Pharmacognostic, Forensic and Pharmaceutical, Organizational and Legal, Clinical and Pharmacological Multidisciplinary Study with an Assessment of Peculiarities of Circulation (Use) of Smoking Mixtures of Spices and Entheogens of Amanita Muscaria Mushroom

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Abstract. A multidisciplinary pharmacognostic, forensic and pharmaceutical, organizational and legal, clinical and pharmacological, forensic and medical, toxicological, chemical evaluation of the irrational use of spices in smoking mixtures from the group of entheogens was carried out. An expert assessment of spices – plants and mushrooms containing psychoactive substances with hallucinogenic effects. Forensic and pharmaceutical practice was analyzed. A conclusion was made about the irrational use of smoking mixtures from the group of entheogens of the amanita muscaria mushroom, which contain psychoactive substances – psilocybin or psilocin. A forensic medical and toxicological study of amanita poisoning was conducted. Informed about pharmaceutical safety measures in case of amanita poisoning. A pharmacognostic study of "Amanita muscaria" – a fly agaric mushroom was conducted. According to the results of the normative study of the features of the circulation of fly agaric entheogens, normative initiatives are proposed.

Keywords: pharmacognosy, forensic pharmacy, organization of pharmaceutical business, clinical pharmacy, psychoactive substances, pharmaceutical law, smoking mixtures, entheogens, Amanita muscaria mushroom.

Introduction. In the previous studies of the authors, the consequences of the abuse of psychoactive substances of various classification and legal groups with the formation of addictive disorders were given. The perspective of the development of forensic pharmacy were substantiated. Comorbid, covid, post-covid and long-covid disorders on background of the spread of infectious diseases were presented. The possibility of medical errors in pharmacotherapy in the system of legal relations "doctor-patient-pharmacist-lawyer" is indicated [1-9].

According to the United Nations, the negative impact of synthetic cannabinoids – spices on users of psychoactive substances has been proven [10]. Synthetic cannabinoids can cause unconsciousness, psychosis, agitation, and in some cases, death. Products containing cannabinoids first appeared in the mid-2000s. Sold as herbal concoctions or legal alcoholic beverages. Currently, plant materials are sprayed with solutions of synthetic cannabinoids or these solutions are used to prepare cigarette paper for smoking. More recently, tablets and liquid preparations have begun to appear on the market. UNODC experts point to the spread of synthetic cannabinoids, which the Global Smart Program captures. The program tracks analyzes and reports on the global synthetic drug problem. Between 2009 and 2016, UNODC received reports on 240 synthetic cannabinoids from 65 countries around the world. During the years 2009-2014, a significant increase was observed, but since 2015, there has been a downward trend in the spice market. People who use them do not know about the narcotic properties of spices. They also do not know about the negative consequences for the body. Emergency services have no idea of the actual composition of the spices. Experts in 250

laboratories in 75 UN member states work to provide forensic pharmaceutical, forensic medical support for the identification of synthetic spice cannabinoids.

European countries and Ukraine became actively interested in the so-called spices at the end of the 20th century. According to the experts of the World Health Organization, the number of people who tried cannabis preparations at least once a year in 2006-2022 was 165.6 million, or 2.6% of the total population of the planet [11-14].

New derivatives of synthetic cannabinoids - spices - are constantly appearing on the criminal market of illegal drugs. The lack of methods of forensic-pharmaceutical, chemical analysis for synthetic cannabinoids of spices creates obstacles for law enforcement agencies and health care institutions. Psychoactive substances of spices (synthetic, designer drugs) were developed in order to circumvent the current legislation in the area of prohibiting the circulation of dangerous narcotic drugs [15-17].

A multidisciplinary study of spices within the framework of pharmacognosy, forensic pharmacy, clinical pharmacy, clinical pharmacology, pharmaceutical case management, pharmaceutical safety, forensic medicine, pharmaceutical and criminal law, and forensic medicine has not been conducted so far.

The purpose of the study was a multidisciplinary pharmacognostic, forensic and pharmaceutical, organizational and legal, clinical and pharmacological, forensic and medical, toxicological evaluation of the irrational use of spices in smoking mixtures from the group of entheogens, using the example of the mushroom Amanita muscaria, which contains psychoactive substances – psilocybin or psilocin.

