

Grasses of West Tripura District, Tripura, India

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Abstract

The paper presents the systematic enumeration of the grasses of West Tripura District, Tripura, with reference to their occurrence, distribution, flowering and fruiting period and importance. Altogether 64 species (12 cultivated and 52 wild) belonging to 36 genera have been recorded from the district. Some grasses like species of *Cynodon*, *Dactyloctenium*, *Digitaria*, *Echinochloa*, *Eleusine*, *Panicum*, *Eragrostis*, etc., are being used as fodder by local farmers. Among the 64 species, 8 are arborescent bamboos those are distributed throughout the district.

Keywords: Grasses, Poaceae, Tripura, India

INTRODUCTION

The grasses, comprising a large and distinctive family the Poaceae Barnhart, are the most widely distributed and largest of the flowering plants, the angiosperms, inhabiting a wide range of soil and climatic conditions. Due to their cosmopolitan distribution and growth, the family Poaceae includes 620 genera (Hutchinson 1959) and over 10,000 species (Hubbard 1954; Carnahan & Hill 1961). In India, this family is represented by 240 genera (Bor 1960) and about 1,200 species (Jain *et al* 1972). Deb (1983) has recorded 79 species of grasses covering 51 genera from Tripura. Economically the grasses are probably of greater value than any other group of the plant kingdom. The family includes many important and major food plants like *Oryza sativa*, *Triticum aestivum*, *Zea mays* and *Saccharum officinarum*. Bamboo shoots like that of *Melocanna baccifera*, *Bambusa balcooa*, *B. polymorpha*, *B. tulda*, *Dendrocalamus longispatus* etc. are also intimately associated with food and many other needs of human beings. Besides these, the grasses in the form of green herbage and dried fodder (*Cynodon dactylon*, *Dactyloctenium aegyptium*, *Digitaria ciliaris*, *Echinochloa colonum*, *Eleusine indica*, *Eragrostis gangetica*, *E. tenella*, *Panicum repens*, *P. triperon* etc.) also provide the basic food for most of the domestic and wild herbivorous and carnivorous animals (Thakur 1992). *Thysanolaena latifolia* plays an important role in the socio-economic life of forest dwelling people of the state as a non timber forest produce (Broom) and several species of bamboo and grasses are used for building and construction purpose for huts, utensils, fishing items, agricultural implements, ornaments etc.

West Tripura is the largest district of the state of Tripura and covers an area of 2,996.82 sq km and lies between 23°16' to 24°14' N latitude and between 91° 09' to 91° 47' E longitude. The West Tripura District is bounded by Bangladesh in the north and west, by North Tripura in the east and by South Tripura in the south. The district headquarters is located at Agartala, which is also the State capital. The climate of Tripura is characterized by intermediate temperature and highly humid atmosphere. The year may be divided into four seasons. December to February is the cold season which is followed by summer season (March – May), June to September is the monsoon season and October to November is the post monsoon period. The cold weather starts by the end of November and continues up to February with daily maximum temperature of 26°C and minimum 8 – 4°C. During summer season (April – May), maximum temperature is 34°C. Humidity remains high throughout the year. During summer the relative humidity ranges between 50 – 75% while in monsoon period it remains over 92%.

In the West Tripura district the grasses are common in forest floor, river beds, pasture lands, road sides, edges of tanks and ponds, etc. forming a true natural family. It has been noticed that the grasses are predominant in open places where large tracts consists of grasslands.

A thorough survey grasses (Poaceae) of West Tripura district reveals the occurrence of 64 species (12 cultivated and 52 wild) belonging to 36 genera. All the specimens cited in this paper were collected and properly identified with the help of standard literatures (Hooker 1897; Prain 1903; Arber 1934; Hubbard 1954; Majumdar 1956; Bor 1960; Jain *et al* 1972; Saldahna & Nicholson 1976). The collected plant specimens were preserved as dry herbarium sheets for future reference and were kept in the herbarium of the Department of Botany, Tripura University, Suryamaninagar. The recorded genera and species were enumerated below alphabetically along with their author citation, flowering period and references to voucher specimens.

ENUMERATION

Apluda mutica (L.) Hook.f.: A tall slender perennial grass. **Flowering:** March – May. Commonly found in tilla areas.

Exsiccatus: Sekerkote, *Majumdar 1004*, dated 14. 04. 2007.

