

Phenotypic Plasticity of Wild Rice (*Oryza nivara*) Between the Native and Introduced Environments in Sri Lanka

Wijerathna¹, P., Sandamal^{1,2}, S., Tennakoon³, A. and *Ratnasekera¹, D.

¹Department of Agricultural Biology, University of Ruhuna, Sri Lanka

²State Key Laboratory of Systematic and Evolutionary Botany, Institute of Botany, Chinese Academy of Sciences, Beijing, China

³Department of Biosystems Technology, Eastern University, Sri Lanka

*Corresponding E-mail: disnaratnasekera@gmail.com

Wild rice species, *Oryza nivara* is the progenitor of Asian cultivated rice and has been recognized as a valuable genetic resource for rice genetic improvement. In Sri Lanka, reciprocal transplant studies of wild rice species are limited. This study fulfils the knowledge gap on morphological variation of *O. nivara* grown in native and introduced environments for evaluating phenotypic variation for local adaptation. The reciprocal common garden experiment was conducted in the dry (Hambantota: N6.232684, E81.147097) and wet (Akuressa: N6.162225, E80.42886) zones of Sri Lanka. Phenotypic plasticity was measured by 8 quantitative traits following the rice descriptor published by IRRI. The independent t-test revealed that the all quantitative traits of *O. nivara* showed a significant difference between the dry and wet zones. According to the results, significantly highest culm length (78.4 ± 11.2 cm), anther length (3.38 ± 0.34 mm), awn length (66.9 ± 14.9 mm), panicle length (24.66 ± 3.25 mm), and plant height (101.2 ± 23.3 cm) were recorded in the wet zone. However, the dry zone showed the significantly highest culm diameter (8.21 ± 1.23 mm), flag leaf angle (85°), and horizontal distribution (145.0 ± 17.4 cm) compared to the wet zone. *Oryza nivara* was mostly confined to the dry zone thus, its phenotype was more prominent in the wet zone when compared to its native habitat. The investigation of phenotypic plasticity provides a new clue for the local adaptation and speciation studies and the effective use of wild stains in the development of location-specific modern cultivars.

Keywords: Wild rice, phenotypic plasticity, morphological diversity, local adaptation and speciation, reciprocal experiment