

## **Shoot multiplication and callus induction of *Labisia pumila* var. *alata* as influenced by different plant growth regulators treatments and its polyphenolic activities compared with the wild plant**

### **ABSTRACT**

This study aims to investigate whether the in vitro-cultured *L. pumila* var. *alata* has higher antioxidant activity than its wild plant. An 8-week-old *L. pumila* var. *alata* nodal segment and leaf explants were cultured onto Murashige and Skoog (MS) medium supplemented with various cytokinins (zeatin, kinetin, and 6-benzylaminopurine (BAP)) for shoot multiplication and auxins (2,4-dichlorophenoxyacetic acid (2,4-D) and picloram) for callus induction, respectively. The results showed that 2 mg/L zeatin produced the optimal results for shoot and leaf development, and 0.5 mg/L 2,4-D produced the highest callus induction results (60%). After this, 0.5 mg/L 2,4-D was combined with 0.25 mg/L cytokinins and supplemented to the MS medium. The optimal results for callus induction (100%) with yellowish to greenish and compact texture were obtained using 0.5 mg/L 2,4-D combined with 0.25 mg/L zeatin. Leaves obtained from in vitro plantlets and wild plants as well as callus were extracted and analyzed for their antioxidant activities (DPPH and FRAP methods) and polyphenolic properties (total flavonoid and total phenolic content). When compared with leaf extracts of in vitro plantlets and wild plants of *L. pumila* var. *alata*, the callus extract displayed significantly higher antioxidant activities and total phenolic and flavonoid content. Hence, callus culture potentially can be adapted for antioxidant and polyphenolic production to satisfy pharmaceutical, and nutraceutical needs while conserving wild *L. pumila* var. *alata*.

**Keyword:** Shoot multiplication; Callus induction; Plant growth regulator; Antioxidant activities; Polyphenolic activities; *Labisia pumila* var. *alata*