

α-Pyrrolidinoisohexanophenone (α-PiHP) in three fatal cases

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Introduction

The New Psychoactive Substances (NPSs) are widely spread worldwide through the illicit markets and are increasingly the cause of intoxication deaths. Alpha-pyrrolidinoisohexanophenone (α-PiHP) (figure 1.) is a positional isomer of α-pyrrolidinoisohexanophenone (α-PHP) (figure 2.) and has been reported for the first time in 2016 at seized materials in China. Both substances are pyrovalerone derivatives from the synthetic cathinones group, and mainly exert cardiovascular, psychological, and neurologic effects. In addition, as published in literature and regardless of their isomerism, both cathinones can appear separately or together in a mixture. This work presents 3 fatal cases associated with the consumption of α-PiHP and/or α-PHP, analysed in the Forensic Chemistry and Toxicology Laboratory of the Centre Branch (Coimbra) of the National Institute of Legal Medicine and Forensic Sciences.

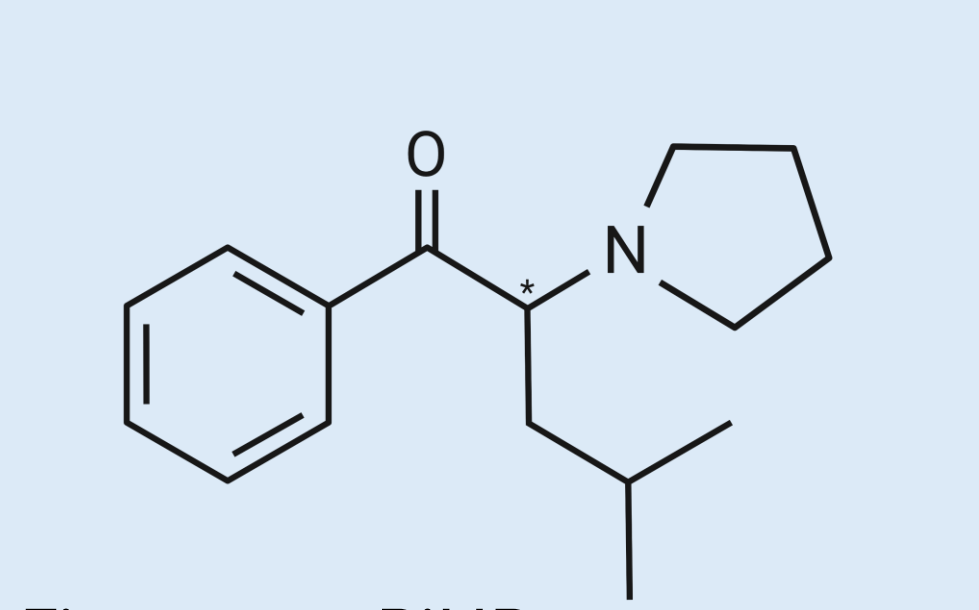


Figure 1. α-PiHP.

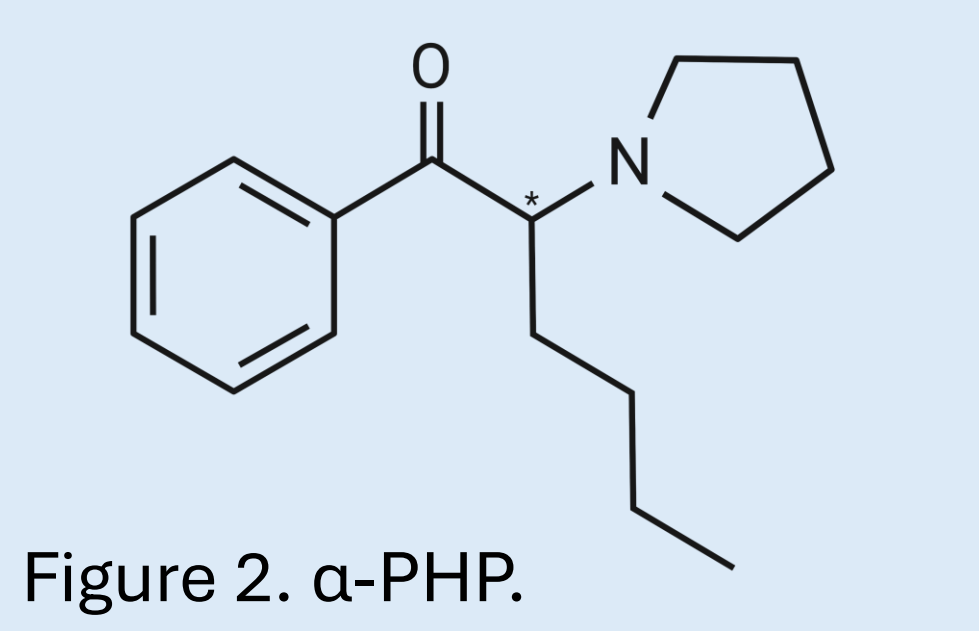


Figure 2. α-PHP.

