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Occurrence of *Trichophyton megninii* in Ontario. Identification with a Simple Cultural Procedure

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Five strains of *Trichophyton migninii* were isolated in Toronto from four people. One patient probably was infected in Toronto since he had not visited the European endemic area. These were the first isolates made in Ontario; a requirement for L-histidine was determined. A cultural differentiation of *T. migninii* and *T. rubrum* is described. Attention is directed to the similarity of the metabolism for dextrose in Bromocresol purple milk dextrose agar by *T. megninii* and *T. mentagrophytes* which differs form *T. rubrum*.

Trichophyton megninii occurs chiefly in Europe and is especially common in Sardinia (8). Since 1971 we have isolated five cultures that are the subject of this report. Although the identification of the dermatophyte has been made more certain as a result of the nutritional studies of Georg (4), there is still confusion in differentiating between the primary colonial appearance of *T. megninii* and some strains of *T. rubrum*.

MATERIALS AND METHODS

Christensen urea broth (5), Bromocresol purple (BCP) milk dextrose agar (2), brain heart infusion agar (2), and ammonium nitrate agar with and without L-histidine (4) were the materials used.

Strains of *T. megninii* were isolated from skin scrapings submitted by physicians in Toronto and adjacent municipalities. The laboratory procedure was as follows. All dermatophytes showing a colonial appearance on Sabouraud-cycloheximide-antibiotic agar ([2] with gentamicin 20 mg per liter), suggestive of *T. megninii* or *T. rubrum*, were checked for purity and then transferred to urea broth, BCP milk dextrose agar, and brain heart infusion agar. If the growth on these media was suggestive of *T. megninii*, transfers were made to ammonium nitrate agar to check for L-histidine requirement.

CASE REPORTS

Case 1. Case 1 was Italian, male, and 55 years old. The patient came from Calabria and has been a resident of Toronto for 20 years. He has not left Toronto during this time. The site of the original infection in the beard area showed marked inflammation. *T. megninii* was isolated from the beard region in 1971 (F7583-71) and the scalp in 1973 (F2020-73).

Case 2. Case 2 was Portuguese, female, and age 37. The patient travelled to Portugal in 1972; *T. megninii* was isolated from a hand in 1973 (F2725-73).

Case 3. Case 3 was Israeli, male, and age 47. The patient had traveled around most of Europe during World War II and spent considerable time in Sardinia and Corsica. He has not been back to that area since the war, but has been elsewhere in Europe and Israel. *T. megninii* was isolated from the hand in 1974 (F2626-74).

Case 4. Case 4 was Canadian of Italian parents, male, and age 13. The patient has not been outside of Canada. He visited a dermatologist in 1974 because of well-defined lesions on the right foot from which *T. megninii* was isolated (F11233-74).

RESULTS

Isolates from cases 1, 2, and 3. The primary cultural appearance of the isolates from these patients showed white velvety aerial growth which turned a rose color with age. The underside of the colony was reddish. As the colonies matured, irregular furrows developed (Fig. 1). Microscopy examination showed pyriform microconidia produced singly along the filaments indistinguishable from those of *T. rubrum*. No macroconidia were seen.

Isolate from case 4. *T. megninii* (F11233-74) isolated from this patient was atypical (Fig. 2). The primary growth was velvety with a central crater. In 3 weeks the edge of the colony showed a very narrow buff color comparable to no.45, Rayner Mycological color chart, British Mycological Society, 1970, (RMCC), with a livid red (no. 56 RMCC) blending into a greyish rose (no. 55 RMCC). The crater was also a livid red color. Sectors of equal size were formed by radial furrows.

The growth on ammonium nitrate agar with L-histidine was slower than the other isolates. It was because of the requirement for this amino acid as well as the coloring that we accepted it as an atypical strain of *T. megninii*. Additional studies of this strain are being made.

