

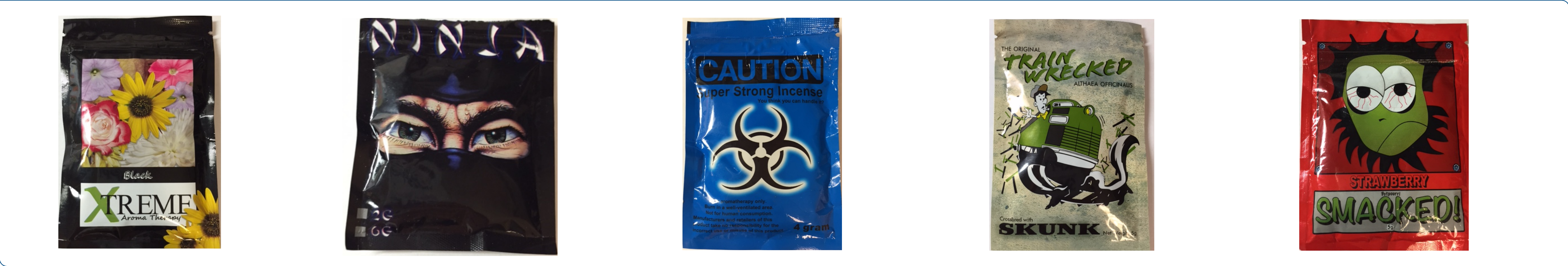
The “K2” Epidemic: Preliminary Results of a Health Department’s Synthetic Cannabinoid Receptor Agonist (SCRA) Surveillance Project

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Figure 1. “K2” Packets



BACKGROUND:

- SCRA’s are popular novel drugs of abuse
- Despite their banning, use has skyrocketed in the US
- In 2015, there was a rise in the number of emergency visits associated with suspected SCRA use¹
- The clinical presentations of these patients vary

HYPOTHESIS:

- We hypothesize that the clinical effects of a specific SCRA are predictable based on the SCRA

METHODS:

- ED patients reporting “K2” use with SCRA toxicity were identified *via* New York City Poison Control Center (NYC PCC) calls from May to November 2015
- Subjects in possession of suspected SCRA product(s) who had blood and urine specimens obtained and clinical features reported were included
- Blood, urine, and product samples were linked along with clinical effects in a de-identified fashion
- Specimens were stored and shipped at -20°C to an independent laboratory for analysis
- The products were analyzed by GC-MS
- The biological samples were analyzed by LC-MS-ToF and LC-MS/MS
- This ongoing public health surveillance investigation was approved by the NYC Department of Health and Mental Hygiene

RESULTS:

- In this preliminary report, six products and seven biological results from 10 patients were available for analysis
- SCRA’s found in products (Figure 3) included: NM2201 (N=1), MAB-CHMINACA (N=2), XLR11 (N=2), AMB (N=1), AB-CHMINACA (N=1), and MDMB-FUBINACA (N=1), with some products having more than one SCRA identified

RESULTS CONTINUED:

- SCRA’s found in biological specimens included: MAB-CHMINACA, MAB-CHMINACA metabolites, and AMB-CHMINACA metabolites
- Not all SCRA’s found in products could be identified in corresponding patient biological specimens
- Some SCRA’s found in biological specimens were not found in corresponding products
- In patients with confirmed MAB-CHMINACA alone in biological specimens (N=4), one had agitation and three presented with central nervous system (CNS) depression (Table 1)
- CNS depression (N=1), delirium (N=1), and seizure (N=1) were reported in patients with biological confirmation of AB-CHMINACA alone (Table 1)

DISCUSSION:

- Preliminary data from this health department investigation identified multiple SCRA’s in products and biological specimens
- Clinical effects varied from sedation to agitation in patients with the same SCRA’s
- This variability may result from dose-dependent effects, individual host factors, or co-exposures

LIMITATIONS:

- Not all suspected SCRA’s or their metabolites can easily be identified in biological specimens
- It is unclear if the products carried by patients were the exact products used
- Some of the clinical effects may be due to coingestions that were unreported by the patients or bystanders and not found on clinical evaluation

CONCLUSIONS:

- SCRA’s identified in packaged materials were primarily analogs of the most recent amino acid-based (‘INACA’) subclass
- Metabolites of forensically identified SCRA’s were detected and confirmed in 17 of the 32 samples
- The toxicity associated with a specific SCRA is unpredictable based on this preliminary data

