

# Preventing Auto-Battery Thefts with Problem-Oriented Policing Model and SARA Problem Solving Method

Arif BOZDEMİR<sup>1</sup>, Belgin İZGİ<sup>2</sup>

<sup>1</sup>Bursa Uludag University, Graduate School of Natural and Applied Science, Forensic Science, Bursa, Turkey

<sup>2</sup>Bursa Uludag University, Science and Art Faculty, Department of Chemistry, Bursa, Turkey

[502240008@ogr.uludag.edu.tr](mailto:502240008@ogr.uludag.edu.tr)

## Introduction

The Problem-Oriented Policing ( POP ) employs the problem-solving method known as SARA (Scanning, Analysis Response, Assessment), serves as a valuable guide during the activities of law enforcement units in crime prevention.

In our presentation, we are discuss our study at preventing auto battery theft based on the POP and share one significant example of its outcomes.

## Methods

The study utilized POP and SARA.

As part of this action plan, various materials such as UV pens, labels, brochures were procured, and training and promotional meetings were organized, culminating in a three-month long study.

*Figure 1*



## Results

Our auto theft team encountered a labeled battery at a second-hand autoparts store. Collaborating with the relevant team, they traced the owner of the battery and determined that the vehicle was stolen, dismantled, and sold, leading to the capture of the criminals.

*Figure 2*



## Conclusions

The incidents will continue as long as the problem that creates them persists.(!) Security units should take various steps based on the Situational Crime Prevention Theory, POP and SARA to address and prevent recurring problems, and these efforts should persist until the problem is resolved.

## References

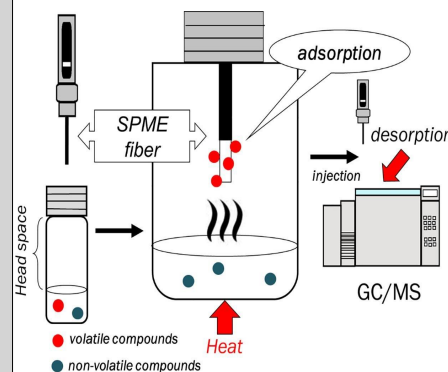
- 1- Braga Anthony A. , ' PROBLEM-ORIENTED POLICING AND CRIME PREVENTION' 2nd edition , Criminal Justice Press Monsey, New York, U.S.A. 2008  
Figür-1 Bursa Emniyet Müdürlüğü-2011  
Figür-2 Bursa Emniyet Müdürlüğü-2011

## Introduction

- Amphetamine type stimulants(ATSS) are the second most abused substances.
- Analytical methods developed to microextractionn method such as SPME that use less solvent and allow working with small volumes.
- In this study, an SPME method was developed for ATSS with commercially available fibers, and laboratory-made electrospun fibers were synthesized and successfully applied as an alternative.

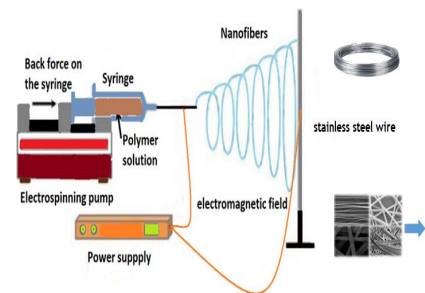
## Methods

A headspace SPME method was developed using a PDMS/DVB fiber after procedures in urine with gas chromatography-mass spectrometry(GCMS).



*Figure 1*

Polyacrylonitrile (PAN) and carbon nanotubes (CNT) nanofibers were deposited on stainless steel wire by electrospinning method.



*Figure 2*

## Results

- TFA was the most suitable derivatizing agent.
- The best results were obtained with 10 min adsorption time, 80 °C derivatization temperature and 1 min derivatization time.
- PAN-0.5% CNT fibers were applied to real samples successfully.

## Conclusions

- A simple, user-friendly, and solvent free HS-SPME method was developed.
- This method allowed simultaneous extraction of ATSS.
- New coated SPME electrospun nanofibers can be a powerful approach in terms of price, selectivity and sensitivity.



# 5F-BZO-POXIZID - A NOVEL SYNTHETIC CANNABINOID IN BULGARIA

<sup>1</sup> Forensic Toxicology Laboratory, Department of Toxicology, Military Medical Academy, Sofia, Bulgaria

<sup>2</sup> Laboratory of Biocoordination and Bioanalytical Chemistry, Sofia University "St. Kliment Ohridski", Sofia, Bulgaria

## Introduction

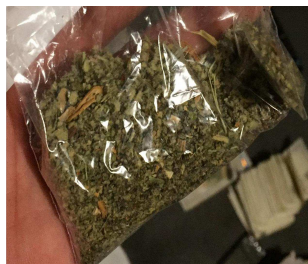
Synthetic cannabinoids (SCs) are new psychoactive substances which are distributed like intended for smoking „legal high” on the drug street market.

