# Spice Report

Psychonaut Web Mapping Research Project



# The Psychonaut Web Mapping Research Group

Paolo Deluca (1), Fabrizio Schifano (2), Zoe Davey (1), Ornella Corazza (2), Lucia di Furia (3), Magi Farre (4), Liv Flesland (5), Miia Mannonen (6), Aino Majava (6), Valentina Minelli (3), Stefania Pagani (3), Teuvo Peltoniemi (6), Norbert Scherbaum (7), Holger Siemann (7), Arvid Skutle (5), Marta Torrens (4), Cinzia Pezzolesi (2) and Peer van der Kreeft (8)

- 1 Institute of Psychiatry King's College London, London, United Kingdom
- 2 School of Pharmacy, University of Hertfordshire, Hatfield, United Kingdom
- 3 Servizio Salute Regione Marche, Ancona, Italy
- 4 IMIM-Hospital del Mar, Barcelona, Spain
- 5 Bergen Clinics Foundation, Bergen, Norway
- 6 A-Clinic Foundation, Helsinki, Finland
- 7 Addiction Research Group, Department of Psychiatry and Psychotherapy, LVR-Hospital Essen, Germany
- 8 De Sleutel, Brussels, Belgium

This report has been prepared with the contribution of: Stefano D'Offizi, Jeshoor Jebadurai, Alessandro Marchi, Manuela Pasinetti, Joan Mestre Pinto, Alessandra Ricciardi.

- Created 20 March 2009
- Last updated 01 March 2010



For more information: email: info@psychonautproject.eu or visit: www.psychonautproject.eu

#### THE PSYCHONAUT WEB MAPPING RESEARCH PROJECT

This report has been prepared as part of the Psychonaut Web Mapping Project. This is a European Union funded project with the aim of developing a web scanning system to identify and categorise novel recreational drugs/psychoactive compounds, and new trends in drug use based on information available on the Internet.

Although this publication arises from the Psychonaut Web Mapping Project, which has received funding from the European Union, in the framework of the Public Health Programme [2006 348], it represents the views of the authors. These views have not been adopted or in any way approved by the Commission and do not necessarily represents the view of the Commission or the Executive Agency for Health and Consumers.

More information at: http://www.psychonautproject.eu

#### Disclaimer

Please note that the information in this report reflect a review of the information available online and in other publications (including peer review articles, where available). We have endeavoured to validate this information where possible, however, given the absence of evidenced based literature in many cases, accuracy cannot be guaranteed. All sites and sources used have been appropriately referenced.

# Copyright

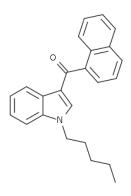
Information on this technical report is copyright of the Psychonaut Web Mapping Project or has been reproduced with permission from other copyright owners. It may be downloaded and printed, but not otherwise copied, altered in any way or transmitted to others (unless explicitly stated otherwise) without the written permission of the Psychonaut Web Mapping Project group. Requests for permission to reproduce material from this report should be addressed to: <a href="mailto:info@psychonautproject.eu">info@psychonautproject.eu</a>

#### How to reference this report

If you wish to cite this publication it should be as follows:

Psychonaut Web Mapping Research Group (2009). Spice report. Institute of Psychiatry, King's College London: London UK

# Table of Contents



Spice	9
Key points	2
Chemical characteristics of active constituents	3
Appearance	4
Available information on purchase price	4
Modalities of Intake	4
Legal status	4
Current use/medicinal use	5
Information on recreational use/misuse in the EU (or elsewhere)	5
Use in combination with other compounds	ć
Pharmacological characteristics	ć
Toxicological effects	7
Desired psychoactive effects	7
Physical/medical untoward effects	7
Psychopathological disturbances associated with its use	7
Related fatalities	7
Youtube videos	7
Google insights	9
Bibliography	10
Sitography	10

# Spice

OVERVIEW	
Synonyms/colloquial terms	Spice Gold, Spice Diamond, Spice Silver, Spice Tropical Synergy, Spice Arctic Synergy, Smoke, Yucatan Fire, eX- ses Gold, eX-ses Platinum, Genie, Mojo, Spicey XXX Regular, Spicey XXX Ultra, Spike 99, Spike 99 Ultra, Magic Silver, Magic Gold
Туре	Herbal, Chemical
Origin	Spice products first appeared in Europe as legal substitutes to Cannabis in 2004.
Active constituents	JWH-018; CP 47,497; HU-210
Status	Novel

