NOTES ON THE OCCURRENCE OF BAMBOO, *GIGANTOCHLOA ALBOCILIATA* (MUNRO) KURZ, FROM BASTAR, CHATTISGARH, INDIA

H.B. NAITHANI* AND R.C. PAL**

Systematic Botany, Botany Division,
Forest Research Institute, Dehra Dun (India).

During a recent botanical exploration in Bastar, Chattisgarh, the authors have given special emphasis for the survey of bamboo species. A total of eight bamboo species were collected viz. *Bambusa bambos* (Linn.) Voss (syn. *B. arundinacea* (Retz.) Willd. (Katang); *Bambusa vulgaris* Schrad. ex Wendl. (Sunderkoya bans); *Dendrocalamus strictus* (Roxb.) Nees (Dunger bans); *Schizostachyum pergracile* (Munro) Majumdar (syn. *Cephalostachyum pergracile* Munro) (Bandre bans), a species for the first time reported for Madhya Pradesh i.e. from South Balaghat Division (Bahadur and Naithani, 1976). Rest of the four species, two of them fall under genus *Bambusa, i.e.* (Silis bans or Pani bans) allied to *Bambusa tulda* Roxb., other one (introduced from Orissa) allied to *B. nutans* Wall. ex Munro. Remaining two species were collected from Kanger Valley Wildlife Sanctuary, which fall under genus *Gigantochloa*. After critical study, one of the common species in the area has been identified as *Gigantochloa albociliata* (Munro) Kurz, locally called 'Peeta bans', while the other species and two species of genus *Bambusa* are under investigation for further identification on species level.

Genus *Oxytenanthera* was described by Munro (1868). Holttum (1956) pointed out that due to typical ovary structure the genus *Oxytenanthera* is monotypic with *Oxytenanthera abyssinica* (A. Rich.) Munro, a species native of Africa. Thus the systematic position of Asiatic species of *Oxytenanthera* has been in a state of great confusion. Hence, all the Asiatic species placed under *Oxytenanthera* now belongs either to genus *Gigantochloa* Kurz ex Munro or *Pseudoxytenanthera* Soderstrom & Ellis (Naithani, 1990a). As regards *Oxytenanthera albociliata* Munro it has already been placed under *Gigantochloa* i.e. *Gigantochloa albociliata* (Munro) Kurz.

Majumdar (1989) in his enumeration of Indian bamboos has not mentioned the distribution of *G. albociliata* from India. However, Shukla (1982) reported it from Meghalaya and Deb (1983) mentioned its occurrence from Tripura. During the present survey of bamboo species conducted by one of the authors (HBN) in Tripura this species could not be located. Even in a very recent publication by Banik (2004) it has not been reported from Tripura. During 1985-86 an extensive

* Consultant Scientist (Retd.), 12-C, New Road, Dehra Dun (Uttaranchal).
** Chief Conservator of Forests, Gandhinagar (Gujarat).

bamboo survey was undertaken by one of the authors (HBN) but the species could not be located in Meghalaya; moreover no specimen of it is deposited in any Indian herbarium. Gupta (1972 and 1987) reported flowering of *Oxytenanthera albociliata* from Hathikhali, R.F., North Cachar Hills, Assam. A flowering herbarium specimen received from Gupta in 1987 deposited in the herbarium of Forest Research Institute, Dehra Dun (DD), was identified as *Thyrsostachys oliveri* Gamble, a species native of Myanmar, however, commonly planted in many parts of India and gregariously flowered during 1986-87 (Rawat, 1987; Naithani, 1993). It seems on the basis of all above mentioned reports, Shukla (1996) mentioned distribution of *O. albociliata* from North-East India.

Another species i.e.*Oxytenanthera nigrociliata* (Buse) Munro, was mentioned by Gamble (1896) from India. In particular from Chattisgarh (Anon., 1961), Sharma and Tomar (1964), Prasad and Chadhar (1988) have reported the occurrence of *O. nigrociliata* from Bastar Division. However, *Oxytenanthera nigrociliata* (Buse) Munro has already been transferred to *Gigantochloa nigrociliata* (Buse) Kurz. This species is so far known only from Indonesia i.e. Java, Bali and Sumatra. (Widjaja, 1987; Naithani, 1999). Dransfield and Widjaja (1995) also stated that "according to older literature *G. nigrociliata* also occur in India and on the Andaman Islands. Most probably these records refer to other species. So far *G. nigrociliata* has only been found in Indonesia and Thailand". Since *G. nigrociliata* is now endemic to Indonesia, then question arises that what is the current status of the bamboo *G. nigrociliata* occurring in India.

