EFFECT OF MEDIA COMPOSITION AND DRAINAGE ON MULTIPLICATION OF *IN-VITRO* POTATO (*Solanum tuberosum* L.) SINGLE NODAL CUTTINGS IN A SEMI AUTOTROPHIC SYSTEM

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ABSTRACT

This study investigated the effect of media composition and drainage on multiplication of *in-vitro* potato (*Solanum tuberosum* L.*)* single nodal cuttings in a semi autotrophic system due to the high cost of potato seed production. A completely randomized design (CRD) with six treatments were tested: T1 (100% coir without drainage), T2 (100% fine sand without drainage), T3 (1:1 mixture of fine sand and coir without drainage), T4 (100% coir with drainage), T5 (100% fine sand with drainage), and T6 (1:1 mixture of fine sand and coir with drainage), with each treatment replicated three times (six cuttings per replicate). Data were statistically analyzed using Minitab 17 statistical software. Effect of these growing media on plant growth parameters and drainage system of its *In-vitro* potato plantlets. Result showed that different growth parameters of the potato plantlet were affected by the different growing media. Although survival plant percentage (P=0.309) did not differ significantly among treatments with T3 and T6 both achieving 100.0 ± 0.0% survival plant percentage, significant ($p<0.05$) differences were found in stem height (p=0.005), leaf number (p=0.018), internodal cutting number (p=0.027), internodal cutting height (0.005), root length (p=0.000), number of roots (p=0.012), fresh weight (p=0.007), dry weight (p=0.037), and moisture content (p=0.037). The results recorded T6 the highest stem height (8.90 ± 0.53 cm), highest number of leaves (14.00 ± 5.29), highest number of internodal cuttings (5.33 ± 0.58), highest Fresh weight (0.70 ± 0.15 g) and highest moisture content (93.55 ± 0.36%), and T3 exhibited the greatest internodal cutting height (1.75 ± 0.18 cm) and dry weight (0.050 ± 0.0051 g), whereas T5 consistently demonstrated lower performance across several parameters such as lowest stem height (2.66 ± 0.56 cm), lowest number of inter nodal cuttings (2.34 ± 0.58), lowest inter nodal cuttings height (0.91 ±0.08 cm), lowest fresh weight (0.26 ±0.11 g), lowest dry weight (0.027 ± 0.0085 g) and lowest moisture content (89.31 ±1.67 %). It was observed, 1:1 mixture of fine sand and coir with drainage (T6) provide the best medium in many aspects. Treatment 6 produced favourable effects on other relevant growth. These findings suggest that a 1:1 mixture of fine sand and coir, particularly when combined with drainage, optimizes plant survival, growth, and root development, thereby offering a promising strategy to reduce the production costs associated with potato plantlets multiplication.

Key words: Coir, Drainage, Fine sand, Growing media, Potato (*Solanum tuberosum* L.), Semi Autotrophic System.

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