

Case Report of Tinea Capitis Caused by Combined *Microsporum audouinii* and *Microsporum canis*

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Abstract

Case Report

A 10-year-old boy was presented with small patches of alopecia and short broken hair. Fungal culture showed mixed growth of two types of colonies. *Microsporum audouinii* and *Microsporum canis* identification was made by macro and microscopical colony morphology analyses. Treatment with oral griseofulvine for two months was effective. This is one of the rarest cases found in our knowledge.

Keywords: Alopecia, Mixed Infection, Mycological Examination, *Microsporum Audouinii*, *Microsporum Canis*.

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INTRODUCTION

Dermatophytosis are common superficial fungal infections, primarily affecting the skin, hair, and nails. Among these, tinea capitis, or scalp ringworm, is frequently caused by species from the *Microsporum* genus, such as *Microsporum canis* and *Microsporum audouinii* [1, 2]. While these two species are typically found separately, mixed infections remain rare but pose particular diagnostic and therapeutic challenges [3]. *M. canis* is primarily zoonotic, whereas *M. audouinii* is anthropophilic, making the co-occurrence of these pathogens unusual. This study presents a case of simultaneous infection by both species in a patient, highlighting the diagnostic difficulties due to the morphological similarities between these dermatophytes and the importance of an appropriate therapeutic approach.

CASE

A 10-year-old with unremarkable past medical history, presented with small patches of alopecia and short broken hair. The boy then suffered from hair loss for 3 months unsuccessfully treated with ciclopiroxolamin and pyriithione zinc shampoo. Besides, he lives in the rural and keeps pets including dogs and cats. Physical examination demonstrated circular and

patchy alopecia with diffuse scaling on his scalp (Figure 1)

Dermoscopic examination could not be conducted as the required equipment was not available.

Scrapings from the scalp and hair sampling were submitted for direct examination with 10% solution of potassium hydroxide and for culture on Sabouraud dextrose agar with addition of Chloramphenicol and Actidione. After 8 days of incubation, two types of colonies grew (Figure 2); which were further subcultured on Sabouraud dextrose agar for 15 days. One was white cottony colony, and the other was velvety, greyish. Under the microscope, the cottony colony showed spindle-shaped macroconidia with thick walls and thinner septa alongside undifferentiated hyphae while the brownish colony showed pectinate hyphae, terminal chlamydoconidia and macroconidia.

Taking these data together, the two isolates were identified as *M. canis* and *M. audouinii* respectively. (figure 2)

The patient was treated by local terbinafine 1% and oral Griseofulvin (20mg/kg/j) for two months. The lesion improved significantly, and no relapse was noted at 3-month follow-up visit.



Fig. 1: Clinical presentation: multiple small patches of alopecia and short broken hair

