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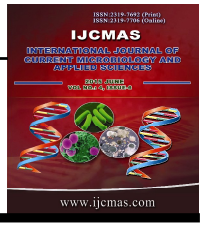

Original Research Article

In-vitro Propagation Studies of *Rheum moorcroftianum* Royle: A Threatened Medicinal plant from Garhwal Himalaya

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A B S T R A C T

In *Rheum moorcroftianum* callus induction from seedling explants were found successful on MS medium supplemented with IBA individually and rooting were observed better at higher concentration of BAP+ IAA (1.6mg/L +2.0mg/L) as compared to lower concentration.

Keywords

Rheum moorcroftianum, Polygonaceae Biodiversity,

Introduction

Rheum (viz *R.emodi* and *R. moorcroftianum* of Polygonaceae) a perennial stout herbaceous genus commonly Known as Rhubarb is well represented by about 10 species in the temperate and alpine region of Himalaya. Out of which only two species, namely *R. emodi* and *R. moorcroftianum* have been reported for Garhwal Himalaya (Anonymous 1972). The preparations from the rhizomes of later species are well known for their medicinal properties pharmacologically. Beside the purgative effects, roots are also used for dyeing woolens Yellow. The long and stout petioles are eaten either in raw or cooked vegetable form (Peigon, X. *et al.*, 1984).

Now a day's conservation of biodiversity is the major concern at biological research. Globally several attempts are being made to understand the causes responsible for the loss of biodiversity among plants. This is due to the fact that, almost all organisms on this earth are totally dependent on the plants in several ways. So the immense need is being realized for the conservation of biodiversity. Due to the habitat destruction and human interference several species of medicinal importance are at the edge of threat for their survival.

Materials and Methods

Freshly germinating seedling washed with running and double distilled water for 20min. The washed seedlings were treated with 0.1% mercuric chloride for 3-4 minutes for surface sterilization process. After this process washed seedlings were washed for 5-6 minutes with sterilized distilled water to remove the mercuric chloride under aseptic conditions in a laminar flow. Their after processed seedlings were immediately inoculated into the culture medium.

Results and Discussion

In *Rheum moorcroftianum* the suitable explants (seedlings) were used for germination under laboratory conditions on M S basal medium supplemented with various concentrations of BAP, IAA and IBA. The seedlings used for explants were raised from the seed collected from the Tungnath region for organogenesis. However, the seedlings have higher potential for production of adventitious roots and shoots from callus. After 9 weeks of inoculation the Whitish/Yellowish initiations were observed from seedling explants with IBA (4.0 mg\L, 2.0mg\L, 1.0mg\L) and BAP (4.0 mg\L, 2.0mg\L, 1.0mg\L) combinations (Plate1a). Whereas, the immediate initiation of callii was reported after 7 weeks in BAP and IAA combinations (Table 1). Similarly in another set experiments for combined effect of several combinations of of BAP and IAA, callusing took place after 7 weeks of inoculation (Table 1). In callus obtained from seedling explants, no regeneration was observed in pure treatments of BAP, and IAA.

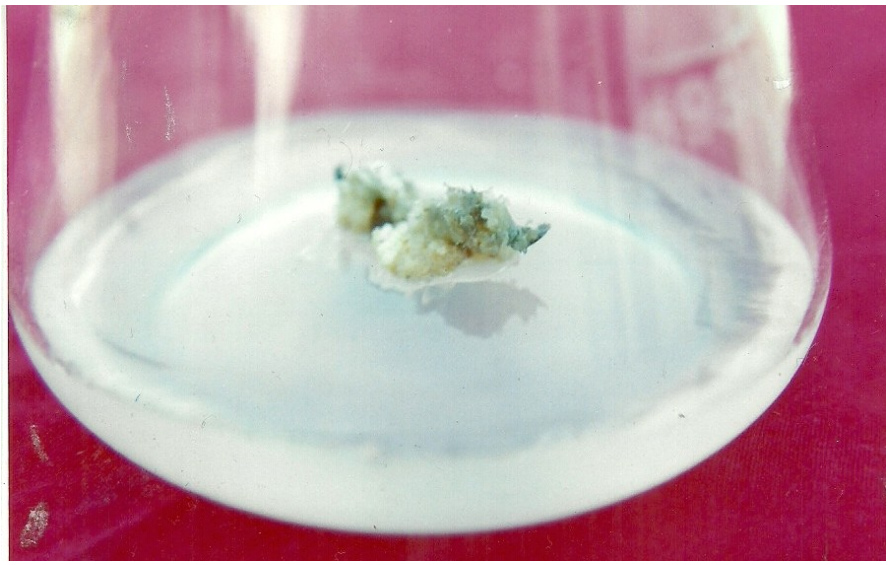
Table.1 Effect of MS medium supplemented with BAP, IBA and IAA growth hormone on differentiation in-vitro grown seedling explants of R. moorcroftianum

S. N.	Treatment MS.+Gro. Hor.	Concentration (mg\L)	% of Elongation	Initiation of callus (after week)	Differentiation to stage
0	Control	-	50	-	-
1	BAP	3.2	50	-	-
2	BAP	1.6	50	-	-
3	BAP	0.8	50	-	-
4	IAA	4.0	50	-	-
5	IAA	2.0	50	-	-
6	IAA	1.0	50	-	-
7	IBA	4.0	50	9	Callus with root
8	IBA	2.0	75	9	Plant lets with callus root and shoot
9	IBA	1.0	50	8	Plant lets with callus root and shoot
10	BAP+IAA	1.6+2.0	75	7	Callus with root
11	BAP+IAA	0.8+1.0	25	-	-
12	BAP+IBA	1.6+2.0	25	7	Plant lets with callus root and shoot
13	BAP+IBA	0.8+1.0	50	7	Multiple shoot
14	BAP+IAA+IBA	1.6+2.0+2.0	50	7	Plant lets with callus root and shoot
15	BAP+IAA+IBA	0.8+1.0+1.0	50	7	Callus with multiple shoot

PLATE-1

a

b



In MS basal medium controlled condition without growth hormone only enlargement of seedlings and curling as well as swelling of leaves were observed but callus production could not observed. Best calli were observed with the appearance of globular shiny structures on MS basal medium containing 1.6mg\L BAP and 2.0mg\L IAA (Plate 1b). In these plants, regeneration of shoot from callus required higher concentrations of Kinetin (BAP) and Auxin (IAA) then that of lower concentrations. It is well known that the addition of higher concentration of BAP to the MS basal medium stimulates shoot regeneration (Chang and Hsing, 1980, Shoyama et al, 1988).

Regeneration in tissue culture is a genetically controlled trait (Bhojwani *et. al.* 1984). Thus the response of tissue culture of different species varies from one species to another. Callusing through leaf explants has been reported earlier in *Aconitum heterophyllum* (Giri *et al.,* 1983) and *A. atrox* (Singh *et al.,* 1998). In *Rheum emodi*

poor callusing was observed when leaf and shoot explants were taken directly from plants (Lal and Ahuja 1993).

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