the suppressed ear-heads). Macnicol[7] proposed that IAA-oxidase activity was associated with isoenzyme of peroxidase. Yoneda and Endo[8,9] observed seven isoperoxidases in *Pharbitis nil* but only two of them showed IAA-oxidase activity. In our studies we have also noted that the diseased tissue extracts containing high levels of ortho-dihydroxyphenols induced a lag in the peroxidase catalysed IAA-oxidation *in vitro* and the addition of $MnCl_2$ or H_2O_2 in the reaction mixture could reduce the lag period[3] to large extent. Yoneda and Endo[8,9] and Stonier, Stasinos and Murthyreddy[10] concluded that auxin protectors migrated along with some of the isoperoxidases and interferred in IAA-oxidase activity.

It is concluded that infection of *S. graminicola* in pearl-millet, induced formation of new isoperoxidases but they were not able to oxidise auxin in diseased system because of high level of ortho-dihydroxy phenols associated with infection.

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STERILITY IN *PHRAGMITES COMMUNIS* (RETZ.) TRIN.

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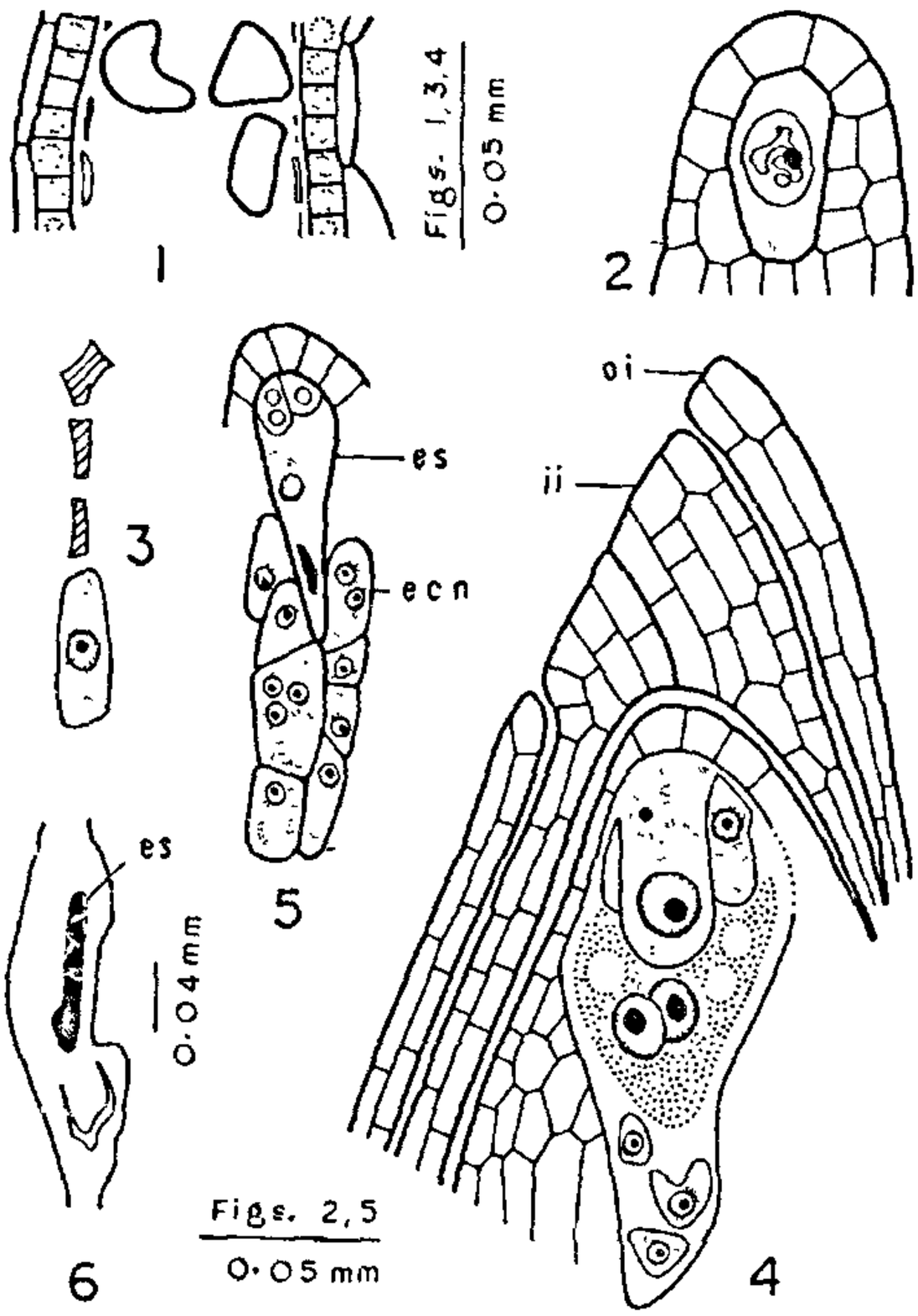
PHRAGMITES COMMUNIS is the common reed widely used for thatching houses and in the manufacture of pulps for rayon and paper. During embryological investigations in the family Poaceae it was observed that this grass propagates exclusively by vegetative means by underground rhizomes with no seed set, though it flowers regularly. The present report describes the developmental aspects of the anther and ovule of *P. communis* which was collected from Kolleru Lake (Andhra Pradesh).

