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FORENSIC INVESTIGATION OF NARCOTIC DRUGS THROUGH ANALYTICAL METHODS

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ABSTRACT
Addiction and euphoria with hallucination is well accepted in mostly early teens and late teens especially in school and college life to enjoy fantasy world by usage of narcotics and alcohol consumption. The fantasy world of drugs is highly enjoyed by the young students of age 15-30 years and in early Middle Ages of 40-50 years. All these psychedelics are lipid soluble and can be absorbed in brain cells to produce euphoria in high extent to create unwanted crime. Forensic science deals with these mentally sick persons to identify the extent of drug consumed by snooze, swallow, injections, smoking etc to identify the extent of drugs consumed by spectrophotometry or by chromatography that how much concentration of drug has reached to the blood supply.

KEYWORDS: Addiction, Uppers, Downer, Hallucination, Euphoria, LSD, Cannabis, Mandrax, Cocaine, Heroin, Ecstasy, Amphetamine, Narcotics, MDMA, Alcohol.

INTRODUCTION
A drug is defined as a chemical substance obtained from either natural source [flora, fauna, marine], synthetic source or semisynthetic source having definite structural network to fit on the bioreceptor platform to control the biochemical malfunction in body. (1) It is a xenobiotic which is coming from outside into the body which is a substance recognized in an official pharmacopoeia or formulary. (2) It is a substance intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease. (3) It is a substance other than food intended to affect the structure or function of the body. The word drug is divided into two categories: (1) therapeutic drug which is used for treatment for disease and (2) narcotic drug which is used for hallucinogen purpose to form height of ecstasy to the depths of hell.

The most common narcotic drugs:
There are three main classes: uppers (stimulants), downers (depressants) and hallucinogens (which cause you to see strange things).[1-5]

Uppers (stimulants)
Uppers include cocaine, crack, Ecstasy, tick, crystal meth or methamphetamine, amphetamines, ephedrine and khat. These substances stimulate the brain and increase the heart rate. Young people use them to feel stronger, more energetic and more decisive. Typical signs of stimulant use are a reduced appetite, high energy levels, insomnia, dilated pupils, talkativeness, irritability, anxiety, increased excitability and hyperactivity, abrupt mood changes, impatience and nervousness.

Stimulants, sometimes called uppers, temporarily increase alertness and energy. The most commonly used street drugs that fall into this category are cocaine and amphetamines. Prescription stimulants come in tablets or capsules. When abused, they are swallowed, injected in liquid form or crushed and snorted.[6-8]

SHORT-TERM EFFECTS
The short-term effects of stimulants include exhaustion, apathy and depression the down that follows the up. It is this immediate and lasting exhaustion that quickly leads the stimulant user to want the drug again. Soon he is not trying to get high, he is only trying to get well to feel any energy at all.

Figure-1: Hallucination and narcotic world.

LONG-TERM EFFECTS

Stimulants can be addictive. Repeated high doses of some stimulants over a short period can lead to feelings of hostility or paranoia. Such doses may also result in dangerously high body temperatures and an irregular heartbeat. Tolerance to many depressants can develop rapidly, with larger doses needed to achieve the same effect. The user, trying to reach the same high, may raise the dose to a level that results in coma or death by overdose. Long- term use of depressants can produce depression, chronic fatigue, breathing difficulties, sexual problems and sleep problems. As a dependency on the drug increases, cravings, anxiety or panic are common if the user is unable to get more. Withdrawal symptoms include insomnia, weakness and nausea. For continual and high-dose users, agitation, high body temperature, delirium, hallucinations and convulsions can occur. Unlike withdrawal from most drugs, withdrawal from depressants can be life-threatening. These drugs can also increase the risk of high blood sugar, diabetes, and weight gain (instances of up to 100 pounds have been reported). In a study conducted by USA Today, based on Food and Drug Administration data over four-year period, antipsychotics (a type of depressant) were the prime suspects in forty-five deaths caused by heart problems, choking, liver failure and suicide.[9]

