

Research Article

Wild fodder plants used by the tribes of Srikakulam District, Andhra Pradesh, India

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Abstract

The form of forage, silage and hay . The present study reported 39 wild fodder plant species of 34 genera belonging to 23 families from 7 tribal mandals of Srikakulam district. These are tabulated alphabetically followed by their vernacular, Hindi, Sanskrit and English names, family and part of the plant species used as fodder. Among 23 families, 3 plant species each from Fabaceae, Caesalpiniaceae, Euphorbiaceae and Dioscoreaceae; 2 plant species each from Mimosaceae, Rubiaceae, Rhamnaceae; one plant species each from Malvaceae, Bombacaceae, Tiliaceae, Burseraceae, Celastraceae, Linaceae, Rutaceae, Sapindaceae, Ulmaceae and Piperaceae were reported. The main tribes in the district Jatapu, KapuSavara, KondaSavara and Gadaba etc. Savaras and Gadabas are considered as Particularly Vulnerable Tribal Groups (P.V.T.G). Agriculture is the main occupation of the tribes. They mainly depend on shifting cultivation on hill slopes, collection of non-timber forest products, grazing of animals and poultry keeping, fishing, house. As green fodder is an important source of nutrients for dairy animals, further investigation like nutritional analysis of these fodder plants, popularizing them and introducing in plain areas should definitely reduce the fodder shortage to livestock. Agriculture and animal husbandry are culturally, religiously, and economically intertwined. The dependency of farmers only on agriculture will cause loss during crop failure. But cattle rearing along with sufficient fodder with agriculture provides draught power, rural transport, manure, fuel, milk and meat

Keywords: Fodder, livestock, Savara, Jatapu (P.V.T.G) tribe.

Introduction: Fodder, also known as hay, silage, or forage, is any crop or crop by-product used as feed for livestock, making it an essential source of protein and fat [Skibbe, 1922]. Fodder crops are the plant species that are cultivated and harvested for feeding the animals in the form of forage (cut green and fed fresh), silage (preserved under anaerobic condition) and hay (dehydrated green fodder). Green fodder is an important source of nutrients for the dairy animals, providing good health, improving the breeding efficiency of animals and plays an important role in sustainable agriculture, improving soil health, increasing biodiversity. It reduces cost of milk production.

Agriculture and animal husbandry are culturally, religiously, and economically intertwined with the intricate fabric of human society, as mixed farming and livestock rearing are a vital element of rural life (Dagar, 2017). Draught power, rural transportation, manure, fuel, milk and meat all are provided by livestock, which is quite often the only source of monetary revenue for subsistence farmers and also act as insurance against the crop failure. It also directly affects the

livelihood and food security of nearly a billion people around the world and affects the diet and health of many more (Downing et al., 2017). Singh et al.,(2021) reviewed India's fodder production status and opportunities.

Sharma and Mishra (2009) reported diversity, utilization pattern and indigenous uses of 217 plant species belonging to 160 genera of 68 families including medicine, fuel, wild edible food, fodder, religious in and around a cement factory by the local people in Bilaspur district of Himachal Pradesh. Tajinder et al.,(2016) reported total of 63 wild fodder plants species from Rajouri district (J&K) used as fodder from the study area belonging to 33 families and 51 genera which were in threat due overgrazing, lopping, and cutting of forest plants in large scale by the tribes and local inhabitants for the expansion of agricultural lands and local settlements outside and inside of the forests .Dinesh Jadhav (2010) reported 102 plant species belonging to 88 genera and 42 families which are sources of fodder used by Bhil tribe of the district for their domestic animals from tribal inhabited villages of Ratlam district (Madhya Pradesh). Dangwal ,2012 reported a total of 57 fodder weeds belonging to 3 monocot and 19 dicot families.

Study area: The study area is located in Srikakulam district of Northeastern Andhra Pradesh, India (18o 5' -19o 12' N and 83o 32' -84o 47' E). It possesses a considerable tribal population in hilly and forest habitats. The main tribes in the district Jatapu, Kapu Savara, KondaSavara and Gadaba etc. Savaras and Gadabas are considered as Particularly Vulnerable Tribal Groups (P.V.T.G). The study area includes 7 mandals with tribal population in the district viz., Seethampeta, Kothuru, Bhamini, Hiramandalam, Pathapatnam, Meliaputti and Mandasa (Fig. 1). Agriculture is the main occupation of the tribes, along with paddy, they cultivate ragi, bajra and jowar are also equally important crops. They mainly depend on shifting cultivation on hill slopes, collection of non-timber forest products, grazing of animals and poultry keeping, fishing, housebuilding materials, and as wage labour.

