Ancient Chinese People’s Knowledge of Macrofungi during the Period from 220 to 589

Lu Di

Lu Di is currently a Ph.D. student at University College London, specializing in the circulation of ancient and modern mycological knowledge between East and West. Before completing his Master’s programme in Science Communication and Society at the University of Kent, he earned his bachelor’s degree in Biosciences at Nanjing Agricultural University in 2007, and spent two years studying Cell Biology at the Graduate School of Nanjing Agricultural University. During the past ten years of exploring the knowledge of fungi in ancient China’s ethnic majority and minority cultures, he published a series of essays and finished a monograph which will be published soon. Contact: ludiresearch@gmail.com

Abstract: To explore the knowledge of macrofungi in ancient China from 220 to 589, several aspects are studied in detail, including the meanings of ancient Chinese characters or words for macrofungi, naturalistic descriptions of macrofungi, the earliest record of the cultivation of macrofungi, the earliest record of the custom of eating macrofungi in Taiwan Island, methods of cooking macrofungi dishes, macrofungi in literature, and macrofungi in Taoist texts. More kinds of macrofungi are mentioned in the various works of this period than in earlier works, including the earliest record of the cultivation of fuling 茯苓 (Wolfiporia cocos), as well as the earliest record of the custom of eating monkey head mushroom (houtou gu 猴頭菇; Hericium erinaceus). There are two intriguing Taoist monographs of great significance for the history of zhi 芝 in Taoist literature. Moreover, the stories about lingzhi 灵芝 (Ganoderma lucidum) in Chinese literature indicate that macrofungi were not only lauded by poets, but also used by them to represent virtues.

Introduction

The important role played by macrofungi in human history is a long and rich one. In the West, written records about them date back to ancient
Greece. According to the text of Deipnosophistae, the ancient Greek dramatist Euripides (c. 480-406 BC) was alleged to have written an epigram on the death of a woman who had been poisoned with her children by θανασιμός μύκητας (thanasis mykētas; literally ‘fatal fungus’). The ancient Greek physician Hippocrates of Cos (c. 460-c. 370 BC) noticed the medicinal properties of μύκης (mykēs; literally ‘fungus’ or ‘mushroom’) in his work Epidemics. The ancient Greek philosopher Aristotle (383-322 BC) once took μύκης (mykēs) as an example of things of fiery and glittering appearance. Aristotle’s pupil Theophrastus (370-c. 285 BC), who succeeded his teacher in leadership of the Peripatetic school, spoke of μύκης δύδνον (hydnon; literally ‘truffle’, Tuber cibarium), κεραύνων (keraunion; literally ‘truffle’, Tuber aestivum) and πέζις (pezis; literally ‘bullfist’ or ‘puff-ball’, Lycoperdon bovista) in his work Inquiry into Plants (also known as Historia Plantarum). And later in the famous herbal work De Materia Medica, Pedanius Dioscorides (c. 40-c. 90 AD), a Greek pharmacologist who practiced in Rome at the time of Nero, mentioned not only the poisonous μύκητας (mykētas; literally ‘fungus’), whose toxicity could be detoxified with wine, and the edible μύκητας (mykētas) growing out of earth that had been manured and scattered with small pieces of the bark of the leuke tree, but also the ἀγαρικὸν (agarikon; literally ‘agaric’), which grew in Agaria in Sarmatia and was good for all internal disorders. In addition, he recorded a method of boiling pears together with mushrooms in order to ensure their safe consumption. Another great ancient physician Galen of Pergamum (131-c. 199) mentioned the Greek words βόλιτης (bōlitēs; literally ‘terrestrial fungus’) and ἀμανίται (amanitai; literally ‘champignons’) in his work De Alimentorum Facultatibus.

Turning to ancient China, there are also descriptions of macrofungi in the works of a few ancient philosophers and poets, such as Mo Di 墨翟 (c. 468-376 BC), Qu Yuan 屈原 (340-278 BC), Zhuang Zhou 莊周 (forth to third century BC), Lü Buwei 呂不韋 (?-235 BC), etc. In spite of this, historical materials concerning macrofungi before 220 AD (when the Han Empire...
collapsed) are comparatively scarce when compared with materials of later periods. There are, for instance, no monographs on macrofungi before 220.

Following the fall of the Han Empire, no further unified empire emerged during the period from 220 to 589. It was an era of civil wars and political chaos as well as cultural integration and prosperity, somewhat like the immortal saying by Charles Dickens: “it was the best of times, it was the worst of times.” A number of dynasties controlled parts of China during this period, which is divided into the Three Kingdoms (220-280), Jin dynasty (265-420), Southern dynasties (420-589) and Northern dynasties (386-581). Among the numerous historical materials from this time, it is particularly important to distinguish the genuine ones from forgeries. Books that were forged in this period, but attributed to people living a few centuries earlier, will also be used as reference materials. *Liezi* (The Book of Master Lie), for example, attributed to a fictitious figure living in the Warring States period (475-221 BC) but thought to have been written in the Jin dynasty,⁸ will be referred to as a book of the Jin dynasty when cited in this paper.

To date, within the field of the history of science and technology in China, there has been a lack of a comprehensive and systematic study of knowledge of macrofungi in ancient China. Even Dr. Joseph Needham’s *Science and Civilization in China*, which is the most famous series of books on the history of science and technology in China, does not have any special or individual chapters providing a brief history of this subject. In *Science and Civilisation in China, Volume 6: Biology and Biological Technology, Part 5: Fermentations and Food Science* (by Dr. Huang Hsing-tsung), there is only a small paragraph mentioning three ancient Chinese monographs on macrofungi, *Junpu* (A Monograph on Fungi), *Guangjunpu* (Extensive Treatise on Fungi), and *Wuxunpu* (Mushrooms in the Wu Region). Likewise, a few accounts of macrofungi as food are hidden away in different parts of the book. I appreciate Dr. Huang’s scholarship, but macrofungi as food is not given due emphasis in the book. Macrofungi comprise a very important group of organisms used for food and medicine in ancient and modern China. Their role in ancient Chinese society is also intriguing, for example, the close relation between macrofungi and Taoism. It is a pity that a detailed and systematic account of macrofungi in ancient China is unavailable.

