

## Ethnobotanical usages of grasses by the tribals of West Dinajpur district, West Bengal

S Mitra and Sobhan Kr Mukherjee\*

Department of Botany, University of Kalyani, Kalyani 741235, West Bengal

Email: sobhankr@yahoo.com; sunitmitra2003@yahoo.co.in

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In the present paper, 27 ethnobotanical usages of 16 taxa of grasses are documented from 4 major tribal communities of West Dinajpur district of West Bengal. All the ethnobotanical information collected from these tribal communities is documented along with their vernacular name, phenology, place of collection, mode of preparation, and the processes of medication.

**Keywords:** Ethnobotany, Grasses, West Dinajpur District, West Bengal, Munda Tribes, Santal Tribes, Oraon Tribes, Polia Tribes, Ethnomedicine

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Grasses, a natural homogenous group of plants belongs to the family Gramineae (Poaceae), undoubtedly forms one of the most fascinating families of flowering plants with a wide range of diversity and is playing a significant role in the lives of the human beings and animals. The value of grasses to mankind has been recognized since the dawn of human civilization and culture of cereal grasses dates back to a period when man was emerging from wild beast stage. The members of this group are present in all the conceivable habitats suitable for the growth of the plant communities. In India, the Gramineae is one of the dominant families both on the basis of its number of genera and species.

The district West Dinajpur (presently Uttar Dinajpur and Dakshin Dinajpur) lies between 26°29'54" N to 25°10' 55" N latitude and between 89°0'30" E to 87° 48' 37" E longitude, in the Jalpaiguri division of West Bengal (Fig. 1). It has an area of 5350 sq km. The West-South limit of the district is surrounded by the district Malda of West Bengal, Purna district of Bihar, Rajshai and Bogra district of Bangladesh, while the North-East portion is bounded by the river Mahananda and Bogra and Dinajpur districts of present Bangladesh. Eight tribes of which four tribes, viz. Santal, Munda, Oraon, inhabit the district and Polia are the most dominant group<sup>1</sup>.

The reason for the rapid destruction of the natural vegetation is to fulfill the needs of the agricultural land for the production of much crops for the industrial development and for the development of housing complex to meet up the demand of residence of increasing population. Besides this, the rapid westernization of the tribal populace of the district keep the new generation of the tribal communities apart from their age old culture, heritage and practice; which ultimately leads towards the elimination of a vast knowledge of plant usages learned by these tribal communities by observing the nature, developed by trial and error process generation after generation, and keep this knowledge in practice by passing it from father to his son. So to preserve this vast wealth of knowledge from extinction, its documentation is necessary. After the Rio Convention in 1992 and the implementation of the GATT to save the intellectual property and the indigenous knowledge of the tribal communities of a country it is essential to explore its ethnic knowledge and to meet up this goal, the ethno botanical exploration is the only way-out. The flora of this district is inadequately explored<sup>2,3</sup>. There are a few reports, which solely deal with the plants of this district as used by the tribals<sup>4,5,6</sup>. But there is no specific study on the grass plants used by the tribals in this district for medicinal and other purposes. So, keeping all these things in mind, the present study was taken into account.

