## *AUSTRALOXYLON* FROM THE KAMTHI BEDS OF LOWER GONDWANA, INDIA

A new species of *Australoxylon*, *A. kanhargaoense* has been described from the Kamthi Beds (Lower Gondwana) of Kanhargaon village, Chandrapur District, Maharashtra, India.

*Australoxylon* Marguerier, 1971

*Australoxylon kanhargaoense* sp. nov.

*Diagnosis*

Pycnoxylic secondary wood; growth rings clear (macroscopically 5–7 mm wide), late wood 14 tracheids wide (crushed), early wood tracheids polygonal to squarish. Medullary rays in cross section placed at an interval of 3–6 trachieds; rays homogeneous, 1–2 seriate, 1–30 cells deep, average height 9–10 cells (in 25 counts). Tangential surface of tracheids pitted, pitting 1–3 seriate, hexagonal, alternate and contiguous, radial wall pits c t tangentially appearing as beads. Radial wall pitting 1–3 seriate, pits circular, bordered, alternate-opposite-subopposite, separate-contiguous (mixed type of pitting), pits disposed into groups of 2, 3, 4; cross-field pits 1–7, mostly 4, bordered, sub-circular in shape.

*Holotype* : Regd. No. 35307, Birbal Sahni Institute of Palaeobotany, Lucknow.

*Locality* : Kanhargaon village, Chandrapur District, Maharashtra, India.

*Horizon* : Kamthi Beds, Lower Gondwana.

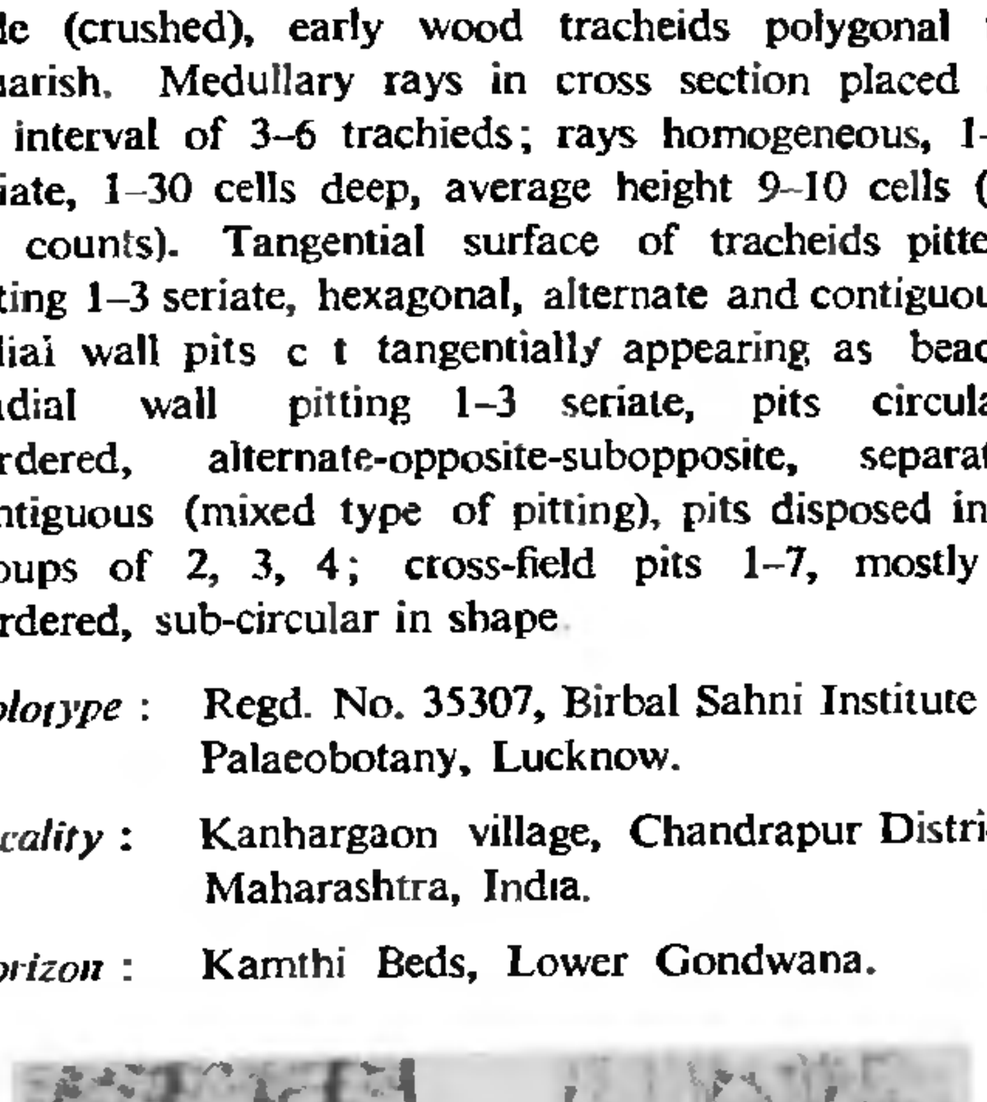

FIG. 1. Cross-section showing the crushed late wood and growth ring zone, 75 .

