

Fumitories and Masticatories

Fumitories and masticatories are plant materials that are smoked or chewed usually for their stimulative and narcotic effects.

Round the globe, people smoke or chew various substances for pleasure, exhilaration, to find change in normal routine, or to escape from the harsh realities of life.

Fumitories are the substances which are used for smoking. Eg. Beedi, Cigarette, Cigar, Charas.

Masticatories are the substances which are used for chewing eg. Betel, Tobacco, Kattha, Supari

These materials that are chewed or smoked, possess constituents, which stimulate or depress the central nervous system of the body. Eg. Caffeine beverages, tobacco, betel and coca. They act as mild stimulants producing no effect, on the consciousness of the user.

Stimulants are chemical agents or drugs which increase the functional activity.

Caffeine beverages, such as coffee, tea, and cocoa, tobacco, betel and cola or beer or wine have gained importance in daily life.

The true narcotics (depressants), on the other hand, contain powerful alkaloids that are deleterious even in small amounts, but in larger dosages, result in coma or in complete paralysis and often death. Continued use of such drugs forces the individuals to become addicts. These drugs cause not only great mental and moral deterioration but also bring about physical degradation. Eg. Opium and its derivatives like morphine and heroin.

In small amounts, narcotics are legitimate medicines relieving anxiety and pain and often inducing badly needed sleep.

There are three kind of narcotics

Hyponotics

Sedatives

Hallucinogens

Hypnotics are drugs that induce artificial but normal sleep, for example, kava kava, *Piper methysticum* (family Piperaceae), indigenous to Fiji and other Pacific Islands.

Sedatives are drugs that produce a calming effect, bringing about a state of physical and mental comfort accompanied by a reduction or even suspension of mental activity and finally leading to complete suppression of consciousness, eg cocaine and opium.

Hallucinogens are the drugs that produce initial cerebral excitation or stimulation accompanied by illusion, hallucination, fantastic coloured visions, unusual

amusement and fear and intense cerebral depression later. The hallucinogens distort the mind and personality. Eg. *Cannabis sativa* (Hemp) of family Cannabinaceae, with the active constituent - Tetrahydrocannabinol

Few Fumitories and Masticatories

➤ **Tobacco**

Botanical name - *Nicotiana tabacum*, *N. rustica*

Family - Solanaceae

Tobacco is the world's most important fumitory material. There are more than 60 species of tobacco known all over the world. Only two species *Nicotiana tabacum* and *Nicotiana rustica* are commercially important. *Nicotiana tabacum* is the chief source of tobacco. It is used in the cigarette, cigar and in cheroot industry because of its low (4 - 6%) nicotine content.

Nicotiana rustica, is preferred for hookah smoking, chewing and sniffing.

Cultivated *N.tabacum*, originated in South America, Mexico and West Indies, from a natural cross between *N.sylvestris* (2n = 24) and *N.otophora* (2n= 24). The sterile hybrid, on chromosomal duplication gave rise to *N.tabacum* (2n = 48).

India, is one of the major tobacco producing nations. Other important producers are US, Brazil, Canada, Turkey, China, Pakistan, Japan, Indonesia, Zimbabwe, Greece, Italy, Malawi. India is also one of the world's top tobacco exporters, along with Brazil, Turkey, US, China, Italy and Malawi.

N. rustica, is a native of Mexico and Texas. It originated from a natural cross between two wild species, *N.undulata* and *N.paniculata*. The hybrid resulted in doubling of the chromosome (2n = 48). It is cultivated in Turkey, India and some parts of Europe.

Morphology - *Nicotiana.tabacum*, is polymorphic. It has got many varieties. It is an annual herb, with approximately 1-3 m height. Leaves are large, alternate, ovate or oblong or lanceolate, sessile, with clasping leaf bases. Glandular hair are present on the surface of the leaves which secrete gums and oils, because of which the leaf surface becomes sticky. The Flower are tubular, borne in terminal panicle and are pink or white in colour. The fruit is a capsule with numerous small seeds. The seeds are oval to spherical and light coloured.

N.rustica, is a small plant with a approximate height of 1 m. The leaves are short, thick, broadly oval and petiolate with puckered (uneven) surface. The flowers are pale yellow to green and campanulate.

Cultivation - This crop is successfully cropped in almost all agroclimatic conditions because of its great adaptability. The tobacco plant requires plenty of moisture in the early and middle part of the growing season with an average optimum temperature of 27° C. The crop requires almost 100 - 130 days for maturity. It can be grown on well drained alluvial, loam and silt loam soils with a pH of 5 to 6.5.

The seedlings are at first raised in nursery. The seedbed is prepared by burning of wood to eliminate weeds, supply potash, calcium, phosphorous and to destroy various soil borne pests and diseases. The other method is to steam sterilize or fumigate the seedbed with certain chemicals such as chloropicrin, dichloropropane or methyl bromide to control diseases, weeds, insects and nematodes. The seedbeds are protected from the chilling winds and direct exposure to the sun. The seeds are then sown and lightly covered with soil, so that they are not blown away. The beds are protected from the direct sunlight by means of muslin cloth or chopped grass.

