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## Strox (Novel Synthetic Cannabinoids) in Egypt: Medical and Legal Challenges

الستروكس (القنب المصنع الجديد) في مصر: تحديات طبية وقانونية

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### Abstract

Besides traditionally abused substances, the use of novel synthetic cannabinoids (SCs) emerged in Egypt a few years ago. Strox is a popular synthetic cannabis in Egypt that consists of smokable herbal products laced with unidentified synthetic cannabinoids. Unfortunately, threats from the escalating use of Strox in Egypt are increasing, which is a challenge for medical and legal systems. Acute Strox intoxication manifested by acute toxic psychosis and severe cases could develop cardiovascular instability and fatal coma. Strox-related toxicity could be attributed to THC analogs and anticholinergic agents along with the presence of additives such as ketamine. Limited knowledge considering exact Strox ingredients makes its identification in biological samples using standard toxicology impossible. In 2018, Egyptian law criminalized the usage of five THC analogs that are rapidly followed by alteration of Strox constituents by its manufacturer using non-prohibited cannabinoids to escape legal prohibition. Therefore, comprehensive studies are needed to identify common Strox constituents with subsequent successful detection. Moreover, the amendment of the law is essential to include any substances that have cannabis-like actions in the schedules of a prohibited substance.

### المستخلص

الستروكس هو حشيش مصنع ذو شهرة واسعة في مصر ويتكون من منتجات عشبية قابلة للتدخين ومزودة بنظائر قنب غير مصنفة. وقد يؤدي التسمم الحاد بالستروكس إلى الذهان الشديد كما يمكن أن يتسبب في اضطراب الجهاز الدوري أو غيبوبة مميتة. وتعزى السمية الناشئة عن تعاطي الستروكس إلى نظائر القنب الصناعية أو لمضادات الكولين إلى جانب وجود بعض الإضافات مثل الكيتامين. ومع الأسف فإن المعرفة القاصرة بمكونات الستروكس الفعلية على وجه دقيق يجعل الكشف عن وجوده في العينات البيولوجية باستخدام الطرق المعتادة أمراً مستحيلاً. وقد قام القانون المصري في عام 2018 بتجريم استخدام خمسة نظائر للقنب، وقد أعقب ذلك تغيير سريع في مكونات الستروكس من قبل صانعيه باستخدام نظائر للقنب غير محظورة للتحايل على الحظر القانوني.

لذلك، هناك حاجة ماسة إلى دراسات شاملة لتحديد مكونات الستروكس الفعلية وسيعقب ذلك نجاح في الكشف عن وجوده في العينات البيولوجية لتعاطيه. كما أنه من الضروري تعديل القانون لإدراج جميع المواد التي لها تأثير شبيه بالقنب في جداول المواد المحظورة

**Keywords:** Forensic Science, Forensic Toxicology, Strox, Cannabinoids, Egypt.

الكلمات المفتاحية: علم الأدلة الجنائية، علم السموم الشرعي، الستروكس، القنب المصنع، مصر.



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## 1. What is Strox?

Besides natural marijuana (cannabis) that is widely abused in Egypt and known colloquially as Bango or Hashish, emerging novel synthetic cannabinoids (SCs) are widely used. Synthetic marijuana (Spice) is the commonest designer drug present in Egypt that is expanding among all social classes and sold under different names such as Voodoo and Strox [1,2].

Strox is the modern Egyptian version of Spice and is the most popular used designer drug at the moment. Unfortunately, no official statistical data is available to determine the magnitude of the problem, though all indicators point to the flourishing abuse of Strox in Egypt [1,2]. Strox abuse is a hazard that affects millions of people, taking into consideration that the Egyptian population has now exceeded 104 million according to the Central Agency for Public Mobilization and Statistics (CAPMAS) [3].

## 2. Chemical Structure and Pathophysiology

Synthetic cannabinoids (SCs) are a large family of chemically unrelated structures functionally similar to  $\Delta$  9-tetrahydrocannabinol (THC), the active principle of cannabis that interacts with CB1 and CB2 cannabinoid receptors to exert their psychoactive effects [4].

Considering the chemical nature of Spice, more than 100 heterogeneous substances have so far been identified. In spite of the cannabomimetic effects of SCs, their undesired effects cannot be predicted and are often more serious than those related to natural cannabis abuse [5].

Synthetic cannabinoids are often dissolved in ethanol or acetone and sprayed on dried plant material so they can be smoked. Sometimes, they are sold as liquids to be vaporized and inhaled in e-cigarettes. The smokable herbal products laced with synthetic cannabinoids are known as herbal incense, Spice, or K2. The common types of THC analogs along with herbal ingredients of Spice vary from one country to another, and their constituents are subjected to continuous modification by manufacturers to escape legal prohibition [2,5].

