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Tinea nigra due to *Hortaea werneckii* in Taiwan



Dear Editor,

Tinea nigra is an uncommon superficial phaeohyphomycosis mainly caused by *Hortaea werneckii*, an environmental halophilic and halotolerant dematiaceous fungus that distributes in (sub)tropical and humid regions and can survive in high salt environments, such as seawaters and salterns.¹

Here, we report a 23-year-old Taiwanese man with tinea nigra who resided in Taiwan and presented an asymptomatic brownish irregular patch on the right palm for 6 months (Fig. 1A). Potassium hydroxide (KOH) examination of skin scrapings showed the presence of short, septate and branched hyphae. Fungal culture on Sabouraud's dextrose agar yielded black fungal colonies that initially appeared yeast-like and later became filamentous (Fig. 1C). Microscopically, brown septate hyphae and annelloconidia were noted (Fig. 1D and E). *H. werneckii* was identified based on morphological characteristics and sequence analysis of the internal transcribed spacer region, demonstrating 99.4% sequence similarity compared with *H. werneckii* strain CBS 126986 (GenBank accession no. MH864373.1). This isolate was sensitive to amphotericin B, terbinafine, itraconazole, isavuconazole, posaconazole, and voriconazole (minimum inhibitory concentration [MIC] = 0.5, 0.12, 0.06, 0.06, 0.03, and 0.06 µg/ml, respectively) but resistant to flucytosine (64 µg/ml) based on the susceptibility testing using the CLSI M38-A2 method. Topical sertaconazole (an imidazole drug) cream was applied twice daily for weeks. Complete remission without recurrence was noted at a six-month follow-up appointment (Fig. 1B).

Tinea nigra generally presents as pigmented, irregular and asymptomatic macules or patches mostly on palms and

soles, and palmoplantar hyperhidrosis is a known predisposing factor. Pigmented tinea nigra lesions are often misdiagnosed as malignant melanoma, and these conditions can be differentiated by using a Wood's lamp examination, KOH examination of skin scrapings, dermoscopy, and pathological examination, in which pigmented hyphae in superficial skin are demonstrated in tinea nigra. Although *H. werneckii* infection is usually limited to the stratum corneum, it could also cause systemic phaeohyphomycosis. A Thai farmer experienced peritoneal dialysis-associated peritonitis due to *H. werneckii*, in whom severe tinea nigra palmaris and touch contamination were the likely source and route of infection.² *H. werneckii* was also recovered from splenic abscesses and the blood of two patients with acute myeloid leukemia during autopsy.³

Most patients with tinea nigra due to *H. werneckii* respond well to various topical antifungal drugs, such as imidazole compounds and terbinafine. There are no standard antifungal regimens for systemic infections, and antifungal susceptibility testing could be considered to guide systemic treatment, as variable MICs of azole drugs and amphotericin B against *H. werneckii* have been reported.¹

To the best of our knowledge, human tinea nigra due to *H. werneckii* has not been reported in Taiwan and from countries in East South Asia and East Asia yet except Thailand and Japan (with most cases from Okinawa) by PubMed searches.^{2,4} However, a recent environmental survey revealed that *H. werneckii* was a common fungus found in crabs, seawater, yellow and black sediment samples at/near the hydrothermal vent system at Kueishan Island, northeastern Taiwan, which is about 6 hundred

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Figure 1. (A) An irregular brownish patch (arrow) on the right palm; (B) No recurrence after 6 months; (C) Colonies on Sabouraud dextrose agar after incubation at 28 °C for 11 days, colonies initially appeared creamy, shiny black, and yeast-like, and later became filamentous (lower left); (D) Pigmented and septate hyphal elements with developing annelloconidia (arrow); (E) Ellipsoidal one-celled annelloconidia (arrow) and later two-celled annelloconidia showing bud development (arrowhead) on microscopic examination (lactophenol cotton blue stain, 1000x magnification).

kilometer away from Okinawa.⁵ Together with our case, *H. werneckii* appears an endemic fungus in Taiwan. Hence, tinea nigra due to *H. werneckii* should also be included in the differential diagnosis of pigmented lesions on palms and soles in this island country.

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