

LITERATURE CITED

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Promoting Germination from Four Cross Combinations of Immature Oriental-Hybrid-Lily Seeds by Embryo Culture and Scarification Treatment

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INTRODUCTION

In a previous study on oriental-hybrid-lily seed germination it was ascertained that the most suitable developmental stage for embryo culture was 60 or 70 days after crossing. It was also shown for in vitro culture that scarification of immature seeds promoted germination of immature embryos. In this study we investigated whether the scarification method was also the best for four additional hybrid combinations.

MATERIALS AND METHODS

In this research four cross combinations were carried out between May and July 1997 (Table 1). Capsules from the four hybrid combinations were harvested every 10 days (between 40 and 70 days) after crossing and used for aseptic culture of immature embryos and scarification studies. Seed scarification was carried out by cutting seed coats near the embryo with scissors; this method was subsequently improved by pricking the upper and lower seed coat with a sharp knife. The medium was half strength Murashige and Skoog supplemented with 30 g liter⁻¹ sucrose and 4 g liter⁻¹ Gellan gum. Medium pH was adjusted to 5.7 and a 10-ml aliquot was used per test tube (25 mm × 100 mm). All explants were cultured under a 12-h day length, 2500 lx, and 25±1°C.

RESULTS AND DISCUSSION

Table 1 shows the germination results of the immature embryos from the four cross combinations. The rate of germination for immature embryos was low at 40 days but maintained a high level, 90% to 100%, with few exceptions between 50 and 70 days after crossing. From this data we believe that the most suitable time after crossing

Table 1. Comparison of germination ability in immature embryo and scarificated immature seed cultured in vitro in four hybrid lily.

Days after crossing	'Miss Birma' X 'Stargazer'						'Stargazer' X 'Early Rose'					
	Embryo culture			Culture of scar. seed			Embryo culture			Culture of scar. seed		
	No. planted	No. germ. (%)	Rate (%)	No. planted	No. germ. (%)	Rate (%)	No. planted	No. germ. (%)	Rate (%)	No. planted	No. germ. (%)	Rate (%)
40	12	5	42	15	3	20	4	1	25	-	-	-
50	50	50	100	25	20	80	36	36	100	25	19	76
60	50	50	100	25	20	80	50	50	100	25	16	64
70	50	49	98	25	2	8	50	50	100	25	14	56
Days after crossing	'Little Girl' X <i>L. rubellum</i>						'Miss America' X 'Stargazer'					
	Embryo culture			Culture of scar. seed			Embryo culture			Culture of scar. seed		
	No. planted	No. germ. (%)	Rate (%)	No. planted	No. germ. (%)	Rate (%)	No. planted	No. germ. (%)	Rate (%)	No. planted	No. germ. (%)	Rate (%)
40	-	-	-	-	-	-	12	1	8	12	5	42
50	15	8	53	-	-	-	20	18	90	20	17	85
60	25	25	100	25	23	92	-	-	-	-	-	-
70	50	50	100	25	18	72	-	-	-	-	-	-

for immature embryo culture of oriental hybrid lilies is at 50 and 60 days after crossing. It should be noted that excision of lily embryos became gradually more difficult with increasing growth of the seed and endosperm development. The germination rate of scarified immature seeds was also high at 50 and 60 days after crossing. We feel from these experimental results that scarification is a useful method for in vitro seed germination of lily seeds as it is more efficient and yields almost as good results when compared to embryo culture.

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