Strox is the Egyptian Spice in which *Atropa Belladonna*, *Datura*, or *Hyposymus* is used as a plant matrix to be enhanced with unidentified synthetic cannabinoids. Interestingly, any plants could be used as a matrix for Strox manufacturing after the addition of a considerable amount of atropine and/or ketamine. Also, the presence of other unidentified mind-altering additives to Strox to enhance its psychoactive effects cannot be excluded [6].

## 3. Strox Medical Challenges

Accidental SCs toxicity is more likely to occur than natural marijuana because of their strong agonistic action on cannabinoid receptors. Also, the constituents and concentrations of SCs are variable from batch to batch, even within the same product. In addition, Spice abusers often consume other mind-altering substances that exaggerate medical hazards [7,8].

In Western countries, chemical ingredients and clinical effects of SCs have been studied. Also, there have been successful attempts to detect these substances in abusers' biological samples. Therefore, basic medical knowledge regarding SCs is available in developed societies [9, 10].

On the other hand, scarce information is available considering the current composition of the popular Egyptian Spice (Strox). Until now, no scientifically published article has addressed chemical or clinical uncertainties regarding Egyptian Strox. The descriptions of the acute toxic effects of Egyptian Strox are based solely on sporadic clinical observations that are either noticed by physicians or disseminated through official newspapers and websites [11-14].

Acute Strox intoxication is often described as visual and auditory hallucinations accompanied by fear and intense aggression. Such manifestations could be attributed to the presence of THC analogs, anticholinergic substances, ketamine or other unknown additives [6].

Moreover, pupillary dilatation, tachycardia, dry flushed skin and other elements of anticholinergic toxidrome have been reported following Strox smoking. In severe cases, fatal cardiovascular collapse and/or deep coma could occur [14]. Similar effects were described in relation to acute cannabinoid toxicity in other countries [15-17].

It is worth mentioning that, until now, almost nothing is known regarding the long-term effects of Strox on various body systems, and questions considering its carcinogenic and teratogenic potential still lack answers.

## 4. Strox Legal Challenges

Social tolerance and acceptability of natural cannabis in Egypt encourages the abuse of its potent synthetic analogs. Moreover, Strox is easily synthesized, which has led to its easily availability at low prices in comparison with cannabis. Furthermore, standard toxicology screening cannot identify Strox users, whereas natural cannabis can be traced [14].

Though no official statistical data is available to



determine the magnitude of the problem, all indicators point to the flourishing of Strox use among different social classes in Egypt. In 2018, the Egyptian Addiction Treatment and Abuse Fund stated that Strox was the third most abused substance among addicts seeking treatment following cannabis and Tramadol use. Strox addiction was recorded in 22% of the cases [11].

Regarding legal action, in 2014 Voodoo was enlisted in Drug Schedule 1 in Egypt. Criminalization of Voodoo abuse resulted in a reduction in Voodoo abuse at the expense of a large increase in Strox abuse as an SC alternative. Four years later, the official spokesman for the Ministry of Health announced that the five common types of synthetic cannabinoids present in Strox have been added to the Egyptian list of highly addictive and dangerous narcotics (act No. 440 of 2018 under Law 182/1960, that prohibits the possession or trafficking of narcotics). These SCs are; AB-FUBINACA, AMB-FUBINACA, 5F-ADB, AB-CHMINACA, and XLR-11. Strox manufacturers are always altering their chemical structures, using non-prohibited substances to avoid prosecution [13, 14].

## 5. Recommendations

There is a critical demand to increase awareness about the serious hazards of synthetic cannabinoids among the general population of countries that are suffering from their presence. Also, physicians should be trained to deal efficiently with cases of acute intoxication with synthetic cannabis.

The data regarding Spice constituents obtained from other countries could not be applied in Egypt, as its formula is highly variable from one country to another. Therefore, comprehensive studies are needed not only to elucidate the effects of THC analogs but also to identify their most abundant constituents with subsequent successful detection. Moreover, the amendment of the law is essential to include all substances that have cannabis-like actions in the schedules of prohibited substances.