\*Corresponding author

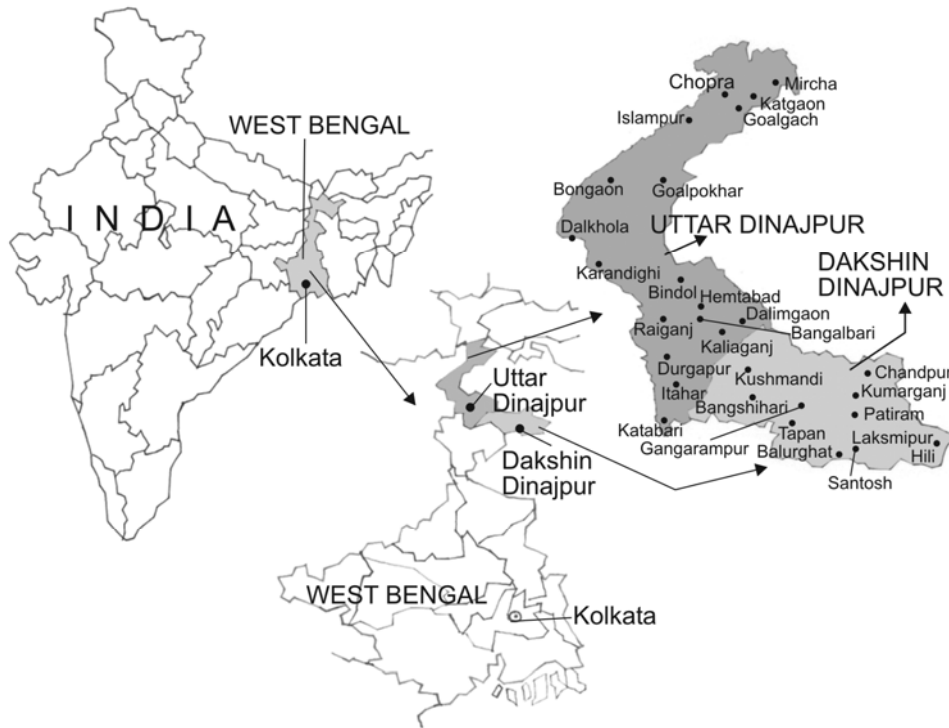


Fig. 1 Location Map of West Dinajpur (presently Uttar Dinajpur & Dakshin Dinajpur) district

### Methodology

The present study is the outcome of the five years of critical, minute and systematic study of the plants and their usages by the local tribal inhabitant of the district, representative of almost all the corners of the district. Field trips were undertaken in every season and in all the representative localities of the district from ethnobotanical point of view. Nomenclature of each taxon has been checked in the light of the rules of the International Code of Botanical Nomenclature (15<sup>th</sup> ICBN, 1994).

A political map of the district marked with the important places of collection as well as tribal pockets of the district and the detailed list of the collection are given. For ethnobotanical information, emphasis is given on the field interview of the medicine men (Fig. 2,3) and elderly people of the tribal community and the process of usages are noted down. In some cases, case study can also be done if it is admissible. During the field trips and collection of the ethnobotanical data regarding the ethnomedicine, special emphasis is given on the mode of preparation of the drugs and the processes of their medication. All the specimens are collected in duplicate or triplicate forms and they were deposited in the Herbarium of Pharmacognosy unit of BSI, Kolkata, India.

Botanical names of the plants are arranged in alphabetical sequence. Each entry has scientific name followed by their synonyms and vernacular name, phenology, distribution, place of collection, collection number and ethno botanical information. Name of that tribe from which the respective information is collected, is given in parenthesis after the vernacular name and after the name of each disease.

### Observations

- 1 *Apluda mutica* Linn., Sp. Pl. ed. 1, 82. 1753. var. *aristata* (Linn.) Hackel ex Baker, Handb. Fl. Java 2: 54.1928; Bor, Gramineae in Rechin., Fl. Iran. 524. 1970; Moulik, Grass. Bamboos India 1: 305.1997. *A. aristata* Linn., Amoen Acad. 4: 303. 1756. *A. varia* Hack. subsp. *aristata* (Linn.) Hackel in DC. Monogr. Phana 6: 196.1889; Hook. f. in Hook. f., Fl. Brit. India 7: 150.1895; Prain, Bengal Pl. 2: 1194. 1903 (Rep. ed. 2: 900.1963).

*Vernacular name:* Chofki-Santali.

*Distribution:* January-November; throughout the state; common in waste grounds, bushes and in the forest floors. Tapan; Mitra (All India Coordinated Research Project on Ethnobiology, AICRPE) 2179.

*Uses:* Root is crushed along with a little mustard oil and the paste is applied on the mouth sore of cattle. The plant is used as a thatching material by Santal tribes.

