

HALLUCINOGENIC PLANTS IN CHINESE HERBALS

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The Chinese literature contains an extensive series of works on pharmaceutical botany, composed mainly of pharmacopoeias or materia medicas known as *pên-t'sao* or herbals. These works deal with drugs of all origins, mineral, animal, but mainly vegetable, hence the name. Then there are also many other treatises on plants and natural products from various parts of the country or neighboring states. All these works, accumulated in the last two thousand years, provide us with a vast store of knowledge on medicinal and economic plants and their uses, as well as on natural history in general, origin and distribution of plants, ethnobotany, agricultural history, and other related subjects. Plants with hallucinogenic properties are the subject of the present study.

Since very early times, the Chinese, like many other peoples, have discovered plants with hallucinogenic properties in their native flora, finding them perhaps along with their search for plants for medicinal uses. Plants with hallucinogenic effects were recorded in the earliest herbals nearly two thousand years ago. The special significance of these hallucinogenic plants was, however, not specifically discussed until the sixteenth century, when Li Shih-chên, the greatest authority on Chinese medicinal plants, in his magnum opus *Pên-ts'ao kang-mu* (first published in 1596 after his death) recorded along with details of a criminalistic episode involving the possible use of some hallucinogenic drugs. So far as I know, there has been no report of any use of hallucinogenic plants in China in more modern times. We do not know whether the practice of using some such plants by "sorcerers" or some other peoples as mentioned in earlier works occurred also in recent ages or not. It is not impossible that some use of hallucinogens may be found among the aborigines or other non-Han tribesmen along

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the remote borderlands in the southwest or elsewhere. There seems to be no such ethnobotanical study or survey ever having been made. We do come across, however, some records indicating that *Cannabis* was being used by the Uigurs along the Sinkiang (Chinese Turkestan) border in the remote northwest as late as the early twentieth century (Li 1974b).

Li Shih-chên's encyclopedic work, the *Pên-ts'ao kang-mu*, upon its publication, became the standard treatise on materia medica in China. Later authors, dealing with medicinal plants, nearly all derive their information from his work. This paper is also largely based on it as a primary source. In this work, he gave the details of an event in connection with a note on the general use of hallucinogens. This episode occurred in the year 1561 A.D. Apparently it was a news event of great nation-wide interest, as afterwards, because of this, the Emperor especially proclaimed an edict of warning throughout the whole country. His account is translated below.

“Lang-tang (*Hyoscyamus niger*), Yün-shih (*Caesalpinia sepiaria*), Fang-k'uei (*Peucedanum japonica*) and Red Shang-lu (*Phytolacca acinosa*) all can cause hallucination in peoples. In the past, this significance has not been fully divulged. Plants of this kind are all toxic, which can obscure the mind, alter one's consciousness, and confuse one's perception of sight and sound. In the T'ang times, An Lu-shan [a foreign warlord in the Chinese army service] once enticed the Kitan [tribesmen surrendered to his command] to drink Lang-tang wine and buried them alive while they were unconscious. Again in the second month of the 43rd year of the Chia-ch'in period (1561 A.D.), a wandering monk, Wu Ju-hsiang of Shensi province, who possessed wizardry, arrived at Ch'ang-li and stopped over at the house of a resident, Chang Shu. Upon finding the latter's wife being very beautiful, he asked that the entire family sit together at the table with him when he was being offered a meal. He put some reddish potion in the rice and after a while the whole family became unconscious and submitted to his assault. He then blew a magic spell into the ears of Chang Shu and the latter turned crazy and violent. Chang visualized his entire family as all devils and thereby killed them all, sixteen altogether, without any blood shed. The local authorities captured Chang Shu

and kept him in prison. After ten days, he spat out nearly two spittoonsful of phlegm, became conscious, and found out himself that those he killed were his parents, brothers, sisters-in-law, his wife, sons, sisters, nephews. Both Chang and Wu were committed to the death sentence. The Emperor, Shih-tsung, proclaimed throughout the country about the case. The particular magic potion must be of the kind of Lang-tang or similar drugs. When the man was under the spell, he saw everyone else as a devil. It is thus very important to find out the remedy that counteracts such a thing.”

The four plants mentioned by Li Shih-chên above, as well as other hallucinogenic plants from Chinese works, are given below, in the order of their relative importance.