Holttum (1958) and Gilliland (1971) both have considered a part of *Oxytenanthera nigrociliata* as a synonym of *Gigantochloa hasskarliana* (Kurz) Backer ex Heyne. Thus, probably Shukla and Roy (1983), Roy (1984, 2001), Bose *et al.* (1987), and Naithani (1990b) have followed Holttum and Gilliland *loc. cit.,* and mentioned *G. hasskarliana* from India. Widjaja (1987) while revising the Malaysian *Gigantochloa* stated that "none of the specimens cited or used by Munro is identical with *G. hasskarliana*". This suggest that *G. nigrociliata* is quite distinct from *G. hasskarliana,* which differs from *G. hasskarliana* by its culm sheaths with raised rounded auricles and ending in curved sheath extension. Regarding origin and geographical distribution of *G. hasskarliana,* is native to parts of Western Indonesia (Sumatra, Java, Bali, Bkalimantan), where it occurs wild and cultivated. Occasionally cultivated in botanical gardens and for hedges in Malaysia, Singapore and Papua New Guinea (Dransfield and Widjaja, 1995). Seethalakshmi and Muktesh Kumar (1998) treated *Oxytenanthera nigrociliata* as a synonym of *Gigantochloa rostrata* Wong and mentioned its distribution from Bastar, Chattisgarh. Recently, Naithani (1999) treated *Oxytenanthera nigrociliata* non (Buse) Munro as a synonym of *Gigantochloa andamanica* (Kurz) Kurz, which is distributed in Andaman Islands, Meghalaya and Tripura. However, *G. rostrata* Wong has been merged under *Gigantochloa macrostachya* Kurz, a species so far known only from Myanmar and Malaya.

Two registered or incorporated herbarium specimens viz. *Hewettson* 8 (Oct. 1950) and *Balakrishnan* & *Henry* 1205 (Feb. 1961), both having flowers were

critically examined and found out to be *Gigantochloa albociliata*. Thus collection made by the present authors from Kanger Valley, National Park and study of above mentioned two herbarium specimens suggest that after Myanmar and Thailand, *G. albociliata* from wild is for the first time reported in India i.e. from Bastar, Chattisgarh. To facilitate its identification, a description along with an illustration and photograph is provided. The specimen is deposited in the herbarium of Forest Research Institute, Dehra Dun (DD).

Gigantochloa albociliata (Munro) Kurz, For. Fl. Burma 2:555. 1877. *Oxytenanthera albociliata* Munro in Trans. Linn. Soc. London 26:129. 1868. *Oxytenanthera nigrociliata* sensu Sharma & Tomar in Proc. All India Bamboo Study Tour Symposium 1-27, 1964 non (Buse) Munro 1868. *Gigantochloa hasskarliana* sensu Roy in Fl. Madhya Pradesh 3:446. 2001 non (Kurz) Backer ex Heyne (1927).

Vernacular name : Bastar, Chattisgarh – *'Peta bans'*.

An arborescent bamboo, evergreen or deciduous. *Young shoots* purplish-green or light green, covered with dark brown hairs, blades reflexed. *Culms* densely tufted, young one straight, old arching, sometimes zig-zag, 7-10 m tall, hispid at the summit, sometimes with thin yellow stripes; *nodes* oblique, slightly raised; *internodes* 15-40 x 1.5-2.5 cm; *wall* 6-8 mm thick; *branches* 2-3 from old culm nodes, very thick, about 4 cm in girth, without cavity at base. *Culm sheaths* 10-20 x 15 cm (broader than long), thick, hard, at first covered with tawny appressed hairs, afterwards smooth, folded and coriaceous at the base, ending at the truncate mouth in a narrow, slightly auricled, naked band; *imperfect blade* oblong-lanceolate, about as long as the sheath, acuminate, broad and rounded at the base, straight in young culms, decurrent in old; *ligule* 1.0-2.5 cm high, truncate, toothed. *Leaves* 15-20 cm x 2-2.5 cm, linear-lanceolate, rounded at the base, shortly petioled, long-setaceous, glabrous above, margins scabrid; secondary veins 6-8, intermediate usually 4-5, transverse veinlets absent but frequent pellucid glands having appearance like them present on the lower surface; *sheath* smooth, striate, ending in a smooth callus and truncate edge; *ligule* rather long, faintly ciliate.