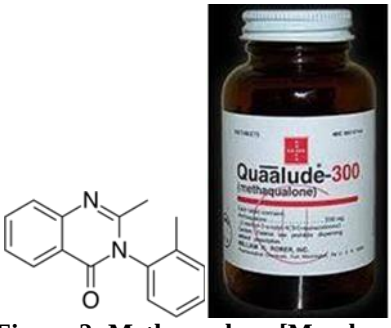

Figure-2: Methaqualone [Mandrax]

Downers (depressants)

Sometimes called downers, these drugs come in multicolored tablets and capsules or in liquid form. Some drugs in this category, such as Zyprexa, Seroquel and Haldol, are known as major tranquilizers or antipsychotics, as they are supposed to reduce the symptoms of mental illness. Depressants such as Xanax, Klonopin, Halcion and Librium are often referred to as benzos (short for benzodiazepines). Other depressants, such as Amytal, Numbutal and Seconal, are classed as barbiturates drugs that are used as sedatives and sleeping pills.[10]

SHORT-TERM EFFECTS

Slow brain function, slowed pulse and breathing, Lowered blood pressure, Poor concentration, Confusion, Fatigue, Dizziness, Slurred speech, Fever, Sluggishness, Visual disturbances, Dilated pupils, Disorientation, lack

of coordination, Depression, Difficulty or inability to urinate, Addiction. Higher doses can cause impairment of memory, judgment and coordination, irritability, paranoia and suicidal thoughts. Some people experience the opposite of the intended effect, such as agitation or aggression. Using sedatives (drugs used to calm or soothe) and tranquilizers with other substances, particularly alcohol, can slow breathing and the heart rate and even lead to death.[11]

Figure-3: Narcotics world.

Narcotics

These are substances which lessen or eliminate pain to induce sleep and depress vital functions including blood pressure, pulse rate and breathing rate and produce psychological dependence. OxyContin, active ingredient oxycodone, not derived from opium, but has same physiological effects on the body as opium narcotics. Methadone synthetic opiate helps to eliminate the addict's desire for heroin while producing minimal side effects. Hallucinogens can be divided into three broad categories: psychedelics, dissociative, and deliriants. They can cause subjective changes in perception, thought, emotion and consciousness. Unlike other psychoactive drugs such as stimulants and opioids, hallucinogens do not merely amplify familiar states of mind but also induce experiences that differ from those of ordinary consciousness, often compared to non-ordinary forms of consciousness such as trance, meditation, conversion experiences, and dreams. Psychedelics, dissociative, and deliriants have a long worldwide history of use within medicinal and religious traditions. They are used in shamanic forms of ritual healing and divination, in initiation rites, and in the religious rituals of syncretistic movements such as União do Vegetal, Santo Daime, Temple of the True Inner Light, and the Native American Church. When used in religious practice, psychedelic drugs, as well as other substances like tobacco, are referred to as entheogens.[12]

Figure-4: Drug addiction.

Starting in the mid-20th century, psychedelic drugs have been the object of extensive attention in the Western world. They have been and are being explored as potential therapeutic agents in treating depression, post-traumatic stress disorder, obsessive-compulsive disorder, alcoholism, and opioid addiction. Yet the most popular, and at the same time most stigmatized, use of psychedelics in Western culture has been associated with the search for direct religious experience, enhanced creativity, personal development, and "mind expansion". The use of psychedelic drugs was a major element of the 1960s counterculture, where it became associated with various social movements and a general atmosphere of rebellion and strife between generations.

Opiates

These are most common source for narcotics is opium, extracted from poppies. Morphine [extracted from opium: *Papaver somniferum*], Heroin [made from morphine by acetylation], Codeine [prepared synthetically from morphine]. Heroin produces a "high" that is accompanied by drowsiness and a sense of well-being that generally last for three to four hours.