It may be mentioned that the botanical identity of some of these plants are not positive, and others may also be subject to questioning. Among the Chinese drug plants in these old herbals, certain items appearing under one name may actually involve several different species of the same genus or even several species belonging to different genera. In other instances, a Chinese drug under one name may involve several species of the same genus as occurring in different geographical areas. However, in many cases, a plant drug may be positively determined as representing a certain species. It is not the aim of this paper to ascertain the definitive botanical identity of all the plants herein discussed, nor the chemical nature of the alleged hallucinogenic agents involved. These plants are being given here on the basis of their records as such as found in the literature. In some cases, as can be seen, an older record was not being further substantiated by later authors or may be even questioned or disputed.

Many attempts have been made by modern authors for the botanical identification of Chinese medicinal plants in the old herbals. Among the chief sources available are the works of Matsumura (1915), Stuart (1911), and Read (1936). However, the botanical identifications as well as the nomenclature in these works are, in some cases, subject to further more critical verification or modification.

The Chinese herbals and other related works cited here are given below with the author's name first and arranged

chronologically to give a historical perspective to this record. References to these old works are given by the number in the following text. A Bibliography to modern works is given at the end of the paper with citations to the author and year of publication in the text. It has to be noted that most of the earlier herbals have been lost and existed only as quotations in subsequent works. A number of these items have been reconstituted by later workers.

The illustrations given here are from Chang Ts'un-hui (20), the 1249 A.D. edition of T'ang Shên-wei's *Chêng-lei pên-ts'ao* of 1108 A.D. (16), which is one of the earliest illustrated *pên-ts'ao* extant.

HAN DYNASTY (206 B.C.-220 A.D.)

1. Anonymous *Shen-nung pên-ts'ao ching* (Classical Pên-ts'ao of the Heavenly Husbandman). (Based on Chou and Ch'in, 1122-206 B.C., material reaching final form ca. 2nd cent. A.D.)
2. Chang Chung-ching *Chin-k'uei yao-lüeh* (Essentials of the Golden Cabinet). ca. 150-219 A.D.

CHIN DYNASTY (265-420 A.D.)

3. Chang Hua *Po-wu chih* (Record of the Investigation of Things). 290 A.D.
4. Ko Hung *Pao-p'u tzu* (Book of the Preservation-of-Solidarity Masters). ca. 320 A.D.
5. Ko Hung *Chou-hou pai-i fang* (Remedies for Emergencies). 340 A.D.

NORTHERN AND SOUTHERN DYNASTIES (386-589 A.D.)

6. Lei Hsiao *Lei-kung p'ao-chih lun* (Master Lei's Treatise on the Decoction and Preparation of Drugs). 470 A.D.
7. T'ao Hung-ching *Ming-i pieh-lu* (Records of Famous Physicians) ca. 510 A.D.
8. Ch'ên Yên-chih *Hsiao-p'ing fang* (Minor Prescriptions).

T'ANG DYNASTY (618-906 A.D.)

9. Chen Ch'üan *Pên-ts'ao yao-hsing* (Nature of Drugs in Pên-ts'ao).
ca. 620 A.D.
10. Su Ching (=Su Kung) *T'ang pên-ts'ao* (Pên-ts'ao of the T'ang
Dynasty). 659 A.D.
11. Mêng Shen *Shih-liao pên-ts'ao* (Nutritional Therapy Pên-ts'ao).
ca. 670 A.D.
12. Ch'ên Ts'ang-ch'i *Pên-ts'ao shih-i* (A Supplement for the Pên-
ts'ao). ca. 725 A.D.

FIVE DYNASTIES (907-960 A.D.)

13. Han Pao-shun *Shu pên-ts'ao* (Pên-ts'ao of Szechuan). ca. 934-965
A.D.
14. T'ao Ku *Ch'ing-i lu* (Records of Unworldly and Strange Things).
950 A.D.
15. Ta Ming (Jih Hua Tzu) *Jih-hua chu-chia pên-ts'ao* (The Sun-rays
Master's Pên-ts'ao, Collected from Many Authors). ca. 972 A.D.

SUNG DYNASTY (960-1279 A.D.)

16. T'ang Shên-wei *Chêng-lei pên-ts'ao* (Reorganized Pên-ts'ao).
1108 A.D.
17. Su Sung *et al.* *Pên-ts'ao t'u-ching* (Illustrated Pên-ts'ao). 1061
A.D.
18. Fan Ch'êng-ta *K'uei-hai yü-hêng chih* (Guide to the Southernmost
Region [of China]). 1175 A.D.
19. Ch'ên Jên-yü *Chün p'u* (A Treatise on Fungi). 1245 A.D.

