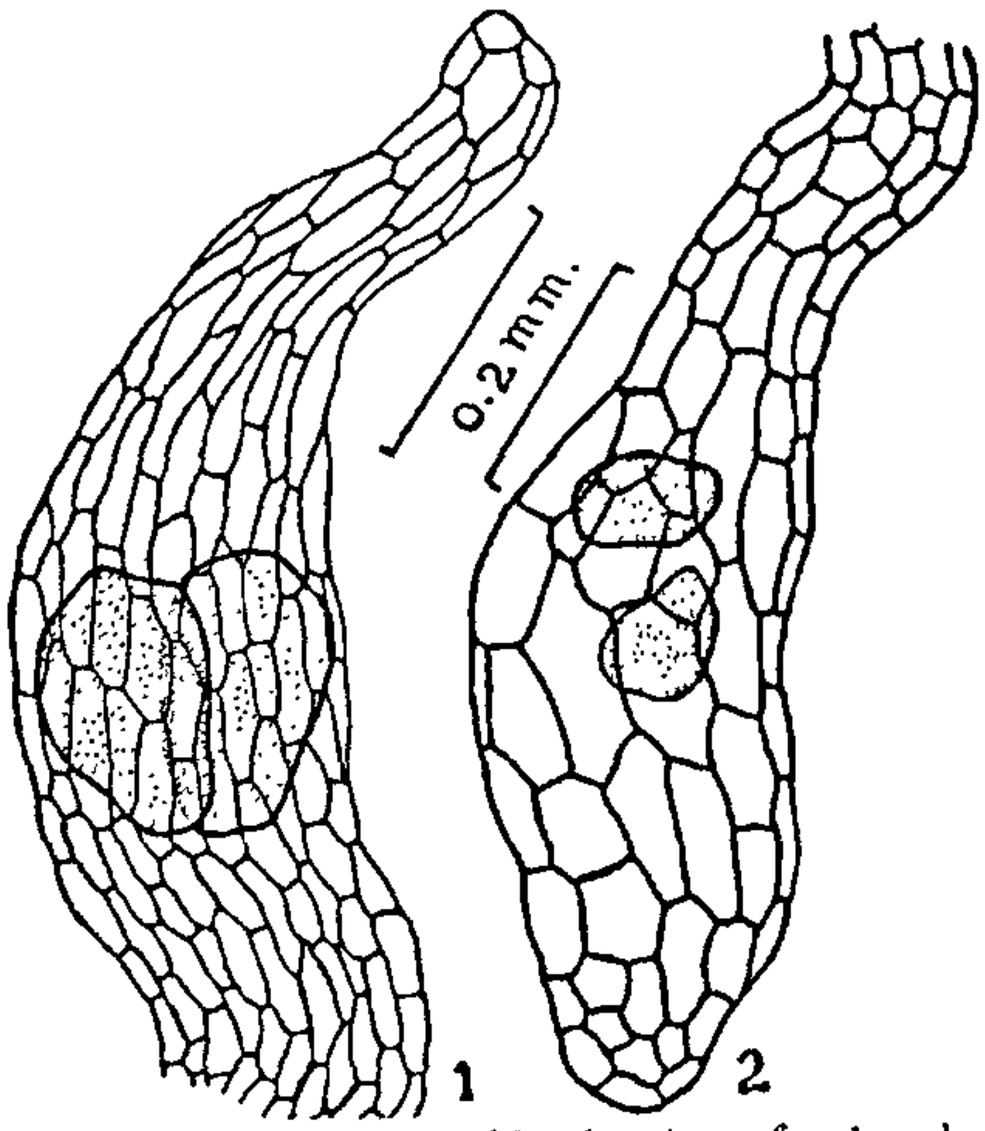
OBSERVATIONS ON THE OCCURRENCE OF POLYEMBRYONY IN TWO SPECIES OF ORCHIDS

POLYEMBRYONY has been observed in some of the Gymnosperms and in some species of Angiosperms. The occurrence of this phenomenon in few species of orchids has been reported earlier[1–5]. While studying the frequency of distribution of polyembryony among orchids, two more species, *viz.*, *Spathoglottis plicata* (Bl.) Bijd. and *Geodorum densiflorum* Schlecht. were found to exhibit this phenomenon under natural conditions. The important features observed in the polyembryonic seeds of the above two species are recorded in this communication.

In both the species studied, the polyembryonic condition is found to be of two embryos only, and these two embryos in a seed are generally lying almost parallel to each other. Further, the twin embryos when compared with that of the normal ones, are found to be remarkably smaller. In the case of *Spathoglottis plicata* (Fig. 1) this difference in size is about 93 × 31 μ and in the other species, *Geodorum densiflorum* (Fig. 2) it is measured to be about 31 × 15 μ. In addition to this, it is also noted that, of the two embryos, one is always slightly smaller than its sister–embryo. However no major difference between the polyembryonic and normal seeds has been noticed either in the shape of the embryos or in the size and shape of the seeds.



FIGS. 1–2. Camera lucida sketches of polyembryonic seeds. Fig. 1. *Spathoglottis plicata* (Bl.) Bijd. Fig. 2. *Geodorum densiflorum* Schlecht.

