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# Optimization of *in vitro* micropropagation protocol for *Aloe variegata*: An ornamental succulent

Jayathilaka K.M.D.S.S[1], Chathuranga H.L.T.S.[2], Abeysinghe P.D.[1*] and Hemamali K.K.G.U.[1]

[1]*Department of Botany, University of Ruhuna, Wellamadama, Matara, Sri Lanka.*
[2]*Golgi tec- plant tissue culture laboratory, Wariyagoda, Alawwa, Sri Lanka.*

*Aloe variegata* is distinctive ornamental succulent plant which is commercially important both in local and export markets. Poor regeneration with abnormal organs and hyperhydricity are the associated problems in *in vitro* propagation of this plant. The present study was attempted to develop an efficient and reproducible micropropagation protocol by optimizing the culture medium conditions. The effect of different combinations of Plant Growth Regulators (PGRs) concentrations on *in vitro* shoot regeneration was evaluated using side-shoots as explants. Explants were pretreated by using 0.2% (w/v) fungicide (Captan) followed by 0.1% (w/v) antibiotic (Doxycycline) solution. Surface sterilization was done with series of concentration of Clorox (85%-25%) mixed with Tween-20 and sterilized explants were established on the hormone-free Murashige and Skoog (MS) medium. Shoot multiplication was tested on MS media augmented with various combination of 6-Benzylaminopurine (BAP), Tiadiazuron (TDZ) and Indole-3-acetic-acid (IAA) concentrations, having 12 replicates for each treatment level. Data analysis was performed using statistical software R 3.6.3 for calculating both Kruskal Wallis test and Dunn's test. The highest number of shoots (44.83 ± 3.60) per explant were recorded on MS medium fortified with 2.5 mg/L BAP, 0.3 mg/L TDZ and 0.3 mg/L IAA ($p<0.05$) while the maximum number of roots (6.2 ± 0.34) per shoots were obtained when adventitious shoots were inoculated on MS medium fortified with 0.2 mg/L IBA ($p<0.05$). The developed protocol is efficient since a successful plant regeneration could be obtained within 16 weeks. The optimal PGR combination for enhanced shoots and roots development in *A. variegata* was optimized.

**Keywords:** *Aloe variegata,* Optimization, Plant growth regulators, Side-shoot explants

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*Corresponding author: pushpa@bot.ruh.ac.lk