*Figure 1*



SCs are alternative to cannabis and possess higher binding affinity for cannabinoid receptors than THC.

## Methods



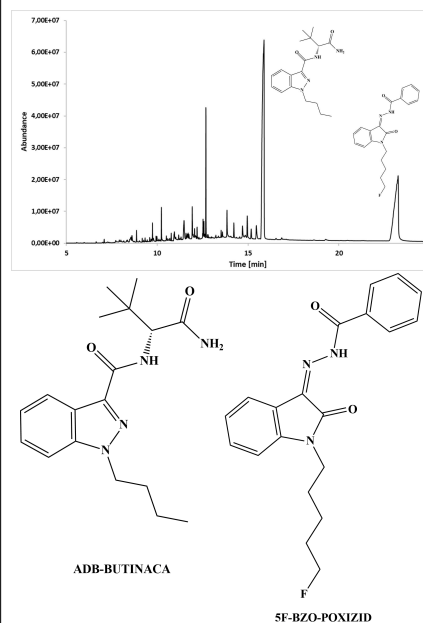
- 50 mg of herbal mixture
  - 2 mL methanol
  - vortexed for 1 min
  - sonicated for 20 min
- filtrated and evaporated to dryness
- reconstituted in 100 µL ethyl acetate
  - 1 µL analyzed by GC-MS



- Agilent 7890B / 5977A
  - DB-1701 column 30 m × 0.25 mm × 0.25 µm
  - Oven program: 50°C for 5 min, 50-290°C ramp at 30°C/min, hold at 290°C for 13 min
    - He carrier gas 2.0 mL/min flow rate
    - Injector in splitless mode
      - Front inlet - 270°C;
      - Transfer line - 250°C;
    - Ion source temperatures were - 230°C

## Results

*Figure 2*



The results from the general screening, TWO unknown synthetic cannabinoids, applied to dried crushed plant materials - 5F-BZO-POXIZID and ADB-BUTINACA.

## Conclusions

Synthetic cannabinoids are the most common new psychoactive substances distributed in Bulgaria. In many cases on the dried herbal material is applied more than one SC. In Bulgaria the most used are indole and indazole type SCs. For the first time in our practice were identified different than these two types SCs – oxoindoline (5F-BZO-POXIZID), which is not scheduled drug and different in structure form the other classes.

## Introduction

Novichok agents, or “newcomers”, became well-known after the attempted killings of Sergei Skripal (2018) and Alexei Navalny (2020).

Despite the threat they pose, there is limited data with regard to Novichok agents.

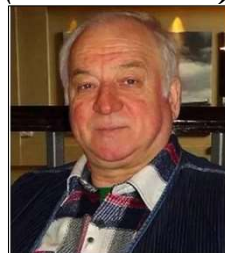
Our work aims to:

- Describe the origins of Novichok agents
- Identify the posited mechanisms of action
- Offer protocols of treatment in cases of exposure

## Methods

- Online search
- Peer-reviewed articles
- Focus on cases of Sergei Skripal and Alexei Navalny

**Fig.1: Sergei Skripal (Reuters/BBC)**



**Fig. 2: Alexei Navalny (Reuters)**



## Results

- First developed in 1970s USSR
- Thought to block AchE, necessary for acetylcholine (Ach) degradation
- Prolonged Ach action leads to seizures, coma, and death
- Current treatment protocols include:
  - antimuscarinic drugs;
  - oxime drugs;
  - neuroprotective drugs;
  - critical care

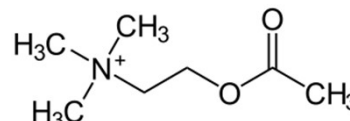
## Conclusions

Treatment developed but not consistently successful. Highly likely to be AchE inhibitors. Novichok agents will continue to be created - imperative that mainstays of treatment evolve.