#### **KEY POINTS**

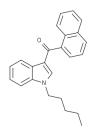
Spice is intended as a brand name for what is usually described as an 'herbal smoking blend' sold as an 'ethno drug' or legal substitute of cannabis (Schifano et al 2009). It comes under a variety of names, such as 'Spice Diamond', 'Spice Gold', 'Spice Silver', '2Spicy' and 'Spice of Life' that, according to

users, are meant to produce subtly different effects (Champagne Legals, 2009; Drugs-forum, 2009). Sometimes they are labelled 'not for human consumption', or 'not suitable for under 18' (e.g. Spiceworld420 [30]). Ingredients listed on product packaging and in product descriptions include several psychoactive plants, some of which have been traditionally known as marijuana substitutes, meaning users expected effects similar to that of smoked cannabis (Ujvary 2009). However, recent laboratory analyses (late 2008) have identified in these herbal mixtures the presence of the synthetic cannabinoids such as JWH-018; CP47, 497 and similar analogues (Auwa "rter et al., 2009; Steup, 2009) and since then spice drugs have received an extensive media attention.

Spice is not detected via drug tests (according to online users).

### CHEMICAL CHARACTERISTICS OF ACTIVE CONSTITUENTS

# JWH-018 (1-pentyl-3-(1-naphthoyl)indole)



IUPAC Name: Napthalen-1-yl-(1-pentylindol-3-yl)methanone

Molecular Formula:  $C_{24}H_{23}NO$ Molecular Weight: 341.45 [g/mol] CAS-Number: 209414-07-3

JWH-018 is a synthetic cannabinoid receptor (CB) agonist (Huffman et al., 2003; Huffman, 2009) that was identified in at least three Spice products by researchers in Germany and Austria at the end of 2008 (Steup, 2008) [10].

# CP 47,497

IUPAC Name: 2-[(1R<sub>3</sub>S)-3-hydroxycyclohexyl]=5=(2-methyloctan-2-yl-phenol)

Molecular Formula: C<sub>20</sub>H<sub>34</sub>O<sub>2</sub>

Molecular Weight 318.49346 [g/mol]

CAS-Number: 70434-82-1

CP 47,497 is a synthetic CB receptor agonist with potency 2 to 28 times greater than THC, and was identified in Spice products by a team of researchers from the University of Freiburg and the German Federal Criminal Police Office (BKA) on 20 January 2009 (Auwarter et al., 2009; Uchiyama et al., 2009; EMCDDA, 2009).

#### HU-210

IUPAC Name: (6aR,10aR)-9-(Hydroxymethyl)-6,6-dimethyl-3-(2-methyloctan-2-yl)-6a, 7,10,10a-tetrahydrobenzo[c]chromen-1-ol

Molecular Formula: C<sub>25</sub>H<sub>38</sub>O<sub>3</sub>

Molecular Weight 386.56742 [g/mol]

CAS-Number: 112830-95-2

HU-210 is a synthetic cannabinoid that was found in 'small but verifiable amounts' in Spice products seized by the US Customs and Border Protection service (Cooper, 2009). On June 14, 2009, Hu-210 was identified for the first time in three Spice products in the UK (EMCDDA, 2009)

[1]

#### **APPEARANCE**







Spice products are commercially available in prepackaged bags (containing loose leaf) or as pre-rolled joints. The synthetic cannabinoids are sprayed on to the herbal mixture prior to packaging. Often spice products were marketed as herbal blends to be used as incense (not as smoking mixtures), and were advertised as 'not for human consumption'. This type of marketing is employed to circumvent laws and regulations controlling medicines and other legal substances not intended for human consumption.

#### AVAILABLE INFORMATION ON PURCHASE PRICE

€20-30 for 3g

#### **MODALITIES OF INTAKE**

Most common route of administration is by smoking, using either a pipe, a water pipe, or by rolling using a cigarette papers. Spice products are sometimes sold as a pre-rolled cigarette, as revealed by a video posted to YouTube [8].