## References

1. Egypt Today (online press): Egypt Under the influence. Available from: <http://www.egypttoday.com/Article/15/21048/Under-the-influence>. [Last accessed online in August 2018].
2. Gabrah R. Prevalence of New Psychoactive Substances Use Among Outpatient of Addiction Management Clinic in Assiut University Hospital (Registered Clinical Trials NCT03695419). Available from: <https://www.smartpatients.com/trials/NCT03695419>. [Last accessed online on December 2019].
3. The Central Agency for Public Mobilization and Statistics (CAPMAS). Available from: <https://www.capmas.gov.eg/HomePage.aspx>. [Last accessed online in December 2019].
4. Nicholasa P, Barbarac L, Maddalenab M. Synthetic cannabinoids: the hidden side of Spice drugs. *Behav Pharmacol*. 2017; 28(6): 409-19. <https://doi.org/10.1097/FBP.0000000000000323>
5. Farquhar CE, Lefever TW, Marusich JA, Kevin RC, McGregor IS, Wiley JL, Thomas BF. Molecular and Behavioral Pharmacological Characterization of Abused Synthetic Gamage Cannabinoids MMB- and MDMB-FUBINACA, MN-18, NNEI, CUMYL-PICA, and 5-Fluoro-CUMYL-PICA. *J Pharmacol Exp Ther*. 2018; 365(2): 437-46. <https://doi.org/10.1124/jpet.117.246983>
6. Abo Regela Addiction Recovery Center, Cairo, Egypt. Available from: <https://www.aboregela.com/strox-drug/>. [Last accessed online in October 2018].
7. Clayton HB, Lowry R, Ashley C, Wolkin A, Grant AM. Health risk behaviors with synthetic cannabinoids versus marijuana. *Pediatrics*. 2017; 139(4): 14-23. <https://doi.org/10.1542/peds.2016-2675>
8. Tellioglu T. Synthetic marijuana: what do we know about this recent hazard on the streets? *J Drug Abuse*. 2018; 4: 1-2. <https://doi.org/10.21767/2471-853X.100069>
9. World Health Organization. Expert Committee on Drug Dependence, Thirty-ninth Meeting Geneva, 6-10 November 2017. Available from: [https://www.who.int/medicines/access/controlled-substances/CriticalReview\\_ABPINACA.pdf?ua=1](https://www.who.int/medicines/access/controlled-substances/CriticalReview_ABPINACA.pdf?ua=1). [Last accessed online in December 2019].
10. Potts A J, Cano C, Thomas H L, Hill S L. Synthetic cannabinoid receptor agonists: classification and nomenclature. *Clinical Toxicology* (2019) DOI: 10.1080/15563650.2019.1661425. Available from: <https://www.tandfonline.com/doi/abs/10.1080/15563650.2019.1661425?needAccess=true&journalCode=ictx20>. [Last accessed online in December 2019].
11. Egypt Today (online press): 7.7% of high-school students are drug addicts Available from: <https://www.egypttoday.com/Article/1/39772/7-7-of-high-school-students-are-drug-addicts>. [Last accessed online in December 2019 ].
12. Cairo Scene (online press): 6 types of 'strox' added to Egyptian ministry of health's dangerous narcotics list, Cairo Scene. Available from: <http://cairoscene.com/Buzz/ministry-bans-synthetic-cannabinoids>. [Last accessed online in August 2018].
13. Al-Monitor (online press): Egypt pulse: Egypt moves against synthetic narcotics. Available from: <https://>



- www.al-monitor.com/pulse/originals/2019/02/egypt-amend-drug-law-users-trafficking.html. [Last accessed online in December 2019 ].
14. Ahram Online (online press): Voodoo: Egypt's battle against 'Satan's drug'. Available from: <http://english.ahram.org.eg/NewsContent/1/64/311917/Egypt/Politics-/Voodoo-Egypt-battle-against-Satans-drug.aspx>. [Last accessed online in December 2019 ].
  15. Trecki J, Gerona RR, Schwartz MD. Synthetic cannabinoid-related illnesses and deaths. *N Engl J Med*. 2015; 373: 103–7. <https://doi.org/10.1056/NEJMp1505328>
  16. Schwartz MD, Trecki J, Edison LA, Steck AR, Arnold JK, Gerona RR. A common source outbreak of severe delirium associated with exposure to the novel synthetic cannabinoid ADB-PINACA. *J Emerg Med*. 2015; 48: 573–80. <https://doi.org/10.1016/j.jemermed.2014.12.038>
  17. Von Der Haar J, Talebi S, Ghobadi F, Singh S, Chirurugi R, Rajeswari P, Kalantari H, Hassen G. Synthetic cannabinoids and their effects on the cardiovascular system. *J Emerg Med*. 2016; 50(2): 258–62. <https://doi.org/10.1016/j.jemermed.2015.10.009>.

