

**0709-2 *Microsporium canis***

**HISTORY** This sample was sent as scalp scraping culture isolate.

**CMPT QA:** Pure growth of *Microsporium canis* viable for 36 days.

**Reference Laboratory:** Growth of *Microsporium canis*.

Results received and media and methods noted are listed in Table 1.

**IDENTIFICATION** <sup>1-5</sup> *Microsporium* differs from *Trichophyton* and *Epidermophyton* by having spindle-shaped macroconidia with echinulate to rough walls. *Microsporium canis* is urease positive and hair perforation positive. Invaded hairs show an ectothrix infection and fluoresce a bright greenish-yellow under Wood's ultra-violet light. *Microsporium canis* differs from *Microsporium audouinii* by perforating hair and growing on polished rice grains. See Table 2 for a comparison of *M. canis* with *M. audouinii* and *T. mentagrophytes*.

**CLINICAL SIGNIFICANCE** *Microsporium canis* is a dermatophyte which causes ringworm of the scalp and skin in children and has been occasionally reported as the cause of nail infections <sup>1</sup>. Tinea or ringworm is the result of the host reaction to the enzymes released by the fungus during the digestive process <sup>2</sup>. Rarely, mycetoma-like lesions have been observed in immunocompromised hosts <sup>3</sup>. *Microsporium canis* is a complex species with several variants. *M. canis* var. *canis* is the most commonly encountered species in human infections and is distributed world wide; however, it is less common in North America, the United Kingdom, and Scandinavia than the rest of the world.

Most *M. canis* infections in humans are acquired from infected dogs or cats. In an *M. canis* outbreak affecting 15 people and 2 dogs with rapid transmission, the researchers noted that family pets may have acted as intermediate hosts, facilitating transmission between human contacts <sup>6</sup>. They concluded that while *M. canis* is an infrequent cause of tinea infections in the USA, it should remain in the differential diagnosis when a fungal infection presents in an atypical fashion.

**TREATMENT** Griseofulvin has been established as a safe and effective drug for children, when prescribed in doses from 20 to 25 mg per kilogram of body weight. However, due to side effects such as headaches and gastrointestinal disturbances, or even idiosyncratic ones, such as hypersensitivity it is not always well tolerated. Under such

circumstances, terbinafine, itraconazole and even fluconazole are alternatives. Oral therapy with terbinafine and itraconazole are very widely used for treatment of *Microsporium* infections; however, treatment failure with terbinafine has been reported for *M. canis*. Itraconazole, in the dose of 5 mg per kilogram of body weight is effective, even though there may be restrictions to its use in virtue of its cost or less experience of its use in children. Topical therapy with Tea Tree Oil, might be considered before oral therapy <sup>8</sup>.

**REFERENCES**

1. Summerbell RC, Weitzman I, Padhye AA. 2007. *Trichophyton, Microsporium, Epidermophyton, and Agents of Superficial Mycoses*. pp. 1874-1897. In PR Murray et al. (eds.) *Manual of Clinical Microbiology*. 9th ed. ASM Press. Washington, DC.
2. Larone DH. 2002. *Medically Important Fungi*. 4th ed. ASM Press. Washington, DC.
3. [http://www.doctorfungus.org/thefungi/microsporium\\_canis.htm](http://www.doctorfungus.org/thefungi/microsporium_canis.htm)
4. <http://www.provlab.ab.ca/mycol/tutorials/derm/7case.htm>
5. [http://www.mycology.adelaide.edu.au/Fungal\\_Descriptions/Dermatophytes/Microsporium/Microsporium\\_canis.html](http://www.mycology.adelaide.edu.au/Fungal_Descriptions/Dermatophytes/Microsporium/Microsporium_canis.html)
6. Chiller K, Resneck J, Chiller T, Aly R. 2002. An outbreak of *Microsporium canis* in the community demonstrating rapid transmission. *Exogenous Dermatology*. 1:18-21.
7. Marques SA. 2005. *Tinea capitis*: epidemiological and ecological aspects of cases observed from 1983 to 2003 in the Botucatu Medical School. *An Bras Dermatol*. 80:6. p. 597-602. [http://72.14.253.104/search?q=cache:edS77LHGmB8J:www.scielo.br/pdf/abd/v80n6/en\\_v80n06a05.pdf+microsporium+canis+canada&hl=en&ct=clnk&cd=40&gl=ca](http://72.14.253.104/search?q=cache:edS77LHGmB8J:www.scielo.br/pdf/abd/v80n6/en_v80n06a05.pdf+microsporium+canis+canada&hl=en&ct=clnk&cd=40&gl=ca)
8. Hammer KA, Carson C, Riley T. 2002. In vitro activity of *Melaleuca alternifolia* (tea tree) oil against dermatophytes and other filamentous fungi. *J Antimicrob Chem*. 50. p. 195-199.