### LEGAL STATUS

Spice products, or one or more of their active (synthetic cannabinoid) constituents are currently controlled in:

Estonia
Germany
Finland
France
Chile
Poland
Russia
South Korea
Sweden
Switzerland
Argentina
Luxembourg
United Kingdom
Slovak Republic
[6][3]  CURRENT USE/MEDICINAL USE
CORRENT OSE/ MEDICINAL OSE
None
INFORMATION ON RECREATIONAL USE/MISUSE IN THE EU (OR ELSEWHERE)
We first picked up Spice products in online searches carried out in Italy, Norway, Germany and Finland at the start of the project in 2008. However, from analyses of web forums and Google searches it is apparent that Spice products became available to purchase online and or at street level retailers/headshops in or after 2004.
Spice products are often sold as incense and advertised online as 'the mystical incense with

Austria

2009).

great reviews' 'the perfect stuff for chilling out at home or going out with friends' along with perfumes and fragrances for the house. Because of their packaging, which also looks like

'incense' or 'tea', and their scented smell, they are far less noticeable as drugs. According to some forum discussions, young people seem to be particularly pleased about this because they can hide them from their parents and smoke them comfortably at home (Schifano et al.,

Users seem to like them for a number of reasons. The most important probably being that it has cannabis-like effects (i.e. energizing, euphoric, uplifting, or sedating) and it is legal in most countries. Some other reasons behind their popularity are that they: smell and taste good (i.e. honey, vanilla, etc); have a relatively low cost; have generally a short duration of action (2-3 hours), which allow users to cope with an 'active' style of life; are popular amongst users' friends and thus can be shared with them; are easy to buy on the Internet, where they are often sold at a discounted rate; apparently don't show positive in conventional police and/or workplace blood and urine tests for cannabis; are not noticeable and thus they are the perfect product to be sent/delivered via mail; come in nice packaging; help users to have more fun, be more open and less inhibited with others at social gatherings or parties (Schifano, et al 2009).

Prior to the identification of synthetic cannabinoids in Spice products in 2008 it was widely assumed that the cannabis-like effects were a result of the plant ingredients advertised as being in the products. These include: 'Beach bean' (Canavalia maritima; syn. C. rosea), 'Blue lotus' (Nymphaea alba and N. caerulea), 'Dwarf skullcap' (Scutellaria nana), 'Indian warrior' (Pedicularis densiflora), 'Wild Dagga' (Leonotis leonurus), 'Maconha brava' (Zornia latifolia or Z. diphylla), 'Pink or Sacred lotus' (Nelumbo nucifera), 'Honeyweed' or Siberian motherwort (Leonurus sibiricus), 'Marshmallow' (Althaea officinalis), and 'Dog rose or Rosehip' (Rosa canina). Since some of these plants have traditionally been known as marijuana substitutes, users expected effects similar to that of smoked cannabis (Ujváry 2009).

However, it is also important notice how some members of the online drug-forum community began to speculate the presence of additional secret ingredients, including synthetic cannabinoids as early as 2006.

#### USE IN COMBINATION WITH OTHER COMPOUNDS

According to some web forums in Finland, it is used in combination with other substances, such as Kratom (*Mitragyna speciosa*) [20]

One of the latest trends is the combination of Spice products and ketamine, which aims to enhance the effects of the latter when taken at low doses and/or to facilitate the 'coming down' or exit from 'k-holing' (Corazza & Schifano, in press; Drugs-Forum, 2009). Further, Spice products could be taken in combination with other substances, such as Kratom (Mitragyna speciosa: [31]; Babu, McCurdy, & Boyer, 2008), Salvia and Cannabis [32].

#### PHARMACOLOGICAL CHARACTERISTICS

There is a lack of information about the complete chemical make up, and little is known about the pharmacology and toxicology of the plant materials contained in the Spice products.

#### TOXICOLOGICAL EFFECTS

See above.

#### DESIRED PSYCHOACTIVE EFFECTS

Desired/reported psychoactive effects of 'Spice' Drugs include:-

- Euphoria/sociability
- Anxiolytic and anti-depressant
- Relaxations
- Stimulant
- Dream/latent memory enhancement

[3] [4] [5] [9] [10] [11] [12] [13] [16] [17] [23]

### PHYSICAL/MEDICAL UNTOWARD EFFECTS

Reported negative side effects include:

- Paranoia (and/or vomiting)
- Headache

[3] [5]

# PSYCHOPATHOLOGICAL DISTURBANCES ASSOCIATED WITH ITS USE

Unknown.

#### RELATED FATALITIES

None reported.