Aristida cumingiana Trinius & Ruprecht: A tall perennial grass. **Flowering:** September – October. Usually cultivated, also naturalized.

Exsiccatus: Jirania, *Datta 521*, dated 02. 05. 2007.

Arundo donax L.: A tall stout perennial grass. **Flowering:** February – March. Wild. Common in tilla land.

Exsiccatus: Indranagar, *Datta 553*, dated 12.02. 2006.

Bambusa arundinacea (Willdenow) Hook.f.: A large bamboo. Wild as well as cultivated.

Exsiccatus: Ishanchandranagar, *Majumdar 991*, dated 05. 08. 2007.

Bambusa balcooa Roxburgh: A large bamboo. Culms upto 25 m tall. Common in forests, also cultivated.

Exsiccatus: Ishanchandranagar, *Datta 556*, dated 16. 03. 2007.

Bambusa cacharensis Majumdar: A caespitose bamboo. Culms 20 – 21 m tall. Cultivated.

Exsiccatus: Bishalgarh, *Saha 116*, dated 02. 12. 2006.

Bambusa pallida Munro: A caespitose bamboo. Culms 13 – 20 m high. Culms white bloomy. Frequently found as wild as well as cultivated.

Exsiccatus: Bisramganj, *Majumdar 993*, dated 16. 07. 2007.

Bambusa polymorpha Munro: Tall handsome evergreen bamboo. Stem grayish green, Cultivated in villages.

Exsiccatus: Bamutia, *Datta 542*, dated 18. 04. 2007.

Bambusa tulda Roxburgh: An evergreen tufted bamboo. Culms 7 – 20 m high, sometimes streaked with yellow. Commonly cultivated in village and also found in forest.

Exsiccatus: Mohanpur, *Saha 153*, dated 26. 03. 2007.

Bambusa vulgaris Schrader: A moderate sized bamboo with much swollen base, culms yellow striped. Commonly cultivated.

Exsiccatus: Gandhigram, *Majumdar 997*, dated 28. 06. 2006.

Brachiaria distachya (L.) Stapf: Perennial erect much branched herbs, hairy at the nodes. **Flowering:** August – September. Common along the roadsides.

Exsiccatus: Tarapur, *Datta 531*, dated 08. 09. 2007.

Brachiaria mutica (L.) Stapf: An annual glabrous herb. **Flowering:** November – December. Commonly found in marshy land.

Exsiccatus: Nandannagar, *Saha 118*, dated 19. 11. 2006.

Chloris barbata Swartz: An annual grass. **Flowering:** March – April. Common in open field.

Exsiccatus: Anandanagar, *Datta 512*, dated 21. 04. 2007.

Chrysopogon aciculatus (Retzius) Trinius: A perennial grass with creeping woody rhizome. **Flowering:** August – July. Very common in grassy localities.

Exsiccatus: Suryamaninagar, *Saha 188*, dated 10. 04. 2007.

Coix lacryma-jobi (L.) Hook.f.: A tall herb with perennial root-stock. Prefer marshy places. **Flowering:** February – April.

Exsiccatus: Hapania, *Datta 612*, dated 27. 03. 2006.

Cymbopogon nardus (L.) Randle: A Perennial aromatic herb. **Flowering:** February – April. Occasionally found in bushy areas.

Exsiccatus: Badharghat, *Saha 126*, dated 27. 02. 2006.

Cynodon dactylon (L.) Persoon: Perennial glabrous creeping grass. **Flowering:** March - September. Abundant in open fields.

Exsiccatus: Nandannagar, *Majumdar 884*, dated 15. 04. 2007.

Dactyloctenium aegyptium (L.) Beauverd: An erect or prostrate annual grass. **Flowering:** March - May. Common in grassy localities.

Exsiccatus: Phatikchara, *Datta 664*, dated 22. 05. 2006.

Dendrocalamus hamiltonii Nees & Arnott: An aborescent large bamboo. Culms 10 – 20 m high. Frequently found in the forest and also in village areas.

Exsiccatus: Pratapghar, *Datta 712*, dated 02. 01. 2008

Dendrocalamus longispathus Kurz: A handsome tufted bamboo. Culms upto 20 m tall. Occasionally found in the forest.

Exsiccatus: Kanchanmala, *Datta 715*, dated 10. 01. 2008.

Dendrocalamus strictus Nees: A deciduous, densely tufted bamboo; culms 8 – 16 m tall. Wild as well as cultivated.

