

MORPHOLOGICAL TRAITS AND GRAIN QUALITY OF LONG SLENDER RICE ACCESSIONS IN SRI LANKA

W.M.P.D.T. Weerakkodi¹, D.S. Kekulandara², W.M.R.S.K. Warnasooriya¹ and P.N.M.S. Piyaarathne¹

¹*Department of Plant Sciences, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.*

²*Exploration Division, Plant Genetic Resources Center, Gannoruwa, Peradeniya, Sri Lanka.*

Basmati rice is renowned for its aroma, delicate texture, and distinctive long, slender grains. However, limited production due to a lack of suitable varieties makes it expensive in Sri Lanka. This study aimed to identify superior long-slimmer rice accessions conserved at the Plant Genetic Resource Centre (PGRC), Gannoruwa, Sri Lanka, with desirable morphological and grain quality traits. Seven long slender rice accessions; AR 2024.05.03, AR 2024.05.04, AR 2024.05.05, AR 2024.05.06, AR 2024.05.07, AR 2024.05.08, and AR 2024.05.09 and three standard long slender rice varieties, At 405, At 306 and 309 were grown in Wagner pots under controlled conditions in a greenhouse in a complete randomized design. Nineteen morphological traits and eleven-grain quality traits of rice were assessed based on the rice characterization catalogue. Data analysis was performed using GLM and Duncan's test in SAS, while similarity was analyzed using single-linkage cluster analysis in Minitab. At 405 recorded significantly ($p<0.05$) greater panicle and culm lengths, indicating improved plant vigor. A significantly greater culm number was in AR 2024.05.09, while more panicles were in AR 2024.05.07, boosting productivity. At 405, a late-maturing variety took nearly four months to maturity, while the others matured in three months. AR 2024.05.05 had the longest grain, while AR 2024.05.03 had the highest length-width ratio, aligning with consumer preferences for grain shape and quality. At 309 had the highest head grain percentage, improving grain quality, while AR 2024.05.04 recorded the highest per-day yield, helping farmers to increase productivity and reduce costs. Interestingly, all accessions had similar aroma levels. The accessions were grouped into five clusters, at a similarity level of 50.67%, highlighting trait variations. In conclusion, At 405, At 309, AR 2024.05.03, AR 2024.05.04, AR 2024.05.07, and AR 2024.05.09 are aromatic long slender rice accessions and valuable genetic resources as donor parents for aromatic and long slender quality rice breeding programs.

Keywords: Grain length, Long slender grain shape, Panicle number, Rice productivity