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Short Communication

INDIAN MATCANE *Schumannianthus dichotomus* (ROXB.) GAGNEP : AN UNDERUTILIZED FIBER PLANT OF INDIA

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Schumannianthus dichotomus, the matcane of tropical Asia is underexploited. The plant is cultivated for the preparation of mats in the North-eastern parts of India. This fiber plant could prove to be a great asset for the rural economy. The present investigation provides information on the cultivation and economics of this neglected species.

Key words : *Schumannianthus dichotomus*, Indian matcane, systematics, cultivation, processing, uses

Schumannianthus dichotomus (Roxb.) Gagnep., a monocotyledonous plant, belonging to the family Marantaceae, grows sporadically in the north-eastern states of India. The species occurs in the wild form but its economic importance is largely unknown. Very less attention has been given to this plant species for its improvement and development. The species has enormous potential and is commercially viabile if cultivated on large scale. This may help to uplift the rural economy and render the waterlogged and semi-aquatic wasteland areas of tropical environment for cultivation.

1. Distribution and Botany

The genus *Schumannianthus* Gagnep has 2 species i.e., *S. dichotomus* (Roxb.) Gagnep. and *S. virgatus* (Roxb.) Rolfe. The genus is distributed in Sylhet (Bangladesh), Assam, Tripura, Cooch-Behar and Coromandel coast (South India), Tenasserim (Myanmer), Thailand, Combodia, Cochinchina and Philippines. The species of *S. virgatus* (syn. *Clinogyne virgata* (Roxb.) Benth.) is confined to Southern India and Andaman-Nicobar island. It occurs in both wild and cultivated forms. Wild varieties are normally small and less robust than the cultivated variety. The species is found in low- lying areas of Assam, Tripura and some pockets of North Bengal, in north-eastern parts of the country. Existing herbarium (ASSAM) collections reveal that it occurs in Kamrup, Sibsagar, Jorhat, North Lakhimpur, Cachar, Karimgunj, Nagaon and Goalpara districts of Assam whereas in North Bengal, it is confined to some areas of Cooch-Behar district. In Tripura it grows in low-lying areas of West Tripura district. In southern parts of India, it grows in Coromandal Coast. The major cultivation of the species is being done in Cachar and Goalpara districts of Assam by about 200 farmers and in Cooch-Behar district of North Bengal, by about 60 farmers.

This little known species normally grows in low-lying areas where water remains stagnant, over a long period. The species grows well in riverine alluvium, yellow loams and raw humus type (grey to black in colour) of soil. The species

Schumannianthus dichotomus (Roxb.) Gagnep., earlier known as *Clinogyne dichotoma* Salisb., is a member of the family Marantaceae. The *Schumannianthus dichotomus* is basically spread over in India, Sri Lanka, Myanmar and Indo-Malayan region. In India, the species locally known as '*Muktapata*', '*Madurpata*' in Bengali language, while in Assamese it is known as '*Patidoi*', '*Mutra*' (Wlth India, 1950). The plant is an erect shrub of *ca.* 5 m tall, 2 cm in diameter without any nodes except the apical portion which is dichotomously branched. The leaves are ovate-oblong in shape with variable size of 8-15 × 3.8-5 cm. The inflorescence is panicle with 7.5 to 10 cm. in length and it bears small, white flowers which are *ca.* 2.5 cm. in length. The fruits are 1.5 cm in diameter, indehiscent with 2-3 lobed and each lobe contains single seed. The plant starts flowering from April onwards and fruit sets within 3-4 months which lasts up to August.

Fig. 1. Cultivated field of *Schumannianthus dichotomus*

2. Cultivation

The plant propagates vegetatively either through transplanted rootstock or cuttings. Rootstocks form twice in a year, in April-May and October-November, when there is no stagnation of water. Propagation can also be done through the seeds. Seeds are normally collected in June-August, dehusked and dried in sunlight. The nursery is laid in February-March and the sapling grows in April-May. When the saplings turn 18-20 cm. long or attain two to four leaf stage, they can be transplanted. Four to five seedlings per hill are planted at 20-25 cm distance apart in muddy soil. Fertilizers are not needed initially. However, farmyard manure can be used after first weeding and it is to be done at the tillering initiation stage. The process is repeated for the second year from the previous year's plant at maturity. Thus it takes at least two years to produce the raw material (Fig. 1).

