

Heat stress resistance of Ilmi

Woon-Ha Hwang^{*}, Jung Seon Back, Sung Hyun An, Jae-Heok Jeong, Han-Yong Jeong,
Hyeon-Seok Lee, Jong Tak Yoon, Gun-Hwi Lee, and Kyung-Jin Choi¹

National Institute of Crop Science (NICS), RDA, Jeon-ju, Republic of Korea

Abstract

Rice production and quality could be changed by temperature condition. Extremely high temperature event have been occurred more frequently for global warming. To increase rice quality against to global warming, breeding of heat tolerance rice cultivar is needed. Ilmi which is the one of Korean leading rice cultivar shows heat stress resistant character during ripening stage. Yield and quality (brown and milled rice) of Ilmi did not show significant different under high temperature condition compared to control condition. However, the main physiological characters for heat resistance of Ilmi have been not investigated yet. Therefore we try to investigate the heat tolerance characters of Ilmi. Two rice cultivars, Ilmi and Ilpum-which is heat susceptible rice cultivar, were cultivated under natural condition in wagner pot until heading was appeared. After checking heading date, each material was cultivated under different temperature condition, heat(32/22°C) and control(26/16°C) condition. Anti-oxidant enzyme activity was checked during ripening stage in each material. Catalase and ascorbic peroxidase activity of leaf under heat stress condition were higher in Ilmi than Ilpum especially early ripening stage. Analyzing of stress resistance using H₂O₂, the flag leaf of Ilmi showed more green color than Ilpum with higher chlorophyll content than those of Ilpum. We also checked the amount of H₂O₂ content in young leaf of each material by treating high temperature. H₂O₂ content in each material was increased according to treatment time. However H₂O₂ content of young leaf in Ilmi was less than those in Ilpum. Also catalase and ascorbic peroxidase activity in leaf increased much faster in Ilmi than Ilpum. With those data, we confirmed that heat stress resistance of Ilmi is due to the higher anti-oxidant activity against to stress condition. We will investigate the heat tolerance characters of Ilmi more in further study to enhance the breeding effect of heat stress tolerance rice.

Keywords: rice, heat stress, resistance, Ilmi

Corresponding author*

Woonha, Hwang

Address : Hyuck sin-ro 181, Jeon-ju, Jeonbukdo, Korea

Tel and Fax : +82-63-238-5263

E-mail : hwangwh@korea.kr ...