## References

- A. Inrui, Y. et al. (2020) 'A theoretical study of the hydrolysis mechanism of A-234 : the suspected novichok agent in the Skripal attack', *RSC Advances*, 10(47), pp. 27884–27893.
- Alieva, L., Moffitt, J.D. and Carley, K.M. (2022) 'How disinformation operations against Russian opposition leader Alexei Navalny influence the international audience on Twitter', *Social Network Analysis and Mining*, 12(1), p. 80.
- Bauer, G. et al. (2023) 'Crime Scene Novichok – Optical Detection of Fourth-Generation Agents (FGAs) Using Handheld Forensic Light Sources', *Forensic Sciences*, 3(2), pp. 231–244.
- Carlsen, L. (2019) 'After Salisbury Nerve Agents Revisited', *Molecular Informatics*, 38(8–9), p. 1800106.
- Chai, P.R. et al. (2018) 'Novichok agents: a historical, current, and toxicological perspective', *Toxicology Communications*, 2(1), pp. 45–48.
- Cox, M.A. et al. (2020) 'Beyond neurotransmission: acetylcholine in immunity and inflammation', *Journal of Internal Medicine*, 287(2), pp. 120–133.
- Etkind, A. (2022) 'Alexei Navalny: A hero of the new time', *New Perspectives*, 30(1), pp. 19–26.
- Franca, T.C.C. et al. (2019) 'Novichok: The Dangerous Fourth Generation of Chemical Weapons', *International Journal of Molecular Sciences*, 20(5), p. 1222.
- Furlong, R. (2020) 'Less Than A Raindrop: How Much Is A "Fatal Dose" Of Novichok?', *Radio Free Europe/Radio Liberty*.
- Haslam, J.D. et al. (2022) 'Chemical, biological, radiological, and nuclear mass casualty medicine: a review of lessons from the Salisbury and Amesbury Novichok nerve agent incidents', *British Journal of Anaesthesia*, 128(2), pp. e200–e205.
- Hulse, E.J. et al. (2019) 'Organophosphorus nerve agent poisoning: managing the poisoned patient', *British Journal of Anaesthesia*, 123(4), pp. 457–463.
- Kyhoiesh, H.A.K. et al. (2021) 'Synthesis, spectral characterization, lethal dose (LD50) and acute toxicity studies of 1,4-Bis(imidazolylazo)benzene (BIAB)', *Helvion*, 7(9), p. 067969.
- Mirzayanz, V.I.S. (1995) 'Disarming the Soviet/Russian chemical weapons complex: An insider's view', pp. 21–33.
- Mukherjee, P.K. et al. (2007) 'Acetylcholinesterase inhibitors from plants', *Phytomedicine*, 14(4), pp. 289–300.
- Steindl, D. et al. (2021) 'Novichok nerve agent poisoning', *The Lancet*, 397(10270), pp. 249–252.

**Fig. 3: Acetylcholine**



# SUDDEN DEATH AFTER USE OF METHCATHINONE (EPHEDRONE) – A CASE REPORT

Rositsa Kostandieva<sup>1\*</sup>, Silviya Stoykova<sup>1,2</sup>, Stanimir Tepavski<sup>3</sup>, Vasil Atanasov<sup>1,2</sup>

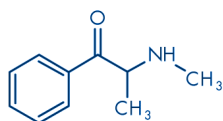
<sup>1</sup> Forensic Toxicology Laboratory, Department of Toxicology, Military Medical Academy, 3, St. G. Sofiyski Str., 1606 Sofia, Bulgaria

<sup>2</sup> Laboratory of Biocoordination and Bioanalytical Chemistry, Department of Analytical Chemistry, Sofia University "St. Kliment Ohridski", 1, J. Bourchier Blvd., 1164 Sofia, Bulgaria

<sup>3</sup> Emergency Toxicology Clinic, Department of Toxicology, Military Medical Academy, 3, St. G. Sofiyski Str., 1606 Sofia, Bulgaria

## Introduction

- Methcathinone (MCAT) is a synthetic derivative of cathinone.
- The main routes of administration of MCAT are inhalation, ingestion, intramuscular or intravenous injection.
- Main symptoms of MCAT overdose are agitation, insomnia, hyperthermia, diaphoresis, tachycardia, hypotension, abdominal pain, tremor, etc.;
- Synthetic cathinones can cause death due to multiple organ failure.



## Case description

A 16-year-old girl was admitted to the ICU in a critical condition. Several hours earlier the girl experienced sudden and severe abdominal and back pain which later aggravated throughout the body. The presenting symptoms included also recurrent vomiting, tachycardia and fever. A 3 hours and 50 minutes later the girl died of multiple organ failure.

