From Narcotics Case Files

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ABSTRACT: This paper reported several unusual encounters over the years in the Narcotics Sections of Department of Chemistry. The first case reported a court case that led to amendment of definition opium poppy and raw opium in the Dangerous Drugs Act. The second case reported our encounter with condom-liked packets following a surgical operation of a man suffering from severe abdominal pain, suspected to be controlled substances recovered from a body, which was subsequently identified as iguana eggs. The last case reported our experience with black gummy substance suspected to be opium which was encountered twice in our laboratories. These cases delineate the unusual side of the work with drug cases in our laboratories.

Keywords: narcotics, opium, controlled substance

Introduction

In Malaysia the Narcotics Section at Petaling Jaya and branch laboratories examine all the drug cases submitted by law enforcement agencies for prosecutorial and investigative purposes. In this paper, we relate several unusual encounters over the years.

1. *Papaver somniferrum L* vs *Papaver setigerum DC*

Raw opium smuggling was rampant in the 70's and 80's with most of this drug coming through the border in the north of Peninsular Malaysia. Nearly all cases were handled by the laboratory of Department of Chemistry branch in Penang since most of the arrests were made near the border and in the northern states of Penang, Perlis and Kedah. Raw opium was trafficked mostly in multiple 2-kilogramme packages, wrapped with layers of rice paper and plastic sheets. The presumptive weight for trafficking in raw opium is one kilogramme which carries the death penalty on conviction.

In 1984, an issue arose in the Kangar High Court over a raw opium trafficking case when the chemist of Department of Chemistry was asked whether he had ascertained that the raw opium was derived from the species *Papaver somniferrum L.* (PSL) and not from *Papaver setigerum D.C.* (PSDC). Note that at that time, the Malaysian law was explicit that only raw opium from PSL was illicit as the Malaysian Dangerous Drugs Act (1952) then defined "opium poppy" as

> "a plant of the species *Papaver somniferrum L* or the species *Papaver setigerum D.C.* and any plant from which morphine may be produced"

and "raw opium" as

> "the spontaneously coagulated juice obtained from the plant *Papaver somniferrum, L.*, which has not undergone the process necessary to convert it to medicinal opium, whatever its content of morphine".

Although it had been reported that PSDC was not known to be a source of raw opium, whether licit or illicit, the chemist in the eyes of the court could not convincingly answer the question based on the analytical tests carried out at that time [1, 2]. A literature search revealed that Japanese scientists had profiled the alkaloidal contents of PSL and PSDC and had shown that they are actually distinct [3]. Based on this literature finding, the Department of Chemistry Malaysia informed the prosecutorial authorities and the High Courts that the laboratory could carry out an alkaloid profiling to determine the source of the questioned raw opium. As a result, all the raw opium evidence had to be profiled to determine if it had come from PSL and all raw opium cases awaiting trial at the High Courts had to be returned to the laboratory for retesting. A total of 100 raw opium samples from both the fresh cases and the returned evidence were therefore profiled on their codeine, morphine, thebaine, papaverine and noscapine contents using a packed column Gas Chromatography method with amitriptyline as the internal standard [4, 5]. A brief

of the procedure and results of analysis of these raw opium samples is as follows:

i) *Equipment:* Perkin Elmer F11 Gas Chromatograph equipped with a FID and a Hewlett Packard 3390A integrator.
ii) *Column:* Glass column 2mx2mm i.d. containing a packing of 3% OV-1 on 100-120 mesh Supelcoport.
iii) *Temp. programme*: 230°C to 280°C at a rate of 5°C/min. and held at the final temp. for 3 minutes.
iv) *Internal standard:* Amitriptyline HCl (Roche); morphine standard (MacFarlan Smith), all other alkaloid reference standards from Sigma.
v) *Analysis:* Representative samples (ca. 2 g) were dried at 100 °C for 3 h. The dried samples were ground to a fine powder using a mortar and pestle. Duplicate samples (0.5 g) were each extracted with 25 mL of methanol-chloroform (1:1) by ultrasonication for 15 mins. 1 mL of this solution was mixed with 1 mL of the internal standard solution (0.60 mg/mL of amitryptyline HCl). The five principal alkaloids were quantitated simultaneously against a standard solution containing a mixture of the alkaloid reference standards.
vi) *Summary of Results:*

Component	Mean	Range
Moisture	27	15 - 39
Codeine	2.5	1.6 - 4.2
Morphine	11.5	6.4 - 17.4
Thebaine	3	1.6 - 5.3
Papaverine	0.44	0 - 1.2
Noscapine	6.2	2.1 - 9.6

Alkaloid profile of the 100 raw opium samples (w/w %, dry basis)

In September 1984, the definition of "opium poppy" and "raw opium" were amended to obviate the chemist's task of profiling. This amendment via Act A596 now reads:

> "opium poppy" means *any plant from which morphine may be produced*;

and

> "raw opium" means *the coagulated juice obtained from any plant from which morphine may be produced, whatever its content of morphine and in whatever form the coagulated juice is, but does not include medicinal opium*.

A recent work [6] provided further proof that the chemists from the laboratory of Department of Chemistry branch in Penang had not erred in their contention that the raw opium had indeed been derived from PSL.

2. The Night of the Iguana

In the middle of a night, a man in extreme distress and with severe abdominal pain was rushed to the hospital. A surgical operation was performed but when he awoke from the operation, he found that he had landed in serious trouble with the law - the doctor had recovered three condom-like packets from his gastrointestinal tract and alerted the police. Two of the packets appeared to have ruptured while the third one remained intact (**Fig. 1**). He was held in custody while the three packets were sent to the Department of Chemistry to ascertain if they contained controlled substances.

