

S E Q

Sensitization – Exposure - Quotient

„Charts“ of contact allergens IVDK 2011:

|   | <b>HITLISTE 2011</b>       | n     | % pos.<br>(stand.) |
|---|----------------------------|-------|--------------------|
| 1 | <b>Nickel (II)-sulfate</b> | 10859 | <b>15.8</b>        |
| 2 | <b>Fragrance-Mix</b>       | 10874 | <b>8.1</b>         |
| 3 | Perubalsam                 | 10863 | <b>7.3</b>         |
| 4 | Fragrance -Mix II          | 10897 | <b>4.4</b>         |
| 5 | Cobalt (II)-chloride       | 10900 | 5.2                |



Sensitization put into perspective by amount of exposure

|    |                              |       |     |
|----|------------------------------|-------|-----|
| 7  | (Chlor)-Methylisothiazolinon | 10923 | 3.9 |
| 8  | Potassium dichromat          | 10920 | 3.4 |
| 9  | Propolis                     | 10868 | 2.8 |
| 10 | Methylisothiazolinon         | 7292  | 4.4 |
| 17 | Thiuram Mix                  | 10910 | 2.1 |
| 21 | Epoxy Resin                  | 10827 | 1.6 |

# INCI Labelling of preservatives on cosmetics

## CVUA 2006 -2009

**CVUA:** Chemisches und Veterinär- Untersuchungsamt Karlsruhe/Germany =

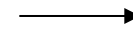
An official laboratory of the state of Baden-Württemberg for surveillance of product safety

Labelling of cosmetic products (**n= 5,451**) purchased at random was documented by the CVUA according to 24 product classes

**Only leave-on products (n= 4278) were considered for further analysis**

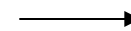
Data were kindly provided by G. MILDAU / CVUA, Karlsruhe

