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(57) Abstract :
The present invention discloses a novel pharmaceutical composition comprising levofloxacin formulated as a microemulsion for use as an antimicrobial agent. The microemulsion is prepared by a water-titration method employing an oil phase, a surfactant, a co-surfactant, and an aqueous phase, optionally stabilized with a polymer such as Carbopol 934. The formulation results in nanosized droplets with high drug entrapment efficiency, uniform distribution, and excellent stability. The optimized microemulsion provides a biphasic drug release profile with an initial burst followed by sustained release for up to 8 hours, thereby improving therapeutic efficacy and patient compliance. In vitro antimicrobial susceptibility studies demonstrate that the levofloxacin microemulsion exhibits significantly enhanced antimicrobial activity against Escherichia coli compared to conventional levofloxacin formulations. The invention offers improved solubility, bioavailability, and controlled release characteristics, making it a superior alternative to existing dosage forms of levofloxacin for the treatment of bacterial infections.

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