Psychonauts' psychedelics: a systematic, multilingual, web-crawling exercise

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Abstract

Psychedelics alter the perception of reality through agonist or partial agonist interaction with the 2A serotoninergic receptor. They are classified as phenethylamines, tryptamines and lysergamides. These classes, according to the United Nations Office on Drugs and Crime (UNODC) and European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), account for an important percentage of the new psychoactive substances (NPS) current scenario.

The paper aimed at: a) identifying and categorise psychedelic molecules from a list of psychonaut websites and NPS online resources; and b) comparing the NPS*finder*® results with those from the European and United Nations databases.

A crawling software (i.e. 'NPS*finder*®') was created to automatically scan, 24/7, a list of URLs and to extract a range of information (chemical/street names, chemical formulae, etc.) to facilitate NPS identification. Data collected were manually analysed and compared with the EMCDDA and UNODC databases.

The overall number of psychedelic NPS detected by NPS*finder*® (November 2017-February 2020) was 1344, almost ten-times higher than that reported by the UNODC and EMCDDA combined. Of these, 994 previously unknown molecules were identified as (potential) novel psychedelics, suggesting a strong discrepancy between online and real-world NPS scenarios.

The results show the interest of psychonauts, and maybe of the much larger community of 'recreational' drug users, towards psychedelics. Moreover, examining online scenarios may help in assessing the availability in the real world of psychedelic NPS; understanding drug trends; and in possibly predicting future drug scenarios.

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Introduction

Psychedelics are "substances that have a mind-manifesting capability, revealing useful or beneficial properties of the mind" (Osmond, 1957). These molecules are often termed hallucinogens (Abdulrahim and Bowden-Jones, 2015), a word that remains the favourite definition and is still widely used across a high number of scientific disciplines (Green, 2008; Griffiths and Grob, 2010; Passie et al., 2008; Winter, 2009). The United Nations Office on Drugs and Crime (UNODC) defines hallucinogens as "a diverse group of naturally occurring and synthetic drugs that induce distorted states of consciousness, perception, thinking and feeling, accompanied by different degrees of auditory or visual hallucinations (UNODC, 2016).They are also referred to as "psychedelics", which ultimately produce "synaesthesia and altered perceptions of reality"(UNODC, 2016).

While the term 'hallucinogen' is used to describe a wide range of different types of psychoactive molecules (Bey and Patel, 2007; Martinotti et al., 2015; Teitler et al., 1990), psychedelics referred here specifically to tryptamines (e.g. psilocin, 5-Meo-DALT; Nichols et al., 2015; Sakashita et al., 2015); LSD; lysergamides/rigidified tryptamines (Seidler, 2001); and phenethylamines (e.g. mescaline and 2C-B; Dinis-Oliveira et al., 2018; Papaseit et al., 2018). This is due to their action as specific agonists or partial agonists on the brain's serotonin (5-HT)-2A subtype receptors (López-Giménez and González-Maeso, 2018). This agonist activity has been proven vital for the psychedelic effect (Halberstadt and Geyer, 2011) with the serotonin subtype receptor 2A indicated and widely accepted as responsible for the distinct hallucinations of psychedelic trips (Fiorella et al., 1995; Kometer et al., 2013; López-Giménez and González-Maeso, 2018). In this paper, the definition of psychedelics will be adopted.

While all psychoactive tryptamine and lysergamide NPS can be classified as psychedelics, phenethylamines represent a wider chemical class, that comprises molecules with diverse activity, including: stimulants, entactogens and psychedelics (Abdulrahim and Bowden-Jones, 2015). Very often one molecule can exhibit several of these effects (Carroll et al., 2012). For the purpose of this paper only the psychedelics subclass was considered.

Psychedelics may be considered one of the most ancient class of psychopharmacological agents. Known to a wide public from the discovery of the psychoactive effects of LSD in 1943 (Hofmann, 1959), they are of high interest mostly for two reasons: the nature of their phenomenon, spread across diverse research fields including anthropology, psychiatry, psychology, sociology, and others (Nichols, 2016); and their ability to produce unique and dramatic consciousness alterations (Freedman, 1968; Nichols, 2018).

Psychedelics' market started to change in the early 2000s with the introduction of a considerable number of synthetic derivatives of LSD, tryptamine and phenethylamines described as Novel Psychoactive Substances (NPS) (Schifano et al., 2006; Schifano et al, 2015). NPS are defined as "substances of abuse, either in a pure form or a preparation, that are not controlled by the 1961 Single Convention on Narcotic Drugs or the 1971 Convention on Psychotropic Substances, but which may pose a public health threat" (UNODC, 2019). Synthetic analogues, often way more potent than their natural counterparts, were offered for purchase and were spreading on the recreational drug market, although no knowledge regarding their pharmacologic profiles (dosage, effects and toxicity; Corkery et al., 2012; Maurer, 2010; Schifano et al., 2017) was available. Over the last few years, many acute intoxication and lethal cases, unprecedentedly associated with the use of psychedelics,

have been reported (Dean et al., 2013; Iwersen-Bergmann et al., 2019; Luethi and Liechti, 2020; Tang et al., 2014). The polysubstance drug consumption trend of use/abuse (EMCDDA, 2019a; Hall and Miczek, 2019) has been a reason of concern as well.

Contextually, alongside the emergence of psychedelic, 'modern', NPS there has been a parallel growth in and consolidation of a modern form of shamanism, e.g. a new trend in drug experimentation carried out by NPS enthusiasts, the so-called e-psychonauts (Deluca et al., 2012; Orsolini et al., 2016). Psychonauts define themselves as either 'techno-shamans' (Booth, 2000; Labate and Jungaberle, 2011) or 'sailor of the mind/soul'. They typically explore their inner universe using psychedelic NPS whilst sharing their on drug experiences online (Orsolini et al., 2015a, 2015b). Psychonauts are typically very attracted to psychedelic NPS (Móró et al., 2011; Orsolini et al., 2015a, 2015b) and consider these molecules as the best way to investigate the human mind and address spiritual questions (Carroll, 1987).

The NPS diffusion and e-psychonauts phenomena can be considered strongly interlinked, with the latter allegedly being a strong influencing voice in defining and feeding the market for the former (Orsolini et al., 2017; Schifano et al., 2003). Psychonauts, as 'psychedelic influencers', may help shape and populate online drug scenarios with a huge number of new substances not yet seized or officially detected (EMCDDA, 2019b).

Understanding the online psychedelic scenarios, whilst identifying which substances are being discussed online, may be of great help in trying to assess the availability of, and demand for, psychedelic NPS (Corazza et al., 2013; Schifano et al., 2015). Previous studies have emphasised the importance of users' experiences in creating knowledge, and thus possible NPS trends (Duxbury, 2018; Kataja et al., 2018).

Concerns have arisen in recent years about certain psychedelic NPS in respect of their potential to cause serious acute intoxications, short/long-term mental issues and fatalities (Luethi and Liechti, 2020; Schifano et al., 2015)

The aims of the current research were: a) use a web crawler, e.g. the NPS*finder*®, to identify and categorise, from a list of psychonaut websites and NPS online resources, the number of psychedelic molecules; and b) to compare the NPS*finder*® results with related listings from the European Monitoring Centre for Drugs and Drug Addictions (EMCDDA) and UNODC databases.

Experimental procedures; Methods

Identification of molecules

A crawling/navigating software (i.e. NPS*finder*®; www.npsfinder.com) was created to facilitate identification of NPS dissemination on the surface web. This web crawler automatically scans a list of URLs for new/novel/emerging NPS on a 24/7 basis, whilst extracting information about a large variety of psychoactive molecules (Schifano et al., 2019). The scanned URLs were representative mostly of online psychonaut websites/fora but also of other NPS online resources (*Appendix 1*). NPS*finder*® was designed by Damicom, an IT enterprise based in Rome (Italy), to extract a range of data regarding NPS including chemical and street names; chemical formulae; three-dimensional images; and anecdotally reported clinical/psychoactive effects. These data were then automatically stored in an online, restricted access/password-controlled, database located within firewall-protected/highly secure and consistently performing proprietary servers. When necessary, the

International Chemical Identifier Key (InChIKey) was added to the single entries to facilitate identification of the index NPS and minimise chances of duplicates. InChIKey is a hashed representation of the full International Chemical Identifier (InChI) (Heller et al., 2013), created for the purpose of facilitating online searching of chemical compounds. The predominant language used in these websites was English, but other languages were also analysed, including: Spanish, German, Russian, Italian, Dutch, French, Swedish and Turkish. A control panel composed of five professionals trained in medicine; chemistry; and psychiatry (i.e., FN; DA; CZ; LG and VC) analysed manually all the data extracted by the web crawler from 26 November 2017 to February 2020. Afterwards, a full assessment and editing of each NPS*finder*® data item was carried out and the range of unique psychedelic molecules documented was identified.

Classification of psychedelic molecules

The study focus was here on psychedelic tryptamines, lysergamides and phenethylamines. All the molecules denominations identified by the web crawler were searched for in Google®/Google® Scholar ("Google," 2019), PubMed ("PubMed-NCBI," 2019) and PubChem ("PubChem," 2019) to classify them according to their chemical description (e.g. phenethylamines, tryptamines and lysergamides). No plant-based or natural derived molecules were included in the study.

Phenethylamines were furtherly classified in NBOMes ('N-Benzylmethoxy') (Ninnemann and Stuart, 2013), FLYs and dragonFLYs, respectively rigid dihydrofuran or furan rings series (Trachsel et al., 2013). When available, reported/proven pharmacology and effects were added to each entry profile. For phenethylamines, only those showing psychedelic effects were considered for the scope of this paper; those possessing unsatisfactory levels of pharmacological data were here considered as 'putative psychedelics' (Rickli et al., 2015a).

Comparison between NPSfinder®, EMCDDA and UNODC databases

NPS*finder*® entries were compared with those from both the EMCDDA European Database on New Drugs (EDND, 2019) and the UNODC Early Warning Advisory on NPS (UNODC EWA, 2020) databases; with authorised to access to these restricted resources having here been provided to JMC. The comparison was conducted using the International Chemical Identifier Key (InChIKey).

Results

Data from the NPSfinder® web crawler

After more than two years of operation (26 November 2017 to 24 February 2020), the overall number of unique NPS identified by the web crawler activities was 4,368. Phenethylamines were the most popular NPS class mentioned in psychonaut fora with 1263 (28.9%) entries; including 31 NBOMes and 16 FLYs/ dragonFLYs. Further phenethylamines with confirmed psychedelic activity were 141, whilst those with stimulant/entactogenic activity totalled 109. For the remaining 966 phenethylamines no information about pharmacology/effects were found. Because one cannot assume/predict any pharmacological activity from the structure itself all 966 were considered as putative psychedelics. Conversely, tryptamine and lysergamide entries represented a smaller portion of the whole database, with 65 and 16 molecules, respectively (Figure 1).

Data from the EMCDDA and UNODC databases

Across these two databases (EDND, 2019; UNODC EWA, 2020) a total of 27 NBOMe, 3 FLYS, 50 psychedelics, 58 stimulant/entactogenic and 32 molecules with no reported effects were identified. The total tryptamines identified were 48 and lysergamides were 11. Overall, across the three different classes the UNODC database reported more substances than the EMCDDA

Comparison of NPSfinder® vs EMCDDA and UNODC database entries

NPS*finder*® results for psychedelics were compared with those listed on the EMCDDA and the UNODC databases (Tables 1-5; Appendix 2). Overall, the NPS*finder*® detected a number of psychedelics that was almost ten times higher compared to figures from the other 2 databases. More precisely, the phenethylamine entries in the NPS*finder*® were 1263 vs 123 from the EMCDDA and 156 from the UNODC. Across the three databases, 976 molecules were here considered as 'putative psychedelics' due to lack of data on their psychoactive activity; out of these, 946 resulted to be previously unknown molecules to both the EMCDDA and the UNODC databases.

