

## **Variation in fruit morpho-biochemical characters and bioactive compounds of bilimbi (*Averrhoa bilimbi* L.) genotypes under semi-arid lateritic belt of West Bengal**

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### **ABSTRACT**

*Bilimbi is one of the underutilized fruits and abundantly found under semi-arid lateritic belt of West Bengal. As there is no such report of scientific study on this fruit from this region, the study has been conducted during the year 2022 and 2023 for morpho-biochemical characterization, determination of bioactive compounds and genetic diversity analysis of different bilimbi genotypes selected from natural vegetation. A wide array of distinctness with respect to fruit length (3.56 to 5.78 cm), fruit diameter (1.51 to 2.43 cm), fruit weight (9.52 to 14.11g), number of seeds (6.55 to 17.23), TSS (3.5 to 4.6°Brix), acidity (1.26 to 1.41%) and ascorbic acid content (33.5 to 57.2 mg/100g) has been found. Additionally, the fruits are found to be rich in antioxidants (70.5 to 87.0% of DPPH inhibition), total phenols (38.4 to 30.2µgGAE/g) and flavonoids (29.7 to 41.2mgQE/g). Statistical analysis of observations gave out significantly positive correlation between number of seeds, fruit length, fruit diameter, ascorbic acid, antioxidant activity. Ascorbic acid content of bilimbi fruits has exhibited very high positive correlation with antioxidant activity, fruit weight, fruit length, fruit diameter, and total sugar. Noteworthy negative correlation was also noted between TSS and number of fruits per cluster, acidity in addition to between fruit diameter and number of fruits per cluster and acidity. The population of bilimbi genotypes fall under three clusters comprising 5, 7 and 4 different genotypes while five different parameter clusters have been noted to create variation among the bilimbi genotypes. With respect to fruit size and quality parameters bilimbi genotype BG-16 and BG-10 was found best under the present study.*

**Key words:** Bilimbi, bioactive compounds, fruit morphology, genetic diversity, quality parameters.