Figure 2. Parent SCRA’s, metabolites, and degradants detected in blood and urine specimen

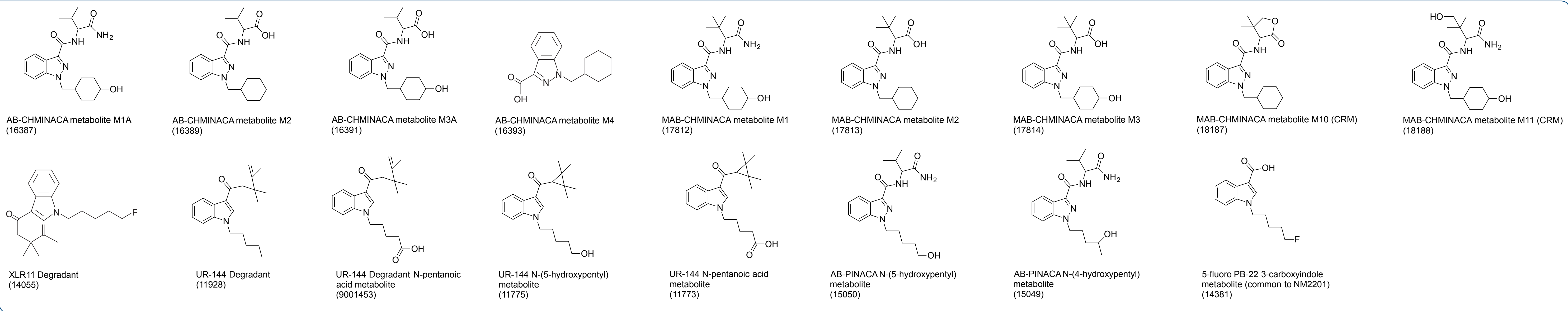


Table 1. Clinical signs with confirmed MAB-CHMINACA or AB-CHMINACA

SCRA	CNS Depression	Delirium	Agitation	Seizure
MAB-CHMINACA	✓✓✓		✓	
AB-CHMINACA	✓	✓		✓