- 2 *Chrysopogon aciculatus* (Retz.) Trin., Fund. Agrost. 188.1820; Raizada *et al.* in Indian For. Rec. (Bot.) 4: 218.1957; Bor, Grass. Burma, Ceylon, India & Pakistan 115.1973 (Rep. ed.); Moulik, Grass. Bamboos. India 1: 240.1997. *Andropogon aciculatus* Retz., Obs. Bot. 5: 22.1789; Hook. *f.* in Hook. *f.*, Fl. Brit. India 7: 188. 1897; Prain, Bengal Pl. 2: 1205. 1903 (Rep. ed. 2: 907.1963).  
*Vernacular name:* Chorkanta-Bengali, Santali.  
*Distribution:* July-August; throughout the state; common on sandy soil. Raiganj; *Mitra* (AICRPE) 2000.  
*Uses:* Fresh rhizome (5 gm) along with 3-5 black peppers is crushed to paste. It is taken at the early morning in empty stomach to cure stomachache and gastric disorder by Santal tribes.
- 3 *Coix lacryma-jobi* Linn., Sp. Pl. ed. 1, 972.1753; Hook. *f.* in Hook. *f.*, Fl. Brit. India 7: 100. 1895; Prain, Bengal Pl. 2: 1210.1903 (Rep. ed. 2: 912.1963); Bor, Grass. Burma, Ceylon, India & Pakistan 264. 1973 (Rep. ed.); Moulik, Grass. Bamboos. India 1: 175.1997.  
*Vernacular name:* Baksi-horeng-Santali, Mundari.  
*Distribution:* July-December; throughout the state; common in open and dry places. Balurghat; *Mitra* (AICRPE) 1819.  
*Uses:* Santal tribes take decoction of the seed at early morning in empty stomach to cure dysentery. Dried seed powder is mixed with a glass of warm milk and taken at the bedtime by the Mundas as galactogauge.
- 4 *Cymbopogon martinii* (Roxb.) Wats. in Atkins. Gaz. N. W. Prov. India 392. 1882; Bor, Grass. Burma, Ceylon, India & Pakistan 129. 1973 (Rep. ed.); Moulik, Grass. Bamboos India 1: 215.1997. *Andropogon martinii* Roxb., Fl. Ind. (Carey & Wallich ed.) 1: 280.1820. *A. schoenanthus* var. *martinii* Hook. *f.* in Hook. *f.*, Fl. Brit. India 7: 204.1895; Prain, Bengal Pl. 2: 1203.1903 (Rep. ed. 2: 906.1963).  
*Vernacular name:* Gandhi-ghash-Santali.  
*Distribution:* September-February; throughout the state; cultivated, rarely found as an escape. Kulik bird sanctuary; *Mitra* (AICRPE) 2311.
- 5 *Cynodon dactylon* (Linn.) Pers., Syn. Pl. 1: 85.1805; Hook. *f.* in Hook. *f.*, Fl. Brit. India 7: 288. 1897; Prain, Bengal Pl. 2: 1227.1903 (Rep. ed. 2: 925.1963); Bor, Grass. Burma, Ceylon, India & Pakistan 489. 1973 (Rep. ed.); Moulik, Grass. Bamboos India 2: 566.1997. *Panicum dactylon* Linn., Sp. Pl. ed. 1, 58.1753.  
*Vernacular name:* Durba-Bengali, Mundari.  
*Distribution:* Throughout the year; throughout the state; very common, road side, near wet areas, etc. AAASM-medicinal plant garden. Raiganj; *Mitra* (AICRPE) 2673.  
*Uses:* Extract of the rhizome is applied on the cut to check bleeding and to prevent infection by Munda tribes. Extract of the whole plants is applied externally on the outer portion of the eyelid to cure the redness and the irritation of the eye due to summer heat by Munda tribes.
- 6 *Echinochloa crusgalli* (Linn.) P. Beauv., Ess. Agrost. 53: 161. 1812; Bor, Grass. Burma, Ceylon, India & Pakistan 310.1973 (Rep. ed.); Moulik, Grass. Bamboos India 1: 99.1997. *Panicum crus-galli* Linn., Sp. Pl. 1, 56.1753; Hook. *f.* in Hook. *f.* Fl. Brit. India 7: 30.1895; Prain, Bengal Pl. 2: 1177.1903 (Rep. ed. 2: 886.1963).var. *crusgalli* (Fig. 4).  
*Vernacular name:* Sama-Santali.  
*Distribution:* June-November; throughout the state; common, generally found on the roadside, sandy riverbeds and often in the cultivated lands as weed. Debipur; *Mitra* (AICRPE) 2846.  
*Uses:* Grains are edible. Seeds are boiled and eaten as a substitute of rice by Santal tribes.
- 7 *Eleusine indica* (Linn.) Gaertn. Fruct. 1: 8.1789; Hook. *f.* in Hook. *f.*, Fl. Brit. India 7: 293. 1897; Prain, Bengal Pl. 2: 1229, 1903 (Rep. ed. 2: 927. 1963); Bor, Grass. Burma, Ceylon, India & Pakistan 493. 1973 (Rep. ed.); Moulik, Grass. Bamboos India 2: 590.1997. *Cynosurus indicus* Linn., Sp. Pl. ed. 1, 72.1753 (Fig. 7).  
*Vernacular name:* Malkantari-Mundari.  
*Distribution:* August-November; throughout the state; common, found in open places, near ponds, roadside, waste places and as a weed in cultivated lands. Kulik riverbed; *Mitra* (AICRPE) 2858.