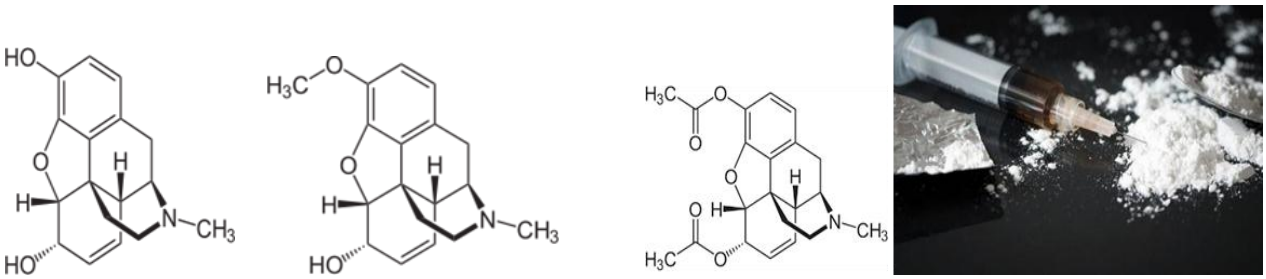

Figure-5: Morphine, Codeine & Heroin.

Hallucinogens (psychedelics, dissociatives and deliriants).: LSD [lysergic acid diethylamide], mescaline, PCP, psilocybin [mushrooms]. LSD is synthesized from lysergic acid and can cause hallucinations that can last for 12 hours. Phencyclidine or PCP is often synthesized in clandestine laboratories and is often mixed with other drugs, such as LSD or amphetamine. Oral intake of PCP first leads to feelings of strength and invulnerability, which may turn to depression tendencies towards violence and suicide. Psychedelics, dissociatives, and deliriants have a long worldwide history of use within medicinal and religious traditions. They are used in shamanic forms of ritual healing and divination, in initiation rites, and in the religious rituals of syncretistic movements. When used in religious practice, psychedelic drugs, as well as other substances like tobacco, are referred to as entheogens.[13]

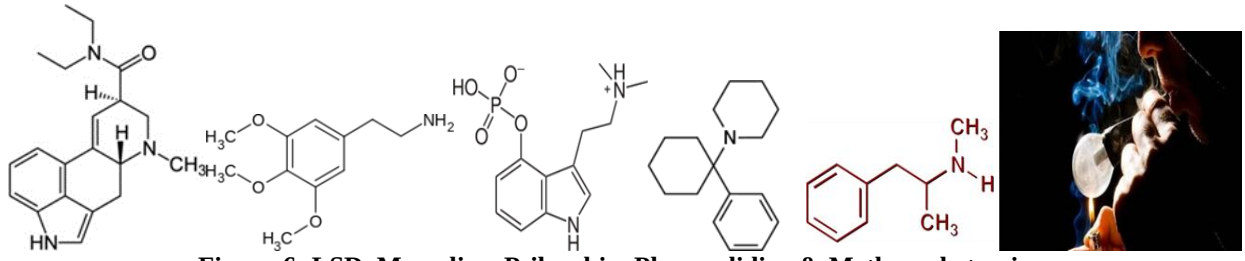

Figure-6: LSD, Mescaline, Psilocybin, Phencyclidien & Methamphetamine.

Depressants: Alcohol [ethyl alcohol] quickly travels to the brain, acts to supress the brain's control of thought process and muscle coordination. Barbiturates or doweners are normally taken orally and a feeling of well-being, ralax the body and produce sleep. Tranquililzers unlike barbiturates produce a relaxing tranquility without impairment of hight thinking faculties or inducing sleep.

Stimulants: These include amphetamine known as 'uppers' or ''speed, cocaine. These increase alertness often injected IV, cause initial 'rush', intense feeling of pleasure followed by a period of exhaustion and a prolnged period of depression.[14]

Figure-7: Cocaine & Crack.

Cocaine

It is extracted from the leaves of *Erythroxylin coca*, causes increased alertness and vigor, accompanied by supression of hunger, fatigue and boredom. Crack is cocaine mixed with backing soda and water, then heated which is often smoked.

