Figure 1A–B. Callus initiation and plantlet regeneration from glumes of triticale. **A.** Five-week old callus. **B.** Plantlet regeneration from seven-week old calli.

with 1 mg/l KN plus 2 mg/l NAA and LS media with 2 mg/l KN plus 1 mg/l NAA. Calli were grown under flourescent light at 26 ± 2°C for regeneration.

Callus was successfully initiated from the glumes on LS media with 2 mg/l 2,4-D (figure 1 A). Callusing ability of different age groups varied significantly. Among three age groups tested over hundred samples, ten-day old glumes were more efficient for callus initiation (30-35%) compared to five (20-25%), followed by fifteen days (10-12%).

Successful regeneration of plantlets (figure 1 B) was observed on media supplemented with 0.5 mg/l KN plus 0.1 mg/l NAA (7%). On the other hand only roots were regenerated on media with 1 mg/l KN plus 2 mg/l NAA besides basal media. Shoot bud initiation and extensive rooting was observed on the media supplemented with 2 mg/l KN plus 1 mg/l NAA. Subsequent transfer of these shoot buds onto basal media resulted in development of complete plantlets after two weeks. The suppression of further development of shoot buds into complete plantlets on media with 2 mg/l KN plus 1 mg/l NAA may be due to the inhibitory effect of excess levels of either auxin and/or cytokinin as evidenced by plantlet regeneration when these were transferred onto media devoid of hormones.

The present study shows that ten-day old glumes were more efficient for callus initiation compared to five and fifteen days, suggesting the importance of developmental stage and the physiological state of the explant used. That the media supplemented with 0.5 mg/l KN plus 0.1 mg/l NAA was superior for plant regeneration clearly suggests that specific concentration and ratio of kinetin and NAA plays an important role.

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DIFFERENTIATION OF MULTIPLE SHOOT BUDS AND PLANTLETS IN CULTURED EMBRYOS OF *CAPSICUM ANNUUM* L. VAR. *MATHANIA*

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FOLLOWING the success in rapid multiplication of orchids by shoot meristem culture[1], considerable progress has been made in the clonal multiplication of several plant species such as *Asparagus*, *Chrysanthemum*, *Gerbera* and others[2]. The main intent of clonal propagation is to quickly establish uniform plants with predictable qualities. Various explant sources have been used for clonal propagation. Embryos have been successfully used for clonal propagation in *Cichorium endivia*[3], *Solanum melongena*[4], *Hordeum vulgare*[5]. *Capsicum annuum* is an economically important crop and not much work has been done to establish culture conditions for its regeneration. George and Narayanaswamy[6] reported haploid plants through anther culture in *C. annuum* var. *grossum*, and later Gunay and Rao[7] observed regeneration from hypocotyl and cotyledon explants. In the present communication we report formation of multiple shoots (20–25 per embryo) and their further development into complete plantlets from excised mature embryos.

Seeds of *C. annuum* var. *mathania* procured from the Agriculture Research Station, Durgapura, were soaked in tap water for 24 hr, then surface-sterilized with 0.1% mercuric chloride for about 5 min, and were thoroughly washed with sterilized water. Embryos were excised aseptically and cultured on Murashige and Skoog[8] (MS) medium supplemented with kinetin (K) and 6-benzylaminopurine (BAP) alone or in combination with indole acetic acid (IAA) and 2,4-dichloro-phenoxyacetic acid (2,4-D) (figure 1). The pH of the medium was adjusted to 5.8. The cultures were maintained in diffused continuous light from fluorescent tubes and incandescent bulbs at 26 ± 2°C.

When embryos were grown on a medium supplemented with kinetin (0.1 mgl^{-1}) and IAA (0.1 mgl^{-1}), the size of the cotyledon increased considerably. On a medium supplemented with 2,4-D (0.5–1 mgl^{-1}) alone or in combination with kinetin (0.5 mgl^{-1}), a fragile and actively growing callus was initiated all over the surface of embryo. On a medium supplemented with kinetin (0.5 mgl^{-1}) and IAA (3–5 mgl^{-1}), a good number of roots (7–8) were formed. When embryos were cultured on a medium with a higher level of a cytokinin (5 mgl^{-1}) alone or in combination with IAA (0.5–1 mgl^{-1}), numerous shoot buds were formed all over the margins of the expanded cotyledons (figure 2). These buds when subcultured on a medium containing BAP (5 mgl^{-1}) proliferated further into numerous shoot buds This characteristic feature has been retained during repeated subcultures on the same medium. However, the size of buds remained checked. On subculturing individual buds on a medium supplemented with NAA (0.1–5 mgl^{-1}), rooting was induced within 7–10 days, and the best growth of root and shoot buds was observed on 0.1 mgl^{-1} NAA (figure 3, 4).

Figures 1–4. 1. Mature embryo on MS medium × 3. **2.** Proliferation of shoot buds on MS + BAP (5 mgl^{-1}). **3,4.** Plantlet formation on MS + NAA (0.1 mgl^{-1}).

The plantlets were formed from shoot buds and originated diretly from the embryos and not *via* intervening callus formation. The direct regeneration of shoots is advantageous as it preserves the ploidy level of the parental tissue which is an essential feature of clonal multiplication.

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PRELIMINARY OBSERVATIONS ON THE BIOECOLOGY OF THE ECTOPROCT — *PECTINATELLA BURMANICA* ANNADALE

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THE ectoprocts are microscopic, sessile, colonial coelomates, permanently fastened in exoskeletal cases or gelatinous material of their own secretion. Generally most ectoprocts inhabit unpolluted and unsilted ponds, shallow lakes, slow and fast streams. All freshwater ectoprocts are from the class phylactolaemata. The class is characterized by horseshoe-shaped, oval, circular or crescentic lophophore covered with ciliated epistome. They are provided with a recurved digestive tract, bringing the anus near the mouth and that lack nephridia and a circulatory system[1]. The current information on the Indian phylactolaemates has been reviewed recently[2]. However, reports are scanty and the subject requires more detailed investigations. Some additional observations on the bioecology of the fresh water ectoproct, *Pectinatella burmanica* are reported.

While studying the fresh waters of Pune (Maharashtra), a very dense population of ectoprocts was located in a fresh water pond near the Poona University campus. These animals were found attached to the lower side of the leaves and roots of the aquatic floating macrophyte, *Lemna polyrhiza* Linn. Samples of these plants and pond water were collected in plastic buckets for further analysis.

Water samples collected from the surface were analysed to record the physicochemical conditions of