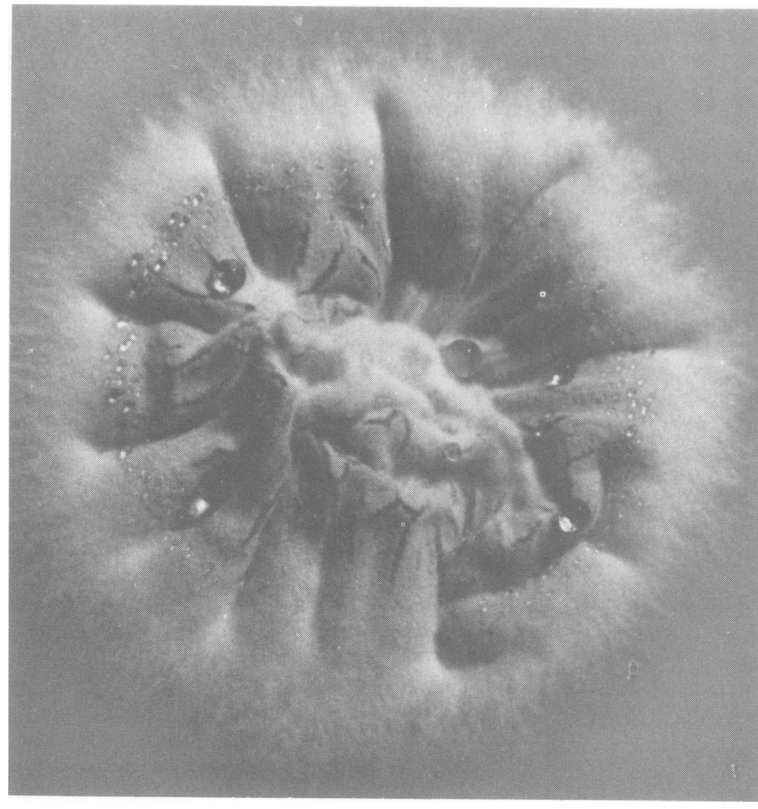

FIG. 1. *Colonial appearance of typical T. megninii (F2725-73) on Sabouraud-cycloheximide-antibiotic agar in 3 weeks.*

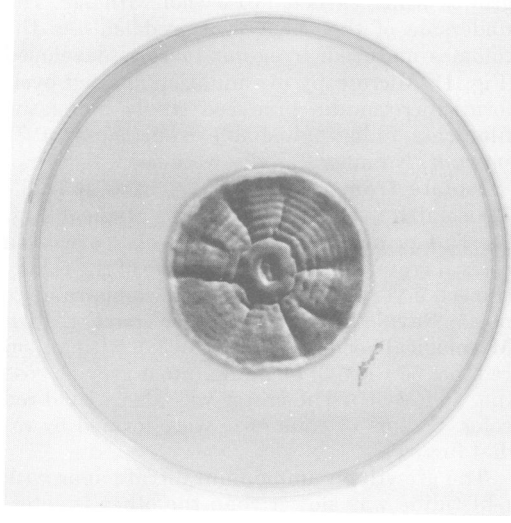

FIG. 2. *Colonial appearance of the atypical colony of T. megninii (F11233-74) on Sabouraud-cycloheximide-antibiotic agar incubated for 2 weeks.*

The colonial appearance of *T. megninii* may be confused with *T. rubrum* because of the similarity of the colors produced by these two species. This is especially true with atypical strains. Although verification of the identification of *T. megninii* depends on determining its requirement for histidine we wish to report a difference in growth in 7 days of *T. megninii* and *T. rubrum* on BCP milk dextrose agar (Fig. 3), and Christensen urea broth.

BCP milk dextrose agar is a standard medium in our diagnostic procedure to differentiate *T. rubrum* from *T. mentagrophytes*. All isolates of *T. rubrum* are grown on this medium. The isolates of *T. megninii* reported here produced a different type of growth and reaction, which resulted in using the nutritional test to check for L-histidine requirement for their recognition as *T. megninii;* no growth occurred unless the medium was supplemented with histidine. On BCP milk dextrose agar (Fig. 3), *T. rubrum* produces a restricted colony of short aerial growth in 7 days with a clearly

