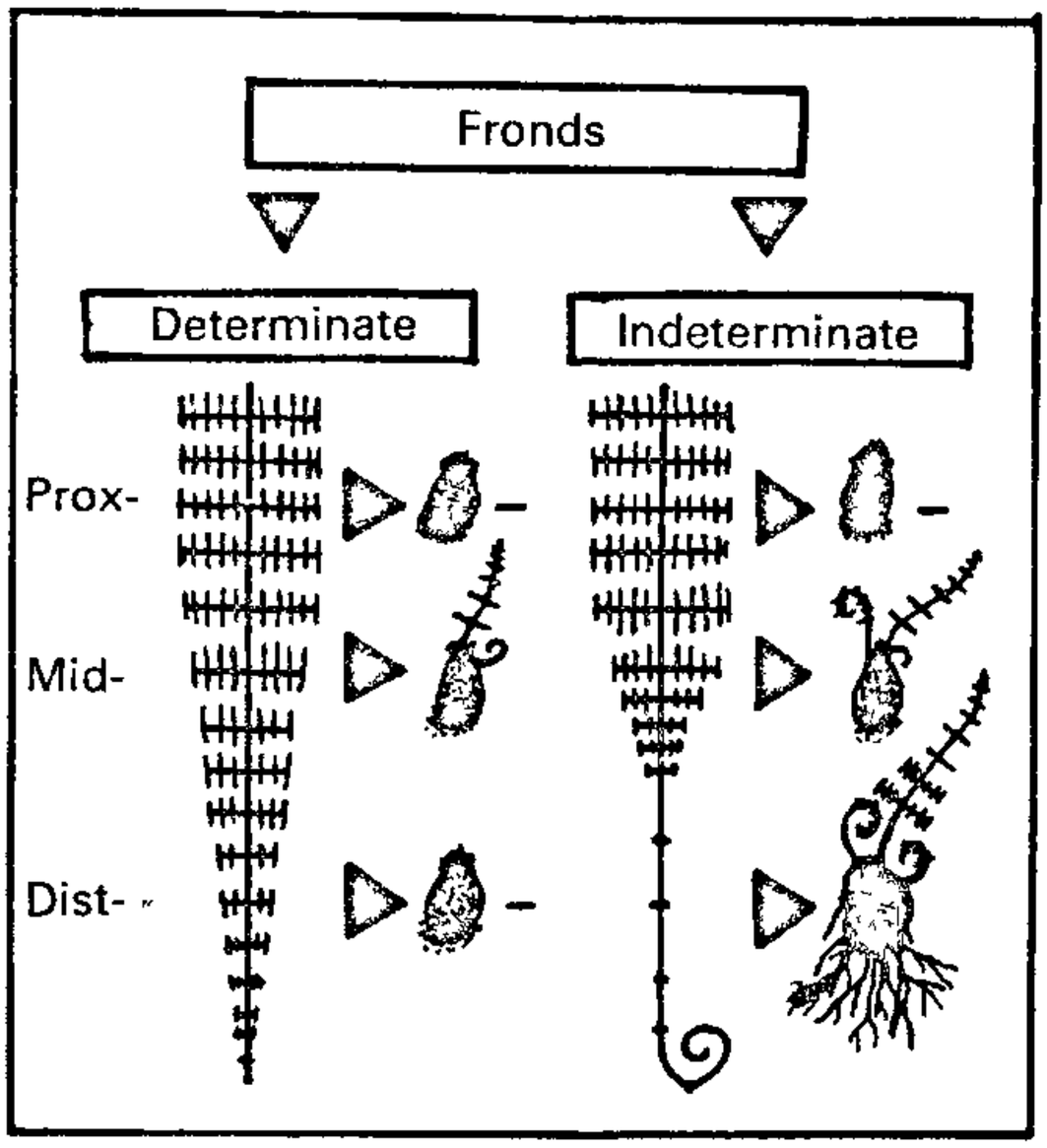

Figure 1. Schematic representation of bud organogenesis in proximal, middle and distal part of rachis *in vivo*. (–) denotes arrested buds.

