time shares international borders with Nepal on West, Bhutan on North and Bangladesh on Southern region. Northern part of West Bengal includes nine districts namely Malda, Murshidabad, Dakshin Dinajpur, Uttar Dinajpur, Darjeeling, Kalimpong, Jalpaiguri Coochbehar and Alipurduar, spread between coordinates of 25.01° N and 88.14° E to 26.6476° N and 89.4135° E (Egiye Bangla 2018). For past thousands of years, these vast lands have been home to diverse group of ethnic people and aboriginal tribes who lived here with their rich tradition and cultural backgrounds (Roy 2016). Despite rapid percolation of modern culture and amenities, most of these tribes have managed to conserve their precious traditional knowledge by practicing it in their day to day life. *Rabha* is one such primitive tribes living in the plains. Majority of them are spread over in western Assam, Meghalaya and North-eastern part of West Bengal (mainly Alipurduar, Jalpaiguri and Cooch Behar Districts) (Roy 2016). *Rabhas* are basically farmers and earn their livelihood through agriculture and by producing and selling their handicrafts. Their population is higher in villages with large agricultural lands with forests at vicinity (Basumatary

2010). As per Das and Teron (2014), *Rabhas* have supposedly developed a valuable ethnobotanical knowledge base which has helped them in sustainable utilization of plant resources around them. This has helped their population in sustainably surviving for many decades in scarce agricultural resources.

Considering present situation of food scarcity in the world, traditional knowledge of this kind can be an important aid to establish better food security (Yongabi & DeLuca 2015). Using and exploiting this knowledge base of wild edible leafy vegetables of *Rabha* tribe can be boon in reducing hunger. As the Indian population has already crossed the 1.3 billion mark, limited agricultural system finds it difficult to produce more food for this rapidly growing mass. Focusing on using non-exploited resources judiciously should be the right approach. Since, most of the people consume already grown food or grow food themselves, however, in developing countries like India, the buying capacity of majority of people is very weak (WESP 2018). Therefore, government should press upon growing foods that require least maintenance, low or no chemical inputs and more resilient to climate change (FAO 2018). Knowing about such food can come from the knowledge base of indigenous people. This paper by and large focuses on the traditional knowledge base of *Rabha* tribe of North Bengal about the wild edible leafy vegetables and their various preparations. Having knowledge of these largely unknown resources can add to dealing with food scarcity among mainstream populace.

MATERIALS AND METHODS

Study Area

This paper primarily focused on *Rabha* tribe and their knowledge of edible leafy vegetables. In West Bengal, *Rabhas* are primarily concentrated in the North-eastern part, generally referred as Duars and politically represented by three districts, namely Alipurduar, Jalpaiguri, and Cooch Behar, and was selected for the data collection. The survey locations covered an estimated area of 9814 km² spread across 25°57' N to 26.59° N Latitude and 88° 23' E to 89°53' E Longitude (Egiye Bangla 2018). These districts are bound by Assam at East, Bhutan at North, Bangladesh Soudeth and Darjeeling and Kalimpong districts at South-western region. The average rainfall is 3500 mm, with mean relative humidity 86 percent (Egiye Bangla 2018). The climatic character is sub-tropical and humid with an average temperature ranging between 6° C and 33° C (winter and summer). Whole region is richly endowed with seasonal as well as perennial rivers and rivulets originating from Sikkim, Bhutan and Darjeeling hills. The major rivers these districts are Teesta, Jaldhaka, Murti, Torsha, Raidak, Kaljani, Sankosh, etc (Egiye Bangla 2018).

Data Collection

Open-ended questionnaire developed based on the initial understandings with the local respondents, was used to collect the information regarding the leafy vegetable plants and their preparations. Village heads, resource persons and locals were elaborately interviewed for more information. Since this work was primarily based on the knowledge-base of local *Rabha* tribe therefore the data was collected as per the guidelines of Nagoya protocol (2011) by Participatory Rural Appraisal (PRA) method in order to ensure active involvement of the locals (Mukherjee 1993; Campbell 2001). Prior published works on edible plants and *Rabhas* of this region were substantiated as secondary information (Roy 2016; Das & Teron 2014; Chowdhury 2012; Narzary *et al.* 2016; Adhikary & Barman 2014) which were corroborated with locals for validation. Specimen of leafy vegetables were collected, identified and deposited at NBU Herbarium, Department of Botany, University of North Bengal.