Multiplication and raising of seedlings is done either through direct sowing of seeds or cutting of one year old rootstock. In direct seed sowing, it requires two years time while in later case only one year for establishment of plants. However, rootstock saplings take a little more time than direct seeded plant for their establishment in soil because roots get damaged during the cutting and thus saplings become weak. Later on, when new sprouts are grown from these established saplings, they grow very rapidly and become thick and strong. On the other hand, direct sown seed turns into plants faster but become comparatively thin and slender due to their dense population. These plants are of superior quality since they yield superior and thin splits for weaving of valuable mats. Harvesting of cane

yield starts from third year onward after sowing or transplanting (Fig. 2). Once the plants got

Fig. 2. Harvested species of *S. dichotomus*

established and started to yield from 3rd year onward, they continue to grow and yield continues for decades unless plants are abandoned. Therefore, regular weeding and tillage in between the hills are necessary every year during the month of March-April. In order to avoid deterioration of the yield in natural condition or to rotate the crop, harvesting may be done during the 6th year, otherwise the plant can be harvested for its selected canes every fifth year which may be continued till it is abandoned.

3. Diseases and pests

This semi-hydrophytic species is attacked by a few diseases and pests. However, little recorded information is available on its susceptibility to diseases. Rats create menace to this plant when water is dried up in the field. They make holes in root zone and gnaw at the tender roots. Grazing is not a major problem because the leaves are not favoured by cattle. The tender plants got damaged when they splash through the unfenced fields. Birds use these plants for their nests and deteriorate the quality of reed then their faeces stain and contaminate the reed.

4. Processing

The nodeless reeds are harvested from the base and split lengthwise into thin slats. The slats are classified according to their degree of processing which determines the quality of mats. Slats are broadly classified into five types but their anatomical distinctions cannot be done in a strict manner.

i) *Stem splits* - The rounded stem split into four major longitudinal sections, wherein the pith portion.

ii) *Cortical splits* - Longitudinal sections of stem splits are further split, leaving aside the endodermal portion is not included.

iii) *Primary cane splits* - Splits are obtained from cortical split after soaking in water for an hour. These splits consist of smooth, green epidermal portion (outer layer) of the stem.

iv) *Secondary cane splits* - After removing the primary layer of cane splits, the second coarse layer reveals a matrix of xylem and bast fibre groups which form the secondary cane splits.

v) *Tertiary cane splits* - The remaining portion of cortical splits are called tertiary cane. These are rough and coarse and may be utilised for thatching or tying purpose. Ash from the pith portion of the splitted stem are also utilised as alkali for washing clothes.

Cool mat is prepared from primary cane split, the epidermal portion, which remains smooth

and glossy. It does not absorb the temperature easily. For processing such split in order to make cool mats, a large earthen pot is filled up with rice starch or with water with rice soaked in it for at least a week. Acidic leaves of *Tamarindus indicus, Phyllanthus niruri, Oxalis corniculata* and *Averrhoa carambola* may be threshed into a paste and added to this water. This mixture is then filtered and kept safely in a cool place. The freshly harvested and prepared primary cane splits (without pre-soaking in water) are then immersed in a soil form in processed water (starch + acidic leaves) as indicated above. Sunlight and wind should be avoided during this process. After 3-4 days, the cane splits are boiled with water in an aluminium pot. After boiling for thirty minutes, the splits are allowed to cool down, cleaned in water and dried in sunlight. These cane splits are then used for knitting (Fig. 3).

