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Influences of different growing media on growth and development of *Piper longum*

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Abstract

Piper longum (family Piperaceae) is an imperative medicinal herb used in indigenous medicine. Lack of proper cultivation protocols exist as a major bottleneck for the commercial production of this invaluable species. Therefore, systematic cultivations with developed cultivation packages should be available to overcome the problems associated with this species. Further, *P. longum* cultivated without chemical inputs possess high quality, efficacy, and reliability. Therefore, a pot experiment was conducted to find out appropriate growth media for better growth and development of *P. longum*. Rooted cuttings were established in six different growth media with triplicates under Completely Randomized Design (CRD). Data on plant height (cm), number of leaves, number of branches, shoot and roots dry weights (g), and root volume (ml) were collected at 3 months after planting. All potting media were studied for available Nitrogen, Phosphorous, Potassium, Organic Matter %, pH and electrical conductivity. Data were analysed with analysis of variance (SAS 9.1 version) and means were separated using Duncan's multiple range test. According to the results, the highest number of leaves (43.3 ± 4.2), number of branches (7 ± 1), shoot dry weight (15.7 ± 1.1 g), root dry weight (2.86 ± 0.6 g) and root volume (19.7 ± 5.6 ml) were recorded from topsoil: sand: compost 1:1:1 medium. Different growth media showed significant difference ($P \leq 0.05$) for pH, electrical conductivity, nitrate nitrogen, ammonium nitrogen, phosphorus, potassium, and organic matter contents. Topsoil: sand: compost 1:1:1 showed pH and electrical conductivity 7.7 and 1.2 mS/cm, respectively. The same growth media reported 1.6 ppm of nitrate nitrogen, 0.76 ppm of ammonium nitrogen, 126.5 ppm of phosphorus, 193 ppm of potassium and 4.6% of organic matter. Topsoil with compost help to retain water as well as provide nutrients. Sand facilitates drainage and improves aeration. The lowest values for all the growth and yield parameters were recorded in topsoil: compost 1:2 indicating that excess compost may also negatively impact on growth and development of *P. longum*. Therefore, Topsoil: sand: compost 1:1:1 appeared to be the most promising growing media for *P. Longum* to grow under organic cultivations.

Keywords: Growth, Irrigation, Medicinal herb, Potting media, Yield

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