

HP TLC in veterinary forensic toxicology

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Forensic veterinary toxicology

⤴ What is the need ?

- ⤴ Post-mortem evidence of poisoning

- ⤴ Low-cost analysis

 - ☞ Paid by owners

 - ☞ Few legal cases and funding

- ⤴ Investigation of most common toxicants with few analyses

 - ☞ Screening techniques needed

 - ☞ Selected biological samples



Forensic veterinary toxicology

↑ Our answer with HPTLC

← Screening techniques for

- ☞ Convulsive agents
- ☞ Anticoagulant rodenticides
- ☞ Several herbicides

← Rapid, reliable

← Sensitive

← Results

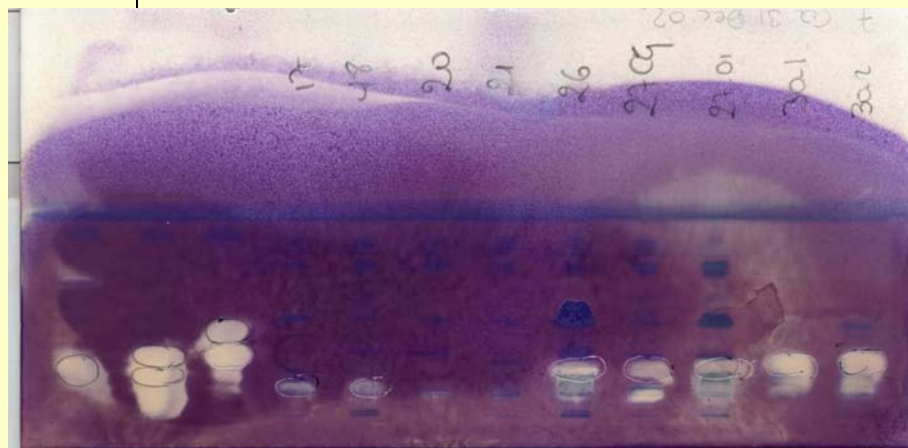
- ☞ 1,500-2,000 cases/year
- ☞ Answer <2 weeks



Investigation of several cases

⤴ OP and carbamate insecticides

- ⤴ Over 20 products tested in 1 screening
- ⤴ UV detection
- ⤴ UV spectrum
- ⤴ Biological activity on plate



Application in 2 severe cases

↑ Legal case involving 135 dogs

↻ 2 years, 135 dogs and cats with 70% mortality

↻ Analysis on gastric content and baits

☞ Carbofuran

☞ Marketed as 1, 5 or 10% granules

☞ Baits collected and analyzed

⌚ 5% carbofuran in all of them

☞ Distribution limited to farmers

⌚ Local sales investigated

⌚ Few sales of 5% granules

☞ Police inquiry

⌚ 1 suspect : granules in his house, car...

☞ Legal case :

⌚ 2 years jail and 30,000 € fine (+ reimbursement of vets and training of hunting dogs : 1,000 €/dog)



Second case : unusual deaths

⤴ About the case

⤵ SW France, 20 dogs dead in 2002, 15 affected and 6 dead in 2003 near a river

☞ Summer, warm and dry (river $>26^{\circ}\text{C}$)

☞ Clinical signs : salivation, tremors, seizures, dyspnea, death within 2 hours

☞ Screening for OP

⤴ $> 50\%$ cases found positive (cholinesterase inhibition on plate) but no identification of precise substance

⤴ Confirmatory GC-MS and LC-MS : no OP, no carbamate

⤴ So what ?



Second case : unusual deaths

➤ Identification of blue-green algae

➤ Neurotoxins with potential action as cholinesterase inhibitors



HP TLC in rodenticide poisoning

↶ Anticoagulants are mainly involved in animals

↻ 300-500 analyses per year

↻ Available as commercial products

↷ E.g. Chlorophacinone

↷ Wheat baits, granules (50 mg/kg)

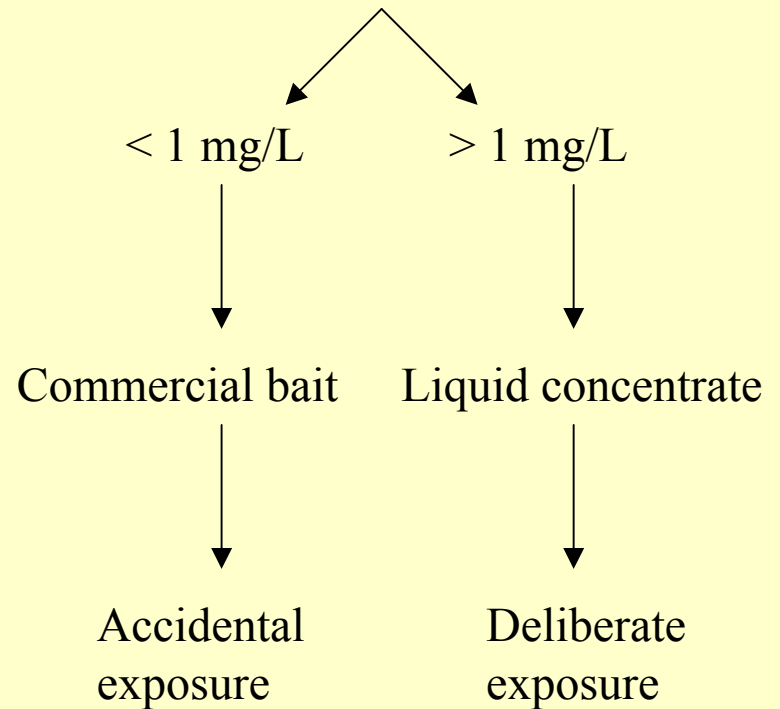
↷ Liquid concentrates (2.5 g/L) Not marketed anymore

↻ Plasma concentrations

↷ Measured during clinical phase (D2 - D4)

↶ Diagnostic scheme

↷ Plasma concentrations :



Commercial baits available



Conclusions

⤴ Veterinary analytical toxicology

- ⤴ Usually post-mortem

- ⤴ Low cost

- ⤴ Rapid answer

⤴ Can be completed with various confirmatory techniques

- ⤴ For legal cases

- ⤴ GC-MS, LC-MS