Materials and methods. Data from the UN, WHO, analysis of scientific literature and publications, examples from forensic pharmaceutical, regulatory practice, legislation of the EU, Ukraine, Gambia, France, USA, National Institute on Drug Abuse (NIDA) and National Institute of Health (NIH), International the "Alliance of Public Health" charity fund and the Elton John AIDS Foundation, etc. A pharmacognostic, forensic and pharmaceutical, clinical and pharmacological, organizational and legal evaluation of the irrational use of psychoactive substances was carried out on the example of smoking mixtures from the group of entheogens of the mushroom Amanita muscaria, which contain psychoactive substances – psilocybin or psilocin. Study period: January 01,2017 – January 01, 2023.

The methods of normative and legal, statistical, documentary, system analysis, forensic and pharmaceutical, classification and legal, clinical and pharmacological, graphic analysis were used.

The research of the article is a fragment of research works of Kharkiv Medical Academy of Postgraduate Education on "Improving the organizational and legal procedure for providing patients with drugs from the standpoint of forensic pharmacy, organization and management of pharmacy" (state registration number 0116U003137, terms 2016-2020) and "Pharmaceutical and medical law: integrated approaches to the system of drug circulation from the standpoint of forensic pharmacy and organization of pharmaceutical business" (state registration number 0121U000031, terms 2021-2026); Petro Mohyla Black Sea National University on the topic "Conceptual interdisciplinary approaches to the drug circulation system, taking into account organizational and legal, technological, biopharmaceutical, analytical, pharmacognostic, forensic and pharmaceutical, clinical and pharmacological, pharmacoeconomic, pharmacotherapeutic aspects" (state registration number 0123U100468, implementation period 2023-2028); Luhansk State Medical University "Conceptual interdisciplinary approaches to pharmaceutical provision and availability of drugs, taking into account organizational and legal, technological, analytical, pharmacognostic, forensic and pharmaceutical, clinical and pharmacological, pharmacoeconomic, marketing, social and economic competencies" (state registration number 0123U101632, terms 2023-2027); Lviv Medical Institute LLC on the topic of "Improving the system of circulation of drugs during pharmacotherapy on the basis of evidentiary and forensic pharmacy, organization, technology, biopharmacy and pharmaceutical law" (state registration number 0120U105348, implementation period 2021-2026).

Results and discussion. Abuse of psychoactive spices (designer drugs) has spread among young people in educational institutions. A designer drug is a synthetic analogue of a drug, the

circulation of which is restricted or prohibited by law. In scientific domestic literature, the term designer drug is used, since design can be translated as designing, developing, constructing. The name emphasizes the artificiality of spices, as well as their difference from known drugs. In the English-language literature, the term "new psychoactive substances" is used for spices [18-21].

Clinical and pharmacological evaluation of spices. Spice abuse creates spice addicts. Spices cause nausea, vomiting, disorientation, convulsions, difficulty breathing and long-term psychotic disorders, paranoia, can stimulate progressive schizophrenia and even death in drug users. The effect of spices lasts 2-3 hours. Spice addicts are constantly forced to take spices for a state of euphoria. Disorders of mental and physical state arise, addiction forms. Degenerative consequences of spice abuse are irreversible, it is impossible to fully recover. Previously, the authors conducted a forensic-pharmaceutical and organizational-legal study of the illegal circulation of smoking mixtures containing JWH-018, HU-210, CP 47,497 and its homologues C6, C8, C9 [22].

Later, the authors presented the results of a study of the illegal circulation of functional food products and smoking mixtures, which include psychoactive medicinal plants that cause drug addiction [23]. The legal framework for the legal circulation of functional food products containing medicinal plants has been developed, and their pharmacological properties have also been studied. It should be noted that medical and pharmacy experts recommend using the sage plant to patients: ♦ orally; ♦ make external applications (wiping, washing); ♦ in the form of rinsing; ♦ inhalations, etc. Sage is used for diseases of the liver, gallbladder, enterocolitis, gastritis and enteritis, tumors of the spleen, urinary incontinence, hemorrhoids, diarrhea, increased sweating. Sage purifies the blood, heals the respiratory system and the skin. But it should be noted that sage is not recommended for patients during pregnancy and lactation, and long-term use of this plant and its excessive doses can cause poisoning, intoxication, and later – addiction.