In its very early development, the anther comprises of a homogenous mass of cells. The archesporium is hypodermal and the development of the anther wall is of the Monocotyledonous type[1] showing a subepidermal endothecium with fibrous thickenings, single middle layer and uniseriate glandular tapetum of binucleate cells. The microspore mother cells undergo the usual meiotic divisions and give rise to isobilateral microspore tetrads. The microspores do not undergo any further development but degenerate. Thus the anther lobe at maturity encloses only aborted microspores without any protoplasmic contents (figure 1).

The ovary is superior and unilocular with a subbasal, bitegmic ovule. The ovule is campylotropous and tenuinucellar, (figure 4). The archesporium functions directly as the megaspore mother cell (figure 2). Meiosis in the megaspore mother cell results in a linear tetrad of megaspores (figure 3). The embryo sac development conforms to the Polygonum type[2]. The egg which is usually bigger than the synergids is flask-shaped with a large apical vacuole. The three antipodal cells occupy the narrow chalazal part of the embryo sac (figure 4).

There is no fertilization and the embryo sac degenerates. This is followed by enlargement of some of the nucellar cells at the chalazal end which become two or three nucleate due to mitotic divisions (figure 5).

Thus in *P. communis*, ovular degeneration and failure of seed development appear to be due to nonfunctional pollen development which has been compensated by its aggressive vegetative growth.



Figures 1–6. Sterility in *Phragmites communis* (Retz.) Trin. **1.** L.s. of an anther lobe. **2–4.** Development of the ovule and embryo sac. **5.** Enlarged nucellar cells surrounding the degenerating embryo sac. **6.** L.s. of ovary showing degenerating ovule and embryo sac. (ecn, enlarged cells of the nucellus; es, embryo sac; ii, inner integument; oi, outer integument)

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REDUCTION IN COST OF TISSUE CULTURE OF *LEUCAENA LEUCOCEPHALA* (LAM) DE WIT BY REPLACING AR GRADE SUCROSE BY SUGAR CUBES

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TISSUE culture techniques are being increasingly applied in industry and agriculture. A major consideration in any commercial operation is the cost of the product. In the developed countries the main factor that contributes to the fixation of price of a tissue culture product is the cost of labour[1]. However, in India equipment, glassware and importantly the media constituents escalate the cost of tissue culture operations. Sucrose is a necessary ingredient of all plant tissue culture media and is used in the range of 2–4%[2] but sometimes at much higher levels[3,4]. Whereas for critical analytical studies on growth and development a highly purified sucrose is needed, for large scale micropropagation commercial grades of sucrose should be adequate as energy sources.

AR grade surcrose which now costs Rs 150 per kg is used in most laboratories in India. To minimize the cost of nutrient media we have tried two inexpensive sources of sucrose and have compared them with AR grade sucrose (BDH) for *in vitro* shoot multiplication and embryo culture of *Leucaena leucocephala* cv K-8. The two experimental systems are described below.

(1) *In vitro shoot multiplication*: The cultures were initiated from single node and terminal cuttings (1 cm long cuttings consisting of shoot-tip and one node) derived from aseptically raised 14-day old seedlings. On MS[5] medium (with 4% BDH sucrose) supplemented with 6-Benzylaminopurine (BAP; 3×10^{-6} M) the explants developed an unbranched shoot which after three weeks provided 4 nodal and terminal cuttings (propagules) for further shoot multiplication. Comparative effects of sucrose from different sources were studied in the third passage of shoot multiplication, and the growth parameters considered were: (a) per cent cultures showing bud break, (b) shoot length, and (c) rate of shoot multiplication, which refers to the number of culturable cuttings obtained after three weeks growth.

(2) *Embryo Culture*: Seedling development in the cultured decotylated embryos on MS medium was studied. Sucrose samples were tested at 3% level.