Indirect Somatic Embryogenesis of *Coffea arabica* var Geisha and N39-6 Variety Using Leaf Explants.

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Introduction

Coffea arabica is the most popular variety of coffee and is utilized worldwide in the food, pharmaceutical, and cosmetics industries. The somatic embryogenesis technique promotes the micropropagation of several coffee varieties for the commercial production of plantlets. However, this technique depends on the genotype of a particular plant for successful regeneration. This study aims to develop a protocol for the multiplication of *Coffea arabica* var. Geisha and N39-6 varieties using somatic embryogenesis.

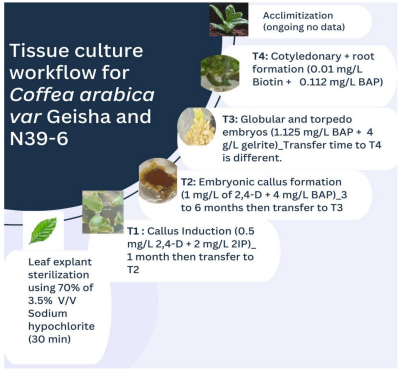

Fig 1: Schematic methodology of indirect somatic embryogenesis for *Coffea arabica* var Geisha and N39-6.
We used Murashige & Skoog (MS) supplemented with indicated plant growth hormones to activate indirect somatic embryogenesis on T1, T2, T3 and T4.

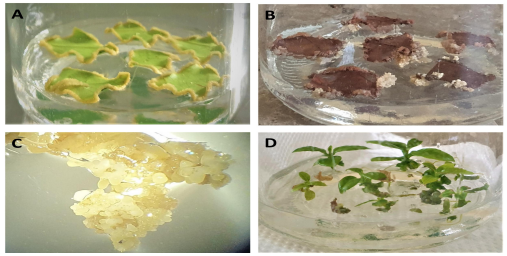

Fig 2: Indirect somatic embryogenesis of *N39-6* **A**.Callus activation **B**. Embryonic callus formation **C**. Proliferation of somatic embryos **D.** Germination of cotyledonary embryo.

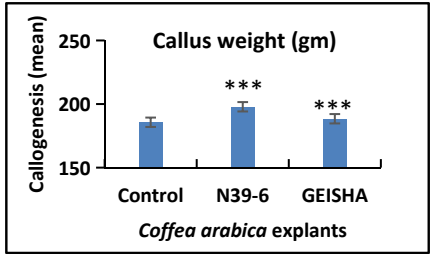

Fig 4: Callus formation on Geisha and N39-6 explants 60 days after initiation in T2 media.
*** $p \leq 0.001$

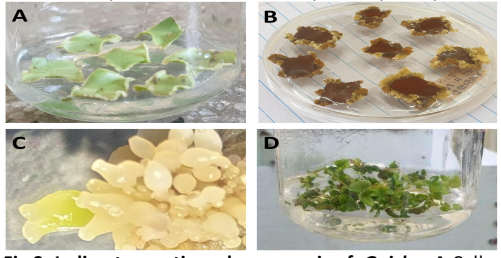

Fig 3: Indirect somatic embryogenesis of *Geisha*. **A**.Callus activation **B.** Embryonic callus formation **C.** Proliferation of somatic embryos **D.** Germination of cotyledonary embryo.

Results/Discussion

30 days after initiation ,T1 media activated callus formation on N39-6 and Geisha explants **(Fig 2A and 3A)** respectively. T2 media promoted callogenesis and the highest number was observed on the N39-6 explants after 3 to 6 months **(Fig. 4)**, However, the formation of indirect somatic embryos was more potent in Geisha explants **(Fig. 2B and 3B)**. T3 media stimulated proliferation of somatic embryos to form globular and torpedo embryos in both explants **(Fig. 2C and 3C)**. T4 media with half concentration of MS induced cotyledonary and root formation in both explants **(Fig. 2D and 3D)**.

Conclusion/Perspectives

The results of this study suggested that somatic embryogenesis may be a viable method for the micropropagation of *Coffea arabica* var. Geisha and N39-6 varieties. Nevertheless, it is crucial to standardize these conditions and follow appropriate acclimatization practices to ensure that our protocol produces many plantlets from the leaf explants.

References:

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2.Maren, N.A., Duan, H., Da, K., Yencho, G.C., Ranney, T.G. and Liu, W., 2022. Genotype-independent plant transformation. Horticulture Research, 9.