



From horticulture to psychonautics: an analysis of online communities discussing and trading plants with psychotropic properties

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Published online: 8 July 2020

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Abstract

This study is a spinoff of the cross-disciplinary project “FloraGuard: Tackling the Illegal Trade in Endangered Plants”, and focuses on the analysis of online forums dedicated to the discussion and the trades of plant species, often highly endangered in nature, that are sought after for their psychotropic properties. The study sheds light on the interesting but overlooked area of the intersection of environmental crimes, illegal online trades, and drug use. Some species of conservation concern have known psychoactive/analgesic properties; as these properties are now openly and broadly discussed in specialised online communities, attention is required both as regards the potential for health-related harms suffered by reckless users, and for environmental-related harms for the species in question.

Keywords Illegal plant trades · Online communities · Psychonautics · Online trades · Entheogens

Introduction

Plant crime, and particularly illegal commerce in plants and their derivatives, is a major environmental problem that threatens and destroys numerous species and important natural resources, and may cause phytosanitary and health problems. This illegal trade, which has been boosted by the commercialisation of the internet, has been relatively overlooked over the years, but is receiving increasing attention by conservation scientists (Sajeva et al. 2013; Phelps and Webb 2015; Vaglica et al. 2017; Hinsley et al. 2017a, b; Hinsley and Roberts 2018) and, more recently, also by criminologists

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(Arroyo-Quiroz and Wyatt 2019; Lavorgna et al. 2020a). Despite the consensus that a better understanding of the characteristics of online illegal markets and of the actors operating in them is a necessary starting point for any intervention to mitigate the problem (Interpol 2018; CITES 2019), there are still several research gaps on the role of the internet as a facilitator in the illegal trade of plants, and on its policing. In this context, the ESRC-funded project “FloraGuard: Tackling the Illegal Trade in Endangered Plants” offered an analysis of the characteristics of illegal online trading in plants and of the actors operating therein, of current policing practices and challenges, and developed a software to assist law enforcement in the detection and investigation of illegal trades of endangered plants.

This study is a spinoff of the FloraGuard project, and focuses on the analysis of online forums dedicated to the discussion and the trades of plant species, often highly endangered in nature, that are sought after for their psychotropic properties. The study sheds light on the interesting but overlooked area at the intersection of environmental crimes, illegal online trades, and drug use. Some species of conservation concern have known psychoactive/analgesic properties; as these properties are now openly and broadly discussed in specialised online communities, attention is required both as regards the potential for health-related harms suffered by reckless users, and for environmental-related harms for the species in question.

Background

Particularly over the last 60 years, the trade in exotic and wild plants has shown a strong increase: specimens are harvested and traded all over the world for horticultural purposes, while plants’ parts and derivatives are used for a variety of documented purposes, including pharmaceuticals, food and beauty products (Sajeva et al. 2007; Novoa et al. 2017). The commercialisation of the internet has affected also plant trades (both legal and illegal), facilitating the connection of supply and demand both for large-scale commerce (for instance, for derivatives used in cosmetics or as health supplements) and for very niche markets such as for collectors of rare species (Sajeva et al. 2013; Lavorgna 2014; Hinsley et al. 2016; Olmos-Lau and Mandujano 2016; Roberts and Hernandez-Castro 2017; Vaglica et al. 2017; Miller et al. 2019).

The global trade in plants is mostly regulated by the 1975 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). CITES provides a framework (to be enacted by domestic legislation) to control the trade of species which international commercialisation and over-exploitation poses a serious threat to their survival, or could threaten survival in future if not regulated (Young 2003; Jenkins et al. 2018; Lavorgna et al. 2018; Lavorgna et al. 2020b). CITES lists in its Appendices three different levels of protection for endangered species, depending on the level of threat they are exposed to. More than 30,000 taxa of plants are included in the CITES Appendices (vs. only about 5000 taxa of animals). Overall, the CITES framework is extremely complex, and can be difficult to navigate, even for experts; nonetheless, it (should) affect the daily business of anyone dealing with international plant trades, even on an occasional basis. It should also be born in mind that there are different levels of illegality/seriousness (in terms of conservation concerns) in the illegal plant trade; some acts of illegality are in fact nothing more than “administrative offences” (where a permit

is accidentally missing), while others result in potentially serious environmental harms, for instance when a very endangered species is collected from the wild (Lavorgna and Sajeva 2020).