## Methods

### Quantitative analysis of MCAT in blood/ tissues

1 mL blood	5 g tissue (liver/brain) was minced with scissors and homogenized with 2-3 mL of 0.9% NaCl solution
50 µL internal standard (AMP-d5; 5 µg/mL)	
250 µL 10 M KOH : saturated solution of NaHCO <sub>3</sub> (3:17)	1 mL 10 M KOH : saturated solution of NaHCO <sub>3</sub> (3:17)
derivatization (acetylation) with 50 µL (CH <sub>3</sub> CO) <sub>2</sub> O	derivatization (acetylation) with 500 µL (CH <sub>3</sub> CO) <sub>2</sub> O
LLE with 3 mL TBME	LLE with 6 mL TBME
centrifugation at 3000 rpm for 10 min	
evaporation of supernatant to dryness under N <sub>2</sub>	
the dry extract is then dissolved in 80 µL TBME	the dry extract is then dissolved in 100 µL MTBE
GC-MS* analysis	

\*Agilent 7890B/5977A; DB-1701 capillary column (30 m × 0.25 mm × 0.25 µm); oven T: 50°C (2 min), 50-170°C (15°C/min), 170-280°C (30°C/min), 280°C (15 min); carrier gas He - 2.0 mL/min flow rate; splitless mode; 250°C T of the front inlet; 270°C T of the transfer line; 230°C T of the ion source; 70 eV electron energy.

## Results

Sample	Concentration of methcathinone
<i>Antemortem</i> blood	2 ng/mL
<i>Postmortem</i> blood	7 ng/mL
Brain	3 ng/g
Liver	1 ng/g
<i>Antemortem</i> urine	identified
Adipose tissue	not identified
Gastric contents	not identified
Bile	not identified

### Clinical data upon admission:

GCS 15, BP 80/60 mmHg, HR 150 bpm, RR 25 bpm, SpO<sub>2</sub> 70%, BT 38,8 C

### Lab test (abnormal):

PLT 51\*10<sup>9</sup>/l, CRP 36.6 mg/l, Blood glucose 1.99 mmol/l (36,5 mg/dl), ASAT 54 U/l, Creatinine 231 µmol/l, Potassium 6,0 mmol/l, Blood pH 7.05, INR >9,5

### CT scan:

Interstitial pulmonary edema, hepatic congestion and hepatomegaly, free fluid in pelvis.

### ECG:

Vertical axis, sinus tachycardia, no repolarization abnormalities in ST segment.

## Conclusions

The clinical findings in this case overlap with MCAT use induced symptoms described in the literature.<sup>1</sup>

The quantitative results obtained cannot be interpreted unambiguously as they depend on several factors such as ongoing *postmortem* redistribution processes, elimination half-life of the drug (short  $t_{1/2}$  of the synthetic cathinones)<sup>2</sup>, time of sampling, etc. Some of the factors described above, which are important for forensic interpretation, can explain the measured low concentrations of MCAT in the biological samples here compared to those reported in fatal cases.<sup>3</sup>

## References

- Lovrecic et al., Heroin Addict Relat Clin Probl, 20(3):13-24, 2018.
- Soares et al., Arch Toxicol, 95(9):2895-2940, 2021.
- Adamowicz, Clin Toxicol (Phila), 59(3):246-251, 2021.

\*correspondence at:  
rositsa.kostandieva@gmail.com

# EVALUATION OF URINE COTININE LEVELS RELATED TO PASSIVE TOBACCO EXPOSURE BY OCCUPATIONAL GROUPS



**Ezgi Emen, Duygu Yesim Ovat, Serap Annette AKGÜR**  
*Institute on Drug Abuse, Toxicology and Pharmaceutical Science*  
*Ege University, Türkiye*



ezgi.bezcii@gmail.com

## Introduction

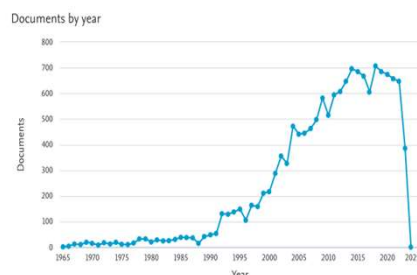
Environmental Tobacco Smoke (ETS) in the workplace can cause 433,000 deaths in workplaces each year. The most widely used biomarker to determine the level of ETS is Cotinine (COT), a nicotine metabolite.



This study aimed to compare urinary COT levels measured in studies among workers who exposed to ETS from 2008 to 2023.

## Methods

Using the terms “tobacco exposure, urine COT levels and occupation” keywords search was carried out in the ScienceDirect and

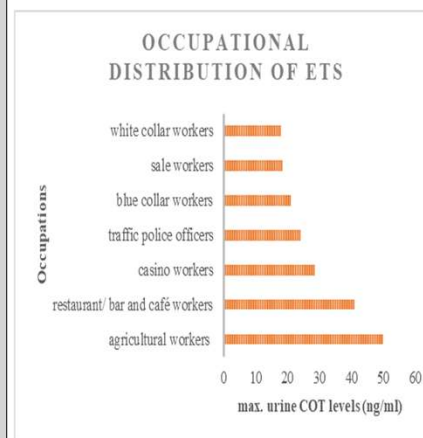


**Graph 1.** Tobacco Exposure studies distribution by year

From a large number of search results, 78 articles were selected for review and the levels of COT levels in the urine of ETS exposed individuals were viewed.

