

**Developing *Paraphalaenopsis labukensis* (Shim, A. Lamb & C.L. Chan), an Orchid Endemic to Sabah, Borneo, Asymbiotic Seed Germination and In Vitro Seedling Development**

**ABSTRACT**

*Paraphalaenopsis labukensis* Shim, A. Lamb & C.L. Chan (*P. labukensis*) is an endangered monopodial epiphytic orchid threatened due to habitat fragmentation and overharvesting. Consequently, this research aimed to achieve in vitro propagation of *P. labukensis* through asymbiotic seed germination and seedling development. This study focused on identification and optimizing capsule maturity, basal media and nutrient requirements. In addition, after hand pollinating the plant, their capsules' flowers, length, girth, and colour variations were recorded weekly to ascertain morphological maturity characters of this species. Murashige and Skoog (MS), Knudson C (KC), and Vaccin and Went (VW) basal media were used to determine seed vegetation at 60, 90, and 120 days. Subsequently, for the proliferation and development of protocorms, the best basal media were those supplemented with different organic additives (coconut water (CW) and banana homogenate (BH)) and plant growth regulators (PGRs). As a result, 120 days after pollination (DAP) was chosen as the best capsule age for germination since the capsules had reached maturity. The highest germination rate was attained after 90 days of culture in Knudson C (KC) medium, with  $98.78 \pm 0.89\%$ , followed by Murashige and Skoog (MS) medium, with  $92.80 \pm 3.26\%$ . The KC supplemented with 0.5 mg/L NAA media documented a maximum percentage of  $17.25 \pm 0.96\%$ . The 5 g/L (w/v) BH recorded a higher protocorm proliferation percentage than CW. Additionally, after 150 days of culture (DOC), this medium combination produced the most leaves, averaging four or five. The result of this present study has successfully established an effective in vitro propagation protocol for this species. X CV