Exsiccatus: Golaghati, *Datta 718*, dated 12. 01. 2008.

Dichanthium caricosum (L.) A. Camus: Small annual grass. **Flowering:** June – August. Commonly found in open pasture.

Exsiccatus: Kalsimura, *Majumdar* 882, dated 20. 07. 2007.

Digitaria adscendens (H.B.K.) Henrard: Annual tufted herb. **Flowering**: March – September. Common in open field.

Exsiccatus: Tulakona, *Mjumdar* 871, 14. 08. 2006.

Digitaria ciliaris (Retzius) Koeler: Annual grass. **Flowering**: August – July. Common in open field.

Exsiccatus: Barjala, *Saha* 163, dated 16. 08. 2006.

Echinochloa colonum (L.) Lamarck: Annual small tufted grass; culms slender. **Flowering**: July – September. Common in shady fields.

Exsiccatus: Jogendranagar, *Datta* 756, dated 01. 12. 2006.

Echinochloa crusgalli (L.) P. Beauvois: An annual much variable erect herb. **Flowering**: March – April. Common in marshy areas.

Exsiccatus: Anandanagar, *Roy* 751, 23. 02. 2007.

Eleusine indica (L.) Gaertner: An annual grass with soft, stout stem. **Flowering**: almost throughout the year. Very common in open grass lands.

Exsiccatus: Brajapur, *Datta* 731, dated 12. 05. 2007.

Eleusine coracana (L.) Gaertner: An annual tall, erect, glabrous herb. **Flowering**: August – July. Commonly cultivated; also found naturalized in grassy localities.

Exsiccatus: Berimura, *Majumdar* 873, dated 10. 07. 2006.

Eragrostis cynosuroides Beauverd: A perennial grass. Occasionally found in thickets.

Exsiccatus: Charipara, *Datta* 752, dated 24. 03. 2007.

Eragrostis gangetica Steudel: A perennial sub-erect grass. **Flowering**: March – August. Common in grassy localities.

Exsiccatus: Rahimpur, *Datta* 777, dated 18. 06. 2006.

Eragrostis pilosa Beauverd: A slender annual tufted erect grass. **Flowering**: March – April. Commonly found in open fields.

Exsiccatus: Konaban, *Roy* 774, dated 02. 03. 2007

Eragrostis tenella (L.) P. Beauvois *ex* Roemer: A slender loosely tufted annual grass. **Flowering**: June – July. Common in open grasslands.

Exsiccatus: Jogendranagar, *Datta* 771, dated 05. 06. 2007.

Eragrostis uniloides (Retzius) Nees *ex* Steudel: A solitary or tufted annual grass. **Flowering**: November - January. Common in wet and marshy land.

Exsiccatus: Barjala, *Datta* 711, dated 06. 05. 2007.

Hackelochloa granularis (L.) O. Kuntze: An annual much branched annual herb. **Flowering**: June – August. Common in grassy localities.

Exsiccatus: Charipara, *Datta* 721, dated 11. 08. 2006.

Imperata cylindrica (L.) P. Beauvois var. **major** (Nees) C. E. Hubb *ex* Hubb. A perennial grass with underground stems and erect leaves. **Flowering:** February – May. Abundant in open fields. **Exsiccatus:** Nalchar, *Mjumdar* 889, dated 19. 04. 2007.

Ischaemum rugosum Salisbury: An annual tufted grass with branching culms. **Flowering:** June – August. Common in grassy localities. **Exsiccatus:** Ishanchandranagar, *Mjumdar* 887, dated 10. 07. 2006.

Ischaemum trinorense Kunth: Slender annual herb; culms rooting at base. **Flowering:** March – April. Common in tilla lands. **Exsiccatus:** Hrapur, *Majumdar* 877, dated 20. 04. 2006.

Melocanna baccifera (Roxburgh) Kurz: Evergreen unarmed tall bamboo; culms solitary. Very common in the forest. Cultivated throughout the district. **Exsiccatus:** Anandanagar, *Roy* 734, dated 12. 03. 2007.

Oplismenus burmannii (Retzius) P. Beauvois. An annual grass with slender culms. **Flowering:** July – August. Common in grass lands. **Exsiccatus:** Madhupur, *Datta* 701, dated 20. 08. 2006.