Material and Methods

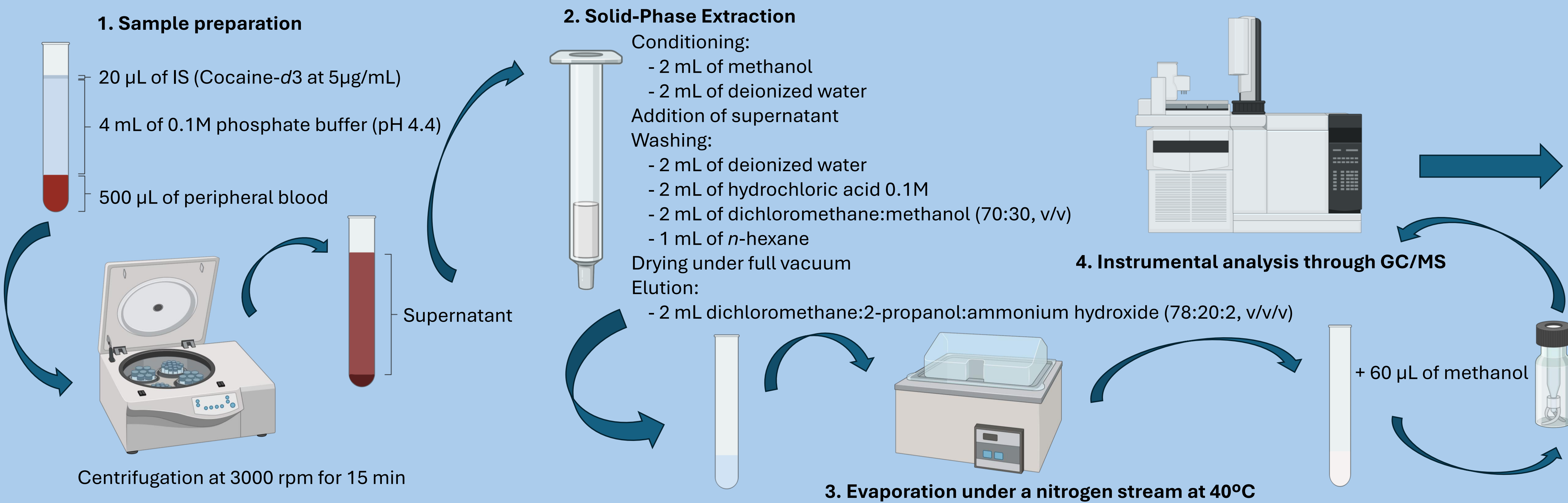


Table 1. Monitored ions.

Substances	Ions
α-PiHP	140
	98
	77
α-PHP	140
	105
	77
IS	185

Results and Discussion

Cases	Gender Age	Case information	α-PiHP	α-PHP	Other substances detected	Additional Data
Case 1	Male 41	Drug user, mostly of “bloom”. Suicide by hanging: mechanical asphyxia.	Detected/ Confirmed	Not Detected	Tramadol; Fluoxetine; Diazepam; Nordiazepam; Cyamemazine; Olanzapine; Paliperidone; Risperidone.	-
Case 2	Male 32	Synthetic drugs addict. A sample of “weed” was collected next to the corpse.	Detected/ Confirmed	Not Detected	Cocaine, benzoylecgonine and ecgonine methyl ester; Delta-9-tetrahydrocannabinol and 11-nor-9-carboxy-delta-9-tetrahydrocannabinol; Phenacetine; Morphine; Paracetamol; Alprazolam; Nordiazepam; Sertraline; Mirtazapine.	In the “weed” sample were detected several cannabinoids (cannabicyclol, cannabichromene, cannabidiol, cannabidivaryl, cannabigerol, cannabinol, delta-9-tetrahydrocannabinol, delta-8-tetrahydrocannabinol and tetrahydrocannabivarin), nicotine and α-PiHP.
Case 3	Male 58	Synthetic drugs addict. Admitted to the emergency unit in a state of coma, ending up dying through cardiorespiratory arrest secondary to poisoning by an unknown substance.	Detected/ Confirmed	Detected/ Confirmed	Paracetamol	-

Conclusions

With the three cases presented in this work, we can conclude that the search for NPSs in biological and non-biological specimens plays an important role, especially in cases of drug-related deaths. The concomitant use of traditional drugs of abuse, prescription medication, α-PHP and α-PiHP, either separately or in combination, increases the possibility of a fatal intoxication since both substances have a high toxic potential.