After two and a half months, when the seedlings have attained a height of approximately 4-7 inches, they are transplanted into the fields. The fields are prepared by repeated ploughing and levelling and fumigating. When flower buds begin to appear, the inflorescence along with the topmost leaves are plucked by hand. This is known as topping, which improves the size and quality of leaves. **Suckering** is the removal of growing shoots from the leaf axils.

Harvesting - After three to four months, the leaves start to change colour (from dark green to greenish yellow) and texture (brittle and tough), and are ready for harvesting.

Pruning/Priming - Mature leaves are picked individually by hand, mainly used for tobacco for the manufacture of cigars and cigarettes.

Curing - It is oxidation or dry fermentation. Here the water is driven off, the green colour is lost, leaves texture change to tougher and they also undergo chemical changes. For different quality of tobacco, there are different curing methods like Flue curing, Air Curing, Sun Curing and Fire Curing.

The cured tobacco leaves, are bundled on the floor of the fermentation barn for 4-6 weeks. The leaves are then graded according to size, colour and texture. The tobacco is aged in warehouses for 6 months to 3 years. Much of the nicotine is eliminated along with its harshness, bitterness. This tobacco is used.

The typical aroma and flavour is due to the essential oils and resins secreted by the glandular hair of the leaves. An alkaloid Nicotine ($C_{10}H_{14}N_2$), is present in the plant, with its highest concentration in leaves. Nicotine originates in the roots and from there it is translocated to the leaves (Dawson, 1948). Nicotine content in *N. tabacum* is 4-6% and in *N. rustica* is 12%. Nicotine is habit forming.

Uses

Tobacco acts as a mild stimulant, but the combustion products of tobacco formed during smoking are more harmful and may cause diseases of the respiratory tract, including possibly lung cancer.

Cigars and Cigarettes - The nicotine content in cigarettes is 1.5 - 2.5%. The paper used in cigarettes is made from flax or hemp.

Beedi - It is made by rolling 0.25 - 0.5 g of sun dried and processed tobacco flakes, with fingers, in a dried tendu leaf, *Diospyros melanoxylon*

Hookah - It is an instrument for vaporizing and smoking tobacco, whose vapour or smoke is passed through water basin before inhalation.

Smokeless tobacco or Chewing tobacco - This kind of tobacco is not burned and is consumed orally. Eg. Gutkha, paan masala etc. **Khaini** is a mixture of sun dried tobacco with slaked lime. **Gutkha** consist of betel nut mixed with slaked lime, catechu and graded tobacco. **Paan masala** is prepared by using areca nut, slaked lime and condiments. **Pan** is prepared with betel leaf containing tobacco, areca nut, slaked lime, catechu, condiments and sweetening agents. **Zarda** is a moist or dry chewing tobacco blended with a variety of colouring , chopped areca nut, spice essences and sweetners. Smokeless tobacco products are major source of carcinogenic nitrosamines that are known to cause oral , oesophageal and pancreatic cancers.

➤ **Betel nut /Areca nut/Supari**

Botanical name - Areca catechu

Family - Arecaceae

Betel nut palm tree - *Areca catechu*, originated in Philippines and Malaya peninsula. India is one of the largest producers. Other major producers are China, Myanmar, Bangladesh, Indonesia, Sri Lanka. In India, areca nut palm is mainly cultivated in Karnataka, Kerala and Assam.

Morphology - Betel nut palm has a slender, unbranched trunk, topped by crown of large 6-9 pinnate leaves. Inflorescence is spadix, covered with a spathe. Flowering takes place after almost four years. The fruits are handpicked. The fruit is fibrous ovoid drupe, with a single hard brown seed with ruminant endosperm.

The betel nut endosperm contains arecoline alkaloid, along with arecaidine, arecolidine, guvacine and guvacoline. The stimulating or slightly intoxicating effect on the central nervous system is due to the alkaloid arecoline, (C₈H₁₃O₂N).

Use

It is used as masticatory. People chew sliced betel nut directly or with other ingredients wrapped in a betel leaf. Excessive chewing may produce dental decay, pyorrhoea alveolaris and oral cancer.

Betel

Botanical name - *Piper betel*

Family - Piperaceae

The betel plant is a native of Malaysia. Now- a - days, it is cultivated as a cash crop in India, Bangladesh and Sri Lanka. In India, it is cultivated in the states of Andhra Pradesh, Karnataka, Kerala and Tamil Nadu.

Morphology - The betel plant is evergreen , dioecious, perennial creeper, with glossy heart - shaped leaves. It has got white flowers in catkins.

Cultivation - Betel vine is propagated vegetatively by cuttings from old vines. It is a creeper and needs support. The life of the crop is 3- 10 years. Generally fresh leaves are used. However, bleaching of the leaves is also done. Leaves are moistened and then placed in warm, ventilated place in the absence of sunlight, till they are bleached.

