

Challenge 0904-2

April 2009

*Microsporium audouinii***HISTORY**

This sample was sent as simulated skin scrapings from a child with scalp infection.

CMPT QA

The sample was verified by a reference laboratory. *Microsporium audouinii* was isolated as a pure culture after 3 days of culture at 30°C in both phytone and mycosel media.

CMPT QA showed a 4+ pure culture viable for 23 days.

SURVEY RESULTS

Three laboratories reported *Microsporium*, two of them identified the species as *audouinii*.

Five laboratories identified the isolate as *Trichophyton*, three of them *tonsurans*, one *terrestre* and one as "species". One lab reported dermatophyte.

Seven laboratories incubated the cultures at 30°C, two of them at 25°C and one laboratory incubated most of the media at 25°C with the addition of one IMA at 37°C.

Table 1: Results – 0904-2 *Microsporium audouinii* challenge

Reported	No of labs
<i>Microsporium audouinii</i>	2
<i>Microsporium</i> species	1
<i>Trichophyton tonsurans</i>	3
<i>Trichophyton terrestre</i>	1
<i>Trichophyton</i> sp., presumptive, refer	1
Dermatophyte, refer	1
snp	1
Total	10

METHODS**Sample Processing****Primary Culture Media**

Numerous types of media are used for isolating fungi from superficial fungal infections.

Potato Dextrose Agar (PDA) enhances production of reproductive structures and production of pigment; Dermatophyte Test Medium (DTM) is a differential medium for dermatophytes. Both media are useful in the identification of dermatophytes.¹

Microscopic examination

Specimens submitted for fungus culture can be examined microscopically for fungal elements.

KOH preparation is particularly useful for the detection of fungal elements in skin samples since most interfering substances are transformed to a clear background.

Small hyphae (2-3 µm), regular, some branching, sometimes with rectangular arthrospores in skin scrapings are presumptive of Dermatophyte diagnosis².

Differential Diagnosis¹***Microsporium audouinii***

- Seldom forms conidia. Hyphae are septate with terminal chlamydoconidia..
- Colony: flat, silky, grayish or tannish white.
- Reverse is light salmon with reddish brown center.

Trichophyton tonsurans

- Many variably shaped microconidia. Hyphae are septate
- Macroconidia are rare, irregular form with bit thick wall.
- Colony: usually suede like, color highly variable (grayish, yellow, rose or brownish).
- Reverse: usually reddish brown, sometimes yellow.

Trichophyton terrestre

- Septate hyphae, with characteristic larger peg-shaped microconidia.
- Colony: surface is gwhite to yellow and velvety or granular.
- Reverse variable

Table 2: Primary media for isolation and Identification methods used

Reported	No of labs
IMA/29C, Myc/29C	1
IMA/30C, FSA/30C	2
IMA/30C, Myc/30C	1
Littman/25C, Mycosel/25C	1
Myc/30C	1
Mycobiotic agar w/ thiamine & inositol/25C, PDA/25C	1
SAB/25C, PDA/25C, IMA/25C & 37C, BHI/CC/25C, urease	1
SAB/PDA, DTM/30C, Myc/30C, LOA/30C	1
snp	1
Total	10

IMA - inhibitory mould agar, SAB - Sabouraud Dextrose media, BHI/CC - BHI with chloramphenicol and cycloheximide, PDA - potato dextrose agar, DTM - dermatophyte test medium

DERMATOPHYTOSES IN CANADA

According to Havlickova et.al.⁴ the incidence of *T. tonsurans* in confirmed tinea capitis cases increased from 9% in 1985 to 76% in 1996. Prior to this, the more common agents were *T. verrucosum*, *M. canis* and *M. audouinii*.

IDENTIFICATION

Macroscopic examination

The texture and surface color of the colony together with any pigment that diffuses into the medium are crucial for dermatophyte identification and differentiation.

M. audouinii's colony shows a flat surface, downy to silky, with a radiating edge. It is grayish or tannish white. Reverse is light salmon with reddish brown center¹. Pigment is best on PDA or cornmeal agar³.

Microscopic examination

Microsporum genus is characterized by the formation of numerous macroconidia that are thick walled and rough. Microconidia are also usually present¹.

However, *M. audouinii* is an exception and it **seldom forms conidia**. Terminal chlamydospores with a short, nipple-like structure are usually present³.

CLINICAL RELEVANCE

Microsporum audouinii belongs to the dermatophytes group characterized by the ability to digest and obtain nutrients from keratin.

This group causes infections of keratinized tissues: epidermis, hair and nails.

M. audouinii's most common site of infection is the scalp, almost exclusively in children. *M. audouinii* also causes ringworm of glabrous skin³.

Tinea capitis is a common dermatophyte infection of the scalp in children. Dermatophytes are classified as anthropophilic, geophilic and zoophilic. The etiological agents of tinea capitis usually fall in the first and last categories.

Tinea capitis is generally observed in children over the age of 6 years and before puberty. Clinical presentations are seborrheic-like scale, 'black dot' pattern, inflammatory tinea capitis with kerion and tiny pustules in the scalp⁷.

TREATMENT

Treatment of tinea capitis requires an oral antifungal agent⁶.

The data from the use of terbinafine, itraconazole and fluconazole are promising and suggest that these agents have an efficacy similar to griseofulvin while shortening the duration of therapy.

Both griseofulvin and the newer antimycotics have a favorable adverse-effect profile and are associated with high compliance⁷.

REFERENCES

1. Larone DH 2002 Laboratory Procedures pp293–312 in Medically Important Fungi, a guide to identification 4th edition ASMpress Washington DC.
2. WHO 2006 Guidelines on Standard Operating Procedures for Microbiology, chapter 21: Mycological Techniques [Link](#)
3. Kwon-Chung KJ. 1992 Chapter 6: Dermatophytoses pp105 -161 Laboratory Diagnosis. Medical Mycology. Lea & Fe-

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4. Havlickova B, Czaika VA, Friedrich M. Epidemiological trends in skin mycoses worldwide *Mycoses*. 2008 Sep;51 Suppl 4:2-15.
 5. Havlickova B, Friedrich M. The advantages of topical combination therapy in the treatment of inflammatory dermatomycoses *Mycoses*. 2008 Sep;51 Suppl 4: 16-26
 6. Huang DB, Ostrosky-Zeichner L, Wu JJ, Pang KR, Tyring SK. Therapy of common superficial fungal infections. *Dermatol Ther* 2004; 17: 517-22
 7. Gupta AK, Summerbell RC. 2000 Tinea capitis. *Med Mycol*. Aug;38(4):255-87.

USEFUL WEBSITES

The University of Adelaide, Australia. Mycology Online [Microsporum audouinii pictures](#)