

DAYA KULTUR ANTERA PADI (*Oryza sativa* L.) ‘MENTIK WANGI’ MUTAN GENERASI PERTAMA (M1) HASIL IRADIASI SINAR GAMMA

INTISARI

Kombinasi pemuliaan mutasi dengan kultur antera berpotensi sebagai upaya perbaikan padi aromatik lokal secara cepat dengan pembentukan galur haploid ganda. Aplikasi sinar gamma diketahui menyebabkan perubahan pada struktur genetik dan proses fisiologis tanaman karena pengaruh cekaman oksidatif. Oleh karena itu, evaluasi pengaruh mutagen terhadap efisiensi kultur antera perlu dilakukan. Penelitian ini bertujuan untuk mendeteksi pengaruh dosis iradiasi sinar gamma terhadap induksi kalus dan regenerasi planlet pada kultur antera padi mutan generasi pertama (M1). Benih padi ‘Mentik Wangi’ diberi perlakuan iradiasi sinar gamma pada dosis 0, 100, 200, 300, 400, dan 500 Gray, kemudian benih ditanam sebagai tanaman donor kultur antera. Malai dikoleksi saat fase bunting dan dilakukan optimasi preperlakuan malai sebelum antera ditanam. Hasil optimasi menunjukkan inkubasi malai pada suhu 4 °C selama 8 hari dapat meningkatkan kemampuan induksi kalus pada kultur antera padi ‘Mentik Wangi’. Dosis iradiasi sinar gamma 100 Gray mampu meningkatkan respon antera untuk membentuk kalus, sementara dosis 200, 300, 400, dan 500 Gray menyebabkan kemampuan antera untuk membentuk kalus menurun. Kalus yang tumbuh menjadi planlet diperoleh dari perlakuan dosis iradiasi sinar gamma 0, 100, dan 400 Gray. Dosis iradiasi sinar gamma 100 dan 400 Gray dapat meningkatkan daya regenerasi kalus menjadi planlet dan pertumbuhan tunas hijau. Tiga tanaman haploid ganda spontan diperoleh dari kultur antera padi ‘Mentik Wangi’ mutan pada dosis iradiasi sinar gamma 100 dan 400 Gray, masing-masing sebanyak 1 dan 2 tanaman.

Kata kunci: haploid ganda, kultur antera, Mentik Wangi, sinar gamma

ANTHER CULTURE ABILITY OF M1 ‘MENTIK WANGI’ MUTANT RICE (*Oryza sativa* L.) GENERATED BY GAMMA RAY IRRADIATION

ABSTRACT

Mutation breeding combined with anther culture has potential to improve the character of local aromatic rice rapidly through the formation of double haploid lines. Gamma ray irradiation treatment is known to cause changes in the genetic structure and physiological status of plant due to the influence of oxidative stresses. Therefore, it is necessary to evaluate the effect of mutagens on the efficiency of anther culture. This study aimed to detect the effect of gamma ray irradiation doses on callus induction and plantlet regeneration in the first generation of mutant (M1) rice anther culture. ‘Mentik Wangi’ rice seeds were treated with gamma ray irradiation at doses of 0, 100, 200, 300, 400, and 500 Gray, then the seeds were planted as donor plants for anther culture. Panicles were collected at the booting stage and optimization of panicle cold pretreatment was carried out before the anthers were planted. The optimization results showed that incubation of panicles at 4 °C for 8 days could increase callus induction ability of ‘Mentik Wangi’ anther culture. Gamma ray irradiation at dose 100 Gray was able to increase the anther response towards callus formation, while at doses of 200, 300, 400, and 500 Gray the frequency of callus formation decreased. Planlet regeneration was obtained from gamma ray irradiation treatment at doses of 0, 100, and 400 Gray. Applied doses at 100 and 400 Gray could increase callus regeneration into plantlets and growth of green shoots. Three spontaneous double haploid plants were obtained from anther culture of ‘Mentik Wangi’ mutant rice at treatment doses of 100 and 400 Gray with 1 and 2 plants, respectively.

Keywords: double haploid, anther culture, Mentik Wangi, gamma ray