

OPTIMIZATION OF AN EFFICIENT DNA EXTRACTION PROTOCOL FOR
MARKER ASSISTED SELECTION IN RICE

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A dissertation submitted in partial fulfilment of the
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I would like to thank my supervisor for giving me the opportunity and support in completing this thesis. I am also grateful to my family and friends for their love and support throughout my study. They have encouraged me to pursue my research to the end.

I declare that this dissertation entitled "*Optimization of an efficient DNA extraction protocol for marker assisted selection in rice*" is the result of my own research except as cited in the references. The dissertation has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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ABSTRACT

Marker assisted selection (MAS) in rice depends on the good purity and quantity of extracted genomic DNA. The cost of DNA extraction protocol, time frame and plant sample (generally the leaf) are the main limitations in the extraction of DNA. Several factors were set up to evaluate the effects of these on efficiency of DNA extraction by using Ikeda protocol. Ikeda DNA extraction protocol is one of the most convenient DNA extraction protocols from leaves. Purity and quantity of genomic DNA was measured by using Nanodrop. Among all these factors, seedling age significantly influences the purity of genomic DNA extraction from leaves. ANOVA reflected that an interaction of these factors significantly affect the purity and quantity of genomic DNA. It is suggested that the leaves (10 mg) of two weeks of seedling could give the desired purity of DNA to screen the segregation population at molecular level.

ABSTRAK

'Markers Assisted Selection' pada padi amat bergantung kepada keaslian DNA dan kuantiti DNA yang bagus pada DNA genomik yang diekstrak. Kos yang tinggi, jangka masa yang lama dan jumlah berat sampel daun merupakan limitasi limitasi di dalam ekstrak DNA. Beberapa faktor ditetapkan untuk mengkaji kesan kesan ke atas keberkesanan ekstrak DNA dengan menggunakan kaedah ekstrak DNA oleh Ikeda. Protokol ekstraksi DNA daripada Ikeda adalah salah satu kaedah protokol ekstraksi DNA yang diyakini ramai untuk mengekstrak DNA daripada daun. Keaslian dan kuantiti DNA diukur dengan menggunakan Nanodrop. Kesemua faktor yang dijalankan menunjukkan hanya tempoh anak benih ditanam memberikan perbezaan jelas terhadap keaslian genomik DNA yang diekstrak. ANOVA berkesan menunjukkan terdapat hubung kait untuk kesemua faktor terhadap keaslian dan kuantiti genomik DNA. Oleh itu, dicadangkan bahawa dengan menggunakan daun (10 mg) dari 2 minggu anak benih ditanam boleh memberikan keaslian DNA yang diperlukan dalam membuat penyaringan populasi segregasi padi pada tahap molekular.