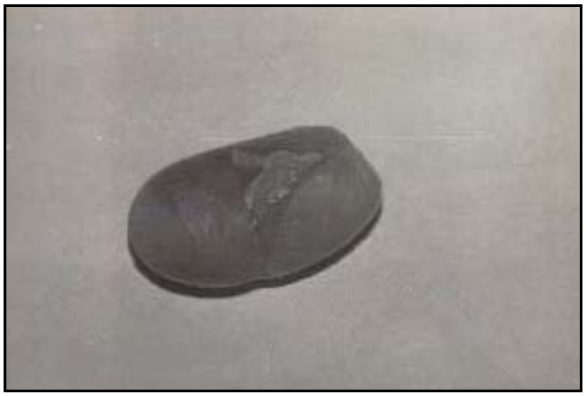

Fig. 1: One of the 3 packets recovered from the gastrointestinal tract of the man

Quick screening tests were negative for common controlled substances encountered in our laboratories. It was also observed that the surface of the packets had background lines appeared to be fine blood vessels. When the initial findings were relayed to the investigating officer, the chemist was informed that the man had related the source of his misfortune:-

The afternoon previous to the incident, he had been urged by a friend to swallow three immature iguana eggs with a Guinness Stout® drink to improve his sex life. For comparison purpose, the chemist from our laboratory purchased some specimen of immature iguana eggs (**Fig. 2**) from the same vendor at Sentul market.

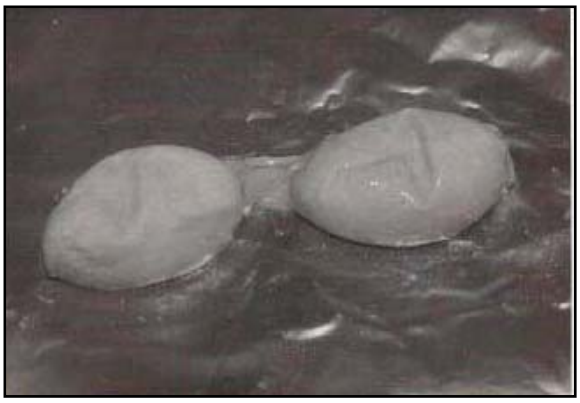

Fig. 2: Two specimen immature iguana eggs purchased from the market

It was found that the three condom-like packets physically resembled the specimen. Both consisted of a tough elastic outer layer with a homogenous dough-like mass inside. The eggs might have been too tough to digest or caused a gastrointestinal blockage.

3. I can't believe it's not opium!

In 2008, the Alor Setar branch laboratory of Department of Chemistry received a case comprising some black gummy substance suspected to be opium. The substance had very similar physical appearance and odour of prepared opium (**Fig. 3**).

Fig. 3: The opium-like black sticky substance (2008)

To the great surprise of the analyst, all screening tests were negative; TLC and GC-MS failed to detect any opium alkaloids. Instead, the GC-MS analysis showed a major peak (RT=21.788, **Fig. 4**) which its mass spectrum matched aloe-emodin from the mass spectral library (**Fig. 5**).

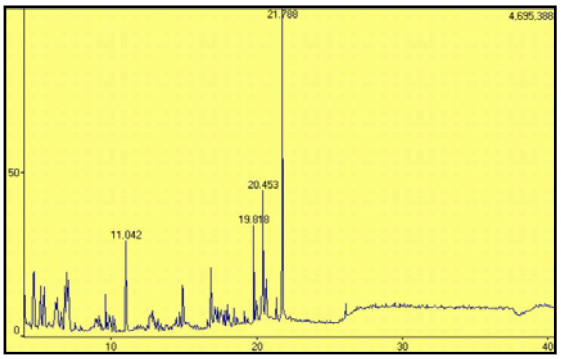

Fig. 4: GC-MS chromatogram of opium-like substance with the peak at RT=21.788 min

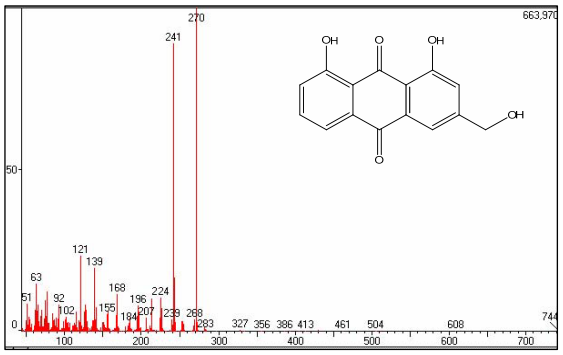

Fig. 5: Mass spectra of the peak eluted at 21.788 min matched the library spectrum of aloe-emodin

Merck Index indicates that aloe-emodin (Molecular structure as in Figure 4, right) occurs in the free state and as a glycoside in Rheum (rhubarb), in senna leaves and in various species of Aloe (Liliaceae) [7]. It is freely soluble in hot alcohol, in ether, in benzene with yellow colour, in ammonia water and in sulfuric acid with crimson colour [7]. This compound has been reported to have antitumor, genotoxicity, antioxidation, and antibacterial effects [8, 9] and can be used as laxative. The substance was suspected to be derived from the sap of the Aloe plant; however, this could not be confirmed due to the lack of an authenticated sample and literature data.

About 30 years earlier, the Penang branch laboratory of Department of Chemistry had encountered a similar case in which several large tins of an opium-like substance were seized from an abandoned boat thought to have come from Myanmar (Burma). Screening tests and TLC ruled out the presence of opium (Note that GC-MS was not available then). A hint to the identity of the substance came from a note in the cabin which bore the word "aloes".

Conclusion

We report some of the rare encounters over the years in our narcotics laboratories. These unusual experiences undoubtedly make our life as chemists more colourful besides performing routine narcotics laboratory analysis.

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