RESULTS AND DISCUSSION

In total 100 informants were interviewed which yielded the names of 40 vegetable plants belonging to 26 families (Table 1). Among all, Amaranthaceae recorded the maximum species with eight numbers, followed by Rubiaceae with four numbers. For rest of the family either two or at least one species could be recorded. In almost all cases, tender shoots or leaves were cooked and consumed, whereas only in case of vegetable plants like *Alternanthera paronychioides*, *Oldenlandia corymbosa*, *Polycarpon prostratum* and *Portulaca oleracea* were reported to be cooked wholly. Some of these species also has reported medicinal values and are often eaten as part of traditional system of treatment for different ailments. The database of such plants can help in solving problems of food securities by utilizing traditional knowledge of *Rabha* people or in larger perspective any other tribes.

Table 1. Wild Leafy Vegetables of *Rabhas* in Duars of West Bengal

Botanical Name [Family]; specimen cited	Rabha name	Habit	Edible parts and consumption pattern	Additional uses
<i>Acmella calva</i> (DC.) R.K.Jansen [Compositae]; <i>Ajita & AP Das 118</i>	<i>Samnami</i>	Herb	Young leaves cooked as vegetable	Ethnomedicine
<i>Alternanthera paronychioides</i> A. St. Hill [Amaranthaceae]; <i>Ajita & AP Das 276</i>	-	Herb	Whole plants cooked as vegetable	
<i>Alternanthera philoxeroides</i> (Mart.) Griseb. [Amaranthaceae]; <i>Ajita & AP Das 243</i>	-	Herb	Leafy-twigs as vegetable	
<i>Alternanthera sessilis</i> (L.) R.Br. ex DC. [Amaranthaceae]; <i>Ajita & AP Das 254</i>	<i>Resang-mama</i>	Herb	Fried leafy-twigs eaten	
<i>Amaranthus blitum</i> subsp. <i>oleraceus</i> (L.) Costea [Amaranthaceae]; <i>Ajita & AP Das 274</i>	<i>Kudum</i>	Herb	Young leafy-twigs as vegetable	
<i>Amaranthus spinosus</i> L. [Amaranthaceae]; <i>Ajita & AP Das 103</i>	<i>Kudumfisa</i>	Herb	Young shoots cooked as vegetables	
<i>Amaranthus viridis</i> L. [Amaranthaceae]; <i>Ajita & AP Das 275</i>	<i>Kudum</i>	Herb	Young shoots cooked as vegetables	
<i>Boerhavia diffusa</i> L. [Nyctaginaceae]; <i>Ajita & AP Das 218</i>	<i>Samkanka</i>	Herb	Leaves fried and consumed	Medicinal
<i>Centella asiatica</i> (L.) Urb. [Umbelliferae]; <i>Ajita & AP Das 053</i>	<i>Mochatn-achar</i>	Herb	Whole plants cooked as vegetables	Medicinal

Botanical Name [Family]; specimen cited	Rabha name	Habit	Edible parts and consumption pattern	Additional uses
<i>Chenopodium album</i> L. [Amaranthaceae]; <i>Ajita & AP Das 298</i>	-	Herb	Leaves cooked as vegetable	
<i>Coccinia grandis</i> (L.) Voigt [Cucurbitaceae]; <i>Ajita & AP Das 123</i>	-	Climber	Young leafy-twigs cooked as vegetable	Medicinal, rice beer preparation
<i>Colocasia esculenta</i> (L.) Schott [Araceae]; <i>Ajita & AP Das 050</i>	<i>Lheng Basar</i>	Herb	Whole young plant cooked as vegetables	
<i>Commelina benghalensis</i> L. [Commelinaceae]; <i>Ajita & AP Das 319</i>	<i>Surung</i>	Herb	Fried leaves eaten	Fodder
<i>Deeringia amaranthoides</i> (Lam.) Merr. [Amaranthaceae]; <i>Ajita & AP Das 085</i>	<i>Janger</i>	Climber	Young leafy shoots cooked as vegetables	Ethnomedicine
<i>Diplazium esculentum</i> (Retz.) Sw. [Athyriaceae]; <i>Ajita & AP Das 036</i>	-	Herb	Tender fronds cooked as vegetable	
<i>Drymaria cordata</i> (L.) Willd. ex Roem. & Schult. [Caryophyllaceae]; <i>Ajita & AP Das 095</i>	-	Herb	Fried whole plants eaten	Ethnomedicine
<i>Enydra fluctuans</i> DC. [Compositae]; <i>Ajita & AP Das 441</i>	<i>Jharaing</i>	Herb	Young leafy-twigs cooked as vegetable	Medicinal
<i>Euphorbia hirta</i> L. [Euphorbiaceae]; <i>Ajita & AP Das 311</i>	<i>Dudeleka</i>	Herb	Leaves cooked as vegetable	Medicinal
<i>Glinus oppositifolius</i> (L.) Aug.DC. [Molluginaceae]; <i>Ajita & AP Das 186</i>	-	Herb	whole plants as consumed	Medicinal
<i>Helminthostachys zeylanica</i> (L.) Hook. [Ophioglossaceae]; <i>Ajita & AP Das 216</i>	<i>Musitop</i>	Herb	Tender leaves cooked as vegetables	
<i>Houttuynia cordata</i> Thunb. [Saururaceae]; <i>Ajita & AP Das 070</i>	<i>Bagnetra</i>	Herb	Young leaves pounded with onion, green chilli and salt taken as pickle	
<i>Ipomoea aquatica</i> Forssk. [Convolvulaceae]; <i>Ajita & AP Das 079</i>	<i>Kulum</i>	Herb	Young shoots cooked as vegetables	Medicinal

