

**EVALUATION OF SUBMERGE TOLERANCE FROM  
RICE GENOTYPE**

**NURUL TASHA BINTI ZULKIFLE**

**BACHELOR OF SCIENCE (Hons.) BIOLOGY  
FACULTY OF APPLIED SCIENCE  
UNIVERSITI TEKNOLOGI MARA**

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This Final Year Project Report entitled “**Evaluation of Submergence Tolerance From Rice Genotype**” was submitted by Nurul Tasha binti Zulkifle, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Biology, in the Faculty of Applied Sciences, and was approved by



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Dr. Nor' Aishah binti Hasan  
Supervisor  
B. Sc. (Hons.) Biology  
Faculty of Applied Sciences  
Universiti Teknologi MARA  
72000 Kuala Pilah Negeri Sembilan



---

Siti Norazura binti Jamal  
Project coordinator FSG611  
B. Sc. (Hons.) Biology  
Faculty of Applied Sciences  
Universiti Teknologi MARA  
72000 Kuala Pilah,  
Negeri Sembilan



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Dr. Aslizah binti Mohd Aris  
Head School of Biology  
Faculty of Applied Sciences  
Universiti Teknologi MARA  
72000 Kuala Pilah  
Negeri Sembilan

Date : \_\_\_\_\_

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## ABSTRACT

### EVALUATION OF SUBMERGENCE TOLERANCE FROM RICE GENOTYPE

Rice (*Oryza sativa* L) is one of the most popular food and feed over half population of the world. However, nowadays drastic changes in environment such as flooding have seriously threatened traditional rice cultivation practices in several parts of the world including Malaysia. Therefore, the present study aims to develop a simple screening technique to evaluate the tolerance and susceptible levels of various rice genotypes against submerged stress. A total of fourteen genotypes of rice including two check varieties (FR13A and Bina 10) were analysed in an experiment to determine their tolerance and susceptible levels against submergence stress. Two different methods namely test-tube method and water lodged soil method were used along with positive and negative control varieties which is Towuti and Bina 10 respectively. The experiment was designed in a complete randomized design with three replications. Germination results demonstrated that only six genotypes (NMR151, NMR152, MR219, Towuti, FR13A and Bina 10) showed 50% survival of germination rate. NMR152 rice genotypes performed the highest shoot length and elongation per day with  $5.25 \pm 0.20$ cm and  $1.05 \pm 0.15$ cm respectively in test tube method. Seedling recovery score recorded that Towuti performed the best performance of growth with score of 1 whereas MR219 exhibited the lowest performance of growth recorded score of 5. Result indicated that Towuti, NMR152 and NM151 rice genotypes exhibited moderately tolerance against submergence stress. Test tube method exhibited the most efficient method with all rice genotypes tested showed a significantly highest shoot length compared to water lodge method. Test tube method indicated as a simple, rapid and cheaper technique to evaluate the abiotic stress tolerance in rice genotypes. Finding in this study serve as a fundamental information for future breeders to use these three varieties as positive control against submergence stress.