At the next stage of the study, the authors conducted a forensic and pharmaceutical, and organizational and legal investigation of the plants genus Rose Hawaiian (Argyrea nervosa) [24].

In continuation of our research, a multidisciplinary expert assessment of plants and mushrooms containing psychoactive substances, which have hallucinogenic effects that alter consciousness, became a task. Cases of abuse of plants and mushrooms (entheogens) have been recorded. In particular, from the amanita mushroom, which contains psilocybin or psilocin [25, 26].

Retrospective studies have established that "entheogens" (from the Greek, literally "becoming divine from within") are a class of plants used to achieve euphoria. Entheogens were used by ancient shamans to enter "mystical states" in which they "communicated with spirits and deities." Today, this term unites several illegal psychoactive substances of various types of action [27].

Interdisciplinary study of the causes and conditions that cause abuse, illegal circulation of psychoactive substances of classification and legal groups, drug crimes (thefts, robberies, murders, hooligan acts, road accidents, bodily injuries of various degrees of severity), the spread of addictive disorders among all segments of the population (especially among minors , minors, young people, women), pharmacotherapy, pharmaceutical support was carried out taking into account the scientific works of Linskyi I.V., Sosin I.K., Chuiev Y.F., Hayduchok I.H., Ryabukha O.I., Vasina Y.V., Gudzenko O.O., Zbrozhek S.I., Gubskii Yu.I., Vyshar H.M. and others [1, 2, 7, 11, 13, 14, 28-42]. Documentary, systemic and organizational and legal analysis of the Internet made it possible to systematize information about the use of mushroom hallucinogens [43]. Free consultations by doctors on Viber and Telegram have been recorded, as well as the sale of drugs with fly agaric for treatment [44].

Thus, on the website of the Kyiv Center of Fungotherapy, Bioregulation and Ayurveda [45] it is indicated that amanita is used as a medicine in folk medicine in the treatment of more than 200 diseases. Amanita is a real panacea; it has all universal healing properties. For internal use, tinctures on alcohol or vodka are used. Tinctures and compresses from amanita are used to heal wounds, for rheumatism, gastric, mental, neurological, oncological disorders, tuberculosis. The results of biochemical studies showed that the skin of the cap of the red fly agaric contains the antibiotic muscarufin – a fiery orange pigment that inhibits the development of tumors. Paracelsus in the 16th century recommended the red amanita mushroom as a good remedy for diabetes and for the

prevention of tuberculosis. Traditional healers learned to make preparations for patients with spasms of blood vessels, cerebral sclerosis, chronic angina, chorea, and epilepsy from red amanitas. Amanita preparations have passed preclinical tests, but are not allowed in official medicine due to the toxicity of the source material. In phytotherapy, there is a whole direction – oncophytotherapy, which deals with the problems of treating cancer with plants. Hemlock is the leader in the list of plants, fly agaric is in second place. Red mushroom is widely used in homeopathy [46].

As noted by Boryspolets M. and co-authors, hallucinogenic mushrooms are also sold in online stores, along with entheogens, which are officially allowed [47]. Hallucinogenic mushrooms cause a feeling of euphoria, long visual and auditory hallucinations. People often jumped out of windows under the mushroom high. Addiction to mushrooms leads to catastrophic destruction of brain cells. In Ukraine, there is a "trend" for the use of fly agaric mushrooms for treatment, relaxation, and hallucinogenic effects. Unfortunately, minor children and young people use poisonous mushrooms to argue or even for the sake of videos on TikTok [48].

With the use of forensic and pharmaceutical and regulatory analysis, we present typical examples from forensic and pharmaceutical practice regarding the irrational use of the fly agaric mushroom, which contains psychoactive substances – psilocybin and psilocin.

Example 1. Citizen V., 20 years old, on the street, near the shopping center, offered to citizen N., 23 years old, to eat 70 mushrooms. The remaining mushrooms (100 pcs.) citizen V. decided to eat it himself. For a greater effect, the mushrooms were drunk with 0.5 liters of 2.5% fat milk. After that, c. V. and c. N. smoked one cigarette each with a smoking mixture with a psychoactive substance. Then they went to the shopping center to "wait for arrival". Somewhere around 7:30 p.m., sitting on a chair in a shopping center, citizen V. began to notice changes in the body: dizziness, headache, nausea, tremors of hands and feet, severe fatigue, as well as hallucinations in the form of people who were under the influence of "amphetamines", alcohol, or other psychoactive substances. About four hours later, citizen V. came home and tried to fall asleep, but he could not, he felt very tired and weak [48].