This author has already surveyed ancient Chinese people’s knowledge of macrofungi to 220,⁹ and now it is time to do the same for the period from 220 to 589. Since Chinese characters are the basis for understanding all

---

⁹ Lu Di (2011).
Chinese historical materials, we might as well begin with the Chinese characters or words related to macrofungi.

**Characters or Words on Macrofungi in Ancient Chinese Dictionaries**

In the Jin dynasty, the great scholar Guo Pu (276-324), a master of literature, paleography and divination, not only annotated *Erya* （Literary Expositor） in detail, but also illustrated it elaborately, greatly facilitating the use and understanding of this dictionary. Chinese characters or words on macrofungi in *Erya* （爾雅） have been discussed elsewhere, but here, Guo Pu’s glosses on them will be reviewed. First, he attached importance to the pronunciations of single characters, and added the pronunciations of most of the characters that concern macrofungi, including *xiu* （苬）, *kui* （馗） and *jun* （菌）. Second, he emphasized the evolution of these various names, as a result of which we know that *zhongkui* （中馗） (an edible mushroom) was also called *tujun* （土菌） or *kuichu* （馗厨） in Guo Pu’s time. Finally, he also provides descriptions of the shapes, edibility or habitats of the flora and fauna mentioned in the work. For example, according to his annotation, *zhongkui* （中馗） is edible, shaped like a cap and grows at least in the areas south of the Chang River. In addition, his exquisite illustrations of some flora and fauna (including macrofungi) in the *Erya* （爾雅） aid in their probable identification.

Another great figure of this time, Zhang Yi 張揖, who lived in the Kingdom of Wei, compiled three dictionaries during his lifetime. Only one, *Guangya* （廣雅）（Enlargement of the Literary Expositor）, compiled in 230 AD, remains extant. According to the literal meaning of the title, this work is a revised and enlarged edition of *Erya* （爾雅）. It includes two words concerning macrofungi: *fushen* （茯神） and *zhaojun* （𦩻菌）. The former means *fuling* （茯}, `10 Lu Di (2011).
13 The illustrations are preserved in *Erya yintu* （爾雅音圖） (Commentary on Literary Expositor with Illustrations; reprinted by Zhongguo shudian 中國書店 in Beijing in 1985).
14 *Guangya* (1983), pp. 315, 345. 朝 is a variant form of 朝. Now 朝菌 is written as 朝菌, which is frequently cited to describe short-lived things. This word originates from Zhuangzi 莊子 (The Book of Master Zhuang), the original phrase being *chaojun bu zhi huishuo* 朝菌不知晦朔 (literally “the macrofungi which grow in the morning and die in the evening won’t experience what a month’s time is”).
蕶 (scientific name: *Wolfiporia cocos*), while the latter means the macrofungi that grow in the morning. Additionally, the character *jun* 菌, which means cap-like edible macrofungus in *Erya*, means *xun* 蕈 (*Lysimachia foenum-graecum*) in *Guangya*. The latter meaning of *jun* 菌 was not widely used in history.

Another dictionary containing characters on macrofungi is *Zilin* 字林 (The Forest of Characters), which was compiled by Lü Chen 呂忱 in the Jin dynasty. This work has not been preserved *in extenso*, although it was well-known for a long period after its completion, and now survives only in quotations which have been collected together. According to this collected text, two characters on macrofungi are included: *xun* 蕈 and *ruan* 蘢.* Ruan 蘢 refers to the *Auricularia* species growing on trees or rotten wood, while the gloss giving the meaning of *xun* 蕈 has not been passed down. However, the two characters are also included in *Shuowen jiezi* 說文解字 (Commenting on the Wen [character consisting of only single graphic elements], Analyzing the Zi [character made up of more than one graphic component], finished in 100 AD). Based on the gloss for *xun* 蕈 in *Shuowen jiezi*, it should refer to the *Auricularia* species growing on mulberry trees.

Among the other dictionaries of this period, *Yupian* 玉篇 (Jade Page Dictionary), compiled in 534 AD, the first regular script dictionary in Chinese history, is the most valuable for our purposes. The following characters are included in this dictionary: *xiu* 苹, *zhi* 芝, *jun* 菌, *xun* 蕈, *ruan* 蘢, *fu* 茯 and *ling* 茗. According to this dictionary, *xiu* and *zhi* are synonymous; both refer to the *Ganoderma* species (especially *Ganoderma lucidum*), which are thought to symbolize good fortune. *Jun* and *xun* are synonymous, both generally referring to macrofungi growing on the ground; *ruan* refers to the *Auricularia* species growing on rotten wood; *fu* 茯 and *ling* 茗 both refer to *fuling* 茯苓, also called chenfutu 車茯兔 (*Wolfiporia cocos*). In the dictionary, *fuling* is considered as *materia medica*. As the word *fuling* shows, it is a compound word made up of *fu* and *ling*, however in both ancient and modern times, Chinese people usually used the compound word to refer to *Wolfiporia cocos*, not the single characters. It is important and interesting to note the change in the meaning of *xun* 蕈, which formerly referred to the *Auricularia* species growing on mulberry trees in *Shuowen jiezi* 說文解字, but now refers to macrofungi growing on the ground in *Yupian*.