NPS*finder*®results for the tryptamine and lysergamide classes were more in line with the EMCDDA and UNODC figures. However, NPS*finder*® still showed a higher number of entries; e.g. 65 tryptamines compared to 50 reported by the UNODC and 44 by the EMCDDA. Lysergamides accounted for 16 entries in the NPS*finder*®, 11 in the UNODC and 7 in the EMCDDA databases (Figure 2).

Across the three classes of substances the total number of either novel or putative psychedelics, previously unmentioned by both the UNODC and EMCDDA, amounted to 994.

Discussion

To the best of our knowledge, the present paper provides a unique insight into the previously under-recognised number of psychedelic molecules. Indeed, some 994 novel/putative novel psychedelics molecules were here first identified with the help of systematic, multilingual, (open) web crawling activities. This project is part of a larger study carried out by our research group that analyses the differences between the extent of the NPS phenomenon online versus the real-world situation. The discrepancy between the numbers of various NPS classes found after the analysis of the NPS*finder*® web activity and the number reported by official sources has already been reported by this group in previous publications (Arillotta et al., 2020; Orsolini et al., 2020; Schifano et al., 2020; Zangani et al., 2020). However, the current psychedelic NPS data, and especially so for phenethylamines which were here 10-fold higher in number than those previously identified by specialized databases, are unprecedented. Hence, it is here suggested that examining the online scenarios is of great potential to assess the NPS phenomenon. Even if it is not possible to guarantee with 100% certainty that the discussed NPS in fact exist and are being used, scanning and analysing the web can still be of help in predicting and assessing the real world psychedelic NPS scenario (Corazza et al., 2013; Schifano et al., 2015).

The striking differences between the NPS*finder*® and the remaining databases can however be explained in considering that the online drug scenario is different from the reactive, event-based, reporting to official databases (Schifano et al., 2003). Indeed, limitations and challenges encountered in the NPS identification (UNODC, 2013), e.g. not limited to appropriate analytical techniques, reference standards availability, lack of analytical libraries for novel substances, etc. slow down the NPS identification process and reduce considerably the amount of molecules actually detected and reported. These challenges are not encountered online, where information is very

easily accessed and shared, in a fast and very often anonymous way. Aware of the limitations that surround the analytical NPS identification, one should not assume that the "real" drug market is described only by the substances that are officially reported and consider other sources to be used as supportive/integrative tools. The best resource could be the web, e.g. the virtual space/world where everything happens in the modern era, including drug-related activities (Corazza et al., 2013).

The results presented here support the idea that psychonauts favour drugs with entheogenic/psychedelic properties (Móró et al., 2011; Orsolini et al., 2015a, 2015b) and their drug intake shows high similarities with ancient shamanic ritual plant consumption (Orsolini et al., 2016). In the NPS era, these mind navigators are exposed to a large variety of easily available new psychedelic compounds. Once could argue that psychonauts experiment with this large number of unknown molecules to achieve new inner explorations and deeper trips into the mind to access areas and realms never 'dreamt of' before. The attitude of psychonauts towards psychedelics can help explain why phenethylamine entries reported by NPS*finder*® are much higher than the ones reported by the UNODC or EMCDDA, while for the overall NPS the number is 'only' five-fold higher.

Another consideration is that the consumption of psychedelic NPS is still seen as advantageous by psychonauts, and therefore by online drug users as well, who are attracted to the idea of the evolutionary role and positive effects (e.g. increased empathy levels, better establishment/strengthening of attachment bonds in an environment, improvement of own social status) that psychedelics have had for millennia (Orsolini et al., 2016).

Unfortunately, some modern psychedelics exhibit high toxicity levels(Luethi and Liechti, 2020) and their ingestion should be considered unsafe (Schifano et al., 2017, 2016). The recreational use of NBOMes has caused, on many occasions, severe toxic effects, leading to fatalities, even after emergency medical intervention (Bersani et al., 2014; Kamińska et al., 2020; Luethi and Liechti, 2020; Morini et al., 2017; Poulie et al., 2019).Fatalities and near misses have been reported as well after the use of the psychedelic Bromo-dragonFLY (Andreasen et al., 2009; Iwersen-Bergmann et al., 2019) and 2,5-dimethoxy-4-bromoamphetamine (DOB) (Balíková, 2005). Fatalities and intoxications have been reported also following the use of synthetic tryptamines (alpha-methyltryptamine, 5-methoxy-N,N-diisopropyltryptamine ('Foxy'), etc) (Tittarelli et al., 2014). Alpha-methyltryptamine was reported in 22 cases of drug related poisoning deaths in England and Wales (Office for National Statistics, 2019). The extreme toxicity (e.g. severe agitation, tachycardia, hyperthermia, seizures, rhabdomyolysis, metabolic acidosis, renal failure, multi-organ failure, and coma; (Poulie et al., 2019) of some psychedelic NPS such as the NBOMes is associated with distinct selectivity for the 5-HT2A receptor (Braden et al., 2006; Luethi and Liechti, 2020; Rickli et al., 2015b), resulting in high clinical potency (EMCDDA-Europol, 2014; Nichols et al., 2008). Moreover, psychedelic NPS can induce, consistent with their pharmacodynamic, paranoid and full-blown systematic delusions, mood alteration towards hypomanic states, suicidal thoughts, and depression states (Martinotti et al., 2015). When the use of these drugs is sporadic then the psychotic features are reversible, but when it is more frequent and at high doses then psychotic disorders are long-lasting and can culminate in a 'lysergic psychoma' (Martinotti et al., 2015).

Whilst for some of psychedelic NPS the related pharmacology and toxicity in vivo/in vitro studies are available (e.g. phenethylamines(Eshleman et al., 2018; Jensen et al., 2017; Luethi et al., 2018; Luethi and Liechti, 2020); tryptamines (Halberstadt et al., 2019; Rickli et al., 2016); lysergamides (Brandt et al., 2019, 2018), for most NPS here mentioned there is a lack of reliable data. Hence, the substances here listed and categorised as tryptamines, phenethylamines, and lysergamides possess

a likely misusing element, and may be considered as potent and potentially dangerous recreational drugs. On this basis, the findings highlighted by NPS*finder*® can be considered a reason of concern, with the scientific world and health care institutions facing thousands of substances for which very little knowledge, if anything, is known. Furthermore, serious concern arises from the very limited data available on the human absorption, distribution, metabolism, and excretion properties of these substances, with no knowledge about possible drug-drug interactions or toxic metabolites. Complex behavioural and medical toxicity (Schifano et al., 2019; Schifano et al., 2019) issues could be the issues that healthcare professionals will need to face, without any ad hoc intervention and harm reduction strategies in place.

A final consideration to be made is that, while the number of substances listed between the two official databases provides a full overview of NPS historical data regarding the different NPS appearance over the last 15 years or so, NPS*finder*® reports a more dynamic, and possibly current, picture of their existence and diffusion. NPS*finder*® ability to continuously scan the web and detect new psychedelics in 'real time' makes it more focused on the present time and can provided some levels of understanding about future trends (Corkery et al., 2017).

Limitations

Current NPS*finder*® results cannot confirm in any possible way the prevalence levels of use of psychedelics or their circulating number in the real-world market. However, current findings still suggest the interest shown by psychonauts, and the possible interest of the much wider community of 'recreational' drug users, towards these categories of substances. Although it is not possible to guarantee with 100% certainty that the discussed NPS in fact exist and are being used, it is here suggested that scanning and analysing the web can represent a valuable option to assessing/predicting current/future real-world drug scenarios. Indeed, present data analysis strategy carried out for each molecule identified by the web crawler consisted as well in a detailed search against several databases and web pages, including vendor websites. These ancillary activities have possibly helped in "tracing" the new NPS, confirming their presence on the online markets and hence increasing the levels of likelihood that the molecules here discussed exist and are potentially being used.

One could argue that some of the psychonauts here discussing the range of NPS online did not possess a deep understanding of both chemistry and appropriate analytical techniques; hence, it is possible that some chemical names and structures stated in web discussion fora were potentially incorrect. However, most websites scanned by the web crawler were here psychonauts' websites. As illustrated by previous studies (Orsolini et al,2015), psychonauts may well be perceived as "educated and informed" users, with highly advanced levels of academic background, usually providing reliable and detailed information on psychoactive compounds/combinations. However, there is still the chance that some substances may have here been mislabelled or referred to with slang denominations or common names. To overcome these possible biases in data acquisition activities, a thorough analysis and data evaluation was carried out, and the authors were able to assign a proper/unique chemical name and structure to all the substances here commented.

It must be emphasised here that the NPS*finder*® crawling activity has been conducted so far only on the surface web. Further studies from our group will focus on both the deep web and the darknet, since there may be more information in the hidden web (Orsolini et al., 2017). Since previous studies have highlighted the importance of other languages like Chinese, Japanese and Arabic in NPS-related studies, these will need to be added to the NPS*finder*® capabilities. Furthermore, a range of

multidisciplinary (e.g. docking, virtual screening, computational model; Kontoyianni, 2017) investigations are being carried out by our group in order to properly classify all the 'unknown' molecules (Appendix 2) found by the NPSfinder. Docking studies focussing on the 5-HT2A receptor will be essential to understand these molecules' possible clinical activity, recreational profile and impact on healthcare systems.

Conclusions

NPS*finder*® has the potential to identify a large number of new and previously unmentioned NPS, including psychedelics, with the chance of providing information on current and future drug trends. It may help explaining how a drug moves through the journey from manufacturing to distribution in both the virtual and real markets.

NPS*finder*® could be used as a support for the European and United Nation Early Warning Systems. Its ability to identify a molecule shortly after being mentioned on the web for the first time can make it a very important tool for a range of activities, including: informing, influencing and impacting law-making, monitoring/surveillance, pharmacovigilance, law-enforcement, understanding sales and use, and for drafting both treatment/management guidelines and educational packages. Predictive data regarding these molecules' acute and long-term effects, adverse effects and abuse potential could be generated, through in silico, in vitro, and in vivo studies in order to minimise the impact that NPS currently have on healthcare systems. Indeed, some of the novel psychedelic molecules here identified could exhibit very severe toxicity levels. Future work will hopefully include the creation of ad hoc reports/fact sheets for those newly identified NPS that are considered more threatening to public health. These reports will be shared with official sources, stakeholders and public health organisation to help researcher identify which substance to study first.

Moreover, NPS*finder*® can be used as an effective monitoring tool. As reported in the 2009 Integrated and Balanced Strategy to Counter the World Drug Problem, systematic global monitoring is recognised as a powerful tool against drug problem (LSS/RAB/DPA/UNODC, 2016). This unique web-crawler has the potential to scan the web systematically, consistently, and globally, since no country borders are available on the web.

The monitoring ability of NPS*finder*® could be useful in the current situation the world is facing due to the COVID-19 pandemic. As reported by the EMCDDA, restrictions on movement enforced all across Europe and worldwide (i.e., China, India, etc.) may evolve into serious disruption of the drug markets (UNODC, 2020) with a possible rise in online drugs purchases. The use of NPS, and of psychedelics in particular, may increase during the COVID-19 as individuals seek to self-medicate to deal with the trauma of isolation and anxiety about the virus(Chiappini et al., 2020). Through the analysis of the NPS*finder*® activity we may be able to notice possible changes in the online drug markets that can reflect the real-world situation (Catalani et al., 2020, in press).

