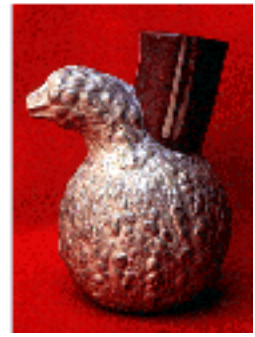




## Ethnobotanical Leaflets



### **Ephedra (*Ma Huang*)**

**By Erica McBroom**

Ephedras species are an evergreen shrub, native to North China and Inner Mongolia. It's yellow/green branching shrub growing to an average of 20 inches (50cm) with long narrow, sprawling stems and tiny leaves, can be found in desert or arid regions throughout the world. Its color can be green, gray, or red, depending on the species. The plant has small greenish yellow flowers and tiny nodes (joints) on the stalks (2). Ephedra is propagated from seed or by root division in autumn and demands well drained soil. It usually grows on dry, rocky or sandy slopes, and loves full sun. It matures very slowly and is very challenging to grow (1).

#### **General Information**

Ephedra (common name) comes from the family Ephedraceae. It has several scientific names that depend upon the plants founding location; *Ephedra major* (American), *Ephedra trifurca* (American), *Ephedra nevadensis* (American) are found in North America; and *Ephedra sinica* (Chinese- *Ma Huang*) is found in Asia. Other varieties of Ephedra can be found in Europe, India, and Pakistan. Ephedra was initially found in a Neolithic grave in the Middle East. This evidence may indicate that Ephedra was used as a medicine more than 60,000 year ago. In China, Ephedra was the first herbal remedy to yield an active constituent, in this case ephedrine. The first isolation of ephedrine was in 1887, by a Japanese chemist, N. Nagai (2,5).

#### **Folk and Historic Traditions**

The Zen Monks used Ephedra to encourage calm concentration during meditation. According to a legend, a tea containing Ephedra was given to the bodyguards of Genghis Khan, to keep them from falling asleep on sentry duty. Mormon Tea, one of Ephedra's folk names, stems from the use of the tea by Mormons; it was used as a replacement stimulant for the coffee and black tea the Mormons couldn't drink. In the 1800's Ephedra tea was served in Brothels, claiming to cure gonorrhea and syphilis. Ephedra tea today is not used as a cure; it will not cure these STD's (2).

## Medicinal Values

The Medicinal use of Ephedra in China dates from approximately 2800B.C. In 1923 the practitioners of Western Medicine began their interest in Ephedra. Soon after, ephedrine became widely used as a nasal decongestant, a central nervous system stimulant, and a treatment for asthma in America. The isolated alkaloid originally obtained from Ephedra species, have been used in a substantial amount of prescription drugs and over-the-counter decongestants and allergy medications (2,4). The main alkaloids are ephedrine and pseudoephedrine. Ephedrine taken orally or by injection is a successful bronchodilator used in the treatment of mild to moderate asthma and hay fever. Its been known that long term use of Ephedra may weaken the adrenal glands, causing a decrease in the therapeutic effects and a development of dependency. Another popular use of Ephedra is its ability to suppress the appetite. It increases the body's metabolic rate, and aids in fat breakdown (5). Research has shown that weight reduction is greatest in individuals with a naturally low basal metabolic rate. Ephedra's thermogenic effects can be intensified when taken in combination with caffeine. Herbal sources rich in caffeine include coffee (*Coffea arabica*), tea (*Cameilia sinensis*), and cola nut (*Cola nitida*). Ephedra has also been used in decreasing of cigarette craving, promotion of uterine contraction, and promotion of menstruation (3).

Ephedra is very similar in action to Epinephrine (adrenaline). They both increase heart rate, blood pressure, and cardiac output, but Ephedrine lasts about ten times longer. Ephedrine can be administered orally, whereas Epinephrine must be injected. Ephedra's molecular structure is similar to methamphetamines (speed), and therefore can produce a positive urine test for amphetamines (speed). Ephedrine has been used as an alternative to "Ecstasy", an illegal street drug (2,5).

## Warnings

The known side effects of Ephedra include insomnia, slight elevation in blood pressure, increased pulse rate, anxiety, dry mouth, and headaches. Ephedra has multiple adverse effects, particularly in large doses. One effect is its action in the gastrointestinal tract; it decreases tone motility, and secretory activity, which can result in nausea and vomiting. The Food and Drug Administration, recommends individuals with heart disease, high blood pressure, thyroid disease, diabetes, and/or an enlarged prostate should not take Ephedrine (2-5).

## Dosage

Alkaloid content is a key factor in providing an appropriate dosage of Ephedra. Ephedra sinica has an average total alkaloid content of 1 to 3 percent. For asthma and as a weight loss aid, 15 to 30mg total alkaloid, calculated as ephedrine, and should be taken two to three times daily. Maximum daily dosage should not exceed 300 mg total alkaloid, calculated as ephedrine. Standardized preparations are more dependable in terms of therapeutic activity (4).

Despite warning labels producers have put on the product, there has been few cases of overdosing due to disregard of dosage recommendations. Ephedra has an extremely good safety record, considering the

large amount of usage it receives. Ephedra has a mere 8 accidents resulting in death, compared to Aspirin and Aspirin substitutes, a whopping 20,000 American deaths each year. When used correctly Ephedra can be as safe as most over the counter medications.

## References

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