---

16 *Zilin* (1891).
17 *Shuowen jiezi* (1992), p. 36.
18 *Yupian* (1919).
Of all the Chinese characters or words mentioned above——zhi 芝, jun 菌, xun 蕈, fu 茯, ling 茯芩, fuling 茯苓, fushen 茯神 and zhaojun 朝菌—are still widely used today, whereas the others are not.

**Macrofungi in Ancient Chinese Naturalistic Works**

Ancient Chinese medical works, especially those on *materia medica* that give descriptions of the morphologic characteristics of medicinal macrofungi, provide us with the most valuable source materials for identifying the scientific names of the macrofungi. *Wu Pu bencao* 吳普本草 (Wu Pu’s Pharmaceutical Natural History), which was compiled in the Kingdom of Wei 魏 (220-266), includes a plant called *guiduyou* 鬼督郵 (also called *shencao* 神草 or *yangou* 陽狗). 19 According to the description, it grows on Mount Tai 太山 or Mount Shao Shi 少室山; its stem looks like an arrow shaft, red in color, without any leaves; its root looks like the corm of *Colocasia esculenta*. Therefore *guiduyou* 鬼督郵 probably refers to the orchid *Gastrodia elata*, the “root” of which is actually a stem tuber, while its small-scale leaves are obviously not regarded as leaves by the compilers. *Gastrodia elata* is a plant that grows without roots, but the *Armillaria* species, such as *Armillaria mellea* (also known as ‘honey mushroom’), can function as a mycorrhizal symbiont, getting nourishment from the mycelia of the macrofungi. The stem tubers of *Gastrodia elata* are said to be collected, sun-dried and stored for future use in curing abscesses. In addition, this work mentions four macrofungi: *zizhi* 紫芝 (*zi* means purple), *fuling* 茯苓, *zhuling* 猪苓 and *leiwan* 雷丸. 20 With regard to *zizhi* 紫芝, there is no description but another name: *muzhi* 木芝 (*mu* means wood). I think *zizhi* 紫芝 should be *Ganoderma sinense*, a wood-rotting macrofungus of purple color. The ancient Chinese people regarded *zhi* 芝 (including *zizhi* 紫芝) as a synonym for good things, such as *materia medica* that can confer immortality, for *zhi* actually is harmful (causing wood decay) in terms of forest protection. *Fuling* 茯苓, which grows under pine roots, should refer to *Wolfiporia cocos*, which parasitizes the roots of conifers. *Zhuling* 猪苓, the shape of which resembles *fuling* 茯苓, should refer to *Grifola umbellata*. And *leiwan* 雷丸, which is merely said to have another name *leishi* 雷實, should refer to *Omphalia lapidescens*. It should be pointed out that each of the three kinds of macrofungi (*fuling*, *zhuling* and *leiwan*) can form sclerotia (compact mass of

---

19 *Wu Pu bencao* (1987), p. 20. For the various Chinese synonyms for *guiduyou* 鬼督郵 in other ancient Chinese medical works, see Lu Di (2009).

mycelia) and then fruiting bodies. Although this work does not clearly mention the sclerotia or the fruiting bodies, fruiting bodies grow on the ground while the sclerotia grow under the ground. So it is reasonable to consider the sclerotia of the three species as the objects collected for medical use.

_Fuling_ 茯苓 ( _Wolfiporia cocos_ ), _zhuling_ 猪苓 ( _Grifola umbellata_ ) and _leiwan_ 雷丸 ( _Omphalia lapidescens_ ) are also mentioned in the _Leigong paozhilun_ 雷公炮炙論 (Master Lei’s Treatise on Preparing Materia Medica), which is the earliest medical work putting emphasis upon preparing _materia medica_ in the history of Chinese medicine, written by Lei Xiao 雷敩, who lived in the Liu Song dynasty (420-479). It records that the process of preparing _fuling_ is: peel off the skin and the ligneous part, pound the rest to a mash, transfer the mash to a basin filled with water, stir it thoroughly and then skim off the floating matter, which is said to cause constriction of the pupils of one’s eyes or blindness; for _zhuling_, the process is: peel off the rough skin with a copper knife, slice the rest into thin pieces, immerse them in water running eastward for one night, chop them fine, steam the small fragments with the leaves of rhizome of _Cimifuga sp._ for one day, and then remove the leaves and dry the small fragments in the sun; and for _leiwan_, the process is: immerse it in a decoction of _Glycyrrhiza uralensis_ for one night, peel the black skin with a copper knife, slice the rest into four or five pieces and immerse them in the _Glycyrrhiza uralensis_ decoction for one night again, steam them for four hours, dry them in the sun and then soak them in wine, steam them for four hours again and then dry them in the sun. Moreover, this work also records the process of preparing _tianma_ 天麻.  

_Tianma_ 天麻 is another name for _guiduyou_ 鬼督郵 ( _Gastrodia elata_ ), and was more widely used by later Chinese people to refer to the orchid _Gastrodia elata_. It is an orchid plant rather than a macrofungus, but its stem tubers have a necessary relationship with the _Armillaria_ species. So it will be mentioned in this paper but not discussed in detail.

More kinds of macrofungi are recorded in the _Mingyi bielu_ 名醫別錄 (Additional Records of Famous Physicians, finished c. 510 AD), and _Bencaoqing jizhu_ 本草經集註 (Collected Commentaries on the Classical Pharmacopoeia, written after 492 AD), both of which were written by the great pharmacologist and Taoist Tao Hongjing 陶弘景 (456-536). In the former work, the first mentioned macrofungi are the _liuzhi_ 六芝 ( _liu_ means six). These six kinds of _zhi_ 芝 are: Green _zhi_ ( _qingzhi_ 青芝), Russet _zhi_ ( _chizhi_ 赤芝), Yellow _zhi_ ( _huangzhi_ 黃芝), White _zhi_ ( _baizhi_ 白芝), Black _zhi_ ( _blackzhi_ 黑芝), Pink _zhi_ ( _pinkzhi_ 粉芝), and Brown _zhi_ ( _brownzhi_ 褐芝).

