

SHORT TERM SCIENTIFIC MISSION (STSM) SCIENTIFIC REPORT

This report is submitted for approval by the STSM applicant to the STSM coordinator

Action number: CA16224

STSM title: Developing a Network of Analytical Labs and Government Institutions

STSM start and end date: 15/09/2019 to 15/12/2019

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PURPOSE OF THE STSM

(max.200 words)

The main purpose of this STSM is the begin of the creation of a European network of laboratories working in veterinary forensic toxicology with wildlife and to start a communication between the laboratories in the fight against wildlife poisoning, specially focused on raptors. To achieve this, potential labs, services, centers or institutions working in Europe with wildlife where necropsy and forensic reports are relevant tasks in their routine work should be searched. After that, a questionnaire to obtain information on forensic methods used with special interest in those related to poisoning of raptors should be prepared and sent.

The topics asked are related with the type of work developed in the laboratory, the species received, necropsies, substances analyzed, type of sample and analytical methods used, other activities about the laboratory routine, legal cases and funding.

DESCRIPTION OF WORK CARRIED OUT DURING THE STSM

(max.500 words)

An email account (toxlabnetwork@hotmail.com), was created in the web Outlook.com to start the communication between the laboratories. The questionnaire was carried out by the website SurveyMonkey®.

Email contacts from the possible candidates were obtained from different sources: internet searching by the key words; laboratory, forensic, toxicology, wildlife, veterinary, Europe; European veterinary faculties; members from COST Action: CA16224; personal contacts.

A total of 110 mails were sent. The period given to the candidates to response the questionnaire was 3 weeks and reminders were sent on a regular basis.

The questionnaire had a total of 39 questions grouped by different topics (laboratory information, species, wildlife species, raptors, necropsies information and protocol, analytical information, activities, legal cases, funding and other information). All questions had closed answers with only one option or multichoice. A gap called "Others (Please specify)" was also provided in most questions. Moreover, according to each answer, the candidates were redirected to a different block of questions.

The analysis of the data was carried out using Microsoft Excel (2016).

A total of 14 laboratories completed the whole questionnaire and 3 did an uncomplete questionnaire: Albania, Croatia, Estonia, France, Germany, Greece, North Macedonia, Netherlands, Portugal, Romania, Serbia, Spain, United Kingdom.

Among the list provided, the Common buzzard (*Buteo buteo*) is received in every laboratory, except in one. The three most frequent compounds detected in raptors in the European laboratories were carbamates, anticoagulant rodenticides (AR) and organophosphates.

The groups of compounds most analyzed in the participant laboratories are anticoagulant rodenticides, carbamates, organochlorines. Barbiturates are the group of compounds less analyzed.

Baits, gastric content and liver are the matrices most used to analyze poisoning substances. On the contrary, plasma and kidney are not used very often. AR are mostly analyzed in liver and baits by LC-MS. Bromadiolone and brodifacoum are the most analyzed AR.

The samples more used to analyze carbamates are gastric content and baits. Carbamates are mostly analyzed by LC-MS. Carbofuran and aldicarb are the carbamates most analyzed.

Organochlorines are more usually analyzed in liver and baits by GC-MS. Endosulphan and lindane are the organochlorines most analyzed.

The samples more frequently used to analyze organophosphates are gastric content and baits, and the analytical technique most common is GC-MS. Chlorpyrifos and diazinon are the organophosphates most analyzed.

More than a half of the participants, carry out necropsies in their laboratories. Only 3 laboratories provide specific necropsy veterinary forensic training to their staff. Seven laboratories have a necropsy protocol. Three of them never carry out X-Ray, three laboratories always do X-Ray because it is part of their protocol, and one laboratory does X-Ray when a trauma is suspected.

Six laboratories estimate the date of death. The average of the analysis costs is 50-250 € and the funding is provided mostly from the governments. In the majority of laboratories funding comes from the government, combined with NGO and private sources. Eight laboratories provide toxicology training to their staff. The major part are able to process samples from outside of the institution and/or cooperation with other countries. Some laboratories publish data online. Many laboratories provide interpretation of the analytical results. In general, laboratories give results in 15-30 days. Twelve laboratories prepare legal reports. Most of the laboratories have analyte reference material. Some laboratories work with accreditation, and all of them work under quality assurance program ISO 17025.

FUTURE COLLABORATIONS (if applicable)

(max. 500 words)

The results of this survey demonstrate a potential for networking and sharing future analytical techniques and standardized operations to harmonize wildlife forensic toxicology across Europe. Unfortunately, the study could not identify laboratories in all European countries and the future working group on wildlife forensic toxicology should aim at training and disseminating standards and procedures to most European countries to develop a common approach in veterinary forensic toxicology.

The next steps are :

- Completion of the survey if possible (one lab was identified in Italy only in January 2020)
- Round-testing of samples (as suggested in the Proof of Concept Study)
- Development of reference material if possible
- Training in wildlife forensic toxicology (necropsy, analytical investigation)
- Harmonisation of techniques and analytical procedures (as possible)
- Harmonisation of report and interpretation
- Working group / forum to exchange on difficult cases, interpretations, analytical questions