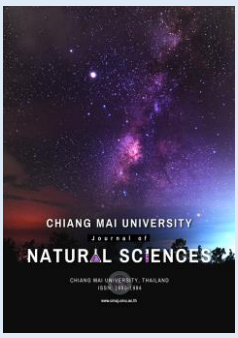


***Editor:***
***Editor:***
1. Korakot Nganvongpanit,
Chiang Mai University, Thailand
2. Wasu Pathom-aree,
Chiang Mai University, Thailand

***Article history:***
Received: December 22, 2020;
Revised: February 18, 2021;
Accepted: March 3, 2021;
Published online: March 18, 2021

***Corresponding author:***
Lalida Shank,
E-mail: lalida.shank@cmu.ac.th

***Research article***

# Sterile Tissue Preparation and Callus Induction of *Curcuma longa* Linn.

**Warunya Kaewthip[1], Srisulak Dheeranupattana[2], Pornchai Junta[3], and Lalida Shank[3, *]**

*1 Division of Biotechnology, Graduate School, Chiang Mai University, Chiang Mai 50200, Thailand*
*2 Department of Biology, Faculty of Science, Chiang Mai University, Chiang Mai 50200, Thailand*
*3 Department of Chemistry and Center of Excellence for Innovation in Chemistry, Faculty of Science, Chiang Mai University, Chiang Mai 50200, Thailand*

**Abstract** *Curcuma longa* Linn. (family Zingiberaceae), commonly known as 'turmeric', is native to Southeast Asia. Turmeric has been used for color, flavor as a spice in cuisine and employed for treatment of various diseases. The major component in yellow-pigmented fraction of turmeric is curcuminoids. Curcuminoid production in callus of *C. longa* Linn. is our focus of study. Sterile techniques to obtain germ-free of *C. longa* Linn. explants were investigated and the results showed that immersing rhizome buds in 70% ethanol for 5 min, followed by 0.10% $HgCl_2$ for 10 min offered approximately 66% survival rate. Multiple shoots were generated from the aseptic rhizome explants cultured on Murashige and Skoog (MS) agar medium fortified with 3.00 µM of 6-Benzylaminopurine (BA) and 0.50 µM of 1-Naphthaleneacetic acid (NAA) at 25 ± 2°C under a photoperiod of 16 h light and 8 h dark. The sterile leaf sheath and root were subsequently used for callus induction which produced various responses when cultured on MS agar medium fortified with different concentrations of 2,4-dichlorophenoxy acetic acid (2, 4-D), Thidiazuron (TDZ) and BA. The highest induction yields of friable callus were obtained from leaf sheath segments cultured on MS agar medium fortified with 0.50 mg/l 2, 4-D which are the conditions proposed for successful production of callus culture of *C. longa* Linn.

**Keywords:** Callus induction, *Curcuma longa* Linn., Turmeric, Plant tissue culture

**Funding:** The authors are grateful to Department of Chemistry and Center of Excellence for Innovation in Chemistry (PERCH-CIC), Faculty of Science, Chiang Mai University for project funding.

**Citation:** Kaewthip, W., Dheeranupattana, S., Junta, P., and Shank, L. 2021 Sterile Tissue Preparation and Callus Induction of Curcuma longa Linn. CMUJ. Nat. Sci. 20(3): e2021062.