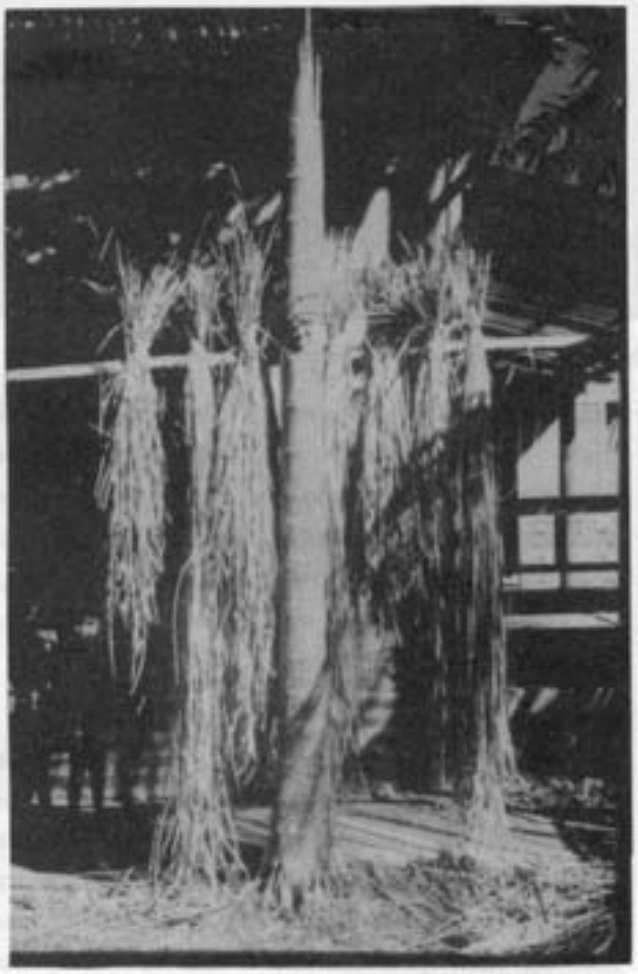

Fig. 3. Fibre strips of *S. dichotomus* being dried in sun

If coloured fibres are required, the splitted coils are soaked in warm coloured water with colour or choice and then boiled for at least five minutes. A little common salt may be added and the mixture boiled again for another 2-3 minutes. Later on, the splits can be cleaned in water and dried in a shady place to get the proper tinge of colour.

5. Uses

Split, polished and glossy stems of the mature plant are used for knitting mats, hats, curios, bags, cushions etc. The strips are separated from the stem and are sorted under different grades. Quality and gradation determine the nature of the split and degree of processing. The rhizomatous portion of the plant yields a commercial starch (Winton and Winton, 1935).

6. Cost and benefits of the cultivation

The cultivation of the matcane is a lengthy process. However, weeding and tillage between the hills are necessary during the months of March and April every year. The plant starts yielding in the 3rd year onwards of each new plantation. Dey (1987) calculated the total economics of the cultivation and production based on one location while the present author had surveyed two different locations and interacted with the farmers. According to the market price of 1990-91, the approximate cost expenditure for cultivation has been shown in Table 1. This is based on the survey of rural market where it is sold.

The annual return from the crop starts from the 3rd year onwards. As the 'hills' become gradually mature the number of reeds also increase in each subsequent year and the peak yield is attained in the 6th year, when the reeds can also be harvested completely. The quantity of production per hectare of raw material and their

Table 1. Cost of cultivation per hectare since beginning of harvest

Year		Cultural operations	Amount (Rs.)	Total (Rs.)
1. First Year	i)	Seedling	19000.00	22750.00
	ii)	Cultivation, planting and fertilizer	3750.00	
2. Second Year		Fencing, weeding, fertilizer application and other nursing	3750.00	3750.00
3. Third Year		-Do-	3750.00	3750.00
				Rs 30220.00

corresponding rate in terms of per mat including the manufacturing cost have been shown in the Table 2. Qualitywise harvest from third year's plant is a bit inferior due to non- glazed and stained surface of the reed (fetching a low rate). During the harvest of the fourth year's plant, the mature plants are extracted only after they are selected. The rate of these culms is a little more than the third year's harvest due to the degree of maturity. However, the fifth and sixth year's harvested reeds yield best quality, thus fetching superior price in the market. Now plantations can be done in the same field next year after completely harvesting the previous crop. In this process, the cultivation prevents the deterioration of the field.

Fig. 4. Prepared conemat being dried before marketing

Table 2. Production per hectare of mats and returns over different years of crop growth

	Year	Production - in terms of material for number of mats × rate (Rs.)	Amount (Rs.)
i)	Third Year	375 × 10.00	3750.00
ii)	Fourth Year	750 × 15.00	11250.00
iii)	Fifth Year	1250 × 20.00	22410.00
iv)	Sixth Year	300 × 20.00	60000.00
			Rs 97410.00

When the mats are knit, each mat costs roughly from Rs. 15/- to 300/- depending on the quality and design. It was observed that the profit is approximately five to six times over the investment, which includes the processing and knitting cost. The demand is limited locally due to poor purchasing capacity of the rural people,

whereas in large towns and cities, the mats fetch a lucrative price (Fig. 4).

7. Future prospects

The cultivation of crop needs to be boosted up on a large scale which can promote the cottage industry in the North-eastern region of India and its neighbouring tropical countries. Marshy, waterlogged wastelands can be utilised for the cultivation of such crops that require minimum care and attention. Farmers may be encouraged to cultivate such crop by allotting Panchayat wastelands by the Government/authorities alongwith subsidised loan for cultivation. Cooperative marketing system will be ideal and may be introduced so that the farmers may get proper market price for their raw as well as manufactured products. The plant yields sufficient quantity of fibre and can be utilized for the manufacturing of paper. If the cultivation extended to large scale and the production enhanced, this can be a good substitute of mats prepared from the strips of *Calamus* spp. which is now over exploited. Besides, the preparation of mats, the fibres may be used for making various artifacts, curios, hats, baskets etc. which can earn some foreign exchange too. At present, the marketing scope is confined to the region but it can be extended to other parts of the country and may even be exported outside the country. Marketing scope will then be widened when more people will come to know about its importance and variety of uses.

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