Oryza rufipogon Griffith: An annual aquatic herb. **Flowering:** August – November. Occasionally found in swampy localities. **Exsiccatus:** Kanchanmala *Majumdar* 703, dated 21. 10. 2006.

Oryza sativa L.: Widely cultivated ephemeral crop. **Flowering:** September – October. **Exsiccatus:** Suryamaninagar, *Saha* 141, dated 28. 10. 2007.

Oxytenanthera nigrociliata Munro: Evergreen arborescent bamboo. Culms 7-10 m high. Common in road sides and forest patches. **Exsiccatus:** Ishanchandranagar, *Majumdar* 709, dated 10. 4. 2006.

Panicum auritum Presler *ex* Nees: A perennial herb. **Flowering:** March – April. Occasionally found in bushes. **Exsiccatus:** Barjala, *Saha* 135, dated 28. 03. 2007.

Panicum brevifolium L.: A slender decumbent grass. **Flowering:** February – April. Commonly found in bush-lands. **Exsiccatus:** Charipara, *Majumdr* 751, dated 18. 04. 2007.

Panicum psilopodium Trinius: An annual herb. **Flowering:** March – April. Common in open fields. **Exsiccatus:** Tulamura, *Datta* 753, dated 06. 03. 2007.

Panicum repens L.: An annual erect herb. **Flowering:** February – April. Common in grassy localities. **Exsiccatus:** Golaghati, *Saha* 129, dated 27. 04. 2006.

Panicum triperon Schultes: An annual tall erect grass. **Flowering:** April – May. Common in grassy localities. **Exsiccatus:** Kanchanmala, *Datta* 748, dated 05. 05. 2007.

Panicum walinsa Mez: A small annual herb. **Flowering:** March – April. Common in Tilla lands.
Exsiccatus: Rahimpur, *Datta 744*, dated 17. 03. 2007.

Paspalidium flavidum (Retzius) A. Camus: A herb with leafy branching stem. **Flowering:** February – April. Common in wet places.
Exsiccatus: Paddanagar, *Datta 791*, dated 08. 04. 2006

Paspalum distichum L.: A perennial grass with creeping and rooting stem. **Flowering:** July – August. Common in open fields.
Exsiccatus: Berimura, *Datta 795*, dated 20. 08. 2006.

Pennisetum pedicellatum Trinius: An annual grass with narrowly ribbed stems. **Flowering:** October – December. Common in paddy fields.
Exsiccatus: Jirania, *Datta 793*, dated 03. 11. 2006.

Pennisetum purpureum Schumann: A tall erect annual grass. **Flowering:** March – May. Common in grassy localities.
Exsiccatus: Jogendranagar, *Datta 797*, dated 04.05. 2007.

Phragmites kakra (Retzius) Trinius *ex* Studel: A creeping rhizomatous herb. **Flowering:** September – October. Occasionally found on the banks of Howrah.
Exsiccatus: Aralia, *Datta 796*, dated 25. 10. 2007.

Saccharum munja L.: A tall erect perennial grass. **Flowering:** February – April. Commonly cultivated, also naturalized.
Exsiccatus: Chandrapur, *Majumdr 873*, dated 18. 4. 2006.

Saccharum officinarum L.: A tall herb with solid stem. **Flowering:** September – December. Cultivated for sugarcane.
Exsiccatus: Bamutia, *Majumdr 878*, dated 20. 11. 2006.

Saccharum spontaneum L.: A perennial robust grass with thick rhizome. **Flowering:** September – October. Common along the river banks and swampy localities.
Exsiccatus: Rahimpur, *Datta 765*, dated 23. 09. 2006.

Setaria glauca (L.) P. Beauvois: An annual tufted grass with slender glabrous stem. **Flowering:** February – March. Common in pasture land.
Exsiccatus: Golaghati, *Datta 761*, dated 30. 03. 2006.

Sorghum vulgare L.: Erect annual herb. **Flowering:** September – October. Occasionally cultivated.
Exsiccatus: Konaban, *Datta 722*, dated 16. 09. 2007.

Sporobolus coromandalianus (Retzius) Kunth: An erect annual grass. **Flowering:** June – July. Common in grass land.
Exsiccatus: Kalsimura, *Majumdr 871*, dated 27. 07. 2007.

Sporobolus diander P. Beauvois: Erect annual grass. **Flowering:** June – July. Common in grass land.

Exsiccatus: Barjala, *Datta 793*, dated 06. 04. 2006.