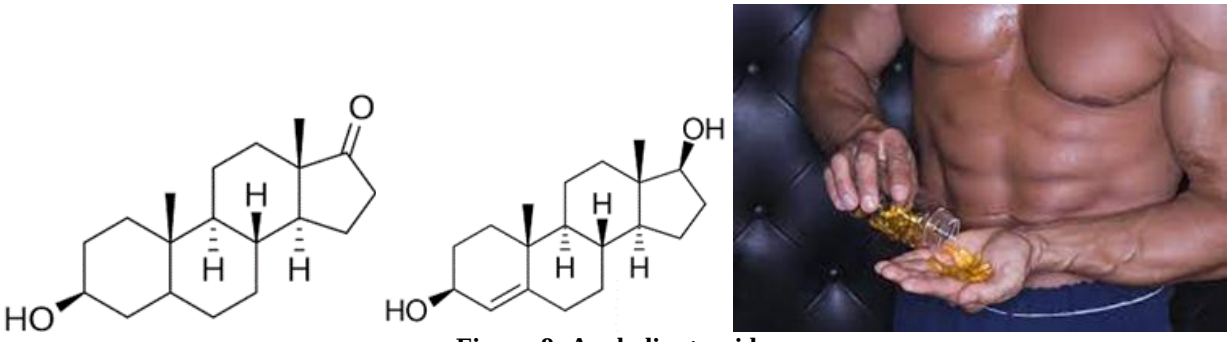

Figure-8: Anabolic steroids.

Anabolic Steroids

These are another category of drugs which are synthetic compounds chemically related to the male sex hormone testosterone. Anabolic steroids are often abused by individuals who are interested in acclerating muscle growth. Side effects include unpredictable effects on mood and personality, depression, diminished sex drive, halting bone growth and liver cancer.[15]

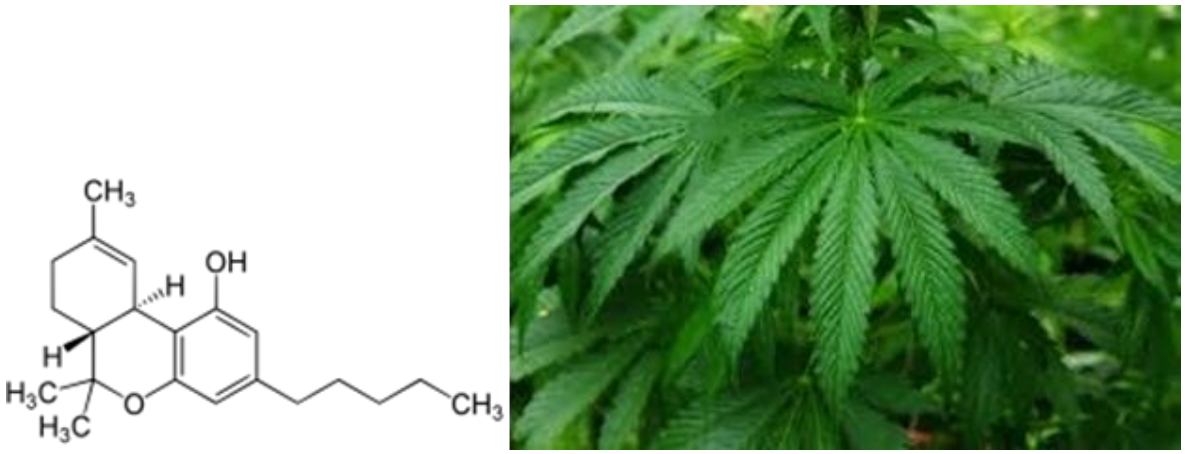

Figure-9: Cannabis, Hashish, Charas, Ganja.

Drug analysis

In forensic science analysis of drugs is categorised as follows:

Schedule-I: Heroin, LSD. Schedule-II: Morphine, Methadone. Schedule-III: Barbiturates, Amphetamines. Schedule-IV: Other stimulants and Depressants. Schedule-V: Codeine

Preliminary Analysis

Unknown substance may be one of a thousand or more commonly encountered drugs. Colour tests that will produce charateristic colours for more commonly encountered illicit drugs. Microcrystalline tests can also be used by studying the size and shape of crystals when the drug is mixed with specific reagents.

Confirmation of Drug

Forensic chemists employ s specific test to identify a drug substance to the exclusion of all other known chemical substance. Infra red spectrophotometry or gas chromatography-mass spectrometry [GCMS] is used to specifically identify a drug substance.