So far, the illegal plant trades have not been studied in connection to drug use with the exception of work of anthropological, archaeological and historical relevance on the use of fauna, flora and fungi species with psychoactive properties in cultural, religious, shamanic, or spiritual contexts (so called “entheogens”, or “becoming the divine within”) (see, for instance, Harner 1973; Wasson et al. 1978; Ott 1996; Glass-Coffin 2010). While the term entheogen is generally used to contrast with the recreational use of the same substances, in the course of history entheogens have been used by virtually all human cultures for religious, therapeutic and recreational use. Entheogens (such as peyote, *Salvia divinorum*, cannabis or datura) can have psychedelics, hallucinogens and deliriant effects; some entheogens have been used in ritualised context for thousands of years, and are still used in both formal and informal religious or traditional structures (Clark 1968; Adovasio and Fry 1976; Sullivan and Hagen 2002; Merlin 2003; Guerra-Doce 2015). While nowadays their use is generally forbidden because of widespread drug prohibition, there are still some exceptions: for instance, in the United States the 1978 American Indian Religious Freedom Act allows Native American persons to use the peyote cactus in traditional religious ceremonies. Similarly, under section 2 subsection 3 of the Indian Narcotic Drugs and Psychotropic Substances Act 1985, *bhong* (which is a mixture made from the buds, leaves, and flowers of the female cannabis plant) is allowed to be consumed for Hindu religious practices in India (Iversen 2007; Balhara and Mathur 2014). Cyberspace has allowed so-called psychonauts (i.e., those who explore altered states of consciousness through psychoactive substances) to have easier access to many sought-after substances and to communities of like-minded people (Walsh 2011; Davey et al. 2014; Lavorgna 2014; Orsolini et al. 2015), possibly blurring the divide between entheogenic psychonauts and some online communities specialised in certain types of plants.

Methodology

As part of the FloraGuard project, the research team carried out a test in October 2019 to check the ability of the cross-disciplinary effort and specifically of the newly developed software (as described in Lavorgna et al. 2020a, 2020b) to identify illegal trades of endangered species: over a week, the criminologist, the computer scientists and the conservation scientists worked together to identify major online markets and discussion forums, and to crawl data for further analyses (the research design is fully described in Lavorgna et al. 2020b).

For the test, the research team focused on eight species (and sub-species) of the genus *Ariocarpus*, a type of cactus listed in CITES Appendix I and that are considered endangered and quite rare in the wild. *Ariocarpus*, which is originally found in north Mexican highlands and in Texas, is traded mainly as live plants for horticultural reasons (these cacti are relatively easy to ship over long distances), but also in derivatives for medical use. In the course of this exercise, however, the research team encountered also some forums where *Ariocarpus* was discussed, alongside other plant species, for its psychotropic properties. This article offers an analysis of two of these forums (that were

accessible to us in the open web, so to comply with our ethical requirements for data collection – see Lavorgna et al. 2020b). The forum identified as Forum I is an Australia-based forum with a total of 8843 members and 1717 crawled posts in cacti-related discussion (as they were in forum threads where *Ariocarpus* was discussed); Forum II is based in the United States, has a total of 7058 members and 1708 crawled posts in cacti-related discussions. Both forums, however, have an international reach, and the associated websites are used as platforms to sell plants all over the world. Apart from the crawled posts, the leading researcher also explored the context in which both forums were published – that is, the overarching websites and their different webpages and other forum threads.