FIG. 2. Tangential longitudinal section showing the beaded appearance of tangential trachied walls, 225 .

FIG. 3. Radial longitudinal section showing opposite—alternate pits and groups of 2, 3, 4 pits, 500 ×.

According to Marguerier[3], the main diagnostic features of *Australoxylon* are mixed type pitting and arrangement of 2, 3, 4, or 5 pits into clusters. Marguerier described two species, *viz.*, *A. teixeirae* (Type species) from the Lower Permian of Mozambique and *A. natalense* from the Ecca Formation of Natal. *A. teixeirae* differs from *A. kanhargaoense* in lacking tangential wall pits and *A. natalense* differs in having well differenciated growth rings. Hence, the present wood is referred to a new species.

It is interesting to add that mixed pitting and grouping condition of pits has also been found in *Dadoxylon chandaensis* Chitaley[1] (1949 *a*), *Dadoxylon eocenum* Chitaley[2] (1949 *b*), *Dadoxylon deccani* Shukla[4] (1938), *Dadoxylon resinosum* Shukla[5] (1944).

Birbal Sahni Institute of Palaeobotany, Lucknow,
*March* 27, 1978.

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## INDUCED MALE STERILE LEAF MUTANTS IN *CAJANUS CAJAN* (L.) MILLSP.

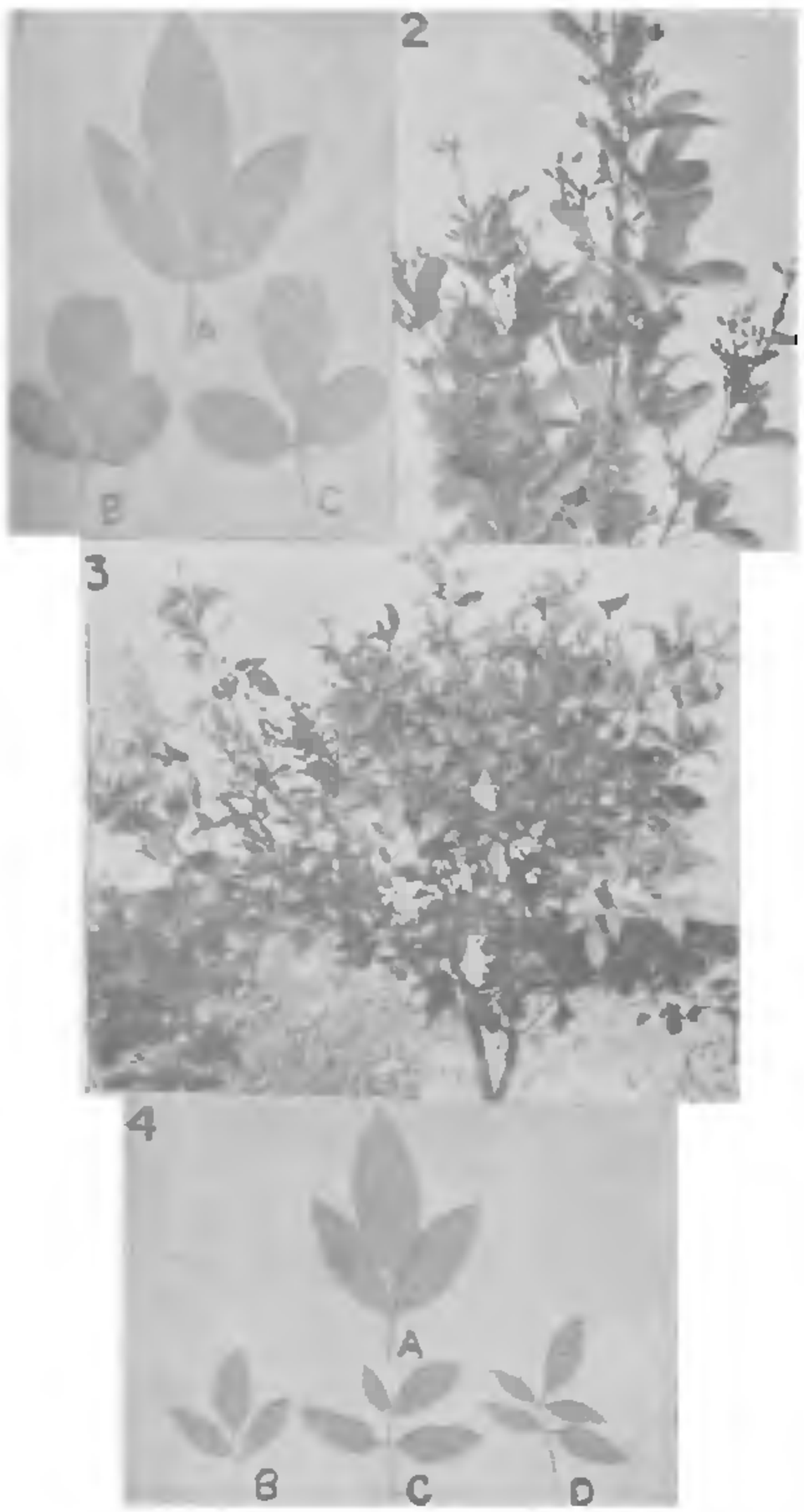
THE utilization of male sterility has become a handy tool in the proluction of hybrids, as it eliminates a laborious process of hand emasculation and pollination. Artificial induction of male sterility has been possible with the nse of physical and chemical muragens[1–6]. However, there are very few reports of male sterility in pigeon-pea which would promote out-crossing[7–9]. The present paper deals with the induction of male-sterile leaf mutants in an early maturing var. Pusa Ageti of *Cajanus cajan* (L.) Millsp. with ethyl methane sulphonate (EMS) and gamma-rays.