Acknowledgments; Conflicts of interest

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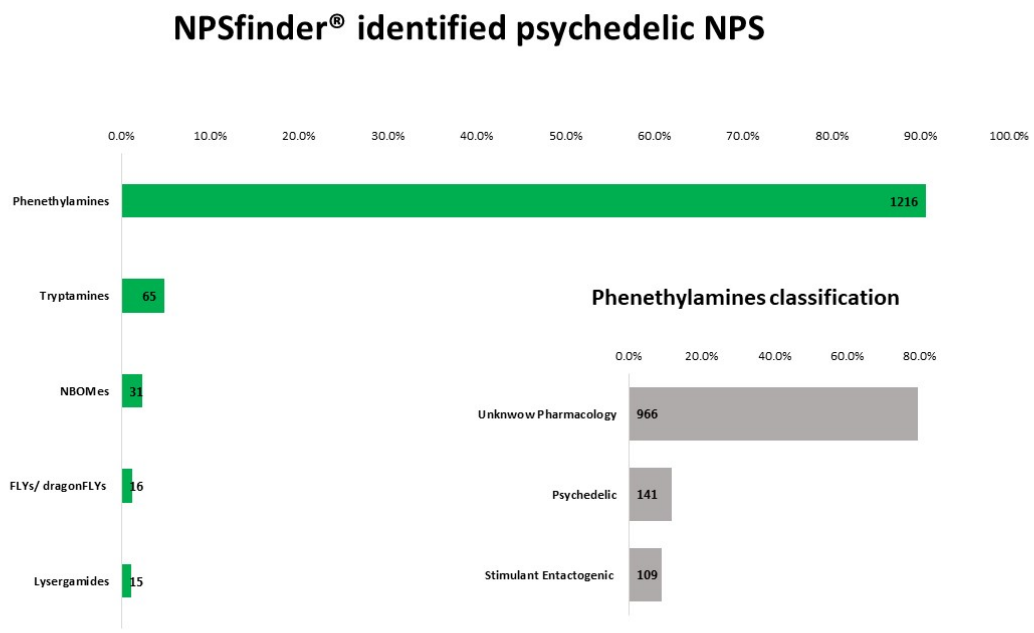

Figure 1 Psychedelic NPS identified by the NPSfinder®. The subclassification of the phenethylamines class is presented as well.

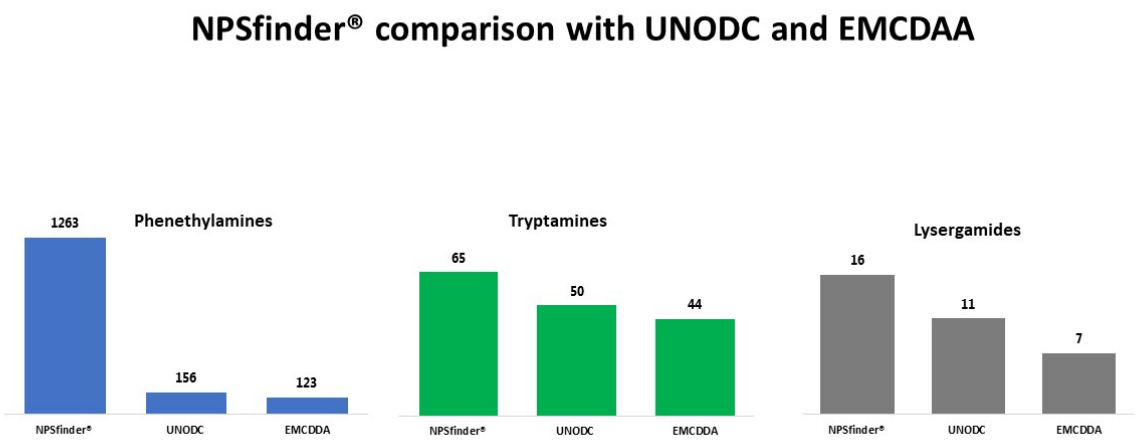

Figure 2 NPSfinder® comparison with UNODC and EMCDAA databases

Table 1 NPSfinder® psychedelic phenethylamines and comparisons with EMCDDA and UNODC databases

N	*NPSfinder® name*	*Other names*	*IUPAC*	*InChIKey*	*EDND (Feb 2020)*	*UNODC (July 2019)*	*NPSfinder®*
1	1-(1H-Indol-6-yl)-1-methylethylamine	N/A	*1-(1H-Indol-6-yl)-1-methylethylamine*	XLWCMUNJQRCUQC-UHFFFAOYSA-N	–	–	Y
2	1-methylethylamine	2-Amino-propano	propan-2-amine	JJWLVOIRVHMVIS-UHFFFAOYSA-N	–	–	Y
3	1-phenyl-1-propanamine	N/A	1-phenyl-1-propanamine	AQFLVLHRZFLDDV-UHFFFAOYSA-N	Y	–	Y
4	2-(1,4-Dimethoxy-2-naphthyl)-1-methylethylamine	N/A	2-(1,4-Dimethoxy-2-naphthyl)-1-methylethylamine	KWKDBIVLRQTMKR-UHFFFAOYSA-N	–	–	Y
5	2-(4,7-Dimethoxy-2,3-dihydro-1H-indan-5-yl)-1-methylethylamine	N/A	2-(4,7-Dimethoxy-2,3-dihydro-1H-indan-5-yl)-1-methylethylamine	GLFZOKOHBIKEKN-UHFFFAOYSA-N	–	–	Y
6	2,3-MDA	2,3-Methylenedioxyamphetamine	1-(1,3-benzodioxol-4-yl)propan-2-amine	XOOVOZRNDZPGLF-UHFFFAOYSA-N	–	–	Y
7	2,4-DMA	2,4-Dimethoxyamphetamine	1-(2,4-Dimethoxyphenyl)propan-2-amine	DQWOZMUBHQPFFF-UHFFFAOYSA-N	Y	Y	Y
8	2,5-Dimethoxy-4-(n)-propylthiophenenthylamine	2C-T-7	S 2-[2,5-Dimethoxy-4-(propylsulfanyl)phenyl]ethanamine	OLEVEPDJOFPJTF-UHFFFAOYSA-N	Y	Y	Y
9	2-BM	2-Bromomescaline	*2-(2-Bromo-3,4,5-trimethoxyphenyl)ethan-1-amine*	UXQBKANLBLUVMK-UHFFFAOYSA-N	–	–	Y
10	2-Br-4,5-MDA	6-Bromo-MDA	1-(6-Bromo-2H-1,3-benzodioxol-5-yl)propan-2-amine	PHCFFGXVMHXBGD-UHFFFAOYSA-N	–	–	Y
11	2C-2-TOET	4-Ethyl-5-methoxy-2-methylthiophenethylamine	2-[4-Ethyl-5-methoxy-2-(methylsulfanyl)phenyl]ethan-1-amine	QUBYTLZGKDGHHS-UHFFFAOYSA-N	–	–	Y
12	2C-2-TOM	5-Methoxy-4-methyl-2-methylthiophenethylamine	2-[5-Methoxy-4-methyl-2-(methylsulfanyl)phenyl]ethan-1-amine	NCCC1=CC(OC)=C(C)C=C1SC	–	–	Y
13	2C-3a	N/A	2-(4-Methoxy-1,3-benzodioxol-5-yl)ethan-1-amine	AXEJSBWWIHAWJM-UHFFFAOYSA-N	–	–	Y
14	2C-C	(4-Chloro-2,5-dimethoxyphenethyl)amine	2-(4-Chloro-2,5-dimethoxyphenyl)ethan-1-amine	CGKQFIWIPSIVAS-UHFFFAOYSA-N	Y	Y	Y
15	2C-D	2,5-Dimethoxy-4-methylphenethylamine	1-(2,5-Dimethoxy-4-methylphenyl)-2-aminoethane	UNQQFDCVEMVQHM-UHFFFAOYSA-N	Y	Y	Y
16	2C-D-2,5-DIEtO	2,5-Diethoxy-4-methylphenethylamine	2-(2,5-Diethoxy-4-methylphenyl)ethan-1-amine	ALVWRNQBQUMSMA-UHFFFAOYSA-N	–	–	Y
17	2C-D-2-EtO	2CD-2ETO; 2-Ethoxy-5-methoxy-4-methylphenethylamine; 2-Tweetio	*2-(2-Ethoxy-5-methoxy-4-methylphenyl)ethan-1-amine*	VYXRROQVSSPCGC-UHFFFAOYSA-N	–	–	Y
18	2C-D-5-EtO	5-Ethoxy-2-methoxy-4-methylphenethylamine	2-(5-Ethoxy-2-methoxy-4-methylphenyl)ethan-1-amine	ZMQDQUPRBYFPSO-UHFFFAOYSA-N	–	–	Y
19	2C-E	2,5-Dimethoxy-4-ethylphenethylamine	2-(4-Ethyl-2,5-dimethoxyphenyl)ethanamine	VDRGNAMREYBIHA-UHFFFAOYSA-N	Y	Y	Y

20	2C-F	4-Fluoro-2,5-dimethoxyphenethylamine	2-(4-Fluoro-2,5-dimethoxyphenyl)-1-aminoethane	QAVFEDRVOUKIPM-UHFFFAOYSA-N	–	Y	Y
21	2C-G	2,5-Dimethoxy-3,4-dimethylphenethylamine	2-(2,5-Dimethoxy-3,4-dimethylphenyl)ethan-1-amine	NFOHGLKGLZIHJQ-UHFFFAOYSA-N	Y	Y	Y
22	2C-G-3	2,5-Dimethoxy-3,4-(trimethylene)phenethylamine	2-(4,7-Dimethoxy-2,3-dihydro-1H-inden-5-yl)ethan-1-amine	DUYSKWSFDDDWQI-UHFFFAOYSA-N	–	–	Y
23	2C-G-5	3,4-Norbornyl-2,5-dimethoxyphenethylamine	2-(5,8-Dimethoxy-1,2,3,4-tetrahydro-1,4-methanonaphthalen-6-yl)ethan-1-amine	ASPWVWSIJQTXDB-UHFFFAOYSA-N	–	–	Y
24	2C-H	2,5-Dimethoxyphenethylamine	2-(2,5-Dimethoxyphenyl)ethanamine	WNCUVUUEJZEATP-UHFFFAOYSA-N	Y	Y	Y
25	2C-I	2,5-dimethoxy-4-iodophenethylamine	*2-(4-iodo-2,5-dimethoxyphenyl)ethanamine*	PQHQBRJAAZQXHL-UHFFFAOYSA-N	Y	Y	Y
26	2C-IP	Jelena	2-[2,5-Dimethoxy-4-(propan-2-yl)phenyl]ethan-1-amine	XUGPCRRUMVWELT-UHFFFAOYSA-N	–	Y	Y
27	2C-N	2,5-dimethoxy-4-nitrophenethylamine	2-(2,5-Dimethoxy-4-nitrophenyl)ethan-1-amine	ZMUSDZGRRJGRAO-UHFFFAOYSA-N	Y	Y	Y
28	2C-O-4	2,5-Dimethoxy-4-isopropoxyphenethylamine	2-(4-Isopropoxy-2,5-dimethoxyphenyl)ethanamine	KAKXJLWAEMHHTL-UHFFFAOYSA-N	–	Y	Y
29	2C-P	2,5-Dimethoxy-4-propylphenethylamine	2-(2,5-Dimethoxy-4-propylphenyl)ethanamine	PZJOKFZGPTVNBF-UHFFFAOYSA-N	Y	Y	Y
30	2C-T	4-methylthio-2,5-DMPEA	2-(2,5-dimethoxy-4-(methylthio)phenyl)ethanamine	UPZMYCMLLQTYEM-UHFFFAOYSA-N	–	–	Y
31	2C-T-13	2,5-dimethoxy-4-(β-methoxyethylthio)phenethylamine	2-[4-(Methoxyethylthio)-2,5-dimethoxyphenyl]ethanamine	PYJLRNOGMKMRTK-UHFFFAOYSA-N	–	–	Y
32	2C-T-15	4-Cyclopropylthio-2,5-dimethoxyphenethylamine	2-[4-(Cyclopropylsulfanyl)-2,5-dimethoxyphenyl]ethan-1-amine	HHAPMOUVSYQKLK-UHFFFAOYSA-N	–	–	Y
33	2C-T-16	4-Allylthio-2,5-dimethoxyphenethylamine	*2-{2,5-Dimethoxy-4-[(prop-2-en-1-yl)sulfanyl]phenyl}ethan-1-amine*	BXCMEIZBXNLJKM-UHFFFAOYSA-N	–	–	Y
34	2C-T-17	4-sec-Butylthio-2,5-dimethoxyphenethylamine	2-[4-(but-2-ylthio)-2,5-dimethoxyphenyl]ethanamine	KSZHVRPGICAZOA-UHFFFAOYSA-N	–	–	Y
35	2C-T-19	4-n-Butylthio-2,5-dimethoxyphenethylamine	2-[4-(Butylsulfanyl)-2,5-dimethoxyphenyl]ethan-1-amine	LGUVDOBGXUFUAJ-UHFFFAOYSA-N	–	–	Y
36	2-CT-2	4-Ethylthio-2,5-dimethoxyphenethylamine	2-[4-(Ethylsulfanyl)-2,5-dimethoxyphenyl]ethan-1-amine	HCWQGDLBIKOJPM-UHFFFAOYSA-N	Y	Y	Y
37	2C-T-21	4-(2-fluoroethylthio)-2,5-dimethoxyphenethylamine	2-[2,5-Dimethoxy-4-(2-fluoroethylthio)phenyl]ethanamine	ZBUUUKBTOCTOPW-UHFFFAOYSA-N	–	–	Y
38	2C-T-25	4-Isobutylthio-2,5-dimethoxyphenethylamine	2-{2,5-Dimethoxy-4-[(2-methylpropyl)sulfanyl]phenyl}ethan-1-amine	OEPKQBQEDYEXMC-UHFFFAOYSA-N	–	–	Y
39	2C-T-8	4-Cyclopropylmethylthio-2,5-dimethoxyphenethylamine;	2-{4-[(Cyclopropylmethyl)sulfanyl]-2,5-dimethoxyphenyl}ethan-1-amine	AHMSSHCYIDBVQB-UHFFFAOYSA-N	–	Y	Y
40	2C-TFM	2C-CF3	2,5-Dimethoxy-4-(trifluoromethyl)phenethylamine	LYXGNMLWYONZID-UHFFFAOYSA-N	Y	Y	Y
41	2-Me-MDA	2-Methyl-3,4-methylenedioxyamphetamine	*1-(4-methyl-1,3-benzodioxol-5-yl)propan-2-amine*	WVACHJAKQMSYSU-UHFFFAOYSA-N	–	–	Y
42	3,2,4-DOET	N/A	1-(3-Ethyl-2,4-dimethoxyphenyl)propan-2-amine	YMKTXNPDCOUJMV-UHFFFAOYSA-N	–	–	Y
43	3,4-DMA	3,4-Dimethoxyamphetamine	1-(3,4-Dimethoxyphenyl)propan-2-amine	KAZPHAGSWZTKDW-UHFFFAOYSA-N	–	Y	Y

