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SCCP

Opinion on

Liquidambar spp. Balsam Extracts and Oils (Storax)

(sensitisation only)

Adopted by the SCCP during the 3rd plenary meeting of 15 March 2005
# TABLE OF CONTENTS

1. BACKGROUND.................................................................................................................. 3

2. TERMS OF REFERENCE.................................................................................................. 3

3. OPINION ............................................................................................................................ 4

4. CONCLUSION .................................................................................................................... 14

5. MINORITY OPINION ........................................................................................................ 14

6. REFERENCES.................................................................................................................. 14

7. ACKNOWLEDGEMENTS ............................................................................................... 17
Opinion on *Liquidambar* spp. Balsam Extracts and Oils (Storax)

1. **BACKGROUND**

During the 18th Plenary meeting of 25 September 2001, the SCCNFP\(^1\) adopted an opinion (SCCNFP/0392/00 final) on an initial list of perfumery materials to be included in Annex III to Directive 76/768/EEC.

Following a review of the list, the SCCNFP adopted an updated opinion (SCCNFP/0770/03) during the 26th plenary meeting of 9 December 2003. The SCCNFP asked for additional information to allow further evaluation of fragrance ingredients.

For further evaluation of fragrance ingredients the SCCNFP asked for additional information.

In June 2004, the European Flavour & Fragrance Association submitted additional information on the following fragrances:

- Methylhydrocinnamic aldehyde
- Tagetes absolute, Tagetes minuta absolute and Tagetes oil
- Opoponax
- Storax

2. **TERMS OF REFERENCE**

- **On the basis of currently available information, the SCCP is asked to assess the risk to consumers when *Liquidambar* spp. Balsam Extracts and Oils (Storax) are present in cosmetic products, and if necessary, to revise the maximum concentration in fragrances used in cosmetic products considering the concentration limits or other restrictions suggested by industry.**

- **Does the SCCP recommend any further restrictions with regard to the presence of *Liquidambar* spp. Balsam Extracts and Oils (Storax) as ingredients of fragrances used in cosmetic products?**

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\(^1\) SCCNFP - Scientific Committee on Cosmetic Products and Non-Food Products intended for Consumer Use
3. OPINION

3.1. Chemical and Physical Specifications

3.1.1. Chemical identity

3.1.1.1. Primary name and/or INCI name

This opinion concerns the following fragrance ingredients according to EU Inventory Names (*):

1. *Liquidambar Orientalis* Balsam Extract (EU Inventory Name)
2. *Liquidambar Orientalis* Balsam Oil (EU Inventory Name)
3. *Liquidambar styraciflua* Balsam Extract (EU Inventory Name)
4. *Liquidambar styraciflua* Balsam Oil (EU Inventory Name)

(*) The complete EU Inventory entries are given in the Appendix.

3.1.1.2. Chemical names

1. *Liquidambar Orientalis* Balsam Extract is the extract of the exudate obtained from the trunk of *Liquidambar orientalis*, *Hamamelidaceae*. It consists primarily of cinnamic and benzoic acids and their esters. Its main constituents are α- and β-storesin and its cinnamic ester (33-50%), styracin (5-10%), ethyl- and phenylpropyl-cinnamate (10%), benzyl cinnamate, free cinnamic acid (5-15%), a levorotatory oil (0.4%) and traces of vanillin.

2. *Liquidambar Orientalis* Balsam Oil is the Essential oil of the exudate obtained from the trunk of *Liquidambar orientalis*, *Hamamelidaceae*.

3. *Liquidambar styraciflua* Balsam Extract is the extract of the exudate obtained from the trunk of *Liquidambar styraciflua*, *Hamamelidaceae*. It consists primarily of cinnamic and benzoic acids and their esters. Its main constituents are α- and β-storesin and its cinnamic ester (33-50%), styracin (5-10%), ethyl- and phenylpropyl-cinnamate (10%), benzyl cinnamate, free cinnamic acid (5-15%), a levorotatory oil (0.4%) and traces of vanillin.