*Uses:* Root of this plant (20 gm) is crushed along with the *Ada* (*Zingiber officinale* 10 gm) and 9 black peppers pieces. The paste thus obtained is divided into two equal parts. One part mixed with a few drops of honey is given orally and other part is applied on the biting site as antidote of snake venom by Munda tribes. It is said that the single dose is sufficient and effective.

- 8 *Hygroryza aristata* (Retz.) Nees. *ex* Wight & Arn. in *Edinb. New Phil. J.* 15: 380.1833; Hook. *f.* in Hook. *f.*, *Fl. Brit. India* 7: 95.1897; Prain, *Bengal Pl.* 2: 1185.1903 (Rep. ed. 2: 892. 1963); Bor, *Grass. Burma, Ceylon, India & Pakistan* 597.1973 (Rep.ed.); Moulik, *Grass. Bamboos India* 1: 43.1997. *Pharus aristatus* Retz., *Obs. Bot.* 5: 23.1789.

*Vernacular name:* Dolddi-Mundari.

*Distribution:* November-April; throughout the state; a common aquatic grass, found in all the ponds and ditches with logging water. Radhikapur; *Mitra* (AICRPE) 2107.

*Uses:* The plants are used as a fodder and galactogauge by Munda tribes.

- 9 *Paspalum scrobiculatum* Linn., *Mant.* 1:29.1767; Hook. *f.* in Hook. *f.*, *Fl. Brit. India* 7: 10. 1895; Bor, *Grass. Burma, Ceylon, India & Pakistan* 340.1973, (Rep. ed.); Moulik, *Grass. Bamboos India* 1: 134.1997. *P. orbiculare* G. Forster., *Fl. Insul. Austr. Prodr.* 7: 1786; Bor, *Grass. Burma, Ceylon, India and Pakistan* 340.1973 (Rep. ed.).

*Vernacular name:* Khado-dhan-Santali.

*Distribution:* April-January; throughout the state, common in forest edges, sandy riverbeds, and often on waste open places. Atrai riverbed, Balurghat; *Mitra* (AICRPE) 1833.

*Uses:* The grains are used by Santal tribes for the preparation of country liquor.

- 10 *Saccharum spontaneum* Linn., *Mant. Alt.* 183.1771; Hook. in Hook. *f.*, *Fl. Brit. India* 7: 118. 1897; Prain, *Bengal Pl.* 2: 1188.1903 (Rep. ed. 2: 895.1963); Mukherjee in *Bull. Bot. Soc. Bengal* 8: 145.1949; Bor, *Grass. Burma, Ceylon, India & Pakistan* 214. 1973 (Rep. ed.) (Fig. 5).

*Vernacular name:* Kush-Mundari, Santali, Oraon, Bengali.

*Distribution:* September-November; throughout the state; common in the sandy riverbeds, in hedges and in waste open places. Tangan riverbed; *Mitra* (AICRPE) 2822.