44	3,4-methylenedioxy-N, N-dimethylamphetamine	MDMMA	(2-Benzo[1,3]dioxol-5-yl-1-methyl-ethyl)-dimethylamine	JEJGUIDNYBAPGN-UHFFFAOYSA-N	Y	Y	Y
45	3,5-DMA	3,5-Dimethoxyamphetamine	1-(3,5-Dimethoxyphenyl)propan-2-amine	PDCLPGSYMZLLDX-UHFFFAOYSA-N	–	–	Y
46	3-Bromophenethylamine	N/A	2-(3-bromophenyl)ethanamine	ORHRHMLEFQBHND-UHFFFAOYSA-N	–	–	Y
47	3C-BZ	4-Benzyloxy-3,5-dimethoxyamphetamine	1-[4-(Benzyloxy)-3,5-dimethoxyphenyl]propan-2-amine	IQKPLBJGFPDASR-UHFFFAOYSA-N	–	–	Y
48	3C-DFE	3C-F2EM	1-[4-(2,2-Difluoroethoxy)-3,5-dimethoxyphenyl]propan-2-amine	TYXHBMNQOVLYRX-UHFFFAOYSA-N	–	–	Y
49	3C-E	3C-Escaline	1-(4-Ethoxy-3,5-dimethoxyphenyl)propan-2-amine	AHLXCGRWNKUNTQ-UHFFFAOYSA-N	Y	Y	Y
50	3C-P	alpha-Methyl-4-propoxy-3,5-dimethoxyphenethylamine	3,5-dimethoxy-4-propyloxyamphetamine	KKMCHCCXGKYEKJ-UHFFFAOYSA-N	Y	Y	Y
51	3-DESMETHYL	3-Demethylmescaline	5-(2-Aminoethyl)-2,3-dimethoxyphenol	PDKPJPTZKPCMKR-UHFFFAOYSA-N	–	–	Y
52	3-TSB	3-Thiosymbescaline	3-ethylthio-4-methoxy-5-ethoxyphenethylamine	BTJFGKUKBHSKHI-UHFFFAOYSA-N	–	–	Y
53	3-T-TRIS	3-Thiotrisescaline	2-[3,4-Diethoxy-5-(ethylsulfanyl)phenyl]ethanamine	JSWFZFXPKROBKR-UHFFFAOYSA-N	–	–	Y
54	4-Bromo-2,5-Dimethoxyphene Thylamine	2C-B	2-(4-bromo-2,5-dimethoxyphenyl)ethanamine	YMHOBZXQZVXHBM-UHFFFAOYSA-N	–	–	Y
55	4-Bromo-Beta,2,5-trimethoxyphenethylamine	BOB	2-(4-bromo-2,5-dimethoxyphenyl)-2-methoxyethanamine	FYTLQNZPDWLGNU-UHFFFAOYSA-N	Y	–	Y
56	4C-iPrO	α-Ethyl-4-isopropoxy-2,5-dimethoxyphenethylamine	1-{2,5-Dimethoxy-4-[(propan-2-yl)oxy]phenyl}butan-2-amine	KKDGVJJZQGSVHK-UHFFFAOYSA-N	–	–	Y
57	4-Isopropylthio-2,5-dimethoxyphenethylamine	2C-T4	*2-[4-(Isopropylthio)-2,5-dimethoxyphenyl]ethanamine*	HDYZSVKZKDPLDT-UHFFFAOYSA-N	Y	Y	Y
58	4-TSB	4-Thiosymbescaline	4-methylthio-3,5-diethoxy-phenethylamine	OMJVPFLTCMALSV-UHFFFAOYSA-N	–	–	Y
59	4-T-TRIS	4-Thiotrescaline	2-[3,5-Diethoxy-4-(ethylsulfanyl)phenyl]ethan-1-amine	VFCYKJRATPCSED-UHFFFAOYSA-N	–	–	Y
60	5-APDI	indanylaminopropane (IAP)	(±)-1-(2,3-dihydro-1H-inden-5-yl)propan-2-amine	QYVNZHBQYJRLEX-UHFFFAOYSA-N	Y	Y	Y
61	5-Me-MDA	3-Methyl-4,5-methylenedioxyamphetamine; 1-(7-Methyl-2H-1,3-benzodioxol-5-yl)propan-2-amine; 1-(7-Methyl-1,3-benzodioxol-5-yl)propan-2-amine	1-(7-Methyl-2H-1,3-benzodioxol-5-yl)propan-2-amine	OLENSVFSNAULML-UHFFFAOYSA-N	–	–	Y
62	5-MeO-DIBF	5-MeO-MiPT	5-Methoxy-N,N-diisopropylbenzofuranethylamine	JIUANGKGSPXHML-UHFFFAOYSA-N	Y	–	Y
63	5-TASB	5-Thioasymbescaline	2-[3,4-Diethoxy-5-(methylsulfanyl)phenyl]ethanamine	WEGXTQPSIDDJRM-UHFFFAOYSA-N	–	–	Y
64	6-APDB	6-(2-Aminopropyl)-2,3-dihydrobenzofuranY	1-(2,3-Dihydro-1-benzofuran-6-yl)propan-2-amine	VRNGXHJGMCJRSQ-UHFFFAOYSA-N	–	–	Y
65	6-EAPB	N/A	*1-(1-benzofuran-6-yl)-N-ethylpropan-2-amine*	MIRNYUKRRZFBOI-UHFFFAOYSA-N	–	–	Y
66	6-MAPB	N/A	1-(benzofuran-6-yl)-N-methylpropan-2-amine	QLAAURQYEAEHBO-UHFFFAOYSA-N	Y	Y	–

67	6-Me-MDA	2-Me-4,5-MDA	1-(6-Methyl-1,3-benzodioxol-5-yl)propan-2-amine	HCFHWXDIZOAUTQ-UHFFFAOYSA-N	–	–	Y
68	AAM	α-Amylmescaline	1-(3,4,5-Trimethoxyphenyl)heptan-2-amine	QAYOKGOYZRYNSU-UHFFFAOYSA-N	–	–	Y
69	AHM	α-Hexylmescaline	1-(3,4,5-Trimethoxyphenyl)octan-2-amine	KMLNVPCGVUWXEK-UHFFFAOYSA-N	–	–	Y
70	ALEPH-2	dot2	1-[4-(Ethylsulfanyl)-2,5-dimethoxyphenyl]propan-2-amine	MCYCODJKXUJSAT-UHFFFAOYSA-N	–	–	Y
71	Allylescaline	AL	4-Allyloxy-3,5-dimethoxyphenethylamine	JNUAYHHGCXYBHX-UHFFFAOYSA-N	Y	Y	Y
72	Beatrice	MDO-D	1-(2,5-Dimethoxy-4-methylphenyl)-N-methylpropan-2-amine	IWYGVDBZCSCJGT-UHFFFAOYSA-N	–	–	Y
73	bH-2C-B	beta-hydroxy-2c-b	*2-Amino-1-(4-bromo-2,5-dimethoxyphenyl)ethan-1-one*	HFYJGAIOBIDRPX-UHFFFAOYSA-N	–	–	Y
74	bk-2C-I	beta-keto-2C-I	2-Amino-1-(4-iodo-2,5-dimethoxyphenyl)ethan-1-one	SGQREGRMRKZYSF-UHFFFAOYSA-N	–	–	Y
75	b-Me-2C-2	β-Me-2C-2	2-(6-Methoxy-2H-1,3-benzodioxol-5-yl)propan-1-amine	MKNWKDHPSQLEJJ-UHFFFAOYSA-N	–	–	Y
76	BOHD	4-methyl-2,5-dimethoxy-beta-hydroxyphenethylamine; 2-(4-Methyl-2,5-dimethoxyphenyl)ethan-beta-hydroxyamine	2-Amino-1-(2,5-dimethoxy-4-methylphenyl)ethanol	WCURBUJUIMRCCJ-UHFFFAOYSA-N	–	–	Y
77	BOM	BETA,3,4,5-TETRAMETHOXYPHENETHYLAMINE	2-methoxy-2-(3,4,5-trimethoxyphenyl)ethanamine	GAKIJEPUVBHWCK-UHFFFAOYSA-N	–	–	Y
78	Cyclopropylmescaline	CPM	2-(4-Cyclopropylmethoxy-3,5-dimethoxy-phenyl)-ethylamine	LNTBHKZMYJTHTH-UHFFFAOYSA-N	–	–	Y
79	Dimethoxyamphetamine	DOH	1-(2,5-dimethoxyphenyl)propan-2-amine	LATVFYDIBMDBSY-UHFFFAOYSA-N	–	–	Y
80	DMCPA	2-(2,5-Dimethoxy-4-methylphenyl)cyclopropylamine	2-(2,5-Dimethoxy-4-methylphenyl)cyclopropan-1-amine	HYVPPECPQRBJEQ-UHFFFAOYSA-N	–	–	Y
81	DME	3,4-Dimethoxy-beta-hydroxyphenethylamine	2-Amino-1-(3,4-dimethoxyphenyl)ethanol	WIUFFBGZBFVVDL-UHFFFAOYSA-N	–	–	Y
82	DMMDA	2,5-dimethoxy-3,4-methylenedioxyamphetamine	1-(4,7-Dimethoxy-2H-1,3-benzodioxol-5-yl)propan-2-amine	GRGRGLVMGTVCNZ-UHFFFAOYSA-N	–	–	Y
83	DMMDA-2	2,3-Dimethoxy-4,5-methylenedioxyamphetamine	1-(6,7-Dimethoxy-2H-1,3-benzodioxol-5-yl)propan-2-amine	UQXNREZPUUGSKM-UHFFFAOYSA-N	–	–	Y
84	DOB	Bromo-DMA	1-(4-Bromo-2,5-dimethoxyphenyl)-2-aminopropane	FXMWUTGUCAKGQL-UHFFFAOYSA-N	–	–	Y
85	DOB-bk	N/A	2-Amino-1-(4-bromo-2,5-dimethoxyphenyl)propan-1-one	NFDUSHHXFRLENI-UHFFFAOYSA-N	–	–	Y
86	DOC	2,5-Dimethoxy-4-chloroamphetamine	1-(4-Chloro-2,5-dimethoxy-phenyl)propan-2-amine	ACRITBNCBMTINK-UHFFFAOYSA-N	Y	Y	Y
87	DOET	2,5-dimethoxy-4-ethylamphetamine	1-(4-Ethyl-2,5-dimethoxyphenyl)propan-2-amine	HXJKWPGVENNMCC-UHFFFAOYSA-N	–	–	Y
88	DOF	2,5-Dimethoxy-4-fluoroamphetamine	1-(4-Fluoro-2,5-dimethoxyphenyl)propan-2-amine	NRANUECGGQVXOT-UHFFFAOYSA-N	Y	Y	Y
89	DOI	2,5-Dimethoxy-4-iodoamphetamine	*1-(4-Iodo-2,5-dimethoxyphenyl)-2-propanamine*	BGMZUEKZENQUJY-UHFFFAOYSA-N	Y	Y	Y
90	DOIP	2,5-Dimethoxy-4-isopropylamphetamine	1-[2,5-Dimethoxy-4-(propan-2-yl)phenyl]propan-2-amine	SPKSLAUXKHSASF-UHFFFAOYSA-N	Y	Y	Y

