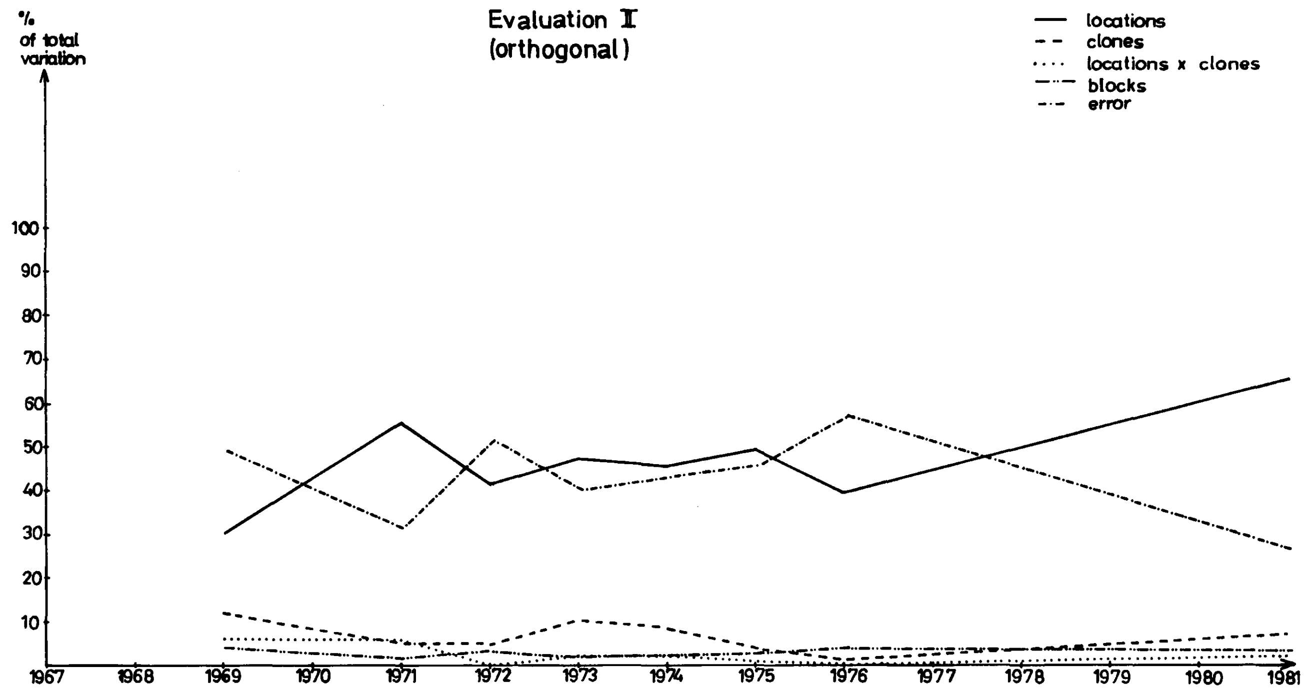

Figures 1a and *1b*. — Proportions of variability for the different sources of variation for the orthogonal evaluations I and II dependent on age (trait: growth = height-increase).

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Short Note: Albino Gene Carriers and Mating System in Bambusa arundinacea (Retz.) Willd.

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Summary

On analysis of the frequencies of albinos produced by two albino gene carriers, it is inferred that *Bambusa arundinacea* (RETZ.) WILLD. prefers selfing. A possible explanation for favouring self pollination is discussed.

Key words: Albino gene carriers, Mating System, *Bambusa arundinacea*.

Bambusa arundinacea (RETZ.) WILLD., an important species for paper and pulp production, is very much preferred since it can be used as a raw material for high quality paper due to its long fibred nature and also for its many other uses. Hence, there is a great demand for this species, which exceeds raw material supply. India has achieved great strides in production of bamboo forests with 160,000 hectares of bamboo plantations raised till 1980 (SHARMA, 1980). Even then, the demands cannot be fully satisfied without sacrificing the natural resources and due to overexploitation there is a very rapid depletion of the natural resources. To overcome this, plantations of improved bamboos are to be raised on a large scale.

To attain increased volume production and growth rate, genetic principles should be followed for which the information on natural breeding system is necessary.

B. arundinacea is generally considered to be cross-pollinated. KONDAS *et al.* (1973) deduced the species to be self-compatible as they observed seed set on bagged and unemasculated inflorescences. The present author also observed seed set adopting the same method. But that does not give an idea that the species is self or cross pollinating. The degree of selfing can be calculated either by using gene markers or by allozyme studies. SQUILLACE and KRAUS (1963) estimated the degree of natural selfing in slash pine using albino gene carriers as gene markers.

