

Procjena genetske raznolikosti kultivara pšenice

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Sažetak

Genetska raznolikost i visoke prosječne vrijednosti poželjnih svojstava roditelja za križanja među najvažnijim su preduvjetima za genetsko unapređenje kultivara i uspješnost programa oplemenjivanja. Mikrosatelitni biljezi su zahvaljujući visokoj razini polimorfizma i informativnosti postali široko prihvaćeni u analizama genetske raznolikosti. Cilj ovog istraživanja bio je procijeniti genetsku raznolikost 122 kultivara pšenice pomoću 45 mikrosatelitnih biljega. Unutar skupine svih kultivara (n=122) umnoženo je ukupno 413 polimorfni alela. Unutar skupine hrvatskih kultivara (n=98) umnožena su 354 alela, a unutar skupine kultivara stvorenih na Poljoprivrednom institutu Osijek (n=74) utvrđena su 303 alela. Broj alela po lokusu (N_a) varirao je od tri do 20 uz prosječne vrijednosti od 9.18, 7.87 i 6.73 alela redom unutar skupine od n=122, n=98 i n=74 kultivara. Srednje vrijednosti genske raznolikosti (HE) i Informacijskog sadržaja polimorfizma (PIC) varirale su od HE=0.69 i PIC=0.65 (n=122) do HE=0.63 i PIC=0.58 (n=74). Sveukupna opažena genska raznolikost i Informacijski sadržaj polimorfizma (po biljegu) varirali su od HE=0.34 i PIC=0.32 (biljeg gwm493) do HE=0.86 i PIC=0.85 (biljeg wmc634). Obavljena procjena genetske raznolikosti kao i karakterizacija većeg broja hrvatskih kultivara pšenice na mikrosatelitnoj molekularnoj razini trebaju pomoći pri izboru roditelja za križanja za razvoj novih oplemenjivačkih populacija pšenice.

Ključne riječi: oplemenjivanje, pšenica, genetska raznolikost, mikrosateliti.

Genetic diversity estimation of wheat cultivars

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Summary

Genetic diversity and high average values of desirable traits of parents for hybridization are among most important prerequisites for cultivar genetic improvement and successfulness of breeding programs. Microsatellite markers due to their high level of polymorphisms and informativeness become widely accepted in genetic diversity analysis. Objective of this study was to estimate genetic diversity of 122 wheat cultivars using 45 microsatellites. A total of 413 polymorphic alleles were amplified within group 122 cultivars. Within group of Croatian cultivars (n=98) 354 alleles were amplified, while 303 alleles were found within group of cultivars created on Agricultural Institute Osijek (n=74). Allele number per locus (N_a) was varied between 3 to 20 with a mean value of 9.18, 7.87 and 6.73 alleles within group of n=122, n=98 and n=74 cultivars, respectively. Mean value of gene diversity (HE) and polymorphic information content (PIC) were varied from HE=0.69 and PIC=0.65 (n=122) to HE=0.63 and PIC=0.58 (n=74). Overall observed gene diversity and polymorphic information content (per marker) were varied from HE=0.34 and PIC=0.32 (marker gwm493) to HE=0.86 and PIC=0.85 (marker wmc634). Conducted estimation of genetic diversity as well as the characterization of larger number of Croatian wheat cultivars on microsatellite molecular level should help in selection of parents for hybridization for development of new breeding populations of wheat.

Key words: wheat, breeding, genetic diversity, microsatellites.