Example 2. A 47-year-old resident of the Cherkasy region was advised by his friend, a folk healer, to eat amanitas in raw form as an alternative method of treatment [49]. The man collected mushrooms in the forest, he works in forestry. He ate one cap of red fly agaric; he did not notice any changes in his health. He ate the second cap of a red amanita mushroom – dizziness, nausea and vomiting occurred. The man was taken to the intensive care unit of the hospital. This is the first case in practice when a person knowingly used poisonous mushrooms for the purpose of treatment. The red amanita mushroom is a neurotropic mushroom. Muscarine can affect the liver, kidneys, and nervous system. The red amanita mushroom is considered edible in most European countries. In Ukraine, amanita is classified as poisonous.

Example 3. According to the experts of the Varaska district department of the Rivne regional center for disease control and prevention of the Ministry of Health of Ukraine, a 43-year-old resident of the Varaska community, Rivne region, was poisoned by fly agaric [50]. In ancient times, fly agaric was used only to kill flies, bugs, and other insects. Hence the name Amanita. Psychoactive substances contained in amanita (muscarine, mycoatropin) affect the liver, kidneys, and central nervous system. Lethal consequences occur in 2-3% of cases, occur after 6-12 hours with large amounts of eaten mushroom. Some species of fly agaric led to poisoning, the symptoms of which appear too late, when it is almost impossible to help a person.

Example 4. Emergency doctors of the Transcarpathian Emergency Medical Center received a message from a boy. He said that his 20-year-old girlfriend felt sick. Not far from the "Karpaty" sanatorium, first aid was provided and they were taken to the Svalyavsk city hospital. The girl complained of dizziness, convulsions, worsening of her general condition [51]. In the hospital, it was established that the girl had consumed a fly agaric, as a result of which she was poisoned. The young people decided to have fun and test the hallucinogenic properties of the fly agaric. Only a timely call to 103 and the help of doctors saved the girl's life.

Example 5. A resident of Shatska makes a tincture from fly agarics and drinks it as a medicine [52]. Residents of the Volyn forest collect not only porcini mushrooms, chanterelles, and buttercups,

but also do not pass by when they come across fly agarics. They make, as they say, a healing tincture that helps with various diseases. They rub sore legs and joints, drink and even chew fly agarics. Folk healers also emphasize that amanita mushrooms should be treated carefully, because they are poisonous mushrooms. They are used mainly as external means - tinctures for rubs and ointments. By the way, creams are made from dried toadstools, which helps with fungal wounds. According to healers, tinctures treat convulsions, rheumatism, mastopathy, gynecological diseases, intestinal diseases, tumors, arthrosis, relieve swelling, pain, and inflammation. Even animals are saved by fly agaric. Foresters say that, for example, moose, eating these poisonous mushrooms, drive out worms – this is how they prepare for winter. Our medicine does not recognize such treatment. But abroad they pay a hundred euros for a kilogram of such mushrooms. Therefore, buyers resell amanitas to European countries [52].

Example 6. In the Dnipropetrovsk region, a 51-year-old woman was poisoned by fly agaric while trying to cure cancer. She bought amanita through a network of online stores [53]. The sick woman bought dry, red amanita mushrooms and on December 31, 2020, around 12 o'clock in the morning, she consumed a piece of dried mushroom. Already on January 1, 2021, the first symptoms appeared: dizziness, drowsiness, weakness, and feeling unwell. For medical help, the patient turned to the doctors of the intensive care hospital only on January 3, 2021. She was immediately hospitalized in the infectious department with a diagnosis of moderate wild mushroom poisoning. After it was determined by toxicologists that these mushrooms are poisonous, they were disposed of.

