

Category	: International Rice Research Conference
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Keyword 1	: Estimation of Variance Components
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Title of Entry	: Phylogenetic relationship and functional trait diversity among wild rice species in Sri Lanka
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**Abstract** : The diversity of agronomical characteristics of wild relatives of rice (*Oryza*) play very important role in rice breeding programs worldwide. In this study, the morphological, physiological and anatomical characteristics of five wild rice species (*O. nivara*, *O. rufipogon*, *O. eichingeri*, *O. rhyzomatis* and *O. granulata*) available in Sri Lanka were examined. Ten pots (replicates) for each wild rice species were included in the common garden experiment, in which pots were arranged following a complete randomized design. One way ANOVA was used to compare the mean values. Overall, these five species are morphologically more differentiated in terms of plant height, flag leaf length and width, panicle type, and ligule shape. Moreover floral morphology indicates many differences in stamens among species. Plumose type stigma exhibited in *O. granulata* and in rest are same shape but in different colors. *O. granulata* and *O. nivara* have compact panicles, *O. rufipogon* has open panicle and both *O. eichingeri* and *O. rhyzomatis* have intermediate type panicles. Physiological functions of the five wild rice species are varying from each other indicating potentiality of using such functional traits in rice breeding. The rate of photosynthesis differed among the five species under the same environmental conditions. The highest net photosynthetic rate ( $5.86 \mu\text{mol m}^{-2} \text{s}^{-1}$ ), highest cluster width of the base ( $61.4 \mu\text{m}$ ), and trichome density ( $184.33 \text{ per } 25\text{mm}^2 \text{ area}$ ) were observed in *O. rufipogon* compared to the rest, and such desirable traits are effective in rice breeding. *O. eichingeri* and *O. rufipogon* showed the significantly highest transpiration rates and stomatal conductance, however photosynthetically active radiation and sub stomatal  $\text{CO}_2$  concentration are not significantly differed among five species. The highest and the lowest stomatal density were recorded in *O. granulata* and *O. nivara* respectively. The highest trichome density was detected in *O. rufipogon* and the lowest in both *O. eichingeri* and *O. granulata*. *O. eichingeri* and *O. rufipogon* showed the significantly highest number of buliform cells per one cluster. Knowledge of such variation patterns provide the information for field identification and efficient use of rice germplasm in new varietal developments. Key words: genetic resources, wild rice, phylogenetic relationship

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