---

Lu Di: Ancient Chinese People’s Knowledge on Macrofungi

(heizhi 黑芝) and Purple zhi (zichi 紫芝) that grow on Tai Mountain (Taishan 太山), Huo Mountain (Huoshan 火山), Song Mountain (Songshan 蓬山), Hua Mountain (Huashan 華山), Heng Mountain (Hengshan 恒山) and Gao Xia 高夏 respectively. According to the Chinese mycologist Zhao Jiding’s 趙继鼎 study, Green zhi refers to Coriolus versicolor, Russet zhi to Ganoderma lucidum, Yellow zhi to Laetiporus sulphureus, White zhi to Fomitopsis officinalis, Black zhi to Amauroderma sp. (e.g. Amauroderma rugosum) or Polyporus melanopus, and Purple zhi to Ganoderma sinense. Zhiuling 猪苓 (Grifola umbellata), leiwan 雷丸 (Omphalia lapidescens), fuling 茯苓 (Wolfiporia cocos) and fushen 茯神 are mentioned, too. The former three kinds of macrofungi have already been mentioned in the medical works above. As for fushen, it specifically refers to the fuling 茯苓 that enwraps pine roots. Mabo 马勃, another mentioned macrofungus growing in soil rich in humus, are the edible species of the Lycoperdaceae family (e.g. Calvatia gigantea); guigai 鬼蓋, which is described as ephemeral, russet in color and to grow under walls, probably refers to Coprinus micaceus; guanjun 雠菌, which is described as growing in areas near the East China Sea, the Bohai Sea and a place called Zhangwu 章武 (today’s Huanghai 黃驊 city, Hebei province), refers to the Morchella species, e.g. Morchella esculenta; chijian 赤箭, a synonym for guiduyou 鬼督郵, refers to the orchid Gastrodia elata, already mentioned above. In addition, a materia medica called xuncao 蕈草 is described as growing in the marshes south of the Huai River, and can be used to make salt. Xun 蕈 means macrofungi growing on the ground, while cao 草 means herbs. Considering the habitat, xuncao 蕈草 may also refer to morels (i.e. the Morchella species), though it may refer to other organisms.

In the latter work, Bencaojing jizhu 本草經集註, fuling 茯苓, zhuling 猪苓, leiwan 雷丸, mabo 马勃, guanjun 雠菌, chijian 赤箭, xuncao 蕈草 and the six kinds of zhi 芝 are also mentioned. Tao Hongjing added further materia medica to this work. For example, mabo 马勃, guanjun 雠菌 and xuncao 蕈草, which cannot be found in Shennong bencaojing 神農本草經 (Classical Pharmacopoeia of the Divine Husbandman; c. 25 AD), are included in Bencaojing jizhu. And compared with Mingyi bielu, the descriptions of the same macrofungi in Bencaojing jizhu are similar but more detailed. For example, in Mingyi bielu, mabo 马勃 is described as growing in soil rich in

23 Zhao Jiding (1989).
24 Mingyi bielu (1986), pp. 16-17, 250.
humus; but in *Bencao jing jizhu*, there are additional details about its biological characteristics: it looks purple in color, feels fragile and soft, is shaped like a dog’s lung, and releases powders with a flick. Based on this description, it can be accurately identified as *Calvatia lilacina*.

Traditional Chinese pharmaceutical works mention fewer kinds of macrofungi. *Zhouhou beijifang* (Handbook of Prescriptions for Emergency) is the first emergency medicine work in the history of traditional Chinese medicine, written by Ge Hong (c. 284-c. 363). Of the various kinds of macrofungi, only *fuling* 茯苓, *fushen* 茯神 or *zhuling* 猪苓 is used as one of the components of some prescriptions. In this work, there are twenty-two prescriptions that contain *fuling*, four prescriptions that contain *fushen*, and two prescriptions that contain *zhuling*. And in another pharmacy work *Liu Juanzi guiyifang* 劉涓子鬼遺方 (Liu Juanzi’s Prescriptions Handed down by Spirits), which was written by Liu Juanzi 劉涓子 and compiled by Gong Qingxuan 龔慶宣 in 483 AD, there are only sixteen prescriptions involving the use of *fuling* as one of the components, and no other kinds of macrofungi except *fuling* are mentioned. The statistics indicate that *fuling* is the most important macrofungus in traditional Chinese pharmacy works.

There is a prescription in *Zhouhou beijifang* 肘後備急方 for toadstool poisoning: drink one sheng 升 (approximately 204 ml) of liquid human excrement, take emetics or drink two or three sheng of aqueous slurry. A similar and earlier prescription can be found in *Jinkui yaolüe fanglun* 金匱要略方論 (Synopsis of Prescriptions of the Golden Chamber) by the medical sage Zhang Zhongjing 張仲景 (150-219). Taking emetics will help the patient vomit the residue of the toadstools. As for drinking liquid human excrement or aqueous slurry, the effect is still waiting to be checked. Actually, liquid human excrement is rich in ammonia, and ammonia water is a dissolvent for amatoxins (toxic substances produced by some toadstools), so drinking liquid human excrement would only aggravate the toxic symptom.