We conceptualised our data (that is, the posts crawled by the software and organised into an Excel file) into three main groups. First, posts were read and manually coded individually by both researchers to identify relevant information regarding (potentially) illegal trades (because of the plants being endangered); in particular, we were interested in the specific cases reported, where they occurred, the central actors involved, and how these trades were perceived by the forums' users. Second, we looked for information regarding drug use and how they were framed by forum users. Third, posts were coded by paying specific attention to elements detailing demographic and behavioural characteristics of the forums' users, and accounting relevant subcultural elements. Researchers' notes were then shared and discussed, and integrated into a coherent analysis by drawing on reflexive thematic analysis (Braun and Clarke 2019; Braun et al. 2019), an approach that allows researchers – among other things – to describe the experiences of particular social groups and particular aspects of their lives, and identify views about particular phenomena and factors that might influence them. In reflexive thematic analysis, even if main themes can be defined as domain summaries at the start of the analytic process, researchers do not rely on a pre-existing coding frame; coding is rather an organic and open iterative process, which allows to better capture the researchers' developing conceptualisation of the data; the researchers' aim is to provide a well-founded and congruent interpretation of the data, grounded in the data themselves (Braun et al. 2019).

Results and discussion

A few additional notes on the forums analysed

Forum I is linked to a webstore, which sells besides plants, seeds, herbs and extracts, also books, artwork, and laboratory and ritual tools such as beakers, pipettes and capsules to fill. It is clarified that plants can be mailed outside Australia, but only by prior arrangement; the purchaser takes full responsibility for any customs or other legal matter arising from the purchase. While the forum discusses very explicitly the use of plants and their derivatives as psychoactive substances, a disclaimer can be found in the website saying that the website administrators accept no liability for mis-use or prohibited use of any product, and for any other matter arising from any purchased product after despatch. On the website itself there is information on entheogens, but it is clarified that this information is for educational purposes only, that some of the plants and products sold can have severe psychological and physical effects, but also that even

when products are labelled for ingestion in the webstore the seller does not take any responsibility for any of these effects (including health or legal problems, car accidents, and so on).

In Forum II, because of the ethical approval we got for the FloraGuard research design, we got access only to the features available to guest users, while we could not access additional features available after registration, such as access to certain parts of the forum. Also in the second forum there was the disclaimer that the administrators' team and the forum's host have no liability in relation to any content posted on the forum board. Overall, Forum II appeared more structured in terms of internal organisation: in the FAQ section, for instance, there was a part detailing the separation among administrators, moderators, usergroups and individual users, specifying the different levels of control they have on forum's threads and posts.

Illegal trades of endangered plants

Some plants and derivatives with psychoactive substances cannot be traded internationally (or can be traded only under very specific circumstances) not only because of the real or perceived social or health risks they pose, but also because they are listed in one on the CITES Appendixes. Some types of cacti, including those belonging to the *Ariocarpus* genus, fell under this category. In both the forums analysed, however, we found some evidence of cacti sold and purchased in disrespect of CITES (generally because they were collected from the wild). Interestingly, CITES was never explicitly discussed, even if the international user-base of both forums was self-evident (in Forum I, for instance, there was an entire thread dedicated to facilitate discussions for users from Europe; some users mentioned they cities or countries they live in, e.g. London), or when cross-border movement of plants was explicitly discussed (a user in Forum II, for instance, "asks information for a friend" that needs to move some button cacti from Canada to the United States).

Suspicious (if not illegal) sales are openly discussed. For instance, a user tells how he ordered 4 specimens of *Ariocarpus* from a nursery in Germany found through the help of another user, and the support of a friend in Germany who acted as a middleman. Another user refers to suppliers from Asia (particularly from China and Japan); a third one refers to his Mexican suppliers (to whom it is clear he purchased items many times before, and who can reportedly sell him "hundreds" of *Ariocarpi* at a very competitive price), bragging that going through the paperwork to pass the Australian Quarantine and Inspection Service and customs won't be a problem for him. Of course, it cannot be excluded that some of these manifestly illegal sales are rather scams, and that some posts might serve to groom into a fraudulent sale some buyers desperate (as collectors or psychonauts) to have access to a rare species. Quite surprisingly, a post linked the trades to mugging: according to one user, it is quite frequent for "gullible enriched lunatics" like himself (Forum I, post ID 556135, the quote has been slightly changed to make it not recognisable in line with the ethical requirements of the project, A/N) to agree an offline meeting with sellers met online, and to get robbed of the cash brought for purchasing the rare plant.

