

Quantification of methadone and its metabolite (EDDP) in insect's tissues

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CONTEXT

Forensic entomotoxicology, a relatively new branch of forensic entomology studies the usefulness of insects as alternative toxicological samples.

Larvae are of most interest as they are present in a high number and are more visible on-site. To measure variability in a pool of larvae, single larva must be analyzed separately [1]. Sometimes, forensic case samples are insufficient and analysis of single specimen is also recommended.

In addition, it's important to use a simple and rapid method.

MATERIAL

- Precellys®48 homogenizer.
- Precellys® lysing kit: 03961-1-008 (metal beads 2.8mm).
- Sample: single larva (50 mg) from experiments (n=12) and authentic cases (n=7).
- Buffer: 500 µL of water deionized.

PROTOCOL

- Precellys®48: 4000 rpm, 1x30 sec.
- Liquid / liquid extraction: 500 µL of saturated ammonium chloride buffer (pH 9.2) + 4mL of 1-chlorobutane.
- Analysis: Liquid chromatography and mass spectrometry.



[1] M. Gosselin et al. Quantification of Methadone and its Metabolite 2-Ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine in Third Instar Larvae of *Lucilia sericata* (Diptera: Calliphoridae) Using Liquid Chromatography-Tandem Mass Spectrometry, *Journal of Analytical Toxicology* 2010;34:1-7.

RESULTS

Figure 1 represents the results following the analysis of authentic cases. In a single third instar larva, we have quantified a high concentration of methadone (38.7 pg/mg larva) and EDDP (82.8 pg/mg larva) (Fig.1).

In all cases, both the parent drug and metabolite could be detected following the analysis of a single specimen which confirms variability of drug accumulation in entomological samples.

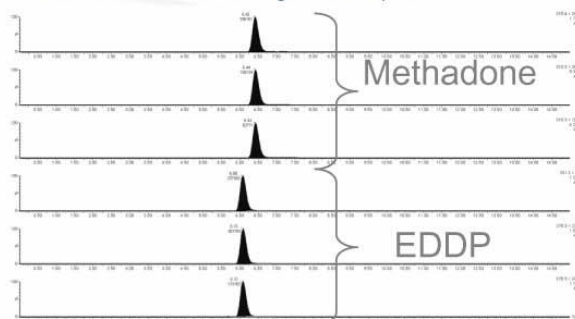


Figure 1. MRM chromatograms for (top to bottom) methadone, methadone, methadone-d9, EDDP, EDDP, and EDDP-d3 in a larva sampled on human remains.

This method allows rapidly detecting methadone and EDDP in single larva on human remains of a young man suspected to consume heroin.



CONCLUSION

Precellys®48 is an ideal tool for sample preparation in forensic entomotoxicology.

Precellys®48 is very easy to use, it is as simple as using a centrifuge. Comparing to the former method (mortar) or mixer, we appreciate the cleanness and the cross-contamination free provided by consumables of Precellys® lysing kit.

For more details, please contact precellys@bertin.fr



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