## Results

The highest level of COT in occupational groups was determined.



**Graph 2.** Occupational distribution of ETS levels (ng/ml) in workplace

Human urine COT levels were measured in the *agricultural workers*, 22-50 ng/ml.

## Conclusions

Many countries have already successfully implemented smoke-free laws for indoor public spaces and workplaces aimed at limiting exposure to ETS. There are no safe levels of exposure that employers must provide a safe environment for their employees. To prevent tobacco exposure, cut-off values and regulations should be established for the control of COT levels in the urine of occupational health.

## References

- M. B., Lee, T. S., Oh, J. E., & Lee, D. H. (2020). Does the implementation of smoke-free laws and smoking culture affect exposure to tobacco smoking? results from 3 hospitality settings in South Korea. *International Journal of Occupational Medicine and Environmental Health*, 34(1), 53–67. <https://doi.org/10.13075/ijomch.1896.01561>
- Tutka, P., Mosiewicz, J., & Wielosz, M. (2005). Pharmacokinetics and metabolism of nicotine. *Pharmacological Reports*, 57(2), 143–153.

## Introduction

The use of alcoholic beverages with 'diet' mixers is becoming more popular. There have been findings in the literature that when compared to normal mixers, they affect the pharmacokinetics of alcohol, possibly via causing faster stomach emptying. The purpose of this study was to assess breath alcohol concentrations (BrAC) and the pace of stomach emptying in healthy volunteers after consuming either sucrose-containing or artificially sweetened alcoholic beverages.

## Methods

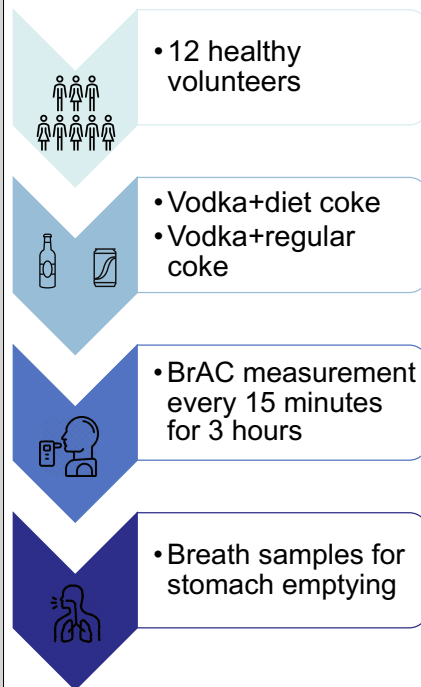


Figure 1. BrAC and gastric emptying measurements



## Results

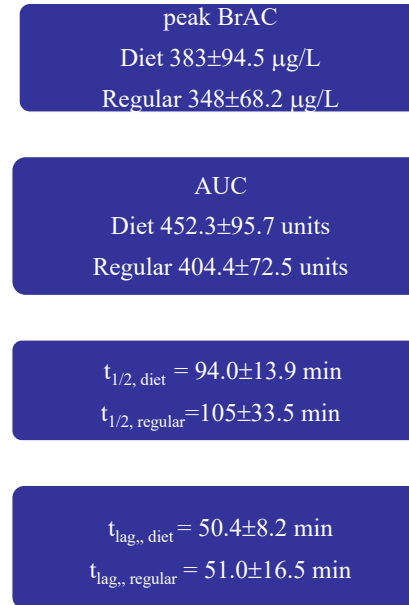
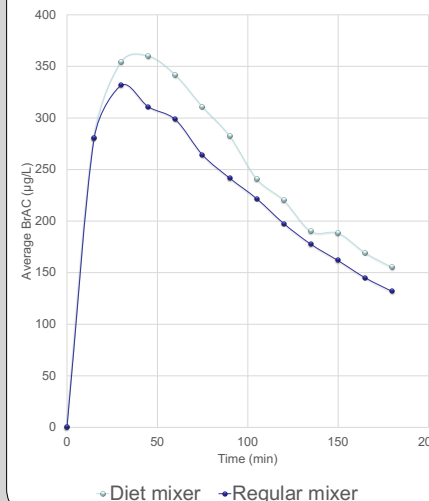


Figure 2. Average BrAC Diet vs. Regular Mixers



## Conclusions

This study emphasises the need of considering factors other than the alcohol level of a drink when determining safe quantities of intake and the potential of intoxication. The lack of sucrose in diet mixers may cause faster stomach emptying of alcohol, increasing its absorption rate into the blood, resulting in higher peak BrAC and increased exposure to other alcohol-related dangers.

