

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202511025111 A

(19) INDIA

(22) Date of filing of Application :20/03/2025

(43) Publication Date : 04/04/2025

(54) Title of the invention : CHEMICALLY MODIFIED XANTHAN GUM MULTIPARTICULATES BEARING PHYLLANTHUS EMBLICA FRUIT EXTRACT

(51) International classification :A61K0036470000, A61K0009500000, A61K0009200000, A61K0008978900, A61K0009160000

(86) International Application No :NA  
Filing Date :NA

(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

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(57) Abstract :

Xanthan gum, a natural polysaccharide, was chemically modified and used to prepare multiparticulates encapsulating Phyllanthus emblica (Indian gooseberry) fruit extract. The modified xanthan gum enhanced the delivery of the bioactive compounds from the extract. Characterization techniques like FTIR and NMR confirmed the structural integrity of the multiparticulates. In vitro release studies demonstrated the controlled release profile of the extract, which was influenced by the degree of xanthan gum modification. Stability testing under various storage conditions ensured the formulation's longevity. Biocompatibility studies established the safety of the multiparticulates for human use. The chemically modified xanthan gum multiparticulates effectively delivered the therapeutic benefits of Phyllanthus emblica extract, representing a promising approach for drug delivery systems. Xanthan gum is a versatile polymer that can be used to develop modified-release multiparticulate drug delivery systems. The formulation and evaluation parameters can be optimized to achieve the desired drug release profile for a given active ingredient, such as Phyllanthus emblica fruit extract. The results of this study suggest that chemically modified xanthan gum, particularly carboxymethylated xanthan gum (CMXG), can be used as promising carriers for the controlled delivery of amla fruit extract and potentially other therapeutic agents. The modified xanthan gums demonstrated improved swelling and drug release properties, making them suitable for oral delivery to enhance the therapeutic efficacy of the encapsulated phytochemicals as well as antioxidant activity.

No. of Pages : 18 No. of Claims : 8