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Contact dermatitis caused by C30–38 olefin/isopropyl maleate/MA copolymer in a sunscreen

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Copolymers are chemical compounds that are used in many consumer products. They have been reported as a cause of contact allergy in cosmetics and adhesives. We report 4 cases of copolymer allergy to C30–38 olefin/isopropyl maleate/MA copolymer (CAS 75535-27-2) in a sunscreen.

Case Reports

Case 1

A 49-year old man developed a severe reaction after using a sunscreen. He was patch tested with the European baseline series and the individual sunscreen ingredients. He developed a +++ reaction to C30–38 olefin/isopropyl maleate/MA copolymer 10% pet. on D4. Patch testing gave negative results with the other ingredients.

Case 2

A 25-year old female presented with a widespread eczematous eruption after using a sunscreen. She had a history of allergy to plasters and fragrance. She was patch tested with the European baseline series, the photopatch series, and the sunscreen ingredients. She developed a + reaction to colophonium and a ++ reaction to hydroxyisohexyl 3-cyclohexene carboxaldehyde. She had a ++ reaction on D4 to C30–38 olefin/isopropyl maleate/MA copolymer 10% pet.

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Case 3

A 31-year old female presented with an inflammatory rash after using a sunscreen. She had a history of skin reactions to some toiletries. She was patch tested with the European baseline series, the fragrance series, the photopatch series, and the individual sunscreen ingredients. She developed a + reaction to C30–38 olefin/isopropyl maleate/MA copolymer 10% pet. on D4. She was also found to be allergic to linalool and elofenamate.

Case 4

A 45-year-old female with a history of reactions to sunscreens presented with a generalized, erythematous eruption. Patch testing with the British baseline series and photopatch testing gave negative results. Testing with the sunscreen ingredients revealed a ++ reaction to C30–38 olefin/isopropyl maleate/MA copolymer 10% pet. and a + reaction to trisolaxane on D4.

In all cases, Finn Chambers® on Scanpor® tape were used, with occlusion for 2 days and readings on D2 and D4. Thirty controls were negative to C30–38 olefin/isopropyl maleate/MA copolymer 10% pet.

Discussion

Copolymers are frequently used in cosmetics, because of their ability to disperse pigment, form films, and increase viscosity. They have anti-static and water-repellent properties. They can stabilize emulsions and act as humectants and conditioners. The International Nomenclature of Cosmetic Ingredients inventory lists approximately 200 different copolymers among approximately 7600 ingredients (1).

Copolymers are chemical compounds with high molecular weights, and this suggests that they should

have a low sensitizing capacity. However, allergenicity may be related to impurities or degradation products.

There have been previous case reports of contact allergy to a number of copolymers, including methoxy PEG-17/dodecyl glycol copolymer (2), polyvinylpyrrolidone (PVP)/eicosene copolymer (3), phthalic anhydride/trimellitic anhydride/glycols copolymer (4), and PVP/hexadecene copolymer (5).

C30–38 olefin/isopropyl maleate/MA copolymer is the copolymer of maleic anhydride, isopropyl maleate, and C30–38 olefin monomers. It is used as a surfactant to control viscosity and stabilize emulsions. It can be found in sunscreens, other cosmetic types, and topical medications. In our 4 cases, it was present in a Piz Buin® sunscreen, and all cases were seen within a few weeks of each other. Urgent investigation is required to determine the safety of this copolymer in cosmetic formulations.

References

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