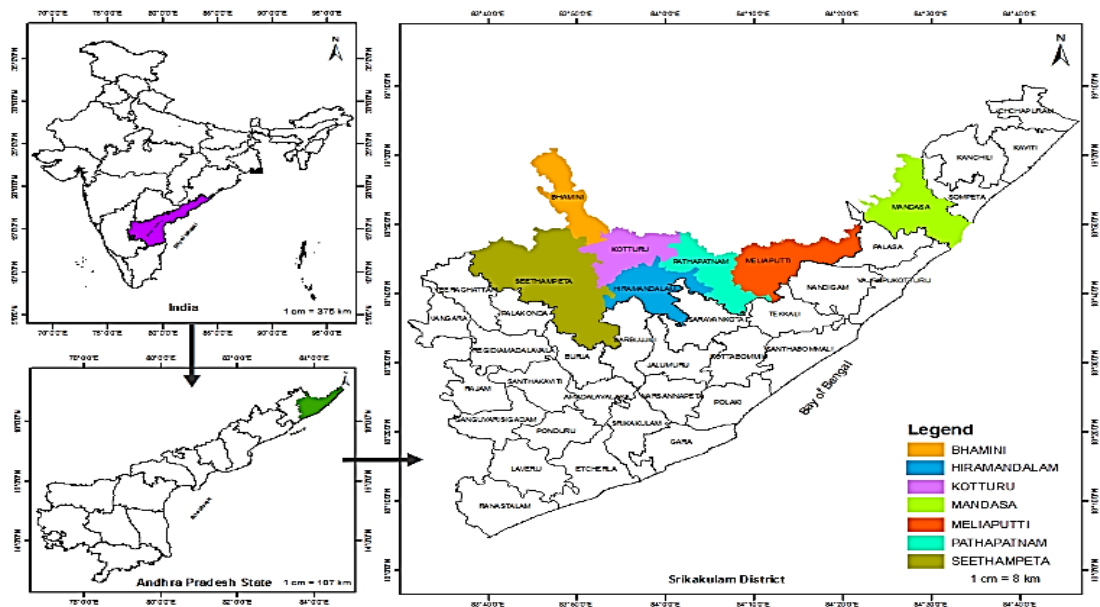


Fig.1 Study Area

Methodology: The approaches and methodologies for Ethnobotanical work suggested by Jones (1941), Jain (1987, 1989), Croom (1983) and Chadwick and Marsh (1994) were followed. Emphasis was given mainly on intensive field study in selected tribal habitations. The study is mainly based on interactions and field surveys undertaken in seven mandals of the district (viz.

Seethampeta, Kothuru, Bamini, Hiramandalam, Pathapatnam, Meliaputti and Mandasa) during January, 2014-Nov 2016.

Data collection: The study is mainly based on interactions and field surveys undertaken in seven mandals of the district (viz. Seethampeta, Kothuru, Bamini, Hiramandalam, Pathapatnam, Meliaputti and Mandasa) during January, 2014-Nov 2016. For the purpose of gathering detailed information on the fodder plants utilized by tribesto feed livestock, tribal pockets were visited. Extensive field visits were planned in different seasons of the year. In each mandal interior tribal pockets were selected and each field trip is planned to stay for 7-8 days duration covering 3-4 pockets in nearby mandals helped a lot to gather information on wild edibles. Oral interviews were conducted with Village elders, farmers, and womenfolk at their habitats. To collect voucher specimens, well-acquainted informants were chosen and taken to the field. Scientific names for vernacular names were identified with the help of voucher specimens collected in the field. The data were substantiated in different villages among the informants showing the same plant sample and with the same informants on different occasions.

Objectives: Main objective is to identify, and document the different plant species and their parts used as fodder.

Results and discussion: The present ethnobotanical study reported 39 wild fodder plant species of 34 genera belonging to 23 families from 7 tribal mandals of Srikakulam district. Each Species are arranged alphabetically followed by vernacular, Hindi, Sanskrit and English name, family and part of the plant species. Among 23 families 3 plant species each from Fabaceae, Caesalpiniaceae, Euphorbiaceae and Dioscoreaceae; 2 plant species each from Mimosaceae, Rubiaceae, Rhamnaceae; one plant species each from Malvaceae, Bombacaceae, Tiliaceae, Burseraceae, Celastraceae, Linaceae, Rutaceae, Sapindaceae, Ulmaceae and Piperaceae.

