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When Rare Fungi Invade the Cornea: Curvularia hawaiiensis Keratomycosis–A Case Report

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ABSTRACT

Background: Keratomycosis (fungal keratitis) is a significant cause of corneal morbidity, particularly in tropical regions with potential corneal scarring, opacity & blindness. Most of the cases of Keratomycosis are caused by corneal trauma with vegetative matter contaminated with fungal spores in farm workers and other agricultural practices

Case Presentation: A 55-year-old woman presented with irritation, burning, and foreign-body sensation in the right eye for four days. Corneal scrapings showed septate hyphae on KOH mount. Fungal culture yielded a brown-black colony, and LPCB mount indicated Curvularia species. MALDI-TOF MS confirmed Curvularia hawaiiensis. The patient responded well to topical voriconazole, natamycin, and moxifloxacin, achieving full recovery in three weeks.

Conclusion: Early diagnosis and species-level identification are essential to guide therapy in fungal keratitis. This case highlights the emerging role of rare dematiaceous fungi such as C. hawaiiensis..

KEYWORDS: Keratomycosis; Curvularia hawaiiensis; MALDI-TOF; Dematiaceous fungi.

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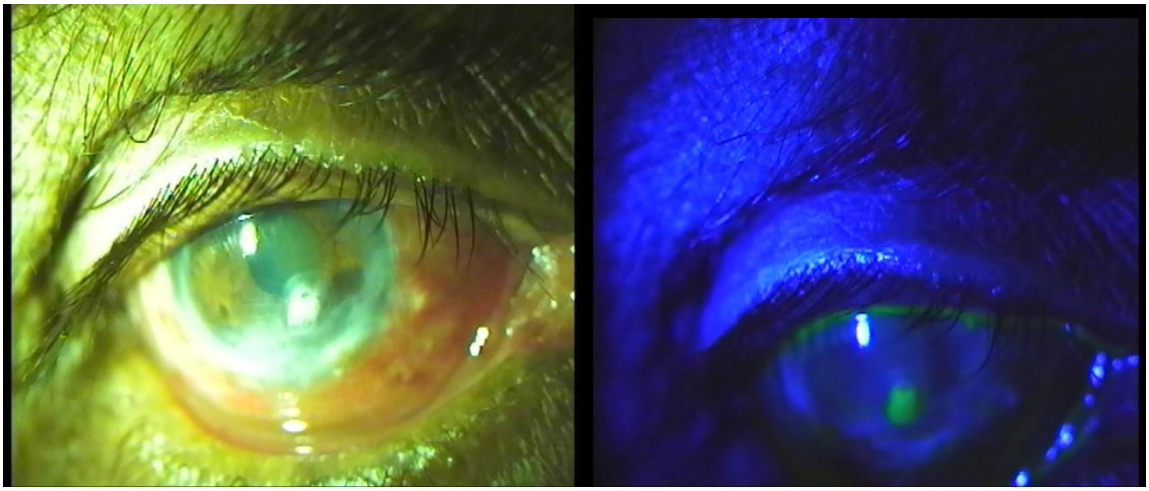
INTRODUCTION

Fungal keratitis remains an important cause of corneal ulceration and blindness, especially in tropical climates with high agricultural exposure [1–3]. Filamentous fungi, particularly *Aspergillus* and *Fusarium*, dominate the etiological spectrum in India [4–6]. However, recent studies show an increasing proportion of dematiaceous fungi, including *Curvularia*, *Bipolaris*, and *Alternaria*, associated with ocular infections [5,7]. The rise is attributed to increased steroid misuse, delayed presentations, and environmental exposure [6–8]. *Curvularia hawaiiensis* is an uncommon pathogen, and its involvement in keratitis is rarely reported.