*Uses:* Stem is used for thatching the huts by all tribes. Root decoction (20 ml) is given to cure the eruptions on the skin caused due to excessive consumption of country liquor by Oraon tribes.

- 11 *Setaria glauca* (Linn.) P. Beauv., *Ess. Agrost.* 51: 169, 178.1812; Hook. *f.* in Hook. *f.*, *Fl. Brit. India.* 7: 78.1895; Prain, *Bengal Pl.* 2: 1170.1903 (Rep. ed. 2: 880.1963); Bor, *Grass. Burma, Ceylon, India & Pakistan* 360.1973 (Rep. ed.); Moulik, *Grass. Bamboos India* 1: 153. 1997. *Panicum glaucum* Linn., *Sp. Pl.* ed. 1, 56.1753.

*Vernacular name:* Khukurs-Polia.

*Distribution:* June-September; throughout the state, commonly grows in varieties of habitats, generally found on sandy loam soil, near riverbeds, roadside and in the hedges. Atrai riverbed, Balurghat; *Mitra* (AICRPE) 1835.

*Uses:* A low-grade country liquor is prepared from the achenes. The grains are used as fodder by Polia tribes.

- 12 *Setaria verticillata* (Linn.) P. Beauv., *Ess. Agrost.* 51: 178.1812; Hook. *f.* in Hook. *f.*, *Fl. Brit. India* 7: 80.1897; Prain, *Bengal Pl.* 2: 1170. 1903 (Rep. ed. 2: 881.1963); Bor, *Grass. Burma, Ceylon, India & Pakistan* 365.1973 (Rep. ed.); Moulik, *Grass. Bamboos India* 1: 159. 1997. *Panicum verticillatum* Linn., *Sp. Pl.* ed. 2, 1: 82.1762.

*Vernacular name:* Solnaja-Santali.

*Distribution:* August-October; throughout the state, uncommon, often found in dry sandy riverbeds. Kulik riverbed; *Mitra* (AICRPE) 2860.

*Uses:* Inflorescences are mixed with the stored grains by Santal tribes to expel the rodents.

- 13 *Sporobolus diander* (Retz.) P. Beauv., *Agrost* 26: 1812; Hook. *f.* in Hook. *f.*, *Fl. Brit. India* 7: 247.1897; Prain, *Bengal Pl.* 2: 1213.1903 (Rep. ed. 2: 914.1963); Bor, *Grass. Burma, Ceylon, India & Pakistan* 629.1973 (Rep. ed.). *Agrotis diander* Retz., *Obs. Bot.* 19.1789. *Sporobolus indicus* (Linn.) R. Br. var. *diander* (Retz.) Jov. & Gaed. in *Bull. Centre et Rech. Sc. Biarritz.* 7: 65.1968, and in *Taxon* 22: 163.1973.

*Vernacular name:* Khui ghas-Santali.

*Distribution:* September-December; throughout the state; common, in sandy alluvial loam soil, found on roadside, waste open places. Atrai riverbed; *Mitra* (AICRPE) 1839.



Fig. 2 Tribal medicine man (*Munda*) with medicine box



Fig. 3 Tribal medicine man (*Santa*) examining patient



Fig. 4 *Echinochloa crusgalli* (Linn.) P. Beauv.



Fig. 5 *Saccharum spontaneum* Linn.



Fig. 6 *Vetiveria zizanioides* (Linn.) Nash.



Fig. 7 *Eleusine indica* (Linn.) Gaertn.