Analysis of forensic and pharmaceutical practice and conducted forensic and pharmaceutical monitoring of the irrational use of smoking mixtures from the group of entheogens, using the example of the mushroom Amanita muscaria, which contain psychoactive substances – psilocybin or psilocin, showed that minors, young people and the sick are prone to abuse hallucinogens When combined with the abuse of psychoactive substances of various classification and legal groups, poisoning and addictive disorders occur [13, 35, 39, 54-58].

Forensic and medical, and toxicological study. Signs of mushroom poisoning can appear both 30 minutes after consumption and within several days. The clinical course after taking amanita usually begins after 30 minutes: nausea, vomiting, sharp abdominal pain, diarrhea, convulsions, tremors, increased body temperature, decreased pulse, suffocation, blood flow from the extremities (cold hands and feet), delirium, hallucinations ataxia and incoordination, intoxication, restlessness, dizziness, increased psychomotor activity, depression of the central nervous system and disorders of the gastrointestinal tract. After 60 minutes, there is the appearance of an altered mental state, characterized by worsening sensations alternating between excitement and stupor, and strange behavior, including disorientation and depersonalization. Hallucinations in the form of visual and auditory distortions are also common. There is no antidote for poisoning, as the symptoms are both cholinergic and anticholinergic. Treatment after ingestion usually involves gastric lavage, the use of activated charcoal, and symptomatic supportive therapy. However, swallowing the cap is unlikely to cause death, and fatalities are very rare. However, the lethal dose for an adult was calculated to be equivalent to taking 15 capsules. In addition to acute toxicity, as previously mentioned, mushrooms are also consumed as edibles after detoxification, and the caps can accumulate pollutants. Thus, repeated consumption of mushrooms collected in contaminated areas can lead to chronic toxicity associated with long-term exposure to heavy metals.

In the presence of any of the above symptoms, call a doctor immediately!

Pharmaceutical safety. First aid in case of mushroom poisoning

- urgently call the emergency number 103;
- rinse the stomach with plain water;
- observe bed rest;
- drink plenty of fluids (water, salted water, or cool tea) — this will help restore the water-salt balance and remove toxins;
- take sorbents.

It is strictly forbidden to consume alcoholic beverages, any food, or dairy and fermented milk products - this can accelerate the absorption of toxins into the body. Do not engage in self-medication,

it is life-threatening! The remains of mushrooms or mushroom dishes should be preserved, because their laboratory examination will help to find out the cause of poisoning and prescribe the correct treatment.

Pharmacognostic study. The authors found out that "Amanita muscaria" – a mushroom of the genus Amanita or Amanita (lat. Amanita) of the order Agaricales (lat. Agaricales) has the following scientific synonyms: ● Agaricus muscarius L. 1753 basionym; ● Amanitaria muscaria (L.) E.-J. Gilbert 1941; ● Venenarius muscarius (L.) Earle 1909.

In many European languages, the name of the mushroom Amanita comes from the ancient method of use – as a means against flies (English fly agaric, German Fliegenpilz, French Amanite tue-mouches). The Latin species epithet also comes from the word "fly" (lat. musca). In Slavic languages, the word "amanita" (Polish: muchomor, Bulgarian: Muhomorka, Czech: Muchomůrka, etc.) became the name of the genus Amanita [25].

Studying the morphological properties of the mushroom Amanita muscaria, it was established that the cap of the mushroom has a size from 8 to 20 cm. Its shape is hemispherical at the beginning, then it opens to a flat one. The rind is bright red, of varying color density, shiny, dotted with white warty flakes, the open cap is markedly shaded at the edges. The flesh is white, light orange or light yellow under the skin, odorless, with a sweetish taste. Plates 0.8-1.2 cm wide, white, or cream, frequent, free, there are numerous intermediate plates. The leg is cylindrical, 8-20 cm high and 1-2.5 cm in diameter, white or yellowish, with a bulbous-thickened base, hollow in mature mushrooms. The flakes on the skin of the cap are cottony, white, and may fall off. A membranous ring in the upper part of the stem, hanging, persistent, the edge is often uneven, the upper surface is sometimes slightly scarred. The vulva is grown, multi-layered, very fragile, looks like several rings of whitish warts near the base of the leg. Spore powder is whitish, spores 9×6.5 μm, ellipsoidal, smooth. The color of the skin can be of different shades from orange-red to bright red, it becomes lighter with age. Plates sometimes acquire a light-yellow shade. It grows on acidic soils, is a common mushroom in the temperate forests of the Northern Hemisphere, and is found in the mountains up to the upper limit of the forest [26].

