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IN-VITRO REGENERATION STUDIES IN SUGARCANE CULTIVARS.

Biological Science

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ABSTRACT

Sugarcane varieties Co 7704 and Co 8371 used to study tissue culture aspects. The calli, shooting and rooting induction was achieved. Basically on MS medium with different composition of auxin and cytokines with various compositions tested. The successful induction of root and shoot achieved. The hardening part is in progress. Co 7704 was found better response than Co 8371 in the tissue culture trials.

KEYWORDS

Callus, MS medium, root induction, shoot induction

Introduction

Sugarcane is an important cash crop of India. Sugarcane is an oldest crop known to man, a major crop of tropical and sub tropical region. With the ever increase human population the demand for product needs the technology to produce many fold increase the yield. As because this crop is vulnerable to infect by number of bacterial, fungal as well as viral diseases. The review of history of sugarcane cultivation, some incidence like sereh and downy mildew has damaged the sugar industry [1]. In addition to this sugarcane is facing important problem like water stress, salinity and iron deficiency causing the substantial damage to the crop. In the present investigation, 2 local verities, like Co 7704 and Co 8371 of the Bhadra area were selected and standardized the protocol for in-vitro studies.

Materials & Methods

In the present investigation, the basic medium [2] have been used with apical bud as explants. Stem segments (10-15 mm) containing the meristem were excise and first rinse with water containing a detergent then treated with 30% saturated chlorine water for 15 minutes. At each step the explants were thoroughly washed with sterile distilled water. The dissection of the individual segment was then carried out in a laminar air flow and inoculated on culture vials containing 120ml of semi solid basal medium (medium supplemented with 0.8 % agar). The cultures were maintained at 26° ± 2°C. 16 hours light (incandescent and fluorescent 3:1, 2500 lux at culture level) with 60 % relative humidity.

Results

The 2 local cultivars varieties showing calli induction, shoot and root induction were presented in table 1. The successful induction of callus was found to be 80% in Co7704, 80% in Co8371 after 8 day and 12 days of inoculation. Then the calli was sub cultured on respective combinations supplemented with 10% coconut milk and obtained profuse callus. Later the callus was subjected for shoot and root induction with modified hormone combinations.

The callus further transferred to MS medium supplemented with cytokine and Benzyl amino purine (BAP) for shoot and auxin and 2,4-D (2,4- Dichlorophenoxy acetic acid) for root induction. The shoot induction was covered with with healthy green shoots after 24 to 28 days of culture. Later on modified medium with auxin and 2,4-D, found thin hairy sprouts from shoot induced cultures were noticed after 20 to 26 days of culture. However the shoot induction was better than root induction observed over a time. The experiments are in progress for further hardening and transfer to field conditions.

TABLE 1. TISSUE CULTURE MEDIA COMPOSITION OF SUGARCANE CULTIVARS.

Sl no	Cultivars	Callus Induction	Shoot Induction
1	Co 7704	MS+2,4-D (3mg/ltr)	MS +6-BAP (2mg/ltr)
2	Co 8371	MS+2,4-D (1mg/ltr)	MS +6-BAP (1.5mg/ltr)

Discussion

Tissue culture is now widely used in sugarcane improvement programme. Research on sugarcane tissue culture was started long back in Hawaii in 1961 [3]. Callus induction and subsequent shoot differentiation was reported much earlier [4]. Later its history has been reviewed [5, 6]. Further application of tissue culture methods [7, 8, 9], salinity [10] and iron deficiency [11] were reported.

The present report on callus and regeneration will be continued for selecting local problems like Salinity and smut disease resistance to meet the local demands.

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