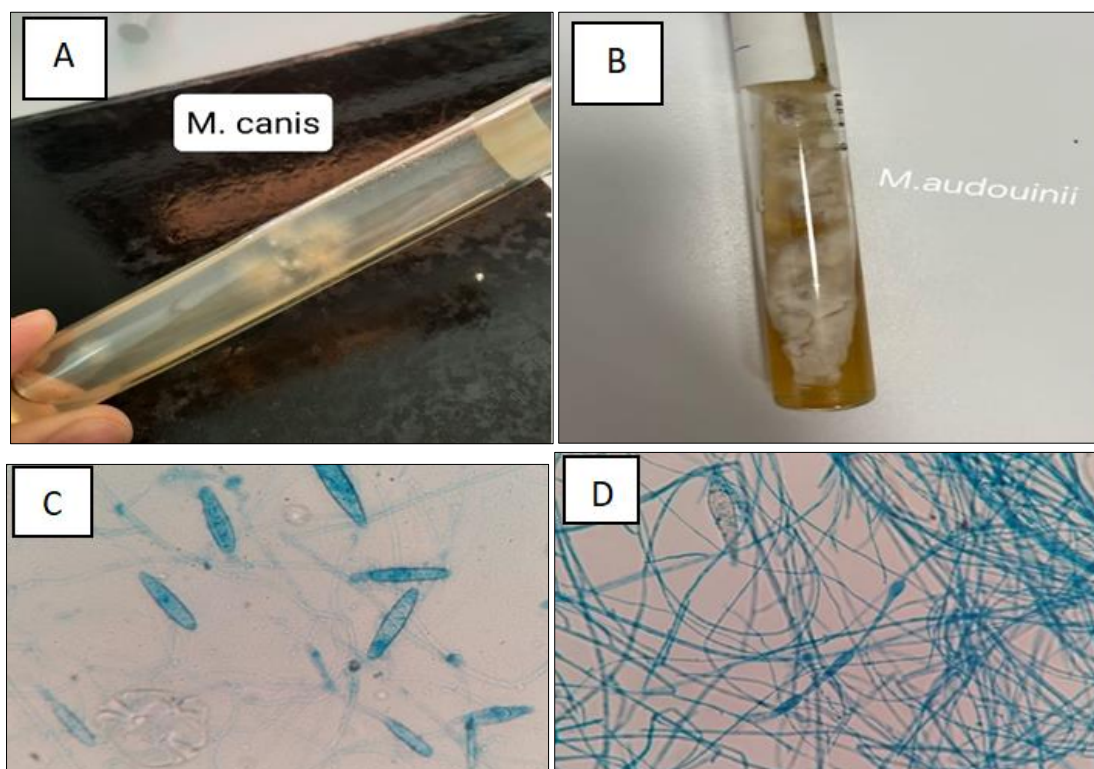


Fig. 2: A and B, Subcultures of hairs and scales in Sabouraud Chloramphenicol Actidione agar for 15 days at 28°C. White colony (A), and avelvety, greyish colony (B) are observed. Microscopic observation shows in figure (C) spindle-shaped macroconidia with thick walls and thinner septa alongside undifferentiated hyphae and in figure (D) pectinate hyphae, terminal chlamydoconidia and macroconidia

DISCUSSION

This case report highlights a rare occurrence of tinea capitis caused by a combined infection of *Microsporum audouinii* and *Microsporum canis*, two dermatophytes with distinct epidemiological patterns [1, 2]. While both species are common causative agents of scalp ringworm, co-infections involving both pathogens are infrequent, presenting unique diagnostic and therapeutic challenges.

Microsporum canis, a zoophilic dermatophyte, is primarily transmitted through contact with infected animals, especially domestic pets like cats and dogs. On the other hand, *Microsporum audouinii* is an anthropophilic fungus typically transmitted from human

to human, making it more common in environments with close human contact such as schools [4]. The coexistence of these two species in a single infection is unusual and may be explained by the patient's exposure to both human carriers and infected animals, increasing the risk of contracting both fungi simultaneously [5].

From a diagnostic perspective, the morphological similarities between these dermatophytes complicate their identification, as they share overlapping characteristics in microscopy and culture. Misidentification is a risk, particularly in resource-limited settings where advanced diagnostic tools, such as molecular methods, are not available [6]. In this case, accurate identification was crucial, as both *M. canis* and *M. audouinii* can exhibit varying sensitivities to

antifungal treatments. Cultures and sequencing are therefore essential for differentiation, ensuring that treatment is appropriately tailored to address both pathogens. This case perfectly highlights the importance of the biologist's role, as well as the necessity of a thorough understanding of each species' specific characteristics. Indeed, without careful observation, the presence of two different species could have gone unnoticed, potentially compromising the diagnosis, especially since their differentiation in culture proved to be challenging.

Therapeutically, this case underlines the importance of using broad-spectrum antifungal agents, such as terbinafine or itraconazole, which are effective against a wide range of dermatophytes. Standard treatments like griseofulvin may be insufficient in cases of co-infection, particularly if one of the species displays resistance. Early and precise identification, combined with a targeted treatment strategy, is essential for resolving dual infections and preventing recurrence [7-9].

This case also raises epidemiological questions. The dual presence of these species suggests that mixed infections may be underdiagnosed, especially in regions where close human-animal contact is common. This underscores the need for heightened awareness in clinical settings where dermatophytosis is prevalent, as well as for more comprehensive diagnostic approaches that can detect and differentiate multiple pathogens.

CONCLUSION

Such cases illustrate the challenges in diagnosing mixed infections, as both fungi share similar characteristics, potentially leading to misidentification. The treatment can also vary depending on the resistance profile of the pathogens involved.

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Disclosure of Conflict of Interest: The authors declare no conflict of interest.

Statement of Ethical Approval: All data has been collected anonymously following patient confidentiality.

Statement of Informed Consent: Informed consent was obtained from the patient participant

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