New on Slovenian illicit drug market

M. Janežič*, B. Koštrun*, S. Klemenc*

Ministry of the interior, Forensic Centre, Vodovodna 95, 1000 Ljubljana, Slovenia

1. Introduction

•Several new drugs appeared on Slovenian illicit drug marked, mostly in the year 2009. These designer drugs are commercially available on Internet and therefore easily accessible.

•The drugs were identified by different analytical techniques, such us GC-MS, including derivatization with acetanhydride or MBTFA, FTIR of samples or dried residue of different extracts, and NMR (at Infrastructural NMR Centre of Faculty for Chemistry and Chemical Technology, University Ljubljana). BZP, mCPP, pCPP, and p-fluoroamphetamine reference materials were used to confirm identification.

•All the new identified drugs except BZP which became banned in December 2009 are still legal in Slovenia.

2. Results

Before 2008:

m-Chlorophenylpiperazine (mCPP)

mCPP appeared in tablets usually in combination with amphetamine and/or MDMA and caffeine. The first seizure of mCPP was in a form of rainbow tablet. 157 and 17 461 tablets containing mCPP were seized in Slovenia in the years 2008 and 2009, respectively.

mCPP was identified by GC-MS, meta position of chlorine on benzene was additionally confirmed by NMR (Fig. 1).

No oCPP or pCPP have been detected in any sample till current.

Figure 1: Different types of illicit tablets containing mCPP.

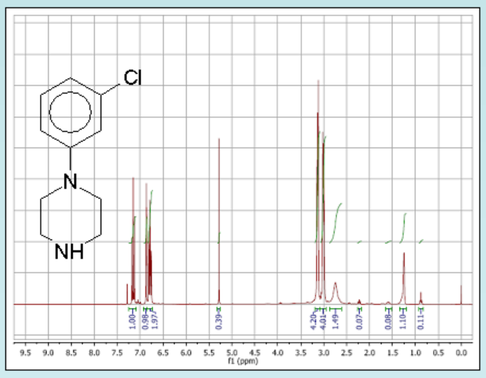

Figure 2: NMR spectrum of mCPP.

Spice

In the year 2008, a case of Spice product, seized in Slovenia, was investigated in Forensic Research Centre. The product was an originally packaged cigarette labelled Spice, filled with a mixture of various dried plant material. Methanol extract of the mixture was analysed by GC-MS. The analysis confirmed presence of α-tocopherol (vitamin E) and a compound, which was later identified on the basis of the literature [1] as CP 47,497 - C8 homologue. No illicit drugs were detected in the product. See Fig. 3.