Data on sensitization



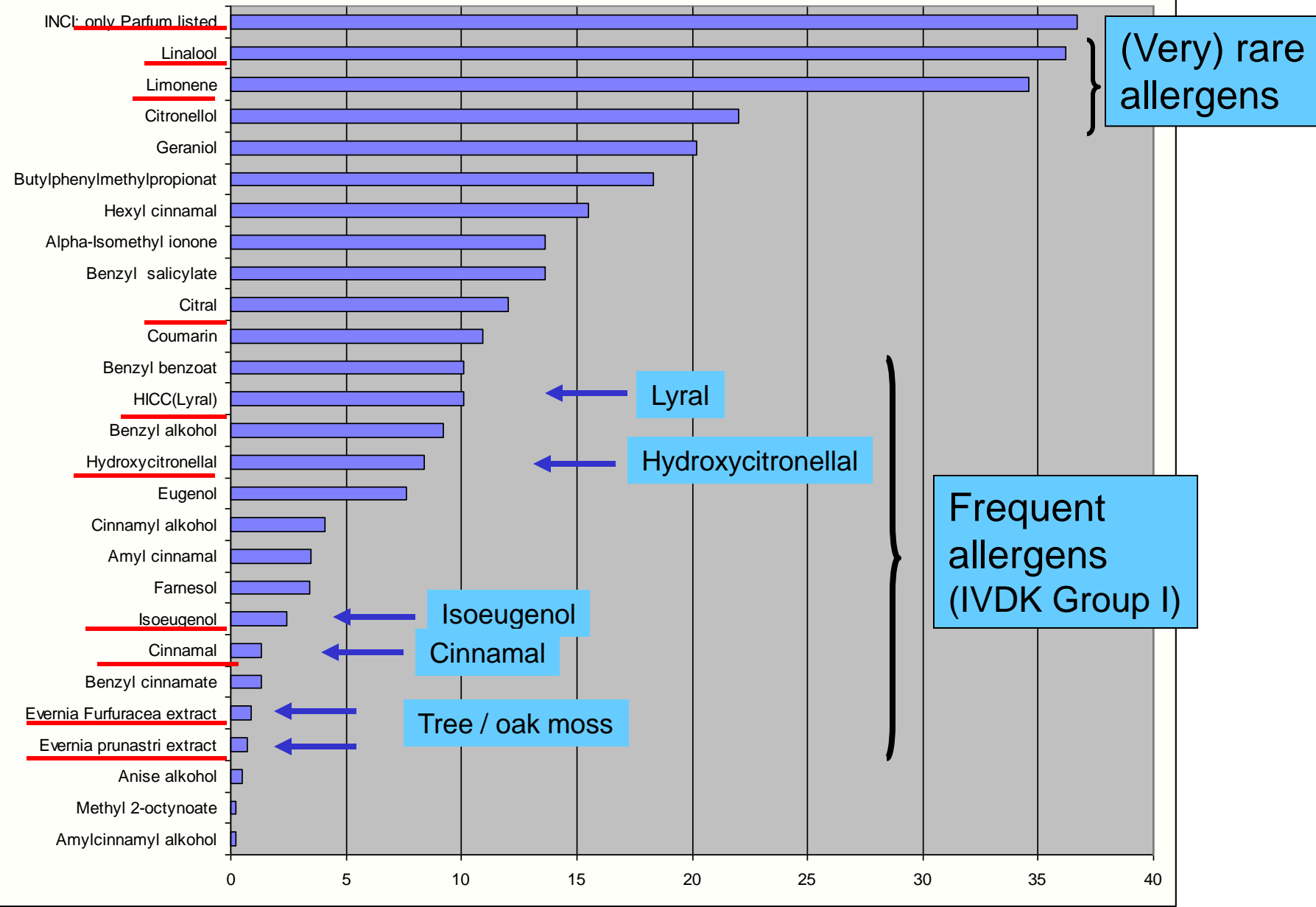
IVDK

Data on frequencies of exposure/  
Use



CVUA

# Proportion of 26 fragrances identified on cosmetic and household products



% of scented products

## Sensitization – Exposure Relationship

## Isoeugenol

The share of positive reactions  
(out of the sum of all positive reactions)

**=relative frequency of sensitization)**

and

the share of labelling of a fragrance  
(out of the sum of labelled products)

**=relative frequency of exposure**

were calculated



1,2% allergic



11,6%



103 products



1,9%

# Sensitization – Exposure - Quotient (SEQ)

relative frequency of sensitization

= SEQ

relative frequency of exposure

Sensitization – Exposure - Quotient (SEQ)

Isoeugenol

relative frequency of sensitization

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11,6

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relative frequency of exposure

1,9

SEQ= 6,0



SEQ = „relative risk“

SEQ

oak moss **26,9**

Cinnamal 8,0

Isoeugenol 6,0

HICC 2,6

Cinn alc 1,9

farnesol 1,9

Hydroxycitronellal 1,3

eugenol 0,7

amyl cinn al 0,7

Citral 0,7

geraniol 0,2

hexyl cinnal 0,2

coumarin 0,1

citronellol 0,1

# Relation between frequency and risk

|                    | Freq<br>Sens |                    | SEQ  |
|--------------------|--------------|--------------------|------|
| HICC               | 2,2          | oak moss           | 26,9 |
| oak moss           | 2,0          | Cinnamal           | 8,0  |
| Isoeugenol         | 1,2          | Isoeugenol         | 6,0  |
| Hydroxycitronellal | 0,8          | HICC               | 2,6  |
| Cinnamal           | 0,8          | Cinn alc           | 1,9  |
| Citral             | 0,7          | farnesol           | 1,9  |
| Cinn alcohol       | 0,6          | Hydroxycitronellal | 1,3  |
| farnesol           | 0,5          | eugenol            | 0,7  |
| eugenol            | 0,4          | amyl cinn al       | 0,7  |
| geraniol           | 0,3          | Citral             | 0,7  |
| amyl cinnamal      | 0,2          | geraniol           | 0,2  |
| hexyl cinnamal     | 0,2          | hexyl cinnal       | 0,2  |
| coumarin           | 0,1          | coumarin           | 0,1  |
| citronellol        | 0,1          | citronellol        | 0,1  |

