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IN VITRO INDUCTION OF MULTIPLE SHOOTS IN *DENDROBIUM*

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ABSTRACT

Investigations to standardise the optimal chemical environment for *in vitro* induction of multiple shoots in *Dendrobium* cv. Sonia revealed that MS medium fortified with 5.0 mg l^{-1} kinetin and 0.5 mg l^{-1} GA^3 recorded the maximum number of microshoots per culture, the longest microshoots and the maximum number of leaves per microshoot.

KEY WORDS: *Dendrobium, In vitro*, Multiple shoots.

Dendrobiums which are known to be 'splendid' among the orchid genera have now become endangered in their natural habitat due to ruthless denudation of lands. Though several methods of vegetative propagatin like division of pseudobulbs, roots and off-sets exist, they are found to be slow and time consuming and they can never meet the everlasting demands of both domestic and export markets. Presently, the cut-flower industry suffers for want of quality planting materials in adequate quantities. These limitations could be counteracted only through In *vitro* culture which is the rapid means of clonal propagation (Kukulezanka and Wojciechowska, 1983). In the present study, optimal chemical environment for in *vitro* induction of multiple shoots from seed derived protocorm like bodies (PLBs) of *Dendrobium* was standardised.

MATERIALS AND METHODS

The present investigation was carried out during 1997 at the Tissue Culture Laboratory, Horticultural College and Research Institute, Coimbatore. PLBs derived from seeds served as the source material for multiple shoot induction. MS medium (Murashige and Skoog, 1962) fortified with different combinations of BA, GA, NAA and kinetin was employed to standardise the best growth regulator combination.

The best growth regulator treatment identified was then combined with different strengths of MS medium viz., full strength, 3/4 strength, 1/2 strength and 1/4 strength in order to standardise the optimal strength of culture medium. The cultures were subjected to three subcultures at 30 day intervals. The experiment was conducted by adopting Completely Randomised Design.

The treatment details are as follows :

a) Effect of growth regulators on induction of multiple shoots

Treatment No.	Growth regulators (mg l^{-1})		
	BA	GA^3	NAA
1.	5.0	-	-
2.	5.0	0.5	-
3.	5.0	-	0.5
	KIN	GA^3	NAA
4.	5.0	-	-
5.	5.0	0.5	-
6.	5.0	-	0.5

b) Effect of culture media on multiple shoot induction

Treatment No.	Culture medium
1.	Full MS
2.	3/4 MS
3.	1/2 MS
4.	1/4 MS

RESULTS AND DISCUSSION

The results of this study showed that with subsequent subcultures, there was considerable increase in the number of multiple shoots produced per culture, length of the microshoot and the

Table 1. Effect of growth regulators on induction of multiple shoots

	Growth regulator combinations (mgl^{-1})			I Subculture			II Subculture			III Subculture		
				No.of multiple shoots/ culture	Length of the micro shoot (cm)	No. of leaves per micro shoot	No. of multiple shoots/ culture	Length of the micro shoot (cm)	No. of leaves per micro shoot	No. of multiple shoots/ culture	Length of the micro shoot (cm)	No. of leaves per micro shoot
	BA	GA3	NAA									
1	5.0	-	-	2.68	2.97	3.84	5.11	2.89	4.98	7.84	3.86	8.34
2	5.0	0.5	-	2.94	3.04	4.09	5.28	3.09	5.38	7.94	3.97	8.21
3	5.0	-	0.5	1.86	2.14	3.04	0.97	2.43	4.32	6.13	3.86	7.93
	KIN	GA3	NAA									
4	5.0	-	-	3.01	2.96	4.15	5.73	3.14	5.78	8.12	4.09	7.96
5	5.0	0.5	-	3.16	3.05	4.84	5.92	3.49	5.97	8.23	4.46	8.93
6	5.0	-	0.5	2.04	2.46	3.18	4.93	2.73	4.86	6.48	3.74	8.18
SEd				0.141	0.126	0.134	0.141	0.110	0.184	0.098	0.141	0.207
CD at 5%				0.291	0.260	0.277	0.291	0.227	0.380	0.202	0.291	0.427

number of leaves produced per microshoot (Table 1 and 2). Among the growth regulator combinations tested, 5.0 mg l^{-1} Kinetin + 0.5 mg l^{-1} GA_3 recorded the maximum number of multiple shoots per culture (8.23), the longest microshoot (4.46 cm) and the maximum number of leaves per microshoot (8.93) in the third subculture. The present findings are in accordance with those of Vij *et al.* (1984) and Mujib and Jana (1994) who have reported that incorporation of GA^3 at lower concentration along with a cytokinin to the medium enhanced protocorm differentiation and growth.