Chromatography

It separates components of a mixture. Substances that interact with the moving phase will slowly pull ahead and separate from those substances that prefer ti interacts with stationary phase.

Spectrophotometer

It si the instrument used to measure and record the absorption spectrum of a chemical substance. The components of a spectrophotometer are: a radiation source, a monochromator or frequency selector, a sample holder, a detector to convert electromagnetic radiation into an electrical signal, a recorder to produce a record of the signal. Absorption spectra can be done in the visible, UV [ultraviolet] or IR [infrared] regions.

UV spectrometry: simplicity of the UV spectrum can be used as a screening test, different substances absorb different wavelengths of light.[16]

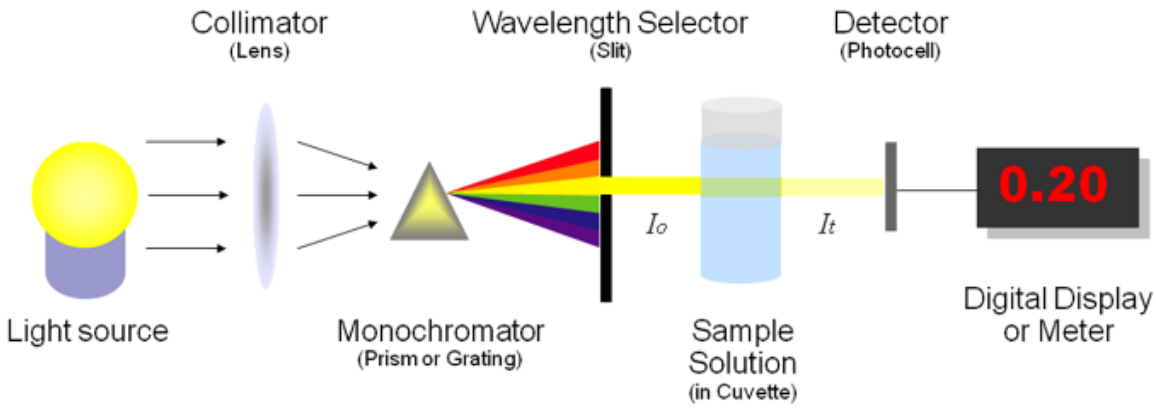

Figure-10: UV Spectrophotometer.

Wavelengths of different drugs:

