पेटेंट कार्यालय
शासकीय जर्नल

OFFICIAL JOURNAL
OF
THE PATENT OFFICE

निर्गमन सं. 50/2025	शुक्रवार	दिनांक: 12/12/2025
ISSUE NO. 50/2025	FRIDAY	DATE: 12/12/2025

पेटेंट कार्यालय का एक प्रकाशन
PUBLICATION OF THE PATENT OFFICE

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :31/10/2025
(21) Application No.202511105278 A
(43) Publication Date : 12/12/2025

(54) Title of the invention : NOVEL HERBAL TRANSETHOSOMAL NANOCARRIER GEL FOR TARGETED DELIVERY IN DIABETIC WOUND HEALING

(51) International classification	:A61K0009000000, A61K0009127000, A61P0017020000, A61K0047100000, A61K0047540000
(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 Filing Date	:NA :NA
(62) Divisional to Application Number Filing Date	:NA :NA

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(57) Abstract :
The present invention relates to a novel herbal transethosomal nanocarrier gel formulation specifically designed for accelerated diabetic wound healing through targeted delivery mechanisms. The formulation comprises herbal extracts encapsulated within transethosomes, which are ultra-deformable lipid vesicles containing edge activators and ethanol, providing superior skin permeation and drug retention. The nanocarrier system ensures enhanced bioavailability, controlled release, and deep tissue penetration of therapeutic agents. The gel formulation incorporates biocompatible polymers that provide optimal viscosity, spreadability, and sustained release characteristics. Clinical evaluation demonstrates significant improvement in wound closure rates, reduced inflammation, enhanced collagen synthesis, and accelerated re-epithelialization in diabetic wound models. The invention addresses critical challenges in diabetic wound management including poor drug penetration, inadequate angiogenesis, persistent inflammation, and bacterial colonization. The transethosomal system exhibits particle sizes ranging from fifty to two hundred nanometers with high entrapment efficiency exceeding eighty percent, ensuring optimal therapeutic outcomes while minimizing systemic side effects.

No. of Pages : 17 No. of Claims : 8