Inflorescence spreading, compound panicle, spikelets in sub-verticillate groups, placed laterally and alternately on the floriferous branches, having yellow, ciliate scales at the base. *Spikelets* 18-20 mm long, pale, narrowly cylindrical, often curved, composed of two glumes, one male floret, with (sometimes) hermaphrodite, no perfect floret at the top; *glumes* ovate-acute, white-ciliate; *lemmas* elliptic or ovate, acute or feebly emarginate, convolute, many-nerved, white-ciliate; *paleas* often much shorter, ovate-obtuse, 2-keeled, ciliate on the keels, that of the upper floret not keeled, convolute. *Stamens* long exserted; *anthers* yellowish-green, long hirsute, apiculate. *Ovary* narrowly ovoid, long-acuminate, pubescent; *style* long; *stigmas* 2, white. *Caryopsis* elongate, oblong-cylindrical, acuminate, beaked.

Specimens examined : Dandak Gufa, Kanger Valley, National Park, Jagdalpur, Bastar, *Naithani* 4297 (DD); Barsur Reserve, South Bastar, *Hewettson* 8 (DD); Kutamsar Cave, Bastar, *Balakrishnan* & *Henry* 12054 (MH).

Distribution : Myanmar and Thailand, India. Introduced in Laos and Europe.

Sharma and Tomar (1964) stated that *Oxytenanthera nigrociliata* is found scattered is parts of Dhandhai, Narainpur, Kondagaon and Makdi ranges of North Bastar Division. It also occurs in Korar, Keskal and Antagarh ranges of Kanker Division and is confined particularly to the alluvial nala banks. A few miserable clumps also occur at places in South Raipur Division.