91	DOM	4-Methyl-2,5-dimethoxyamphetamine	1-(2,5-dimethoxy-4-methylphenyl)propan-2-amine	NTJQREUGJKIARY-UHFFFAOYSA-N	Y	Y	Y
92	DOPR	2,5-Dimethoxy-4-propylamphetamine	1-(2,5-Dimethoxy-4-propylphenyl)propan-2-amine	UEEAUFJYLUJWQJ-UHFFFAOYSA-N	Y	Y	Y
93	DOT	2,5-dimethoxy-4-methylthioamphetamine	1-[2,5-Dimethoxy-4-(methylsulfanyl)phenyl]propan-2-amine	COBYBOVXXDQRAU-UHFFFAOYSA-N	Y	Y	Y
94	DOTFM	2,5-Dimethoxy-4-trifluoromethylamphetamine	1-[2,5-dimethoxy-4-(trifluoromethyl)phenyl]propan-2-amine	WPGOTSORDNBMHP-UHFFFAOYSA-N	–	–	Y
95	Ephenidine	NEDPA	N-Ethyl-1,2-diphenylethan-1-amine	IGFZMQXEKIZPDR-UHFFFAOYSA-N	–	–	Y
96	Escaline	3,5-methoxy-4-ethoxyphenethylamine	2-(4-Ethoxy-3,5-dimethoxyphenyl)ethan-1-amine	RHOGRSKNWDNCDN-UHFFFAOYSA-N	Y	Y	Y
97	ETHYL-K	N-Ethyl-α-propyl-3,4-methylenedioxyphenethylamine	*1-(2H-1,3-Benzodioxol-5-yl)-N-ethylpentan-2-amine*	YIJZJPAWMJJXQD-UHFFFAOYSA-N	–	–	Y
98	F-2	6-(2-Aminopropyl)-5-methoxy-2-methyl-2,3-dihydrobenzofuran	1-(5-Methoxy-2-methyl-2,3-dihydro-1-benzofuran-6-yl)propan-2-amine	XBHKBTCXRYPZMX-UHFFFAOYSA-N	–	–	Y
99	F2-MDA	3,4-Difluoromethylenedioxyamphetamine	1-(2,2-Difluoro-2H-1,3-benzodioxol-5-yl)propan-2-amine	BHDXKBALNFHXDV-UHFFFAOYSA-N	–	–	Y
100	G-5	3,6-Dimethoxy-4-(2-aminopropyl)benzonorbornane	1-(5,8-Dimethoxy-1,2,3,4-tetrahydro-1,4-methanonaphthalen-6-yl)propan-2-amine	MZFVFTFFHRCTIO-UHFFFAOYSA-N	–	–	Y
101	Ganesha	2,5-dimethoxy-3,4-dimethylamphetamine	1-(2,5-Dimethoxy-3,4-dimethylphenyl)propan-2-amine	RBZXVDSILZXPDM-UHFFFAOYSA-N	–	–	Y
102	homo-Mescaline	N/A	3-(3,4,5-Trimethoxyphenyl)propan-1-amine	LKINXVPAOSIISW-UHFFFAOYSA-N	–	–	Y
103	HOT-17	2,5-Dimethoxy-4-sec-butylthio-N-hydroxyphenethylamine	2-{4-[(Butan-2-yl)sulfanyl]-2,5-dimethoxyphenyl}-N-hydroxyethan-1-amine	BUKIXGXYEUJJHQ-UHFFFAOYSA-N	–	–	Y
104	HOT-2	2,5-dimethoxy-4-(β-ethylthio)-N-hydroxyphenethylamine	2-[4-(Ethylsulfanyl)-2,5-dimethoxyphenyl]-N-hydroxyethan-1-amine	XGFJCRNRWOXGQM-UHFFFAOYSA-N	–	–	Y
105	IDNNA	4-Iodo-2,5-dimethoxy-a-methylphenethyl(dimethyl)amine	*1-(4-Iodo-2,5-dimethoxyphenyl)-N,N-dimethylpropan-2-amine*	XBCUSBRGRALQID-UHFFFAOYSA-N	–	–	Y
106	IRIS	5-Ethoxy-2-methoxy-4-methylamphetamine	1-(5-Ethoxy-2-methoxy-4-methylphenyl)propan-2-amine	IPJRCKIREPMKNE-UHFFFAOYSA-N	–	–	Y
107	LOPHOPHINE	MMDPEA	2-(7-Methoxy-2H-1,3-benzodioxol-5-yl)ethan-1-amine	ORXQUAPZHKCCAX-UHFFFAOYSA-N	–	–	Y
108	M-ALPHA	Alpha-ethyl-N-methyl-3;4-methylenedioxybenzylamine	1-(2H-1,3-Benzodioxol-5-yl)-N-methylpropan-1-amine	NLINVDHEDVEOMJ-UHFFFAOYSA-N	Y	Y	Y
109	MDA	3,4-Methylenedioxyamphetamine	1-(2*H*-1,3-Benzodioxol-5-yl)propan-2-amine	NGBBVGZWCFBOGO-UHFFFAOYSA-N	–	–	Y
110	MDAL	N-Allyl-3,4-methylenedioxyamphetamine	N-[1-(2H-1,3-Benzodioxol-5-yl)propan-2-yl]prop-2-en-1-amine	BMKCDDFQEGYEJC-UHFFFAOYSA-N	–	–	Y
111	MDBU	3,4-Methylenedioxy-N-butylamphetamine	N-[1-(2H-1,3-Benzodioxol-5-yl)propan-2-yl]butan-1-amine	RDXVRDCQDITVDV-UHFFFAOYSA-N	–	–	Y
112	MDBZ	N-Benzyl-3,4-methylenedioxyamphetamine	1-(2H-1,3-Benzodioxol-5-yl)-N-benzylpropan-2-amine	DWLUHTUYTBWOLO-UHFFFAOYSA-N	–	–	Y
113	MDCPM	3,4-Methylenedioxy-N-cyclopropylmethylamphetamine	*1-(2H-1,3-Benzodioxol-5-yl)-N-(cyclopropylmethyl)propan-2-amine*	AEIQNPMGFQNZNV-UHFFFAOYSA-N	–	–	Y

114	MDHOET	Hydroxyethyl-3,4-methylenedioxyamphetamine	2-{[1-(2H-1,3-Benzodioxol-5-yl)propan-2-yl]amino}ethan-1-ol	SCUUYKMQDUDNBP-UHFFFAOYSA-N	Y	Y	Y
115	MDMEOET	N-Methoxyethyl-MDA	1-(2H-1,3-Benzodioxol-5-yl)-N-(2-methoxyethyl)propan-2-amine	LOZJEWOZOKSOKA-UHFFFAOYSA-N	–	–	Y
116	m-DOB	5-Bromo-2,4-dimethoxyamphetamine	1-(5-Bromo-2,4-dimethoxyphenyl)propan-2-amine	YFSLPSITQIUFQK-UHFFFAOYSA-N	–	–	Y
117	m-DOT	2,4-Dimethoxy-5-methylthioamphetamine	1-[2,4-Dimethoxy-5-(methylsulfanyl)phenyl]propan-2-amine	BEMIKIUJWHLJTP-UHFFFAOYSA-N	–	–	Y
118	MDPH	3,4-Methylenedioxyphentermine	1-(1,3-Benzodioxol-5-yl)-2-methylpropan-2-amine	OIZBHKBNZXRXSM-UHFFFAOYSA-N	–	Y	Y
119	MDPL	N-Propargyl-3,4-methylenedioxyamphetamine	N-[1-(2H-1,3-Benzodioxol-5-yl)propan-2-yl]prop-2-yn-1-amine	LRYUTPIBTLEDJJ-UHFFFAOYSA-N	–	–	Y
120	MDPR	N-PROPYL-3,4-METHYLENEDIOXYAMPHETAMINE	N-[2-(1,3-Benzodioxol-5-yl)-1-methylethyl]-1-propanamine	LBXMQBTXOLBCCA-UHFFFAOYSA-N	Y	Y	Y
121	MEM	2,5-dimethoxy-4-ethoxyamphetamine;	1-(4-ethoxy-2,5-dimethoxyphenyl)propan-2-amine	ITZLAXJQDMGDEO-UHFFFAOYSA-N	–	Y	Y
122	Methallylescaline	4-methallyloxy-3,5-dimethoxyphenethylamine	2-{3,5-dimethoxy-4-[(2-methylprop-2-en-1-yl)oxy]phenyl}ethanamine	FOXJFBFFGULACD-UHFFFAOYSA-N	Y	Y	Y
123	Methamnetamine	methylnaphetamine	N-Methyl-1-(naphthalen-2-yl)propan-2-amine	BWWWOLYZMKACSB-UHFFFAOYSA-N	Y	Y	Y
124	METHYL-MESCALINE	M-M; N-Methyl-3,4,5-trimethoxyphenethylamine-	N-Methyl-2-(3,4,5-trimethoxyphenyl)ethan-1-amine	OTXANOLOOUNVSR-UHFFFAOYSA-N	–	–	Y
125	N-(2,5-Dimethoxy-4-propylthiophenthyl)hydroxylamine	HOT-7	N-[2-(2,5-dimethoxy-4-propylsulfanylphenyl)ethyl]hydroxylamine	ASTNLROMDNGJLS-UHFFFAOYSA-N	–	–	Y
126	N-ethyl-1-phenyl-butane-2-amine	N,α-DEPEA	N-Ethyl-1-phenylbutan-2-amine	KHWYSUBVXWWBRB-UHFFFAOYSA-N	Y	Y	Y
127	N-Hydroxy MDA	N-Hydroxy-3,4-methylenedioxyamphetamine	N-Hydroxy-1-(3,4-methylenedioxyphenyl)-2-aminopropane	FNDCTJYFKOQGTL-UHFFFAOYSA-N	Y	Y	Y
128	N-Me-3-DESMETHYL	3-Hydroxy-4,5-dimethoxy-N-methylphenethylamine;	2,3-Dimethoxy-5-[2-(methylamino)ethyl]phenol	ZIXMCYWHHXSJOK-UHFFFAOYSA-N	–	–	Y
129	N-Me-DOB	4-Bromo-2,5-dimethoxy-N-methylamphetamine	1-(4-Bromo-2,5-dimethoxyphenyl)-N-methylpropan-2-amine	GURVSGCCXMIFMQ-UHFFFAOYSA-N	–	–	Y
130	N-methyl-2C-B	4-Bromo-N-methyl-2,5-dimethoxyphenethylamine	2-(4-bromo-2,5-dimethoxyphenyl)-N-methylethan-1-amine	ZRTYZUYYGULHEW-UHFFFAOYSA-N	Y	Y	Y
131	N-Methyl-N-(alpha-methyl-3,4-methylenedioxyphenethyl)	FLEA	N-Methyl-N-(alpha-methyl-3,4-methylenedioxyphenethyl) hydroxylamine	ORADFQZOLNHWRQ-UHFFFAOYSA-N	–	–	Y
132	o-DOT	2-Methylthio-4,5-dimethoxyamphetamine	1-[4,5-Dimethoxy-2-(methylsulfanyl)phenyl]propan-2-amine	GQUWSNDODZTHKC-UHFFFAOYSA-N	–	–	Y
133	PiPT	N-propyl-N-isopropyl-tryptamine	[2-(1H-indol-3-yl)ethyl]-N-propyl-N-isopropylamine	OFXPLOPRCQJJFP-UHFFFAOYSA-N	–	–	Y
134	PMA	4-Methoxyamphetamine	1-(4-Methoxyphenyl)propan-2-amine	NEGYEDYHPHMHGK-UHFFFAOYSA-N	Y	Y	Y
135	PMMA	4-methoxy-N-methylamphetamine	1-(4-Methoxyphenyl)-N-methyl-2-propanamine	UGFMBZYKVQSQFX-UHFFFAOYSA-N	Y	Y	Y