There is also an edible type of mushroom, this is Amanita caesarea (Amanita caesarea). Widespread exclusively in Southern Europe. It is distinguished by a golden-yellow leg and plates, a free bag-like vulva. The royal amanita (Amanita regalis) is distinguished by a darker, red-brown cap [59].

The fruiting body of the mushroom contains a number of toxic compounds, some of which have a hallucinogenic effect – ibotenic acid, muscimol (chemical name: 3-hydroxy-5-aminomethyl-1-isoxazole, unsaturated cyclic hydroxamic acid), muscazole. It was found that ibotenic acid and its metabolite – muscimol penetrate well through the blood-brain barrier and act as psychotomimetics. Muscazone content in these mushrooms is insignificant, and it does not have a significant effect on the body [60].

Chemical study. Amanita contains compounds that individually exhibit various biological activities (Fig. 1): muscarine, ibotenic acid, muscimol, etc. [61].

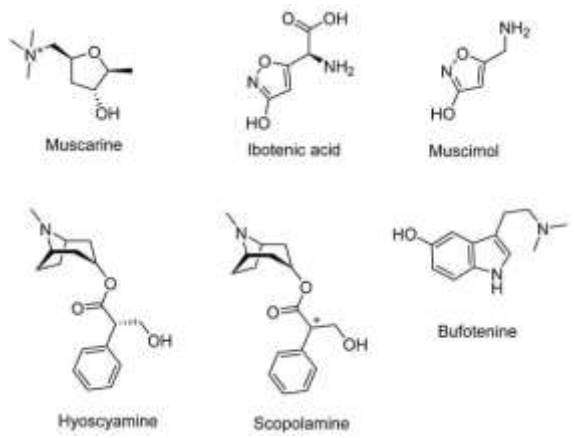

Fig. 1. Chemical structures of the main compounds found in Amanita muscaria.

Japanese scientists carried out a chemical determination of the compounds of the mushrooms Amanita muscaria, Amanita pantherina, extracts from Amanita muscaria, which are currently distributed in Japan [62]. Extracts from Amanita muscaria contain psychoactive chemicals (eg, hallucinogenic tryptamines). An analytical method was developed for the quantification and identification of muscimol and ibotenic acid [63].

Clinical and pharmacological research. Muscarine, isolated in 1869, has long been considered an active hallucinogenic substance in Amanita muscaria. In the middle of the 20th century, English researchers, as well as a group from Japan and Switzerland, did not prove that the psychotropic effects of amanita are caused mainly by ibotenic acid and muscimol. Ibotenic acid and muscimol are structurally similar and close in structure to two important mediators of the central nervous system – glutamic acid and GABA.

Muscarine, which is contained in the fly agaric, is similar to acetylcholine, in large doses it can cause a characteristic picture of poisoning, which includes the following symptoms: nausea, vomiting, salivation, increased sweating, and a decrease in blood pressure. In severe cases, patients may experience suffocation, convulsions, sometimes loss of consciousness and death.

The bright color makes it easy to distinguish amanita from edible mushrooms. The toxic properties of the amanita mushroom against some insects have been known since the 13th century. This gave the mushroom a characteristic name and allowed its infusion to be used as an insect repellent for a long time. In humans, the use of raw or insufficiently processed amanita mushrooms first causes mental disorders, which was associated with its use in shamanic rites, and then, with somewhat large doses, severe poisoning.

Based on the review of the literature, it was established that the psychoactive properties of the amanita mushroom were used by the peoples of the north and east of Siberia, as it was the only known intoxicant. The action of the Amanita mushroom is similar to severe intoxication: alternating bouts of laughter and anger, hallucinations appear with changing outlines and doubling of objects, color visions and auditory hallucinations. Then follows loss of consciousness and lethargic sleep, accompanied by amnesia. In folk medicine, the amanita mushroom is used for medicinal purposes.

