

TIGMOMORFOGENESIS TANAMAN PAKCOY (*Brassica rapa* subsp. *chinensis*) AKIBAT PEMBERIAN IRIGASI CURAH DAN IRIGASI KABUT

INTISARI

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Tanaman memiliki respon terhadap rangsangan yang diberikan oleh lingkungan. Salah satunya adalah rangsangan mekanik oleh butir air pada saat pemberian irigasi. Respon tanaman terhadap rangsangan mekanik ini disebut dengan tigmomorfogenesis. Tujuan dari penelitian ini adalah mengamati fisiologi tanaman pakcoy (*Brassica rapa* subsp. *chinensis*) pada kasus tigmomorfogenesis akibat pemberian irigasi curah dan irigasi kabut serta menerapkan model matematik *logistic equation* untuk memprediksi pertumbuhan tanaman pakcoy. Dalam penelitian ini, dilakukan pengukuran ukuran butir air pada tiap perlakuan irigasi. Kemudian, parameter yang diukur dan diamati adalah tinggi tanaman, diameter batang, jumlah daun, berat basah, luas daun dan panjang akar. Analisis yang digunakan adalah analisis grafik perbandingan, eksponensial, regresi linier, uji homogenitas, uji ANOVA dan model *logistic equation*.

Dari hasil pengukuran butir air, irigasi curah memiliki jumlah butir air 36,83 butir/s, nilai rerata massa air satu butir: 4×10^{-5} gr; volume satu butir air: 5×10^{-5} cm³; diameter butir: 0,44 mm. Sedangkan irigasi kabut memiliki jumlah butir air 1548,25 butir/s, nilai rerata massa air satu butir: 2×10^{-3} gr; volume satu butir air: 2×10^{-3} cm³; diameter butir: 1,50 mm. Nilai rerata pertumbuhan tanaman pada irigasi curah yaitu tinggi tanaman: 11,35 cm; diameter batang: 1,87 mm; jumlah daun: 4,83 helai; luas daun: 226,85 cm²; berat basah tanaman: 15,50 gr; panjang akar: 30,48 cm. Sedangkan pada irigasi kabut yaitu tinggi tanaman: 11,17 cm; diameter batang: 2,05 mm; jumlah daun: 4,53 helai; luas daun: 309,76 cm²; berat tanaman: 17,88 gr; panjang akar: 27,73 cm. Hasil uji anova satu arah menunjukkan bahwa perlakuan irigasi tidak berpengaruh signifikan terhadap pertumbuhan tanaman (sign. > 0,05). Hasil pemodelan matematika dengan *logistic equation* menunjukkan bahwa model ini dapat diterapkan untuk memprediksi jumlah daun tanaman pakcoy.

Kata kunci: Tigmomorfogenesis, sawi (*Brassica rapa* subsp. *chinensis*), fisiologi tanaman, irigasi tetes, irigasi kabut, model *logistic equation*.

**THIGMOMORPHOGENESIS OF PAKCOY (*Brassica rapa subsp.*
chinensis) AS A RESULT OF THE APPLICATION OF SPRINKLER
IRRIGATION AND MIST IRRIGATION**

ABSTRACT

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Plants have a response to stimuli provided by the environment. One of them is mechanical stimulation by water grains when giving irrigation. The response of plants to mechanical stimulation is called thigmomorphogenesis. The purpose of this study is to observe the physiology of Pakcoy plants (*Brassica rapa subsp. chinensis*) in the case of thigmomorphogenesis due to the application of sprinkler irrigation and mist irrigation and to apply mathematical logistic equation models to predict the growth of pakcoy plants. In this study, water grain sizes were measured for each irrigation treatment. Then, the parameters measured and observed were plant height, stem diameter, number of leaves, wet-based weight, leaf area and root length. The analysis used were comparative graph analysis, exponential analysis, linear regression, homogeneity test, ANOVA test and logistic equation model.

From the results of measurements of the water grain number, mass per water grain, volume per water grain, and grain diameter of sprinkler irrigation were 36.83 grains/s, 4×10^{-5} g, 5×10^{-3} cm³ and 0,44 mm, respectively. Whereas the water grain number, mass per water grain, volume per water grain, and grain diameter of mist irrigation were 1548.25 grains/s, 2×10^{-3} g, 2×10^{-3} cm³, and 1.5 mm, respectively. The average value of plant height, stem diameter, number of leaves, leaf area, plant weight, and root length of sprinkler irrigation were 11.35 cm, 1.87 mm, 4.83 strands, 226.85 cm²; 15.50 g, 30.48 cm, respectively. Whereas the average value of plant height, stem diameter, number of leaves, leaf area, plant weight, and root length of mist irrigation were 11.17 cm, 2.05, 4.53, 309.76 cm², 11.88 g, and 27.73 cm, respectively. One-way ANOVA test results showed that irrigation treatment did not significantly influence plant growth (sign.> 0.05). The results of mathematical model with logistic equations showed that this model can be applied to predict the number of leaves of Pakcoy plants.

Keywords: Thigmomorphogenesis, mustard greens (*Brassica rapa subsp. chinensis*), plant physiology, drip irrigation, mist irrigation, logistic equation model.