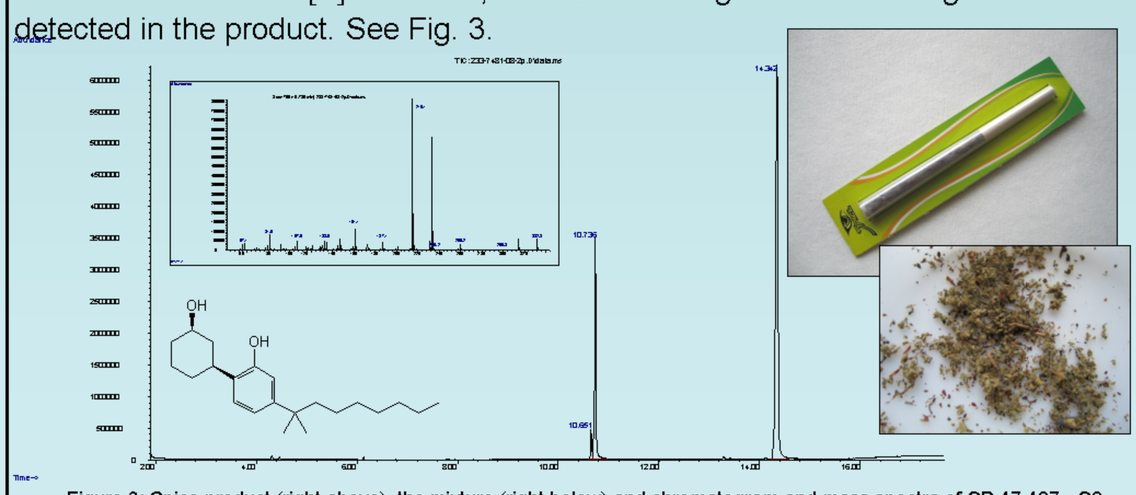

Figure 3: Spice product (right above), the mixture (right below) and chromatogram and mass spectra of CP 47,497 - C8 homologue (left).

In the year 2009:

Mephedrone (4-methylmethcathinone, 4-MMC)

Catinones appeared recently on Slovene illicit drug market. Mephedrone was the first synthetic catinone, identified in Slovenia. The identification was confirmed by GC-MS, IR and NMR (Fig. 4) [2].

Mephedrone (4-methylmethchatinone, street names used by Slovene users meph, mefedron) is not a controlled substance in Slovenia. The Police do not systematically collect data about seized material where mephedrone was identified. Consequently, here we can only provide a non-verified seizure size of mephedrone for the year 2009, which was in total approx. 6g of white powder material, seized in 3 cases.

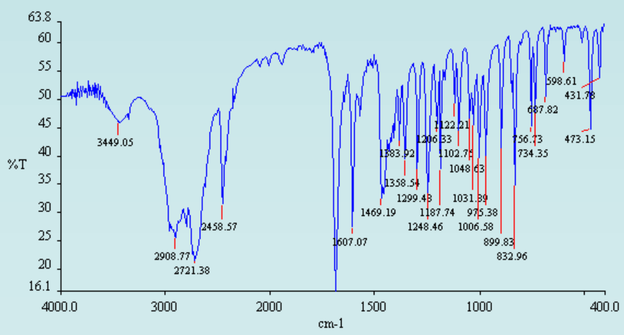

Figure 4: IR spectrum of mephedrone HCl (left) and NMR spectrum with structure of mephedrone (right).

4-fluoroamphetamine (4-FA, PFA)

In the year 2009, approx. 52 g of white powder containing p-fluoroamphetamine was seized in 6 cases. In some samples amphetamine presence was confirmed as well. p-fluoroamphetamine was identified by GC-MS after derivatization of dichloromethane extract from alkaline solutions of the samples with acetic anhydride [3] and MBTFA (Fig. 5). In all the samples caffeine was detected as well.

