AN OPTIMIZED BIOPROCESS FOR ENHANCING CAMPTOTHECIN YIELD FROM ENDOPHYTES

IITM Technology Available for Licensing

Problem Statement

- Existing methods for Camptothecin (CPT) production from plant sources are inefficient, yielding low quantities, and are economically unfeasible.
- Camptothecin production by endophytic fungi, like *Fusarium solani*, decreases over time, potentially due to the absence of host stimuli in culture media.
- There is a demand for an optimized in vitro bioprocess to enhance Camptothecin production from endophytes, addressing the challenges of low yield and production attenuation.

Technology

Enhanced Camptothecin Yield: The optimized bioprocess increases Camptothecin (CPT) production by over 60% from Fusarium solani using exogenous agents like ethanol and extracts of Catharanthus roseus.

Efficient Extraction Process: Camptothecin is efficiently extracted from the dry biomass through a sonication and solvent extraction method, followed by quantitative analysis using RP-HPLC.

Cost-Effective and Scalable: The process uses readily available elicitors and growth medium components, making it a cost-effective and robust method for large-scale CPT production.

Intellectual Property

- IITM IDF Ref. **1083**
- **IN 365151 - Patent Granted**
- **NBA/IPR/Appl/ 3514/20-21/2571**

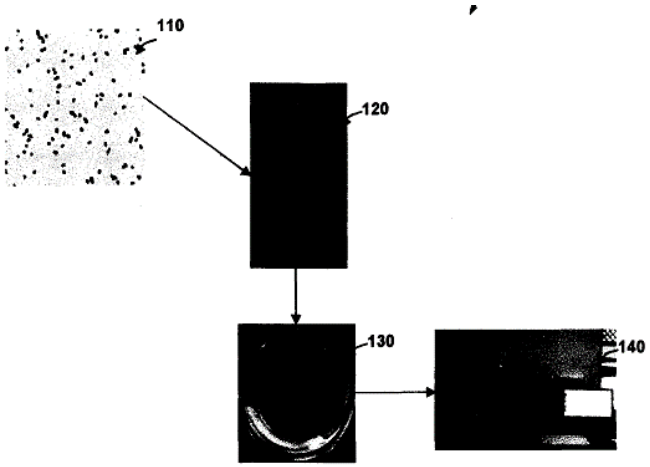

FIG. 1. illustrates a perspective view of a bioprocess for enhancing Camptothecin (CPT) yield from endophyte, *Fusarium solani.*

Technology Category/ Market

Category - Biotechnology and Bioprocessing
Applications - Pharmaceutical, Biopharmaceutical R&D,
Industry - Pharmaceuticals and Biotechnology

Market - Global bioprocess technology market size is expected to reach $45.04 Bn by 2028 at a rate of **15.1% CAGR.**

TRL (Technology Readiness Level)

TRL - 4: Technology validated in lab scale.

Research Lab

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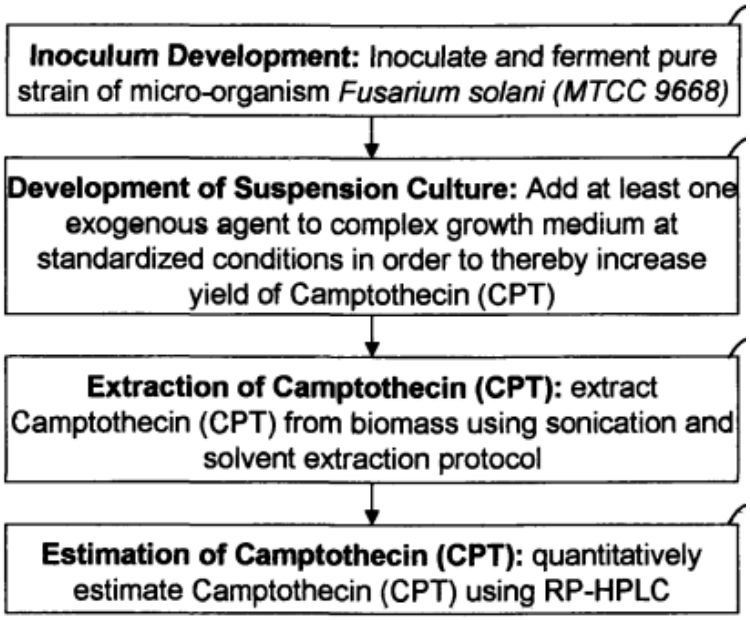

FIG. 2. illustrates a flow chart of operations illustrating logical operational steps of the improved method for enhancing Camptothecin (CPT) yield from endophyte, *Fusarium solani.*

Key Features / Value Proposition

1. . Increased Yield Efficiency
- Over 60% enhanced Camptothecin (CPT) production through optimized bioprocesses using *Fusarium solani*.

2. Cost-Effective Production
- Utilizes readily available exogenous agents and growth mediums, reducing overall production costs.

3. Scalability Potential
- The robust and scalable process is suitable for large-scale industrial applications, meeting growing demand for CPT.

4. Enhanced Extraction Method
- Efficient sonication and solvent extraction protocol ensures high purity and yield of Camptothecin.

5. Versatile Growth Medium
- Employs Potato Dextrose Broth (PDB) for optimal growth and metabolite production in endophytes.

6. Reliable Quantitative Analysis
- Accurate quantification of CPT using RP-HPLC, ensuring consistent product quality and potency.

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