The leaf-trace was unitary (i.e. a composite of 2 xylem masses) on (a) medium in contrast to 2-stranded, normal trace at a comparable level on (b) medium. Also, the ground parenchyma cells in the latter case were spherical with ample starch accumulation. (c) Buds regenerated on BM + 2% S + 1.5% IAA + 0.2% KN differentiated fronds only and the formation of pinnae on one side of the rachis remained suppressed; while the shoot remained inhibited, roots were differentiated in large numbers in 50-day-old cultures. (d) Buds turned green on BM + 2% S + 1.5% IAA + 1% KN but further regeneration was inhibited as seen in 50-day-old cultures. Perhaps the higher kinetin:auxin ratio, compared to other media, proved inhibitory. (e) On cultures containing BM + 2% S + 2% IAA + 0.2% KN, the buds differentiated fronds as well as roots comparable to those *in vivo*. (f) In 35-day-old explants on BM + 2% S + 2% IAA + 1% KN, the shoot formation was noted in addition to fronds comparable to those of the preceding culture. It appears that the aforesaid auxin:kinetin ratio was optimal for the differentiation of plantlet.

If relatively younger buds were cultured on (e) and (f) media cylindrical appendages were differentiated during the period of experiment.

In conclusion it can be stated that the normal bud organogenesis is a consequence of subtle interactions of carbohydrate metabolism and appropriate ratios of growth regulators. *In vivo* such interactions emanate from the frond, and like the shoot apex, one can regard the frond apex of this fern as capable of morphogenetic control on the subtended buds (cf. figure 1). Secondly, in sharp contrast to calluses which are prone to chromosomal as well as cytoplasmic upsets, the buds in different spatial position on the rachis, can be used as genotypically stable systems (barring those rare cases of spontaneous mutations) for performing more critical experiments to uncover the integrational aspect of fern organ categories.

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POLYEMBRYONY IN *MELOTHRIA MADERASPATANA* (L.) COGN.

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THE embryo in Angiosperms, at times, is produced from other constituents of the embryo sac, besides egg, with or without fertilization. The literature on the subject of polyembryony in Angiosperms has been reviewed by Lakshmanan and Ambegaokar[1]. During a study of the embryology of *Melothria maderaspatana* (Cucurbitaceae) an interesting case

