

## INTISARI

Salinitas pada lahan produktif di pesisir utara dan selatan Jawa, mengancam produktivitas padi nasional. Sebagai upaya untuk meningkatkan adaptasi tanaman terhadap salinitas digunakan fungi mikoriza arbuskular sebagai solusi yang ekonomis dan ramah lingkungan. Penelitian ini bertujuan untuk mengkaji pengaruh dari aplikasi mikoriza arbuskular terhadap fisiologi pertumbuhan dan hasil dari tanaman padi IR 64 yang ditanam secara gogo. Penelitian dilaksanakan di rumah kawat Fakultas Pertanian, Universitas Gadjah Mada pada bulan Juli 2020 hingga Maret 2021, menggunakan rancangan acak kelompok lengkap 2 faktor dengan 3 ulangan. Faktor pertama yaitu tingkat salinitas 4 aras yaitu  $0 \text{ dS m}^{-1}$ ,  $2,5 \text{ dS m}^{-1}$ ,  $5 \text{ dS m}^{-1}$ ,  $7,5 \text{ dS m}^{-1}$ . Faktor kedua adalah perlakuan mikoriza dan tanpa mikoriza. Hasil penelitian menunjukkan jika salinitas menyebabkan kerusakan membran sel, peningkatan kadar  $\text{Na}^+$  dalam jaringan tanaman, meningkatkan kadar prolin serta laju pertumbuhannya tanaman menurun. Hal ini mengakibatkan penurunan biomassa dan komponen hasil tanaman. Inokulasi mikoriza pada tanaman padi dapat mengurangi dampak negatif cekaman melalui penurunan serapan  $\text{Na}^+$  daun dan menjaga rasio Rasio  $\text{Na}^+/\text{K}^+$  akar rendah, peningkatan kapasitas tukar kation akar, serta peningkatan laju pertumbuhan tanaman padi, sehingga bobot kering total lebih tinggi pada tanaman bermikoriza. Persentase penurunan bobot gabah per rumpun akibat salinitas lebih rendah pada tanaman bermikoriza dibandingkan tanaman non-mikoriza.

Kata kunci: stres osmotik, stres ionik, toleransi tanaman, efluks  $\text{Na}^+$ , KTK akar

## ABSTRACT

*The increase of soil salinity on productive lands in north and south Java coastal threatens national rice productivity. As an effort to improve plant adaptation to salinity, arbuscular mycorrhizal fungi are used as an economical and environmentally friendly solution. This study was aimed to examine the effect of arbuscular mycorrhizae application on growth physiology and yield of IR 64 rice plants grown upland. The study was conducted at screen house of Faculty of Agriculture, Universitas Gadjah Mada from July 2020 to March 2021, using completely randomized block design with 2 factors and 3 replications. The first factor was mycorrhizal and non-mycorrhizal treatment. The second factor was salinity levels, i.e. 0 dS m<sup>-1</sup>, 2.5 dS m<sup>-1</sup>, 5 dS m<sup>-1</sup>, 7.5 dS m<sup>-1</sup>. The results showed that salinity caused damage to cell membranes, increased Na<sup>+</sup> levels in plant tissues, increased proline levels and decreased plant growth rates. This results in decreased of plant biomass and its yield components. Mycorrhizal inoculation in rice plants was able to reduce the negative impact of stress by decreased the leaf Na<sup>+</sup> uptake and maintained a low root Na<sup>+</sup>/K<sup>+</sup> ratio, increased root cation exchange capacity, and increased plant growth rate, resulted in higher total dry weight in mycorrhizal plants. The decreased in percentage of grain weight per plant due to salinity was lower in mycorrhizal plants than in non-mycorrhizal plants.*

*Keywords: osmotic stress, ionic stress, plant tolerance, Na<sup>+</sup> efflux, root CEC.*