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Determination of the chromosome number and genome size of *Garcinia mangostana* L. via cytogenetics, flow cytometry and k-mer analyses

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Abstract

Mangosteen (*Garcinia mangostana* L.) is one of the most popular tropical fruit of South-East Asia. It has considerable economic potential for local and export markets. This paper describes a research work to determine the number of chromosomes and genome size of *G. mangostana* through chromosome counting, flow cytometry and k-mer analyses. Chromosome count analysis revealed that the chromosome number of *G. mangostana* varied from 74 to 110. The high number observed could be due to the occurrence of mutation and aneuploidy in *G. mangostana*. Using flow cytometry with *Glycine max* cv. Polanka (2C = 2.5 pg) used as standard, *G. mangostana* genome size was found to be 2C = 6.00 +/- 0.17 pg. Meanwhile, a genome survey of *G. mangostana* was performed using Illumina HiSeq 2000 DNA sequencing; k-mer analysis revealed that the genome size of *G. mangostana* was approximately 5.92 Gbp, or approximately 6.05 pg (1 pg DNA = 0.9780 x 10⁹ bp). Based on the flow cytometry and genome survey, the study concludes that the genome size of *G. mangostana* is between 6.00 and 6.05 pg.

Keywords

Author Keywords: Chromosome count; flow cytometry; genome size; *G. mangostana*; k-mer analysis

KeyWords Plus: NUCLEAR-DNA CONTENT; MICROSATELLITE MARKERS; REGENERATED PLANTS; KARYOTYPE ANALYSIS; FLUORESCENCE; FLUOROCHROMES; ANGIOSPERMS; SENSITIVITY; DIVERSITY; FOREST

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