plates with 7–20 (25) sieve areas per plate in all the investigated species.

In our study on secondary phloem of some dicotyledons, we observed compound sieve plates in two genera: *Psidium* and *Syzygium* of Myrtaceae. The compound sieve plates of *Syzygium malaccensis* exhibit a few interesting features. Its smallest sieve plate has 7 sieve areas; 35 to 56 sieve areas are normal in the majority of its sieve plates. The highest number recorded is 76 sieve areas per plate (Fig. 1). It is a scalariform sieve plate, with sieve areas almost as wide as the sieve element lumen. The sieve plate length is 421 μm, diameter: 35 μm and its total area is 12,650 μm^2. The area occupied by the sieve areas is 6,608 μm^2. The sieve pores are considerably small with an average diameter, 0·39 μm. The sieve tube element length in the plant ranges from 210·34 μm to 618·54 μm.

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MEMBRANE PERMEABILITY IN TETRAPLOID AND HEXAPLOID WHEATS UNDER SALINITY STRESS

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SALINE salts have been reported to derange the integrity of membrane, chemi-osmotic potential and in turn the permeability processes of roots in glycophytes[1]. The loss in permeability leads to unrestricted entry and accumulation of toxic ions, mineral salts and decrement in retension of nutrients in cells[2] as a result of which proper growth and survival of plants become dubious[1]. The halophytes are known to resist salt stress by possessing various salt enduring processes besides the maintenance of membrane permeability[3]. A few crop plants and their varieties including hexaploid wheat also resist salinity to a certain extent. However, it is not known whether the permeability plays some role in such plants and their genotypes to withstand salt stress. An experiment was conducted with tetraploid ($2n = 28$). *T. durum* L cv HD 4502 (salinity sensitive) and hexaploid ($2n = 42$). *T. aestivum* L cv Kharchia (salinity resistant) in solution culture and 0, 40 and 80 milliequivalent NaCl stresses using radioactive calcium (^{45}Ca) as permeating element. One month old seedlings growing under sand culture conditions were taken out along with their roots. The roots were cleaned in running water. Such plants were kept in water for 3 hr to adjust with aqueous environment. The roots of 24 plants, with intact shoot in triplicate were transferred to 0, 40 and 80 milli-equivalent NaCl solution contained in opaque 250 ml conical flasks. The specific activity of $^{45}CaCl_2$ was 100 mci. Samples from each flask were drawn after 5, 10, 30, 60 min, 6, 12, 18 and 24 hr of stress exposure. The shoots and roots were separated immediately. Roots were cleaned with water and 0·01% HCl to remove the adsorbed ^{45}Ca. Plant samples were dried and powdered. Hundred mg samples were ashed and counted in End-Window G.M. Counter. The results are pesented in Fig. 1.

From the data of Fig. 1 it is evident that the accumulation of ^{45}calcium in the root and shoot of control (0 milli-equivalent NaCl stress, *i.e.*, distilled water) plant increased with time and it became steady after

