

PATCH TESTS WITH THE ETHER-SOLUBLE FRACTIONS OF MOLD PELLICLES

STEPHAN EPSTEIN, M.D., MARSHFIELD, WIS., HOMER E. PRINCE, M.D., HOUSTON, TEXAS, AND MARIE B. MORROW, PH.D., AUSTIN, TEXAS

THE causative role of molds in atopic dermatitis is well known since Feinberg² published his studies. However, there is, as far as we can see, no report about contact dermatitis from molds.* Yet, in analogy with ragweed dermatitis, it appears likely that there might also be two forms of dermatitis from molds: (1) atopic dermatitis due to protein fractions of the molds and (2) contact dermatitis due to the ether-soluble oleoresinous fractions. That oleoresins of molds are capable of producing experimental contact dermatitis in animals was shown by Bocobe and associates.¹ The possibility that clinical contact dermatitis might be caused by molds is further suggested by the fact that mold spores and mycelium, like ragweed pollen grains, are known to contain an abundance of oleoresinous material, up to 40 per cent in some species.⁵

For this reason, patch tests with the ether-soluble fractions of mold pellicles were carried out and are reported in this article.

MATERIAL AND METHODS

For these studies, we employed a variety of mold oleoresins which were available as a by-product of our early investigations in the preparation of mold allergens. In these experiments, we had subjected washed, air-dried mold pellicles to extraction in a Soxhlet apparatus with ethyl ether. After removal of all traces of ether by evaporation, the crude oleoresinous substances were dissolved in acetone in a concentration of 1 per cent for patch testing.

TECHNIQUE OF TESTS

The "open patch test" technique was used. Squares were marked with a ball-point pen, and then the individual mold oleoresins were applied; the patch tests were read by the physician during the first three days, and the patient was instructed to check them for four more days.

RESULTS

In 1945, eighty patients were patch tested with the oleoresins of the molds shown in Table I. These patients included especially farmers, persons with contact dermatitis of obscure origin, or those in whom one might suspect contact with molds to be significant. The mold oleoresins were also used in various

Received for publication Nov. 27, 1956.

*A contrary note by Grinnell⁴ is based on a misunderstanding. Feinberg³ never observed contact dermatitis from oleoresins of molds.

TABLE I. MOLDS USED FOR PATCH TESTS IN 1945

1. <i>Alternaria tenuis</i> (pool)
2. <i>Alternaria tenuis</i>
3. <i>Aspergillus flavus</i>
4. <i>Aspergillus niger</i>
5. <i>Curvularia trifolii</i>
6. <i>Fusarium</i> species
7. <i>Helminthosporium</i> (mixed species)
8. <i>Hormodendrum cladosporioides</i> group
9. <i>Monilia sitophila</i>
10. Sterile mycelium
11. <i>Penicillium notatum</i>
12. <i>Penicillium</i> species
13. <i>Pullularia pullulans</i>
14. <i>Rhizopus nigricans</i> (pool)
15. <i>Spondylocadium</i> species
16. <i>Trichoderma lignorum</i>

controls, persons with other dermatoses and respiratory diseases; some of the control group had given positive immediate reactions to a protein extract of *alternaria*. Contrary to our expectations, all these patients tested were negative.

Between December, 1946, and March, 1949, twenty-five more patients were patch tested with oleoresins from eight molds Nos. 2, 3, 5, 7, 8, 11, and 14 of Table I, plus *Stemphylium botryosum*. All tests again were negative. In November and December of 1955, patch tests were performed on thirty additional patients, using the oleoresins listed in Table II. All the oleoresins except those from *Botrytis cinerea* and *Trichophyton mentagrophytes* had been employed in the earlier tests. All but one of the tests were negative.

TABLE II. MOLDS USED FOR PATCH TESTS IN 1955

1. <i>Alternaria tenuis</i>
2. <i>Aspergillus</i> species
3. <i>Botrytis cinerea</i>
4. <i>Curvularia trifolii</i>
5. <i>Helminthosporium</i> mixed species
6. <i>Hormodendrum cladosporioides</i> group
7. <i>Penicillium</i> species
8. <i>Penicillium chrysogenum</i>
9. <i>Rhizopus nigricans</i>
10. <i>Spondylocadium</i> species
11. <i>Stemphylium botryosum</i>
12. <i>Trichophyton mentagrophytes</i>

In one patient, *helminthosporium* oleoresin repeatedly produced a positive patch test consisting of a tuberculin-like reaction with erythema and swelling. After forty-eight hours the lesions became more follicular, but never eczematous and vesicular. This patient suffered from an atopic dermatitis aggravated by house dust sensitivity, and benefited greatly by desensitization with dust. We consider this the first definite positive patch test to mold oleoresin which we have seen. We cannot, at this time, correlate the reaction with the fact that the patient has clinically an atopic rather than a contact dermatitis; nor can we explain the tuberculin type rather than the typical eczematous patch test reaction.

The publication of these reports was delayed because of our reluctance to publish negative results. The number of patients tested was not large enough to permit definite conclusions, except that our extracts were not primary irritants. Our essentially negative results do not exclude molds as a possible cause of contact dermatitis.

SUMMARY AND CONCLUSION

Patch testing with oleoresins prepared from various molds produced only one positive reaction to *helminthosporium* among 135 patients, many of whom were persons with contact dermatitis of unknown origin where contact with molds was considered a possible cause. This seems to be the first case of a positive reaction to a mold oleoresin in man.

This article is presented in an effort to stimulate others to duplicate the work on a larger scale.

REFERENCES

1. Bocobe, Florante C., Curtis, Arthur C., Block, Walter D., and Stubbart, James: Studies on Fungi Encountered in the Atmosphere. II. Production of Dermatitis in Guinea Pigs by Crude Ether-Soluble Extracts of *Alternaria*, *Hormodendrum*, *Penicillium* and *Aspergillus*, *J. Invest. Dermat.* **23**: 489-496, 1954.
2. Feinberg, S. M.: Seasonal Atopic Dermatitis: The Role of Inhalant Atopens, *Arch. Dermat. & Syph.* **40**: 200, 1939.
3. Feinberg, S. M.: Personal Communication.
4. Grinnell, Ernest: The Diagnosis and Treatment of Mold Allergy, *Journal Lancet* **69**: 205, 1949.
5. Prince, Homer E., and Morrow, Marie B.: Mold Fungi in the Etiology of Respiratory Allergic Diseases. III. Immunological Studies With Mold Extracts; 1. Preparation of Experimental Extracts, *Ann. Allergy* **2**: 483-501, 1944.

650 S. CENTRAL AVE.
MARSHFIELD, WIS.