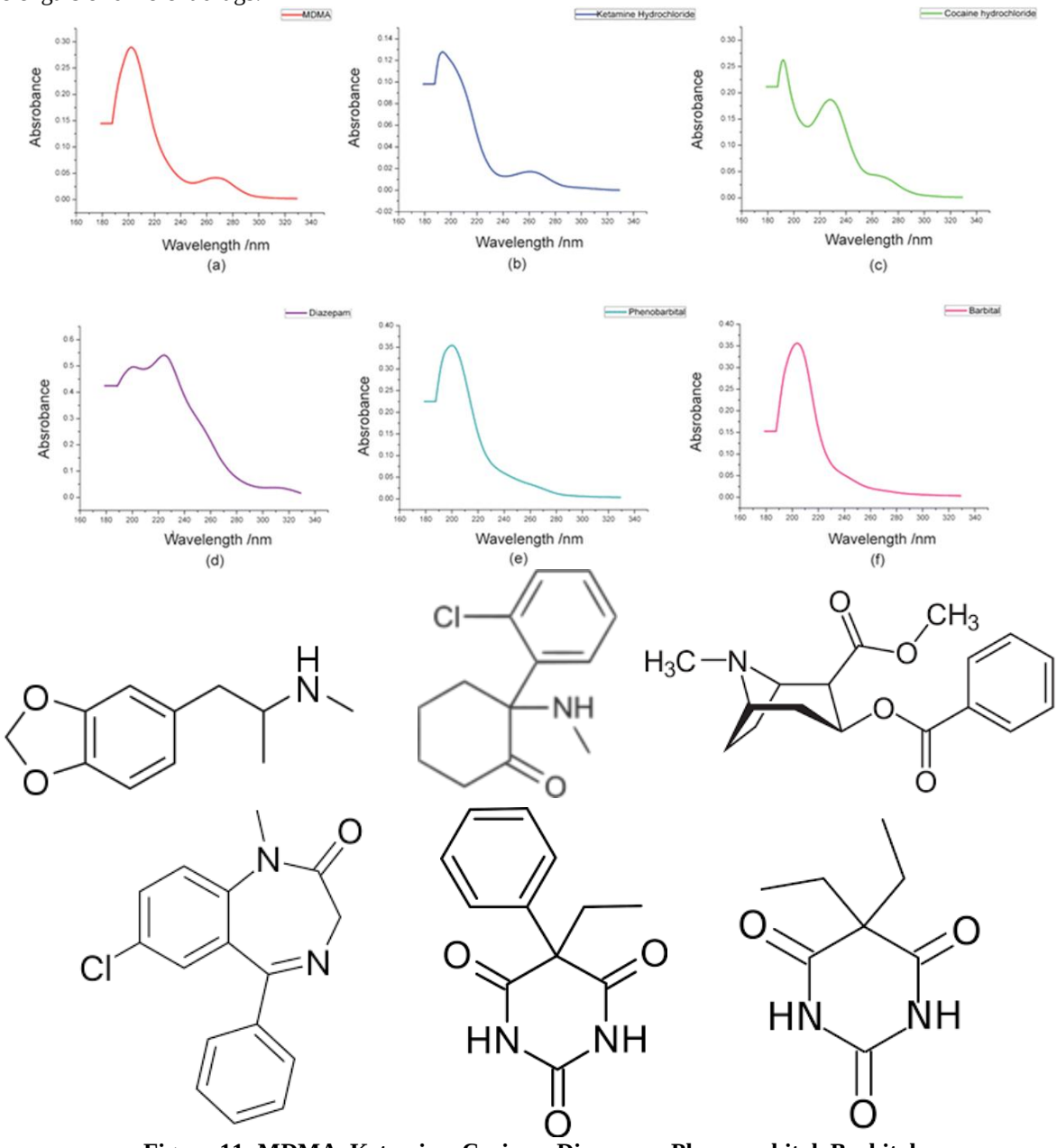

Figure-11: MDMA, Ketamine, Cociane, Diazepam, Phenoparbital, Barbital.

IR Spectrometry: IR spetrum provides confirmation test by fingerprint of that substance by different amounts of energy are absorbed by asubstance.

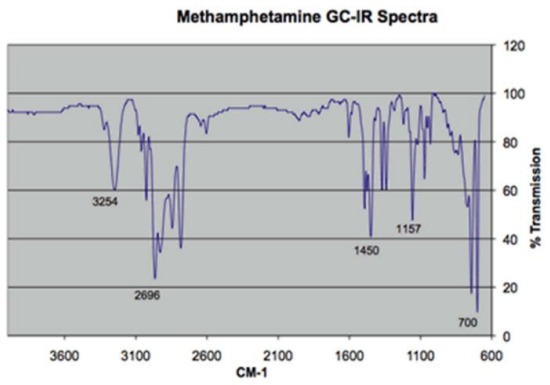

Figure-12: Methaphetamine & Breathalyser for alcohol detection.

GC-Mass Spectrometry

Direct connection allows each component to flow into the mass spectrometer as it emerges from the GC/HPLC [high performance liquid chromatography] which separates components of a mixture and performs a confirmation test on all components of the mixture.

Boreii is a mixed Cocker Spaniel; Nero, Bambi and Zozo are Malinois (short-haired Belgian Shepherds). They belong to a highly trained drug detecting unit of police dogs from the Iranian Anti Narcotics Police. Just the sight of these police dogs is enough to deter drug traffickers from attempting to pass checkpoints. narcotics dogs are trained to find heroin, cocaine, methamphetamines, marijuana, spice, suboxone and tobacco. However, a trained drug-detection dog is able to use their powerful sense of smell to pinpoint exactly where drugs are being hidden. Dogs can sniff out everything from marijuana, methamphetamines, opioids, ecstasy, cocaine, and bars (xanax or alprazolam). The shape signal method is another popular way to train drug dogs. First, the dog learns a simple command, like "sit" or "bow." Teach them using a hand signal or clicker. Then, use your hand signal and expose the dog to a sample scent. Reward the pup when they perform the wanted action after smelling the scent. Dogs are famed for their ability to detect substances by scent. For this reason, dogs have become invaluable in the role of sniffer dogs, picking up tell-tale scent traces of illicit or banned substances from money through to drugs.