## References

1. WU, K. L., CHAIKOMIN, R., DORAN, S., JONES, K. L., HOROWITZ, M. & RAYNER, C. K. 2006. Artificially sweetened versus regular mixers increase gastric emptying and alcohol absorption. *Am J Med*, 119, 802-804.
2. MARCZINSKI, C. A. & STAMATES, A. L. 2013. Artificial sweeteners versus regular mixers increase breath alcohol concentrations in male and female social drinkers. *Alcohol Clin Exp Res*, 37, 696-702.
3. HOLT, S., STEWART, M. J., ADAM, R. D. & HEADING, R. C. 1980. Alcohol absorption, gastric emptying and a breathalyser. *Br J Clin Pharmacol*, 9, 205-208.
4. KIBION 2013. IRIS® - the reliable instrument for breath test analysis. [Online]. Available: [https://www.biovendor.cz/download/6195/Letak\\_4\\_WT%208011.pdf](https://www.biovendor.cz/download/6195/Letak_4_WT%208011.pdf)
5. LION LABORATORIES. n.d. Lion Alcolimeter® SD-400 [Brochure] [Online]. Available: <http://www.lionlaboratories.com/preview/wp-content/uploads/SD-400.pdf>

## Introduction

The seeds of the cannabis plant are in contact with the leaves and as there is no adequate washing process in the production of these oils, contaminated cannabinoids can penetrate the seed oil during the pressing process.

The aim of our study is to determine the concentrations of  $\Delta$ 9-THC, THCA, CBD and CBN cannabinoids in hempseed oils produced/consumed in our country that are easily available in shops and on the internet.



**Figure 1: Hempseed oil**

## Methods



Hempseed Oils



Internal standard (THCCOOH-d<sub>3</sub>) and acetonitrile added



Samples were vortex and centrifuged



The supernatant was transferred to another tube



LC-MS/MS Shimadzu 8045

## Results

The calibration range: 0.05 to 7.50  $\mu$ g/mL. Samples above the calibration point were diluted 1/10. Extraction recovery: 74- 110.6 %.



• CBD ranged from 0.21 to 79.32  $\mu$ g/mL.



• CBN ranged from 0.07 to 6.17  $\mu$ g/mL.



•  $\Delta$ 9-THC ranged from 0.20 to 59.59  $\mu$ g/mL.



• THCA ranged from 0.07 to 25.65  $\mu$ g/mL.

**THC conc. limit** in hemp seed oil are **5  $\mu$ g/mL** in Germany and US, **10  $\mu$ g/mL** in Australia, Belgium, Canada, EIHA, New Zealand, Taiwan and Korea, and **20  $\mu$ g/mL** in Switzerland.

The results of this study show that **9 out of 19** different hempseed oils were found to be **above the conc. limit.**

## Conclusions

In Türkiye, there is a 'zero tolerance' approach to drugs, which can be summarized as criminalizing even the smallest quantities of detected illegal substances.

For this reason, it is being discussed whether the quantities detected can be given the status of "illegal substance" in a possible judicial investigation.

Based on our study, the aim is also to propose a cut-off value for  $\Delta$ 9-THC that can be found in hemp seed oils in our country.

## References

1. Citti, C., Pacchetti, B., Vandelli, M. A., Forni, F. & Cannazza, G. Analysis of cannabinoids in commercial hemp seed oil and decarboxylation kinetics studies of cannabidiolic acid (CBDA). *J. Pharm. Biomed. Anal.* 149, 532–540 (2018).
2. Jang, E. et al. Concentrations of THC, CBD, and CBN in commercial hemp seeds and hempseed oil sold in Korea. *Forensic Sci. Int.* 306, 110064 (2020).
3. Kitamura, M. et al. Cannabidiol Content and In Vitro Biological Activities of Commercial Cannabidiol Oils and Hemp Seed Oils. *Med.* 2020, Vol. 7, Page 57 7, 57 (2020).



