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FORMULATION AND *IN-VITRO* CHARACTERIZATION OF HERBAL NANOGEL FOR ANTIMICROBIAL ACTIVITY

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ABSTRACT

Nanogels (also known as nanosized hydrogels) are small, swellable particles made of malleable hydrophilic or amphiphilic polymer networks that have been mechanically or chemically cross-linked. The present study was focused on the formulation and *in-vitro* characterization of *P. wallichiana* loaded nanogel for anti-nociceptive activity. *Pinus wallichiana* (fresh leaves) was obtained from the Uttarakhand region and made authenticated from a botanist. Extract was developed by maceration process. Noveon polycarbophil AA-1, Propyl Paraben, PEG, Ethanol, Tween 80, DMSO were purchased from the local supplier. Nanogel of *P. wallichiana* is created using a modified emulsification-diffusion technique. The formulated nanogels were evaluated for preformulation studies i.e., solubility, extract-excipients compatibility. Nanogels were evaluated for parameters i.e., Physical appearance, Droplet size & Polydispersity index (PDI), In-vitro drug release, % Drug content, Viscosity, pH, Spreadability, Stability. NG0- NG6 showed excellent stability strengths but much significant effect was observed in the NG3, NG5 & NG6 nanogels. In results, NG showed an excellent formulation property when observed. Physical appearances were optimistic in terms of better clarity and transparency of the emulsions. In conclusion, nanogels of *Pinus wallichiana* found as optimized formulation when compared with NG0 (blank nanogel) in terms of particle size, viscosity, % drug content, stability etc. It might be effective externally in the cure of fungal infections due to its already proved antibacterial efficacy. It suggests to fellow researchers to recognize and elucidate the actual constituent that is important for the activity.

KEYWORDS: nanogel, formulation, evaluation, *Pinus wallichiana*, FTIR.