Odor

The dog perceives the odor as a result of the odorant binding to olfactory receptors located in the olfactory mucosa in the nasal epithelium. Odorants are molecules that elicit an olfactory response. A study under controlled conditions has confirmed that dogs can easily master at least 10 odors simultaneously. Research has shown that dogs are trained to recognize and alert the volatile odor of drug-associated chemicals rather than the original drug; targeted substances for detection usually involve multiple chemical components. It has been demonstrated, for example, that methyl benzoate, a by-product of cocaine, is the chemical that dogs alert when detecting cocaine, as well as piperonal, heliotropin (fragrance fixer) in MDMA (Ecstasy), and the main components detected in the cannabis headspace (α-pinene, β-pinene, myrcene, limonene, and β-caryophyllene). For this reason, according to 2008, the use of dogs may be justified in indicating non-illegal products. In the study, pseudo-odors were tested and none were reliably detected. This may stem from the fact that the suppliers of these products use components that do not create the same volatile odor compounds as the actual smuggled compounds. Considering the experience of the present authors, the pseudo-odors have not been used, due to failures. The odors used for the training and formation of CNK9 dogs come from real substances, of the target narcotics themselves, and previously analyzed with a degree of proven purity. In another study by the Polish police, with 1219 experimental searches, the results in order of difficulty were as follows: cannabis, hashish, amphetamine, cocaine, and heroin. Regarding the persistence of residual odors, hashish odor lasted longer and was indicated by dogs in 100% of searches performed 24 hours after hash removal and in 80% of searches after 48 h. The percentage of indications of hashish odor residues after 24 h was even higher than that for fresh odor emitted by samples that were present at the search site. A significantly lower detection rate was reported for residual heroin odor, which almost undetected after 48 h. An individual's well-being is his state in relation to his attempts to adapt to his environment. In any welfare assessment, it is necessary to take into account individual variations when facing adversity and the effects that adversity has on animals. To have adequate welfare, an animal must be physically and psychologically fit and there is a link between welfare and the work of stressed dogs, which tend to perform poorly during searches. Dogs that work in military organs are bred and trained for extreme and complex behaviors. The most common reason these dogs fail in training programs involves some aspect of anxiety, which seems to interfere with their ability to learn

complex tasks and to adapt to changes. They may become excessively reactive, aggressive, or nervous. Anxious dogs are eventually rejected during training programs. Whenever dog housing is considered, the needs associated with social and environmental enrichment deserves particular attention, and many kennel environments do not meet the animals´ needs (e.g., social contact, control over their environment, proper exercise). Therefore, dogs may have difficulty coping with the environment and may experience negative emotions. There is a belief that working dogs cannot receive the toy at any other time than during work. A study was conducted in which dogs received the "kong" toy with food inside. Handlers tend to base their evaluations on their dog's performance during regular training sessions and indicated that enrichment in an environment kennel did not affect the dog's motivation to play or retain a toy used as a reward during training. Therefore, these diverging motivations mean that providing kennel enrichment providing this kind of toy had little or no effect on a dog's motivation to play or work for a reward. Dogs do not use kong as toys, but as a feeding device. Once emptied, dogs later did not return or play with the device within the observation time.

