Serological cross-reactivity between Sporothrix schenckii and various unrelated fungi

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Abstract

The serological cross-reactivity of Sporothrix schenckii with various unrelated fungi was investigated by use of immunodiffusion tests. A rabbit anti S. schenckii serum was obtained, which reacted with Cladosporium werneckii, C. carrionii, C. bantianum, Coccidioides immitis, Phialophora jeanselmei, P. gougerotii, P. dermatitidis, Fonsecaea pedrosoi, Aspergillus fumigatus, Histoplasma capsulatum and Trichophyton mentagrophytes, but not with Saccharomyces cerevisiae antigens. The serological determinants responsible for the cross-reactions were suggested to be D-galactosyl residues.

Introduction

In a previous paper (6), we reported the serological cross-reactivity of some rabbit anti Sporothrix schenckii sera with Cladosporium werneckii antigen, which is reported to be a galactomannan (10), and we speculated that S. schenckii antigens might have mannose or galactose as well as rhamnose determinants. From these results, we investigated further the serological cross-reactivity of S. schenckii with various unrelated fungal antigens and the serological determinants that are responsible for this cross-reaction.

Materials and methods

Preparation of antigen: Sporothrix schenckii ATCC 10268 (ATCC: American Type Culture Collection), Cladosporium werneckii DUMC 2785 (DUMC: Duke University Medical Center), C. bantianum DUMC 2590, C. carrionii DUMC 2569, Fonsecaea pedrosoi ATCC 9475, Phialophora dermatitidis KU 1183 (KU: Kanazawa University), P. jeanselmei KU 1171, P. gougerotii KU 999, Histoplasma capsulatum KU 967, Coccidioides immitis KU 522, Aspergillus fumigatus KU 1901, Saccharomyces cerevisiae MCP J-6001 (MCP: Meiji College of Pharmacy), and Trichophyton mentagrophytes (KU clinical isolate) were grown on a dialyzate medium (from 0.5% peptone, 0.5% yeast extract) plus 2% glucose at room temperature for 7 days with constant shaking. Antigens were prepared as reported previously (5).

Preparation of antiserum: Four white rabbits were immunized intravenously with 2 mg of yeast form S. schenckii cells twice a week for 3 weeks, and one week after the final injection, the rabbits were bled. The antisera were stored at −70 °C until used.

Absorption of antiserum: The antiserum was mixed with the Cladosporium werneckii cells, Saccharomyces cerevisiae cells, D-galactose and D-mannose (40 mg/ml) respectively, kept at 37 °C for 2 hours, then 4 °C overnight. The mixtures were used after centrifugation at 10,000 X g for 15 minutes at 0 °C.

Immunodiffusion tests were carried out as reported previously (5).

Results

Two rabbit antisera reacted only with S. schenckii antigen whereas the other two antisera
cross-reacted with *C. werneckii* antigen. One of the cross-reacting antisera was used in this study. All antigens except the *S. cerevisiae* antigen yielded precipitin lines against the antiserum, although differences were seen in intensity and number (Fig. 1). A disappearance of, or a decrease in intensity and number of, precipitin lines was revealed by inhibition of immune precipitation with D-galactose (Fig. 2). The cross-reactions were also completely inhibited by absorption with *C. werneckii* cells, but not at all with *S. cerevisiae* cells and D-mannose.

**Discussion**

The immunodominant determinants of *S. schenckii* have been reported to be branched nonreducing endgroups of rhamnose linked to a mannan backbone (11). On the other hand, the other fungal antigens used in this study, with the exception of the *S. cerevisiae* mannan antigen, are reported to contain galactomannan (1, 2, 10, 13–16). Suzuki and Takeda (15) reported that antibody response to *Aspergillus fumigatus*, *A. niger*, *Trichophyton rubrum*, *C. werneckii*, and *Hormodendrum pedro*-