

Among and Within Population Diversity of *Oryza nivara* in Sri Lanka Revealed by Phenotypic Characterization

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The genetic diversity of wild rice plays an important role in rice (*Oryza sativa*) improvement programs. Population genetic diversity with proper sampling strategy of wild relatives of rice is not well documented under Sri Lankan context. This study was conducted to identify the morphological variation pattern of the wild rice *O. nivara* populations distributed in different natural habitats of Sri Lanka. Seven populations (P1; Anuradhapura, P2; Mannar, P3; Kurunegala, P4; Vavuniya, P5; Kilinochchi, P6; Batticaloa, P7; Siyambalanduwa) collected from different agro climatic regions were grown in a common garden and characterized based on nine morphological traits. The results revealed that, higher variations was observed in among the population compared to within population ($p < 0.05$). According to the coefficient of variation (CV %), flag leaf panicle neck length and flag leaf angle were the most significant variable traits, while the flag leaf length was the least variable. The cumulative value of the first two principal components was 58.7 % of the total variance. Populations from the similar natural habitats were clustered together. The population of P7 was adapted to absorb more sunlight by increasing the width of the leaves and the angle of the leaf blades under the competition of weeds and other shrubs. P2 and P5 were the most closely related populations, representing approximately similar ecological conditions of the dry zone. P3 population from intermediate zone in Kurunegala district showed vigorous plant growth with significantly highest plant height, culm girth and awn length. The knowledge of this morphological diversity offers the opportunity to design conservation strategies and basic information for the improvement of rice genetics and the proper use of wild strains in breeding programmes.

Keywords: Ecological niche, Rice, Genetics, Morphological traits, *Oryza nivara*