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Growth Promotion of Fruity Vegetable, Leafy Vegetable and Rice Seedlings Using Various Water Extracts

Ei Ei¹, Hyun Hwa Park¹, Yong In Kuk^{1*}

¹Department of Bio-oriental Medicine Resources, Suncheon National University, Suncheon 57922, South Korea

[Introduction]

Plant nutrition has a beneficial impact on plant growth and development, which leads to increased crop yield. Chemical fertilizers are being used in higher amounts in order to increase crop growth but can cause pollution in the air, water, and soil as well as cause harm to human health. Plant extracts are one of the most useful substitutes for chemical fertilizers as they are a healthier form of crop growth promotion. Thus, this study was conducted to investigate the effects of water extracts made using *Psidium guajava*, *Aloe vera*, *Allium sativum*, and *Medicago sativa* on stimulating vegetative characteristics of fruity, vegetables, leafy vegetables and rice crops.

[Materials and Methods]

For this study, four water extracts were made from the leaves of *P. guajava* and *A. vera*, the tubers of *A. sativum* and aboveground plant parts of *M. sativa*. These four extracts were tested at concentrations of 0, 0.05, 0.1, 0.5, and 1 % while control tests used urea at a 0.6% concentration. Test crops tomato and cucumber (fruity), kale and lettuce (leafy) and rice were studied in greenhouse conditions. At 2 to 3 leaf stages, the seedlings of all test crops were transplanted to plastic pots and were maintained in a greenhouse. At 3 days after transplanting, plant extracts were applied using soil drench application. Plant height and shoot fresh weight were measured 7 and 14 days after treatment.

[Results and Discussion]

These four plant extract treatments, regardless of concentration, positively affected the growth of all test crops compared to control. Plant height at 14 DAT increased in tomato (51 %), cucumber (57 %), kale (55 %), lettuce (67%), and rice (33 %) compared to the control. Shoot fresh weight at 14 DAT also increased in tomato (77 %), cucumber (69 %), kale (66 %), lettuce (61%), and rice (80 %) compared to the control. The four extracts at 0.5% concentration had the greatest effects on increasing plant height and shoot fresh weight. Generally, the extract made using *P. guajava* had higher growth promotion effects than the other extracts. Among test crops, cucumber growth was the most positively affected by plant extract treatments. Overall, all four plant extracts used in this study can be used as effective growth promoters of the crops used in this study.

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*Corresponding author: E-mail, yikuk@chonnam.ac.kr Tel. *** - **** - ****