Among the different strengths of MS media compared *viz.*, full, 3/4, 1/2 and 1/4, full MS proved to be the best with respect to the above said three characters, as already reported by Veera Reddy *et al.* (1992). The values were 8.37 microshoots, 4.21 cm and 9.27 leaves respectively in the third subculture (Table 2). More the dilution of the medium, more was the reduction in the *in vitro* growth of *Dendrobium*. Full MS medium contains higher concentration of major and minor salts which might have enhanced protocorm differentiation while their serial dilution in the other

Table 2. Effect of culture media on multiple shoot induction

	Culture medium	I Subculture			II Subculture			III Subculture		
		No.of multiple shoots/ culture	Length of the micro shoot (cm)	No. of leaves per micro shoot	No. of multiple shoots/ culture	Length of the micro shoot (cm)	No. of leaves per micro shoot	No. of multiple shoots/ culture	Length of the micro shoot (cm)	No. of leaves per micro shoot
1	Full MS	3.83	2.93	4.31	6.07	3.62	6.54	8.37	4.21	9.27
2	3/4 MS	1.76	1.39	2.74	4.34	2.07	3.04	5.62	2.24	5.30
3	1/2 MS	1.24	1.26	1.91	3.62	2.13	2.94	4.93	2.07	4.24
4	1/4 MS	1.17	1.21	1.84	2.84	1.89	2.69	5.14	1.93	3.80
SEd		0.261	0.460	0.238	0.282	0.244	0.284	0.248	0.123	0.236
CD at 5%		0.554	0.975	0.505	0.598	0.518	0.602	0.525	0.261	0.501

treatments would have adversely affected differentiation, as reported earlier by Churchill *et al.*, (1973).

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INCIDENCE OF LEAF BLIGHT DISEASE IN RELATION TO AGE, VIGOUR OF COCONUT SEEDLINGS AND YIELD OF PALMS

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ABSTRACT

Leaf blight disease caused by *Pestalotiopsis palmarum* was found both in seedlings and adult coconut palms. Adult palms of 20 to 40 years of age were highly susceptible to the disease. It reduced the height, leaf production and girth at collar of coconut seedlings to the extent of 10.4, 20.1 and 12.5 per cent respectively. The nut yield of coconut palms was decreased by 10 to 24 per cent due to leaf blight incidence.

KEY WORDS : Coconut, Leaf blight, Susceptible age, Vigour, Nut yield

Foliar disease like leaf blight and leaf spots cause reduction in vigour and yield of coconut. Though various organisms were reported to be associated with the leaf blight disease, the predominant organism is *Pestalotiopsis palmarum*. Leaf blight disease is also known as grey leaf spot of coconut.

Despite the widespread occurrence of the leaf blight disease in coconut, it is considered important disease perhaps due to its non lethal nature and because its presence in relation to growth and yield has not been clearly demonstrated. Assessment of susceptible age of coconut to the disease incidence will be useful to take appropriate control measures.

MATERIALS AND METHODS

Disease intensity was assessed in 4 months to 2 years old seedlings, 3 to 4 year old young palms and 5 to 60 year old East Coast Tall (ECT) adult coconut palms under natural infection to find out the relationship between leaf blight incidence and age of seedlings / adult coconut palms. Field experiments were conducted during 1991-95 at Coconut Research Station, Veppankulam to study the influence of leaf blight incidence on the vigour of East Coast Tall coconut seedlings in the nursery and to estimate the yield loss in adult palms due to the disease incidence. Disease intensity, growth parameters viz., height of seedling, number of leaves and girth at collar in healthy and diseased seedlings were assessed from fourth to twelveth month after sowing at monthly intervals. Twenty

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