YUAN DYNASTY (1206-1367 A.D.)

20. Chang Ts'un-hui *Ch'ung-hsiu Chêng-ho ching-shih chêng-lei
pei-yung pên-ts'ao* (Revision of the Pên-ts'ao of the Chêng-ho reign-
period). 1249 A.D.

MING DYNASTY (1368-1644 A.D.)

21. Liu Wên-tai *et al.* *Pên-ts'ao p'in-hui ching-yao* (Essentials of the
Pên-ts'ao Ranked According to Nature and Efficacy) 1505 A.D.
22. Li Shih-chên *Pên-t'sao kang-mu* (The Great Pên-ts'ao). 1596 A.D.

Lang-tang — *Hyoscyamus niger* L. — Plate 24

This Solanaceous plant is the most famous hallucinogenic drug in the Chinese herbals. The very name, meaning violent delirium, implies its physiological effect. The hallucinogenic property is from the seeds, while the root is used as a medicine in pernicious malaria and in parasitic skin diseases.

Lang-tang was identified at first with *Scopolia japonica* L. by Japanese authors. But this is a species of Japan and the Chinese plant, as noted by Read and Liu (1925) and later followed by Chinese as well as Japanese (Matsumura 1915) authors, should be *Hyoscyamus niger* L. There is also a species of *Scopolia* in China, *S. sinensis* Hemsl., which is confined only to western China in Hupei and Szechuan provinces and only the root is used in medicine (Bot. Inst. 1972).

Hyoscyamus niger L. is long known as a hallucinogenic drug as given in Schultes and Hoffman (1973), who locate it in western Asia and Europe. The plant is also native to northern and southwestern parts of China, as well as in Russia and India (Bot. Inst. 1972). Makino (1921) considers the Chinese plant as representing a variety as *var. chinensis* Makino.

The seed is long known in the Chinese herbals to be very poisonous and when taken will produce madness. For use in medicine, the seeds should be properly treated to reduce their toxic properties. It is under this drug that Li Shih-chên (22), mentioning it along with three other plants following this item in this paper, discussed the hallucinogenic plants in detail as translated above. The hallucinogenic nature of this drug is noted in the earliest herbal, the *Pên-ts'ao ching* (1), which states “[The seeds] when taken [when properly prepared] for a prolonged period enable one to walk for long distances, benefiting to the mind and adding to the strength . . . and to communicate with spirits and seeing devils. When taken in excess, it causes one to stagger madly.”

In using the seeds as a medicine, the preparation consists of soaking in vinegar and then in milk and afterwards drying in air in the shade. As a drug, it is considered to be tonic and constructive, and is prescribed in dysentery, mania, toothache and other ailments.

In the herbals, it is repeatedly mentioned that the seed should not be broken in its use as a medicine. One early reference to this very fact is Ch'ên Ts'ang-ch'i (12), which states "Do not let the seeds become broken. Broken seeds [when taken] produce madness." Lei Hsiao (6) states that "[The seed] is extremely poisonous, and when accidentally taken, it causes delirium and seeing sparks and flashes." Another author (9) states that "[The seed] should not be taken raw as it hurts people, causing them to see devils, acting madly like picking needles." Li Shi-chên's (22) statement about the seeds is that they produce madness and delirium when taken.

Yün-shih — *Caesalpinia sepiaria* Roxb. — Plate 25

This is a drug plant in the Chinese pharmacopeia from early times. It is a shrubby vine of the Legume family widely distributed in China among the provinces south of the Yangtse River and in other warmer countries of Asia. The stem is hollow and densely beset with backwardly hooked spines. The leaves are doubly pinnate-compound with 6-16 pinnae each with 12-14 elliptical pinnules. The flowers are yellow and arranged in racemes. The flat pods are about 3 inches long, each containing 5 or 6 dark seeds, with a somewhat unpleasant odor.

