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Callus and Adventitious Root Culture of *Dioscoreaceae*

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Materials and Methods

1. Explant: Seed, leaf, stem, and root of *Dioscorea batatas* and *Dioscorea nipponica*
2. Methods: Basal medium; MS supplemented with sucrose 3%, Hormones; auxins (NAA, 2,4-D, IAA), cytokinins (BA, kinetin), Culture method; solid (0.4% gelite) or liquid culture, Carbon source; various concentrations of sucrose

Results and Discussion

Dioscoreaceae species have been used as medicinal and vegetable plants in worldwide. Among the bioactive substances in *Dioscoreaceae* species, dioscin, a main steroidal saponin, showed various phamacological activity, such as anticancer, antimutation, immunomodulation, and inhibition of phospholipase A2. In spite of its prominent activity and diverse usage, a mass production of dioscin remains rudimentary, because diocin is produced in the wild type of *Dioscoreaceae* (*D. nipponica*), not in cultivated species (*D. batatas*), and *D. nipponica* has very small rhizome and rare distribution. In the present study, we have applied a plant tissue culture method for mass production of dioscin from *D. nipponica*. The effects of different growth regulators and sugar concentrations were evaluated based on MS medium for induction of callus and subsequent culture of adventitious root. Callus and adventitious root were successfully induced from the root in MS medium containing BA (0.01 mg/L) or BA-NAA (0.01 mg/L-0.1 mg/L), and in MS medium containing NAA (0.01 mg/L), respectively. Also, callus was induced from stem explant of *D. batatas* in MS with 2,4-D (2.0 mg/L). To date, this is the first report of *in vitro* culture of callus and adventitious root induced from *D. nipponica*, and the acquired callus and adventitious root has high potential as new sources of mass production of dioscin.

Table 1. Optimal condition for *in vitro* culture of *Dioscoreaceae* species.

Results	Explants	Basal	Hormone	others
Callus	Root of *D. nipponica* Stem of *D. batatas*	MS	BA 0.01 mg/L 2,4-D 2.0 mg/L	Dark/25°C
Aventitious root	Callus or root of *D. nipponica*	MS	NAA 0.01 mg/L	Dark/25°C Liquid culture

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