Botanical Name [Family]; specimen cited	Rabha name	Habit	Edible parts and consumption pattern	Additional uses
<i>Leucas zeylanica</i> (L.) W.T.Aiton [Labiatae]; <i>Ajita & AP Das 089</i>	<i>Parbolang</i>	Herb	Young shoots cooked as vegetable	Medicinal
<i>Lippia javanica</i> (Burm.f.) Spreng. [Verbenaceae]; <i>Ajita & AP Das 111</i>	-	Shrub	Young leaves fried to eat; raw leaves added to curry as aromatic	
<i>Marsilea minuta</i> L. [Marsileaceae]; <i>Ajita & AP Das 190</i>	<i>Tengesi</i>	Herb	Fried leaves consumed	Medicinal
<i>Melia azedarach</i> L. [Meliaceae]; <i>Ajita & AP Das 027</i>	<i>Bobaneemp hang</i>	Tree	Fried leaves consumed	
<i>Momordica charantia</i> L. [Cucurbitaceae]; <i>Ajita & AP Das 096</i>	-	Climber	Leaves cooked as vegetable	Medicinal
<i>Moringa oleifera</i> Lam. [Moringaceae]; <i>Ajita & AP Das 041</i>	<i>Sojona</i>	Tree	Young fried leaves consumed as vegetables	Medicinal
<i>Mussaenda glabra</i> Vahl [Rubiaceae]; <i>Ajita & AP Das 193</i>	<i>Kotmotia</i>	Shrub	Young fried leaves eaten	
<i>Mussaenda roxburghii</i> Hook.f. [Rubiaceae]; <i>Ajita & AP Das 192</i>	<i>Kotmotia</i>	Shrub	Young leaves boiled in rice and eaten	Ethnomedicine
<i>Oldenlandia corymbosa</i> L. [Rubiaceae]; <i>Ajita & AP Das 233</i>	-	Herb	Fried whole plants eaten	Medicinal
<i>Ophioglossum reticulatum</i> L. [Ophioglossaceae]; <i>Ajita & AP Das 300</i>	<i>Suga</i>	Herb	Fried leaves consumed	
<i>Oroxylum indicum</i> (L.) Kurz [Bignoniaceae]; <i>Ajita & AP Das 044</i>	<i>Jamlao</i>	Tree	Tender shoots soaked in hot water and fried in oil to consumed	Medicinal
<i>Oxalis corniculata</i> L. [Oxalidaceae]; <i>Ajita & AP Das 112</i>	<i>Amainor</i>	Herb	Raw leaves crushed with green chilli and salt to consume as pickle	Ethnomedicine, plate cleaner
<i>Paederia foetida</i> L. [Rubiaceae]; <i>Ajita & AP Das 264</i>	<i>Giphing</i>	Climber	Fried Young leaves are eaten	Medicinal

Botanical Name [Family]; specimen cited	Rabha name	Habit	Edible parts and consumption pattern	Additional uses
<i>Polycarpon prostratum</i> (Forssk.) Asch. & Schweinf. [Caryophyllaceae]; <i>Ajita & AP Das 261</i>	-	Herb	Whole plants are eaten as vegetable.	
<i>Polygonum plebeium</i> R.Br. [Polygonaceae]; <i>Ajita & AP Das 119</i>	-	Herb	Leafy-branches cooked as vegetable	
<i>Portulaca oleracea</i> L. [Portulacaceae]; <i>Ajita & AP Das 456</i>	<i>Hangshmoi</i>	Herb	Whole plants cooked as vegetable	
<i>Solanum americanum</i> Mill. [Solanaceae]; <i>Ajita & AP Das 205</i>	<i>Parbotaptoi</i>	Small shrub	Fried leaves eaten	Medicinal
<i>Typhonium trilobatum</i> (L.) Schott [Araceae]; <i>Ajita & AP Das 157</i>	<i>Lheng</i>	Herb	Young leaves pounded with green chilli and salt to consume as pickle	

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