EFEO
European Federation of Essential Oils

**22.09.2023**

**EFEO Comments to CLH report "Proposal for Harmonised Classification and Labelling" of p-Cymene as Repr. 1B**

EFEO represents about 200 companies in the production, import, trade and use of Essential Oils and other smelling or tasting plant extracts – collectively referred to as Natural Complex Substances (NCS).

EFEO fully supports the mechanistic analysis of species relevance provided by Givaudan.

Essential Oils are natural complex substances (NCS). They are obtained from natural raw materials of plant origin. The originating plants are used as food or traditionally in cosmetics or in traditional medicine, often as active pharmaceutical ingredients. Such is the case for orange, lemon, peppermint, oregano and thyme oil (food) or for neroli, rose and lavender oil (cosmetic) or eucalyptus, fir needle, lavender and also turpentine oil (active pharmaceutical ingredient in traditional medicine). Essential Oils and / or the related plant material have been used for many centuries, if not millennia. The plants containing the Essential Oils have been part of everyday life for even longer.

Some Essential Oils – such as turpentine oil – also play a vital part as starting material for bio-based organic chemicals. They are an important source for renewable carbon. They are thus an integral part of Europe's net-zero strategy.

Essential Oils are substances (1): therefore, they are classified according to test data if robust test data is available. If no data is available, they are classified according to the classification of their constituents using the (intentional) mixture approach. This classification procedure follows the UN GHS rules.

Most plants use either one of two pathways to produce the constituents of Essential Oils: Terpenic compounds are based on an isoprene-unit (= $C_5H_8$) and are produced by the mevalonate pathway. The mevalonate pathway is the dominant source for Essential Oils, and in terms of volume, essential oily mainly comprising monocyclic terpenes are clearly dominating the market (e.g. mint oils, eucalyptus, turpentine oil). P-cymene is an aromatic hydrocarbon belonging to the cyclic monoterpenes, and it is contained in the majority of oils comprising monocyclic terpenes. It is ubiquitous in Essential Oils.

In food and cosmetics Essential Oils are only used in low concentrations: their content in the final food mimics the use of spice or herb. Thus, the exposure to consumers of p-cymene by food containing Essential Oils is similar to food containing spices and herbs. In cosmetics and fragrances Essential Oils are added to provide a sensory impact similar to smells humankind has been used to over the centuries. In traditional medicine, the concentration of Essential Oils is higher – however, the exposure is only for a limited time. For most Essential Oils used as active pharmaceutical ingredients their use is regulated by monographs of the HMPC


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(Committee on Herbal Medicinal Products at EMA). Risk and hazard of the applications were evaluated during the establishment of the monograph.

The VCF database (https://www.vcf-online.nl/VcfHome.cfm) on published volatile compounds in natural (processed) food products lists 39 food sources in which over 3.000 ppm (0,3 %) of p-cymene had been analytically found including common foods such as citrus fruits, mint oils, oreganum, rosemary, thyme, pepper, celery or cardamom among many others. Similarly, Essential Oils used for naturals-based consumer products widely contain p-cymene. Thus, data from industry shows that about 1/3 of all natural products used in flavors and fragrances contain more than 0,3 % p-cymene. These Essential Oils would be classified as Repr. 1B if p-cymene is classified as Repr. 1B.

Indeed, based on industry figures of the p-cymene content in Essential Oils, the world production and the use of the Essential Oils in the EU, the consumption of p-cymene across all applications by Essential Oils is roughly 1.100 µg/capita/day. No negative effects of this consumption have been reported.

A safe history of consumption and use of Essential Oils containing p-cymene has thus been established. In addition, it was shown that the bio-pathway leading to adverse effects in rats is not relevant to humans (2), (3), (4).

A classification of p-cymene as Repr. 1B based solely on male rats would potentially lead to a number of Essential Oils classified as Repr. 1B as well. These Essential Oils could in effect no longer be used in cosmetics and consumer goods, thus stopping the use and therefore the production of Essential Oils in Europe and worldwide.

Considering that the effects have only been observed on male rats, such a classification is not justified.

(1) Essential Oils are classified as UVCBs under REACH (Substances of unknown or variable compositions, complex reaction products or of biological origin), mostly because of their variable composition. Due to the complex nature of identification, a guidance document was created in order to align the REACH registration process (https://echa.europa.eu/view-article/-/journal_content/title/guidance-on-substance-identification-for-essential-oils-now-available).

(2) Laue, H., et al., *p-Alkyl-benzoyl-CoA conjugates as relevant metabolites of aromatic aldehydes with rat testicular toxicity - studies leading to the design of a safer new fragrance chemical.* Tox. Sci., 2017. **160**(2): p. 244-255.

(3) Natsch, A., et al., *A species specific metabolism leading to male rat reprotoxicity of Cyclamen aldehyde: in vivo and in vitro evaluation.* Food Chem Toxicol, 2021. **153**: p. 112243.

(4) Laue, H., et al., *Benzoyl-CoA conjugate accumulation as an initiating event for male reprotoxic effects in the rat? Structure-activity analysis, species specificity, and in vivo relevance.* Arch. Toxicol., 2020. **94**(12): p. 4115-4129.

About E.F.E.O. (www.efeo.eu)

The European Federation of Essential Oils (E.F.E.O.) aims to represent producers, importers and traders of Essential Oils and related products within Europe. It protects and promotes their interest and acts in defence of these products at relevant national, European and international level.

E.F.E.O. is a non-profit organisation which has become a highly esteemed counterpart in the supply chain, for all topics relating to trade, production, and use of natural Essential Oils. EFEO contributes to a variety of major international events, such as IFEAT, WPC, FAFAI/India, Centifolia, PCIE, CHINAEASA and delivers lectures particularly on relevant EU legislation all over the EU and beyond.

Since its foundation in 2002, E.F.E.O. has been involved in regular lobbying and discussions with EU Commission and EU Parliament, and has contributed to several legislative procedures, such as the Cosmetic Directive 76/768/EEC (now Cosmetic Products Regulation No 1223/2009/EC), the Detergents Regulation No 648/2004/EC, the REACH Regulation No 1907/2006/EC and the new Flavouring Regulation No 1334/2008/EC.

Giving legal, technical, and scientific advice to the members, E.F.E.O. has actively helped the sector for REACH registration. For several important Essential Oils, E.F.E.O. has established Registration Consortia and has issued a fundamental guidance on NCS (Natural Complex Substances) under REACH.

EFEO is in the European Transparency Register under N° 180153441003-55.