Polyembryony among Orchidaceae is mainly due either to (1) cleavage of the zygote or proembryo or (2) apomixis. The first type was reported by Swamy[2] in *Cymbidium bicolor* where the resulting seeds were with two embryos each, one among them being slightly smaller. Another form of cleavage polyembryony with some variations was reported in *Eulophia epidendraea* in which case the seeds formed were wth multiple embryos.[3] Apomictic type of polyembryony[5] was recorded in *Zeuxine sulcata* where the number of embryos produced in a seed varied from one to several. In *Gastrodia elata* two embryo sacs in the same ovule often develop to maturity[4]. However, in the present studies, from the number and size of the embryos, it appears that this phenomenon in these two species is due to cleavage, and especially of *Cymbidium type*. The frequency of polyembryony in these two species is found to be as high as about 5%, which is comparatively higher than that reported earlier[2].

The author is thankful to Dr. N. C. Nair, Dr. J. Joseph and Sri. A. V. N. Rao for encouragement and to Dr. S. N. Hegde for valuable suggestions.

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A SIMPLE TEST FOR ASSESSING COMPARATIVE RESISTANCE OF VEGETABLE FIBRES TO MICROBIAL DAMAGE

To avoid unnecessary economic loss the Vegetable fibres must be graded according to their susceptibility to microbial damage. The present study describes a simple but reliable method of assessing the comparative durability of the fibres against microorganisms. The method proved successful in this respect with ramie fibres having different gum contents.[1]

White jute (*Corchorus capsularis*), tossa jute (*Corchorus olitorius*), mesta (*Hibiscus cannabinus*) and roselle (*Hibiscus sabdariffa*) were obtained from Jute Agricultural Research Institute, Barrackpore, West Bengal; sisal (*Agave sisalana*) from Sisal Research Station, Bamra, Orissa; sunnhemp (*Crotalaria juncea*) from Sunnhemp Research Station, Pratapgarh, U.P.; *banana* (*Musa sapientum*) from Khadi and Village Industries Commission, Bombay and Manila (*Musa textilis*) from a private source. The fibres were first sorted to eliminate the defective and unclean fibres. The selected

fibres were then tested for their initial tenacity. The fibres were then sampled and bundles 8" in length and 15g in weight were incubatesd at 30° C with 30°g sterile distilled water in sterile petri dishes under covered condition for different periods of time. Loss of moisture in the petri dishes during incubation was made up aseptically with sterile distilled water once a week. At definite intervals of time, representative samples were taken out, washed first with water and then with rectified spirit and finally dried in air. The fibre strength was then tested in J.T.R.L. bundle strength tester[3] and the extent of retention of strength was taken as an index of extent of resistance to microbial damage.

Results are presented in Table 1 from which the fibres may be graded in the order of decreasing resistance to microbial damage as Manila > sisal > mesta > sunnhemp > *banana* > tossa jute > white lute.

TABLE I

Comparative resistance of different fibres to microbia damage

Fibre	% retention of tensile strength after incubation for			
	15 days	1 month	2 months	3 months
White jute	64·9	60·4	36·0	7·2
Tossa jute	68·5	47·6	25·0	14·9
Banana	78·7	37·0	34·3	15·0
Sunnhemp	43·4	32·7	27·3	20·6
Mesta	73·2	51·4	44·6	34·5
Sisal	80·5	66·7	70·2*	52·5
Manila	100	99·6	86·9*	91·3

N.B.—Results were calculated on the average of 3 replications.

* These anomalies may be due to minor sample variations.

In the method described, the clean and undamaged fibres were sampled under identical conditions and during the period of sampling all the fibres were under the same microbial exposure. As such, there was no significant difference in the initial microbial population of the fibres. Obviously, incubation in moistened state with sterile distilled water under covered condition at 30° C allowed the predominant growth and activity of the microorganisms (mainly fungi and bacteria) in their normal association to degrade the fibre cellulose proportionately as the susceptibility to damage.

Reports so far published[3,4] indicate that the resistance to damage of a fibre is mainly related to its physical properties, *viz.*, crystallinity, chain length of cellulose and mode of association of fibre constituents and its chemical composition, *viz.*, lignin/hemicellulose ratio and presence of some minor constituents. The findings of the present study are more or less concordant with the reasoning as evidenced from available data on different fibres[5–7]. In general higher the crystallinity, chain length and lignin/hemicellulose ratio values, less is the microbial damage.

The methods of testing resistance of fibres to damage includes soil burial test and mixed culture inoculation method[8]. The former is the universal method of testing rot resistance and is most suitable for testing fibre goods treated with antiseptics. The mixed culture test is no doubt every sound but is a bit cdmbersome as the propagation and maintenance of five different cellulolytic fungi are involved in it. Along with the above two methods, the method mentioned here may be used as a very simple and inexpensive technique for comparing the resistance of different cellulosic fibres and fibre goods to microbial damage without any serious drawback.

The authors are indebted to Dr. A. C. Chakravarty, Director, Dr. S. B. Bandyopadhyay, former Director and Dr. P. C. Das Gupta, Head of the Division of Chemistry, for encouragement and facilities. Sincere thanks are also due to Shri N. Geo Paul for his kind co-operation.

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A NEW DISEASE OF *SOLANUM KHASIANUM* C. B. CLARKE emend SEN GUPTA

DURING the survey on diseases of solanaceous plants, the authors observed an interesting disease of *Solanum khasianum* caused by *Colletotrichum capsici* (Syd.) Butl. and Bisb. which is not reported[1-2] earlier from India.

All the aerial parts are susceptible to the disease, which generally appeared at the collar region as dark-brown lesion which deepened and gradually