

EPHEDRA

Synonyms

Ma Huang.

Biological Source

Ephedra consists of the dried aerial parts of *Ephedra gerardiana* Wall, *Ephedra sinica* Stapf, *Ephedra equisetina* Bunge, *Ephedra nebrodensis* Tineo and other Ephedra species, belonging to family Ephedraceae.

Chemical Constituents

Ephedra contains alkaloids Ephedrine (water-soluble salt of an alkaloid), Pseudoephedrine (analog of ephedrine), Norpseudoephedrine (An analog of ephedrine). The leaves and stems of ephedra also contain many potentially active compounds, such as tannins, saponin, flavone and volatile oils.

Chemical Test

To the drug (10 mg) in water (1 ml) dilute HCl (0.2 ml), copper sulphate solution (0.1 ml) and sodium hydroxide solution (2 ml) are added; the liquid turns violet. On adding solvent ether (2 ml) and shaking vigorously, the ethereal layer turns purple and the aqueous layer becomes blue.

Uses

Ephedrine is anti-allergenic, antiasthmatic, antispasmodic, decongestant, cough suppressant, stimulant and vasoconstrictor. Pseudoephedrine is decongestant, cough suppressant and norpseudoephedrine is peripheral vasodilator used to treat angina. As a whole it is decongestant; it opens sinuses, increases sweating, dilates bronchioles (antiasthmatic use), diuretic, CNS stimulant, raises blood pressure, alleviates aches and rheumatism, alleviates hay fever/colds, etc.

OPIUM

Synonyms

Crude Opium; Raw Opium; Gum Opium; Afim; Post.

Biological Source

Opium is the air dried milky latex obtained by incision from the unripe capsules of *Papaver somniferum* Linn, or its variety *P. album* Decand., belonging to family Papaveraceae.

Opium is required to contain not less than 10% of morphine and not less than 2.0% of codeine. The thebaine content is limited to 3%.

Chemical Constituents

Opium contains about 35 alkaloids among which morphine (10–16%) is the most important base. The alkaloids are combined with meconic acid. The other alkaloids isolated from the drug are codeine (0.8–2.5%), narcotine, the-baine (0.5–2%), noscapine (4–8%), narceine and papaverine (0.5–2.5%). Morphine contains a phenanthrene nucleus. The different types of alkaloids isolated are:

1. *Morphine Type*: Morphine, codeine, neopine, pseudo or oxymorphine, thebaine and porphyroxine. Morphine consists of alkaloids which has phenanthrene nucleus whereas those of the papaverine group has benzyliso-quinoline structure. Protopine and hydrocotamine are of different structural types. The morphine molecule has both a phenolic and an alcoholic hydroxyl group and acetylated form is diacetyl morphine or heroin. Codeine is ether of morphine (methyl-morphine). Other morphine ethers which are used medicinally are ethylmorphine and pholcodine.
2. *Phthalide Isoquinoline Type*: Hydrocotarnme, narcotoline, 1-narcotine, noscapine, oxynarcotine, narceine, and 5'-O-demethyl-narcotine.
3. *Benzyl Isoquinoline Type*: Papaverine, dl-laudanine, lau-danidine, codamine and laudanosine.
4. *Cryptopine Type*: Protopine, cryptopine.
5. *Unknown Constituents*: Aporeine, diodeadine, meconidine, papaveramine and lanthopine.

The drug also contains sugars, sulphates, albuminous compounds, colouring matter and moisture. In addition to these anisaldehyde, vanillin, vanillic acid, β -hydroxystyrene, fumaric acid, lactic acid, benzyl alcohol, 2-hydroxycinchonic acid, phthalic acid, hemipinic acid, meconin and an odorous compound have also been reported.

Chemical Tests

Aqueous extract of Opium with FeCl_3 solution gives deep reddish purple colour which persists on addition of HCl . It indicates the presence of meconic acid.

Morphine gives dark violet colour with conc. H_2SO_4 and formaldehyde.

Uses

Opium and morphine have narcotic, analgesic and sedative action and used to relieve pain, diarrhoea dysentery and cough. Poppy capsules are astringent, somniferous, soporific, sedative and narcotic and used as anodyne and emollient. Codeine is mild sedative and is employed in cough mixtures. Noscapine is not narcotic and has cough suppressant action acting as a central antitussive drug. Papaverine has smooth muscle relaxant action and is used to cure muscle spasms. Opium, morphine and the diacetyl derivative heroin, cause drug addiction.