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During the experimental studies on a progeny trial in *B. arundinacea*, two albino gene carriers were detected (INDIRA and KOSHY, 1986). To ascertain the nature of the mating system in the species, the frequencies of the albinos produced were analysed taking into account the distance between the two clumps which carried the albino gene.

Gregarious flowering of the thorny bamboo, *B. arundinacea*, occurred in Kerala during 1982 to 1986 which received much attention due to its very long flowering cycle and semelparous nature (flowering only once in its lifetime). As part of a progeny trial, seeds collected from thirteen individual clumps from Kannara and Peechi area of Trichur Dist., Kerala were sown in nursery beds. In each family more than 1000 seeds were germinated. Albinos were noticed in two families, No. 9 and 12. It was interesting to note that in both cases albinos segregated in a 3:1 (3 green: 1 albino) simple Mendelian ratio showing one-factor inheritance for this character (INDIRA and KOSHY, 1986). Single factor inheritance for albinism was reported in other forest tree species as in slash pine (SQUILLACE and KRAUS, 1963) and himalayan pine (VENKATESH and THAPLIYAL, 1977). The albinos noticed were lethal homozygous recessives and they were not spontaneous mutants but recombinants produced either by selfing or crossing between the parent clumps 9 and 12, which were heterozygous for this character. Other eleven parent clumps must be homozygous dominants as they produced no albinos.

It was observed that only the neighbouring clumps No. 9, 10, 11 and 12 had flowered during the same time in 1983 and no other clump of that area had flowered during this period. To find out whether the recombinant albinos have resulted from either selfing or by a cross between the gene markers, the distance between the clumps No. 9 and 12 and the presence of other clumps in between them were considered. The distance between the clumps were 12.1 m, 23.1 m, 8.5 m and 41.5 m between clumps 9—10, 10—11, 11—12 and 9—12 respectively.

There is comparitively little chance for cross pollination between the gene markers 9 and 12 since 10 and 11 were in between them. As stated by STRAND (1957), a given tree will most likely cross with its nearest neighbours. Clump 9 had more chances to cross with 10 or 11 rather than with 12 and vice versa. So to produce albinos in a well defined ratio of 3:1, the gene carriers 9 and 12 should have self fertilized. If *B. arundinacea* is a cross fertilizing species, then the gene carriers would have produced only phenotypically normal plants or significantly varying proportion of albinos. In both cases, the ratio is very close to 3:1, X^2 being 0.0025 and 0.33 in family No. 9 and 12 respectively. Hence it is inferred that *B. arundinacea* prefers self pollination. However, the extent of outcrossing could not be estimated for want of enough data.

If *B. arundinacea*, a mass flowering semelparous species having a very long vegetative phase of 30—45 years, resort to cross-pollination, then the variation in flowering time between clumps within and between populations would affect seed production and moreover, isolated clumps would not produce any seed, which in turn would endanger the species. So to ensure enough seed production, or to have a 'fertility insurance' selfing might have evolved as an adaptation for the species' survival.

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Buchbesprechungen

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In dem Tagungsband sind 23 deutschsprachige Vorträge enthalten, die sich mit der Entwicklung und dem derzeitigen Stand der Buchenwirtschaft, der Saatgutversorgung und Anzucht, der Begründung von Buchenbeständen und verschiedenen Fragen der Bewirtschaftung von Buchenbeständen in Thüringen und in der Tschechoslowakei befassen. G. VON WÜHLISCH

Genetic Differentiation and Dispersal in Plants. Edited by P. JACQUARD, G. HEIM and J. ANTONOVICS. Springer Verlag, Berlin, Heidelberg, New York, 1985. NATO Advanced Sciences Institutes Series. Hardcover. DM 179,—

This book is based on a Workshop on "Population Biology of Plants: The Interfaces (Genetics, Physiology, Demography, Biogeography)" held in Port-Camargue, France, May 21—25, 1984. In this Workshop specific emphasis was placed on diversification of plant populations in relation to genetic and physiological mechanisms and modes of reproduction and dispersal. All populations are subjected to environmental screening and modification. Given adequate genetic diversity and plasticity, the populations can adapt to a changing environment. These are interesting problems from the standpoint of population genetics, physiological and ecological genetics. Genetic differentiation and dispersal in both herbaceous and woody plants are discussed in 28 chapters of this book. Genetic differentiation is considered at two levels: variation in single gene or molecular variation, and variation in phenotype and fitness. Dispersal of plants is considered at the gene flow level and at an individual or phenotype level. This book discusses the structure of populations, their migration, adaptation, differentiation, dispersal and evolution in plants.

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