

# Formulation and Evaluation of Nail Lacquer Containing Anti fungal Griseofulvin for the Treatment of Onychomycosis

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**Abstract:-** Onychomycosis is a fungus that infects the human nail and affects 19% of the world's population. It is responsible for half of all nail problems in diabetic and older individuals. Dermatophytes are the most frequent cause of onychomycosis, although yeasts and candida may also cause it, because the illness is persistent, difficult to eliminate, and prone to recurrence, it is tough to control. The diseased nails are unsightly, discoloured, thicker, and dystrophic, which has a detrimental effect on the patient's social life.

Topical therapy has been shown to be a viable alternative to systemic administration in the treatment of onychomycosis, since it is capable of overcoming many of the constraints of systemic administration and targeting the medication at its site of action with minimal interactions and side effects. Limited permeability of the medication through the nail plate and blood supply in the afflicted region may result in sub-therapeutic concentrations, which may be addressed by applying the drug topically. Furthermore, since most commonly used formulations are easily removed by rubbing or washing, they are not particularly suited to the nail. To get over these obstacles, unguinal delivery (drug administration across the nail plate) may be used.

Transungual drug delivery is a method for transporting drugs through the nail to provide targeted medication administration in the treatment of nail disorders. "Trans" means "through", and "unguis" means "nails" in the word transungual [10]. Because of its superior adherence and localised action, which offers less systemic adverse effects, the transungual medication delivery method is considered to be highly useful in managing nail diseases.

Nail lacquers seem to be commercially preferred for a variety of reasons, including their long residence duration on the nail plate and low wash-off or loss resistance. Nail lacquers are also generally accepted by patients and simple to apply, in addition to preventing tranonychia water loss and allowing for prolonged medication diffusion through concentration gradients.

## I. INTRODUCTION

Disease by species of the genus *Epidermophyton*, *Trichophyton*, *Microsporum*, & is referred to as "dermatophytosis." *T. rubrum*, *T. mentagrophytes*, and *Epidermophyton floccosum* are very much common species

which induce onychomycosis in North America & portion of Europe; the initial two species are considerably more frequently associated with *E. floccosum*. Dermatophytes are diseases of the hair, dermis & nails caused by non-dermatophytic moulds such as *Scopulariopsis* & *Scytalidium*. Dermatophytes are responsible for the majority of toenail onychomycosis (90percent) & at least half of nail disease [1]. Onychomycosis is induced by non-dermatophytes & dermatophytes, particularly *C. albicans*; but the frequency of genuine mixed disease (induced by non-dermatophytes & dermatophytes) is hard to estimate exactly [2].

Hyaline septate moulds make up the dermatophytes. This mycelial species' hyphae enter the nail's & skin's stratum corneum. Keratinolytic proteases are produced by cells of fungus and offer a pathway inside live tissues [3]. Some dermatophytic species, which are essentially soil saprophytes with the capacity to breakdown keratinous detritus in soil, has adapted to parasitize keratinous cells of animals [4].

Among the most prevalent dermatological diseases is onychomycosis. In the United Kingdom, a comprehensive questionnaire study of 10,000 individuals revealed a frequency of 27.1 percent [5, 6]. Current mycologically observational trials in Finland [7] & the United States [8] suggest a frequency of ten- seven percent. Increased awareness of infectious diseases, as well as the introduction of better new antifungal medications, has resulted in a higher desire amongst patients to receive therapy & among doctors to prescribe therapy. Medication is frequently recommended without mycological verification of disease; there might be some uncertainty about whether fungi isolated on culture are secondary or primary pathogens; the relative efficacy of different antifungal agents against different fungi is not completely accepted; & medicines are frequently recommended for insufficient durations of therapy.

## II. MATERIAL

### A. Drug and Excipients used in the formulation

Siemen Laboratories sent a free sample of griseofulvin (Gurgaon, India). Evonik Roehm Pharma polymers provided Eudragit RS 100. (Essen, Germany). Hi media Labs Ltd provided the thioglycolic acid (TGA) (Mumbai, India). K. M. Chem Ltd provided the menthol (Mumbai, India). SD-Fine Chem Ltd provided the nbutanol (Mumbai, India). SD-Fine Chem Ltd provided the isopropyl alcohol (Mumbai, India).