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Optimization of Culture Conditions for the Hypericin Production in *Hypricum erectum* Thunb.

Department of Biology, Chonnam National University, Gwangju.
[1]Natinal Institute of Horticultural & Herbal Science, RDA.
Mei-Lan Jin, Ok-Tae Kim[1], Baik Hwang※

Objectives

Hypericum perforatum L. is a traditionally a medicinal plant that is widely utilized for the treatment of mild to moderate depression. Extracts of this species have also been found to exhibit anti-tumoral and anti-bacterial activities. The clinically demonstrated major bioactive compounds of *H. perforatum* include hypericins, pseudohypericins and acylphloroglucinols; more precisely, hyperforin and adhyperforin. These compounds are also produced in other Hypercum species such as *Hypericum erectum* Thunb. The object of this study was to establish optimization of culture conditions for hypericins production in whole plant cultures of *H. erectum* Thunb.

Materials and Methods

- Materials: The Seeds of *H. erectum* were washed with running tap water and were surface-sterilized using sodium hypochlorite (0.3%, v/v) for 10 min, followed by three or four washes with sterile distilled water. Surface-sterilized seeds were placed on MS basal media for germination.
- Methods: Germinated young plants were cultured on liquid medium by inoculating five plants per treatment. To determine the optimization of culture condition for whole plant culture of *H. erectum*, different medium (MS, B5, SH), concentration of MS medium (1, 1/2, 1/3), sucrose (1%, 3%, 5%), cytokinins (TDZ, kinetin, BA), time ourse (3, 4, 5, 6, 7, 8 week) were tested.
- Culture conditions: 25 ℃, 16-h photoperiod (50 umol · m^{-2} · s^{-1})

Results and Discussion

Growth rate was the highest in MS medium among three of B5, SH, and MS medium, and for various element concentrations, which was the highest in MS medium than 1/3MS or 1/2MS medium. Carbon source for growth of *H. erectum* was good at 3% of sucrose, however, the growth of the upper part was inhibited at 5%. Most of the plant did not grow when treated with kinetin, but the TDZ was the most well-grown among three kinds of hormones. The growth pattern of *H. erectum*

Corresponding author : (E-mail) bhwang@chonnam.ac.kr (Tel) 062-530-3390

was examined that the growth of the plant increased after 5 weeks of inoculation and the growth explosively increased at eighth week. On the other hand, the hypericin concentration was highest in 5.38 mg/L at fifth week.

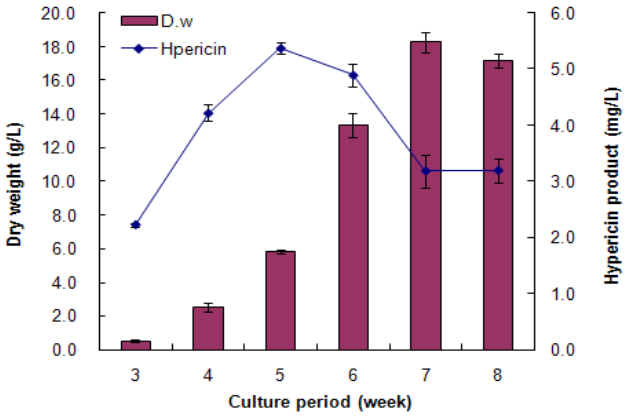

Fig. Time course of growth and hypericin production of *H. erectum* cultured on MS medium.