

CONTACT POINTS

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Methyl esterification of 15-hydroperoxyabietic acid does not affect the patch-test result in colophonium allergic patients

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Colophonium (gum rosin) consists of numerous compounds. We have previously shown that abietic acid (Fig. 1), the major compound in gum rosin, is oxidized to strong contact allergens at air exposure (1). The most potent allergen identified is 15-hydroperoxyabietic acid (15-HPA, Fig. 1), which was isolated as its methyl ester (Fig. 1) and used for patch testing (2, 3). The aim of this study was to confirm the previous postulate that methyl esterification of the carboxyl group in 15-HPA does not affect the allergenic activity.

Key words: contact allergy; hydroperoxide; rosin.

Materials/Methods and Results

Chemicals

Abietic acid was purchased from Sigma-Aldrich Sweden AB (Stockholm, Sweden) and methylated using a method with Cs_2CO_3 and MeI (4). 15-HPA was synthesized from methyl abietate according to literature (5).

Patch testing

29 colophonium-allergic individuals (5 men and 24 women) were selected and patch tested with 15-HPA at 1% pet. (stored at -70°C) and colophonium at 20% pet. (Chemotechnique Diagnostics AB, Malmö, Sweden) according to the procedure described earlier (6). The study was approved by the local ethics committee.

28/29 (96.5%) tested individuals showed positive patch-test reactions to colophonium when retested. 13 (46%) of these 28 individuals reacted to 15-HPA.

Discussion

This study confirms the previous postulate (2, 3) that methyl esterification of the carboxyl group does not affect the allergenic effect of 15-HPA as the reactive centre in the molecule is the tertiary hydroperoxide stabilized by a conjugated system (Fig. 1). We found that a similar proportion of individuals, 13/28 (46%), reacted to the 15-HPA tested at 1% when

compared with its methyl ester used in previous investigations (25/44, 57%) (3).

It is important to distinguish between this methyl ester and the adducts obtained when colophonium is technically esterified with polyalcohols, such as glycerol and pentaerythritol. In the latter cases, molecules with a different reactivity and allergenic activity are formed (7, 8).

Among the allergens isolated from colophonium, we consider 15-HPA to be the most potent one giving positive patch-test reactions in more number of patients than other isolated colophonium allergens (1, 3). However, for screening purposes, 15-HPA is not suitable because it detects only half of the colophonium allergic persons. Moreover, 15-HPA is unstable and cumbersome to synthesize. Thus, we still recommend a preparation of gum rosin, as well defined as possible, for screening. It is important that the content of oxidation products is kept at a constant and rather high level in the test preparation because they are the main allergens.

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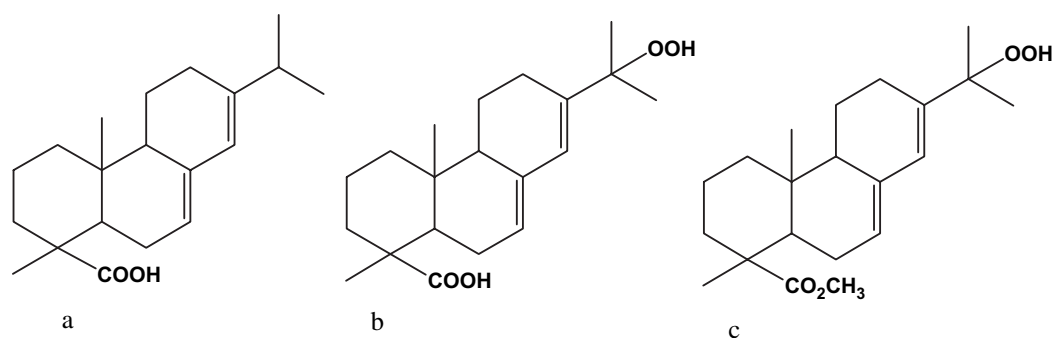


Fig. 1. (a) Abietic acid, (b) 15-hydroperoxyabietic acid (15-HPA), (c) methyl ester of 15-HPA.

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