

**EVALUATE THE EFFECT OF SUGARCANE MOLASSES AS AN
ALTERNATIVE CARBON SOURCE FOR COMMERCIAL WHITE
SUGAR IN IN-VITRO ROOTING OF SOUR BANANA
(MYSORE AAB)**



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ABSTRACT

Banana (*Musa* spp.) is one of the most important fruit crops globally, and in-vitro propagation plays a crucial role in large-scale multiplication, particularly for cultivars like sour bananas (Mysore AAB). In tissue culture, sucrose is the primary carbon source, typically used in the form of commercial white sugar. However, this study investigates the potential of sugarcane molasses as a cost-effective and sustainable alternative to the commercial white sugar in Murashige and Skoog (MS) medium for in vitro sour banana propagation. The experiments were conducted using Murashige and Skoog (MS) medium supplemented with varying concentrations of sugarcane molasses (10 g/L, 20 g/L, 30 g/L, and 40 g/L) compared to the standard 30 g/L of commercial white sugar. Growth parameters such as root initiation, root number, root length, shoot elongation, and overall plantlet health were evaluated over six weeks. The MS medium with sugar (T1) showed the best results, with the highest plant height (53.36 ± 5.0 mm), root number (5.41 ± 1.1), root length (7.68 ± 1.5 cm), and plant dry weight (0.09 ± 0.017 g). Sugarcane molasses in low concentration with MS media (T2, 10 g/L) exhibited promising performance, with plant height (34.4 ± 2.4 mm), root number (4.4 ± 0.30), and shoot dry weight ($0.05 \text{ g} \pm 0.006$ g). However, higher concentrations of molasses resulted in media browning and reduced root growth, likely due to excessive impurities and phenolic compound accumulation. This study demonstrates that sugarcane molasses in low concentrations with further optimization could be a viable, cost-effective, and sustainable alternative carbon source for commercial micropropagation of banana, particularly in regions where white sugar is expensive or less accessible. Therefore, further research is recommended to refine molasses treatment methods to minimize impurities and optimize plantlet development.

Keywords: Banana micropropagation, Carbon source, In-vitro rooting, Mysore AAB, Sugarcane molasses

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