

04-2-24

Comparison of the Growth of an Rare and Endangered Species, *Tripterospermum japonicum* (S. et Z.) Max Cultured *In Vitro* Under light-emitting Diode (LED) Irradiation Source

Moon HK, Park SY, Son SG, Kim CS and Kim YW

Biotech. Div., Korea Forest Research Institute(KFRI), Suwon, Gyeonggi-do 441-350

Objectives

For development of an efficient micropropagation technique by comparison of the growth of an rare and endangered species, *Tripterospermum japonicum* (S. et Z.) Max, cultured *in vitro* under Light-emitting Diode (LED) irradiation source treatment

Material and methods

- plant material : *In vitro* growing shoots(about 2cm long) of Tsuru-rindo
- Methods :
 - 1) Medium: MS basal medium + sucrose 1, 3% and/or gelrite 0.3%, agar 0.8%
 - 2) LED irradiance : Control - Cool-white fluorescent lamps (control)
4 different ratio of red and blue light
(① Red 100, ② red50+blue 50, ③ red70+blue30, ④ blue 100)
 - 3) Culture condition : 24±1°C, 40 $\mu\text{mol} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$ PPFD for 16h per day

Results and discussion

- High rooting rate from 80 to 100% was achieved in red 100 and cool-white fluorescent lamps, above all earlier root induction and vigorous root development were achieved in ascending high ratio of red/blue light illumination.
- Generally, leaf area increment and enhancement of chlorophyll b content was observed in blue light illumination, whereas the rooting rate and root growth were inhibited in the light condition.
- Above 2.0 of chlorophyll a/b ratio is marked in both red 50+blue 50 and red 70+blue 30 light condition, and we conclude that the illumination condition may be enough to optimal growth for the plants.
- In conclusion, it is possible to plant growth control by manipulating the LED illuminating system for optimal plant photosynthetic action.