4. *Liquidambar styraciflua* Balsam Oil is the Essential oil of the exudate obtained from the trunk of *Liquidambar styraciflua*, *Hamamelidaceae*.

- The above definitions include all types of extracts (Tinctures, Concretes, Resinoids, Pomades, Absolutes, Rectified extracts etc.) and all types of Essential Oils (obtained either by dry-distillation or by steam-distillation, flash pasteurization etc.).

3.1.1.3. Trade names and abbreviations
The names Storax and Styrax are known as generic synonyms *L. orientalis* and *L. styraciflua* Extracts. Synonyms of specific extracts are e.g. Storax or Styrax Absolute, Storax or Styrax Concrete, Storax or Styrax Resinoid etc. Synonyms of the respective oils are Storax or Styrax Oil, etc.

The names Storax Levantisch, Storax Levant, Storax Asian, Storax Turkish and Sweet Oriental Gum are generic synonyms of the products derived from *L. orientalis* (mainly native of Asia Minor).

The names Storax Honduras, Storax American, Swee Gum are generic synonyms of the products derived from *L. styraciflua* (native of the Atlantic coast from Connecticut to Central America).

### 3.1.1.4. CAS / EINECS number

<table>
<thead>
<tr>
<th>Product</th>
<th>CAS</th>
<th>EINECS</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>L. orientalis</em></td>
<td>94891-27-7</td>
<td>305-627-6</td>
</tr>
<tr>
<td><em>L. styraciflua</em></td>
<td>8046-19-3</td>
<td>232-458-4</td>
</tr>
</tbody>
</table>

### 3.1.1.5. Structural formula

/

### 3.1.1.6. Empirical formula

/

### 3.1.2. Physical form

/

### 3.1.3. Molecular weight

/

### 3.1.4. Purity, composition and substance codes

/

### 3.1.5. Impurities / accompanying contaminants

/

### 3.1.6. Solubility

/
3.1.7. Partition coefficient (Log \( P_{ow} \))

3.1.8. Additional physical and chemical specifications

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organoleptic properties</td>
<td>/</td>
</tr>
<tr>
<td>Melting point</td>
<td>/</td>
</tr>
<tr>
<td>Boiling point</td>
<td>/</td>
</tr>
<tr>
<td>Flash point</td>
<td>/</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>/</td>
</tr>
<tr>
<td>Density</td>
<td>/</td>
</tr>
<tr>
<td>Viscosity</td>
<td>/</td>
</tr>
<tr>
<td>pKa</td>
<td>/</td>
</tr>
<tr>
<td>RefRACTive index</td>
<td>/</td>
</tr>
</tbody>
</table>

3.2. Function and uses

Storax preparations are widely used fragrance ingredients of many fragrance compounds used in perfumery. Based on the positive results of maximization tests by industry, the IFRA standard recommends:

“Crude gums of American and Asian styrax should not be used as fragrance ingredient. Only extracts or distillates (resinoids, absolutes and oils), prepared from exudations of Liquidambar styraciflua L. var. macrophylla or Liquidambar orientalis Mill., can be used and should not exceed a level of 0.6 % in consumer products. This is equivalent to 3 % in a fragrance compound used at 20% in the consumer product.

This recommendation is made in order to promote good manufacturing practice (GMP) for the use of styrax derivatives as fragrance ingredients. It is based on a wide variety of RIFM test data with gums, resinoids, absolutes and oils of American and Asian styrax (private communication to IFRA).”

In the updated EU Inventory, Section II: Perfume and Aromatic Raw Materials (doc. SCCNFP/0389/00), the above restriction (previously flagged with one asterisk) is summarized as follows:

“The final concentration of Styrax extracts or distillates (resinoids, absolutes, oils) from exudates shall not exceed 0.6 % in the finished product.”