The root, flowers, and seeds are all used in medicine. According to Li Shih-chên (22), the root is used to assist removal of a bone in the throat. The seeds are attributed to have astringent, anthelmintic, antipyretic and antimalarial properties. The flowers are attributed in the early herbals as having certain occult properties, and in at least one instance, the seed is similarly attributed. The first herbal, *Pên-ts'ao ching* (1) thus says, "[The flowers] could enable one to see spirits, and when taken in excess, cause one to stagger madly. If taken over a prolonged period, they produce somatic levitation and effect communication with spirits." Tao Hung-ching (7) states that "[The flowers] will drive away evil spirits. When put in water and burned, spirits can be summoned." The same author, in another instance, says that "The seeds are like Lang-tang (*Hyoscyamus niger*), if burned, spirits can be summoned; but this [sorcery] method has not been observed."

Li Shih-chên (22) admits the occult properties attributed to the flowers of these early records but expresses doubts about their beneficial effect on prolonged use. Remarking on the statement given above by the *Pên-ts'ao ching*, he says that "As the flowers of Yün-shih enable one to see spirits and drive one to madness, how can it be possible to gain somatic levitation by taking it over a long time? This shows that this is an error in these old works."

Caesalpinia sepiaria has not been noted as a hallucinogenic plant in modern works. In fact, as far as I am aware, it has not been investigated medicinally or chemically.

Fang-k'uei — *Peucedanum japonica* Thunb. — Plate 26

This Umbelliferous plant has also not been noted as a hallucinogenic plant in modern works. The root is used in Chinese medicine. It is considered by most authors as an eliminative, diuretic, tussic and sedative, and regarded as a tonic with prolonged use. Some, however, believe it slightly deleterious in nature.

Thus, Tao Hung-ching (7) says that "Feverish people should not take it, because it causes one to be delirious and see spirits." Ch'ên Yên-chih (8) says that "Fang-k'uei, if taken in excess, makes one become delirious and act somewhat like mad."

One of the noted characters of this drug is that it decays readily. Li Shih-chên (22), who cites the above quotation, is of the opinion that the hallucinogenic effects attributed to this drug are due to adulteration by Lang-tu. Lang-tu is generally referred to some species of the genus *Aconitum*, a genus with a large number of species widely distributed in China, many of which enter into the pharmacopeia and all are highly poisonous (Stuart 1911, Read 1936). In the *Chinese Materia Medica* (Pharm. Inst. 1960), however, Lang-tu is referred to a species of *Euphorbia*, *E. fischeriana* Steud. (*E. pallasi* Turcz.). Both *Aconitum* and *Euphorbia* species are poisonous in nature, but in the Chinese herbals, although drugs belonging to these genera are noted for their high toxicity, hallucinogenic properties do not seem to have been attributed to them.

Shang-lu — *Phytolacca acinosa* Roxb. — Plate 27

The species of *Phytolacca* are widely distributed in warm to tropical regions in the northern hemisphere, especially in America, and several species are noted for their edible leaves and poisonous roots. The species *Phytolacca acinosa* Roxb., extensively distributed in China, also in Japan and India, is a well-known drug plant in China. The leaves are known to be edible.

According to the old herbals, there are two kinds of Shang-lu; white with white flowers and white root, and red with red flowers and purplish root. The white root is edible when cooked and that kind is cultivated in some parts of the country for the edible root. The red root is considered to be extremely poisonous. *Phytolacca acinosa* Roxb. var. *esculenta* Maxim. (*Phytolacca esculenta* Van Houtte) is apparently referred to the edible kind which is generally referred to as a synonym.

The old herbals named both the flowers and roots as useful for medicinal purposes. The flowers, called Ch'ang-hau, are prescribed in apoplexy. The very poisonous root is, when used as a medicine, generally applied only in external application for inflammation. It is also prescribed in dropsy and as a remedy for abdominal parasites.

The deadly poisonous nature and the hallucinogenic effect of this drug was noted in many herbals and apparently it must have been quite commonly used by sorcerers in former times. T'ao Hung-ching (7) says that "The T'aoists used it. By boiling or brewing and then taken, it can be used for abdominal parasitic worms and for seeing spirits."

Su Sung (17) says "It was much used by sorcerers in ancient times." The two kinds were carefully differentiated. Han Pao-shun (13) thus states, "The red-flowered kind has reddish roots; the white-flowered kind has white roots." As to the white-flowered kind, which is considered as not poisonous and used as a drug, Ta Ming (15) states that "The white root has a very cooling effect; it is better taken with garlic."

Su Ching (10) summarizes in more detail the pharmaceuticals of this plant. "This drug has two kinds, red and white. The white kind is used in medicine. The red kind can be used to

summon spirits; it is very poisonous. It can be only used as external application for inflammation. When ingested, it is extremely harmful, causing unceasing bloody stool. It may be fatal. It causes one to see spirits.”

