

# **Evaluation of the influence of environmental and nutritional factors on the *in vitro* cultivation of *Paubrasilia echinata* (Lam.) Gagnon, H.C.Lima & G.P.Lewis**

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The species *Paubrasilia echinata*, a national symbol of Brazil (Law No. 6,607 of December 7, 1978), holds ecological, historical, cultural, and commercial importance at the international level, being nearly extinct along the Brazilian coast. Recent studies have sought alternatives to minimize the stress experienced by plants propagated *in vitro*. Photoautotrophic micropropagation, defined as micropropagation in the absence of sucrose, and photomixotrophic micropropagation, known as micropropagation enriched with sucrose, are being studied and developed with the aim of increasing large-scale seedling production for reforestation of degraded areas, economic interest, and also urban afforestation in urban centers.

With the objective of maximizing the survival rate in the *ex vitro* phase of a tree species, a completely randomized design with a triple factorial  $2 \times 4 \times 3$  (medium  $\times$  sealing  $\times$  light) was used to evaluate shoot length (SL), root length (RL), and the number of leaflets (NL) in different culture media, sealing methods, and light quality/intensity for *P. echinata*. Seeds of *P. echinata* were inoculated in MS medium (Murashige & Skoog 1962), with  $30 \text{ g l}^{-1}$  of sucrose and MS medium without sucrose addition, both supplemented with agar gelling agent at  $7.5 \text{ g l}^{-1}$  and pH adjusted to  $5.7 \pm 0.1$ . Four types of sealing were tested: cap, polyvinyl chloride (PVC), and cap with one or two microporous membranes (memb) from the brand Phytotechnology®. White fluorescent lamps, pink LED, and the combination of white and pink light were used.

After 90 days, the results indicated that SL in the culture medium without sucrose was greater in flasks with 2 memb under white light, with an average of 49.17 mm. For RL, the highest average was 74.04 mm in medium with sucrose, with 1 memb under pink and white light. For NL, the highest quantity was in flasks with 1 memb under white light, with an average of 31.4 leaflets. In addition, the culture medium with sucrose showed higher NL in 1 memb with an average of 30.46 leaflets.

The results indicate that the interaction between carbon source, sealing, and light quality is decisive for optimizing the initial development of *P. echinata*. The medium without sucrose, with 2 memb under white light, favored SL, RL, and NL, indicating that the photoautotrophic condition stimulates vegetative development of this species.