136	PROPYNYL	4-Propynyloxy-3,5-dimethoxyphenethylamine	2-{3,5-Dimethoxy-4-[(prop-2-yn-1-yl)oxy]phenyl}ethan-1-amine	KNIWBMMJSJHUJB-UHFFFAOYSA-N	–	–	Y
137	Proscaline	4-propyloxy-3,5-dimethoxyphenethylamine	*2-(3,5-Dimethoxy-4-propoxyphenyl)ethanamine*	HYWLMSUAZVDUFW-UHFFFAOYSA-N	Y	Y	Y
138	ψ-ALEPH	2,6-Dimethoxy-4-methylthioamphetamine	1-[2,6-Dimethoxy-4-(methylsulfanyl)phenyl]propan-2-amine	OAFDDZCNQLOKNK-UHFFFAOYSA-N	–	–	Y
139	TCB-2	(4-Bromo-3,6-dimethoxy-1,2-dihydrocyclobutabenzene-1-yl)methanamine	1-(3-Bromo-2,5-dimethoxybicyclo[4.2.0]octa-1,3,5-trien-7-yl)methanamine	MPBCKKVERDTCEL-UHFFFAOYSA-N	–	–	Y
140	TMA-2	2,4,5-Trimethoxyamphetamine	1-(2,4,5-trimethoxyphenyl)propan-2-amine	TVSIMAWGATVNGK-UHFFFAOYSA-N	Y	Y	Y
141	TMA-6	2,4,6-trimethoxyamphetamine	1-(2,4,6-trimethoxyphenyl)propan-2-amine	DDGNOUVDFKXADP-UHFFFAOYSA-N	Y	Y	Y

Table 2 NPSfinder® NBOMes and comparisons with EMCDDA and UNODC databases

N	*NPSfinder® name*	*Other names*	*IUPAC*	*EDND (Feb 2020)*	*UNODC EWA NPS (July 2019)*	*NPSfinder®*
1	25B-NBF	2C-B-NBF	2-(4-bromo-2;5-dimethoxyphenyl)-N-(2-fluorobenzyl)ethanamine	Y	Y	Y
2	25B-NBOH	2C-B-NBOH	2-({[2-(4-Bromo-2,5-dimethoxyphenyl)ethyl]amino}methyl)phenol	Y		Y
	25B-N(BOMe)2	25B-NNBOMe	2-(4-Bromo-2,5-dimethoxyphenyl)-N,N-bis[(2-methoxyphenyl)methyl]ethan-1-amine	Y	Y	–
3	25B-NBOME	4-Bromo-2,5-dimethoxy-N-(2-methoxybenzyl)phenethylamine	2-(4-Bromo-2,5-dimethoxyphenyl)-N-[(2-methoxyphenyl)methyl]ethan-1-amine	–	–	Y
4	25C-NBF	2C-C-NBF	2-(4-Chloro-2,5-dimethoxyphenyl)-N-[(2-fluorophenyl)methyl]ethan-1-amine	Y	Y	Y
5	25C-NBOH	2C-C-NBOH	2-({[2-(4-Chloro-2,5-dimethoxyphenyl)ethyl]amino}methyl)phenol	Y	Y	Y
6	25C-NBOME	2C-C-NBOMe	2-(4-Chloro-2,5-dimethoxyphenyl)-N-[(2-methoxyphenyl)methyl]ethanamine	Y	–	Y
7	25D-NBOME	2c-D-Nbome	1-2-(2,5-Dimethoxy-4-methylphenyl)-N-(2-methoxybenzyl)ethanamine	Y	Y	Y
8	25E-NBOME	2C-E-NBOMe	2-(4-Ethyl-2,5-dimethoxyphenyl)-N-[(2-methoxyphenyl)methyl]ethan-1-amine	Y	Y	Y
9	25G-NBOME	2,5-Dimethoxy-N-(2-methoxybenzyl)-3,4-dimethylphenethylamine	2-(2,5-Dimethoxy-3,4-dimethylphenyl)-N-[(2-methoxyphenyl)methyl]ethan-1-amine	Y	Y	Y
10	25H-NBOME	2C-H-NBOMe	2-(2,5-Dimethoxyphenyl)-N-[(2-methoxyphenyl)methyl]ethan-1-amine	–	Y	Y
11	25H-NBOME-(3,4,5-TRIMETHOXYBENZYL ANALOGUE)	N/A.	2-(2,3-dimethoxyphenyl)-N-(3,4,5-trimethoxybenzyl)ethanamine	–	Y	–
12	25I-NB4OME	N/A	2-(4-Iodo-2,5-dimethoxyphenyl)-N-[(4-methoxyphenyl)methyl]ethan-1-amine	Y	Y	Y
13	25I-NBF	2C-I-NBF	2-(4-iodo-2,5-dimethoxyphenyl)-N-[(2-fluorophenyl)methyl]ethanamine	Y	Y	Y
14	25I-NBOH	Cimbi-27	2-(4-Iodo-2,5-dimethoxyphenyl)-N-[(2-hydroxyphenyl)methyl]ethanamine	Y	Y	Y
15	25IP-NBOME	2C-iP-NBOMe	2-[2,5-Dimethoxy-4-(propan-2-yl)phenyl]-N-[(2-methoxyphenyl)methyl]ethan-1-amine	Y	Y	Y
16	25N-NBOME	N-Bomb	2-(2,5-dimethoxy-4-nitrophenyl)-N-(2-methoxybenzyl)ethanamine	Y	Y	Y
17	25P-NBOME	2C-P-NBOMe	2-(2,5-Dimethoxy-4-propylphenyl)-N-[(2-methoxyphenyl)methyl]ethan-1-amine	–	Y	Y
18	25T-2-NBOME	2C-T-2-NBOMe	2-[4-(Ethylsulfanyl)-2,5-dimethoxyphenyl]-N-[(2-methoxyphenyl)methyl]ethan-1-amine	–	–	Y

19	25T-4-NBOME	2C-T-4-NBOMe	2-{2,5-Dimethoxy-4-[(propan-2-yl)sulfanyl]phenyl}-N-[(2-methoxyphenyl)methyl]ethan-1-amine	–	–	Y
20	2CBCB-NBOME	NBOMe-TCB-2	N-(2-methoxybenzyl)-1-[(7R)-3-bromo-2,5-dimethoxybicyclo[4.2.0]octa-1,3,5-trien-7-yl]methanamine	–	–	Y
21	2CBFLY-NBOME	NBOMe-2C-B-FLY	N-(2-Methoxybenzyl)-1-(8-bromo-2,3,6,7-tetrahydrobenzo[1,2-b:4,5-b']difuran-4-yl)-2-aminoethane	–	–	Y
22	2C-TFM-NBOME	NBOMe-2C-TFM; 25TFM-NBOMe; Cimbi-138	2-(4-trifluoromethyl-2,5-dimethoxyphenyl)-N-[(2-methoxyphenyl)methyl]ethanamine	–	–	Y
23	3,4-DMA NBOME	N-(Ortho-methoxybenzyl)-3,4-dimethoxyamphetamine	1-(3,4-Dimethoxyphenyl)-N-[(2-methoxyphenyl)methyl]propan-2-amine	Y	–	Y
24	30C-NBOME	25C-NB345OMe	2-(4-Chloro-2,5-dimethoxyphenyl)-N-[(3,4,5-trimethoxyphenyl)methyl]ethan-1-amine	Y	Y	Y
25	4-EA NBOME	4-Ethyl-N-(o-methoxybenzyl)amphetamine	1-(4-Ethylphenyl)-N-[(2-methoxyphenyl)methyl]propan-2-amine	Y	–	Y
26	4-MMA-NBOME	N/A	N-[(2-Methoxyphenyl)methyl]-N-methyl-1-(4-methylphenyl)propan-2-amine	Y	–	Y
27	CIMBI-5	25I-NBOMe	2-(4-Iodo-2,5-dimethoxyphenyl)-N-[(2-methoxyphenyl)methyl]ethan-1-amine	Y	Y	Y
28	MESCALINE-NBOME	N/A	N-(2-Methoxybenzyl)-2-(3,4,5-trimethoxyphenyl)ethan-1-amine	–	–	Y
29	N-MOB-5-APB	5-APB-NBOMe	1-(benzofuran-5-yl)-N-(2-methoxybenzyl)propan-2-amine	–	–	Y
30	N-PROPYL-DOB	N-Pr-DOB	N-[1-(4-Bromo-2,5-dimethoxyphenyl)propan-2-yl]propan-1-amine	–	–	Y
31	RH-34	N/A.	3-(2-{[(2-Methoxyphenyl)methyl]amino}ethyl)quinazoline-2,4(1H,3H)-dione	–	–	Y
32	25E-NBOH	2C-E-NBOH	2-({[2-(4-Ethyl-2,5-dimethoxyphenyl)ethyl]amino}methyl)phenol	Y	Y	–
33	25F-NBOME	2C-F-NBOMe	2-(4-Fluoro-2,5-dimethoxyphenyl)-N-[(2-methoxyphenyl)methyl]ethan-1-amine	–	Y	–
34	25H-NBOH	2C-H-NBOH	2-({[2-(2,5-Dimethoxyphenyl)ethyl]amino}methyl)phenol	–	Y	–
35	25I-NB34MD	4-Iodo-2,5-dimethoxy-N-(3,4-methylenedioxybenzyl)phenethylamine	N-[(2H-1,3-Benzodioxol-5-yl)methyl]-2-(4-iodo-2,5-dimethoxyphenyl)ethan-1-amine	Y	Y	Y
36	25I-NBMD	N/A	2-(2-{[(2H-1,3-Benzodioxol-4-yl)methyl]amino}ethyl)-5-iodo-4-methoxyphenol	Y	Y	Y

