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Overexpression of CM Mitigate UV and Drought Combined Stress in Rice

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[Introduction]

Common abiotic stresses such as UV-light, drought and salinity which causes several physiological and molecular changes in plant and leading to yield losses. To cope with these stresses, either to adopt to the stress condition or to develop transgenic plants. In the current study, we assessed the effect of UV-light and drought combined stress on Cheongcheong and Chorismate mutase transgenic rice plant. UV-light and drought stresses cause oxidative stress due to imbalance osmoregulation which causes to abnormal growth, lower biomass accumulation and finally leads to yield loss.

[Materials and Methods]

In this study, we used Cheongcheong-control, Cheongcheong-treated and OxCM-treated plants and applied UV-light and drought stress. Samples were collected after 0, 3, 6, 12, and 24h exposer to stress condition. We used trypan blue and DAB analysis to detect the oxidative stress, confocal microscope for detection of accumulation of kaempferol and quercetin in leaf and roots and also checked the phenotypic variation.

[Results and Discussion]

Many staining spots were detected at Cheongcheong-treated compared to OxCM-treated in DAB and Trypan blue staining. It means that OxCM-treated were reduced oxidative stresses. OxCM-treated plants appeared a high level of kaempferol and quercetin accumulation. Root and shoot length and leaf width of OxCM-treated were observed higher than the other plants in phenotypic variations. In case of confocal microscope, OxCM-treated plants appeared a high level of kaempferol and quercetin accumulation than the other plants. These results concluded that OxCM-treated plants were tolerant to UV-light and drought combined stress.

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