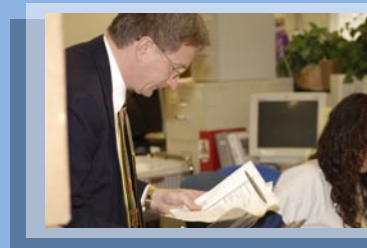


STERLING NEWS & NOTES

A Technical Update from Sterling Reference Laboratories
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Synthetic Marijuana Substitutes: Spice, K2, JWH-018

Third Quarter 2010

There has been a growing concern about the increasing use of synthetic marijuana, in the last several months. These products are known by a variety of names including "Spice", "K2", "JWH-018" and many others. These products consist of herbal materials that have had one or more synthetic THC analogues added to them. These products are sold as herbal incense, not intended for human consumption, and are smoked to obtain a legal high similar to marijuana. They are sold over the internet, in "head shops" and in magazines, and with few exceptions, are legal in most states. [Six states (Alabama, Georgia, Kansas, Kentucky, Missouri and Tennessee) have passed legislation making use of these products illegal and all branches of the military have also banned their use.] These products have been available in many European countries since 2002, but have only recently become available in the United States. Currently available screening and confirmatory tests for THC metabolites do not detect any of the synthetic products.

Many of the synthetic marijuana analogues have their roots in legitimate scientific endeavors. HU-210, initially synthesized at Hebrew University in Israel, is reported to be approximately 100 -800 more times potent than Δ^9 - tetrahydrocannabinol (THC). CP-55490 and CP-47,497, analogues developed by the pharmaceutical giant Pfizer, are reported to be approximately 45 times more potent than THC in stimulating the CB1 and CB2 cannabinoid receptor. In the 1990's, John W. Huffman, a chemistry professor at Clemson University in South Carolina began a systematic study of cannabinoid receptor agonists by synthesizing several hundred compounds and analyzing their interaction with the CB1 and CB2 receptors. The names of these compounds begin with the initials of Huffman's name followed by a number; JWH-018 and JWH-073 are perhaps the best known. The pharmacologic effects of the herbal "Spice" products, spiked with one of the HU, CP or JWH analogues, range from mild euphoria with physiological effects similar to marijuana to those with much more serious side effects. Slurred speech, light headedness, poor coordination and drowsiness are effects in common with the use of marijuana. The more serious side effects include elevated blood pressure, hyperventilation, anxiety, agitation, hallucinations, paranoia, vomiting and even seizures. It is not surprising that the effects of the
(continued next column)

spice products are very similar to marijuana since they both stimulate the same cannabinoid receptors.

Since the spice products are not regulated, their composition and potency vary greatly, which may account for the variable and unpredictable effects. There is a paucity of reliable scientific data relating to the use of spice, and other related products. The pharmacologic effects of the smoked products are most intense in the first several hours after use and may persist for up to twelve hours.

Most, if not all, of the commercially available products are now synthesized in illicit laboratories. The lack of cross reactivity in the screening immunoassays for THC makes detection of the synthetic compounds extremely difficult. In the case of JWH-018, little if any of the parent compound can be detected in urine after smoking the product, however, two principal metabolites have been identified which may be detected by highly sensitive Liquid Chromatographic/Tandem Mass Spectrometric (LC/MS/MS) methods. The detection of the synthetic cannabinoids has been hampered by the lack of suitable reference materials, however, they have just recently become commercially available which should hasten assay development. Since these products are largely legal and difficult to detect, their use and abuse will undoubtedly continue to increase. Media reports have already linked two deaths attributable to the use of spice in the State of Indiana and other cases are under investigation. STERLING's goal is to diligently increase and improve their capability to detect JWH-018 and the other synthetic analogues.

Superimposed upon the analytic issues of detection of these synthetic compounds is the ever increasing move to liberalize existing medical marijuana laws and the proposition in California to legalize marijuana. If the proposition passes, will that also alter the status of the synthetic Cannabinoids? The imposing challenges to the legal system and the analytical laboratories will be immense.

For further information, regarding the status of "Spice" testing at STERLING Reference Laboratories please contact Dr. Bert Toivola, Dr. Dan Baker or Mr. Jim Heit.

How do I order SPICE Screen?

Call the Sales Department today - Screen must be set up on your account, by an authorized account contact.