Use

Pan chewing is a traditional practice. The fresh leaves of betel vine are popularly known as Paan ka patta.. It is used in a common preparation known as Pan. Pan is

set of ingredients such as sliced betel nut, coconut shavings, sweetner, clove, cardamom ,fennel and other spices, wrapped in a fresh betel leaf smeared with kattha (*Acacia catechu*) and lime paste. Pan chewing helps to remove phlegm, kill germs, expel wind, subdue bad odour.

➤ **Coca**

Botanical name - *Erythroxylum coca*

Family - Erythroxylaceae

Coca is a native of Andean highlands. It is cultivated in Bolivia, Ecuador, Peru, Taiwan, Philippines, Indonesia and Sri Lanka.

Morphology-The Coca plant is an evergreen, shrub. Leaves are dark green, alternate, ovate, stipulate. White coloured flowers,are present in axillary clusters. Fruit is small drupe.

Cultivation- It is propagated by cutting or is raised from seeds. Harvesting is done after 2 -3 years of planting.The leaves are hand-picked. The leaves are fermented for some time.

Use - The leaves are chewed as a whole or in powdered form.

Coca is habit forming drug. Leaves are chewed mixed with alkaline ashes of certain plants and powdered limestone. Coca chewing produces high degree of stimulation. The user is able to do high amount of work without fatigue, hunger or thirst.

Cocaine is made from the leaves of the coca plant.

Drug cocaine is a mixture of alkaloids such as **cocaine** (C₁₇H₂₁O₄N), tropococaine, cinnamylcocaine, truxillines and benzoylecgonine.

Cocaine, in small doses, induces pleasing excitation, increased physical strength, increased working capacity, with no fatigue and reduction in hunger because of local anaesthesia of the stomach. Overdoses of cocaine may lead to restlessness, convulsions and hallucinations.

The cocaine powder is sniffed. Cocaine chewing is habit forming.

➤ **Indian Hemp**

Botanical name - *Cannabis sativa*

Family - Cannabinaceae

The plant is native to western and central Asia. In India, it is grown in the states of Bengal, Karnataka and Tamil Nadu.

Morphology - The plant is annual, dioecious herb with palmate leaves. Flowers are small and greenish yellow in colour. Male flowers are arranged in terminal panicles, while female flowers are arranged in axillary leafy spikes. The plant is clothed with glandular hair. The narcotic constituents are concentrated in the resin produced by the glandular hair. Fruit is an achene.

The plant naturally occurs as weed. When cultivated, it grows best in fertile, well drained soil.

Narcotics produced by Cannabis plant -

Bhang - It is prepared from dried leaves, and flowering shoots of the plant. Its decoction in water or milk is used as a beverage. The dried mixture is mixed with tobacco and is smoked. Bhang has low resin content and thus is less potent.

Ganja - It is dried unfertilized female inflorescence . It is high in resin content and is used for smoking and in beverages.

Charas or **Hashish** - It consists of undiluted, unadulterated sticky yellow exudation from the leaves, and unfertilized inflorescence . Crude resin is gathered by rubbing the tops of the plant with hands. The sticky resin is then scraped off. The resin content is high (35 -45%), because of which , intoxication is of higher degree. Charas is smoked

The resin of the plant has high concentration of hallucinogenic compound - THC (tetrahydrocannabinol).

These drug when taken in low amount, produce a temporary feeling of well -being, happiness and increased strength, along with uncontrolled laughter and giggling.

➤ **Cola**

Botanical name - *Cola nitida*

Family - Sterculiaceae

The plant is native to Africa. The top producers are Nigeria, Cote d' Ivoire, Cameroon, Ghana, Sierra Leone and Benin.

Morphology - Cola is a tall tree. It has got simple , glossy, obovate leaves. The flowers are borne in small axillary cymose inflorescences, producing star shaped follicles, with eight seeds. The tree starts bearing fruits when 5- 6 years old. ripe , indehiscent follicles are harvested. The fruits are then split open to free the seeds, which are fermented in heaps, after the removal of seed coats. They are then washed and dried.

Dried cotyledons contain large number of compounds like tannins, fats, sugars, essential oils, kola red, caffeine, 1,3,7,-trimethyl -xanthine, theobromine -3,7-dimethyl-xanthine and a glycoside, kolanin.

Use- For centuries, seeds or nuts of cola has been used as a masticatory. The nuts are either chewed as whole or used in a powdered state. The beverage obtained by boiling the powdered cotyledons in water is a popular soft drink. The stimulatory action is primarily because of the caffeine and partly due to the kolanin, which is a heart stimulant. It is not habit forming and therefore is not damaging to the human system, if consumed in limited quantity . Many of the soft drinks derive their name from the coca cola syrup containing caffeine from cola nut and fatty acids from cola leaves that have been freed from the narcotic alkaloidal constituent.