It is easier to treat addiction to hallucinogenic mushrooms than to heroin or other addictive addictions, according to the doctors of the Medlux Medical Narcology Center. Psilocin does not cause physical dependence [64]. The basis of treatment is psychiatrist's consultations, group classes, involvement of loved ones, as well as social and psychological rehabilitation with further support. During personal classes and visits to groups at the MEDLUX clinic, the psychologist determines the underlying causes of addiction to hallucinogenic mushrooms. The main task of treatment is to return the patient to a social life where there is happiness, loved ones and work, but there is no place for drugs.

Red amanita refers to poisonous mushrooms because it contains psychoactive alkaloids: muscarine, ibotenic acid and muscimol [65]. The last two substances are structurally similar to gamma-aminobutyric acid. They act as neurotransmitters of the central nervous system. After taking mushrooms, ibotenic acid and muscimol are quickly absorbed by the gastrointestinal tract and cross the blood-brain barrier through an active transport system. Ibotenic acid is rapidly and spontaneously decarboxylated to muscimol. The latter is responsible for most of the symptoms of poisoning. Symptoms of poisoning begin 30 minutes – 2 hours after ingestion. Primary effects include CNS manifestations that often alternate between stimulation/excitement and depression. They begin as a state of confusion, dizziness, agitation, ataxia, changes in visual and auditory perception, distortion of space and lack of awareness of time. Nausea, vomiting, and diarrhea are uncommon. Tachycardia, bradycardia, and arterial hypertension can also be observed. Hypothermia and hyperthermia have been reported. Respiratory depression and bronchorrhoea are rarely observed. Mydriasis, miosis and metabolic acidosis are also possible. In case of severe poisoning, the symptoms can be manifested by coma and in some cases lead to death. Treatment of patients who have been poisoned by red fly agaric should be carried out in the inpatient conditions of a health care institution. It is necessary to wash the stomach as soon as possible and carry out symptomatic treatment. If necessary, restraint or

sedation should be used for agitated and delirious patients. Benzodiazepines are effective in controlling agitation, combative activity, and excessive muscle activity, but may cause respiratory depression. In cases of coma or absence of protective reflexes, intubation and ventilation may be required. Electrocardiogram, fluid, and electrolyte balance should be monitored. There is no antidote against fly agaric poisoning. Since the symptoms are cholinergic and anticholinergic, atropine and physostigmine are contraindicated [66-70].

Normative study. From the point of view of pharmaceutical law, it was interesting to analyze the peculiarities of the circulation of entheogens using the example of the mushroom Amanita muscaria, which contain the psychoactive substance – psilocybin or psilocin.

Established that the Resolution of the Cabinet of Ministers of Ukraine No. 4 of January 5, 2011 "On Amending the Resolutions of the Cabinet of Ministers of Ukraine No. 770 of May 6, 2000 and No. 1203 of October 10, 2007" amended the Resolution No. 770 of May 6, 2000 "On Approval of the List of Narcotic Drugs, Psychotropic Substances and Precursors". Thus, the substance "fruiting body (any part) of any type of mushroom containing psilocybin or (or) psilocin" was included in Table I of List No. 2 "Especially dangerous psychotropic substances, the circulation of which is prohibited".

Based on the results of the research, the authors proposed the improvement and expansion of the classification and legal characteristics of psychoactive substances – to add a new subgroup to the "psychotropic substances" group – smoking mixtures (Fig. 2).

