Differentiation of sclerenchyma fibres in the stem cultures of Cissampelos pareira L. (Menispermaceae)

The sclerenchyma fibres are present in stem, leaf and fruits in association with different tissues as either xylary or exxaxyrary fibres. The cell wall is lignified and the cell is usually devoid of protoplast at maturity. The exxaxyrary fibres in the cortex of the stem contribute to the formation of pericycle providing mechanical strength. In the taxa of Menispermaceae the pericycle is continuous, undulating and arching over the vascular bundles.

An attempt was made to culture the stem explants of Cissampelos pareira L. (Sanskrit: Patha) with an objective of growing the callus under different culture conditions.

The young stem explants of C. pareira L., measuring 2 cm long, were surface-sterilized with 0.1% HgCl₂ after a thorough washing with distilled water containing 0.01% (v/v) Teepol and inoculated on Murashige and Skoog medium supplemented with different concentrations of NAA (0.25 to 10 mg/l). The stem explants and the callusing explants representing the 40th day were fixed in Carnoy's B fluid and embedded in paraffin. Deparaffinized transverse sections were stained with toluidine blue for histochemical studies. The explants representing between sixth and eighth nodes responded best for in vitro callusing when compared to other parts of the stem. Among various concentrations of NAA, the medium containing 2 mg/l of NAA supported maximum growth of the callus (fresh weight, 3650 mg/explant).

A transverse section of the explant revealed the lignified sclerenchymatous pericycle sandwiched between the parenchyma cells as evident by the metachromatic staining (Figure 1). During in vitro callusing, the parenchyma of the cortex, pith and medullary rays contributed chiefly to the growth of the callus. In all the samples studied, the lignified sclerenchymatous elements of pericycle have shown a tendency of gradual differentiations by increase in cell size concomitant with the thinning of cell walls and proliferated segmentation of the contiguous parenchyma cells adding to the growth of the callus (Figure 2).

Figure 1. Transverse section of the stem of C. pareira stained with toluidine blue. The sclerenchymatous pericycle has lignified cells (green) (× 400). Sc, sclerenchymatous pericycle; C, cortex; P, pith.

Figure 2. Transverse section of the stem explant of C. pareira showing the development of callus (× 150). Ca, callus.
Comments on ‘Fertile plants regenerated from mesophyll protoplasts of cold tolerant rice’

I am writing about the article ‘Fertile plants regenerated from mesophyll protoplasts of cold tolerant rice’ (Curr. Sci., 1995, 68, 755–758) by J. N. Gupta, Hyderabad and S. N. Gupta, Gorakhpur. J. N. Gupta worked as project fellow in a DBT-funded project in my laboratory on suspension protoplasts of rice and based on the work, he submitted a dissertation to the Gorakhpur University under the supervision of S. N. Gupta and was awarded the Ph D degree.

While J. N. Gupta was working in my laboratory, I and my colleague, Mr A. Fattanayak, were working on plant regeneration from mesophyll protoplast of rice and having succeeded in the same, we published a paper in Bio/Technology (1993, 11, 90–94). J. N. Gupta now claims in the above-mentioned Current Science paper to have regenerated fertile plants from RCPL 1–IC and Meghalaya 1 and the work was supposed to have been done at Gorakhpur University in S. N. Gupta's laboratory. On verification, S. N. Gupta categorically denied that the work was ever done in his laboratory, because facilities for such work do not exist in his laboratory even today.

S. N. Gupta (Gorakhpur) also denied having consented to be a co-author in the paper through a letter. As such, J. N. Gupta (Hyderabad) neither worked on mesophyll protoplasts in my laboratory nor at the University of Gorakhpur. He has, in fact, plagiarised our work on mesophyll protoplasts. He has even used