



5th International Symposium on
Applied Engineering and Sciences (SAES2017)
14th–15th November 2017 | MALAYSIA
UNIVERSITI PUTRA MALAYSIA, SERDANG, SELANGOR



Presentation code:

Keynote

Development of Salt-Tolerant Lines of Malaysian Indica Rice (*Oryza sativa* L. cv. MR219) Using Tissue Culture Approach

Rosimah Nulit*, Nahid Kalhori, Shahrizim Zulkilfy, Rusea Go
Dept. of Biology, Faculty of Science, Universiti Putra Malaysia,
43400 UPM Serdang, Selangor, Malaysia

*Corresponding author's e-mail: rosimah@upm.edu.my

Abstract. Rice is one of the most important staple foods for human. However, millions hectares of rice land in the South and Southeast Asia were left uncultivated and/or grown with very low yields due to salinity. Due to this, development and production of salt-tolerant rice seed as part of integrated management practices is needed. By using tissue culture approach, salt-tolerant lines of Malaysia *indica* rice cv. MR219 were produced. This work started with production and propagation of MR219 callus. Then, callus was sub-cultured separately on MS media supplemented with 2 mg/L 2,4-D and different concentration of NaCl (0, 50, 100, 200, and 300 mM NaCl) to produce salt-tolerant MR219 callus. Screening and selection of salt-tolerant MR219 callus were conducted using morphological and biochemical markers which are total proline content, total soluble sugar, lipid peroxidase and the activity of ascorbate peroxidase and catalase. At regeneration of salt-tolerant plantlets, selected salt-tolerant callus was sub-cultured on MS media supplemented with 2 mg/L kinetin and 1 mg/L BAP for shoot induction, followed by sub-cultured in MS media supplemented with 0.5 mg/L BAP, 1 mg/L kinetin, 1 mg/L IBA and 0.5 mg/L NAA for root formation. At acclimatization stage, MR219 plantlets from 50 mM NaCl found survived and transferred to pots containing paddy soil. These plantlets is called First generation (F1) salt-tolerant MR219. After 70 days, seeds of F1-salt-tolerant MR219 lines was successfully obtained. The grain characteristics of mother plant and F1-salt-tolerant MR219 lines were compared. Germination capability of F1-salt-tolerant MR219 seed in saline showed that seeds of F1-salt-tolerant MR219 able to germinate and growth in 50 -100 mM NaCl. As conclusion, salt-tolerant MR219 rice was produced *in vitro* and have potential to be commercialized. The protocol to produce salt-tolerant rice can be used to produce other salt-tolerant plant.

Keywords: tissue culture, callogenesis, Malaysian indica rice cv. MR219, biochemical markers, salt-tolerant