3.3. Toxicological Evaluation
3.3.1. Acute toxicity

/

3.3.2 Irritation and corrosivity

/

3.3.3 Skin sensitisation

Human Maximization Studies

Human predictive (induction) studies were performed during 1972-1980 by the Kligman maximization test (ref. 52) on different Storax products. According to the summarized reports provided in combination with the respective compiled data worked out by RIFM (ref. 51), the test substance was applied as 8% solution in petrolatum or in diethyl phthalate (ref. 30-35) or in diethyl phthalate/petrolatum (ref. 36, 39, 40, 42, 43). Application was under occlusion to the same site on the volar forearms or backs of all subjects for five alternate-day 48-hour periods. Patch test sites were pretreated for 24-48 hours with 2.5% aqueous sodium lauryl sulfate (SLS) under occlusion. Following a 10-14-days rest period, a challenge patch at the same concentration was applied to a fresh site for 48 hours under occlusion. The challenge sites were pretreated for 30-60 min with 2.5%, 5% or 10% aqueous SLS under occlusion. Reactions to challenge were read at patch removal and 24 hours thereafter. The results are summarized in the following table.

<table>
<thead>
<tr>
<th>Material tested</th>
<th>Number of volunteers</th>
<th>Results</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storax Asian, distilled</td>
<td>25 male</td>
<td>3/25 reactions</td>
<td>13</td>
</tr>
<tr>
<td>Storax Asian, distilled (2nd test)</td>
<td>25 male</td>
<td>no reactions (0/25)</td>
<td>14</td>
</tr>
<tr>
<td>Storax Asian gum</td>
<td>25 male</td>
<td>6/25 reactions</td>
<td>12</td>
</tr>
<tr>
<td>Storax Asiatic crude</td>
<td>28 male</td>
<td>5/28 reactions</td>
<td>28</td>
</tr>
<tr>
<td>Storax Asiatic crude (2nd test)</td>
<td>35 male</td>
<td>no reactions (0/35)</td>
<td>30</td>
</tr>
<tr>
<td>Storax Asiatic crude (3rd test)</td>
<td>8 male and 17 female</td>
<td>4/25 reactions</td>
<td>39</td>
</tr>
<tr>
<td>Storax Asiatic, purified</td>
<td>11 male and 14 female</td>
<td>2/25 reactions</td>
<td>38</td>
</tr>
<tr>
<td>Storax Asiatic purified (2nd test)</td>
<td>30 male</td>
<td>no reactions (0/30)</td>
<td>31</td>
</tr>
<tr>
<td>Storax Asiatic purified (3rd test)</td>
<td>6 male and 21 female</td>
<td>no reactions (0/27)</td>
<td>36</td>
</tr>
<tr>
<td>Storax Asiatic Purified</td>
<td>12 male and 13 female</td>
<td>20/25 reactions</td>
<td>21</td>
</tr>
<tr>
<td>Storax Asiatic</td>
<td>22 male</td>
<td>no reactions (0/22)</td>
<td>23</td>
</tr>
<tr>
<td>Storax Asiatic clarified</td>
<td>14 male and 11 female</td>
<td>12/25 reactions</td>
<td>19</td>
</tr>
<tr>
<td>Storax Turkish</td>
<td>26 male and female</td>
<td>4/26 reactions</td>
<td>11</td>
</tr>
<tr>
<td>Storax Turkish</td>
<td>25 male and female</td>
<td>no reactions (0/25)</td>
<td>45</td>
</tr>
<tr>
<td>Storax Turkish crude</td>
<td>35 male</td>
<td>no reactions (0/35)</td>
<td>34</td>
</tr>
<tr>
<td>Storax Turkish</td>
<td>25 male and female</td>
<td>no reactions (0/25)</td>
<td>33</td>
</tr>
<tr>
<td>Storax Honduras crude</td>
<td>33 male</td>
<td>no reactions (0/33)</td>
<td>35</td>
</tr>
<tr>
<td>Storax Honduras</td>
<td>24 male and female</td>
<td>no reactions (0/24)</td>
<td>44</td>
</tr>
<tr>
<td>Storax Honduras clarified</td>
<td>12 male and 13 female</td>
<td>3/25 reactions</td>
<td>20</td>
</tr>
</tbody>
</table>
### Opinion on *Liquidambar spp.* Balsam Extracts and Oils (Storax)

