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Adverse cutaneous reactions to cosmetic allergens

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We report a retrospective European survey of allergic contact reactions to cosmetics. Data on 475 patients with contact allergy to cosmetic ingredients, observed during a 4-month period (January–April 1996), were collected in 5 European dermatology centres: 1.: 40%, 2.: 16%, 3.: 8%, 4.: 18%, 5.: 18%. Results are given in Tables 1–3.

Although perfume components are still the most frequent allergens in cosmetics (e.g., (1)), they rank 2nd here (Table 1) since data on perfumes and toilet waters, aftershave lotions, and deodorants, the main agents of perfume allergy, were excluded from this study.

Individual differences between clinics (countries) may be ascribed to several factors.

Table 1. Number of positive reactions to cosmetic allergens by class

1. preservatives	165
2. perfume components ^{a)}	144
3. active/category-specific ingredients	112
4. excipients/emulsifiers	105
5. sunscreens	43
6. antioxidants	22

^{a)} Not including fragrance mix ingredients.

Table 2. Reaction rate of each class of cosmetic allergens identified in the various groups of cosmetic products

	Preservatives	Perfume components	Excipients/emulsifiers	Sunscreens	Active/specific	Antioxidants
cleansers	35	26	20	1	1	3
skin care	92	91	61	8	24	9
hair care	12	7	4	–	72	1
suncare	7	9	4	31	1	3
make-up	19	11	16	3	14	6

Table 3. Allergens (INCI) identified and categorized per class and per centre

	Total	Belgium	UK	Germany
(a) Preservatives				
methyl(chloro)isothiazolinone	47	31	14	2
formaldehyde	21	14	9	–
diazolidinyl urea	19	10	9	–
quaternium-15	19	4	15	–
methyldibromoglutaronitrile	15	11	1	3
imidazolidinyl urea	14	8	6	–
2-bromo-2-nitropropane-1,3-diol	10	1	8	1
parabens	8	3	3	2
DMDM hydantoin	4	3	–	1
phenoxyethanol	3	3	–	–
chloroacetamide	2	1	1	–
thimerosal	1	–	–	1
phenyl mercuric borate	1	1	–	–
methyldibromoglutaronitrile (and) phenoxyethanol	1	1	–	–
Antioxidants				
propyl gallate	8	1	7	–
t-butyl hydroquinone	6	–	6	–
BHA	3	2	1	–
vitamin E	2	1	1	–
ethylenediamine	1	1	–	–
sodium metabisulfite	1	1	–	–
octyl gallate	1	–	–	1
(b) Perfume components				
fragrance mix	95	56	27	12
balsam of Peru	41	29	9	3
rosin ^{a)} (=colophony)	3	3	–	–
limonene	1	1	–	–
lemongrass oil	1	–	–	1
salicylaldehyde	1	–	–	1
vanillin	1	–	1	–
wood tars	1	1	–	–

^{a)} Also ingredient in make-up (e.g., eyeshadow, mascara).

Table 3 (cont'd)

	Total	Belgium	UK	Germany
(c) <i>Active or category-specific ingredients</i>				
p-phenylenediamine ^{a)}	33	33	—	—
dihydroxyacetone	12	6	2	4
toluene-2,5-diamine	11	11	—	—
glyceryl monothioglycolate	9	8	1	—
2-nitro-p-phenylenediamine	8	8	—	—
tosylamide/formaldehyde resin ^{b)}	7	7	—	—
ammonium persulfate	6	5	—	1
matricaria extract ^{c)}	4	—	—	4
panthenol	3	3	—	—
propolis	2	2	—	—
n-phenyl-p-phenylene-diamine	2	2	—	—
resorcinol	1	1	—	—
hydroquinone	1	1	—	—
pyrogallol ^{c)}	1	1	—	—
evening primrose oil	1	—	1	—
ammonium thioglycolate	1	1	—	—
bisabolol	1	—	1	—
butcher broom (<i>Ruscus aculeatus</i>)	1	1	—	—
hydrocotyl (asiaticoside)	1	1	—	—
arnica ^{d)}	1	—	—	1
eosin	1	—	1	—
ethyl acrylate	1	1	—	—
cianoacrylate	1	1	—	—
hydroxyethyl acrylate	1	1	—	—

a) One reaction to PPD was due to eye make-up (illegal!).

b) Reactions to nailcare products were not compiled in the UK.

c) According to the EEC directive, pyrogallol is not permitted any longer in cosmetic products.

d) 2 more reactions were seen (Germany) to Compositae mix and sesquiterpene lactone mix. These components are not present as such in cosmetics but are markers for contact allergy to calendula, camomile, arnica, etc.

- Differences in use of certain ingredients: e.g., formaldehyde-releasers, more popular preservatives in the UK (2) than in continental Europe, where reactions to methyl(chloro)isothiazolinone and later methyl-di-bromoglutaronitrile have been more frequent (1, 3, 4).
- Selection of patient files, e.g., data on hair- and nail-care products predominantly from Belgium.
- Nature of allergens tested in each centre. For example, t-butyl hydroquinone was known for many years in the UK (5), while only rarely observed by De Groot (6) in The Netherlands, and in Belgium we have scarcely ever tested it.

And last but not least:

- the level of interest of each clinic in this field.

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Table 3 (cont'd)

	Total	Belgium	UK	Germany
(d) <i>Excipients/emulsifiers</i>				
woolwax alcohols (+ derivatives: e.g., Amerchol L-101, Eucerin)	48	26	14	8
cocamidopropyl betaine	19	10	6	3
rosin ^{a)}	6	6	—	—
cetyl alcohol	3	1	2	—
propylene glycol	3	3	—	—
sorbitan sesquioleate	3	3	—	—
triethanolamine	3	1	2	—
castor oil derivatives	2	2	—	—
cocamide DEA	2	2	—	—
maleated soybean oil	2	2	—	—
hydroabietyl alcohol ^{a)}	1	1	—	—
lauryl alcohol	1	1	—	—
ethanol	1	1	—	—
isopropyl lanolate	1	1	—	—
laureth-4 (PEG-lauryl ether)	1	1	—	—
methyl glucose sesquisteate	1	1	—	—
myristyl alcohol	1	1	—	—
petrolatum	1	—	1	—
PEG	1	—	—	1
polysorbate 80	1	1	—	—
PPG-2-cetareth-9	1	1	—	—
propyl alcohol	1	—	1	—
sorbitan laurate	1	1	—	—
sorbitan oleate	1	1	—	—

a) Rosin and hydroabietyl alcohol considered here as excipient in (mainly eye) make-up.

(e) <i>Sunscreens</i>				
benzophenone-3	14	2	12	—
isopropyl dibenzoylmethane	7	3	4	—
isobutyl PABA	4	4	—	—
PABA	2	—	2	—
octyl methoxycinnamate	2	—	2	—
methylbenzylidene (camphor)	2	1	1	—
benzophenone-10	2	1	1	—
butyl methoxydibenzoylmethane	2	2	—	—
phenyl salicylate	2	2	—	—
octyl dimethyl PABA	2	—	2	—
phenylbenzimidazole sulfonic acid	1	1	—	—
benzyl salicylate	1	—	—	1
ethyl methoxy cinnamate	1	—	—	—
cinoxate	1	1	—	—

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