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| Hydroxycitronellal | 0,8          | HICC               | 2,6  |
| Cinnamal           | 0,8          | Cinn alc           | 1,9  |
| Citral             | 0,7          | farnesol           | 1,9  |
| Cinn alcohol       | 0,6          | Hydroxycitronellal | 1,3  |
| farnesol           | 0,5          | eugenol            | 0,7  |
| eugenol            | 0,4          | amyl cinn al       | 0,7  |
| geraniol           | 0,3          | Citral             | 0,7  |
| amyl cinnamal      | 0,2          | geraniol           | 0,2  |
| hexyl cinnamal     | 0,2          | hexyl cinnal       | 0,2  |
| coumarin           | 0,1          | coumarin           | 0,1  |
| citronellol        | 0,1          | citronellol        | 0,1  |

Change of ranking from freq. of sensitization to SEQ

# Relation between frequency and risk

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| HICC               | 2,2          | oak moss           | 26,9 |
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| coumarin           | 0,1          | coumarin           | 0,1  |
| citronellol        | 0,1          | citronellol        | 0,1  |

Change of ranking from freq. of sensitization to SEQ

# Risk of sensitization to preservatives estimated on the basis of patch test data and exposure, according to a sample of 3541 leave-on products

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Contact Dermatitis **65**, 167-174 (2011)

| Allergens / leave on products                               | 2          | 3          | 4                 | 5            | 6                 | 7           |
|---|------------|------------|-------------------|--------------|-------------------|-------------|
|   | n (tested) | % positive | Allergy share (%) | Products (n) | Product share (%) | SEQ         |
| <b>Preservative</b>   |            |            |                   |              |                   |             |
| Phenoxyethanol <sup>1)</sup>                                | 4995       | 0.14       | 1.64              | 1111         | 29.6              | <b>0.06</b> |
| Benzyl alcohol  | 17740      | 0.17       | 1.99              | 245          | 6.5               | <b>0.30</b> |
| Parabens  | 17925      | 1.18       | 13.79             | 1474         | 39.3              | <b>0.35</b> |
| Sorbates (acid/potassium)                                   | 17855      | 0.55       | 6.43              | 261          | 7.0               | <b>0.92</b> |
| Benzoates (sodium/acid)                                     | 17740      | 0.77       | 9.00              | 250          | 6.7               | <b>1.4</b>  |
| Imidazolidinyl Urea   | 17880      | 0.59       | 6.89              | 102          | 2.7               | <b>1.6</b>  |
| Diazolidinyl Urea   | 17872      | 0.60       | 7.01              | 65           | 1.7               | <b>1.6</b>  |
| Methylisothiazolinone <sup>2)</sup> (MI)                    | 6570       | 0.40       | 4.67              | 28           | 0.7               | <b>1.7</b>  |
| Iodopropynyl butylcarbamate                                 | 17857      | 0.71       | 8.29              | 92           | 2.5               | <b>3.4</b>  |
| Methylisothiazolinone <sup>3)</sup> (MI)                    | 6570       | 1.34       | 14.11             | 28           | 0.8               | <b>5.1</b>  |
| Methylchloroisothiazolinone /methylisothiazolinone (MCI/MI) | 17918      | 2.08       | 24.3              | 73           | 2.0               | <b>9.0</b>  |
| Bromo-2-nitropropane-1,3-diol                               | 17935      | 1.37       | 16.0              | 46           | 1.2               | <b>13</b>   |

.....to put into perspective an assumed problem:  
the case of the **parabens**

| Preservative  | n<br>(tested) | %<br>positive | Allergy<br>share<br>(%) | Products<br>(n) | Product<br>share<br>(%) | SEQ         |
|---|---------------|---------------|-------------------------|-----------------|-------------------------|-------------|
| Phenoxyethanol <sup>1)</sup>                                      | 4995          | 0.14          | 1.64                    | 1111            | 29.6                    | <b>0.06</b> |
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| Methylchloroisothiazolinone<br>/methylisothiazolinone<br>(MCI/MI) | 17918         | 2.08          | 24.3                    | 73              | 2.0                     | <b>9.0</b>  |