In other works, toadstool poisoning is also recorded in *Bowuzhi* 博物志 (Records of the Investigation of Things), which was written by the great naturalist and litterateur Zhang Hua 張華 (232-300). The original text is:

> In the mountains and prefectures south of the Chang River, macrofungi grow out of the big broken trees during spring and autumn, and these macrofungi are

---

29 *Jinkui yaolüe fanglun* (2006), p. 120.
called *shen* 毒. They taste good but poison people in an instant. Some people think the toxicity is generated by the macrofungi themselves, while some people think the toxicity comes from snake venom. The people who have eaten the macrofungi growing on the maple trees will laugh loudly without stopping, and the treatment for them is drinking aqueous slurry.  

Eating toadstools by mistake is not uncommon, for it is so hard to distinguish them from edible macrofungi. Even mycologists are not always absolutely certain of identification. From the symptoms of poisoning mentioned here, the macrofungi growing on the maple trees seem to be a kind of hallucinogenic macrofungus. Zhang Hua does not provide us with any valuable information about the identification of toadstools, but he noticed the growth of wood-rotting macrofungi and especially used a Chinese character to denote them. In Shen Huaiyuan’s 沈懷遠 Nanyuezhi 南越志 (Record of Nanyue), the Yin Mountain 寧山 of Xiuye 攸業 county (today’s Huiyang 惠陽 county, Guangdong province) is mentioned as being rich in *fuling* which grow in the soil under pines. This is another record of the relation between *fuling* and pines, although the essence of the relation is not unveiled due to the limitations of the age. In *Liezi* 列子, which is thought to have been written in the Jin dynasty (265-420), macrofungi are described as growing in soil rich in humus and decaying from morning till evening. The author’s description is somewhat exaggerated, but we know that humus supplies organic nutrients for macrofungi, and that the life history of some kinds of macrofungi (e.g. *Coprinus atramentarius*) is indeed quite short.

### The Earliest Convincing Record of the Cultivation of Macrofungi

With regard to records of the cultivation of macrofungi, although the earliest record seems to be the simple words about the cultivation of *zizhi* 紫芝 in *Lunheng* 論衡 (Discourses Weighed in the Balance), written by

---

30 *Bowuzhi* (1980), p. 39. A similar and earlier record about the symptoms of toadstool poisoning is in *Jinqu yaoao fanglan* 金匱要略方論: “The people who have eaten the macrofungi growing on the trunks of maple trees would cry ceaselessly.” See *Jinqu yaoao fanglan* (2006), p. 120.


Wang Chong 王充 (27-c. 97 AD), I do not find this convincing.33 Here I argue that the earliest convincing record should be the method of cultivating fuling 茯苓 (Wolfiporia cocos) described in Tao Hongjing’s 陶弘景 commentary on the fuling entry in Bencaojing jizhu 本草經集註.34 He says that the natives of Yu Zhou 郁州 (today’s Lianyungang 連雲港 city, Jiangsu province) succeeded in chopping up pine and using the logs to cultivate fuling, although most of the cultivated sclerotia were small and of poor quality. He himself once dug out a sclerotium of high quality grown on pine logs which had been buried over thirty years previously. The reason for the poor quality product is that the method applied then did not allow enough time for maturing to produce a high proportion of sclerotia of high quality. Today pine logs are still used to cultivate fuling, but with the method having been improved from generation to generation, the cultivated sclerotia of fuling are of high quality.

The Earliest Record of the Custom of Eating Macrofungi in Taiwan Island

According to the Sanguozhi 三國志 (History of the Three Kingdoms), the earliest communication between the Chinese Mainland and Taiwan Island occurred in 230 AD. It records the government assignment of an effort to look for Yizhou 夷洲 (today’s Taiwan Island) and Tanzhou 亶洲 in that year.35 The commissioned fleet carrying ten thousand soldiers did not find Tanzhou because of the vast distance, but the fleet reached Yizhou and brought back thousands of the natives. This sketchy account does not provide any information about the local conditions and customs of Taiwan Island at that time, but we can find them in another work Linhai shuitu yiwuzhi 臨海水土異物志 (Record of the Strange Productions of Linhai’s Soils and Waters). Due to the detailed account provided, its author, Shen Ying 沈瑩 (?-280 AD), is believed to have traveled there himself. The Sanguozhi was finished after 280 by Chen Shou 陳壽 (233-297), whereas Linhai shuitu yiwuzhi was finished during the period from 264 to 280. Thus, the latter work should be the earliest extant Chinese literature on Taiwan Island. In it, there is a paragraph relating to the custom of eating houtougeng 猴頭羹 (houtou 猴頭 means ‘monkey head’; geng 羹 means ‘thick soup’) in

---

33 Lu Di (2011), p. 128. For the reasons why I do not find this record convincing, see Lu Di (2011).
Taiwan Island. It is described that the natives were fond of a thick soup of houtou, which they considered to taste better than a thick soup of five kinds of meat, and which could help neutralize the ill-effects of alcoholic drinks. There was a common saying about it: “people would rather lose one thousand dan [roughly equal to 26.4 kg] of foxtail millet [Setaria italic] than lose houtougeng to others.” Here, houtou refers to Hericium erinaceus (‘monkey head mushroom’; also known as ‘lion’s mane mushroom’ or ‘bearded tooth mushroom’), a macrofungus the fruiting body of which is shaped like a monkey head. This description is the earliest written account of the macrofungus as well as the native custom of eating it in Taiwan Island.

