Thesis Title	Variation of Isozyme, Morphology, Yield and Cooking Quality of Rice var. Kao Dawk Mali	
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Abstract

Rice variety, Kao Dawk Mali (KDML105), which was released as extension variety in 1959, was selected from the aromatic rice lines in Amphur Bangkla, Chachengsao province. The variety has been used for forty years, and is expected to vary from the origin KDML105, either because of the seed mixture or mutation. It is also envisaged that there should exist a diversity of aromatic rice which possesses similar quality as KDML105 in many rice growing area of the country.

This research aims to investigate the genetic diversity of 74 Kao Dawk Mali rice accessions collected from 17 provinces by analyzing isozyme characteristics, morphology, growth and development of rice plant, yield and yield related characters, cooking quality and protein content. The breeder seeds of KDML105 and RD6 were used as standard checks.

The study consisted of three parts. Part one was field experimentation to measure the variations in morphological characters, growth and development, characters in relation to yielding ability and yield. Rice plants were hill-planted with spacing 25x25 cm. Each experimental unit consisted of 1x2 m^2 with 2 replications. Grain yield was evaluated from 1 m^2 sample size. The research was conducted at the Multiple Cropping Center field station.

Part two involved isozyme characterization using acrylamide gel electrophoresis. Extraction from young shoot of 7 days old seedlings was used to run polyacrylamide gel prepared by modified Hames and Rickwood (1981) and staining by modified Vallejos (1983) methods. The isozyme analysis was carried out at the Molecular Laboratory, Department of Horticulture.

Part three was to analyze cooking quality and protein content by determining amylose content, gel consistency, alkali spread value, grain elongation ratio after cooking and protien content.

The phenotypic characters that showed significant differences among rice accessions included : width of flag leaf, plant height at flowering stage, days of 50 percent flowering, number of tillers per plant at flowering stage, number of spikes per plant at harvest stage, 1,000 seed weigth, yield and brown rice characters.

Using 6 isozymes : Esterase (EST), Glutamate oxaloacetate transaminase (GOT), Leucine aminopeptidase (LAP), Malic enzyme (ME) in combination with Isocitrate dehydrogenase (IDH) and Malate dehydrogenase (MDH), the study was able to differentiate 74 accessions into 55 groups. There were 42 groups, each consisting of one individual accession, 10 groups with 2 accessions each, one group with 3, one group with 4 and one group with 5 accessions. No individual accession had the same enzymic characteristic as KDML105.

All accessions showed high cooking flour temperature, normal milled rice elongation ratio after cooking, milled rice grain character was long and slender. However rice accessions the exhibited varied amylose content, gel consistency value and protein content.

The yields of 74 rice accessions ranging between 387-598 kg. /rai, were higher than KDML105 which yielded 314 kg. /rai. Five accessions originated from Supanburi, Mahasarakam, Kanlasin, Surin provinces and one with unknown origin possessed same cooking as KDML105, but provided significantly higher yield and protein content than KDML105.