<table>
<thead>
<tr>
<th>Material tested</th>
<th>Number of volunteers</th>
<th>Results</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storax Honduras clarified (2nd test)</td>
<td>25 male and female</td>
<td>no reactions (0/25)</td>
<td>40</td>
</tr>
<tr>
<td>Storax Honduras</td>
<td>3 male and 22 female</td>
<td>no reactions (0/25)</td>
<td>32</td>
</tr>
<tr>
<td>Storax Honduras</td>
<td>12 male and 13 female</td>
<td>2/25 reactions</td>
<td>27</td>
</tr>
<tr>
<td>Storax Honduras crude</td>
<td>23 male</td>
<td>1/23 reactions</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 irritant reactions</td>
<td></td>
</tr>
<tr>
<td>Storax gurn South American</td>
<td>25 male</td>
<td>no reactions (0/25)</td>
<td>11</td>
</tr>
<tr>
<td>Storax Absolute Resin</td>
<td>27 male</td>
<td>5/27 reactions</td>
<td>24</td>
</tr>
<tr>
<td>Storax Anhydrol</td>
<td>21 male</td>
<td>no reactions (0/21)</td>
<td>15</td>
</tr>
<tr>
<td>Storax Honduras crude (2nd test)</td>
<td>8 male and 17 female</td>
<td>no reactions (0/25)</td>
<td>43</td>
</tr>
<tr>
<td>Storax</td>
<td>6 male and 19 female</td>
<td>no reactions (0/25)</td>
<td>26</td>
</tr>
<tr>
<td>Storax</td>
<td>11 male and 14 female</td>
<td>no reactions (0/25)</td>
<td>25</td>
</tr>
<tr>
<td>Storax Oil</td>
<td>8 male and 17 female</td>
<td>no reactions (0/25)</td>
<td>22</td>
</tr>
<tr>
<td>Storax Oil extra</td>
<td>29 male</td>
<td>no reactions (0/29)</td>
<td>41</td>
</tr>
<tr>
<td>Storax Oil American</td>
<td>16 male and 9 female</td>
<td>1/25 reactions</td>
<td>17</td>
</tr>
<tr>
<td>Storax Oil American (2nd test)</td>
<td>16 male and 9 female</td>
<td>2/25 reactions</td>
<td>18</td>
</tr>
<tr>
<td>Storax Pyrogenee</td>
<td>29 male and female</td>
<td>9/29 reactions</td>
<td>29</td>
</tr>
<tr>
<td>Storax Pyrogenee (2nd test)</td>
<td>12 male and 13 female</td>
<td>no reactions (0/25)</td>
<td>42</td>
</tr>
<tr>
<td>Storaxoide (Storax gums processed with methyl phthalate at 90°C after neutralisation of the acids)</td>
<td>8 male and 21 female</td>
<td>no reactions (0/29)</td>
<td>31</td>
</tr>
</tbody>
</table>

**Human Patch Tests on eczema and dermatitis patients, or sensitized to Peru balsam etc.**

**Study 1**

Material tested : Styrax  
Concentration : 2% in petrolatum  
Subjects : 49 male and 36 female dermatitis patients allergic to Peru balsam

Patch Test  
The test substance was applied to the back and reactions read at 24 and 72 hours (no more details are given).

