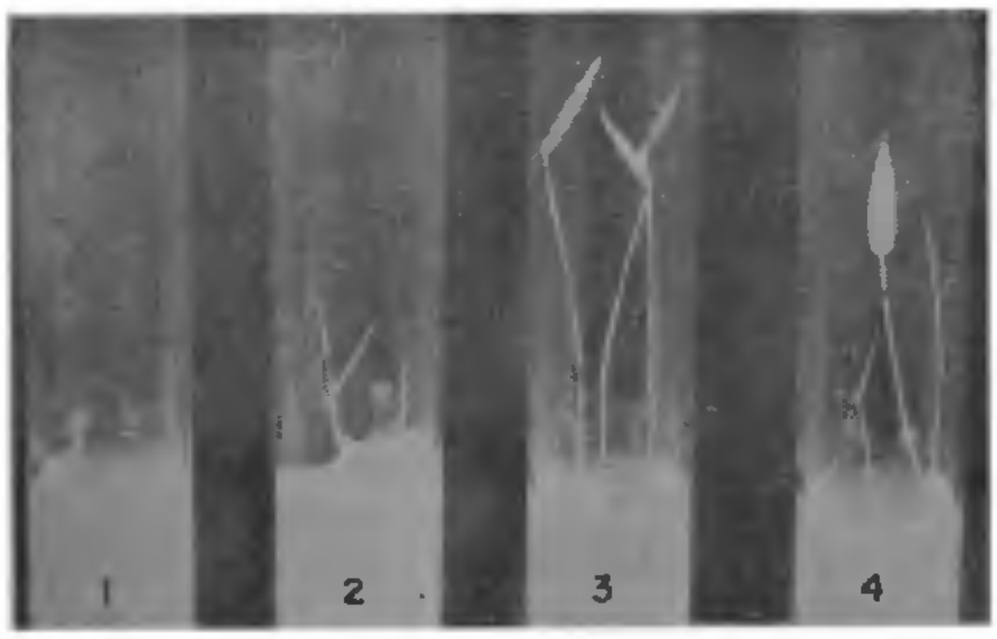
IN VITRO CULTURE OF BAMBOO EMBRYOS

Bambusa and *Saccharum* cross easily but the two genera are isolated by post-fertilization barriers. The most important among these barriers is hybrid inviability (Rao *et al.*, 1967) which could be overcome by resorting to embryo culture. As a first step towards this, the growth requirements of bamboo embryo in artificial nutrient media were standardised and the details are given in this report.

Mature bamboo embryos were aseptically removed from the endosperm and cultured in artificial medium containing Whites major and minor elements and sucrose. Four concentrations of sucrose (0·5, 1·0, 2·0 and 3%) were tried along with the control containing no sucrose. Difco bacterio agar (1%) was melted; other ingredients added; pH adjusted to 5·6; 15 ml. of the medium poured into the culture tubes; tubes plugged with cotton plugs and autoclaved at 15 lb. for 15 mts. After preparing the slants embryos were surface sterilised and implanted five per culture tube. The cultures were kept at 76 ± 1° F. under a 12 hr. photoperiod. Weekly observations were recorded on the growth of the epicotyl and hypocotyl.

In all the treatments the embryo germinated within a period of 3-5 days. The growth of the embryos in the different concentrations is shown in Fig. 1. In the absence of sucrose the



FIGS. 1–4. Growth of bamboo embryo in different concentrations of sucrose. Fig. 1. 0·5% sucrose Fig. 2. 1·0% sucrose. Fig. 3. 2·0% sucrose. Fig 4. 3·0% sucrose.

growth of the hypocotyl and epicotyl was retarded. In the control and in 0·5% sucrose the first leaf did not open out of the coleoptile. The length of the main shoot 15 days after implantation is given in Table I.

From the data it could be seen that in 2% sucrose, maximum growth of the main shoot was obtained. In this case the increase in the length of the main shoot was not on account of the increased number of internodes, but on account of increased length of the internode. From the data it appears that the optimum amount of sucrose required for the growth of the embryo is 2%.

TABLE I

Average length of the main shoot measured 15 days after implantation in nutrient media

Concentration of sucrose	Length of shoot in cm.
Control (0%)	0·5
0·5%	0·8
1·0%	1·25
2·0%	4·66
3·0%	3·6

In embryo culture the role of carbohydrate in the first instance is nutritional and secondly it adjusts the osmotic pressure of the medium equal to that of cell sap. Optimum concentration depends upon the maturity of the embryo and upon the species under consideration. In literature there are many references to the sugar requirements of embryos in artificial media. Haggen-Smith *et al.* (1945) and Sanders and Lieber (1950) used 5% and 4% sucrose respectively for culturing young embryos of corn and *Datura*. Raghavan and Torrey (1963) cultured immature embryos of *Datura, Hordeum* and *Capsella* in media containing 2% sucrose and other growth factors. Simple medium consisting of major and minor elements along with sucrose is satisfactory for mature embryos. Boharmont (1961) tried different concentrations of sucrose for mature embryos of rice and found 2% sucrose to be optimum for satisfactory growth. In the absence of sucrose he found retarded growth for the epicotyl and hypocotyl. The first leaf also did not emerge out of the coleoptile. In the present study also it was observed that mature embryos of bamboo grew satisfactorily in a medium containing 2% sucrose and major and minor elements. In the absence of sucrose even though the embryos germinated their growth was not satisfactory.

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April 17, 1968.

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