INDUKSI MIKROSPORA EMBRIOGENIK KEDELAI [*Glycine max* (L.) Merrill] DENGAN CEKAMAN SUHU DAN STARVASI

INTISARI

Penelitian ini bertujuan untuk melakukan kultur mikrospora kedelai dengan cekaman suhu dan starvasi hingga terbentuk embrio. Penelitian dimulai dengan penanaman 5 kultivar kedelai yaitu Argomulyo, Grobogan, Wilis, Anjasmoro dan Hitam Malika. Jumlah kuncup bunga tiap tanaman dihitung, garis tengah antera diukur, jumlah mikrospora tiap kuncup bunga dihitung dengan perangkat 'Optilab'. Penetapan stadium perkembangan mikrospora dilakukan dengan mengelompokkan kuncup bunga berdasarkan panjang 2,0-2,5 mm, 2,6-3,0 mm, 3,1- 3,6 mm dan 3,7-4,1 mm untuk menentukan kuncup bunga dengan mikrospora uninukleat akhir terbanyak. Selanjutnya uji sifat responsif dengan cara diinkubasi antera pada suhu 34^{o}C selama 4 hari. Kultivar kedelai yang terpilih digunakan untuk kultur mikrospora dengan perlakuan starvasi dan cekaman suhu. Tiga macam cekaman suhu yaitu 4^{0}C, 25^{0} dan 34^{0}C. Setelah penyimpanan selama 2, 4 dan 6 hari, mikrospora disubkultur ke medium embriogenesis A2, B5 dan MS. Pengamatan perkembangan mikrospora hingga terbentuk embrio dilakukan tiap dua minggu. Kuncup bunga panjang 2,6-3,6 mm pada semua kultivar dipilih untuk kultur karena berisi 1847-2010 mikrospora uninukleat akhir. Kultivar Anjasmoro, tinggi tanaman mencapai 68 cm, jumlah cabang 7-9, garis tengah antera 354,67±59,67 µm, jumlah mikrospora tiap kuncup bunga 2003±216, jumlah mikrospora tumpah pada perlakuan starvasi dalam medium B suhu 34^{0}C selama 4 hari adalah 3820 ± 516, terbanyak diantara 5 kultivar. Kedelai kultivar Anjasmoro ditetapkan sebagai yang paling tepat untuk kultur mikrospora. Perlakuan induksi mikrospora paling efektif pada penyimpanan suhu 34^{0}C selama 4 hari karena menghasilkan mikrospora embriogenik 1.756±4,90. Mikrospora embriogenik dapat membesar, volume bertambah dan mengalami pembelahan setelah disubkultur dalam medium embriogensis. Medium B5 lebih baik daripada MS dan A2 karena menghasilkan 24 struktur multinukleat tiap cawan petri. Struktur multinukleat berkembang menjadi embrio bentuk bulat, oval dan setengah oval atau struktur tidak sempurna. Mikrospora kedelai ukuran rata-rata 20 µm setelah 10 minggu berkembang menjadi embrio dengan diameter 50-70 µm. Pseudoembrio dapat terbentuk dari perkembangan trikoma dan *debris*.

Kata kunci: mikrospora, kedelai, cekaman, suhu, starvasi

SOYBEAN [*Glycine max* (L.) Merrill] EMBRYOGENIC MICROSPORE INDUCTION WITH TEMPERATURE AND STARVATION STRESS

ABSTRACT

The objective of this research was done for soybean microspore culture with starvation and temperature stress so that produce the embryo. Research was begun using soybean planting five soybean cultivars Argomulyo, Anjasmoro, Wilis, Grobogan and Black Malika. The number of flower buds per plant was calculated, the diameter of anther was measured, number of microspore was calculated with 'Optilab' software. Detemination microspore development stages was done by grouping based on length of bud 2.0-2.5 mm, 2.6-3.0 mm, 3.1- 3.6 mm and 3.7-4.1 mm to determine the most number of late uninucleate microspore on bud. After determining microspore development stages then was continued to identify the responsive test with temperature incubation of 34^{o}C for 4 days. The selection of soybean cultivar was used for microspore culture with starvation and temperature stress treatment. Three kinds of temperature stress were cold 4^{0}C, hot 34^{0}C and room temperature 25^{0}C. After being kept for 2, 4 and 6 days, the microspore was subcultured on embryogenesis medium. Tracking microspore growth and development until embryo former were done every two weeks. Flower bud 2.6-3.6 mm lenght were chosen for culture, contained 1847-2010 late uninucleate microspore. The most appropriate Anjasmoro cultivar showed plant height 68 cm, 7-9 branches, the diameter of anther of 354.67±59.67 µm, total of microspore per bud 2003±216, total of shedding microspore 3820 ± 516 at starvation treatment on B medium temperature of 34^{0}C for 4 days. The most effective of microspore induction treatment was kept on temperature 34^{o}C for 4 days and produced 1,756±4.90 embryogenic microspore. Embryogenic microspore could swell, increase the volume and developed after subculture on embryogenesis medium. B5 medium was more compatible than MS and A2 because of 24 multinucleate structures were found per petri. Multinucleate structure was developed to round, oval embryo and a half of oval or imperfect structure. The 20 µm average size of soybean microspore and grew to be embryo with diameter of 50-70 µm after 10 weeks. Pseudoembryo could be originated from trichomas and debris.

Key word: microspore, soybean, stress, temperature, starvation