**P127**

# Study on CsRCI2D and CsRCI2H for improvement of abiotic stress tolerance in *Camelina sativa* L.

Hyun-Gyu Lim [1], Hyun-Sung Kim[1], Jung-Eun Kim[1] and Sung-Ju Ahn[1]*

[1)] *Department of Bioenergy Science and Technology, Collage of Agriculture and Life Science, Chonnam National University, Gwangju 500-757, Republic of Korea*

## Abstract

Oilseed crop Camelina (*Camelina sativa* L.) is a suitable for biodiesel production that has high adaptability under low-nutrient condition like marginal land and requires low-input cost for cultivation. Enhanced abiotic stress tolerance of Camelina is very important for oil production under the wide range of different climate. CsRCI2s (Rare Cold Inducible 2) are related proteins in various abiotic stresses that predicted to localized at plasma membrane (PM) and endoplasmic reticulum (ER). These proteins are consist of eight-family that can be divided into tail (CsRCI2D/E/F/G) and no-tail (CsRCI2A/B/E/H) type of C-terminal. However, it is still less understood the function of C-terminal tail. In this study, *CsRCI2D/H* genes were cloned through gateway cloning system that used pCB302-3 as destination vector. And we used agrobacterium-mediated transformation system for generation of overexpression (OX) transformants. Overexpression of target gene was confirmed using RT-PCR and segregation ratio on selection media. We analyzed physiological response in media and soil under abiotic stresses using *CsRCI2D* and *CsRCI2H* overexpression plant. To compare abiotic stresses tolerance, wild type and *CsRCI2D/H* OX line seeds were sown on agar plate treated with various NaCl and mannitol concentration for 7 days. In the test of growth rate under abiotic stress on media, *CsRCI2H* OX line showed similar to NaCl and mannitol stress. In the other hand, *CsRCI2D* OX line showed to be improved stress tolerance that especially increased in 200mM NaCl but was similar on mannitol media. In greenhouse, WT and *CsRCI2D/H* OX lines for physiological analysis and productivity under abiotic stresses were treated 100, 150, 200mM NaCl. Then it was measured various parameters such as leaf width and length, plant height, total seed weight, flower number, seed number. *CsRCI2H* OX line in greenhouse did not show any changes in physiological parameters but *CsRCI2D* OX line was improved both physiological response and productivity under NaCl stress. Among physiological parameters of *CsRCI2D* OX line under NaCl stress, leaf length and width were observed shorter than WT but it were slightly longer than WT in 200mM NaCl stress. Furthermore, total seed weight of *CsRCI2D* OX line under stress displayed to decrease than WT in normal condition, but it was gradually raised with increasing NaCl stress then more than WT relatively. These results suggested CsRCI2D might be contribute to improve abiotic stress tolerance. However, function of CsRCI2H is need to more detail study. In conclusion, overexpression of CsRCI2s family can generate various environmental stress tolerance plant and may improve crop productivity for bio-energy production.

Keywords : *Camelina sativa* L., abiotic stress, stress tolerance, physiological response

Corresponding author* : Sung-Ju Ahn
Address : Department of Bioenergy Science and Technology, Collage of Agriculture and Life Science, Chonnam National University, Gwangju, 500-757, Republic of Korea
Tel and Fax : +82 062-530-2052
E-mail : asjsuse@jnu.ac.kr