Thank you for your patience with our recent IT upgrade.

If you are using Online Web Reporting (Horizon), you NEED to upgrade to Internet Explorer 7 / Internet Explorer 8.

SPECIALITY TESTS AVAILABLE!

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6-Acetylmorphine (6-AM)

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Meperidine - (Demerol®)

SPICE

Carisoprodol - (Soma®)

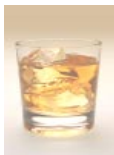
Fentanyl

Tramadol - (Ultram®)

We have cost-effective screening/testing options, for the above substances. Call our Sales Department today!

80-Hour Alcohol Screen as low as \$6.00!

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Customize from 4 to 11 Drugs: Amphetamine, Methamphetamine, Benzodiazepines, Barbiturates, Cocaine, Cannabinoids (marijuana), Methadone, Opiates, Oxycodone, Propoxyphene, Phencyclidine (PCP).

- ✓ Fast and Simple Collection Procedure
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- ✓ Substitution or Adulteration Difficult in Oral Fluid
- ✓ Lack of Required Urine Specimen Production – i.e. Renal Dialysis Patients
- ✓ Gender Neutral Collection
- ✓ Saliva Drug Levels Correlate with Blood Drug Levels
- ✓ Negative **AND** Positive Screen results within 24 hours from receipt at the lab!

Update on Artificial Urine Screening Test

Since the introduction of our artificial urine test in June, it has been an overwhelming success. For the first time our clients have documented evidence that urine specimens suspected of being artificial are indeed artificial. The positivity rate of samples submitted for artificial urine testing is at 21%! Granted, these are specimens our clients suspected of being synthetic. The positivity rate of all submitted specimens in the general population would, of course, be expected to be much lower. To see how one community in Eastern Oregon has tackled the problem of synthetic urine, go to www.ktvz.com.

Buying Onsite Drug Screening Devices / Field Kits from another source?

We have numerous brands of Onsite Screening Devices and Collection Supplies, priced competitively, in multiple drug screening configurations, including urine-based Ethanol (ALCOHOL) screening.

Cups – Dip Cards – Cassettes – Saliva Swabs – Alcohol Saliva Strips – Breathalyzers – Collection Cups – Specimen Pans (Hats) – Infrared Thermometers – Gloves, and more! Call our Sales Department Today!

REMINDER REMINDER REMINDER REMINDER
*Need regular, no-charge lab supplies? Ask for **Logistics**.
Need purchased screening devices? Ask for **Sales**.*

Benzodiazepine Screening Immunoassays

STERLING has received a number of inquiries concerning the cross-reactivity of various benzodiazepines in the screening assay. The assay currently employed at STERLING is calibrated with oxazepam at a concentration of 200 ng/mL. This means any benzodiazepines that cross-reacts with oxazepam equivalency at 200 ng/mL, is interpreted as a positive screening result. The major benzodiazepines and their metabolites, temazepam, alprazolam, diazepam, chlorazepate, nordiazepam and triazolam cross-react with near equivalency to oxazepam, but unfortunately, not all benzodiazepines are created equivalent. Lorazepam, clonazepam, and its metabolite, 7-amino clonazepam, cross-react very poorly in the assay. Lorazepam requires approximately 5-8 times higher concentration to produce a response similar to oxazepam. Clonazepam requires approximately 2.5 to 5 times higher concentration and 7-aminoclonazepam requires approximately 12 -15 times higher concentration to give a result equivalent to 200 ng/mL of oxazepam. However, there is very little parent clonazepam in urine specimens, the 7-aminoclonazepam is the primary metabolite present in urine. In cases where the benzodiazepine screen is negative and clonazepam or lorazepam use is suspected, it is possible to order a benzodiazepine GC/MS LOD confirmation which can detect benzodiazepines, down to 25 ng/mL.

Please contact one of the certifying scientists at STERLING for further information.

STERLING Reference Laboratories is full-service, nationally renowned toxicology laboratory, testing for drugs of abuse, which has been serving its clients with superior service and unsurpassed quality since 1987. SRL is certified by Health and Human Services (SAMHSA) and the College of American Pathologists Laboratory Accreditation Program (CAP) – rigorous laboratory standards designed to ensure quality testing.

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