DrugWatch Information Sheet
MDAI

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DrugWatch

The Drugs Wheel

Figure 1: MDAI (white)

Drug overview: MDAI is a new psychoactive substance (NPS) that has structural similarities to MDA and MDMA and shares some of their behavioural properties[1,2,7].

Chemical name: 5,6 methylenedioxy-2-aminoindane.

Classification: Empathogen.

Street/brand names: Sparkle, Mindy, MDAI Gold.

Background: David Nichols and others from Purdue University developed MDAI in the late 1980s/early 1990s for its anti-depressant properties[3]. Recreational use of MDAI appears to have started in the EU in 2007 with a noticeable increase in the UK in 2009[7], becoming popular following the ban on mephedrone[6]. The first report of MDAI to the EMCDDA was made in Sweden in 2009[5], and in the UK it was analysed in April 2010 by TICTAC Communications[9].

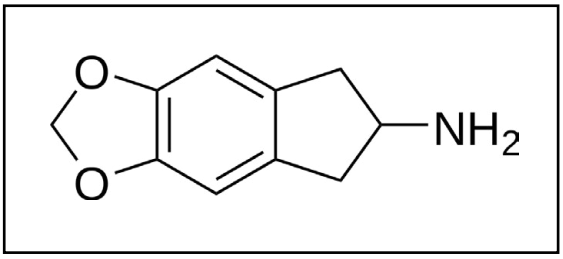

Figure 2: MDAI chemical structure

Availability: There have been at least two occasions of an MDAI 'drought'. The first supply shortage was in 2011; MDAI appeared back on the market later in the year marketed as MDAI Gold in what was claimed by some vendors to be a different formulation. The second 'drought' took place at the beginning of 2014; discussions held with vendors at this time point to the possibility of MDAI production being stopped due to one or more of its precursors being made illegal in China, however this is as yet unconfirmed. It is unclear whether MDAI will re-appear on the market; supply in the UK as of October 2014 is still intermittent, with only the original tan version available.

Figure 3: MDAI (tan)

Figure 4: MDAI (Gold)

Appearance: MDAI is sold in powder, capsule or pellet form, and has also been an ingredient in branded products (see below). There have been three versions of MDAI available: a white powder, a tan powder and lastly MDAI Gold, which is a fluffy, slightly crystalline powder with a more 'sparkly' look. There was speculation on user forums as to whether this was chemically different than previous formulations; many users reported that it was of better quality than its predecessors.

Cost: MDAI bought online (approximate prices) 1g £20, 5g £70-80, 10g £120-150.

Branded products containing MDAI (approximate prices) 1g £10-15 (online) or £15-£30 (in retail outlets). Higher price ranges have been seen during times when supplies of MDAI have been low.

Combinations: In 2013 MDAI was found by TICTAC Communications[10] in branded products such as Sparkle E, Charlie Sheen, Flake and Gogaine. Please note that the contents of these branded products have been seen to fluctuate and it is often unclear which compounds they contain. Due to the limited availability of MDAI at the time of this briefing it is unlikely that any of these products currently contain any of this compound.

Route of administration: MDAI is often consumed orally, either by swallowing pellets, wrapping powder in a cigarette paper (bombing) or by taking some powder from the tip of a moistened finger (dabbing). Users report that mixing MDAI with orange juice minimises the bad taste. Nasal administration (sniffing or snorting) is not thought to be very effective and can be extremely painful. Due to this pain when sniffing, intravenous (IV) use is not recommended; in addition it was reported that MDAI Gold forms a gel when mixed with water, making injection problematic. MDAI can also be taken rectally diluted in water by using a syringe, although this appears fairly uncommon.

Dosage:[4]

Threshold	Light	Common	Strong
20-30mg	60-100mg	150-200mg	200-300mg

Onset and duration: It can take up to an hour for MDAI to take effect, and it can last for up to 4-6 hours[4].

Brain chemistry: MDAI is a selective serotonin releasing agent and selective serotonin reuptake inhibitor[7,11,12] with few stimulant properties[6,8]. It has little effect on the release of dopamine or noradrenalin levels, but studies suggest that it inhibits reuptake of dopamine, noradrenaline and norepinephrine[1,4,6].

Effects: Somewhat similar to ecstasy/MDMA but less intense, without stimulant action. Users report elevated moods and physical rushes, often experienced as a tingling sensation. This is sometimes accompanied by feelings of empathy and a sense of being close or connected to other people. Users report feelings of relaxation and heightened senses.

Increased alertness and pulse rate	Mood elevation
Slightly increased blood pressure	Euphoria
Physical 'rushing'	Increased sensory experiences
Stomach cramps	Loss of inhibitions
Cold chills	Feelings of empathy
Relaxation	Enhanced sociability
Eye jitters and teeth grinding in high doses	Closed eye visuals (hallucinations)
Pain/discomfort in nose if snorted	Open eye visuals (hallucinations) at higher doses

Patterns of use: It is common for users to re-dose as the effects of MDAI can be quite subtle at lower doses, although when taken in larger amounts (over 300mg) the effects are markedly stronger. While MDAI can induce euphoric feelings its lack of stimulant properties can lead users to feel low in energy. MDAI is therefore often mixed with stimulant drugs to achieve a more powerful effect similar to MDMA or cathionones such as mephedrone or methylone. This mixture can in turn lead to a greater likelihood of redosing.