Table.1 List of plant species used as fodder

S. NO	Name of the Plant	Vernacular/Hindi/Sanskrit/English name	Family	Part used
1	<i>Acacia nilotica</i> (L.) Delile.	VN: Nalla thumma H: Kikar S: Babbula E: Indian gum Arabic tree	Mimosaceae	Leaf
2	<i>Allophylus serratus</i> (Hiern) Krz	VN: Salli kunkudu H: Tippani S: Triputa	Sapindaceae	Leaf
3	<i>Ampelocissus latifolia</i> (Roxb.) Planch	VN: Adavi thiga draksha H: Golinda S: Amalavetasah E: Wild grapes	Vitaceae	Leaf
4	<i>Artocarpus heterophyllus</i> Lam.	VN: Panasa chettu H: Halasina S: Panasam E: Jack fruit	Moraceae	Leaf, fruit waste
5	<i>Atlantia monophylla</i> DC	VN: Adavi nimma H: Banjamir nimbu S: Aranyanimbuka E: Wild lime	Rutaceae	Leaf
6	<i>Bauhinia racemosa</i> Vahl.	VN: Arika chettu H: Katmauli S: Yamalapatrakah E: Bidi leaf tree	Caesalpiniaceae	Leaf, fruits
7	<i>B. purpurea</i> L.	VN: Bodanta H: Kaniar S: Kanchan	Caesalpiniaceae	Leaf,

		E: Purple orchid tree		Fruits
8	<i>Bombax ceiba</i> L.	VN: Mundla buruga H: Semul S: Shweta Shalmali E: White cotton tree	Caesalpiniaceae	Leaf
9	<i>Bridelia retusa</i> (L.) A. Juss.	VN: Puttakaraka H: Khaja S: Asana E: Spinous Kino tree	Euphorbiaceae	Leaf
10	<i>Canavalia ensiformis</i> (L.) DC.	Adavi tamma H: Barasem E: Jack bean	Fabaceae	Leaf, pods, seeds
11	<i>Cassia fistula</i> L.	VN: Rela H: Amaltas S: Aragvadha E: Golden shower tree	Caesalpiniaceae	Fruits
12	<i>Cipadessa baccifera</i> (Roth) Miq.	VN:Ranaberi H: Nalbila S: Vananimbam E: Ranabili	Meliaceae	Leaf
13	<i>Commelina benghalensis</i> L.	VN:Amrutha kada H: Kankawa S: Kanchat E: Day flower	Commelinaceae	Leaf
14	<i>Corallocarpus epigaeus</i> Hook.	VN:Naga donda H: Akasgaddah S: Sukanasa E: Bryoms	Cucurbitaceae	Leaf
15	<i>D. hispida</i> Dennst.	VN:Tellagini gaddalu/Pandimuku tega E: Asiatic bitter yam	Dioscoreaceae	Leaf
16	<i>D. oppositifolia</i> L.	VN:Tellagadda/Palleru tega E: Chinese yam	Dioscoreaceae	Leaf
17	<i>Dioscorea alata</i> L.	VN:Kasatega E: Humped yam	Dioscoreaceae	Leaf
18	<i>Erythrina suberosa</i> Roxb.	VN:Mulla moduga/Vanjiram H: Pangra	Fabaceae	Leaf
19	<i>Ficus. religiosa</i> L.	VN:Ravi chettu H: Pipal S: Bodhivriksha E: Peepal tree	Moraceae	Leaf
20	<i>F. benghalensis</i> L.	Marri H: Bar S: Vat E: Banyan tree	Moraceae	Leaf
21	<i>Gardenia latifolia</i> Aiton	VN:Tharipi chettu E: Brilliant Gardenia, H: Dikamali S: Hingu	Rubiaceae	Leaf
22	<i>Garuga pinnata</i> Roxb.	VN:Garuga H: Kharpat S: Karnikarha E: Garuga	Burseraceae	Leaf
23	<i>Gmelina arborea</i> Roxb.	VN:Gummadi H: Gamhar S: Sindhuparni E: White teak	Verbenaceae	Leaf
24	<i>Grewia tiliifolia</i> Vahl	VN:Tada chettu H: Dhamin S: Dhanuvruksha E: Dhaman	Tiliaceae	Leaf
25	<i>Gymnosporia emarginata</i> (Willd.) Thwaites.	VN:Danti/ Gaddalicippa H: Vinger S: Vikankata E: Thorny staff tree	Celastraceae	Leaf, fruit
26	<i>Haldina cordifolia</i> (Roxb.) Ridsdale	VN:Kamba H: Haldu S: Girikadamba E: Yellow teak	Rubiaceae	Leaf
27	<i>Hugonia mystax</i> L.	VN:Kakibeera H: Kamsamara S:	Linaceae	Leaf