# YOUTUBE VIDEOS

The videos collected are not only relevant for their content but also for the accompanying text comments. Please follow the links to watch the following YouTube videos:

**Spice Gold:** A short clip of an individual preparing a pre-rolled Spice Gold joint for consumption. Video posted August 29, 2008.

http://www.youtube.com/watch?v=xfkRL8aoLHA[8]

**Spice Gold @ Hollandbong:** A short clip of an individual smoking Spice Gold using a water pipe (bong). Video linked to the website <a href="http://www.spice-gold-info.de">http://www.spice-gold-info.de</a>. Video posted September 9, 2009.

http://www.youtube.com/watch?v=KcUHDGTzPnM [27]

**Spice Gold Missbrauch Variante Eimer rauchen:** A short clip showing an individual smoking Spice Gold using a 'home-made' water pipe. Video linked to the website <a href="http://www.spice-gold-info.de">http://www.spice-gold-info.de</a>. Video posted October 7, 2009.

http://www.youtube.com/watch?v=mLB7vKTwhgI [28]

**03-06-08 1730**: A longer clip showing two people smoking Spice Diamond mixed with tobacco using a water pipe (bong). Video posted February 2, 2009.

http://www.youtube.com/watch?v=RfCzDkyFhiQ[29]

#### **GOOGLE INSIGHTS**

Google Insights for Search shows search volume patterns for specific keywords across specific regions and time frames since 2004. The screenshot below includes a graph with the search volume, indicating interest over time (GMT) for Spice Gold, Diamond and Silver, plotted on a scale from 0 to 100; the totals are indicated next to bars by the search terms, a breakdown of how the categories are classified, lists of the top searches and top rising searches, a world heat map graphically displaying the search volume index with defined regions, cities and towns.



- Auwärter, V., Dresen, S., Weinmann, W., Müller, M., Pütz, M., & Ferreirós, N. (2009). Spice and other herbal blends: harmless incense or cannabinoid designer drugs? Journal of Mass Spectrometry, 44(5), 832-837.
- Auwärter, V. (2009). Forensic identification, pharmacology and toxicology of JWH-018, CP-47,497 and their alkyl homologs. EMCDDA Expert meeting: Spice and related synthetic cannabinoids, Lisbon, 6 March
- Babu, K.M., McCurdy, C.R., & Boyer, E.W. (2008). Opioid receptors and legal highs: Salvia divinorum and Kratom. Clinical Toxicology, 46(2), 146\_152.
- Cooper, R. (2009). Drugs shipped as incense seized at DHL. Wilmington News Journal, March 2.
- Corazza, O., & Schifano F. (in press). A prospective study on the emergence of near-death states among a group of 50 ketamine recreational users. Substance Use and Misuse.
- EMCDDA (2009). Action on new drugs briefing paper: Understanding the 'Spice' phenomenon. A report from an EMCDDA expert meeting, 6 March 2009, Lisbon. Available for download from <a href="http://www.emcdda.europa.eu/attachements.cfm/att-80086">http://www.emcdda.europa.eu/attachements.cfm/att-80086</a> EN EMCDDA Understanding%20the %20'Spice'%20phenomenon 4Update%2020090813.pdf)
- Huffman, J. W., Mabon, R., Wu, M. J., Lu, J., Hart, R., Hurst, D. P., Reggio, P. H., Wiley, J. L., & Martin, B. R. (2003). 3-Indolyl-1-naphthylmethanes: new cannabimimetic indoles provide evidence for aromatic stacking interactions with the CB(1) cannabinoid receptor. Bioorganic & Medicinal Chemistry, 11(4), 539-49.
- Huffman J. W. (2009), Cannabimimetic indoles, pyrroles, and indenes: Structure-activity relationships and receptor interactions. In P.H. Reggio (Ed.), The Receptors: The Cannabinoid Receptors (Part I) (pp. 49-94). New Jersey: Humana Press.
- Schifano, F., Gorazza, O., Deluca, P., & Davey Z., Di Furia, L., Flesland, L., Mannonen, M., Pagani, S., Peltoniemi, T., Pezzolesi, C., Scherbaum, N., Siemann, H., Skutle, A., Torrens, M., & Van Der Kreeft, P. (2009). Psychoactive drug or mystical incense?: Overview of the online available information on Spice products. International Journal of Culture and Mental Health, 2(2), 137-144.
- Steup, C. (2008). Untersuchung des Handelsproduktes "Spice",THC Pharm GmbH., 30 December 2008.
- Uchiyama N., Kikura-Hanajiri, R., Kawahara, N., Haishima, Y., & Goda, Y. (2009) Identification of a Cannabinoid Analog as a New Type of Designer Drug in a Herbal Product. Chemical and Pharmaceutical Bulletin, 57(4), 439–441.
- Ujváry, I (2009) The herbal components of Spice products. EMCDDA Expert meeting: Spice and related synthetic cannabinoids, Lisbon, 6 March.