Some Methods of Cooking Macrofungi Dishes

The earliest work to provide us with some methods of cooking edible macrofungi in detail is the monograph on agriculture Qimin yaoshu 豐民要術 (Important Arts for the People’s Welfare), written by Jia Sixie 賈思勰 during the period from 533 to 544. A dish called gujun yugeng 菇菌魚羹 (literally ‘mushroom and fish soup’) is prepared as follows: cut a fish into pieces one cun 寸 (approximately 3 cm) long, wash the earth off the mushrooms in boiling water and cut them up, bring the mushrooms to the boil and then put in the pieces of fish. However, there are variations on this recipe. There are two other different accounts: (1) put in mushrooms first, then fish, vegetables, rice, spring onions and fermented beans; (2) do not use boiling water to wash the mushrooms, and fatty meat can also be added to the soup as an ingredient. Another method of preparing macrofungi dishes called foujun 魚菌 (literally boiled mushrooms) is cited as follows: the mushrooms (also called diji 地雞) used for cooking are the unexpanded ones with white flesh and outer layers. The expanded mushrooms with black flesh and which smell terrible are inedible. To store the mushrooms through the winter, they should be washed in salt water and steamed, then dried in the shaded north side of the house. To cook the fresh mushrooms, they should be washed in boiling water in order to remove the raw taste and then ripped apart. Then mix sesame oil with small pieces of spring onion, render the oil till a pleasant flavor is released, and then add more small pieces of spring onion, fermented beans, salt, Chinese pepper and the ripped mushrooms to the oil, and bring the soup to

---

36 Linhai shuitu yiwuzhi (1981), pp. 4-5.
It is best to boil the soup with fatty mutton; chicken and pork are somewhat inferior. In addition to the above agaric mushrooms, Jew’s ear (Auricularia auricula) is also used to prepare dishes. A dish called muerzu 木耳菹 (literally ‘chopped wood ear fungus’; muer 木耳 is synonymous with ‘Jew’s ear’) that tastes tender and smooth, can be prepared as follows: gather soft and fresh wood ear fungi that grow on jujube, mulberry, elm or willow trees, bring them to the boil five times so as to remove the raw taste, then transfer them to cold water and wash them. Next, immerse them in sour pickle water to wash them, pick them out and chop them up into small pieces. Add a little coriander and some spring onion, flavor with fermented bean juice, soy sauce and vinegar, then put in ginger and Chinese prickly ash. Another dish that involves wood ear fungi and tastes delicious can be prepared by mixing boiled and chopped wood ear fungi with ginger and tangerine. Furthermore, there is a new character on macrofungi used in this work: qian 椙, which refers to the wood ear fungus growing from the base of a tree. It seems that only Jia Sixie explained the character in this way, whereas it usually refers to a piece of wood for writing on.

**Macrofungi in Literature**

When the great Chinese geographer Li Daoyuan 郦道元 (c. 470-527) made comments on Wu Mountain 巫山 (located in the northeast of Chongqing municipality) in *Shuijingzhu 水經注* (Commentary on the Waterways Classic), he mentions a beautiful story:

> Once there was a girl called Yao Ji 瑤姬, who was the youngest daughter born of the Emperor of Heaven. Unfortunately, she died before getting married. Then, her spirit changed into grass while her body became lingzhi 靈芝. The Emperor of Heaven granted her the south side of Wu Mountain. She became sailing clouds in the morning and then changed into rains in the evening every day.

---

39 *Qimin yaoshu* (1982), pp. 536-537.
Lingzhi, which is called chizhi 赤芝 (Russet zhi) in Mingyi bielu, refers to Ganoderma lucidum. This story tells us the reason why nowadays one of the twelve peaks of Wu Mountain is called Goddess Peak. However, the rudiments of the story date back to the poem Shangui 山鬼 (Ghost of the Mountain) by Qu Yuan 屈原 (c. 340-278 BC). This depicts the ghost of the Mountain waiting for her sweetheart while “picking sanxiu 三秀 on Wu Mountain.” According to Wang Yi’s 王逸 note, sanxiu is synonymous with zhi 芝, which usually refers to the Russet zhi (Ganoderma lucidum). Later, in the Shanhaijing 山海經 (Classic of the Mountains and Rivers), which was compiled from materials dating from the Zhou and Western Han dynasties (1046 BC-9 AD), there is a story about the daughter of the Emperor of Heaven:

Her name was Nü Shi 女尸. After her death, she became a plant called yaocao 茎草, the leaves of which grew alternately, with yellow flowers and fruits like dodders [Cuscuta chinensis]. Girls who ate it would be deeply loved by other people.44

Then, in the Wenxuan 文選 (General Anthology of Prose and Verse, compiled in 530 AD), there are two fu 赋 (rhapsodies) about the story, respectively titled Shennü fu 神女賦 (Rhapsody of the Goddess) and Gao Tang fu 高唐賦 (Rhapsody of Gao Tang; Gao Tang is a synonym of Wu Mountain), both of which were written by Song Yu 宋玉 who lived in late Warring States period (475-221 BC). Shennü fu describes the beauty and virtue of the goddess of Wu Mountain, who has a tryst with the King of Chu in the king’s dream, while Gao Tang fu additionally mentions the heroine’s own words that follow the tryst: “I am the goddess of Gao Tang. And I was willing to sleep with you when I heard that you are traveling in Gao Tang,” and “I live in the dangerous places on the south side of Wu Mountain, and become clouds in the morning and rains in the evening every day.”45 Later in Xiangyang qijiuji 襄陽耆舊記 (Record of Venerable

47 In Jiang Yan’s 江淹 Biefu 別賦 (Rhapsody of Departure, included in Wenxuan), however, these words were quoted by Li Shan 李善 of the Tang dynasty (618-907) to annotate one line of Biefu as follows: “I’m the youngest daughter of the Emperor of Heaven and my name is Yao Ji 瑤姬. I died before getting married and then existed in Wu Mountain. My spirit became grass while my body became lingzhi 灵芝.” Here, the heroine is named, something absent in the present edition of Gao
Men in Xiangyang), which was written by the historian Xi Zaochi 習鑿齒 (?-383 AD), the heroine’s own words evolve into the following:

I am the youngest daughter of the Emperor of Heaven and my name is Yao Ji. I died before getting married and then was granted the Wu Mountain. My spirit attached to the grass while my body became lingzhi 灵芝. The person who has eaten it is able to meet with me in his dream. I am the goddess of Wu Mountain. I was willing to sleep with you when I heard that you are traveling in Gao Tang.48

Here, the story mode of the goddess of Wu Mountain has been basically finalized: she is the daughter of the Emperor of Heaven and her name is Yao Ji; she died before getting married; her body becomes lingzhi; she exists in Wu Mountain and becomes the goddess of Wu Mountain. In later works such as Shuijingzhu, the story does not vary substantially in plot from this.

