

## Fotosintetska učinkovitost inbred linija kukuruza

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### Sažetak

Učinkovitost fotosinteze u ratarskih kultura može se povezati s otpornošću na stres i s povećanjem prinosa. Kod kukuruza, učinkovitost fotosinteze je važna kako kod inbred linija tijekom oplemenjivačkog procesa i sjemenske proizvodnje, tako i u hibridima. Cilj ovoga rada je ustanoviti razlike u fotosintetskoj učinkovitosti sedam inbred linija kukuruza različitih heterotičkih skupina.

Tijekom svilanja na selekcijskom polju u Osijeku mjerena je učinkovitost fotosinteze Hansatech Handy-PEA analizatorom na elitnim inbred linijama Os1767/99, Os1252/99, Os163-9, B73, Mo17, Os6-2 i B84 u 12 ponavljanja. Indeks fotosintetske učinkovitosti (PIABS) određen je mjerenjem porasta fluorescencije klorofila a uslijed aplikacije pulsa saturacijske svjetlosti (tzv. OJIP test). Duncanov test je pokazao da linije Os1252/99, B73 i B84 značajno bolje fotosintetiziraju od drugih istraživanih linija, dok linija Mo17 ima signifikantno najnižu vrijednost PIABS. Naši rezultati ukazuju da je fotosintetska učinkovitost inbred linija kukuruza povezana s pripadanjem pojedine inbred linije u određenu heterotičku skupinu. Daljnja istraživanja na inbred linijama i njihovim hibridima bi trebala ukazati na način nasljeđivanja svojstava učinkovitosti fotosinteze, te na njihove odnose s najvažnijim agronomskim svojstvima.

Ključne riječi: inbred linije, kukuruz, fotosinteza, OJIP test

## Photosynthetic efficiency of maize inbred lines

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### Summary

Photosynthetic efficiency in crops can be associated with stress resistance and yield increase. In maize, photosynthetic efficiency is important in inbred lines during breeding process and in seed production, as well as in hybrids. Objective of this study is to determine differences in photosynthetic efficiency of seven maize inbred lines belonging to various heterotic groups.

Photosynthetic efficiency was measured in maize field nursery in Osijek during silking by Hansatech Handy-PEA analyzer in the elite inbreds Os1767/99, Os1252/99, Os163-9, B73, Mo17, Os6-2 i B84 in 12 replications. The photosynthetic performance index (PIABS) was determined by measuring of the chlorophyll a fluorescence transient induced by pulse of saturating light (so called OJIP test). Duncan test revealed that the lines Os1252/99, B73 and B84 photosynthesize significantly better than other four lines, whereas inbred Mo17 had significantly the lowest PIABS value. Our results suggest that photosynthetic efficiency of maize inbred lines is associated with genetic background. Further investigations in both inbred lines and their hybrids are needed to elucidate modes of inheritance for traits of photosynthetic efficiency, as well as their relations with the most important agronomic traits.

Key words: inbred lines, maize, photosynthesis, OJIP test