

पेटेंट कार्यालय
शासकीय जर्नल

**OFFICIAL JOURNAL
OF
THE PATENT OFFICE**

निर्गमन सं. 22/2026
ISSUE NO. 22/2026

शुक्रवार
FRIDAY

दिनांक: 29/05/2026
DATE: 29/05/2026

पेटेंट कार्यालय का एक प्रकाशन
PUBLICATION OF THE PATENT OFFICE

(54) Title of the invention : Integrated Phytochemical Engineering and High-Resolution Analytical Fingerprinting of Flavonoid–Alkaloid–Terpenoid Extracts with Systems Pharmacology–Toxicology Evaluation for Bioactive Phyto-Therapeutics Targeting Oxidative Stress, Inflammation, and Multidrug-Resistant Multifactorial Diseases

<p>(51) International classification</p> <p>:G01N 30/02, G01N 30/88, G01N 30/72, G01N 30/06, G01N 30/86</p> <p>(31) Priority Document No :NA (32) Priority Date :NA (33) Name of priority country :NA (86) International Application No : Filing Date :01/01/1900 (87) International Publication No : NA (61) Patent of Addition to Application Number :NA Filing Date :NA (62) Divisional to Application Number :NA Filing Date :NA</p>	<p>(71)Name of Applicant :</p> <p>1)Harpreet Singh Address of Applicant :Professor, School of Pharmaceutical Sciences, Faculty of Pharmacy, IFTM University, Moradabad, Uttar Pradesh- 244102, India Uttar Pradesh India</p> <p>2)Rimmy 3)Srividya Lonkala 4)Snehal Praful Shingade 5)Shubham Ghosh 6)Priyanka Rukminikant Mule 7)Arti Sudhakar Khamat 8)Dipali Chandrakant Hamde 9)Sandeep Gulabrao Adhude 10)Ankita Vijay Thul 11)Gowtham Sundaramoorthy 12)Sundarajan Raju</p> <p>(72)Name of Inventor :</p> <p>1)Harpreet Singh 2)Rimmy 3)Srividya Lonkala 4)Snehal Praful Shingade 5)Shubham Ghosh 6)Priyanka Rukminikant Mule 7)Arti Sudhakar Khamat 8)Dipali Chandrakant Hamde 9)Sandeep Gulabrao Adhude 10)Ankita Vijay Thul 11)Gowtham Sundaramoorthy 12)Sundarajan Raju</p>
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(57) Abstract :

The present invention relates to an integrated system and process for phytochemical engineering, high-resolution analytical fingerprinting, and bioactivity-guided evaluation of plant-derived compositions containing flavonoid, alkaloid, and terpenoid fractions. One or more botanical materials are preprocessed and subjected to selective extraction under controlled conditions to obtain class-enriched fractions, which are then recombined according to a predefined compositional profile. The resulting multicomponent composition is analyzed using chromatographic, spectrometric, and chemometric techniques to generate a reproducible analytical fingerprint. The composition is further evaluated through systems pharmacology to determine multi-target therapeutic relevance and through toxicology assessment to establish safety suitability. The invention thereby provides a standardized phyto-therapeutic platform for generating reproducible bioactive botanical compositions useful against oxidative stress, inflammation, multidrug-resistant conditions, and other multifactorial disease states. Accompanied Drawing [FIGS. 1-2]

No. of Pages : 25 No. of Claims : 10