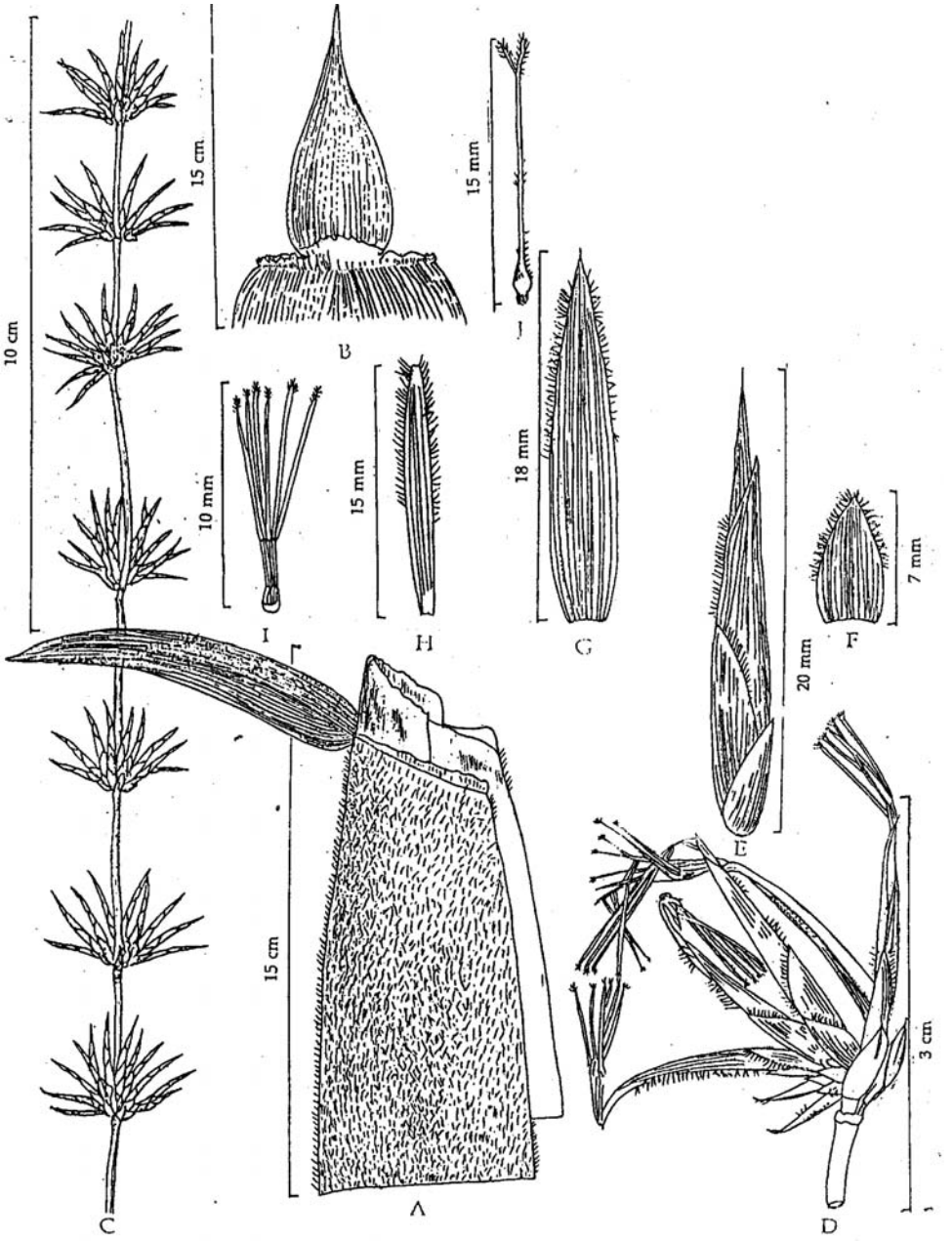
Habitat : It occur chiefly in mixed deciduous forests, often on very sandy soil and sometimes on decomposing laterite (Troup, 1921). According to Brandis (1906) it is a bad companion for teak as the tangled masses of low arching stems tends to smother and break down the saplings, while those which survive are not drawn up by the bamboo and not forced to form tall and clean stems. Tree growth does not generally flourish where the species is abundant. In Kanger Valley, Bastar State it is found very common along water courses and lower slopes in Sal and Teak forest.

Phenology : According to Troup (1921) this species often flowers sporadically. Anantachote (1987) stated that this species flowers every year in Thailand. Dransfield and Widjaja (1995) stated that it flowers sporadically and gregariously. In Thailand, sporadic flowering is common and occur usually from October to December. Mature seed are available from February to April however, gregarious flowering is rare. Gamble (1896) and Blatter (1931) mentioned its sporadic flowering during 1857, 1871, 1880, 1891-92, 1900-1901 in Myanmar and in Europe during 1909. Troup (1921) mentioned its gregarious flowering from Myanmar viz. in part of the Yanaumgmyin in 1911; in Thayetmyo, the East Yoma reserve in 1912; in Toungoo in 1913; in South Toungoo, Shwegyin, Rangoon and Yaw Forest Division in 1914; in North Toungoo and Taungyin Forest Division in 1916 and in Zigon, Tharrawaddy, and West Salween Forest Division in 1917. According to Anon. (1961) and Sharma and Tomar (1964) in India *Gigantochloa albociiliata* (*Oxylenanthera nigroaliata*) it gregariously flowered in March, 1960 in North Bastar Division. An average clump consisting of about 40 culms yielded about 10-12 lbs of ripe seeds. Local enquiry revealed that the species had last seeded some 45-50 years ago. This indicate its flowering cycle of 45-50 years. Dransfield and Widjaja (1995) stated that a flowering cycle of 30 years has been reported from Assam (India). Since *G. albociliata* was wrongly identified *Thyrsostachys oliveri* from Assam, therefore 30 years flowering cycle is not correct for *G. albociliata*. During June 1986 and July 1990 one of the authors (HBN) observed its sporadic flowering in Forest Research Institute, Dehra Dun. Sri Ram Das Baghel, Game Guard, Kanger Valley, National Park, informed the authors that the species has flowered sporadically in 1995 at Kanger Valley, National Park.