Inspired by Song Yü’s 宋玉 Shennü fu 神女賦, the brilliant poet Cao Zhi 曹植 (192-232) wrote Luoshen fu 洛神賦 (Rhapsody of the Goddess of Luo River) in 222, which narrates his melancholy about the separation from the goddess of Luo River by the essential difference between him as a human being and her as a goddess.49 With regard to macrofungi, he wrote a piece titled Lingzhi pian 灵芝篇 (Poem of Lingzhi), using the metaphor of lingzhi to represent his filial piety and the great achievements of his brother Cao Pi 曹丕 (the first ruler of the Kingdom of Wei, reigned 220-226).50 Zhi 芝, especially lingzhi (Ganoderma lucidum) and zizhi 紫芝 (Ganoderma sinense), represent good qualities, such as nobility of character, national prosperity and medicines that confer immortality in ancient Chinese literature.

Lingzhi is further mentioned in a number of poems: Liyou shi 离友詩 (Poem of Farewell to a Friend), by Cao Zhi; Youfen shi 幽憤詩 (Poem of Hidden Resentment), by Ji Kang嵇康 (224-263); Da Ji Kang shi 答嵇康詩 (Poem of Responding to Ji Kang), by Ji Xi嵇喜 (Ji Kang’s brother); Caileng ge 采菱歌 (Ode of Picking Water Chestnuts), by Zhang Xie 張協 (?-307 AD?); Ge Gaozu Xuanhuangdi 歌高祖宣皇帝 (Ode for the Emperor Sima Yi), by Cao Pi 曹丕 (Eastern Jin dynasty); Bayue shiliurixi qingling zhenren shoushi 八月十六日夕請靈真人授詩 (The Great Taoist’s Poem Imparting in the

Evening on August the Sixteenth, written in 365, by Yang Yi 杨义; Hualin beijian shi 华林北涧诗 (Poem of the North Gully in the Luxuriant Forest), by Xu Yuan 徐爰 (394-475); Shiyuanji Yu Yuling yingzhao shi 侍宴庾于陵应诏诗 (Poem of Attending the Farewell Dinner for the Imperial Edict to Yu Yuling), by Liu Xiaochuo 刘孝绰 (481-539), etc.

As for zizhi, it is also mentioned in poems: Youxian shi 游仙詩 (Poems of Immortals, the second poem), by Zou Zhan 鄒湛 (?-c. 299 AD); Youxian shi 游仙詩 (Poems of Immortals, the third and fifth poems), by Yu Chan 庾阐 (Jin dynasty); Zengsong Yang zhangshi shi 贈送羊長史詩 (Poem for General Yang), by Tao Yuanming 陶淵明 (365-427); Nigu shi 擬古詩 (Poem in Imitation of the Early Chinese Classical Poetry), by Fu Zhao 傅昭 (454-528); Guyi shi 古意詩 (Poems of Ancient Imagery, the first poem), by Yan Zhitui 颜之推 (531-c. 595); You Zhongshan zhi Kaishan Dinglin xixin yanzuo yinbi fushi 游鐘山之開善定林息心宴坐引筆賦詩 (Poem of Travelling to the Kaishan and Dinglin Temples in Zhong Mountain), by Shi Hongyan 釋洪偃 (504-564) etc.

Another kind of macrofungus which was generally thought to prolong one’s life was fuling 茯苓 (Wolfiporia cocos). Wang Wei 王微 (415-443) once wrote a poem titled Fuling zan 茯苓贊 (Praise for Fuling) about it. The poem has survived in quotations in later important works such as Daguan bencao 大觀本草 (Classified Materia Medica of the Daguan Reign-period, written in 1108).52

Macrofungi in Taoist Texts

The large collection Daozang 道藏 (Taoist Patrology) contains two monographs on macrofungi, respectively titled Zhong zhicao fa 種芝草法 (Methods of Cultivating Zhi) and Taishang lingbao zhicaopin 太上靈寶芝草品 (A Treatise of Zhi of the Supreme Numinous Treasure) (Figure 1 and 2).53 Zhong zhicao fa 種芝草法 belongs to the zhongshu 萊術 (Practices) class of the dongshen 洞神 (Spirit Grotto) part, while Taishang lingbao zhicaopin belongs to the zhengyi 正一 (Orthodox One) supplement. Both consist of one volume only. It is difficult to determine exactly when both texts were written, a situation that applies to many other Taoist texts. The former text

is generally considered by scholars to have been written after the Jin dynasty (265-420), the latter also in the time range set in this paper.  
Therefore they are both tentatively treated as writings of the Southern Dynasties.

The main text of Zhong zhicao fa comprises 1372 Chinese characters describing the methods of cultivating zhi, probably copied from the seventh part of Shangqing mingjian yaojing (Important Classic of Apperception of Supreme Purity) with slight alterations. The methods in the text are considered to be ineffective in producing zhi or even macrofungi in a broad sense. As for the medicinal properties of zhi, there are hardly any naturalistic descriptions, but several fantastic effects are attributed to it, such as rejuvenating human beings and making them become Taoist celestial beings that ascend into Heaven. The text is full of Taoist mysticism. Still, it does mention that pines produce edible fuling. Although this is not quite factually accurate, the relation between pines and fuling is shown as apparently having been noticed by the Taoists. In addition, the text claims that zizhi shines in the dark. Here, zizhi is surely not Canadema sinense (which never shines in the dark), but macrofungi of this kind do exist, such as Armillariella mellea and Armillariella tabescens. Generally speaking, Zhong zhicao fa is valueless from the perspective of modern science. The real value of this Taoist text lies in providing us with a precious extant text and a chance to discuss the relation between Taoism and macrofungi (especially zhi). Fortunately, there is another more interesting Taoist text of this period to study together with Zhong zhicao fa.