Results  
20/85 reactions  

Ref.: 1

**Study 2**

Material tested : Styrax balsam  
Concentration : 2% in petrolatum, and 1% and 10% in alcohol  
Subjects : eczema patients who had previously exhibited a positive reaction to Peru balsam

Test
Closed patch tests. Patches consisted of a piece of 1 cm² lint with a 2 cm² cellophane disc placed on the lint and then covered with a 4 cm² plaster. Patches were applied to the back, the forearm and the inside of the upper arm for 24 to 48-hours. Reactions were read 30-minutes after patch removal.

Results
16/28 reactions at 2% (14/16 of these subjects also cross-reacted to benzoin)
5/13 reactions at 1% (all 5 of these subjects also cross-reacted to benzoin)
1/10 reactions at 10% (this subject also cross-reacted to benzoin).

Patch tests with Styrax in vaseline produced positive reactions more frequently than test with Styrax in alcohol, probably because of a better absorption from vaseline than from alcohol, or because of lower solubility of common antigens to alcohol. Cross-sensitization from balsam of Peru to Styrax is so common that patients sensitive to balsam of Peru are exposed to a risk of dermatitis from perfumes containing Styrax. Primary sensitivity to styrax was ascertained during the study. As storesinol has been reported to contain abietic acid, it may be mentioned that positive reactions to colophony were found in two patients with positive and two with negative reactions to Styrax. All other cases tested with Styrax showed negative reactions to colophony.

Ref.: 2

Study 3

Material tested: Styrax balsam
Concentration: 2% in petrolatum and 1% and 10% in alcohol
Subjects: eczema patients exhibiting positive reaction to coniferyl benzoate

Patch Test
A 48-hour closed Patch test using a Lysaplast Special patch. Reactions read 10-20 minutes after patch removal and again 72 or 96 hours after patch removal. Reactions read again after 7 -8 days in 50% of the patients.

Results
18/28 reactions. The reactions to Styrax and balsam of Tolu observed in patients sensitised by balsam of Peru might conceivably be due to a common content of cinnamic acid or ester. An analysis of the present results seems to tell against this, as positive reactions to cinnamic acid occur independently of reactions to coniferyl benzoate, while positive reactions to the latter appear to be a prerequisite for positive reactions to Styrax and balsam of Peru.

Ref.: 3

Study 4

Material tested: Styrax
Concentration: 0.05% in a perfumed base cream.
Subjects: 48 Japanese male and female volunteers (10% of which were eczema-prone or allergic persons).

Patch Test
The test material was applied to the inside of the upper arm and to the flexor aspect of the forearm. A 1cm² lint patch was put with the test substance and covered with a cellophane 4cm². It was affixed to the skin by means of adhesive tape 9cm². The results were read after 24 hours, 30 minutes after removal.

Results
No reactions (0/48)

Ref.: 4

Study 5

Material tested : Styrax
Concentration : 0.05-0.5% in 99% ethanol or in a base cream (composition given).
Subjects : 48 dermatitis patients

Patch Test
The test material was applied to a 1 cm² lint patch covered with a 2 cm² cellophane and applied to the back, the flexor aspect of the forearm and the inside of the upper arm with 4cm² adhesive tape. Reactions were read after 24-48 hours, 30 minutes after patch removal.

Results
No reactions (0/48)

Ref.: 49

Study 6

Material tested : Styrax Oil (oil of styrax crude rectified)
Concentration : no dose reported
Subjects : a 62-year old female with contact dermatitis from an eye cream was tested with the individual ingredients of the eye cream

Patch Test
The liquid fragrance components of the eye cream (including styrax oil) were applied “as is” to the back using the “Aluminium Patch Test” (A1-test). Reactions were read after 48 hours and again after 5 days.

Results
A positive reaction to styrax was observed at the 48-hour reading but not at the 5-day reading.

Ref.: 7

Study 7

Material tested : Storax
Concentration : 2% (vehicle not reported)
Opinion on *Liquidambar spp*. Balsam Extracts and Oils (Storax)

Subjects: 21 male volunteers with suspected occupational dermatitis from working at a particleboard manufacturing plant.

