



## EU EARLY WARNING SYSTEM FORMAL NOTIFICATION

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Date issued	22 March 2024	RCS ID	EU-EWS-RCS-FN-2024-0005
Issued by	EMCDDA	Transmitted by	Action on New Drugs Sector, EMCDDA
Subject	Formal notification of 3-heptyl-6a,7,10,10a-tetrahydro-6,6,9-trimethyl-6 <i>H</i> -dibenzo[ <i>b,d</i> ]pyran-1-ol (delta-8-THCP) by Denmark as a new psychoactive substance under the terms of Regulation (EC) No 1920/2006 and Council Framework Decision 2004/757/JHA		

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### 1. Read me first

This document provides formal notification of the analytical identification of 3-heptyl-6a,7,10,10a-tetrahydro-6,6,9-trimethyl-6*H*-dibenzo[*b,d*]pyran-1-ol (delta-8-THCP) for the first time in Europe.

Please report any additional data you have on this substance to: [ews@emcdda.europa.eu](mailto:ews@emcdda.europa.eu)

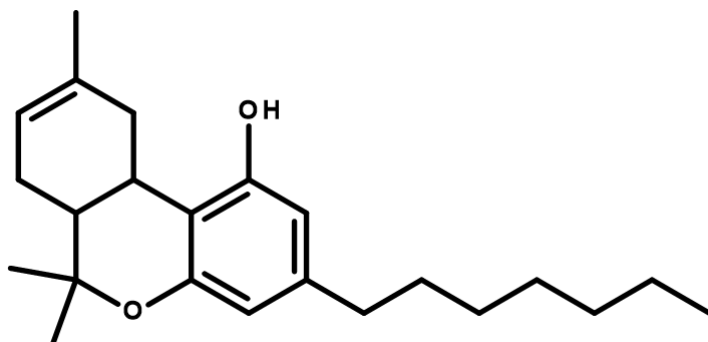
### 2. Data use restrictions

As with all formal notifications issued by the EU EWS remember that they may contain information that could be regarded as sensitive. Should you provide some of the information in this notification to other groups we would ask that you exercise your best judgment on what information needs to be provided. If you have any questions in this respect, please contact us.

### 3. Names of substance and other identifiers

- IUPAC name: 3-heptyl-6a,7,10,10a-tetrahydro-6,6,9-trimethyl-6*H*-dibenzo[*b,d*]pyran-1-ol
- Chemical names: 3-heptyl-6,6,9-trimethyl-6a,7,10,10a-tetrahydrobenzo[*c*]chromen-1-ol
- Common name: delta-8-THCP
- Other names: JWH 091; Δ8-THCP; Δ8-tetrahydrocannabiphorol; Δ8-THC-C7; THC-C7; Δ8-THC-heptyl; THC-heptyl
- Chemical formula: C<sub>23</sub>H<sub>34</sub>O<sub>2</sub>
- Molecular weight: 342.52
- CAS Registry number: 2871779-89-2 (unspecified stereochemistry); 51768-60-6 ((6*aR*,10*aR*)-3-heptyl-6a,7,10,10a-tetrahydro-6,6,9-trimethyl-6*H*-dibenzo[*b,d*]pyran-1-ol); 247073-02-5 (*rel*-6*aR*,10*aR*)-3-heptyl-6a,7,10,10a-tetrahydro-6,6,9-trimethyl-6*H*-dibenzo[*b,d*]pyran-1-ol
- InChIKey: RGXKCMQANRHRCO-UHFFFAOYSA-N

## Molecular structure



## 4. Substance classification

Cannabinoid

## 5. Detection

Type: Seizure

Case Report identifier: [EDND-CR-2023-1123](#)

Details: delta-8-THCP was identified in an ampule containing 1 millilitres of yellow liquid, seized by Danish Customs on 30 March 2023, at the International Mail Centre in Copenhagen. The seized sample was en-route from the US to Denmark.

The substance was analytically confirmed using GC-MS and LC-MS by the Section of Chemistry, University of Copenhagen. Two isomers of THCP were detected in the sample, delta-9-THCP ([THCP](#)) and delta-8-THCP.

## 6. Chemistry and Analysis

Chemical classification: unclassified

Delta-8-THCP, also known as delta-8-tetrahydrocannabiphorol and JWH 091, is a higher homologue of the internationally controlled delta-8-THC, differing in the length of the alkyl side chain on the resorcinol group, namely by the presence of a heptyl linear side chain instead of a pentyl linear side chain. Delta-8-THCP and [THCP](#) (also known as delta-9-THCP), formally notified in 2023, are isomers, differing on the position of the double bond in the cyclohexane ring.

