

Tropical Fungal Infections

Li Yang Hsu, MBBS, MRCP, MPH^{a,*}, Limin Wijaya, MBBS, MRCP, DTM&H^b,
Esther Shu-Ting Ng, MBBS, MRCP^a, Eduardo Gotuzzo, MD^c

KEYWORDS

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- Antifungal therapy

Fungal infections in humans are more prevalent and diverse in the tropics and subtropics,¹ likely because warm and humid climates are more conducive for the growth and dissemination of fungi. Several of the dimorphic and geographically delimited fungi such as *Lacazia loboi* are found only in the tropical zone, but infections by these organisms may present anywhere in the world owing to the increasing frequency of human migration and travel.^{2,3} In global surveys of travel-related diseases, fungal infections are invariably among the most common causes of dermatologic disorders in returning travelers.⁴

One commonly used classification for fungal infections is based on the tissue that is initially colonized.^{1,5} Superficial mycoses are restricted to the outermost layer of the epidermis (stratum corneum) and do not cause any inflammation. Cutaneous mycoses involve the integumentary system, including nails and hair, and generally elicit inflammation of the skin. Subcutaneous mycoses describe infection of the deeper layers of tissue, with the fungi usually being directly implanted following minor trauma. Unlike the previously mentioned mycoses, these infections may invade beyond the initial colonized area, involving muscle, deep fascia, and even bone. The respiratory and gastrointestinal tracts are the main portals of entry for systemic mycoses, which can be further classified into primary and opportunistic mycoses based on whether the fungus in question is able to cause an infection in a normal host.⁵ Several fungi, such as *Sporothrix schenckii* and certain dematiaceous molds, are able to manifest as either subcutaneous or systemic mycoses depending on the portal of entry and the immune status of the human host.

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^a Department of Medicine, National University Health System, 5 Lower Kent Ridge Road, Singapore 119074, Singapore; ^b Department of Infectious Diseases, Singapore General Hospital, Outram Road, Singapore 169608, Singapore; ^c Instituto de Medicina Tropical Alexander von Humboldt, Universidad Peruana Cayetano Heredia, Av. Honorio Delgado 430-Urb. Ingeniería-SMP-Lima 3, 31 Lima, Peru

* Corresponding author.

E-mail address: liyang_hsu@yahoo.com

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In this review, the authors briefly discuss superficial and subcutaneous mycoses that are far more prevalent or restricted to the tropics (Fig. 1, Table 1), as well as fungal infections in returning travelers. Systemic mycoses caused by dimorphic fungi have been extensively reviewed recently⁶⁻⁸ and are not further discussed except in the context of travel-related infections.

SUPERFICIAL AND CUTANEOUS MYCOSES

These very common mycoses affect up to 25% of the global population and occur predominantly in the tropics, although they have a worldwide distribution.⁹

The most common superficial mycoses are pityriasis versicolor, tinea nigra, and the piedras. Pityriasis versicolor is caused by various *Malassezia* spp and is characterized by the presence of asymptomatic (rarely, mild itch) fine hyperchromic or hypochromic macules on the torso, neck, and arms, occasionally extending to face, groin, and thighs.¹⁰ Major risk factors include warm and humid environments, corticosteroids, and tanning lotions. Young adults are more frequently affected, with no gender bias.¹⁰ Differential diagnoses include pityriasis alba and rosea, solar dermatitis, and postlesional melanodermas.^{10,11} Laboratory diagnosis is made by finding clusters of round budding yeast cells on microscopy of skin scrapings with 10% potassium hydroxide solution. Woods (ultraviolet) light is useful in the clinic setting, with macules emitting a characteristic yellow-green fluorescence.¹² Treatment comprises topical therapy (imidazoles, allylamines, ciclopirox olamine, 20% sodium hypochlorite, or 50% propylene-glycol) for 2 to 4 weeks for limited/initial cases and systemic azoles for extensive/recurrent cases. Avoiding or removing risk factors is helpful in preventing relapse.^{10,12}

Tinea nigra presents as chronic, asymptomatic, irregular, scaly, hyperpigmented (tan, brown, or black) patches or spots on the palms, occasionally involving soles, arms, and torso. It is caused by the pigmented yeast *Hortaea werneckii*, occurring predominantly in children and young adults in coastal tropical regions, with the

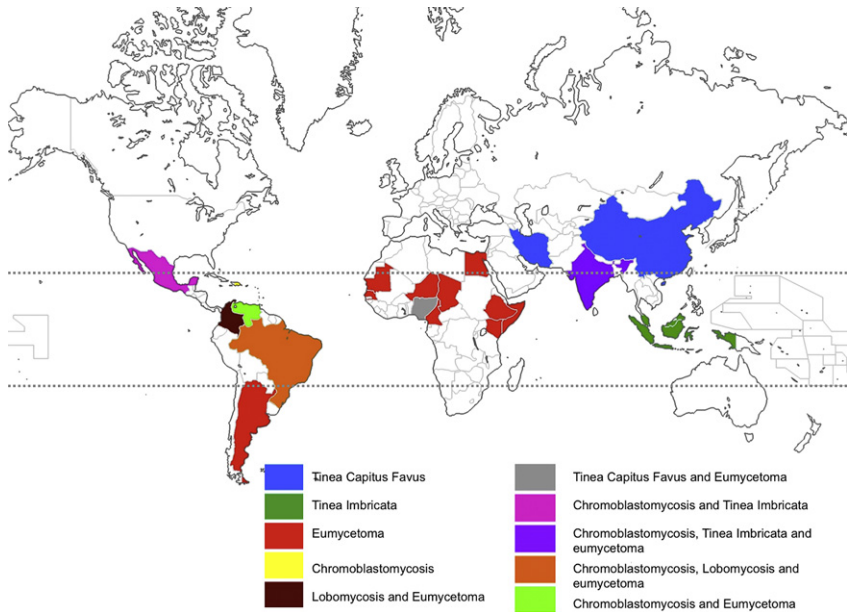


Fig. 1. Geographic distribution of major superficial, cutaneous, and subcutaneous mycoses.

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