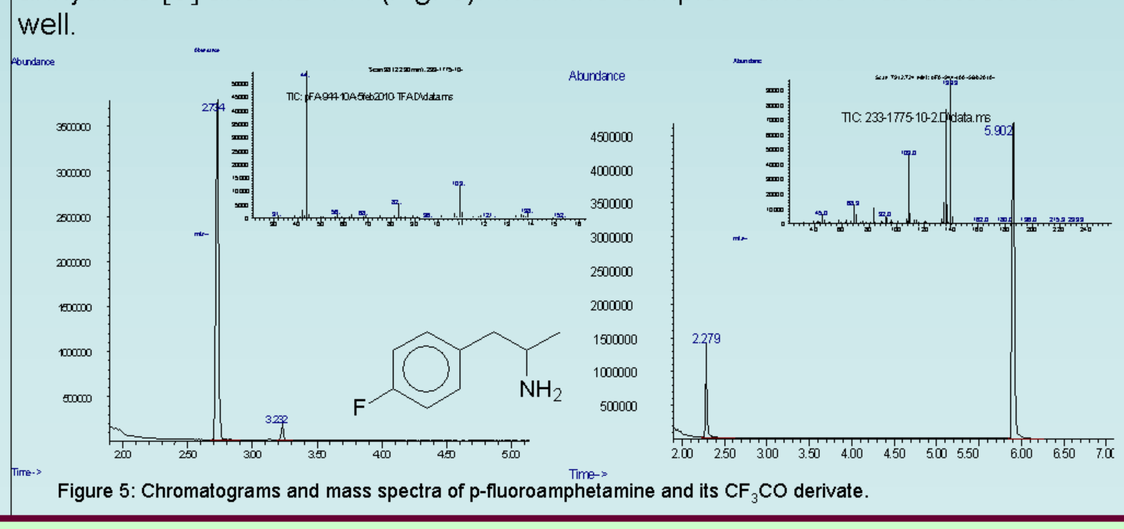

Figure 5: Chromatograms and mass spectra of p-fluoroamphetamine and its CF_3CO derivate.

In the year 2010:

Benzylpiperazine (BZP)

A single sample of 0,11 g of white powder containing BZP was seized in Slovenia. The substance was originally suspected to be mephedrone. GC-MS analysis revealed the presence of BZP. IR spectrum of the sample (Fig. 6) confirmed that the sample was pure BZP hydrochloride [4].

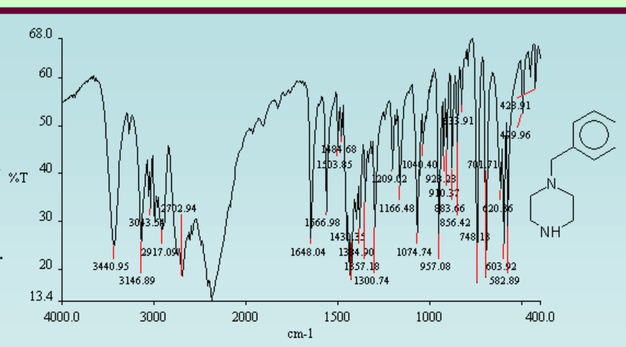

Figure 6: Structure of BZP and IR spectrum of BZP HCl.

Methylone, butylone

In 11,47 g of white powder, submitted to our laboratory, methylone and butylone was identified by GC-MS method (Fig. 7). These two compounds were successfully confirmed by GC-MS with MBTFA derivatization as well.

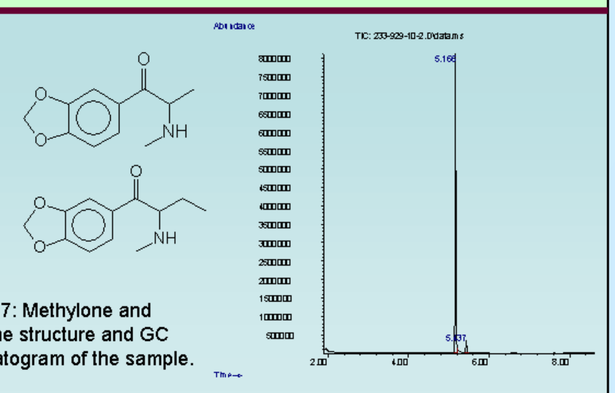

Figure 7: Methylone and butylone structure and GC chromatogram of the sample.

3. Conclusions

• mCPP has been the most common designer drug that appeared on Slovenian market before 2008. It was detected exclusively in tablet forms.

•Spice, commercially available in Slovenia in the year 2008, was seized in a form of a cigarette, filled with a mixture of different plant material. In the mixture, synthetic cannabinoid CP 47,497 - C8 homologue was identified.

• In the year 2009, several samples containing mephedrone and p-fluoroamphetamine were seized in Slovenia.

• BZP, methylone and butylone have been identified in few samples of powdered material since the beginning of year 2010.

References:

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[2] A. Camilleri, M. R. Johnston, M. Brennan, S. Davis, D. G.E. Caldicott, **Chemical analysis of four capsules containing the controlled substance analogues 4-methylmethcathinone, 2-fluoromethamphetamine, a-phthalimidopropiophenone and N-ethylcathinone**, Forensic Sci. Int. 197 (2010) 59–66.

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*Corresponding authors E-mail: mojca.janezic@policija.si, bojana.kostrun@policija.si, sonja.klemenc@policija.si

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