Delta-8-THCP is a dehydrogenated analogue of the semi synthetic cannabinoid [hexahydrocannabiphorol \(HHC-P\)](#), formally notified in January 2023. Delta-8-THCP also shares structural similarities with the semi-synthetic cannabinoids [hexahydrocannabinol \(HHC\)](#), formally notified in October 2022 and placed under intensive monitoring as of 7 November 2022, and [hexahydrocannabinol acetate \(HHC acetate\)](#) formally notified in December 2022.

Delta-8-THCP was originally mentioned in a paper on the identification of synthetic cannabinoids by gas chromatography, by Bailey *et al.*, in 1973 [1]. The synthesis and pharmacology of analogues of delta-8-THC, including delta-8-THCP (*compound 9*) used as a reference compound, was reported by Huffman *et al.* [2].

Delta-8-THCP, THCP (delta-9-THCP), cannabidiphorol (CBDP) and cannabidiol dimethyl ether (CBDD) are isomers. The identification and discrimination of these isomers can pose analytical challenges due to the fact that these substances have the same molecular weight and similar fragmentation patterns. As a result, in addition to GC-MS, other analytical techniques, such as FTIR or NMR, may be required for their identification.

Reference standards are available for delta-8-THCP [3], THCP (delta-9-THCP) [4], CBDP [5] and CBDD [6]. For delta-8-THCP a  $\lambda_{\text{max}}$  (ultraviolet wavelength of maximum absorbance) of 209 nm is reported and it is reportedly soluble in acetonitrile (10 mg/ml) [3].

Delta-8-THCP contains two stereogenic centres and therefore four possible stereoisomers might exist.

## 7. Pharmacology and toxicology

Pharmacological classification: cannabinoid

There is limited information available on the pharmacology and toxicology of delta-8-THCP.

The pharmacology of delta-8-THCP (*compound 9*) was evaluated *in vitro* (CB<sub>1</sub> receptor affinity) and *in vivo* using the mouse model of cannabimimetic activity which measures spontaneous activity, antinociception and rectal temperature and was reported to have greater affinity for the CB<sub>1</sub> receptor than delta-8-THC and was significantly more potent *in vivo* [2].

Delta-8-THCP (*compound 1*; also referred to as JWH-091) was also included in another study assessing the pharmacological potency in mice and receptor affinity of a series of THC analogs [7]. In general, it was found that substitution of a heptyl group, in the case of delta-8-THCP, for the pentyl side chain of THC increased both CB<sub>1</sub> cannabinoid receptor affinity and pharmacological potency [7]. More specifically, delta-8-THCP was found to be considerably more potent than delta-8-THC in all three pharmacological measures (ability to produce hypomotility, hypothermia, and antinociception), although the authors noted that “it appeared to be somewhat less potent in producing antinociception than in reducing spontaneous activity and rectal temperature” [7]. The authors also noted that while the antinociceptive efficacy of delta-8-THCP was similar to that of delta-8-THC, the depression of spontaneous activity was somewhat less [7].

## 8. Further information

Further information on this substance is available on the EDND profile:

<https://ednd2.emcdda.europa.eu/ednd/substanceProfiles/1470>

## 9. Acknowledgements

The Danish National Focal Point, Danish Customs and the Section of Chemistry, University of Copenhagen are kindly acknowledged for the information and analytical data provided.

## 10. Attachments

None.

## 11. References

- [1] Bailey K, et al. Identification of synthetic cannabinoids by gas chromatography. *Journal of Chromatography A*. 1973;87(1):263-6.
- [2] Huffman JW, et al. Synthesis and pharmacology of the isomeric methylheptyl- $\Delta^8$ -tetrahydrocannabinols. *Bioorganic & medicinal chemistry*. 1998;6(12):2383-96.
- [3] <https://www.caymanchem.com/product/30304/%CE%B48-thcp>
- [4] <https://www.caymanchem.com/product/30171/%CE%B49-thcp>
- [5] [https://www.caymanchem.com/product/33611/cbdp-\(crm\)](https://www.caymanchem.com/product/33611/cbdp-(crm))
- [6] <https://www.caymanchem.com/product/13285/cannabidiol-dimethyl-ether>
- [7] Martin BR, et al. Manipulation of the tetrahydrocannabinol side chain delineates agonists, partial agonists, and antagonists. *Journal of Pharmacology and Experimental Therapeutics*. 1999;290(3):1065-79.