In this context, users also use the forum to advertise plants (for instance, a user advertised for sale fully mature and grown *Ariocarpi*, without any reference to their legal status), to exchange advice on how to import illegally some specimens and their

seeds, and to report their experiences with different postal services. This was observed, for instance, when one user asked other forum members for the names of cacti that can be imported legally to pass custom controls: he explains that customs seized some plants he bought from abroad and asked him to identify them; in line with the suggestions received, he decided to provide the names of similar cacti that could be legally imported, and to hope for the best, counting on the fact that it might be very difficult for customs to prove him wrong. When parcels containing plants or seeds are sent (especially overseas), the advice users get from other members of the online community is to just mention that the parcel contain “collectables” (which, as clarified by a user, it is not even lying); other users suggest to simply “lie” when things are sent abroad as the bureaucracy would be too burdensome (post ID180868, Forum II). Forum members agree that standards of control differ widely depending on the specific postal employee encountered, and disparage about postal employees that seem to get suspicious about what is sent in the parcel (while most employees, according to those participating in the discussion, do not even look at what is declared in the form).

Users’ sensitivity on issues of “illegal because endangered” can be very different. When some users referred to “illegally poached” or “wild collected” specimen in their posts, illegality did not seem to be a big deal for them. They just mention they bought something, or to be the “proud owners” (post ID 55119, Forum II) of some endangered species. When these users discuss specimens obtained illegally, they tend to rely on what we might consider techniques of neutralisation – that is, rationalisations offenders use to convince themselves that it is admissible to transcend dominant norms of conduct and commit deviant behaviour (Sykes and Matza 1957) – to deviate and justify their deviation from the environmentally-responsible norms of conduct. In Forum I, for instance, Mexican government is blamed to be very restrictive in authorising the export of native plants or seeds (“condemning the condemners”); a (European) user comments that it is only thanks to poaching in the past that collectors from certain parts of the world can now access certain species (“appeal to higher loyalties”); other users emphasise that poached plants are looked after and bred with care, hence allowing the total number of certain rare species to increase (“denial of injury”), or that (most) cacti removed from habitat are not destroyed (“denial of victim”). In Forum II, a user initially thought that something he bought was a grafted specimen (grafting is a technique that joins two plants into one by using the roots and the bottom portion of one plant and attaching it to a tender shoot from the top portion of another plant) – something that he explicitly said he didn’t care –, but he then discovered that it was indeed a field picked *Ariocarpus*; this aspect seems to be irrelevant to him, as it is the vendor’s responsibility (“denial of responsibility”) (see also Lavorgna et al. 2020b).

Other users, however, seem to deeply care about conservation. A user, for instance, made references to something he recently read and that “opened his eyes” to how certain trade practices might affect endangered species; another user then suggested more readings on the topic. In a thread where a few users were making use of neutralisation techniques to rationalise their negative conducts, other users replied firmly underlying that to destroy a plant in its natural habitat is “bad”, and that past bad practices in terms of poaching should not justify current ones. In the thread previously mentioned in Forum II where a user recently discovered to have bought endangered species picked from the wild, other forum members intervened, for instance

insulting the vendor, imploring other users not to collect wild specimen and, if they happen to find some cacti in the wild, to not collect anything but a couple of seed pods. A sub-group of users concurred that they all should be working against the destruction of endangered or otherwise slow growing cacti.

In the posts, it is frequent to find links to external auction sites and marketplaces when trades of a specific species are reported; many users demonstrate familiarity with those types of sites (such as eBay and Gumtree) when discussing, for instance, the market value of certain species. There are also references to specific nurseries or wholesalers well known in the cacti world (who are described as monopolising the market, and hence increasing prices for certain products). Users rely on the expertise available on the forum to better understand whether a certain specimen listed (externally) for sale has been collected from the wild (and is therefore illegal, in the case e.g. of *Ariocarpus*) or not; for instance, they discuss the apparent age/size of some specimen (as they appear in the picture advertising them) or of the words used in certain posts (e.g., if a recently discovered plant is advertised as very old and it is therefore bigger in size, a characteristic which adds to its value).

