European Monitoring Centre
for Drugs and Drug Addiction

EU EARLY WARNING SYSTEM FORMAL NOTIFICATION

Date issued	06 July 2021	RCS ID	EU-EWS-RCS-FN-2021-0026
Issued by	EMCDDA	Transmitted by	Action on New Drugs Sector, EMCDDA
Subject	Formal notification of 1-(2-methylphenyl)-2-(pyrrolidin-1-yl)pentan-1-one (2'-Me-PVP) by Sweden as a new psychoactive substance under the terms of Regulation (EU) 2017/2101		

1. Read me first

This document provides formal notification of the analytical identification of 1-(2-methylphenyl)-2-(pyrrolidin-1-yl)pentan-1-one (2'-Me-PVP) for the first time in Europe.

Please report any additional data you have on this substance to: ews@emcdda.europa.eu

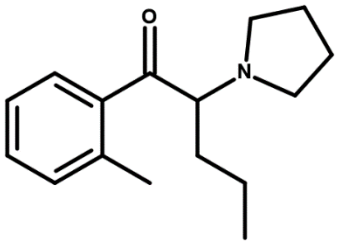
2. Data use restrictions

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: 1-(2-methylphenyl)-2-(pyrrolidin-1-yl)pentan-1-one
- Chemical names: 1-(*o*-tolyl)-2-pyrrolidin-1-yl-pentan-1-one; 1-(2-methylphenyl)-2-(1-pyrrolidinyl)-1-pentanone; 1-(2-methylphenyl)-2-pyrrolidin-1-yl-pentan-1-one; 2-(pyrrolidin-1-yl)-1-(*o*-tolyl)pentan-1-one
- Common name: 2'-Me-PVP
- Other names: *ortho*-pyrovalerone; *ortho*-methyl-α-PVP; 2-methyl-α-PVP; 2-methyl-alpha-PVP; 2-Me-α-PVP; 2Me-α-PVP; 2Me-alpha-PVP; O-2479
- Chemical formula: $C_{16}H_{23}NO$
- Molecular weight: 245.36
- CAS Registry number: 850352-54-4 (base); 850352-13-5 (hydrochloride salt)
- InChIKey: VVIVTDYOMWHKAE-UHFFFAOYSA-N

Molecular structure



4. Substance classification

Cathinone

5. Detection

Type: Seizure
Case Report identifier: EDND-CR-2021-555

Details: 2'-Me-PVP was identified in 2.08 grams of white-off-white powder contained in a foil bag, seized by Swedish Police in Linköping, on 8 March 2021.

The substance was analytically confirmed using GC-MS, LC-MS and NMR by the Swedish National Forensic Centre (NFC). The powder was also found to contain a small amount of MDPHiP (also known as MDPiHP).

6. Chemistry and Analysis

Chemical classification: arylalkylamine; cathinone

2'-Me-PVP is the 2-methyl derivative of the internationally controlled cathinone α-pyrrolidinovalerophenone (α-PVP) (Schedule II of the 1971 United Nations Single Convention on Psychotropic Substances).

2'-Me-PVP is a structural isomer of the internationally controlled cathinone α-pyrrolidinohexanophenone (α-PHP) (Schedule II of the 1971 United Nations Single Convention on Psychotropic Substances). 2'-Me-PVP is also a structural isomer of bk-IVP and α-PHiP, formally notified in 2015 and 2016, respectively. 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.

2'-Me-PVP is also structurally related to the cathinones 4-MeO-alpha-PVP, 4F-α-PVP, 4Br-α-PVP and 3F-α-PVP, differing in both the atom/group and position on the phenyl ring.

The synthesis of the hydrochloride salt of 2'-Me-PVP (*compound 4r*) with NMR and MS data has been published [1].

2'-Me-PVP contains one stereogenic centre and therefore two possible enantiomers may exist.

7. Pharmacology and toxicology

Pharmacological classification: stimulant

Based on its chemical structure and on its similarity to α-PVP and α-PHP, 2'-Me-PVP is expected to have stimulant effects.

The synthesis and biological evaluation at dopamine, serotonin and norepinephrine transporters has been reported for several analogues of pyrovalerone, including 2'-Me-PVP (*compound 4r;* O-2479) [1]. In general, the compounds were found to be potent inhibitors of the dopamine transporter (DAT) and norepinephrine transporter (NET), but relatively poor inhibitors of the serotonin transporter (SERT) [1]. The authors noted that the 'position of the methyl substituent on the aromatic ring influenced NE uptake potency in an opposite sense to its influence on DAT inhibition, although DA uptake inhibition was similar' [1].

The 3-methyl (*compound 4s*) was found to be approximately equipotent to the 4-methyl (*compound 4a*) at the NET, whereas the 2-methyl (*compound 4r*; NE uptake IC_{50} = 19.7 nM) was about half as potent at the NET (NET: K_i = 425 nM) compared with the 4-methyl [1]. The 4-methyl was at least twice as potent as the 2-methyl (DAT: K_i = 59.7 nM) and 3-methyl at DAT. The 2-methyl was also evaluated for inhibition of $5HT_{1A}$, $5HT_{1B}$, $5HT_{1C}$, D_1, D_2, and D_3 receptors and was found to be essentially inactive (IC_{50} > 10 µM) in those assays [1].

8. Further information

Further information on this substance is available on the EDND profile:
https://ednd2.emcdda.europa.eu/ednd/substanceProfiles/1236

9. Acknowledgements

The Swedish National Focal Point, Swedish Police and the Swedish National Forensic Centre (NFC) are kindly acknowledged for the information and analytical data provided.

10. Attachments

None.

11. References

[1] Meltzer PC, *et al*. 1-(4-Methylphenyl)-2-pyrrolidin-1-yl-pentan-1-one (Pyrovalerone) analogues: a promising class of monoamine uptake inhibitors. Journal of medicinal chemistry. 2006;49(4):1420-32.