cmpt clinical microbiology proficiency testing Mycology Plus

May 2006

0605-2 *Microsporum audouinii*

HISTORY Sent as skin scrapings from the scalp.

CMPT QA: Pure growth of 1+ *Microsporum audouinii*, viable for 33 days. The samples were validated by random lot sample.

Reference Laboratory: Growth of *Microsporum audouinii* confirmed.

Table 1 lists the results received. This survey shows an improvement in the identification of *M. audouinii* compared to Mycology Plus 0401-2 (skin scraping) sent April 2004, when only 4 out of 8 participants reported *M. audouinii*; the remaining 4 reported either *Trichophyton tonsurans*, or *Trichophyton* sp., probable *T. tonsurans* with referral to a reference laboratory to confirm identification.

Table 1. Results received for 0605-2.

Identification	No. of labs
Microsporum audouinii	5
Microsporum species, refer (2)	3
Sterile hyphae only, unable to ID	1
Refer growth	2
Grand Total	**11**

Participants may not have encountered this infrequent fungus before and since it produces rare or few conidia it was less easy to identify. A Table (2) comparing colonial and microscopic characteristics of other species is included in the Basic Mycology critique.

PATIENT EXAMINATION Hairs infected with *M. audouinii* (*M. canis* and *M. ferrugineum)* fluoresce bright green under a Wood's lamp (filtered UV light peak of 365 nm). Hairs infected with *Trichophyton schoenleinii* may show a dull green colour. Note, in erythrasma, the skin fluoresces orange to coral red, whereas in dermatophytosis, the skin is not fluorescent [1]. Microscopic examination of the hairs infected with *M. audouinii* will show arthroconidia formed as a mosaic sheath around the hair or as chains on the surface of the infected hair shaft. This is termed ectothrix colonization.

CULTURE MEDIA To inhibit bacterial and saprobic fungal contamination, all participants used a combination of commercially available media, e.g., Mycosel agar (n=8); IMA (n=5); BHI (n=2); Littman oxgall (n=2); PDA (n=2); DTM (n=1); and SAB (n=1).

IDENTIFICATION Colony morphology (texture and color), rate of growth, and microscopic morphology aide in the identification of the dermatophyte species [1,2]

Colony morphology[2,3] *Microsporum audouinii* matures in 7 to 10 days on Sabouraud dextrose agar. The surface of the colony is grayish white to tannish white and rarely rust coloured, flat with a downy or velvety to silky texture, and has a radiating edge. The color on the reverse is salmon pink to peach or rose brown.

Microscopic morphology *M. audouinii* hyphae are septate, usually pectinate (comb-like) with terminal chlamydoconidia that are often pointed on the end, and usually almost devoid of conidia. Rare deformed spindle-shaped macroconidia, with a pointed appearance at the tip (described as a 'beak'), may be seen as well as deformed unicellular drop-shaped/club-shaped microconidia. The macroconidia of *M. audouinii* are longer and smoother than those of *M. canis*. While there are colonial and microscopic similarities between *M. audouinii* and *Trichophyton tonsurans*, the latter dermatophyte is a slower grower and takes 12 days or more to mature. Club or balloon-shaped microconidia usually grow abundantly along the hyphae of *T. tonsurans*.

Tests [1,3,4] Growth on bromcresol purple agar is profuse, alkalinization is observed; urea hydrolysis is variable; in vitro hair perforation test is negative, vitamin growth factor tests are negative, although some strains are enhanced by thiamine; and polished rice medium yields either poor growth, with and without brown pigment; in contrast, *M. canis* produces good growth and a yellow pigment.

CLINICAL SIGNIFICANCE *Microsporum audouinii*, first described by Gruby in 1843, was once common throughout Europe, but is now rare in this area. However, it continues to be an important cause of tinea capitis (scalp ringworm) in West Africa and is also found in parts of the United States and Latin America[5]. *M. audouinii* is anthropophilic, thus it is unable to colonize animals and has no other environmental sources. Tinea capitis is generally a disease of children, and cases are rare after puberty. The mode of transmission is by infected hairs or desquamated epithelial cells. Rarely does *M. audouinii* transmission occur by direct contact.

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TREATMENT[5] Oral therapy with griseofulvin given daily for 6 weeks along with a topical azole shampoo or cream are recommended. Retreatment of children may be necessary.

REFERENCES

1. Summerbell RC. 2003. p. 1798-1819. *Trichophyton, Microsporum, Epidermophyton*, and Agents of Superficial Mycoses. *In* PR Murray et al. (ed.) *Manual of Clinical Microbiology*. 8th ed. ASM Press. Washington, DC. 2003.
2. Larone DH. 2002. Medically Important Fungi. 4th Edition. ASM Press. Washington, DC.
3. http://www2.provlab.ab.ca/bugs/webbug/mycology/maudouin.htm
4. http://www.doctorfungus.org/thefungi/microsporum_audouinii.htm
5. Hay RJ. 2005. Dermatophtosis and other superficial mycoses. P. 3051-3062. *In* GL Mandell, JE Bennett, R Dolin (eds.) *Principles and Practices of Infectious Diseases*. 6th ed. Vol. 2. Philadelphia,PA.

Additional recommended web site:
http://www.mycology.adelaide.edu.au/Mycoses/Cutaneous/Dermatophytosis/