Test
A 48-hour closed Patch test using a Lysaplast Special patch. Reactions read 10-20 minutes after patch removal and again 72 or 96 hours after patch removal. Reactions read again after 7-8 days in 50% of the patients.

Results
No reactions (0/21)

Ref.: 48

**Study 8**

Material tested: Styrax gum
Concentration: 2% in diethyl phthalate
Subjects: 8 male and 13 female dermatitis patients allergic to perfumes and sweet-smelling constituents

Patch Test
Reactions read at 48 hours.

Results
No reactions (0/21)

Ref.: 10

**Study 9**

Material tested: Styrax resinoid
Concentration: no dose reported
Subjects: dermatitis patients
Patch Test: /
Results: Positive reactions were observed in 2.9% of the patients.

Ref.: 5

**Study 10**

Material tested: Styrax
Concentration: 2% in petrolatum
Subjects: a 67-year old female with irritation and redness of her oral mucosa from her toothpaste
Patch Test: /
Results: patient reacted to styrax

Ref.: 47
### Study 11

<table>
<thead>
<tr>
<th>Material tested</th>
<th>Styrax resinoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration</td>
<td>5% (no vehicle reported)</td>
</tr>
<tr>
<td>Subjects</td>
<td>355 eczema and dermatitis patients; 49 control patients</td>
</tr>
<tr>
<td>Patch Test</td>
<td>Patch tests were conducted from 1978-1986 with cosmetic ingredients.</td>
</tr>
<tr>
<td>Results</td>
<td>8/355 positive reactions in eczema and dermatitis patients no reactions in control patients (0/49)</td>
</tr>
</tbody>
</table>

Ref.: 6

### Study 12

<table>
<thead>
<tr>
<th>Material tested</th>
<th>Styrax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration</td>
<td>no dose reported</td>
</tr>
<tr>
<td>Subjects</td>
<td>4 bakers who reacted to cinnamon and other spices</td>
</tr>
<tr>
<td>Patch Test</td>
<td>/</td>
</tr>
<tr>
<td>Results</td>
<td>patients did not react to styrax</td>
</tr>
</tbody>
</table>

Ref.: 8

### Study 13

<table>
<thead>
<tr>
<th>Material tested</th>
<th>Styrax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration</td>
<td>2% in petrolatum</td>
</tr>
<tr>
<td>Subjects</td>
<td>130 consecutive eczema patients</td>
</tr>
<tr>
<td>Patch Test</td>
<td>/</td>
</tr>
<tr>
<td>Results</td>
<td>7/130 reactions</td>
</tr>
</tbody>
</table>

Ref.: 50

### Study 14

<table>
<thead>
<tr>
<th>Material tested</th>
<th>Styrax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration</td>
<td>no dose reported</td>
</tr>
<tr>
<td>Subjects</td>
<td>22 male and 78 female dermatitis patients with leg ulcers</td>
</tr>
<tr>
<td>Patch Test</td>
<td>/</td>
</tr>
<tr>
<td>Results</td>
<td>no reactions (0/100)</td>
</tr>
</tbody>
</table>

Ref.: 9

### 3.3.4. Dermal / percutaneous absorption

/

### 3.3.5. Repeated dose toxicity

/

### 3.3.6. Mutagenicity / Genotoxicity
3.3.7. Carcinogenicity

3.3.8. Reproductive toxicity

3.3.9. Toxicokinetics

3.3.10. Photo-induced toxicity

3.3.11. Human data

See elsewhere in the opinion

3.3.12. Special investigations

3.3.13. Safety evaluation (including calculation of the MoS)

CALCULATION OF THE MARGIN OF SAFETY

Not applicable

3.3.14. Discussion

The exposure data provided in section 3.2 above is not considered conclusive and current exposure data specific to Europe are totally missing.

