colors except red. In addition, fragrant flowers can be produced by future breeding because wild types have a strong scent.

- Additional characteristics of spring gladiolus are the followings:
- There are many types about 20 cm in height (wild type).
- They are suited for planting in perennial borders because of cold hardiness.
- It is possible for them to be used as biennial herbs because of the genetic characters in seedlings for flowering in the 2nd year.

NEEDS IN THE BREEDING OF JAPANESE-STYLE FLOWERS

Today, many flowers such as rose, dahlia, lily, carnation, anemone, pansy, and alstromeria, are bred in the belief that large and brilliant flowers are beautiful. However, small flowers such as red clover, Persian speedwell, and hagi in Ikebana (Japanese flower arrangement) have unforgettable beauty and these remain in the minds of Japanese people in a nostalgic way. Therefore, we also need to produce the traditional Japanese-style flowers because the demand will be present because of nostalgic reasons.

Micropropagation of *Rhododendron yedoense* var. *yedoense* by Hypocotyl Culture

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INTRODUCTION

Tissue culture has been adopted successfully for the mass production of many rhododendrons. However, the micropropagation of the tsutsusi group of evergreen rhododendrons is not commercially successful at the production level. We are conducting research to establish the protocol for the red-data species (threatened speices) found only in one spot on Shikoku Isle. In this paper we report preliminary results on the regeneration of shoots from seedling hypocotyls of *Rhododendron yedoense* var. *yedoense*.

MATERIALS AND METHODS

Seeds of *R. yedoense* var. *yedoense* were washed overnight in running tap water. Then, after sterilization with the calcium hypochloride solution and washing in the sterilized distilled water, the seeds were placed on solidified half-strength Murashige and Skoog medium supplemented with sugar (30 mg liter^{-1}). One-month-old seedlings were collected and hypocotyl explants were excised and placed on the previous medium supplemented with combinations of 2ip (0.5, 0.1, and 0.05) and NAA (0.1, 0.2, 0.4, and 0.8). After 1½ months we recorded the amount/number of callus, green spots, adventitious buds, and shoots present.

RESULTS

Shoot regeneration was observed in all hormonal combinations, however, the combinations with lower concentrations of 2ip and moderate concentrations of NAA was more efficient for the rapid regeneration from hypocotyl explants via callus (Table 1).

Table 1. Regeneration frequency in the hypocotyl culture of *R. yedoense* var. *yedodense* f. *poukhanense*.

Hormone		Callus with regenenation (%)			
2ip (mg liter^{-1})	NAA (mg liter^{-1})	Green spot stage	Bud stage	Shoot stage	Total
0.05	0.05	8.7	25	33.3	66.7
	0.1	22.2	22.2	44.4	88.9
	0.2	15.4	19.2	46.2	80.7
	0.8	20	20	60	100
0.1	0.05	0	66.7	33.3	100
	0.1	0	50	0	50
	0.2	0	0	0	0