

PENGARUH ASAM JASMONAT DALAM INDUKSI KETAHANAN PADI HITAM (*Oryza sativa* L. ‘Cempo Ireng’) HASIL MUTASI SODIUM AZIDA TERHADAP WERENG BATANG COKLAT (*Nilaparvata lugens* Stål.)

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INTISARI

Padi hitam (*Oryza sativa* L. ‘Cempo Ireng’) merupakan salah satu varietas lokal di Indonesia. Padi hitam memiliki kandungan antosianin yang berpotensi sebagai antioksidan. Padi hitam mudah rebah karena memiliki fenotip lebih tinggi daripada varietas padi putih, dan juga rentan terhadap wereng, oleh karena itu dibutuhkan tanaman padi hitam M1 yang memiliki fenotip kerdil melalui induksi mutasi dengan mutagen kimia, dan mendapatkan tanaman yang tahan terhadap wereng batang coklat (WBC) dengan aplikasi asam jasmonat. Penelitian ini bertujuan untuk mengetahui kombinasi perlakuan fenotip hasil mutasi sodium azida dan aplikasi asam jasmonat terhadap pertumbuhan vegetatif dan ketahanan padi hitam terhadap WBC. Sekitar 5000 benih padi hitam direndam dalam 2.5 mM sodium azida selama 18 jam, kemudian biji dicuci dibawah air mengalir. Biji dikecambahkan selama 3 minggu. Beberapa bibit menunjukan fenotip normal, semi kerdil dan kerdil, selanjutnya diseleksi berdasarkan fenotip tersebut dan ditanam pada ember yang berisi campuran tanah dan pupuk organik. Tanaman diberi perlakuan asam jasmonat 0mM, 2.5 mM, 5 mM dan 7.5 Mm, untuk masing-masing perlakuan dibuat 4 ulangan. Pada fase vegetatif maksimum, dilakukan pengukuran tinggi tanaman, jumlah anakan, laju fotosintesis, kerapatan stomata, kandungan klorofil total, kandungan asam oksalat dan luas embun madu. Laju fotosintesis diukur dengan menggunakan LICOR 6400 XT, kandungan klorofil total dan asam oksalat diukur dengan spektrofotometer, luas embun madu diukur dengan kertas Whatman no.1. Hasil penelitian menunjukkan bahwa pada fase pertumbuhan vegetatif, kombinasi perlakuan fenotip hasil mutasi sodium azida dan aplikasi asam jasmonat mampu meningkatkan jumlah anakan, kandungan klorofil total, kerapatan stomata, dan menekan tinggi tanaman namun tidak menunjukkan pengaruh pada laju fotosintesis. Kombinasi fenotip kerdil dengan aplikasi asam jasmonat 2.5mM dan 5mM diperoleh karakter paling tahan terhadap WBC yang ditunjukkan dengan kandungan metabolit sekunder asam oksalat cenderung lebih tinggi dan luas embun madu yang cenderung lebih sempit.

Kata kunci : Padi Hitam, tahan wereng, asam jasmonat, *Nilaparvata lugens*, sodium azida

**THE EFFECT OF JASMONIC ACID-INDUCED RESISTANCE IN
BLACK RICE (*Oryza sativa* L. ‘Cempo Ireng’) BY SODIUM AZIDE
MUTATION ON THE BROWN PLANTHOPPER (*Nilaparvata lugens* Stål.)**

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ABSTRACT

Black rice (*Oryza sativa* L. ‘Cempo Ireng’) is one of local rice varieties in Indonesia. Black rice contains anthocyanin which is potential as antioxidant. Black rice easily falls down because it is relatively taller than white rice varieties and also susceptible to brown planthopper. Therefore shorter trait on the first generation (M1) through mutation is favourable. Brown planthopper (BPH) resistant trait can be obtained by applying jasmonic acid. This research was aimed to observe the effect of mutant phenotypes induced by sodium azide and jasmonic acid application combination in vegetative growth and black rice resistant toward BPH. Around 5000 black rice seeds were soaked in 2.5 mM sodium azide for 18 h, and then seeds were washed under flowing tap water. Seeds were then germinated for 3 weeks. Several seedlings that showed a normal, semi dwarf and dwarf phenotype were selected and planted in a plastic pot containing a mixture of soil and organic fertilizer. Plants were then treated with jasmonic acid of 0mM, 2.5 mM, 5mM, and 7.5 mM. Four replicates were used per treatment. At the maximum vegetative stage, the plant height, tiller number, photosynthesis rate, stomata density, total chlorophyll content, oxalic acid content and honey dew area were determined. The photosynthesis rate was determined using LICOR 6400 XT, total chlorophyll and oxalic acid content in leaves were determined spectrophotometrically, honey dew area was determined using Whatman no.1 paper. The results showed that during vegetative growth, combined treatment of the mutated phenotype sodium azide and jasmonic acid application is able to increase the number of tillers, total chlorophyll content, stomatal density, and reduce plant height but does not show the effect on the rate of photosynthesis. The combination of a dwarf phenotype with jasmonic acid application 2.5mM and 5mM obtained most resistant to BPH character shown by the oxalic acid content of secondary metabolites tend to be higher and the area honey dew which tend to be more narrow.

Key word: Black rice, resistance to brown planthopper, jasmonic acid, *Nilaparvata lugens*, sodium azide