Growth and Development : Culms raised from a rhizome cutting produces 27 culms with average height 10.5 m (ranging 5-16 m), and average diameter 2 cm (ranging 1-3 cm). A mature clump in mature stands in Thailand bears 50-60 culms. Annual culm production in natural stands is 9-46 t/ha. (Dransfield and Widjaja, 1995).

Uses : In Madhya Pradesh it is generally used by tribals for making baskets and fencing (Sharma and Tomar, 1964).

Fig. 1



Gigantochloa albociliata (Munro) Kurz

A. Culm sheath (folded; B. Culm sheath upper portion (inside view); C. Inflorescence; D. Group of spikelets; E. Spikelet; F. Glume; G. Lemma; H. Palea; I. Stamens; J. Ovary

Anon. (1961) stated that during gregarious flowering local people of Bastar collected large quantities of seeds for their food. According to Dransfield and Widjaja (1995) culms of *Gigantochloa albociliata* are used as light construction (cottage walls, frames and thatched roofs), as trellis for climbing vegetables, for fence construction (typical in western parts of Central Thailand), tool handles (basal culm parts), furniture (with proper firing culms can be bent like rattans), woven wares and as raw material for paper and boards. Also grown as an ornamental plant in gardens. Young shoots are eaten as a vegetable. In Thailand, its young shoots are canned and exported (e.g. to Japan). Farmers receive about 0.07 US $/kg for young shoots. For other South-East countries, *G. albociliata* is potentially interesting for the production of edible shoots and the development of a furniture industry.

SUMMARY

***Gigantochloa albociliata* (Munro) Kurz, a native of Myanmar and Thailand has now been reported from the wild from Kanger Valley, Wildlife Sanctuary, Bastar (Jagdalpur), Chattisgarh. It has gregariously flowered Bastar in 1960. It can easily recognized by its narrow white ciliate spikelets, and having long ligule of culm sheaths. It is often confused with *Gigantochloa nigrociliata* (Buse) Munro, a species endemic to Indonesia and Thailand and having long, black ciliate spikelets and culm sheaths having narrow ligule, and raised rounded auricles ending in curved sheath extension.**

बस्तर, छत्तीसगढ़ भारत से *जायगैण्टोक्लोआ एल्बोसिलियाटा* (मुनरो) कुर्ज बांस की प्राप्ति होने पर कुछ टिप्पणिया

एच०बी० नैथाणी व आ०सी० पाल

सारांष

म्यामार और थाईदेश का देशज बांस, *जायगैण्टोक्लोआ एल्बोसिलियाटा* (मुनरो) कुर्ज अब जंगली दशा में कांगेर घाटी, वन्यप्राणि अभयारण्य, बस्तर (जगदलपुर), छत्तीसगढ़ में होता सूचित किया गया है। इसका बस्तर में 1960 में सामूहिक पुष्पन हुआ। इसे अपनी संकरी श्वेत पक्ष्मल शूकिकाओं और सन्धिस्तम्भ–कंचुक की लम्बी जिह्वा रहने से संरलतया पहचाना जा सकता है। इसे बहुधा भ्रमवश *जायगैण्टोक्लोआ नाइग्रोसिलियाटा* (ब्यूसे) मुनरो समझ लिया जाता है जो इन्डोनेसिया और थाईदेश में ही सीमित मिलने वाली जाति है और जिसमें लम्बी, काली पक्ष्मल शूकिकाएं सन्धिस्तम्भों के कंचुक संकरी जिह्वा वाले और उठे हुए गोलायित कान होते हैं जो मुडे हुए कंचुक विस्तार पर जाकर खत्म हो जाते हैं।

References

Anantachote, A. (1987). Flowering and seed characteristics of bamboos in Thailand. *Recent Research in Bamboos* (Rao, A.N., Dhanarajan, G. and Sastry, C.B., eds.), Canada. pp. 136-145.

Anon. (1961). Gregarious flowering of *Oxytenanthera nigrociliata. Indian Fo*rester, **87**:400.

Bahadur, K.N. and H.B. Naithani (1976). Range Extension of the Bamboo – *Cephalostachyum pergracile* Munro. *Indian Forester,* **102** (9) :596-601.

Banik, R.L. (2004). Bamboos of Tripura. *Indian Forester,* **130** (9) :1081-1083.