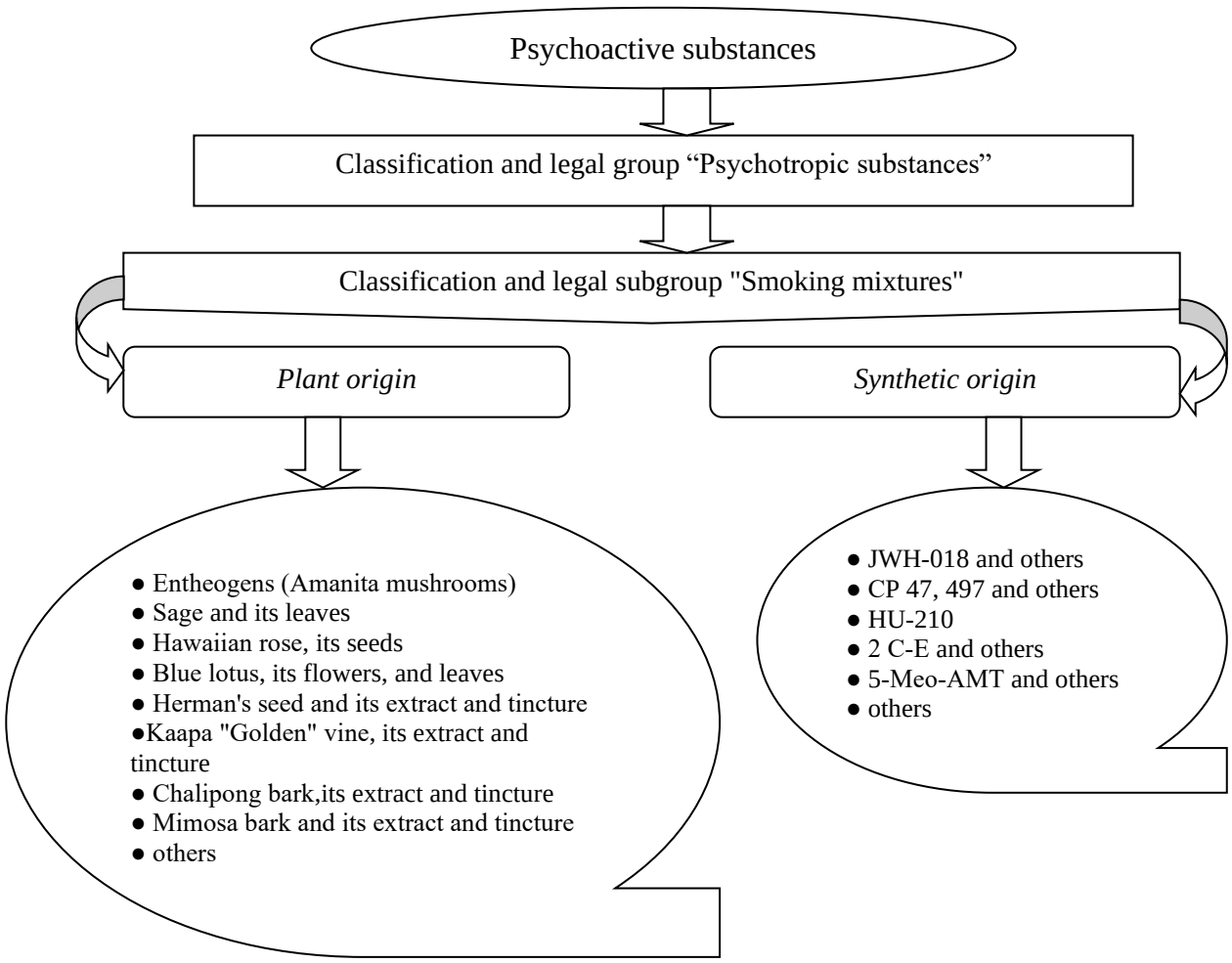

Fig. 2. Organizational and legal, forensic and pharmaceutical characteristics of the classification and legal group "psychotropic substances".

Conclusions. A multidisciplinary pharmacognostic, forensic and pharmaceutical, organizational and legal, clinical and pharmacological evaluation of the irrational use of spices in smoking mixtures from the group of entheogens was carried out. On the example of the mushroom

Amanita muscaria, which contains psychoactive substances – psilocybin or psilocin. In a retrospective context, the results of the study of the illegal circulation of functional food products and smoking mixtures, which include psychoactive medicinal plants that cause drug addiction, are presented. An expert assessment of entheogens – plants and mushrooms that contain psychoactive substances that have hallucinogenic effects. Forensic pharmaceutical practice was analyzed. A conclusion was made about the irrational use of smoking mixtures from the group of entheogens using the example of the mushroom Amanita muscaria. It is noted that minors, young people, and sick tend to abuse hallucinogens. A forensic medical and toxicological study of amanita poisoning was conducted. Informed about pharmaceutical safety measures in case of amanita poisoning. A pharmacognostic study of "Amanita muscaria" – mushrooms of the genus Amanita or Amanita was carried out. According to the chemical study, the chemical formulas of the psychoactive substances of amanita are given: muscarine, ibotenic acid, muscimol. According to the results of the normative study of the features of the circulation of fly agaric entheogens, normative initiatives are proposed.

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