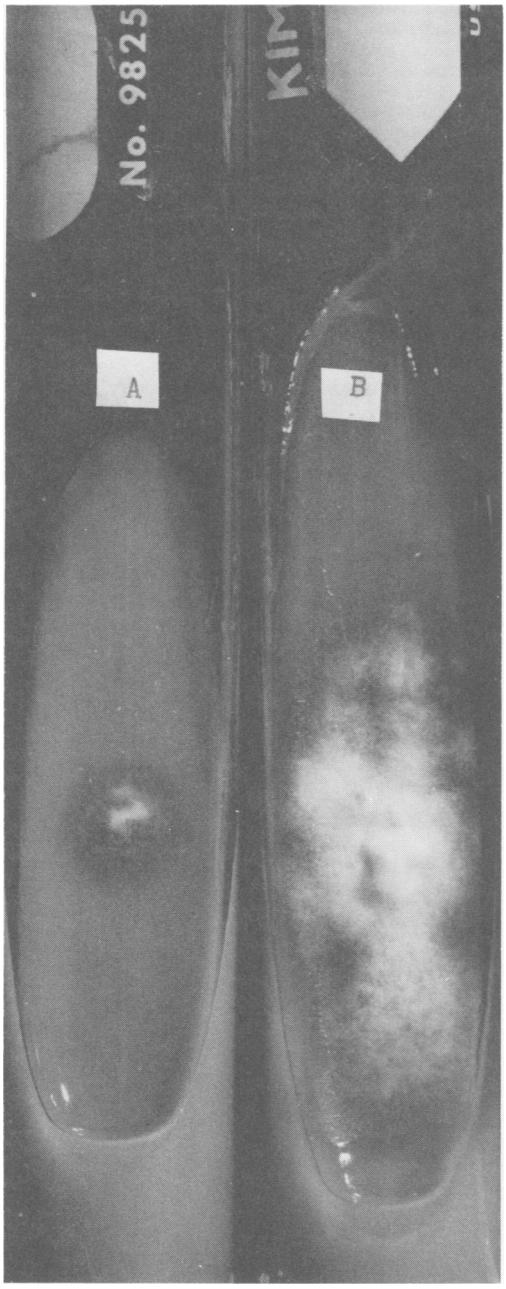

FIG. 3. *Cultural appearance of T. rubrum and T. megninii on BCP milk dextrose agar incubated for 7 days. (A) T. rubrum showing restricted growth with pronounced reddish pigment and slight white aerial growth. (B) T. megninii showing loose white growth. Alkalinity more pronounced on reverse side.*

defined reddish color in the medium. There is no change in pH (2). Unlike *T. rubrum*, *T. megninii* produces a spreading velvety growth (Fig. 1). A darkening of the BCP indicates an increase in pH reaction and no reddish color is prominent around the colony. The aerial growth may show some pink color as the colony ages.

DISCUSSION

The growth of *T. megninii* on BCP milk dextrose agar is comparable to the growth of *T. mentagrophytes* (2). These species produce alkalinity in 7 days on this medium in spite of the presence of dextrose. In contrast, *T. rubrum* shows a restricted growth and no visible change in pH. These observations indicate that *T. megninii* and *T. mentagrophytes* have a similar metabolism for dextrose which differs from *T. rubrum*. In the previous report (2) we demonstrated that *T. rubrum* grows similarly to *T. mentagrophytes* on BCP milk agar, i.e., it produces a spreading growth and alkalinity. However, when dextrose was added to BCP milk agar, the growth of *T. rubrum* was noticeably restricted. Presumably the restricted growth of *T. rubrum* is caused by an inhibitory action of dextrose preventing a rise in pH with which is associated a spreading growth.

T. megninii shows a positive urease reaction in Christensen urea broth in 7 days in contrast to no change by *T. rubrum* (7). On brain heart infusion agar, the growth was flat with radial furrows and a pale pink. On Casamino Acids erythritol albumen agar, *T. megninii* produces a light reddish color (3). A study of the tolerance of 21 species of keratolytic fungi to sodium chloride showed that *T. megninii* grew in a greater concentration than *T. rubrum*. It was inhibited by 12% (6).

Although *T. megninii* is reported to be exclusively confined to Europe (1), the infection reported in case 4 seems to have been contracted in Toronto since the patient had not left the city or country before becoming infected. It is probable that *T. megninii* has been carried to the large Italian community here. The other patients in this reported had traveled to areas where they may have been infected. We believe the isolates reported in this paper are the first proved isolations of *T. megninii* in Canada.

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