Table 1—Details of field trips carried out during the study

S.No	Year	Period	Duration	Place visited
1	1995	15 <sup>th</sup> March-3 <sup>rd</sup> April	19 days	Balurghat: Danga forest, Nama danga, Gangarampur, Hili, Raiganj, Kulik and Chopra.
2	1995	17 <sup>th</sup> September-2 <sup>nd</sup> October	16 days	Chopra, Sapnikla forest, Kushmandi forest, Radhikapur, Kaliaganj and Debipur.
3	1995	8 <sup>th</sup> November-15 <sup>th</sup> December	38 days	Balurghat: Danga forest, Nama danga, Gangarampur, Hili, Karnajora, Bara Sapnikla forest, Kushmandi forest, Radhikapur and Debipur.
4	1996	27 <sup>th</sup> January-16 <sup>th</sup> February	20 days	Raiganj, Kulik, Kaliaganj, Chopra, Debipur, Islampur, Gangarampur, Hili, Danga and Kashia danga.
5	1996	3 <sup>rd</sup> May-9 <sup>th</sup> June	36 days	Danga forest, Kashia danga, Nama danga, Gangarampur, Kulik, Debipur, Karnajora, Chopra and Islampur.
6	1996	5 <sup>th</sup> October-19 <sup>th</sup> November	45 days	Balurghat: Danga forest, Kashia danga, Namdanga, Raiganj, Kulik, Radhikapur, Debipur, Islampur, Chopra, Sapnikla forest and Kushmandi forest.
7	1997	20 <sup>th</sup> February-10 <sup>th</sup> March	18 days	Chopra, Raiganj, Islampur, Gangarampur and Danga forest.
8	1997	3 <sup>rd</sup> July-20 <sup>th</sup> August	48 days	Raiganj, Sitagram, Debipur, Kulik, Chopra, Islampur, Karnajora, Radhikapur, Balurghat, Gangarampur, Danga forest, Kushmandi forest and Kashia danga.
9	1997-98	11 <sup>th</sup> December-15 <sup>th</sup> January	35 days	Balurghat, Hili, Gangarampur, Danga forest, Nama danga, raiganj, Kulik, Bilol, Radhikapur, Debipur and Chopra.s
10	1998	5 <sup>th</sup> April – 10 <sup>th</sup> May	36 days	Raiganj, Bilol, Debipur, Karnajora, Islampur, Kaliaganj, Kushmandi and Balurghat.

Table 2—Statistical analysis of the different usages of the grass by the tribals of West Dinajpur district

Sl. No.	Mode of use	No. of usages	Munda	Oraon	Santal	Polia
1	Human medicine	16	7	2	8	—
2	Veterinary medicine	2	—	—	2	—
3	Edible	2	1	1	2	1
4	Thatching	3	1	1	3	1
5	Material use	1	—	—	1	—
6	Beverage	2	—	—	1	1
7	Fodder	1	—	—	—	1

*Uses:* Stem is chopped into small pieces and is given to the cattle as fodder to promote lactation by Santal tribes. The whole plants are bunched and used as broom by them.

- 14 *Triticum aestivum* Linn., Sp. Pl. ed. 1, 85.1753; Bor, Grass. Burma, Ceylon. India & Pakistan 679.1973 (Rep. ed.); Moulik, Grass. Bamboos India 2: 496.1997. *T. sativum* Lam., Fl. Franc. 3: 625.1778. *T. vulgare* Vill., Hist. Pl. Dauph 2: 153.1787; Hook. f. in Hook. f., Fl. Brit. India 7:

367.1896; Prain, Bengal Pl. 2:1231.1903, (Rep. ed. 2:929.1963).

*Vernacular name:* Gam, Genhu-Santali, Oraon, Mundari.

*Distribution:* December-March; cultivated throughout the state, Debipur; Mitra (AICRPE) 2940.

*Uses:* Decoction of root (10-15 ml each time) is taken thrice a day for 3 days to cure the painful interrupted urine discharge (dysuria) by Oraon tribes.

- 15 *Vetiveria zizanioides* (Linn.) Nash. in Small Fl. South East. U.S. 67.1903; Raizada *et al.* Indian For. Rec. (Bot.) 4: 220.1957. Bor, Grass. Burma, Ceylon, India & Pakistan 258.1973, (Rep. ed.); Moulik, Grass. Bamboos India 1: 256.1997. *Phalaris zizanioides* Linn., Mant. Pl. 2: 183.1771. *Andropogon squarrosus* sensu Hook. f. in Hook. f., Fl. Brit. India 7: 186.1995, *non.* Linn. f. 1781; Prain, Bengal Pl. 2: 1204.1993 (Rep. ed. 2: 907.1963) (Fig. 6).