Cyberspace is explicitly recognised as the major facilitator to give buyers access to otherwise very difficult-to-get species, to the point that internet is defined by a user as “a wonderful” (post ID 179407, Forum II). This is not surprising: it is well recognised in research that, having no borders, the virtual world is extremely attractive for all the actors involved in illegal and illicit trades, and especially within niche markets (Lavorgna 2014): cyberspace is particularly adept at connecting dispersed potential buyers and sellers, and forums provide a space in which social bonding and learning can take place. Actors in these markets can take advantage of greater international mobility, more rapid communications, and anonymity (Martin 2014).

Psychoactive plants’ use and drug narratives

Even if, as detailed above, both forums formally distance themselves from the mis-use or prohibited use of the plants and substances sold or discussed under their umbrella, some (in the case of Forum I) or many (in the case of Forum II) users discuss very openly about psychoactive plants, their effects, how to use them, and where to find them. Some users rely on the forums to actively look for specific information, for instance some users were curious about the psychotropic effects of specific species. In Forum II, for example, a user compares the powerful dissociative effects given by a fungus with those experienced by trying certain putrefied Chinese herbs; other users respond by providing their own (at times different) experiences. Again in the same forum, some members are asked to describe their experiences under substance, or alternative ways to assume them (e.g., vaping them rather than ingesting them orally) are discussed. In Forum I, a user refers to something he recently read on the traditional use by ethnic Mexicans to smoke the tips of certain types of *Ariocarpus* for narcotic effects, but as he cannot remember with precision nor the information neither where he read it, he asks other forum members for guidance.

Specific references to *Ariocarpus* were found, among other posts, in a thread dedicated to lesser known entheogens (Forum II). Here, there was overall consent among users that the issue deserved further investigation: when a user started joking about the fact that he just needed a camper trailer and a couple of weeks in the desert [to

collect wild specimens], another replied in a friendly tone that he needs to mail him “some things” – suggesting both the existence of a real life relationship among these users, and the practice to use the postal services not only to sell drugs for a profit (as recognised consistently by the literature over the past decade) but also to barter psychoactive substances among like-minded people sharing the same “hobby”. Other two users mentioned they bought *Ariocarpus* (one from a nursery, another one from land that was being cleared for livestock) for “research” but that they could not feel much effect. Only one user expressed environmental concerns, stressing that these cacti are endangered and might become extinct if poached for their (potential) psychoactive properties.

Many users clearly identify themselves as psychonauts – “psychedelic researchers” trying to explore altered states of consciousness (Orsolini et al. 2015). As a forum member clearly put it, it is about “exploring the unknown”; they are not simply interested in “getting high” (post ID 221285). Especially in Forum II, it was not uncommon to find conversations where users were expressing the desire to try and eat some rare cacti, and possibly mix them, to test their effects; other users were emphasising their willingness to try *new* psychoactives. Overall, users are encouraged by the community to “experiment” with substances and their dosages. Only in one thread in Forum II a user (self-identifying himself as a researcher) was stressing that it was not a good idea to ingest something without knowing anything about the potential effects. The side effect of psychoactive drugs, indeed, can be very severe (Ericson et al. 2008; Flanagan and Robert 2008; Salisbury et al. 2009). Health-related risks perception are overall minimised by the forum users analysed: in line with what has been observed in other types of potentially dangerous health-related behaviours online, even if some users recognise the potential harms of assuming certain substances (at least to a certain extent), others seem to be more reckless and prepared to face even serious health risks in their search for new experiences (Hall and Antonopoulos 2016; Koenraadt 2019) – as noted by Hall and Antonopoulos (2016) in their seminal work, one of the negative effects of neoliberalism’s emphasis on consumer culture on some individuals.

The only discussion observed addressing specifically potential health implications was related to a post in Forum II where a user mentioned that he decided to postpone the cultivation of certain types of button cacti as he has small children; in that instance, other users also mentioned that the aroma of certain hallucinogenic or otherwise intoxicating cacti could attract children to taste them.

While most forum users, when discussing drug use, were interested specifically to entheogens derived from plants (cacti, because of the nature of the data collected), we identified a discussion in Forum I launched by a user asking other members of the online community to name and discuss their top 10 drugs, clarifying that ethnobotany would have been welcomed in the thread but that the discussion was really “about drugs” (including hard drugs). A few users were interested also in the medical properties of some of the plants discussed. As one of them put it, (in his view) some of cacti are more likely to have medical than psychoactive effects (Forum II). Again in Forum II, it is suggested that some of the cacti discussed can reduce cancer risk, or have potential as antibiotic, as antihypertensive, and even be used as cancer treatment – something probably not surprising, considering the proliferation of non-science-based health misinformation online (Lavorgna and Di Ronco 2019). A user also gave precise indications of the doses he assumed for anxiety relief, or to cope with tension headaches.