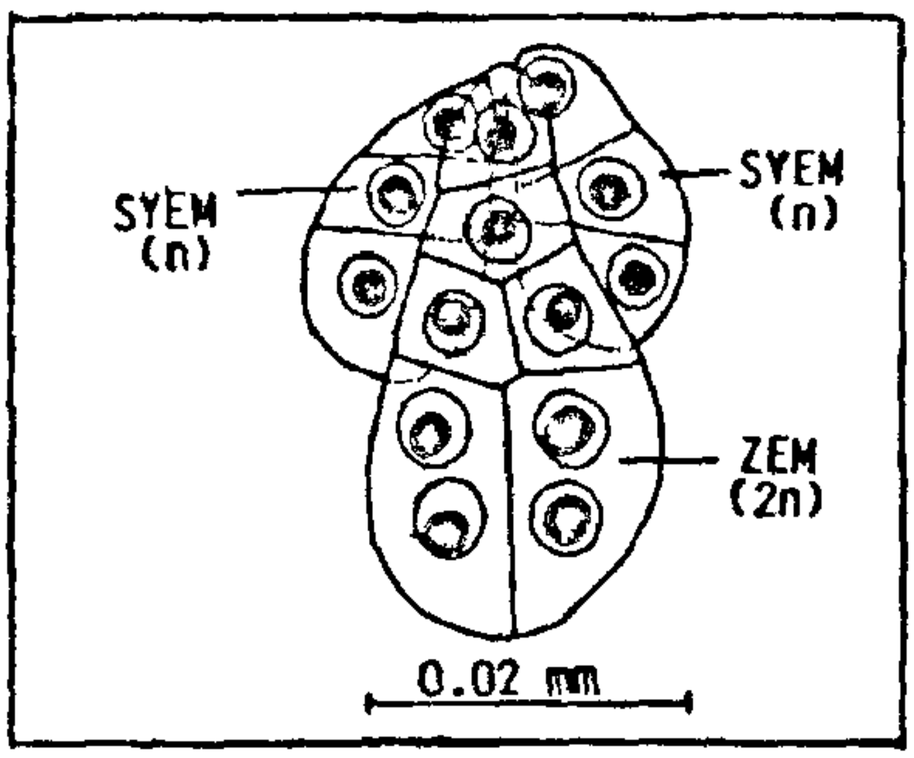

Figure 1. Polyembryony in *Melothria maderaspatana* (L.) Cogn.; note synergid embryos and zygotic embryo. (SYEM = Synergid embryo; n = haploid; $2n$ = diploid; ZEM = Zygotic embryo).

of embryos developing from both the synergids was noticed by the present author. The fertilized egg developed into a normal diploid embryo and endosperm development is also normal. The additional proembryos are seen in the embryo sac in the position normally occupied by the synergids and hence the additional embryos are presumed to be of synergid origin (figure 1). Since no additional pollen tubes are seen to enter the embryo sac, the synergid embryos are presumed to be haploid. The zygotic embryo alone reaches maturity while the additional proembryos get absorbed in the embryo sac during further development.

Polyembryony is uncommon in the Cucurbitaceae. In a recent study, Maheshwari Devi and Naidu[2] recorded a rare instance of twin embryos in *Melothria perpusilla* and they presumed that the second embryo might have originated from one of the synergids. Nucellar polyembryony has been previously recorded in *Momordica charantia*[3] and *Cucumis melo* var. *pubescens*[4].

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EFFECT OF SCENT COMPONENTS ON SOMATIC CELLS OF *ALLIUM SATIVUM* L.

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CERTAIN hemipteran insects are known to discharge a pungent volatile liquid from the abdominal and metathoracic scent glands and their secretion contains aldehydes, ketones, tridecanes etc[1,2]. Although, some of the aldehydes were reported to be antirespiratory[3], carcinostatic[4], antifungal[5], and antimitotic[6], there seems to be no adequate information of *n*-dodecane and *n*-pentadecane at the chromosomal level. In the present investigation an attempt has been made to study the effect of scent components (*n*-dodecane and *n*-pentadecane) on the course of mitosis and on the mitotic chromosomes of *Allium sativum L.*

Actively growing healthy root tips of *A. sativum* were treated with 0.01, 0.5, 1, and 2% concentrations of *n*-dodecane and *n*-pentadecane (ICN K&K Lab, New York) for 1,2 and 6 hr. The scent gland secretion for nymphal pentatomid bug, *Chrysocoris purpureus* was compared with the authentic samples on GLC[7]. The required concentrations were prepared in acetone as the compound did not dissolve in distilled water. Root tips treated with acetone were used as control. After treatment, root tips were fixed in 1:3 acetic alcohol for 24 hr and then squashed using acetoorcein. For determination of mitotic index (MI) and percentage aberrations, 1000 randomly selected dividing cells from 10 different root tips were analysed for each treatment.

The data presented in table 1 show that the mitotic indices at various concentrations were consistently low in all treatments of both the presently employed chemicals and the decline is greater at higher concentrations. Maximum reduction in MI was recorded at 2% concentration of *n*-pentadecane, treated for 6 hr (table 1). The fall in the mitotic indices soon after *n*-dodecane and *n*-pentadecane treatments indicate that a preceding G_2 stage affected many cells entering the mitosis and suggests the chronic effect on all or some of the preceding stages[8].