The submitted data indicate that Storax extracts/oils are mild to moderate sensitizers and they extensively give positive reactions on dermatitis or eczema patients or patients previously sensitized to Peru balsam, coniferyl benzoate (and probably to other known sensitizers of a related nature).
4. CONCLUSION

The provided data do indicate that Storax extracts/oils have allergenic potential, though the quality of the submitted data is poor.

However, under the conditions of its anticipated use as a fragrance ingredient (maximum 0.6 % in the finished cosmetic product), the risk of sensitisation is low.

Nevertheless, Storax extracts/oils may contain one or more fragrance chemicals, which have been identified as contact allergens and for which information should be provided to consumers about the known presence in cosmetic products (Opinion of the SCCNFP concerning fragrance allergy in consumers, doc n° SCCNPf/0017/98).

5. MINORITY OPINION

Not applicable

6. REFERENCES

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2. Hjorth, N., (1961e). “Balsam of Tolu, Styrax and Benzoin” in Eczematous Allergy to Balsams, Chapter 8, pages 61-81. (Location # 16100)
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maximization Studies. RIFM report number 1698, February 27 (RIFM, Woodcliff Lake, NJ, USA).
44. RIFM (Research Institute for Fragrance Material, Inc), 1981. Report on human maximization Studies. RIFM report number 1792, June 8a (RIFM, Woodcliff Lake, NJ,


7. ACKNOWLEDGEMENTS

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APPENDIX

Entries of the EU Inventory, 1st update (2000)

Common Name: LIQUIDAMBAR ORIENTALIS BALSAM EXTRACT
EINECS No.: 305-627-6
CAS RN: 94891-27-7
Chem. Name: “Storax; Styrax; Levant Oil; Asiatic Oil”. Extract of the exudate obtained from the trunk of Liquidambar orientalis, Hamamelidaceae. It consists primarily of cinnamic and benzoic acids and their esters. Its main constituents are α- and β-storesin and its cinnamic ester (33-50%), styracin (5-10%), ethyl- and phenylpropyl-cinnamate (10%), benzyl cinnamate, free cinnamic acid (5-15%), a levorotatory oil 0.4%) and traces of vanillin.
Restrictions: The final concentration of Styrax extracts or distillates (resinoids, absolutes, oils) from exudates shall not exceed 0.6 % in the finished product.

Common Name: LIQUIDAMBAR ORIENTALIS BALSAM OIL
EINECS No.: 305-627-6
CAS RN: 94891-27-7
Chem. Name: “Styrax Oil”. Essential oil of the exudate obtained from the trunk of Liquidambar orientalis, Hamamelidaceae.
Restrictions: The final concentration of Styrax extracts or distillates (resinoids, absolutes, oils) from exudates shall not exceed 0.6 % in the finished product.

Common Name: LIQUIDAMBAR STYRACIFLUA BALSAM EXTRACT
EINECS No.: 232-458-4
CAS RN: 8046-19-3
Chem. Name: “Styrax; Storax; Sweet Gum”. Extract of the gum exudate obtained from the trunk of Liquidambar styraciflua, Hamamelidaceae. It consists primarily of cinnamic and benzoic acids and their esters. Its main constituents are α- and β-storesin and its cinnamic ester (33-50%), styracin (5-10%), ethyl- and phenylpropyl-cinnamate (10%), benzyl cinnamate, free cinnamic acid (5-15%), a levorotatory oil 0.4%) and traces of vanillin.
Restrictions: The final concentration of Styrax extracts or distillates (resinoids, absolutes, oils) from exudates shall not exceed 0.6 % in the finished product.

Common Name: LIQUIDAMBAR STYRACIFLUA BALSAM OIL
EINECS No.: 232-458-4
CAS RN: 8046-19-3
Chem. Name: “Styrax Oil”. Essential oil of the gum exudate obtained from the trunk of Liquidambar styraciflua, Hamamelidaceae.
Restrictions: The final concentration of Styrax extracts or distillates (resinoids, absolutes, oils) from exudates shall not exceed 0.6 % in the finished product.