While discourses on the legalization or decriminalization of drugs were present in both forums, in Forum II there was a specific thread specifically dedicated to this topic, where it was possible to observe a couple of heated discussions on the so-called War on Drugs. For some users, “growing” [plants] is considered as an act of disobedience (“fight”) towards restrictive drug policies; in their view, everyone should have freedom to choose whether and to what extent to use psychoactive substances (in line with the libertine sentiments and “countercultural” efforts of some prescription drug users in online forums, as reported by Hall and Antonopoulos 2016). Legalizing the use of botanicals, in their view, would be a first step in the direction of moving towards a partial legalization of hard (er) drugs; however, they also fear that even if there might be some political willingness to support the cannabis community, there might be less so to sustain the entheogenic one. According to a minority of users active in the discussion, however, this approach could be dangerous as most people might not be able to do informed choices on drugs intake; if this was the case, drug abuse wouldn’t be such a troublesome and widespread problem. These users strongly distance themselves from “narcotic users” (post ID 220656, Forum II) and stress the existence of a difference between the psychoactive substances they use and other recreational drugs. A third view, sustained by a couple of users, is that legalizing the use of psychoactive substances derived from certain plants would be helpful to discourage the abuse of what they consider to be really dangerous recreational drugs, such as heroin, methamphetamine or cocaine (which, in their opinion, should be regulated like alcohol is) – a view in line with the first-pass evidence available from the legalization of the cannabis market across some of the United States (Dragone et al. 2019).

Demographic and behavioural characteristics

Because of the nature of the forums analysed and the ethical constraints of the research design, it was not possible to extract or analyse in a systematic way potentially identifying information to get an in-depth picture of forums’ users and their demography. Nonetheless, there are a few notes that can be made. In line with the findings of the research carried out by Orsolini et al. (2015) on online psychonauts, in both forums most users appear to be males (because of the usernames used/ personal names/ pronouns used in the posts, with only a few female names/pronouns being used or reported); relatively young (for instance, they mention their young families); and Caucasian (because of how they frame the narrative around “traditional” or “tribal” use of certain substances), even if it can be inferred from the context that a couple of users (in Forum II) are indigenous people from the United States or Mexico. Overall, it is possible to recognise some educated and informed users (again in line with the findings of Orsolini et al. 2015): they are quite active in the online community, and are able to provide detailed information on psychoactive substances and their use. Some of them seem to have a good level of understanding of pharmacological issues, as well of botany. However, there was not sufficient information to draw any conclusion on their employment.

Elements of an *entheogenic psychonauts subculture* can be identified. The characteristics of this subculture were observed particularly in Forum II which, besides discussions on cactus and other plants, presents a number of sections dedicated to health, philosophy and spirituality, literature and poetry, visionary art, science and technology. Users self-identify themselves as a community of like-minded people who

share a similar lifestyle. They recognise to be influenced by subcultural values and norms, as exemplified by the discussions present in Forum II on “good reads”. Some books, mostly published in the late 1960s and in the 1970s, and some authors such as Albert Hofmann (a Swiss scientist known best for being the first known person to synthesise, ingest, and learn of the psychedelic effects of LSD) and Richard Evans Schultes (an American biologist, the father of modern ethnobotany, known best for his studies of the uses of entheogenic plants by indigenous people) are particularly popular in the community. However, for those new to the topic, some webpages are also suggested in the posts as introductory readings.