Table 3 NPSfinder® *FLYs and comparisons with EMCDDA and UNODC databases*

N	*NPSfinder® name*	*Other names*	*IUPAC*	*EDND (Feb 2020)*	*UNODC EWA NPS (July 2019)*	*NPSfinder®*
1	DOB-5-HEMIFLY	4-Benzofuranethanamine, 7-bromo-2,3-dihy	*1-(7-Bromo-5-methoxy-2,3-dihydro-1-benzofuran-4-yl)propan-2-amine*	–	–	Y
2	M-HEMIFLY	Hemi-flyscaline	2-(6,7-Dimethoxy-2,3-dihydro-1-benzofuran-4-yl)ethan-1-amine	–	–	Y
3	MESCALINE-FLY	M-FLY	2-(8-Methoxy-2,3,5,6-tetrahydrobenzo[1,2-b:5,4-b']difuran-4-yl)ethan-1-amine	–	–	Y
4	I-SF	DOI-5-hemiFLY	1-(7-Iodo-5-methoxy-2,3-dihydro-1-benzofuran-4-yl)propan-2-amine	–	–	Y
5	ME-3,5-IFLY	ψ-DOM-FLY	1-(4-Methyl-2,3,5,6-tetrahydrobenzo[1,2-b:5,4-b']difuran-8-yl)propan-2-amine	–	–	Y
6	2C-I-FLY	N/A.	2-(8-Iodo-2,3,6,7-tetrahydrobenzo[1,2-b:4,5-b']difuran-4-yl)ethan-1-amine	–	–	Y
7	TFM-FLY	N/A	1-[8-(Trifluoromethyl)-2,3,6,7-tetrahydrobenzo[1,2-b:4,5-b']difuran-4-yl]propan-2-amine	–	–	Y
8	DOM-FLY	N/A	1-(8-Methyl-2,3,6,7-tetrahydrobenzo[1,2-b:4,5-b']difuran-4-yl)propan-2-amine	–	–	Y
9	2C-B-DFLY	2C-B-dragonFLY	2-(8-Bromobenzo[1,2-b:4,5-b']difuran-4-yl)ethan-1-amine	–	–	Y
10	2C-I-DFLY	N/A.	2-(8-Iodobenzo[1,2-b:4,5-b']difuran-4-yl)ethan-1-amine	–	–	Y
11	DOM-DFLY	N/A.	1-(8-Methylbenzo[1,2-b:4,5-b']difuran-4-yl)propan-2-amine	–	–	Y
12	TFM-DFLY	DOTFM-dragonFLY	1-[8-(Trifluoromethyl)furo[2,3-f][1]benzofuran-4-yl]propan-2-amine	–	–	Y
13	2C-B-PLY	2C-B-butterFLY	2-(10-Bromo-2,3,4,7,8,9-hexahydrobenzo[1,2-b:4,5-b']dipyran-5-yl)ethan-1-amine	–	–	Y
14	2C-B-FLY	N/A	2-(4-bromo-2,3,6,7-tetrahydrofuro[2,3-f][1]benzofuran-8-yl)ethanamine	Y	Y	Y
15	3C-B-FLY	8-bromo-2,3,6,7-tetrahydro-a-methyl-benzo[1,2-b:4,5-b']difuran-4-ethanamine	1-(8-bromo-2,3,6,7-tetrahydrobenzo[1,2-b:4,5-b']difuran-4-yl)propan-2-amine	–	Y	–
16	BROMO-DRAGONFLY	Bromo-DragonFLY	(1-(8-bromobenzo[1,2-b;4,5-b']difuran-4-yl)-2-aminopropane	Y	Y	Y
17	TFMFLY	N/A	(2R)-1-(8-trifluoromethyl-2,3,6,7-tetrahydrobenzo[1,2-b:4,5-b']difuran-4-yl)-2-aminoethane	–	–	Y

Table 4 NPSfinder® tryptamines and comparisons with EMCDDA and UNODC databases

N	*NPSfinder® name*	*Other names*	*IUPAC*	*EDND (Feb 2020)*	*UNODC EWA NPS (July 2019)*	*NPSfinder®*
1	4-ACETOXY-N,N-DIISOPROPYLTRYPTAMINE	4-AcO-DiPT	3-[2-[di(propan-2-yl)amino]ethyl]-1H-indol-4-yl] acetate	–	–	Y
2	4-ACO-AET	N/A	3-(2-aminobutyl)-1H-indol-4-yl acetate	–	–	Y
3	4-ACO-EIPT	Ethipracetin	3-(2-(ethyl(isopropyl)amino)ethyl)-1H-indol-4-yl acetate	–	–	Y
4	4-H2PO4-DMT	N,N-Dimethyl-4-phosphoryloxytryptamine	3-[2-(Dimethylamino)ethyl]-1H-indol-4-yl dihydrogen phosphate	–	–	Y
5	4-HO-DALT	Dalocin	3-{2-[Di(prop-2-en-1-yl)amino]ethyl}-1H-indol-4-ol	–	–	Y
6	4-HO-MPMI	4-Hydroxy-N-methyl-(α,N-trimethylene)tryptamine	3-[(1-Methylpyrrolidin-2-yl)methyl]-1H-indol-4-ol	–	–	Y
7	4-PRO-DIPT	N,N-Diisopropyl-4-propionyltryptamine	1-(3-{2-[Di(propan-2-yl)amino]ethyl}-1H-indol-4-yl)propan-1-one	–	–	Y
8	5-BROMO-DMT	5-Bromo-N,N-dimethyltryptamine	[2-(5-Bromo-1H-indol-3-yl)ethyl]dimethylamine	–	–	Y
9	5-METHOXY-N-METHYL-(α,N-TRIMETHYLENE)TRYPTAMINE	5-MeO-MPMI	5-Methoxy-3-{[(2R)-1-methylpyrrolidin-2-yl]methyl}-1H-indole	–	–	Y
10	MEXAMINE	5-MT	2-(5-Methoxy-1H-indol-3-yl)ethanamine	–	–	Y
11	ALPHA-ETHYLTRYPTAMINE	αET	3-(2-aminobutyl)indole	–	–	Y
12	2,3-DIHYDRO-N,N-DIMETHYL-1H-INDOLE-3-ETHANAMINE	CHEMBL159503	2-(2,3-dihydro-1H-indol-3-yl)-N,N-dimethylethanamine	–	–	Y
13	N,N-Diethyltryptamine	DET	N,N-Diethyl-2-(1H-indol-3-yl)ethan-1-amine	–	–	Y
14	DIMEMEBFE	5-MeO-BFE	N,N-Dimethyl-2-(5-methoxybenzofuran-3-yl)ethanamine	–	–	Y
15	MPT	Methylpropyltryptamine	N-[2-(1H-Indol-3-yl)ethyl]-N-methylpropan-1-amine	–	–	Y
16	N-OMEGA- METHYLTRYPTAMINE	N/A	3-(2-Methylaminoethyl)indole	–	–	Y
17	RU-28306	3,4,5-tetrahydro-N,N-dimethylbenz[cd]indol-4-amine	N,N-dimethyl-2-azatricyclo[6.3.1.04;12]dodeca-1(12);3;8;10-tetraen-6-amine;	–	–	Y
18	4-ACETOXY-N,N-DIISOPROPYLTRYPTAMINE	4-AcO-DiPT	[3-[2-[di(propan-2-yl)amino]ethyl]-1H-indol-4-yl] acetate	Y	Y	Y
19	2-ME-DMT	2,N,N-Trimethyltryptamine	N,N-dimethyl-2-(2-methyl-1H-indol-3-yl)ethanamine	Y	Y	Y
20	4-ACO-DALT	4-Acetyloxy-N,N-diallyltryptamine	[3-[2-[bis(prop-2-enyl)amino]ethyl]-1H-indol-4-yl] acetate	Y	Y	Y
21	4-ACETOXY-N,N-DIETHYLTRYPTAMINE	4-ACO-DET	[3-[2-(diethylamino)ethyl]-1H-indol-4-yl] acetate	Y	Y	Y
22	4-ACO-DMT	4-acetoxy-N,N-dimethyltryptamine	[3-[2-(dimethylamino)ethyl]-1H-indol-4-yl] acetate	Y	Y	Y

23	4-ACO-DPT	4-acetoxy-N,N-propilltryptamine	[3-[2-(dipropylamino)ethyl]-1H-indol-4-yl] acetate	Y	Y	Y
24	4-ACETOXY-N-ETHYL-N-METHYLTRYPTAMINE	4-ACO-MET	[3-[2-[ethyl(methyl)amino]ethyl]-1H-indol-4-yl] acetate	Y	Y	Y
25	4-ACETOXY-N-METHYL-N-ISOPROPYLTRYPTAMINE	4-ACO-MiPT	[3-[2-[methyl(propan-2-yl)amino]ethyl]-1H-indol-4-yl] acetate	Y	Y	Y
26	4-HYDROXY-N,N-DIETHYLTRYPTAMINE	4-HO-DET	3-[2-(diethylamino)ethyl]-1H-indol-4-ol	Y	Y	Y
27	4-HYDROXY-N,N-DIISOPROPYLTRYPTAMINE	4-HO-DiPT	3-[2-[di(propan-2-yl)amino]ethyl]-1H-indol-4-ol	Y	Y	Y
28	4-HYDROXY-DIPROPYLTRYPTAMINE	4-HO-DPT	3-[2-(dipropylamino)ethyl]-1H-indol-4-ol	Y	Y	Y
29	4-HYDROXY-N-ETHYL-N-PROPYLTRYPTAMINE	4-HO-EPT	3-[2-[ethyl(propyl)amino]ethyl]-1H-indol-4-ol	Y	Y	Y
30	4-HO-MCPT	4-Hydroxy-N-methyl-N-cyclopropyltryptamine	3-[2-[Cyclopentyl(methyl)amino]ethyl]-1H-indol-4-ol	Y	Y	Y
31	4-HYDROXY-N-METHYL-N-ETHYLTRYPTAMINE4-HO-MET	4-HO-MET	3-[2-[ethyl(methyl)amino]ethyl]-1H-indol-4-ol	Y	Y	Y
32	4-HO-MPT	4-hydroxy-N-methyl-N-propyltryptamine	3-[2-[methyl(propyl)amino]ethyl]-1H-indol-4-ol	Y	Y	Y
33	4-HYDROXY-MIPT	4-hydroxy-N,N-methyl-isopropyltryptamine	3-[2-[methyl(propan-2-yl)amino]ethyl]-1H-indol-4-ol	Y	Y	Y
34	5-MEO-AMT	5-methoxy-alpha-methyltryptamine	1-(5-methoxy-1H-indol-3-yl)propan-2-amine	Y	Y	Y
35	5-MEO-DALT	5-METHOXY DIALLYLTRYPTAMINE	N-[2-(5-methoxy-1H-indol-3-yl)ethyl]-N-prop-2-enylprop-2-en-1-amine	Y	Y	Y
36	5-MEO-DET	5-methoxy-N,N-diethyltryptamine	N,N-diethyl-2-(5-methoxy-1H-indol-3-yl)ethanamine	Y	Y	Y
37	5-METHOXY-N,N-DIISOPROPYLTRYPTAMINE	5-MeO-DiPT	N-[2-(5-methoxy-1H-indol-3-yl)ethyl]-N-propan-2-ylpropan-2-amine	Y	Y	Y
38	5-METHOXY-N,N-DIMETHYLTRYPTAMINE	5-MeO-DMT	2-(5-methoxy-1H-indol-3-yl)-N,N-dimethylethanamine	Y	Y	Y
39	5-MEO-DPT	5-METHOXY-N,N-DIPROPYLTRYPTAMINE	N-[2-(5-methoxy-1H-indol-3-yl)ethyl]-N-propylpropan-1-amine	Y	Y	Y
40	5-MEO-EIPT	5-Methoxy-N-ethyl-N-isopropyltryptamine	N-Ethyl-N-[2-(5-methoxy-1H-indol-3-yl)ethyl]propan-2-amine	Y	Y	Y
41	5-MEO-MALT	N-etyl-N-isopropyl-5-metoxitryptamine	N-[2-(5-Methoxy-1H-indol-3-yl)ethyl]-N-methylprop-2-en-1-amine	Y	Y	Y
42	5-MEO-MET	5-metoxy-N-ethyl-N-methyl-tryptamine	N-Ethyl-2-(5-methoxy-1H-indol-3-yl)-N-methylethan-1-amine	Y	Y	Y
43	5-MeO-MiPT	5-methoxy-N-methyl-N-isopropyltryptamine	N-[2-(5-methoxy-1H-indol-3-yl)ethyl]-N-methylpropan-2-amine	Y	Y	Y
44	5-MEO-NBPBRT	5-Methoxy-N-(4-bromobenzyl)tryptamine	N-[(4-bromophenyl)methyl]-2-(5-methoxy-1H-indol-3-yl)ethanamine	Y	–	Y
45	5-MEO-NIPT	N-Isopropyl-5-methoxytryptamine	N-[2-(5-methoxy-1H-indol-3-yl)ethyl]propan-2-amine	Y	Y	Y