The seeds of *Cajanus cajan* obtained from Division of Genetics, I.A.R.I., New Delhi, pre-soaked for 11 hours in distilled water at room temperature, were treated with (200 seeds per treatment) 0·1, 0·2 and 0·3% aqueous solutions of EMS for 6 hours. The dry seeds were also irradiated with 10, 20 and 25 kR of gamma-rays at I.A.R.I., New Delhi. The chemically treated seeds after thorough washing, and the irradiated and untreated seeds (control, were sown for obtaining $M_1$ genetation. The seeds collected from each $M_1$ plant on individual plant basis were sown in the field in randomized-block-single row design.

Two types of male-sterile leaf mutants following 0·3% EMS and 25 kR of gamma-rays respectively were recorded from two individual plant progenies in $M_2$ generation.

*EMS induced male-sterile leaf mutants*

Three mutants of this type were screened. They attained a height of 85–95 cm as compared to that of control plants (115 cm). The leaflets varied from obcordate or somewhat oval in shape with obtuse apex. The terminal leaflet of each leaf, however, was slightly notched (Fig. 1 B & C). The flowering in these mutants was delayed by nearly a month in comparison with the controlled ones. All the buds of these mutants failed to bloom throughout their existence (Fig. 2). Two types of cliestogamous flowers were present on each mutant, *viz.*, normal and abnormal flowers. The abnormal flowers exhibited bicarpellaty condition of the ovary. In the flowers, the wing petals remained outside the standard petal, whereas the abnormal flowers invariably showed bicarpellary condition of the ovary. None of these mutants produced any pod because of a very high degree of pollen sterility (97·22–99·30%) as tested by Alexander's method[10].




FIGS. 1–4. Fig. 1. Leaves of control and male-sterile leaf mutant. A. Control; B. & C. EMS Induced mutant. Fig. 2. flowering branches of EMS induced male-sterile leaf mutant showing cleistogamous flowers. Fig. 3. Growth habit of gamma-rays induced male-sterile multifoliate mutant. Fig. 4. Leaves of control and gamma-ray induded mutant. A. Control; B, C & D. Tri–, Tetra– and pentafoliate leaves of mutant.

*Gamma-rays induced male-sterile multifoliate mutant*

A single male sterile multifoliate mutant was screened. It exhibited reduction in its height (80 cm) as compared to control plants (Fig. 3). Besides, normal trifoliate leaves, some tetra and pentafoliate leaves were also present on the lower branches of the mutant (Fig. 4).

The flowering in this mutant was delayed about a month as compared with the control plants. All the floral buds were cleistogamous throughout their life span, except for 5–10 buds. This mutant also failed to produce any fruit and exhibited pollen sterility between 34–57%. The causes of fruitlessness are yet to be worked out.

Sincere thanks are due to Doctors J. S. Dhakre, S. V. S. Chauhan, M. P. Singh and R. Kumar for their valuable help.

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*April 7*, 1978.

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