## Introduction

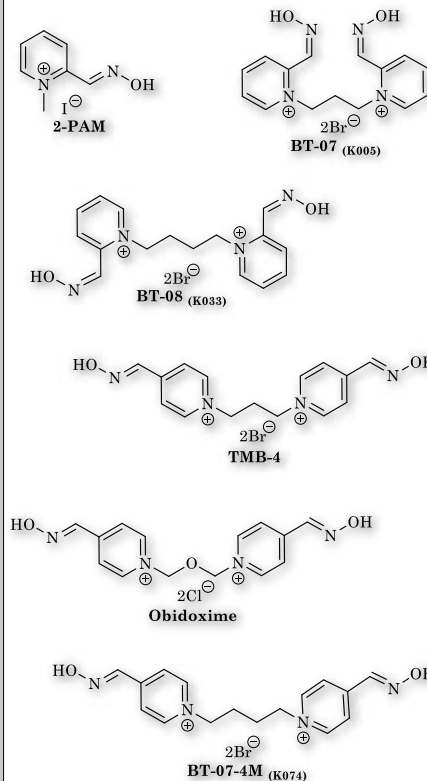
Organophosphorus compounds (OPCs) are commonly used worldwide pesticides or weapons of mass destruction (nerve agents), the latter being the most toxic representatives of the chemical warfare agents. For this reason, they are considered as a potential source of threat to the civilian population in the case of a terrorist attack. The mechanism of action of these compounds is the irreversibly inactivation of acetylcholinesterase (AChE). The standard treatment of OPCs poisoning is administration of atropine, AChE restoration therapy with oximes, and general intensive care. Despite the significant advantages in antidotal therapy of intoxications with OPCs, there are still unresolved issues especially the lack of universal reactivator for all OPCs. The coordination of metal ions with quaternary pyridinium aldoximes is a possible approach for obtaining new cholinesterase reactivators (RChE). To overcome the above mentioned shortcomings, in our laboratory a series of oxime reactivators of cholinesterase with divalent palladium ions was synthesized.

## Aim

The main goal of the present study is the *in vitro* evaluation of the reactivation potential of the newly synthesized complex species.

## Results

The experimental part of the present work is aimed to assess of the reactivation potential of newly obtained complex species of oxime reactivators 2-PAM (HL<sup>+</sup>) and BT-07, BT-08, TMB-4, Obidoxime, BT-07-4M, (H<sub>2</sub>L<sup>2+</sup>) with the ions of Pd(II) towards brain/erythrocyte AChE, inhibited by the insecticides methylparathion (MPT) and paraoxon (PO) *in vitro*, using Ellman's method.



## *In vitro* reactivation of brain-AChE (%)

RChE, inhibitor	Oxime	Complex species, containing n ions of Pd(II)	
		n = 1	n = 2
		Pd(II)	Pd(II)
2-PAM, MPT	4.02 ± 1.34	0.60 ± 0.52	-
BT-07, MPT	16.10 ± 1.18	-	0.30 ± 0.52
BT-08, MPT	24.29 ± 0.93	-	0.00 ± 0.89
TMB-4, MPT	6.41 ± 1.57	0.60 ± 0.68	-
Obidoxime, MPT	6.56 ± 0.93	0.30 ± 0.52	0.75 ± 0.52
BT-07-4M, MPT	25.34 ± 1.37	0.45 ± 0.77	0.00 ± 0.45
2-PAM, PO	42.18 ± 0.27	11.20 ± 2.30	-
BT-07, PO	40.34 ± 2.27	-	-0.15 ± 2.53
BT-08, PO	62.12 ± 0.70	-	18.10 ± 0.46
TMB-4, PO	61.66 ± 0.96	34.36 ± 1.74	-
Obidoxime, PO	62.12 ± 0.96	14.26 ± 1.62	1.38 ± 1.48
BT-07-4M, PO	61.81 ± 2.01	4.91 ± 0.70	-5.83 ± 0.46

## *In vitro* reactivation of RBC-AChE (%)

RChE, inhibitor	Oxime	Complex species, containing n ions of Pd(II)	
		n = 1	n = 2
		Pd(II)	Pd(II)
2-PAM, MPT	1.89 ± 0.60	1.19 ± 0.48	-
BT-07, MPT	12.74 ± 0.52	-	9.65 ± 0.26
BT-08, MPT	13.48 ± 0.31	-	11.54 ± 0.06
TMB-4, MPT	0.40 ± 0.30	0.65 ± 0.31	-
Obidoxime, MPT	0.35 ± 0.31	0.50 ± 0.23	0.70 ± 0.30
BT-07-4M, MPT	13.58 ± 0.38	11.14 ± 0.60	5.02 ± 0.45
2-PAM, PO	16.64 ± 0.71	4.96 ± 0.18	-
BT-07, PO	17.26 ± 0.93	-	-0.10 ± 0.31
BT-08, PO	64.96 ± 0.95	-	53.49 ± 1.25
TMB-4, PO	48.17 ± 0.78	9.77 ± 0.65	-
Obidoxime, PO	34.63 ± 0.71	14.47 ± 0.71	6.05 ± 0.39
BT-07-4M, PO	57.73 ± 0.86	36.85 ± 0.76	18.86 ± 0.24

## Discussion

In the context of the results obtained, it should be summarize that the activity of Pd(II)-containing aldoximes is reduced compared to parent ligands. This can probably be explained in terms of an interaction between the metal(II) ions and the formed oximates, which is sufficiently stable and "blocks" the action of the reactivators. But, it has been agreed that the oxime compounds demonstrating in *in vitro* reactivation experiments activity higher than 10% should be subjected to additional antidote efficacy studies.