Thysanolaena latifolia (Roxburgh ex Horneman) Honda: A perennial grass. **Flowering**: almost year round. Common in tilla land.

Exsiccatus: Hirapur, *Majumdr 875*, dated 28. 04. 2006.

Thyrsostachys oliveri Gamble: A long caespitose bamboo; culms 15 – 20 m high with whitish silky surface when young. Commonly cultivated in Katlamara and Mohanpur.

Exsiccatus: Katlamara, *Datta. 788*, dated 02. 08. 2006.

Triticum aestivum L.: Commonly cultivated, erect annual grass. **Flowering**: January – April.

Exsiccatus: Bamutia, *Saha 126*, dated 02. 04. 2006.

Zea mays L.: Frequently cultivated tall annual grass. **Flowering**: January – April.

Exsiccatus: Bisramganj, *Saha 129*, dated 18. 03. 2007.

DISCUSSION

In the West Tripura district the grasses are common in forest floor, river beds, pasture lands, road sides, edges of tanks and ponds, etc. forming a true natural family. It has been noticed that the grasses are predominant in open places where large tracts consists of grasslands. Among those *Chrysopogon aciculatus*, *Cymbopogon nardus* and *Cynodon dactylon* etc. are dominant and widely distributed both in natural and degraded areas. In the *Jhum* (shifting cultivation) areas when large segments of forests are fired only few species like *Imperata cylindrica*, *Eragrostis* sp., *Eleusine* sp., *Digitaria* sp., *Chrysopogon aciculatus*, *Cynodon dactylon* etc are frequently dominated and slowly merges in the nearest secondary degraded forest land. While several grass species like, *Coix lacryma-jobi*, *Eragrostis cynosuroides*, *Oryza rufipogon*, *Phragmites kakra* and *Panicum auritum* etc. are found occasionally or very rare in occurrence. Maximum number of species is commonly found in grassy localities, tilla land, open fields, road sides and some species are distributed in marshy or wet places. There are seven species of *Bambusa*, three species of *Dendrocalamus* and one species of *Melocanna*, *Oxytenanthera* and *Thyrsostachys* etc. have been reported in this communication. *Bambusa polymorpha*, *Bambusa tulda*, *Bambusa pallida*, *Melocanna baccifera* etc. are found widely distributed and *Melocanna* is the most dominant species among all the bamboo and *Thyrsostachys oliveri*, *Dendrocalamus strictus* etc. are less common. Such bamboos are most important NTFP and hence the utilization of bamboo and bamboo products for daily implementation play a vital role in the socio-economic life of forest dwelling people of those localities. *Thysanolaena maxima* another important NTFP collected and sold mostly by the tribal women.

LITERATURE CITED

- Arber, A. 1934. *The Gramineae: a study of cereal, bamboo and grass*. Cambridge, England.
- Bor, N.L. 1960. *The Grasses of Burma, Ceylon, India and Pakistan (excluding Bambuseae)*. Pergaman Press, London.
- Carnahan, H. L. & Hill, H. D. 1961. Cytology and Genetics of forage grasses. *Bot. Rev.* 27: 1-162.

- Deb, D.B. 1983. *The Flora of Tripura State*, Vol. II. Today and Tomorrow's Printers and Publishers, New Delhi.
- Hooker, J.D. 1897. *Flora of British India*, Vol. VII. , L.Reeve & Co., London
- Hubbard, C.E. 1954. *Grasses – A Guide to their structure, identification, uses and distribution in the British Isles*. Penguin Books, Bungay, Suffolk.
- Hutchinson, J. 1959. *The Families of Flowering Plants*, 2nd edn. Clarendon Press, Oxford.
- Jain, S.K.; Das, D. & Banerjee, D.K.. 1972. Further contribution to Bibliography of Grasses. *Bull. Bot. Surv. India*, 14: 24 – 45.
- Majumdar, R.B.1956. Studies on the grasses of 24- Parganas. *Bull. Bot. Soc. Bengal*, 10: 1 – 114.
- Prain, D.1903. *Bengal Plants*. Vol. II, Calcutta.
- Saldahna, J. & Nicholson, H. 1976. *Flora of Hassan District, Karnataka*, Amerind Publishing Co., New Delhi.
- Thakur, M. J. 1992. *Cytological, embryological and biochemical Investigation in selected forage grasses*. Ph.D. Thesis, L. N. Mithila University, Darbhanga.