COCAINE SAMPLES SEIZED IN SLOVENIA IN THE PERIOD FROM SEPTEMBER 2008 TO JANUARY 2010 – AN OVERVIEW

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INTRODUCTION:

The purpose of this research was to quantify cocaine and major adulterants content in a total of 308 cocaine samples seized in Slovenia. Qualitative and quantitative analyses were performed on an Agilent 1100 HPLC instrument with diode array detector.

Experimental part

Sampling procedure:

If one seizure consisted of a considerable population of samples identical in mass and appearance, only an average sample was analysed. For each average sample the mean weight per packet was calculated by dividing its total weight by number of packets

EXPERIMENTAL PART

Sample preparation
Homogenized cocaine street samples were accurately weighted (approx. 600-800mg) into 2-ml screw micro tubes and dissolved in 1ml of aqueous acid (10 mmol ortho-phosphoric acid) using an ultrasonic bath for 5 min. If the obtained analytical result was outside the calibration range, the sample was prepared and measured again. Sample weight was adjusted appropriately. Filtration prior to injection was necessary (Spartan 13 / 0,2µm RC; Whatman).

Calibration
Quantitative determinations of cocaine and selected additives were performed on the basis of the peak areas using the external standard method. Calibration solutions were prepared by dissolving appropriate amounts of standard substances in 1 ml of 10 mmol ortho-phosphoric acid. Five-point calibrations, for the concentration range from 30 to 600 µg/ml, were performed.

Instrument	HPLC Agilent Series 1100
Column	Zorbax XDB-C18, 4.6 mm x 50 mm x 1.8 µm
Column temperature	40 °C
The mobile phases	A: 5ml of 85% H_3PO_4 + 0.56 ml of hexylamine per 1000ml of water B: 5ml of 85% H_3PO_4 + 0.56 ml of hexylamine per 1000ml of acetonitrile-water (9:1; v/v) Timetable Time (min) solvent B 0 0 8.5 28.8 10 35.7
Flow rate	2 ml/min
Injection volume	10 µl
The detection wavelength	210 nm

