

**PENGARUH ETIL METAN SULFONAT (EMS) DAN GIBERELIN  
TERHADAP PERKECAMBAHAN SERTA PERTUMBUHAN AWAL  
PADI HITAM (*Oryza sativa* L. 'Cempo Ireng')**

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**INTISARI**

Padi merupakan salah satu tanaman palawija yang termasuk makanan pokok bagi masyarakat di Indonesia. Salah satu jenis padi yang mulai banyak dikembangkan adalah padi hitam. Padi hitam diketahui memiliki keunggulan dibandingkan jenis padi yang lain seperti kandungan antosianin tinggi, rasa yang enak serta bermanfaat bagi kesehatan. Oleh karena potensi tersebut, perlu dilakukan peningkatan variasi padi hitam melalui induksi mutasi. Beberapa penelitian melaporkan bahwa cara yang paling efektif untuk menciptakan tanaman yang unggul adalah dengan melalui induksi mutasi secara kimiawi. Salah satu senyawa mutagen yang paling banyak digunakan pada tanaman adalah senyawa kimia yang berasal dari golongan alkyl seperti Etil Metan Sulfonat (EMS). Penelitian ini bertujuan untuk mempelajari pengaruh pemberian kombinasi EMS dan giberelin terhadap perkecambahan dan pertumbuhan awal padi hitam (*Oryza sativa* L. 'Cempo Ireng') yang meliputi persentase perkecambahan, analisis enzim  $\alpha$ -amilase, panjang sel epidermis batang, tinggi tanaman, kerapatan stomata, jumlah daun dan kadar klorofil total. Analisis kadar klorofil total menggunakan metode spektrofotometri. Penelitian dilakukan pada bulan Januari-Mei 2015 bertempat di *Green House* Fakultas Biologi UGM. Penelitian ini menggunakan rancangan acak kelompok faktorial dengan pemberian dua macam konsentrasi EMS yaitu 0,25% dan 0,50% melalui perendaman benih padi hitam. Biji yang berkecambah kemudian diseleksi dan dilakukan penyemprotan dengan GA 10 ppm pada kecambah yang kerdil umur 2 minggu. Hasil analisis melalui uji statistik DMRT taraf kepercayaan 95% menunjukkan pemberian mutagen Etil Metan Sulfonat (EMS) tidak mempengaruhi persentase perkecambahan namun menurunkan aktivitas enzim  $\alpha$ -amilase serta menekan ukuran panjang sel epidermis batang, tinggi tanaman, kerapatan stomata permukaan bawah daun, jumlah helai daun dan kadar klorofil total. Pemberian hormon giberelin dapat meningkatkan ukuran panjang sel epidermis batang, tinggi tanaman, kerapatan stomata permukaan bawah daun dan kadar klorofil total pada perlakuan kontrol+GA dan perlakuan EMS 0,25%+GA.

Kata kunci: 'Cempo Ireng', Enzim  $\alpha$ -amilase, Etil Metan Sulfonat, Giberelin, *Oryza sativa*

**EFFECTS OF ETHYL METHANE SULFONAT AND GIBBERELIN ON  
GERMINATION AND VEGETATIVE GROWTH OF BLACK RICE (*Oryza  
sativa* L. 'Cempo Ireng')**

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**ABSTRACT**

Rice is one of crops plants used as staple food for Indonesian people. There have been many efforts in developing new rice variety. One of the new varieties is black rice. Black rice is known to have more advantages compared to other rice types because its high anthocyanin content, taste good and is benefit for health. Several studies reported that the most effective way to create a new variety is through the induction by chemical mutation. One of the compounds that is normally used as mutagen is a chemical compound derived from alkyl group such as Ethyl Methane Sulfonat (EMS). This study was aimed to determine the effect combination of EMS and gibberellin application spesifically on germination percentage and  $\alpha$ -amylase activity also growth of black rice (*Oryza sativa* L. 'Cempo Ireng') such as epidermal cell length, plants height, stomata density, leaf number and total chlorophyll contents. Total chlorophyll content was analyzed by spectrophotometry method. This experiment was conducted out on January-May 2015 in Green House of Faculty of Biology UGM. This experiment was designed with randomized block factorial design which used two concentration of EMS namely 0,25% and 0,50%. Black rice seeds were soaked in either water (control) or EMS solution. Germinated seeds were selected and dwarf seedling of 2 weeks old were sprayed with GA 10 ppm. Data were analyzed by One way ANOVA and DMRT with  $p=95\%$ . The results showed that Ethyl Methane Sulfonat (EMS) treatment did not alter the germination percentage, but it decreased  $\alpha$ -amylase activity, reduced epidermal cell length, plants height, stomata density, leaf number and total chlorophyll content. Gibberellin application increased epidermal cell length, plants height, stomata density and total chlorophyll at control treatment and EMS 0,25%+GA.

Key words: 'Cempo Ireng', Enzym  $\alpha$ -amilase, Ethyl Methane Sulfonat, Gibberelin, *Oryza sativa*