46	5-METHOXY-N,N-TETRAMETHYLENETRYPTAMINE	5-MeO-pyr-T	5-methoxy-3-(2-pyrrolidin-1-ylethyl)-1H-indole	Y	Y	Y
47	4-MEO-MIPT	N-Isopropyl-4-methoxy-N-methyltryptamine	N-[2-(4-Methoxy-1H-indol-3-yl)ethyl]-N-methylpropan-2-amine	Y	–	Y
48	INDAPEX	5-MeO-2-TMT	2-(5-Methoxy-2-methyl-1H-indol-3-yl)-N,N-dimethylethan-1-amine	Y	–	Y
49	α,N,N-TRIMETHYLTRYPTAMINE	alpha-TMT	1-(1H-indol-3-yl)-N,N-dimethylpropan-2-amine	Y	Y	Y
50	α-METHYLTRYPTAMINE	AMT	1-(1H-indol-3-yl)propan-2-amine	Y	Y	Y
51	DALT	N,N-diallyltryptamine	N-[2-(1H-indol-3-yl)ethyl]-N-prop-2-enylprop-2-en-1-amine	Y	Y	Y
52	N,N-DIISOPROPYLTRYPTAMINE	DIPT	N-[2-(1H-indol-3-yl)ethyl]-N-propan-2-ylpropan-2-amine	Y	Y	Y
53	N,N-DIMETHYLTRYPTAMINE	DMT	2-(1H-indol-3-yl)-N,N-dimethylethanamine	Y	Y	Y
54	N,N-DIPROPYLTRYPTAMINE	DPT	N-[2-(1H-indol-3-yl)ethyl]-N-propylpropan-1-amine	Y	Y	Y
55	EPT	N-Ethyl-N-propyltryptamine	3-[2-(Ethyl(propyl)amino)ethyl]-1H-indole	Y	Y	Y
56	MCPT	N-methyl-N-cyclopropyltryptamine	3-{2-[cyclopropyl(methyl)amino]ethyl}-1H-indole	Y	Y	Y
57	N-ETHYL-N-METHYLTRYPTAMINE	MET	Ethyl-(2-(1H-indol-3-yl)-ethyl)-methylamine	Y	Y	Y
58	MIPT	n-methyl-n-isopropyltryptamine	N-[2-(1H-indol-3-yl)ethyl]-N-methylpropan-2-amine	Y	Y	Y
59	4-AcO-MALT	4-Acetyloxy-N-methyl-N-allyltryptamine	3-(2-(allyl(methyl)amino)ethyl)-1H-indol-4-yl acetate	–	Y	–
60	4-MeO-DMT	4-Methoxy-N,N-dimethyltryptamine	2-(4-methoxy-1H-indol-3-yl)-N,N-dimethylethan-1-amine	–	Y	–
61	4-Methyl-alpha-ethyltryptamine	4-Me-αET	1-(4-Methyl-1*H*-indol-3-yl)butan-2-amine	–	Y	–
62	NMT	N-Methyltryptamine	2-(1H-indol-3-yl)-N-methylethan-1-amine	–	Y	–
64	6-MeO-DIPT	6-Methoxy-N,N-diisopropyltryptamine	N-isopropyl-N-(2-(6-methoxy-1H-indol-3-yl)ethyl)propan-2-amine	–	Y	–
65	4-OH-T	4-Hydroxytryptamine	3-(2-aminoethyl)-1H-indol-4-ol	–	Y	–
66	5-HTP	5-Hydroxytryptophan	(S)-2-amino-3-(5-hydroxy-1H-indol-3-yl)propanoic acid	–	Y	–

Table 5 NPS.Finder® lysergamides and comparisons with EMCDDA and UNODC databases

N	*NPSfinder® name*	*Other names*	*IUPAC*	*EDND (Feb 2020)*	*UNODC EWA NPS (July 2019)*	*NPSfinder®*
1	MiPLA	Methylisopropyllysergamide	*N*,7-dimethyl-*N*-propan-2-yl-6,6*a*,8,9-tetrahydro-4*H*-indolo[4,3-fg]quinoline-9-carboxamide	–	–	Y
2	D-LYSERGIC ACID N-(METHYLOPROPYL) AMIDE	D-iso-Lysergic Acid N-Methyl-N-propylamide	(6*aR*,9*R*)-*N*,7-dimethyl-*N*-propyl-6,6*a*,8α,9-tetrahydro-4*H*-indolo[4,3-fg]quinoline-9-carboxamide	–	–	Y
3	LYSERGIC ACID N-METHYL-N-PROPYLAMIDE	LAMPA	(6*aR*,9*R*)-*N*,7-dimethyl-*N*-propyl-6,6*a*,8,9-tetrahydro-4*H*-indolo[4,3-fg]quinoline-9-carboxamide	–	–	Y
4	N METHYL LYSERGIC ACID DIETHYLAMIDE	MLD-41	(6*aR*,9*R*)-*N*,*N*-diethyl-4,7-dimethyl-6,6*a*,8,9-tetrahydroindolo[4,3-fg]quinoline-9-carboxamide	–	–	Y
5	N-Propylnorlysergic acid N,N-diethylamide	PRO-LAD	(6aR,9R)-N,N-diethyl-7-propyl-4,6,6a,7,8,9-hexahydroindolo-[4,3-fg]quinoline-9-carboxamide	–	–	Y
6	6-PROPYNYL-6-NOR- LYSERGIC ACID DIETHYLAMIDE	PARGY-LAD	(6aR,9R)-N,N-diethyl-7-prop-2-ynyl-6,6a,8,9-tetrahydro-4H-indolo[4,3-fg]quinoline-9-carboxamide	–	–	Y
7	LSM-775	N-Morpholinyllysergamide	[(6*aR*,9*R*)-7-methyl-6,6*a*,8,9-tetrahydro-4*H*-indolo[4,3-fg]quinolin-9-yl]-morpholin-4-ylmethanone	–	–	Y
8	LYSERGIC ACID AMIDE	LSA	(6*aR*,9*R*)-7-methyl-6,6*a*,8,9-tetrahydro-4*H*-indolo[4,3-fg]quinoline-9-carboxamide	–	Y	Y
9	6-ETHYL-6-NOR-LYSERGIC ACID DIETHYLAMIDE	ETH-LAD	6aR,9R)-N,N,7-Triethyl-4,6,6a,7,8,9-hexahydroindolo-[4,3-fg]quinoline-9-carboxamide	Y	Y	Y
10	1CP-LSD	1-Cyclopropionyl-d-lysergic acid diethylamide	(6aR,9R)-4-cyclopropionyl-N,N-diethyl-7-methyl-4,6,6a,7,8,9-hexahydroindolo[4,3-fg]quinoline-9-carboxamide	–	–	Y
11	1-PROPIONYL-D-LYSERGIC ACID DIETHYLAMIDE	1P-LSD	(6*aR*,9*R*)-4-(3-deuteriopropanoyl)-*N*,*N*-diethyl-7-methyl-6,6*a*,8,9-tetrahydroindolo[4,3-fg]quinoline-9-carboxamide	Y	Y	Y
12	1P-ETH-LAD	1-propionyl-6-ethyl-6-nor-lysergic acid diethyamide	(6aR,9R)-4-propionyl-N,N-diethyl-7-ethyl-4,6,6a,7,8,9-hexahydroindolo[4,3-fg]quinoline-9-carboxamide	Y	Y	Y
13	AL-LAD	6-allyl-6-nor-lysergic acid diethylamide	(6aR,9R)-N,N-Diethyl-7-(prop-2-en-1-yl)-4,6,6a,7,8,9-hexahydroindolo-[4,3-fg]quinoline-9-carboxamide	Y	Y	Y
14	1B-LSD	1-butanoyl-lysergic acid diethylamide	(6aR,9R)-4-butyryl-N,N-diethyl-7-methyl-4,6,6a,7,8,9-hexahydroindolo[4,3-fg]quinoline-9-carboxamide	Y	Y	Y
15	ALD-52	1-acetyl-LSD	(6a*R*,9*R*)-4-Acetyl-*N*,*N*-diethyl-7-methyl-4,6,6a,7,8,9-hexahydroindolo[4,3-*fg*]quinoline-9-carboxamide	Y	Y	Y
16	LYSERGIC ACID 2,4-DIMETHYLAZETIDIDE	LSZ	[(6a*R*,9*R*)-7-methyl-6,6a,8,9-tetrahydro-4H-indolo[4,3-fg]quinoline-9-yl]-[(2*S*,4*S*)-2,4-dimethylazetidin-1-yl]methanone	–	Y	Y
17	LYSERGIC ACID METHYL ESTER	Methyl 9,10-didehydro-6-methylergoline-8beta-carboxylate	methyl (6*aR*,9*R*)-7-methyl-6,6*a*,8,9-tetrahydro-4*H*-indolo[4,3-fg]quinoline-9-carboxylate	Y	Y	–
18	1M-LSD	1-methyl-LSD	(6a*R*,9*R*)-N,N-diethyl-4,7-dimethyl-4,6,6a,7,8,9-hexahydroindolo[4,3-*fg*]quinoline-9-carboxamide	–	Y	–
19	2-Bromo-LSD	2-Bromo-N,N-diethyllysergamide	(6aR,9R)-5-bromo-N,N-diethyl-7-methyl-4,6,6a,7,8,9-hexahydroindolo[4,3-fg]quinoline-9-carboxamide	–	Y	–

Appendix 1 List of the websites monitored by the NPSfinder® web crawler, November 2017-February 2020; surface web only**.**

N	Website name
1	*Avalonmagicplants.com*
2	*Azarius.net*
3	*Bluelight.org*
4	*Bluemorphotours.com*
5	*Cannabis.net*
6	*Chemeurope.com*
7	*Committedpsychonaut.tumblr.com*
8	*Consolidated Index of Controlled Substances*
9	*Daath.hu/psychonauts*
10	*Dancesafe.org*
11	*Deviantart.com/psychonaut-a*
12	*Druglibrary.org*
13	*Drugs.tripsit.me*
14	*Drugs-forum.com*
15	*Drugs-plaza.com*
16	*Dutch-headshop.eu*
17	*Ecstasydata.org*
18	*Elephantos.com*
19	*Energycontrol.org*
20	*Entheogen-network.com/forums*
21	*Erowid.org*
22	*Eusynth.org*
23	*Everything2.com/title/Psychonaut*
24	*Fungifun.org*
25	*Hedweb.com*
26	*Hipforums.com/forum*
27	*Isomerdesign.com*
28	*Knehnav.home.xs4all.nl*
29	*Kratomshop.com*
30	*Legal-high-inhaltsstoffe.de*
31	*Mindstates.org*
32	*Mycotopia.net*
33	*Natmedtalk.com*
34	*Npsproject.eu*
35	*Peyote.com/peyolink.html*
36	*Psychedelic-library.org*
37	*Psychonaut.ca*
38	*Psychonaut.fr*
39	*Psychonautdocs.com*
40	*Psychonautwiki.org*

41	*Psyconauts.tripod.com*
42	*Reddit.com and drug-related subreddits (e.g. Reddit.com/r/Psychonaut/; Reddit.com/r/shroomers/)*
43	*Shayanashop.com*
44	*Sjamaan.com*
45	*Tripzine.com*
46	*Tryptamind.com*
47	*Urban75.net*
48	*Wikipedia List of designer drugs*
49	*Zamnesia.com*