

Allelopathic Effect of Weeds Extracts on Growth and Yield of Tomato (*Solanum lycopersicum* L.)

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The weeds are used as mulch, green manure and in compost production that could favourably or adversely affect on crops due to presence of allelochemicals. Such chemicals can be present in any part of the plant and release to microenvironment by leaching, root exudation, residue decomposition and other processes. This study was undertaken to evaluate the allelopathic effect of four common weed species available in agricultural lands on growth and yield of Tomato (*Solanum lycopersicum* L. var. Padma) under plant house conditions. The dried vegetative parts of Kura thampala (*Amaranthus viridis*), Bubovitiya (*Clidemia hirta*), Panithora (*Cassia occidentalis*) and Hulanthala (*Ageratum conyzoides*) were used to extract aqueous solutions at different concentrations i.e. 4%, 8%, and 12%. Aqueous solutions were applied two weeks after transplanting and continued at one-day intervals until harvesting. Three replicates were used for each treatment in Complete Randomized Design with a control (water applied). Vegetative and reproductive characteristics of tomato such as plant height, No of leaves, No of branches, stem girth, total chlorophyll content, No of flowers, No of fruits, and fruit weight were recorded. Total polyphenol content of weed species and variation of soil pH and EC were analyzed in monthly intervals. The application of 4% of Hulanthala was shown the positive performances in vegetative growth, while 12% of Panithora reported the lowest values for both vegetative and reproductive growth of tomato compared to other treatments ($p < 0.05$). Further, the highest total polyphenol content was in Bubovitiya and highest fruit weight was reported in the plants treated with 4% Bubovitiya compared to other weed species ($p < 0.05$) with the highest brix value. It can be concluded that the weeds such as Hulanthala and Bubovitiya could be used in preparation of compost or in other organic applications at lower concentrations to obtain better growth and yield performances of tomato.

Keywords: Allelochemicals, Reproductive growth, Tomato, Vegetative growth, Weeds