<b>Identification</b>	<b>No. reporting</b>	<b>Media &amp; ID Methods</b>
<i>Microsporium canis</i>	1	Potato Dextrose agar, Dermatophyte test media, 25°C, GT, urea; SAB/RT
<i>Microsporium</i> species	1	Fungus selection agar/RT
<i>Microsporium audouinii</i>	1	Fungus selection agar
<i>Trichophyton mentagrophytes</i>	1	Fungus selection agar, Potato Dextrose agar, 25°C
<i>Trichophyton</i> species	1	Fungus selection agar/RT
No report	1	
	6	

<b>Fungus</b>	<b>Colonial Morphology</b>	<b>Microscopic Morphology Phase Contrast</b>
<i>Microsporium canis</i>	<p>Growth rate: moderate within 6-10 days; Texture: flat, spreading, granular, to coarsely fluffy to hairy surface, may show radial grooves. Thallus color: white to cream. Reverse: bright golden yellow to brownish yellow.</p> <p>There are variants that are slow growing, heaped and folded, yellow surface, no reverse pigment, macroconidia absent, but which revert to typical colony on rice grains.</p>	<p>Produces <b>septate hyphae</b> with thin walls. <b>Macroconidia</b> are typically long spindle-shaped, with 5-15 cells, verrucose, thick-walled and often have a terminal knob. <b>Microconidia</b> are rare, unicellular and clavate to pyriform in shape. Raquet hyphae, nodular bodies, and chlamydoconidia may be present. Macroconidia and/or microconidia are often not produced on primary isolation media.</p>
<p><i>Microsporium audouinii</i></p> <p>CMPT 0605-2 <a href="http://www.cmpt.ca/pdf/mycology/mv_0605_2_ma.pdf">http://www.cmpt.ca/pdf/mycology/mv_0605_2_ma.pdf</a></p>	<p>Growth rate: matures in 7 to 10 days; Texture: downy or velvety to silky texture, and has a radiating edge. Thallus: grayish white to tannish white and rarely rust coloured, flat with a Reverse: salmon pink to peach or rose brown.</p> <p>Polished rice medium yields either poor growth, with and without brown pigment; in contrast, <i>M. canis</i> produces good growth and a yellow pigment.</p>	<p><i>M. audouinii</i> produces septate hyphae, usually pectinate (comb-like) with terminal chlamydoconidia that are often pointed on the end, and usually almost devoid of conidia. Rare deformed spindle-shaped <b>macroconidia</b>, with a pointed appearance at the tip (described as a 'beak'), may be seen as well as deformed unicellular drop-shaped/club-shaped <b>microconidia</b>. The macroconidia of <i>M. audouinii</i> are longer and smoother than those of <i>M. canis</i>.</p>
<p><i>Trichophyton mentagrophytes</i></p> <p><a href="http://www.provlab.ab.ca/mycol/tutorials/derm/tment.htm">http://www.provlab.ab.ca/mycol/tutorials/derm/tment.htm</a> for Photo</p>	<p>Granular form: Growth rate: moderate; Texture: granular, flat; Thallus color: buff to tan Reverse: pale yellow, tan, or reddish brown Velvety form: Growth rate: moderate Texture: velvety, flat, thin, with fine powder Thallus color: white to sandy to butter yellow Reverse: white to tan, rarely reddish brown Downy form: Growth rate: moderate Texture: deep, cottony; Thallus color: white Reverse: pale yellow to tan</p>	<p><b>Velvety and granular forms:</b> round microconidia in grape-like clusters spiral hyphae +/- cigar shaped, thin walled macroconidia, narrowly attached to hyphae</p> <p><b>Downy form:</b> pyriform microconidia indistinguishable from <i>T. rubrum</i></p>