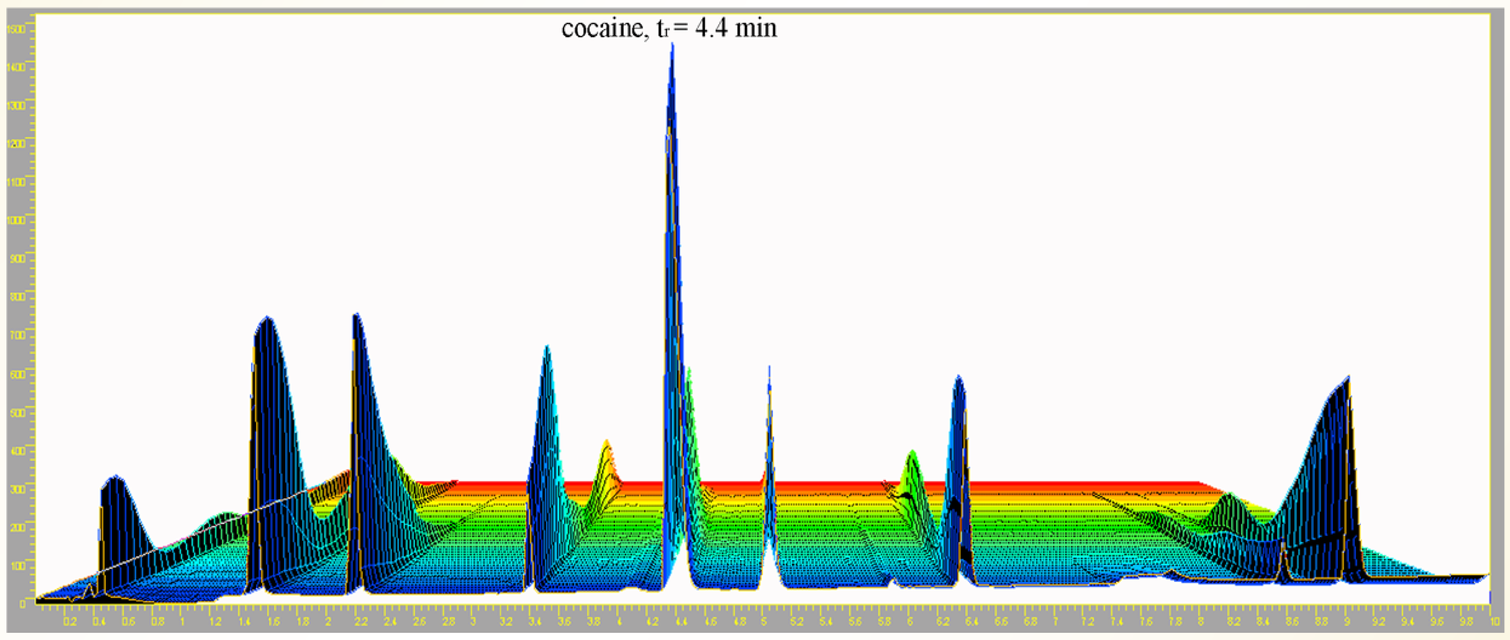

Fig. 1: Chromatogram of a adulterated cocaine sample

Summary of statistical research of cocaine samples in the period September 2008 – January 2010. The sample size was 308.

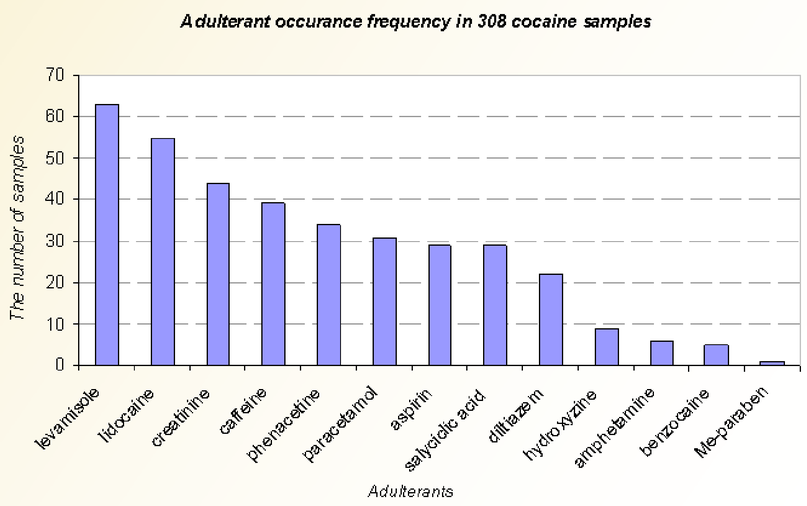

Fig. 2: Presence of adulterants (%) in analysed samples

Adulterants	average (%)	max (%)	min (%)
levamisole	2,0	13,9	1,0
lidocaine	10,6	54,0	0,1
creatinine	26,6	79,0	1,3
caffeine	2,9	30,9	0,1
phenacetine	23,5	95,0	0,1
paracetamol	10,5	44,0	0,1
aspirin	n.c.	n.c.	n.c.
salyciclic acid	n.c.	n.c.	n.c.
diltiazem	1,1	6,2	0,1
amphetamine	0,4	0,5	0,2
hydroxyzine	3,7	7,4	1,2
benzocaine	0,3	0,4	0,2
Me-paraben	n.c.	n.c.	n.c.

n.c. - not calculated

Table 1: The concentration ranges of contents of adulterants (w/w; %) in cocaine samples

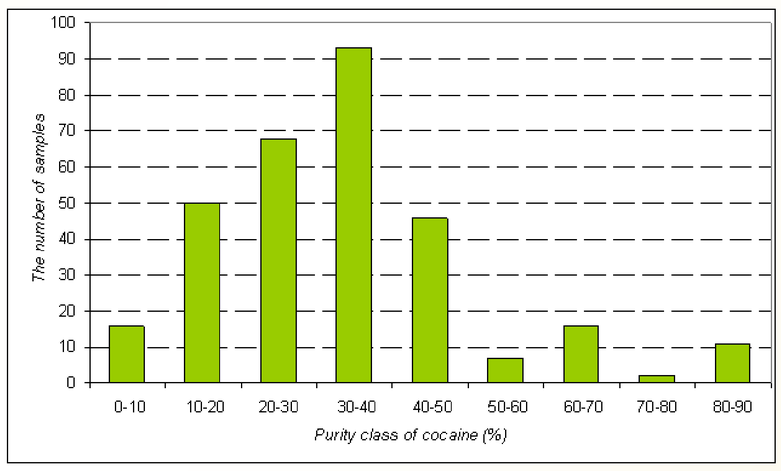

Fig. 3: The frequency distribution of cocaine purity. Purity class 10 refers to the frequency interval 1-10% (etc.)