Ta-ma — *Cannabis sativa* L.

The hemp, *Cannabis sativa* L., was the chief textile plant in northern China, and the seed was a leading grain. It was also an important drug plant. There are archaeological and historical records to indicate that it has been found in China since Neolithic times (Li 1974a).

The early Chinese records clearly differentiate the male and female plants. The male plants produce better fibers. The edible seeds are enclosed in fruit coverings which contain the toxic substance. The *Pên-ts'ao ching* (1) states that “Ma-fên (the fruits of hemp) . . . if taken in excess will produce hallucinations (literally ‘seeing devils’). If taken over a long time, it makes one communicate with spirits and lightens one’s body.” T’ao Hung-ching (7) says that at his time “Ma-fên is not much used in prescriptions. Necromancers use it in combination with ginseng to set forward time in order to reveal future events.” As a drug plant, *Cannabis* was used for various purposes but primarily for its anesthetic effect.

The hallucinogenic effect caused by *Cannabis*, especially the effect of temporal distortion, is mentioned in other later works. T’ang Shên-wei (16) gives a more complete account on the pharmaceuticals use of the plant: “Ma-fên has a spicy taste; it is toxic; it is used for waste diseases and injuries; it clears blood and cools temperature; it relieves fluxes; it undoes rheumatism; it discharges pus. If taken in excess, it produces hallucinations and a staggering gait. If taken over a long term, it causes one to communicate with spirits and lightens one’s body.”

The stupefying effect of the hemp plant, commonly known from extremely early times, was indicated linguistically as the character *ma* assumed also a connotation of numbness and senselessness, apparently derived from the medicinal characters of the leaves and fruits. *Ma* as a radical combines with

many other radicals to form characters with such meaning as demon, grinding, waste, rubbing, porridge, etc.; or as a character it is used in combination with other characters to form bisyllabic words meaning narcotic, numbness, paralysis, etc. (Li 1974b).

In a discussion on the possible use of hallucinogenic plants by ancient Taoist practitioners in their search of elixir for immortality, Needham (1974) notes a record of the addition of *Cannabis* to the contents of incense-burners to generate hallucinogenic smokes. This record is found in a Taoist collection *Wu-shang pi-yao* (Essentials of Matchless Books), a work appeared between 561 to 578 A.D. He also quotes the statement of the hallucinogenic properties of Ma-fên in the *Pên-ts'ao ching* mentioned above.

The use of the plant as a hallucinogen persisted for some time before it gradually declined. Mêng Shen (11) says that "Those people who want to see spirits use raw *ma* fruits, Ch'ang-p'u (*Acorus graminea*), and K'uei-chiu (*Podophyllum pleianthum*) in equal parts, pound them into pills of the size of marbles and take one facing the sun every day. After one hundred days, one can see spirits." It is suggested that in ancient China the use of *Cannabis* as a hallucinogen was probably associated with Shamanism. The later belief became more and more restricted in China since the Han dynasty but its extensive practice among the nomad tribes north of China perhaps carried its use westward to central and western Asia and to India (Li 1974b).

Man t'o-lo — *Datura alba* Nees

This name is generally identified as the Jimson weed, *Datura alba* Nees, although the Sanskrit equivalent of the Chinese Man-t'o-lo, *Madara*, refers to *Erythrina indica* Lam. Several species of *Datura* have been introduced into China from India and they were not clearly differentiated from each other in the former literature. These species were introduced to China probably in the Sung to Ming times and thus they were not recorded in the earlier herbals. Only in Li Shih-chên's *Pên-ts'ao kang-mu* (22) that the medicinal uses of the Man-t'o-lo began to be given. The flowers and seeds are used externally

for infections and eruptions on the face and internally they are prescribed for colds, nervous disorders and others. Notable is the fact that the drug is used in combination with *Cannabis sativa* and taken with wine as an anesthesia for small operations and cauterizations. *Cannabis* was among the earliest plants used in China for its anesthetic effect.

The delirious action produced by the Jimson weed seeds was also known to the Chinese along with its introduction. Li Shih-chên himself experimented with this and recorded his actual experience as follows: "According to traditions, it is alleged that when the flowers are picked for use with wine while one is laughing, the wine will cause one to produce laughing movements; and when the flowers are picked while one is dancing, the wine will cause one to produce dancing movements. [I have found out] that such movements will be produced when one becomes half drunk with the wine and someone else laughs or dances to induce these actions."

