

## THE EFFECTS OF LED LIGHT SPECTRA ON GROWTH AND DEVELOPMENT OF *IN VITRO* *LABISIA PUMILA* VAR. *ALATA*

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**Abstract** - *Labisia pumila* var. *alata* is a well-known and economically important medicinal crop that exhibits numerous pharmacological properties such as antioxidant, anti-inflammatory, and antimicrobial. The present study aimed to evaluate the effect of LEDs on the in vitro morphogenesis, proliferation of shoots, growth, and rooting of *L. pumila* var. *alata* clones. The LEDs light treatments were imposed of white (W), red (R), blue (B), and a combination of red and blue LEDs (1R:1B and 4R:1B) with 12-h photoperiod (alternately 4 hours). Red and blue LEDs lights supplied 32 W (4ft); 22 W (2ft) whereby white LEDs supplied 18 W (4ft); 9 W (2ft). The longest shoot was obtained under treatment W for clone BKF 2/2, followed by clone BKF 1/3; however, treatment 4R:1B (BKF 2/2), R (BKF 2/3), and B (BKF 2/3) produced the shortest shoots. The treatment 4R:1B (BKF 2/3) produced the highest number of shoots and leaves, evidencing that 4R:1B LEDs exert a positive effect on the variables evaluated during the in vitro formation of shoots in *L. pumila*. In contrast, control treatment W (BKF 2/2) produced larger leaves, followed by BKF 1/3. Hence, no leaf produced in treatment R for BKF 2/3 and treatment B for BKF 1/2 and BKF 2/3. After 4 months of culture, significant differences were observed in rooting responses under different LED treatments. Control treatment W produced more roots per explant, followed by BKF 1/3. However, treatment R produced longest root length but no new shoots and leaves produced. No roots produced in the treatment 4R: 1B (BKF 1/3), 1R: 1B (BKF 1/2, BKF 1/3 and BKF 2/3), R (BKF 1/2), and treatment B for all clones. The results revealed that W LEDs light was the most suitable light for the growth of *L. pumila* culture plantlets. The growth duration of the plantlet tissue culture was the shortest and the rates of *L. pumila* growth initiation, differentiation, and regeneration were the greatest under the W LED treatment compared to other treatments.

**Keywords:** Light emitting diodes, shoot multiplication, root formation