

Mattanaporn Maikami 2011: Relation between Drought Tolerance and Some Physiological Traits of *Urochloa ruziziensis* (R. Germ. and C.M. Evrard) Crin. Master of Science (Botany), Major Field: Botany, Department of Botany. Thesis Advisor: Associate Professor Malee Nanakorn, Ph.D. 105 pages.

Water deficit results in change of major physiological traits of ruzi grass such as electrolyte leakage, decreasing of relative water content and osmotic adjustment. From the study, the appropriate procedures to measure electrolyte leakage in ruzi leaf tissues comprised 15 min. for leaching cell death and substances on leaf surface consequently, water stress induction using 30%PEG for 2 hr. and finally, recovering from stress in deionized water for 2 hr. Twenty clones of ruzi grass vary in drought tolerant level were determined electrolyte leakage. The higher drought tolerant clone, the lower electrolyte leakage was found. In addition, water relation of 20 clones which induced drought stress for 7 days in field was lower in the higher drought sensitive clones. Subsequently, those 20 clones obtaining from morphological characteristics determination were *in vitro* estimated drought tolerance ability based on PEG concentration causing median lethal dose (LD_{50}). The result showed that the higher drought tolerant clones performed higher LD_{50} . Furthermore, both osmolality and proline content trend to increase along with increasing of PEG concentrations. Almost the higher drought tolerant clones exhibited higher osmolality increasing and proline content than the lower drought tolerant clones. Total soluble sugar content in cytoplasm, however, expressed various responses when PEG content increased; increased, decreased or stable. This suggested that total soluble sugar content may not play an important role in osmotic adjustment of ruzi grass. Moreover, LD_{50} had significant different correlations with electrolyte leakage of 30%PEG treatment for 2 hr. and also proline content of 20%PEG treatment for 1 week. The correlation coefficient was -0.940 and 0.827, respectively. This study indicated that electrolyte leakage and proline content can be an effective criterion for drought tolerant selection of ruzi grass.

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