

O-A1-04-05

## SIMULTANEOUS DETECTION OF NEW PSYCHOACTIVE SUBSTANCES (NPSs) IN WASTEWATER OF GREECE

V. L. Borova<sup>1</sup>, N. S. Thomaidis<sup>1</sup>, C. Pistos<sup>2</sup>

<sup>1</sup>*Department of Chemistry, National and Kapodistrian University of Athens, Panepistimiopolis 15771, Athens, Greece*

<sup>2</sup>*School of Medicine, National and Kapodistrian University of Athens, Athens, Greece*  
Presenting author: vborova@chem.uoa.gr

In recent years, new psychoactive molecules have appeared worldwide, often under “innocent” appearances (house scents, bath salts, incenses, etc.), finding a wide and efficient distribution through the “e-commerce” or specialized shops. These products are claimed to contain only natural “non-illegal” compounds and consequently have no limitations in their commercial distribution, although exhibiting important psychoactive effects similar to that obtained with illegal stimulants, such as methamphetamine, MDMA, cocaine or cannabis. This heterogeneous class of products are called “New Psychoactive Substances” (NPSs) and are undesirable, as very little is known about their effects and long term risks [1-3]. Among these substances, JWH-018, mephedrone, benzylpiperazine, and a-PVP have been detected in Greece [4]. The analysis of these compounds in wastewater samples provides valuable information about their consumption back in the community. The selected NPSs of this study comprise a broad range of substances, including synthetic cannabinoids (JWH-018, JWH-073, JWH-122, JWH-210, JWH-250, CP47,497), cathinones (mephedrone), piperazines (benzylpiperazine) and pyrrolidinophenones (a-Pyrrolidinopentiophenone, 4'-methylpyrrolidinobutyrophenone). A novel ultra performance liquid chromatography tandem mass spectrometry (UHPLC-MS/MS) method was developed for their determination in wastewater samples. Comparison of various columns, mobile phases and SPE sorbents was performed. The final method employed solid phase extraction with PolyClean 2H sorbents for all the compounds, except BZP which was extracted using Strata XC and subsequent LC-MS/MS analysis in positive and negative electrospray ionization, using a pentafluorophenyl (PFP) column. The new method was successfully applied in influents and effluents of six WWTPs of Santorini Island (a highly touristic resort in central Aegean Sea), and of the WWTP of Athens.

### Acknowledgments

This research has been co-financed by the European Union and Greek national funds through the Operational Program “Education and Lifelong Learning” of the National Strategic Reference Framework (NSRF) – ARISTEIA 624 (TREMOPOL project).

### References

1. I. Vardakou, C. Pistos, and Ch. Spiliopoulou, *Toxicol. Letters*, 197 (3), 157-162 (2010).
2. Ch. L. German, A. E. Fleckenstein, and G. R. Hanson, *Life Sciences*, 97 (1), 2-8 (2014).
3. J. Van Amsterdam, D. Nutt, and W. Van den Brink, *J Psychopharmacol*, 27 (3), 317-324 (2013).
4. Press announcement regarding EKTEPN meeting for “New substances, new challenges...” (<http://www.ektepn.gr/index.php>); Greek Monitoring Centre for Drugs (EKTEPN).