*Vernacular name:* Sirmou-Santali, Mundari.

*Distribution:* December-September; throughout the state, commonly in sandy dry soil, generally found in the hedges, in waste places, etc. Atrai riverbed, Balurghat; *Mitra* (AICRPE) 1838.

*Uses:* Root decoction (10-15 ml) each time is given twice a day before meal to cure the dyspepsia by Santal tribes. The paste of the root (10 gm) is mixed with the paste of black peppers (3-5 pieces) and aqueous solution of sandalwood is applied on forehead to cure the headache. A pinch of root ash (prepared by burning the root) is taken with a glass of lukewarm water to reduce the acidity by Santal and Munda tribes. Decoction of stem and root is given to cure the dysuria by Munda tribes.

- 16 *Zea mays* Linn., Sp. Pl. ed. 1, 971.1753; Hook. f. in Hook. f., Fl. Brit. India 7: 102.1895; Prain, Bengal Pl. 2: 1209.1093 (Rep. ed. 2: 911.1963); Bor, Grass. Burma, Ceylon, India & Pakistan 270.1073 (Rep. ed.); Moulik, Grass. Bamboos India 1: 205.1997.

*Vernacular name:* Makai-Santali; *Bhutta* - Bengali.

*Distribution:* July-September; cultivated throughout the state, Gangarampur; *Mitra* (AICRPE) 2880.

*Uses:* About 20 gm fresh flowers are crushed into paste along with camphor (*Kapur*) 5 gm and turmeric (*Haldi*) 5 gm. The paste so obtained is applied to cure skin disease like wart by Santal tribes. It is said that the drug should be used for 7 days for better result.

## Discussion

The out come of the present study reveals that the four major tribal communities of the district use 16 taxa of grasses in 27 different ways. The statistical analysis of these usages is shown in the Table 1.

From Table 2 it is clear that the Santal tribe of the district is very much rich in ethnobotanical

knowledge, followed by the Munda and Oraon tribes. Polia tribe is very much feeble in relation to the usages of the plant lore of the district. On the other hand it also reveals that among the four studied tribes, Polia is the less studied tribe, whereas the Santal is the most well studied group followed by the Munda and Oraon tribe.

Among the reported 16 prescription of human medicine, 3 were recorded for the pains and aches, 2 each for the dysuria, gastric disorder, galactogouge and skin diseases and a single prescription is recorded for the dysentery, dyspepsia, haematostatic, ophthalmic problem and for the snake bite antidote. Among the 16 taxa used by the tribals of West Dinajpur, *Vetiveria zizanioides* is the most popularly used taxon by all the tribal people of the district.

Further detailed and minute study in this area is required especially among the Polia and Santal tribes to find out some more potential drug plants from which some wrathful medicine can be prepared for human benefit. On the basis of this survey, pharmacological screening can be done to all the taxa represented here to find out the potentiality of the information as provided here by the different tribal communities of the district.

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## References

- Mitra S, *Studies on the flora and ethnobotany of West Dinajpur district, West Bengal (India)*, Ph.D.Thesis, Kalyani University, Kalyani, 2002.
- Banerjee R N & Basu S K, A systematic study of the Pteridophytes of West Dinajpur district, West Bengal, *J Econ Tax Bot*, 16 (1992), 425-431.
- Banerjee R N & Paul T K, Malvaceae of West Dinajpur district, West Bengal, *J Econ Tax Bot*, 19 (1995), 313-315.
- Sur P R, Sen R, Halder A C & Bandyopadhyay S, Observation on ethnobotany of Malda-West Dinajpur districts, West Bengal- I, *J Econ Tax Bot*, 10 (1987), 395-401.
- Sur P R, Sen R, Halder A C & Bandyopadhyay S, Observation on ethnobotany of Malda-West Dinajpur districts, West Bengal- II, *J Econ Tax Bot*, 14 (1990), 453-459.
- Banerjee R N & Ghora Chhabi, On the domestic use of some unreported plants of West Dinajpur district (W B) *J Econ Tax Bot*, Add Ser, 12 (1996), 325-328.