Blatter, E. (1931). Some notes on the flowering of bamboos. *J. Bombay nat. Hist. Soc.,* **34**:1097-1099.

Bose, R.B., H.S. Pandey and A.K. Banerjee (1987). Bamboos of the Indian Botanic Garden. *Bull. Bot. Surv. India,* **29**:29-42.
Brandis, D. (1906). *Indian Trees*, L. Reeve, London. pp. 1-767.
Deb, D.B. (1983). *The Flora of Tripura State*, New Delhi. **2**:486-475.
Dransfield, S. and E.A. Widjaja (1995). Bamboos, Plant Resources of South-East Asia *(PROSEA). No. 7.* Backhuys, Leiden. pp. 1-189.
Gamble, J.S. (1896). The Bambuseae of British India. *Ann. Roy. Bot. Gard. Calcutta,* **7**: 1-133.
Gilliland, H.B. (1971). Flora of Malaya (Grasses). (Burkill, HM, ed.). Singapore. **3**:1-317.
Gupta, K.K. (1972). Flowering in different species of bamboos in Cachar District of Assam in recent times. *Indian Forester,* **98** (2): 83-85.
Gupta, K.K. (1987). Gregarious flowering of *Oxytenanthera* spp. *Indian Forester,* **113** (5) :385.
Holttum, R.E. (1956). The classification of bamboos. *Phytomorphology,* **6**:73-90.
Holttum, R.E. (1958). Bamboos of Malaya Peninsula. *Bull. Gard. Singapore,* **16**:1-135.
Majumdar, R.B. (1989). Bambusoideae. *Florae Indicae Enumeratio: Monocotyledonae* (Karthikeyan, S., Jain, S.K., Nayar, N.P. and Sanjappa, M., eds.). BSI, Howrah. pp. 27-283.
Munro, W. (1868): A monographof the Bambusaceae. *Trans. Linn. Soc. London,* **26**:1-157.
Naithani, H.B. (1990a). Nomenclature of Indian species of *Oxytenanthera* Munro. *J. Bombay nat. Hist. Soc.,* **87**:439-40.
Naithani, H.B. (1990b). *Flowering Plants of India, Nepal & Bhutan.* Dehra Dun. pp. 1-711.
Naithani, H.B. (1993). Taxonomic Studies of Indian Bamboos. II. *Ph.D., Thesis*, submitted to HNB Garhwal University, Srinagar, Uttaranchal.
Naithani, H.B. (1999). Nomenclature and Identity of some Bamboo species. *Indian Forester,* **125** (11) : 1129-1140.
Prasad, R. and S.K. Chadhar (1988). Retrival of Bamboo Forests in Madhya Pradesh. *Indian Forester,* **114** (9) :496-504.
Rawat, B.S. (1987). Flowering of bamboos. *Indian Forester,* **113** (11) :760-761.
Roy, G.P. (1984). Grasses of Madhya Pradesh. *Fl. India Ser.,* BSI, Howrah. **4**:1-180.
Roy, G.P. (2001). Poaceae. *Fl. Madhya Pradesh*-III (Singh, N.P., Khanna, K.K., Mudgal, U. and Dixit, R.D., eds.). BSI, Howrah. pp. 340-546.
Seethlakshmi, K.K. and M.S. Muktesh Kumar (1998). *Bamboos of India : a Compendium.* KFRI, Peechi. pp. 1-342.
Sharma, N.K. and M.S. Tomar (1964). Bamboo Forests of Madhya Pradesh. *Proc. All. India Bamboo Study Tour, Symposium*.F.R.I., Dehra Dun. pp. 1-27.
Shukla, B.K. and G.P. Roy (1983). A contribution to the grasses of Madhya Pradesh II. *J. Econ. Tax. Bot.* **4**:283-286.
Shukla, U. (1982). Grasss of Meghalaya. *J. Econ. Tax. Bot.,* **3**:47-54.
Shukla, U. (1996). *The Grasses of North-Eastern India.* Jodhpur. pp. 1-404.
Troup, R.S. (1921). *The Silviculture of Indian Trees. Clarendon Press,* Oxford. **3**:977-1013.
Widjaja, E.A. (1987). A revision of Malesian *Gigantochloa* (Poaceae – Bambusoideae). *Reinwardtia,* **10**(3):291-380.