#### **SITOGRAPHY**

- [1] http://pubchem.ncbi.nlm.nih.gov (Accessed March 16, 2009)
- [2] <a href="http://www.google.com/insights/search/#q=Spice%20Gold&cmpt=q">http://www.google.com/insights/search/#q=Spice%20Gold&cmpt=q</a> (Accessed September 16, 2009)
- [3] http://www.erowid.org (Accessed March 10, 2009)
- [4] <a href="http://www.entheogen.com">http://www.entheogen.com</a> (Accessed March 10, 2009)
- [5] http://www.drugs-forum.com (Accessed October 2, 2009)
- [6] http://www.usdoj.gov/dea (Accessed March 10, 2009)
- [7] <a href="http://cannazine.co.uk/images/stories/drugs/">http://cannazine.co.uk/images/stories/drugs/</a> (Accessed March 4, 2009)
- [8] <a href="http://www.youtube.com/watch?v=xfkRL8a0LHA">http://www.youtube.com/watch?v=xfkRL8a0LHA</a> (Accessed March 4, 2009)
- [9] <a href="http://forum.herbalhighs.com/ShowPost.aspx?PageIndex=2&PostID=8145">http://forum.herbalhighs.com/ShowPost.aspx?PageIndex=2&PostID=8145</a> ((Accessed March 4, 2009)
- [10] http://usualredant.de/drogen/download/analyse-thc-pharm-spice-jwh-018.pdf (Accessed March 4, 2009)
- [11] http://www.spicealists.de/2008/11/02/spice-yucatan-fire-der-diamond-nachfolger/ (Accessed March 4, 2009)
- [12] http://www.champlegals.co.uk/showthread.php?t=4731 (Accessed March 4, 2009)
- [13] http://www.ebay.co.uk (Accessed March 4, 2009)
- [14] http://www.ebay.com (Accessed March 4, 2009)
- [15] http://forums.mycotopia.net/market-place/29595-xxx-chillin.html (Visited on 04/02/09)
- [16] http://www.shivaheadshop.co.uk/shop/legal\_highs/yucatan\_fire/products/yucatan\_fire.html (Accessed February 4, 2009)
- [17] http://www.paradox.co.uk/acatalog/Spice-Arctic-Synergy.html#a2135 (Accessed March 4, 2009)
- [18] http://www.lca-uk.org/lcaforum/viewtopic.php?f=7&t=14520 (Accessed March 4, 2009)

- [19] http://www.drugs-forum.com/forum/showthread.php?t=74671 (Accessed March 4, 2009)
- [20] http://www.paihdelinkki.fi (Accessed March 18, 2009)
- [21] http://www.wnewsj.com/main.asb?
  - SectionID=49&SubSectionID=156&ArticleID=173262&TM=1065.236 (Accessed March 1, 2009)
- [22] http://www.zonged.eu (Accessed March 25, 2009)
- [23] http://www.bluelight.ru (Accessed October 2, 2009)
- [24] http://www.politics.co.uk/news/education/johnson-launches-legal-highs-warning-\$1328642.htm (Accessed September 20, 2009)
- [25] http://www.salviadivinorum.com.mx/store/product\_info.php? products\_id=45&osCsid=7cdobe53geao6d6714o561cbo4gfoegb (Accessed January 15, 2010)
- [26] http://grass420.wordpress.com/2009/04/ (Accessed January 15, 2010)
- [27] http://www.youtube.com/watch?v=KcUHDGTzPnM (Accessed January 15, 2010)
- [28] http://www.youtube.com/watch?v=mLBzvKTwhgI (Accessed January 15, 2010)
- [29] http://www.youtube.com/watch?v=RfCzDkyFhiQ (Accessed January 15, 2010)
- [30] http://www.Spiceworld420.com/osc/ (Accessed March 23, 2009)
- [31] http://www.paihdelinkki.fi (Accessed January 16, 2009)
- [32] http://www.chilledtimes.com (Accessed April 1, 2009)