Mao-kên — *Ranunculus acris* L.?

The identity of this plant is uncertain. Mao-kên is the name generally referred to species of the genus *Ranunculus*. A species or a variety of a species of the genus, growing along the waters edge, is alleged, in some earlier works, to have delirious effects on man. The whole plant is considered poisonous and it is not used as medicine internally but applied only externally for irritation and inflammation. The delirious action, however, noted in earlier works, is not mentioned in later herbals.

Li Shih-chên cites Ko Hung (4), an author of the 4th century, in the following account: "Among the herbs there is the Shui Lang (water Lang, a kind of Mao-kên) a plant with rounded leaves which grows along water courses and is eaten by crabs. It is poisonous to man and when eaten by mistake, it produces a maniacal delirium, appearing like a stroke and sometimes with blood-spitting. The remedy is to use licorice."

There is the possibility that there is some mistaken identity about the plant in question as a *Ranunculus*. A quotation similar to the one given above appears also in Li Shih-chên separately under Lang-tang (*Hyoscyamus niger* L.). This quo-

tation is credited to Chang Chung-ching (2) which names the plant Shui Lang-tang (water Lang-tang). The two quotations are so similar that they are clearly referable to the same plant and perhaps derived from the same source. As it is described as a semi-aquatic species with shiny leaves, the plant in question is more likely a species of *Ranunculus* rather than a Solanaceous plant related to *Hyoscyamus*. Read (1936) gives *Ranunculus acris* L. var. *japonicum* Maxim. as a deliration.

Fang-fêng — *Siler divaricatum* Benth. & Hook.?

Fang-fêng is a drug generally identified as an Umbelliferous plant, *Siler divaricatum* Benth. & Hooker. However, it could be possibly referable to some species of *Peucedanum*. The root of the plant is regarded in herbals as an antidote for aconite poisoning and as a remedy for curing many types of rheumatism and debility. The leaves, flowers, and seeds are also used for some purposes.

It is not certain whether the drug actually causes hallucinogenic effects or not as there is only one sketchy reference referring to this. T'ao Hung-ching (5) was purported to say that "The root is spicy and non-poisonous. The kind that bifurcates at top produces madness. The kind that bifurcates at the bottom causes reversion of old ailments." This quotation was given in Li Shih-chên (22) without any substantiation or additional explanation.

Lung-li — *Nephelium topengii* (Merr.)Lo?

There is only one reference to the plant Lung-li having hallucinogenic effects. This is in Fang Chêng-ta (18) of the Southern Sung dynasty, subsequently cited in the imperial commissioned pharmacopeia by Liu Wên-tai *et al.* (21) and by Li Shih-chên (22). "Lung-li grows in Ling-nan (Kwangtung province). The shape [of the fruit] is like a small Lychee with the flesh tasting like Longan. The body and foliage of the tree are also similar to these two fruit trees so it is called Lung-li. It blossoms in the third month with small white flowers. The fruit ripens at the same time with Lychee which cannot be eaten raw

but only after steaming. The taste is sweet and the nature hot. When eaten raw, it causes one to go mad or see devils.”

The botanical identity of this plant has never been positively made. The description is too meager for a definitive determination. Judging from the reference given to its characters as intermediate between Lychee, *Litchi chinensis* Sonn. and Longan, *Euphoria longan* (Lour.) Steud. and its geographical occurrence, the plant in question must be a variation of either one of these two species or a species of one closely related genus in the Sapindaceae that grows in the southernmost part of China.

Euphoria longan and *Litchi chinensis*, two well-known fruits of southern China, are unique fruits in that the edible part is the fleshy aril of the single seed. They are the only species of their respective genus that are native to China. *Euphoria* contains about 10 species distributed in southern Asia and *Litchi* two species, the other being known to the Philippines only.

