

Title Flavonoids of the Marigold Flowers on Affects the Plant Growth and Antioxidant Activity of *Lactuca sativa* Linn Cultivated with Hydroponics.

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Abstract

To study the effect of Marigold (*Tagetes erecta* L.) flower extract and pure compound on plant growth regulate using hydroponic lettuce, the aim of this study was to discover natural alternatives to plant growth hormone and value-added to marigold flowers. Firstly, to optimize the solvent system for extraction of phenolic and flavonoid compounds from fresh flowers (11 system, mixture between H₂O and EtOH, EtOH and EtOAc), we found the 60% H₂O/EtOH was an appropriate solvent system with the extract contained 47.08±2.00 mg GAE/g of extract of total phenolic compounds and 1,139.05 mg QE/g of extract of total flavonoids, and the extract antioxidant activity with the IC₅₀= 44.93±0.40 ppm. The column chromatography led to isolated quercetagenin and 6-hydroxy kaemferol, the structure elucidation were achieved by NMR, MS, IR which corresponding with previously report. Then the extract and isolation compound; quercetagenin and 6-hydroxy kaemferol were studied on. The antioxidant activity of quercetagenin and 6-hydroxy kaemferol showed the IC₅₀ = 20.25±0.36 and 32.44±0.35 ppm, respectively.

On the study the effect flower extract and pure compounds on plant growth regulate, firstly, to optimize the hormone (positive control) and extract concentration, we found the 0.02 mg/ml and 0.4 mg/ml, respectively are appropriate concentration. The results were analyzed by the height of lettuce, fresh weight and dried weight of lettuce. The extract and pure compound could promote the growth of lettuce 1.5 and 2.0 fold, respectively (comparison with control).

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