✓ Represents a patient with the reported sign/symptom indicated

Figure 3. SCRA’s detected in “K2” products

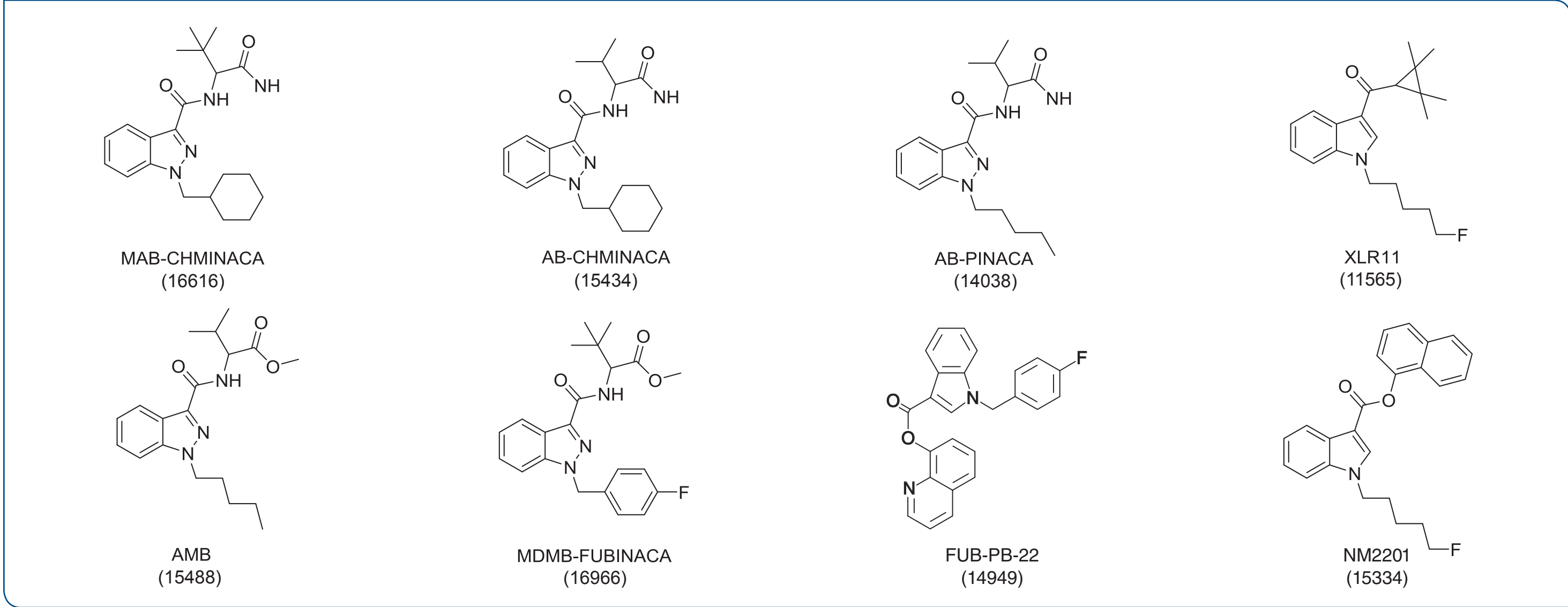


Table 2: Results table of selected examples

NY CASE NO.	CLINICAL SAMPLE NO.	LINKED TO FORENSIC SAMPLE NO.	DESCRIPTION	FORENSIC RESULT	MATRIX	SYNTHETIC CANNABINOID LC-MS/MS CONFIRMATION RESULTS (NG/ML)
010 NYC	2015-C025	F021	Kick Plant Feeder	AB-CHMINACA	blood	AB-CHMINACA metabolite M1A (2.1), AB-CHMINACA metabolite M2 (8.1)
	2015-C026				urine	AB-CHMINACA metabolite M1A (20.7), AB-CHMINACA metabolite M3A (22.4)
011 NYC	2015-C027	F022	Sofa King Amazing	AB-CHMINACA	blood	MAB-CHMINACA (2.1), AB-CHMINACA metabolite M1A (2.0), AB-CHMINACA metabolite M2 (10.1), MAB-CHMINACA metabolite M1 (9.1), MAB-CHMINACA metabolite M11 (4.7), UR-144 N-pentanoic acid metabolite (2.8)
	2015-C028				urine	AB-CHMINACA metabolite M1A (8.3), MAB-CHMINACA metabolite M1 (41.3), MAB-CHMINACA metabolite M3 (37.6), MAB-CHMINACA metabolite M11 (107.4)
012 NYC	2015-C029	F023	DAFUQ	AB-CHMINACA	blood	AB-CHMINACA metabolite M1A (3.9), AB-CHMINACA metabolite M2 (27.0)
	2015-C032				urine	AB-CHMINACA metabolite M1A (16.5)
014 NYC	2015-C035	F025 & F026	Green Giant, Xtreme Aroma Therapy	FUB-PB-22 (F025) & NM2201 (F026)	blood	FUB-PB-22, AB-CHMINACA metabolite M1A (4.3), AB-CHMINACA metabolite M2 (29.8), AB-CHMINACA M3A metabolite (4.5), MAB-CHMINACA metabolite M1 (1.4), MAB-CHMINACA metabolite M11 (0.57)
	2015-C036				urine	AB-CHMINACA metabolite M1A (65.5), AB-CHMINACA metabolite M3A (74.9), 5-fluoro PB-22 carboxyindole metabolite (15.9)
015 NYC	2015-C037	F027	Train Wrecked	MDMB-FUBINACA	blood	none detected
	2015-C039				urine	none detected
016 NYC	2015-C040	F028	Blue Mixx Cigarillos	Negative	blood	AB-PINACA (0.06), PB-22 (0.01), XLR11 Degradant (0.31), AB-CHMINACA metabolite M1A (5.4), AB-CHMINACA metabolite M2 (71.7), AB-CHMINACA metabolite M3A (4.9), UR-144-N-(5-hydroxypentyl) metabolite (0.6), UR-144 N-pentanoic acid metabolite (4.2)
	2015-C042				urine	AB-CHMINACA metabolite M1A (24.2), AB-CHMINACA metabolite M4
017 NYC	2015-C043	F029 & F030	Ice Dragon	MAB-CHMINACA (F029)	blood	MAB-CHMINACA (11.4), XLR11 Degradant (0.11), AB-CHMINACA metabolite M1A (2.3), AB-CHMINACA metabolite M2 (11.6), MAB-CHMINACA metabolite M11 (8.6)
	2015-C044				urine	AB-CHMINACA metabolite M1A (15.7), AB-CHMINACA metabolite M3A (11.9), MAB-CHMINACA metabolite M1 (40.2), MAB-CHMINACA metabolite M3 (37.9)