

# An LC/MS/MS method for the quantification of methadon and its metabolite (EDDP) on developmental stages of *Lucilia sericata* (Diptera, Calliphoridae)



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## Introduction

Entomotoxicology, a new branch of forensic investigation (Fig. 1), studies the application of toxicological analysis to insects especially necrophageous diptera. It allows to identify drugs and toxins present in human remains [1].

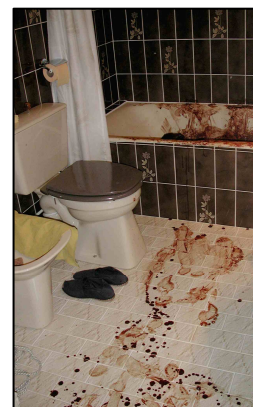


Figure 1. General view of crime scene.



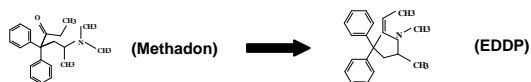
Figure 2. Larvae of *Lucilia sericata* on beef heart.

## Material and Methods

Different development stages (larvae, prepupae, pupae, adults) and puparia of *Lucilia sericata* (Fig. 2) have been sampled on beef heart spiked methadon (4mg/kg). These stages and puparia have been analysed by LC/MS/MS method to identify methadon and EDDP.

## Results & Discussion

➤ Metabolite of methadon is detected in beef heart. The detection of EDDP should be due to cardiac enzyme and/or from exodigestion of larvae.



➤ Methadon and EDDP are detected in all tested larvae

➤ In the post-feeding stage (prepupae, pupae, adults) and puparia, methadon is not detected in all specimens unlike EDDP (Fig.3).

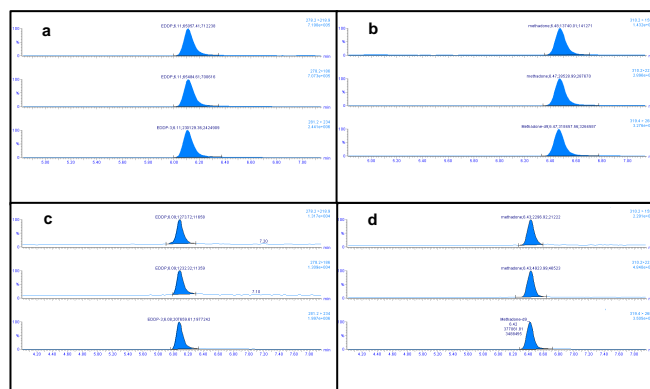


Figure 3. Chromatograms respectively of methadone and EDDP in larvae stage (a,b), puparia (c,d).

## Conclusion

- ✓ Methadon and its metabolite (EDDP) is detected in insects tissues.
- ✓ EDDP is present in all specimens of larvae stages (feeding and post-feeding stages).
- ✓ The reliability of post feeding stages is confirmed for qualitative analysis of EDDP.

## Future perspectives

- Quantification of the accumulation of methadon and its metabolite in different stages of development.
- Evaluation of the correlation between concentrations in infected tissues and larvae.
- Identification of the metabolism patchways in insects for methadon and metabolites.
- Observation and measurements of the drugs effects on the attractiveness and development of *L. sericata*.

## References

[1] Introna F., Campobasso C.P., Lee Goff M., 2001. Entomotoxicology. Forensic Science International, 120: 42-47.