

**MORPHO-AGRONOMIC CHARACTERIZATION OF BITTER
GOURD (*Momordica charntia*) PARENTAL LINES OF DIVERSE
ORIGIN**

By

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ABSTRACT

Bitter gourd (*Momordica charantia* L.) is globally recognized for its nutritional and pharmacological benefits; however, its yield potential remains underexploited. Despite its increasing demand for consumption in various forms, including cooked vegetables, juice, pickles, and processed products, Sri Lanka's bitter gourd cultivation relies heavily on imported F1 hybrid seeds, which are often poorly adapted to local agro-ecological conditions and place a significant burden on foreign exchange. The current study aimed to identify high-performing parental lines suitable for local breeding programs to enhance yield and virus resistance. Forty-one inbred lines sourced from the Asian Vegetable Research and Development Center (AVRDC), Taiwan, were evaluated under field conditions at Onesh Agri (Pvt) Ltd, Giriulla, Sri Lanka, using standardized crop descriptors developed by AVRDC's Genetic Resources and Seed Unit (GRSU). Morphological, phenological, yield, and seed traits were characterized, and virus susceptibility scores (VSS) were recorded. Quantitative data were analyzed using one-way ANOVA followed by Tukey's HSD test at a significance level of $p < 0.05$, while qualitative traits were assessed using the Kruskal–Wallis non-parametric test.

Results revealed significant variation among accessions for key traits, with BG 049 and BG 051 exhibiting the highest yields (4285.63 ± 633.81 g and 3936.25 ± 811.44 g, respectively). Accessions BG 049, BG 050, BG 051, and BG 052 recorded virus susceptible score values below 2.00, indicating a high degree of tolerance to prevalent cucurbit viruses. Significant differences were also detected for qualitative descriptors, including leaf blade margin ($\chi^2 = 121.735$, $p < 0.05$), fruit shape ($\chi^2 = 103.93$, $p < 0.05$), and tubercle prominence ($\chi^2 = 126.00$, $p < 0.05$), highlighting the phenotypic diversity within the evaluated germplasm. These findings demonstrate the potential of BG 049, BG 050, BG 051, and BG 052 accessions as parental lines for the development of locally adapted F1 hybrids with improved yield, morphological uniformity, and virus resistance. Further research should include hybridization trials, multi-location trials, molecular characterization, postharvest quality assessment, and consumer preference studies to support the development and adoption of elite bitter gourd cultivars optimized for Sri Lankan agriculture.

Keywords: Hybrid breeding, *Momordica charantia*, morphological traits, phenotypic diversity, virus resistance

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