		Kamsamara E: Climbing flax.		
28	<i>Ipomoea batatas</i> (L.) Lam.	VN:Kanda munaga dumpa H: Shakar Kanda S: Kitimulab E: Sweet potato	Convolvulaceae	Leaf
29	<i>Lantana camara</i> L.	VN:Gajukampa H: Khaneri S: Chaturangi E: West Indian Lantana	Verbenaceae	Leaf.
30	<i>Limonia acidissima</i> Groff.	VN:Velaga H: Bell S: Kapittha E: Wood apple	Rutaceae	Leaf
31	<i>Piper longum</i> L.	VN:Tamalpaku H: Paan S: Tambul E: Betel	Piperaceae	Leaf .
32	<i>Pithecellobium dulce</i> (Roxb.) Benth.	VN:Seemachinta chettu H: Jilapi S: Kodukkapali E: Madras thorn	Mimosaceae	Leaf
33	<i>Pterocarpus marsupium</i> Roxb.	VN:Yegisa H: Bijasal S: Asana E: Indian kino tree	Fabaceae	leaf, Fruit
34	<i>Ricinus communis</i> L.	VN:Amudamu H: Eranda S: Gandharva hastha E: Castor	Euphorbiaceae	Leaf
35	<i>Securinega leucopyrus</i> (Willd.) Mull. Arg.	VN:Tella Pulielaki/ Mekadavada chettu H: Hartho S: Bhuriphali E: Spinous fluggea	Euphorbiaceae	Leaf
36	<i>Sida acuta</i> Burm. f.	VN:Gayapaku H: Baraira S: Bala E: Morning mallow	Malvaceae	Leaf
37	<i>Trema orientalis</i> (L.)	VN:Boggu chettu H: Gorkul S: Jivanti E: Charcoal tree	Ulmaceae	Leaf
38	<i>Z. oenoplia</i> (L.)	VN:Parimi chettu H: Makkaya S: Karkandhu E: Wild Jujube	Rhamnaceae	Leaf
39	<i>Ziziphus mauritiana</i> Lam.	VN:Regi chettu H: Ber S: Badara E: Indian Jujube	Rhamnaceae	Leaf

They fed their cattle with the leaves of 39 plant species; fruits of *B.racemosa*, *Bauhinia purpurea*, *Cassia fistula*, *Gymnosporia emarginata*, *Pterocarpus marsupium*. Leaves of *Lantana camara*, *Piper longum* are boiled, mixed in rice-washed water and fed to cows and buffalows to ncrease milk production (Table 1).

The characteristic features of green fodder plants should have quick growth, close spacing with optimum seed rate, prevents soil erosion, improve soil health by adding organic residues, and high regeneration capacity reducing the need for frequent planting and tillage compared to perennial fodder crops (Rathod and Dixit. 2019). Continuous cultivation of rice and wheat crops leads to the deterioration of soil health causing decreased production. Following crop rotation with fodder crops increases soil fertility, provides fodder to livestock, and improves the farmer's income by increasing milk and meat production.

The 34th report of the Parliamentary Standing Committee on Agriculture has also indicated shortage of dry fodder, green fodder and concentrate and detail of supply and demand of Fodder and Feed (Table.2).

(Dry matter in Million tonnes)

Type of Fodder	Parameters	2015	2020	2025
Dry Fodder	Requirement	491	530	550
	Availability	387	408	433
	Deficit (%)*	104(21%)	122(23%)	117 (23%)
Green Fodder	Requirement	840	880	1000
	Availability	619	596	600
	Deficit (%)*	221 (26%)	284(32%)	400 (40%)
Concentrate	Requirement	87	96	105
	Availability	58	61	65
	Deficit (%)*	29 (34%)	35 (36%)	40 (38%)

* Deficit in percentage.

Source: Department of Animal Husbandary and Dairying

https://www.dahd.nic.in/sites/default/files/final%20NAP_0.pdf

Santhosh Kumar et al., (2023) reviewed that fodder availability can be increased by scientific fodder crop production by providing improved quality seeds and developing high-yielding varieties

Conclusions: The 39 fodder plant species that were documented through ethnobotanical studies, should be explored for its nutritional value. The identified plant species for quick growth, good nutritional sources should be popularized and supplied to farmers by organizing workshops. It reduces the shortage of fodder. Hence there is an urgent need to produce the required fodder to livestock which can increase the meat and milk production to feed the increasing population. Studies on fodder crops, identification of best crops, and popularizing them will reduce capital investment, feed and labour costs for maintaining livestock properly.

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