Relationships among members of the community appear generally friendly and relaxed, with a couple of exceptions. First, a certain user who used to be active on Forum I but then left was harshly criticised and accused to be a scammer by another user. Second, some users recognise that certain species are “trendier” than others depending on the fashion of the moment (among collectors), and seem to belittle the “newcomers” who succumb to the charm of brittle trends, with a negative impact on market prices. Similarly, those buying cactus in generalist marketplaces such as eBay for very high prices were disparaged by more expert users as “poor suckers” (post ID 169027, Forum I) – hence suggesting boundaries among the observed entheogenic psychonauts subculture, which are created not only as regards diversity of motivations and risk perceptions, but also as regards their ability to be skilled in knowing and understanding entheogens and in navigating the relevant plant markets. Particularly interesting in this respect is the comment of a user in Forum II, commenting that he feels “more comfortable with being [in the forum]” now that he has “more experience under [his] belt” and has done more research, while at the beginning he felt as an outsider and unknowledgeable (post ID 241602).

Conclusions

This article provided insights on the understudied topic of the entheogenic psychonauts subculture, focusing on how it relates with the problem of endangered plants illegally traded or collected from the wild. We have identified evidence of illegal wildlife trade, investigated drug use habits and perceptions, and explored some demographic and behavioural features. A better understanding of the socio-demographic and subcultural characteristics of these types of specialised online communities (and specifically of their diverse motives, risk perceptions, and risk management strategies) can help to design and implement prevention or harm-reduction approaches (Orsolini et al. 2015; Hall and Antonopoulos 2016; Koenraadt 2019). Further research exploring this subculture in offline contexts as well as in different online fora would be useful, but already in this exploratory study it was noted for instance that, through peer discussion, the forum seems to be a relatively effective place to raise awareness over the environmental issues linked to certain drug use. This positive effect, however, is limited by the lack of experts active in the forum able to provide more elements of in-depth analysis on the environmental effects of poaching rare species from the wild, and answers on the legal status and the health effects of certain products and plants discussed. This suggest that a more active role in online communities by health practitioners and conservation science experts to offer advice (including health advice) and clarifications on the

products discussed online could be a relatively cost-effective prevention strategy to mitigate illegal trades and poaching, as well as to improve health-related risk management. This suggestion is in line with analyses of drug-related forums that have identified demand for harm reduction and treatment advice, especially among socially integrated recreational drug users (Thanki and Frederick 2015); in addition, it is recognised that forums and other social media can be useful to engage with otherwise hard-to-reach drug-users, and to provide them with targeted messages (Davey et al. 2012).

The analysis also confirms how cyberspace is used for connectivity locally as well as globally (Wellman et al. 2003), and is a primary player in the creation and development of subcultures. Even if also (offline) friendship ties and core readings appear to have a primary role in identity formation and social learning, the role of cyberspace – and especially of online communities as those examined – in allowing for the development of a niche subculture, however, is of particular interest, as it allows for otherwise dispersed members to find a common place that leads to communal spirit and social bonding and learning (Castells 2001). As stressed by Goldsmith and Brewer (2015) among others, it is important to remember that cyberspace not only should be conceived as a set of social spaces for encounters where people can network and exchange information, but it also enables forms of “self-curation” and the chase for identity-related interests (including, in our case, horticulture and drug use). In internet-facilitated criminality and deviancy, it is also common to experience “digital drifts” (Goldsmith and Brewer 2015) – that is, for delinquency to become casual and transient (Mazda 1964) because of the features of online sociality and the characteristics of cyberspace, that by facilitating anonymity and distance attenuate commitment and permit degrees of involvement and disinvolvement. In this context, cyberspace facilitates the entrance into deviant and illegal spheres of new actors, as well as the existence of individuals moving easily between legal, semi-legal and illegal spheres (in line with Lavorgna 2014). Therefore, it is not surprising that most of the individuals observed in the analysis do not seem to have a serious social and individual commitment towards criminality, but they simply “happen to be” doing something beyond the limits of legality – another base to suggest the need of “soft” interventions for harm reduction rather than intervening (if an intervention was to happen against the entheogenic community) with further criminalisation and an excessive deployment of policing resources.

Research grant information This work was supported by the Economic and Social Research Council [ES/R003254/1].

Compliance with ethical standards

Conflict of interest The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

In the context of our ICT-enabled methodology we submitted our data study plans to our university REC for approval (approved—ERGO/FPSE/41,260 and ERGO/FPSE/46393). For our study, we do not engage in participant observation of virtual communities, but rather in their passive monitoring and in downloading of data created by online community users.

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