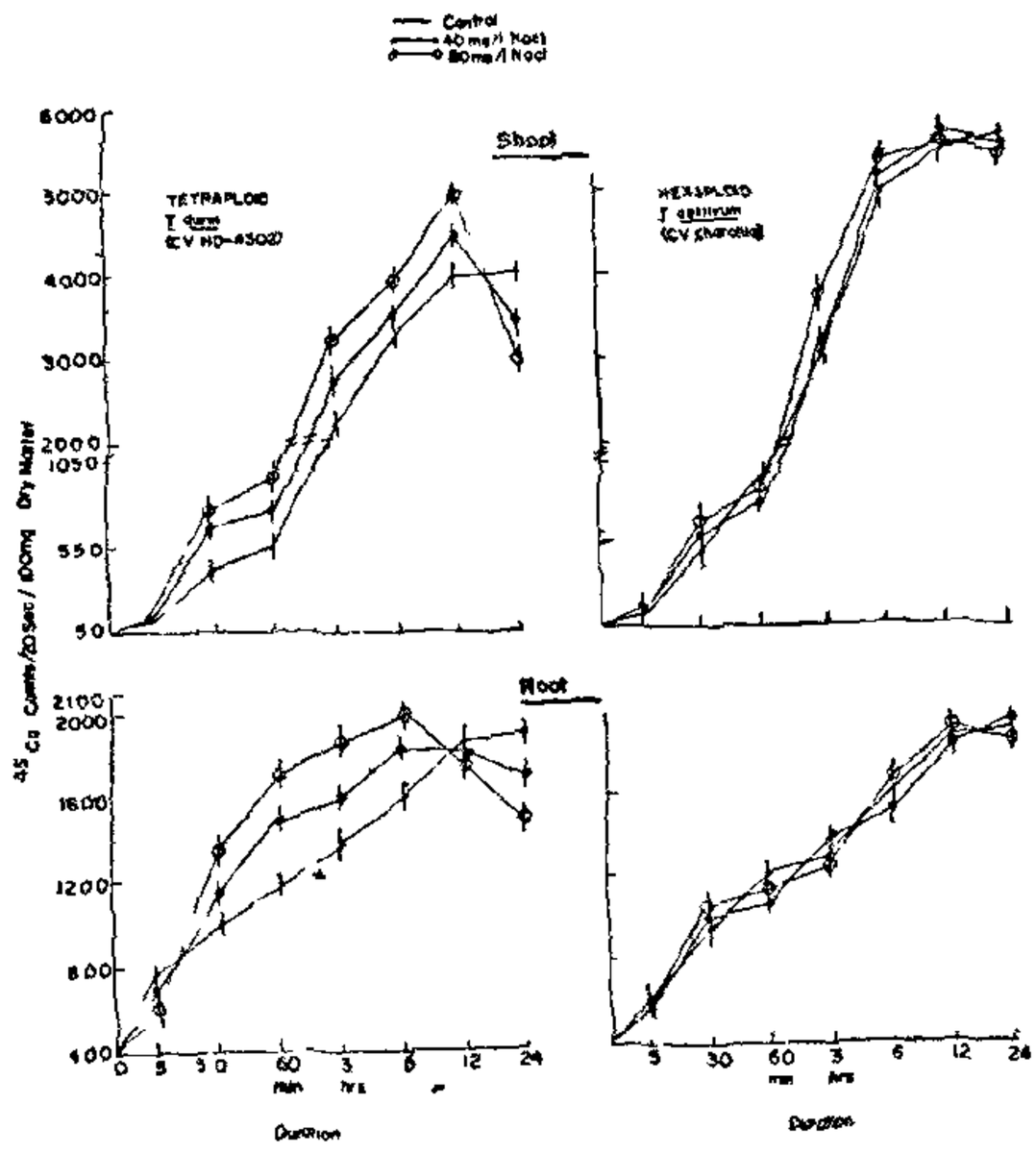

FIG. 1. Accumulation and retention of ^{45}Ca in root and shoot at different salinity levels.

12 hr of exposure in both tetraploid and hexaploid wheats. On the other hand, under stress conditions the two genotypes behaved differently. Tetraploid wheat accumulated ^{45}Ca in its root and shoot significantly as compared with the control after 5 minutes of exposure and this continued to rise till 6th hour. After 12 hr the radioactivity continued to decline and at the end of 24 hr the accumulation of ^{45}Ca in the shoot was found to be only 50-70% of that of the control plant. However, in root, the drop in radioactivity accumulation was noted in the range of 15–25% only. In marked contrast to this in hexaploid, the accumulation of ^{45}Ca in root and shoot did not alter significantly below that of control plants till the termination of stress exposure. These results indicate that root membrane integrity and permeability are very much distorted in tetraploid under salinity stress whereas in hexaploid the effect was noted to be minimal. Waisel[1] also reported least disturbance in root permeability in salinity resistant halophytes. From the results of this experiment, it is, therefore, evident that in hexaploid wheat cv Kharchia the maintenance of root permeability is one of the physiological basis for salt resistance.

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PATCHOULY PLANTS DIFFERENTIATED *IN VITRO* FROM STEM TIP AND CALLUS CULTURES

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The Patchouly plant (*Pogostemon cablin* Benth. syn. *P. patchouli* Pellet var. *suavis* Hook (Family : Labiatae) is cultivated for the Patchouly oil of commerce[1]. The oil is almost a perfume by itself and it is indispensable in cosmetics, soaps and incense. The Patchouly plant is invariably affected by mosaic disease and the vegetative propagation of the plant promotes the spread of the virus disease. Since apical meristem culture offers an efficient and reliable method for eliminating systemic viral infections[2–4] it will be advantageous to obtain disease-free plants from infected parent stock by culturing the shoot-tips. This communication describes the *in vitro* method of virus elimination and propagation of healthy Patchouly plants/clones from shoot-tips and callus cultures.

Stem cuttings of Patchouly plants showing virus infection with three nodes were planted in pots and the upper cut ends sealed with paraffin wax. The pots were maintained in a green house and the cuttings sprouted within 6–8 days. Shoot-tips measuring approximately 0·5–1 mm in length were aseptically dissected and cultured in test tubes (7·5 × 2·5 cm) containing 20 ml of the following sterile media solidified with 0·7% Difco Bacto agar : Murashige and Skoog (MS)[5], B5[6], Eriksson (ER)[7] and Halperin[8]. The media were supplemented with 2,4-D (1 mg/l), 6-benzyladenine (0·5 mg/l) and indole 3-acetic acid

Fig. 1. Four week old culture showing multiple shoot development of *Pogostemon cablin* in Halperin medium.