Cortisol accounts for much of the quality of the stress response. In the short term, it mobilizes energy, but its overproduction contributes to muscle wasting, hypertension, low immunity, and low fertility. Generally, during work, the detector dogs are housed in transport boxes to await the operation or even to be transported. This confinement in the box is a relevant factor for increasing cortisol levels. A study conducted at the Central Kennel of the Federal Police of Brazil showed that the 3-hour confinement was sufficient to increase cortisol concentrations. Subsequently, cortisol concentrations decreased after the completion of the detection tasks, indicating that the longer the confinement time, the higher the cortisol concentrations and that the search and detection work probably functions as a welfare and balance promoter of the dog. The methods by which dogs are trained vary between methods that primarily involve highly controversial negative reinforcement and positive punishment (methods based on aversion) and methods primarily based on positive reinforcement and negative punishment (reward-based methods). Studies have also indicated that e-collar training routines pose a risk to animal welfare. Immediate effects of training give rise to behavioral signs of distress in pet dogs, even without significant differences in corticoid levels. In a study of Belgian military dogs, it was concluded that dog handler teams should train more regularly and adopt training systems that depend on the use of more positive training methods, more frequent training, and better education of trainers regarding learning theory. Some dogs are trained with reward food. But for this methodology, the dogs are deprived of food, that is, they are left without food to work. This method is based on the survival instinct, where, in theory, the animal has to work (hunt) to survive. We do not agree with this methodology, and we do not use it in our training. Other trainers at the moment of the detection training use positive reinforcement, but these same trainers use methods of negative reinforcement in training for obedience, which ends up influencing the dogs negatively in the detection work. It has been nvestigated the effect of low, medium, and high levels of reward on the performance of six dogs searching filters for explosive odor. In this study, the medium and high reinforcement rates produced significantly higher hit rates than the low reinforcement rate condition, but that the medium and high conditions did not differ significantly from one another in terms of hit rate. No significant difference in false-alarm rates was found across the three reinforcement conditions. However, the false-alarm rate was lowest during the medium-reinforcement rate condition for four of the six dogs, and for the mean. It is reviewed research, observational studies, and interventions and showed that the use of aversive training methods (e.g., positive punishment and negative reinforcement) could endanger the health of dogs. A survey of dog owners by reported that owner punishment was associated with an increased incidence of problem behavior. Similarly, it has been reported that military dogs punished by aversive training techniques had lower-performance scores.

Figure-13: Detection of narcoctics by police dog.

Collection and Preservation

The field investigator has the responsibility of ensuring that the evidence is properly packaged and labeled for the laboratory having common sense for keeping in mind that the package must prevent the loss of the contents and or cross contamination. Often the original conatainer

in which the drug was seized will suffice. All packages must be marked with information that is sufficient to ensure identification by the officer in the future and establish the chain of custody.

CONCLUSION

Illegal drugs are drugs which have legal limitations on their ownership or use. They are illegal in certain situations (meaning a person is not allowed to have them). A drug is any chemical that affects the human body or mind when it is swallowed, breathed in, or consumed in another way. A psychoactive drug is a drug that affects the brain. Most laws against drugs are against psychoactive drugs. Some controlled drugs are allowed if you have permission (called a "prescription") from doctor. Other drugs are illegal—meaning you are never allowed to have them. Individual countries and places have different laws about different drugs, and there are also international treaties against some drugs. The most used drugs are not illegal, for example tobacco. Drugs, legal or not, may be taken many ways. Different drugs can be used in different ways, depending on the drug. Some drugs are available in different forms and each form can only be used a certain way - for instance crack cocaine (cocaine in a base form) is more powerful when smoked or vaporized, and powder cocaine (cocaine in a salt form) is usually snorted. Drugs can be taken: Orally - This means they are put into the mouth and swallowed, for instance a pill. Smoked - This means the drug is burned and then the smoke that is produced is inhaled in by the user, for instance through a pipe, bong, cigar or cigarette. Insufflated - This means the drug is snorted up a person's nose. Vaporized - This means a drug is heated up until it turns into a vapour, then the vapour is breathed in. Sublingually - This means the drug is absorbed through the vein under a person's tongue.

Buccally - This means the drug is absorbed through a person's cheek. Intravenous - Also called IV - this means a drug is injected into a person's veins using a needle. Intramuscular - Also called IM - the drug is injected into a person's muscle using a needle. Rectally - This means the drug is put into someone's anus and absorbed there - usually via something called a suppository. Transdermally - A few drugs, such as nicotine and fentanyl, can even be absorbed through a person's skin. Orally is the slowest method of using a drug as it must be digested in the stomach first. Injecting a drug (IV) is the fastest and the most likely to lead to an overdose.

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