In all probability, the plant in question is a species of the genus *Nephelium*, which is closely related to these two genera, especially in having arillate seeds. Some botanists regard *Euphoria* and *Litchi* as congeneric with *Nephelium*. Stuart (1911), who considers *Nephelium* in this broad sense, regards Lung-li as *Nephelium* sp. *Nephelium sens. str.* differs from the other two primarily in the aril being united with the seed coat while it is distinct in *Euphoria* and *Litchi*. There are two species in southern China; *N. lappaceum* L., a species of tropical Asia that is cultivated in the southernmost part of Kwangtung and the Hainan Island as a fruit tree, and *N. topengii* (Merr.) H.S. Lo (*N. lappaceum* L. var. *topengii* (Merr.) How et Ho) (Kwangtung Bot. Inst. 1974) native to Hainan, Kwangtung, Kwangsi and Yunnan. The tree, growing in the forests, has a fruit that is edible but the seed is known to be poisonous (Kwangtung Bot. Inst. 1974). Thus it is quite possible that this is the species in question, especially as the unripened fruit is mentioned as being toxic. However, among the several vernacular names of the species known locally, there is no record of the name Lung-li.

Hsiao-ch'ün — *Panaeolus papilionaceus* Fr.

The earliest record of a Laughing Mushroom appears to be in the early account of natural history by Chang Hua (3) in the Chin dynasty. "In the mountains south of the Yangtze River, on tall trees, there are mushrooms growing from spring through summer . . . which are tasty to eat but often prove fatal. It is said that these mushrooms are mostly poisonous Those growing on the Fêng tree (*Liquidambar*), when ingested, cause people to laugh unceasingly. The method for treating this is to use soil infusion, which cures it readily."

Subsequent authors give many similar records. In the Sung dynasty, T'ao Ku (14) states that "there is a kind of mushroom which causes one to suffer from a dry-laughing disease" In the early *Treatise on Fungi* by Ch'ên Jên-yü (19), the mushroom is named Tu-hsin "which grows in the ground. People believe it to be formed by the air from poisonous vermins, and kills people if taken Those poisoned by it will laugh. As an antidote, use strong tea, mixed with alum and fresh clear water. Upon swallowing this, it will cure immediately." Ch'ên treated 27 species of mushrooms from Taichow, Chekiang province.

The mushroom is often identified as growing on *Liquidambar* trees. Ch'ên Ts'ang-ch'i (12) states that "mushrooms that have poisonous snakes and vermins passing beneath them are all poisonous. Those that grow on Fêng trees (*Liquidambar*) produce an unceasing laughing delirium."

This laughing mushroom was also recorded in old Japanese works, which is called Waraitake or Laughing Mushroom. Kawamura (1918) identified this as *Panaeolus papilionaceus*. Yü (1959) notes that this mushroom is found not only in Japan and China but also in the United States and that the "soil infusion" described in early Chinese works is the clear liquid after soil is mixed with water and allowed to settle, an effective antidote for poisons.

Sanford (1972), in discussing the laughing mushrooms of Japan, records and translates two accounts from Chinese notebooks or *pi-chi*, one in Yeh Mêng-tê's *Pi-shu lu-hua* (early 12th cent.) of the Sung Dynasty, and one from Hsieh Chao-shua's

Wu tsa-tsu (1619) of the Ming Dynasty which are not repeated here. There may be other mentions of this mushroom in the numerous *pi-chi* of all dynasties. It may be noted that in Sanford's translation of the former, the term "Wen-tai" receives a footnote explaining that it is possibly not a place name and is meant for "warm spots." Actually it is an abbreviation for Wenchow and Taichow, two districts in the eastern part of Chekiang province, the same area where Ch'ên Jên-yü prepared his treatise on the fungi (19).

In a study on the search of elixir for immortality by Taoist practitioners in ancient China, Needham (1974) mentions the possible use of hallucinogenic plants, which may include the fly agaric, *Amanita muscaria*. He quotes Watson that this fungus was known in China, as in several other cultures, by the name of toad mushroom, Ha-ma-ch'ün, now often Tu-ying-hsin or fly-killing fungus. The laughing mushroom, Hsiao-ch'ün, is identified by him as *Panaeolus* or *Pholiota*. Needham remarks that "the further exploration of hallucinogenic fungi and other plants in Taoism and in Chinese culture in general will be an exciting task."

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Plate 24. Lang-tang, *Hyoscyamus niger* (From *Chêng-lei pên-ts'ao*, 1249 ed.)

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Plate 25. Yün-shih, *Caesalpinia sepiaria* (From *Chêng-lei pên-ts'ao*, 1249 ed.)

PLATE 26



Plate 26. Fang-k'uei, *Peucedanum japonica* (From *Chêng-lei pên-ts'ao*, 1249 ed.)



Plate 27. Shang-lu, *Phytolacca acinosa* (From *Chêng-lei pên-ts'ao*, 1249 ed.)