## Conclusions

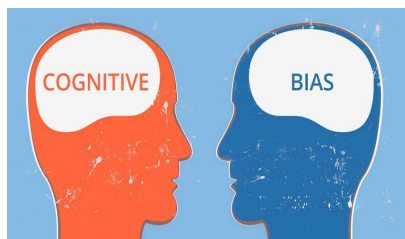
The activity of uncoordinated oximes and their Pd(II)-containing modifications was studied against AChE inhibited by the organophosphorus pesticides MPT and PO. *In vitro* experiments have shown that the aldoximes are most effective in restoring the action of PO and are less effective in case of MPT. The obtained results can serve as a solid basis for continuing the research work. The studied target coordination compounds may find a place in the clinical practice of OPCs poisoning.



## Introduction

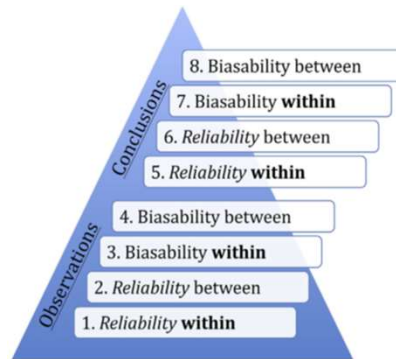
People tend to think in certain ways that can lead to systematic deviations when making rational decisions. Cognitive biases affect the way we think and act and are seen as a major threat to an error-free profession such as forensic science [1-4].

In this study, it is aimed to discuss the place and importance of cognitive bias in forensic sciences, which can be based on information processing shortcuts, limited processing ability of the brain, emotional and moral motivations, deterioration in storing and retrieving memories or social effects.



## Methods

The current studies of Dr. Itiel Dror, who has important studies in the examination of cognitive biases in forensic sciences, and the guidelines prepared for the precautions to be taken in various countries for the prevention of cognitive biases were researched.



**Figure 1.** Dror IE. A hierarchy of expert performance. *J Appl Res Mem Cogn.* 2016;5(2):121-127.



**Figure 2.** Itiel E. Dror (2017): Human expert performance in forensic decision making: Seven different sources of bias, *Australian Journal of Forensic Sciences*

## Results

A number of tools and methods are considered to minimize bias. Some of these tools have already been implemented in several criminal laboratories and are specifically designed to protect and enhance the independence of mind of forensic scientists whose decisions are based on subjective judgment. For example; appoint case managers to avoid contextual bias by protecting the reviewer from exposure to non-task-related information, May limit the number of changes allowed after exposure to reference materials - only limit analysts to a certain number of changes. Itiel E. Dror developed HEP-Hierarchy of Expert Performance (Fig. 1) and LSU-Linear Sequential Unmasking (Fig. 2) approaches to prevent cognitive biases in forensic science. A similar approach was incorporated to the undergraduate and graduate education curricula at the Forensic Science programmes of Uskudar University.

## Conclusions

For many years it was thought that forensic scientists were unbiased, unaffected by contextual information, and even infallible. With the integration of the concept of cognitive bias into forensic sciences, this idea has lost its effect. And various studies have been carried out to minimize cognitive biases all over the world.

Forensic investigators should work from evidence to suspect, not from suspect to evidence. Otherwise, the experts conduct their examination on the suspect, not by the evidence, and causes a biased examination by looking for the suspect in the evidence.

## References

1. Seteavenage S, Bennet A. A biased opinion: Demonstration of cognitive bias on a fingerprint matching task through knowledge of DNA test results. *Forensic Science International.* 2017;93-106.
2. Drod I. A Hierarchy of Expert Performance. *Journal of Applied Research in Memory and Cognition.* 2016;121-127.
3. Dror I. Human expert performance in forensic decision making: Seven different sources of bias. *Australian Journal of Forensic Sciences.* 2017; 49(5).
4. Forensic Science Regulator, 'Guidance Cognitive Bias Effects Relevant to Forensic Science Examinations FSR-G-217 Issue 1 (Englands, 2015).