Comedown: Many users report little or no comedown. Users have reported nasal tissue damage (after snorting), short-term memory loss, suppression of appetite, trouble sleeping, feelings of low mood, stomach cramps, heartburn, headache and dizziness.

Toxicity: As MDAI is a relatively new compound, little is known about long term effects. Studies on rats suggest that MDAI alone does not cause neurotoxity[13], however it contributed to toxicity when combined with dopamine-releasing agents[7]. Assumptions about MDAI's toxicity are mainly based on *in vitro* studies and animal experiments, therefore it remains unclear whether recreational doses in humans would lead to neurotoxity[14]. One human case study however reports multi-organ failure after apparent ingestion of 5 grams of MDAI[15].

Information from the National Poisons Service indicates that the first enquiries about MDAI were received in 2010/11 and continued into 2011/12[16,17]. Three deaths were reported to the National Programme on Substance Abuse Deaths in 2011 and 2012 in which MDAI was implicated[18]. Serotonin syndrome appears to be a possible factor in these MDAI-related deaths[1].

Serotonin syndome: This can be fatal if not recognised and dealt with both quickly and effectively. Symptoms include *hyperthermia* (overheating), *hyperreflexia* (over responsive reflexes), *clonus* (involuntary muscular contractions and relaxations), *hypertension* (high blood pressure), *dysphoria* (mental distress) and *mydriasis* (dilated pupils). Due to muscle tension being triggered by the condition, there is a potential of developing *rhabdomyolysis* (muscle tissue breakdown) which can cause severe kidney damage and can be fatal. It is therefore dangerous to restrain individuals, as increased agitation will lead to increased muscle tension trying to break free from restraints. Treatment can include cooled IV fluids, benzodiazepines to control agitation, rapid cooling via ice packs, oral cyproheptadine (anti-histamine with anti-serotonergenic properties) and anti-psychotic medication in severe cases. Perceptual effects of serotonin toxicity can last up to 24 hours; there is also the possibility of 'rebound effects' more than 12 hours after initial symptoms.

Harm reduction advice: All drugs have the potential to cause harms and some of these can be very serious and rarely, life threatening. There is a significant lack of knowledge about the dose, acute toxicity and harm of MDAI which means that harm reduction options are not always clear.

If you choose to use MDAI, taking some simple steps can reduce some of the risks and help you stay safer:

- Use accurate scales to measure doses: don't "eyeball"
- Start with a small amount and don't re-dose for an hour
- Avoid mixing with other drugs and alcohol
- If snorting, clean out your nose after use and do not share snorting equipment
- If swallowing, do so using a cigarette paper or capsule
- Try not to use alone and tell your friends what you have taken
- Control the quantities you take in one session
- Be aware of the symptoms of serotonin syndrome and call an ambulance immediately if symptoms occur.

We would advise anyone experiencing issues from MDAI or other similar substances to seek medical support via their GP or NHS 24 on 08454 24 24 24 (Scotland) or NHS Direct 111 (England and Wales). If you require support regarding a drug issue you can access information about support in your area at www.scottishdrugservices.com (Scotland) or www.drugscope.org.uk/resources/helpfinder (UK).

Legal status: As of the date of this information sheet MDAI is unclassified and can be purchased legally in the UK. Please be aware however that the legal status of drugs is subject to change.

Long term effects: As stated previously, little is known about the effects of long term use of MDAI. As it is somewhat similar in effect to MDMA the long term effects may be similar: some of these are believed to be damage to the serotonin nerves and cognitive and psychomotor functions, and links to clinical depression[19].

Disclaimer: This information has been collated from a variety of sources including expert users from UK and Europe and information from users via relevant websites and drug forums. This information sheet is to be used as a rough guide only and UK DrugWatch/The Drugs Wheel cannot vouch that all information is factual as there is scant scientific or medical evidence available on the substance and much of the information has been obtained from service users' reports.

Overdose & emergencies: See DrugWatch's Overdose and Emergencies information sheet[20] for further information. Try to make sure a friend is around who is not using the drug. If a user becomes unconscious call an ambulance, then place them in the recovery position to prevent choking (see images below).

Start by placing their arm as if they are waving.

Place the other arm across their chest and hold their hand against their cheek.

Lift up the knee that is furthest from you. Continue to hold their hand in place.

Turn them on their side by pulling the knee towards you and down.

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Image credits

Fig 1 MDAI Kunli Chemical. [Accessed online 07 Jun 2014 http://www.kunlichemical.com/uploadfile/s8/sjzkl274658/product/research-chemicals-other-research-chemicals/MDAI(5-6-Methylenedioxy-2-aminoindane)-1376014202-0.jpg].

Fig 2 MDAI chemical structure. [Accessed online 07 Jun 2014 http://commons.wikimedia.org/wiki/File:MDAI.svg].

Fig 3 MDAI (tan) [Accessed online 07 Jun 2014 http://imageshack.us/photo/my-images/223/mdai.gif/]