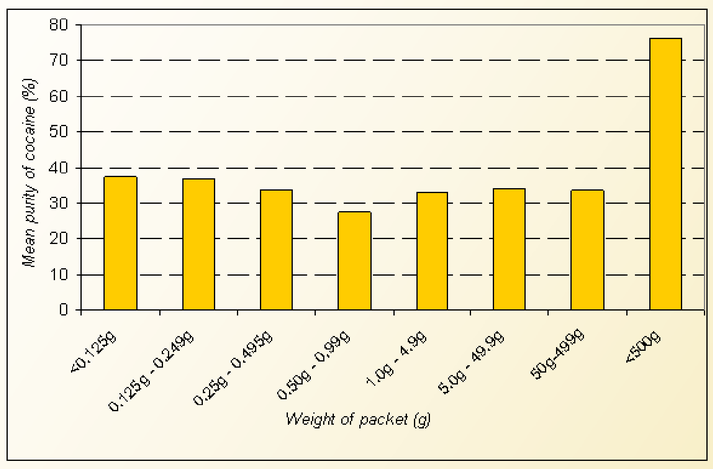

Fig. 4: Purity of cocaine by mean weight of packet

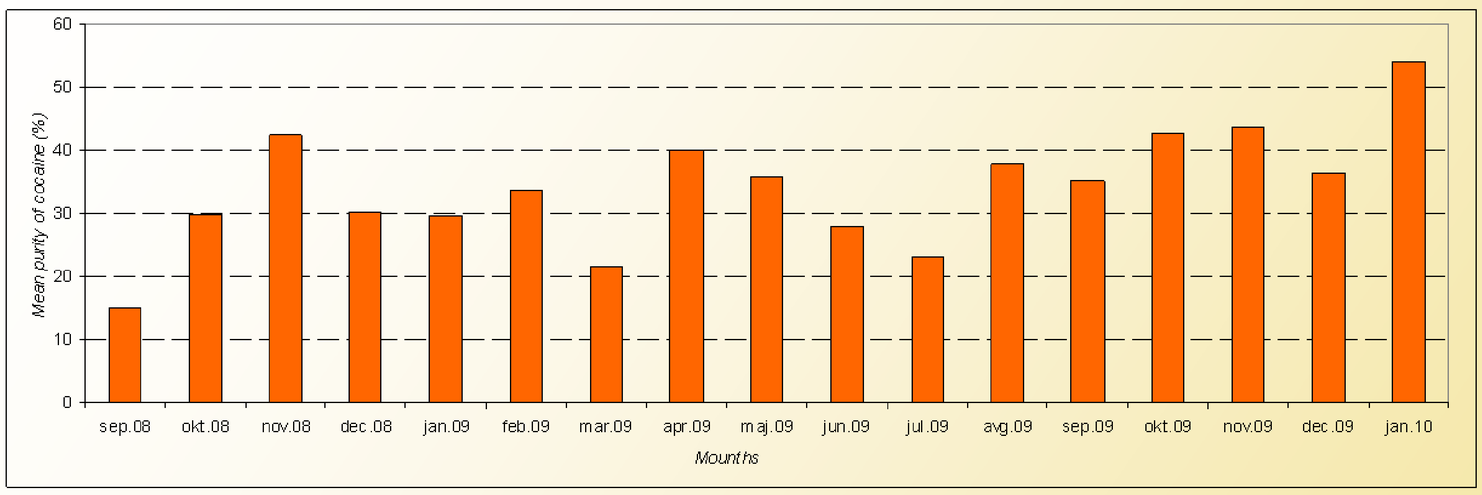

Fig. 5: Purity of cocaine in the period September 2008 – January 2010

CONCLUSION:

- **A purity of cocaine ranged from 2.1% to 87.5%, with an average of 33.3% (expressed as the concentration of cocaine base).**
- **During the entire period, the positive trend of the cocaine purity was observed.**
- **The adulteration of the samples was approximately equally from the street level till 500 g of packet weight.**
- **Levamisol proved to be adulterant that was most frequently encountered in cocaine samples (20.5%, i.e in 63 of 308 samples).**
- **The other most common adulterants in cocaine were lidocaine, creatinine, caffeine, phenacetin, paracetamol and as well aspirin and salyciclic acid. The latter compound was most likely originated as a hydrolysed product of aspirin.**
- **Samples were diluted by phenacetin in a wide range (from less than 1% to 95%).**

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** involved in sample preparation

ENFSI DWG MEETING, SLOVENIA, BLED 2010