CASE REPORT

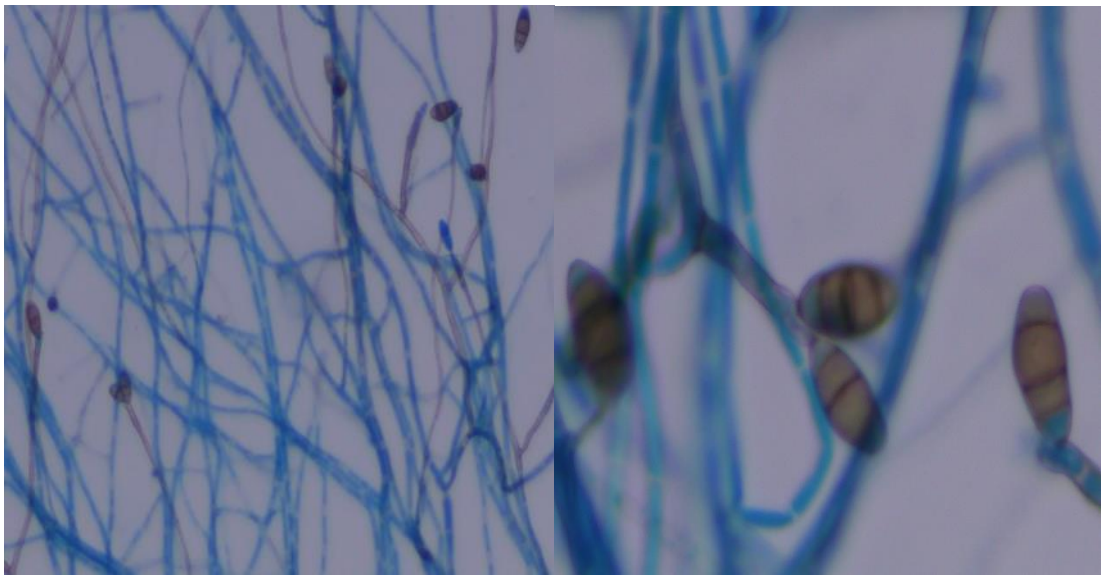
A 55-year-old female residing in a rural area presented with burning, irritation, and foreign-body sensation in the right eye for four days. No definite history of trauma was reported. Examination revealed conjunctival congestion and a corneal epithelial defect (3 × 4 mm) (Figure 1). Corneal scrapings were processed for Gram stain, KOH mount, and bacterial and fungal cultures.

Figure 1



Gram stain and bacterial cultures were negative after 48 hours of incubation at 37°C. KOH mount revealed septate fungal hyphae. Sabouraud Dextrose Agar showed floccose brown-black growth within three days of incubation in the BOD. LPCB mount of the fungal colony demonstrated septate hyphae with large, multi-septate conidia and a dark central cell—features consistent with *Curvularia* spp. (Figure 2) [9].

Figure 2



The fungal isolate was forwarded to the Advanced Mycology Diagnostic and Research Centre, St. John's Medical College (ICMR–South Zone), Bengaluru, where MALDI-TOF MS confirmed it as *Curvularia hawaiiensis*.
Treatment with topical natamycin, voriconazole, and moxifloxacin resulted in complete resolution within three weeks.

DISCUSSION

Fungal keratitis continues to pose diagnostic and therapeutic challenges, particularly in regions with high agricultural activity [4,6]. Although hyaline molds are more common, dematiaceous fungi have gained clinical relevance in recent epidemiological reviews [5,8]. Melanized fungi such as *Curvularia* possess virulence traits, including melanin deposition, that enhance resistance to host immune responses [8,10].

Curvularia hawaiiensis is particularly rare but has been increasingly recognized in ocular and respiratory infections in recent literature [10,11]. Species-level identification plays a crucial role in guiding management, as antifungal susceptibility patterns vary among dematiaceous fungi.

Rapid diagnostic techniques such as KOH microscopy allow immediate detection of fungal elements, while MALDI-TOF MS has significantly enhanced species-level identification of rare fungi in ophthalmic microbiology [13–15]. Recent studies emphasize its accuracy for melanized fungi [14,15].

Therapeutically, *Curvularia* species generally respond well to natamycin and voriconazole, with updated susceptibility profiles supporting their use as first-line agents [16,17]. Early treatment, combined with prevention of bacterial superinfection, improves outcomes [16–18].

CONCLUSION

Accurate and timely diagnosis of fungal keratitis is essential for preventing sight-threatening complications. This case highlights the importance of identifying rare dematiaceous fungi such as *Curvularia hawaiiensis* using advanced tools like MALDI-TOF MS. Clinicians should maintain a high index of suspicion, especially in endemic regions, to ensure early and effective management.

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