Taishang lingbao zhicaopin 太上靈寶芝草品 is a significant contribution to the identification of zhi in Taoist literature. This text consists of 4011 Chinese characters and 127 illustrations (Figures 3 to 8), describing the

---

54 Daozang tiyao (1995), p. 697; Daozang fenlei jieti (1996), p. 339. Furthermore, the Chinese character 恒 in Taishang lingbao zhicaopin 太上靈寶芝草品 uses the form 恒, which indicates that this text was printed during the reign of the emperor Zhao Heng 趙恒 (r. 998-1022), there being a taboo on the use of the emperors’ given names in books in Song dynasty (960-1279), see Daozang tiyao (1995), p. 1116.

55 Count from 黃帝問曰 to 祚享無窮. If the title 種芝草法 and the remarks 種芝草法終 that end the text are added, the whole will add up to 1381 Chinese characters.


57 Lu Di (2010).
characteristics of 127 kinds of zhi and providing each zhi with an illustration. Some names of the various kinds of zhi are closely related to the theory of the Five Elements (Table 1), which indicates that the naming of the zhi in the text is partly influenced by Taoism. I have classified the 127 kinds of zhi into 6 groups: single umbrella-shaped macrofungi (34 kinds; see Figure 3), umbrella-shaped macrofungi in clusters (8 kinds; see Figure 4), umbrella-shaped and cup-shaped macrofungi with branches on a stalk (12 kinds; see Figure 5), umbrella-shaped macrofungi in layers (18 kinds; see Figure 6), strange umbrella-shaped and cup-shaped macrofungi (29 kinds; see Figure 7) and non-macrofungi (26 kinds; see Figure 8). By checking all the 127 illustrations, it is clear that none of the 127 kinds of zhi look like the species of the Ganoderma genus (or even the Ganodermataceae family) from their appearance. Most of them are umbrella-shaped and cup-shaped, regardless of whether they look normal or strange and whether they are natural or imaginary. Others (see Figure 8) that are not macrofungi include items shaped like a human being, Chinese character, flame, cube, snake, lotus or other strange things that cannot be described in words. Why are the 127 kinds of things all called zhi? Taoist texts are usually written in a deliberately mysterious style. However, to make people curious about Taoism, a mysterious style is not enough. The Taoists know what real zhi look like, but real zhi lack attraction when compared with the various dazzling kinds of zhi in the text, which are all different from real zhi. This Taoist text not only subverts the general concept of zhi, but also invents some kinds of zhi that cannot be seen as macrofungi. Besides, based on my survey of the names of the 127 kinds of zhi, not every kind has a unique name: there are 12 names which are used to name 28 kinds of zhi. It reveals that the author’s ability to name the various kinds of ‘zhi’ falls short of his ability to invent them! Zhi, for the Taoists, is a symbol representing immortality rather than a group of macrofungi belonging to the Ganoderma genus.

Although the zhi in the text are not zhi in the real sense, the text does contain some knowledge of macrofungi. It mentions umbrella-shaped
macrofungi (usually called mushroom; e.g. No. 23) and cup-shaped macrofungi (e.g. No. 104 and 49), both of which can be found in the wild (e.g. *Coprinus sterquilinus* and *Clitocybe geotropa*). In the field, single umbrella-shaped macrofungi (e.g. No. 70) and umbrella-shaped macrofungi in clusters (e.g. No. 100) are quite common. As for macrofungi with fruiting bodies that grow closely together (e.g. No. 16), *Armillariella mellea* is a good example. Moreover, illustration No. 60 shows the parasitism among macrofungi (e.g. *Asterophora lycoperdoides* parasites on *Russula pseudodelica*). The text borrows some terms from botany to describe the appearance of macrofungi (stalk, branch, leaf, root), depicts the habitats and the seasons suitable for growth; the tastes and the ways of picking, preparing and eating; special effects, etc.). It also mentions the colors of the inner part of some kinds of *zhí*, which sometimes are very important in identifying macrofungi. From some illustrations, we can even see the gills.

As a comprehensive Taoist work, Ge Hong’s 葛洪 *Baopuzi neipian* 抱朴子内篇 (The Inner Chapters of the Book of Master Baopu) mentions several lost Taoist books titled *Shenzhi tu* 神芝圖 (Illustrations of the Celestial Zhi), *Muzhi tu* 木芝圖 (Illustrations of the Wood Zhi), *Juzhi tu* 菌芝圖 (Illustrations of the Macrofungi Zhi), *Rouzhi tu* 肉芝圖 (Illustrations of the Meat Zhi), *Shizhi tu* 石芝圖 (Illustrations of the Stone Zhi), and *Dapo zazhi tu* 大魄雛芝圖 (Illustrations of the Various Zhi). In addition, it says that among the best celestial medicines, *zhuzhi* 諸芝 (various kinds of *zhí*) ranks fourth, while *fuling* 茯苓 ranks eighteenth. More importantly, it mentions *wuzhi* 五芝 (five kinds of *zhí*): *shizhi* 石芝, *muzhi* 木芝, *caozhi* 草芝, *rouzhi* 肉芝, and *junzhi* 菌芝. Each group is said to comprise more than one hundred kinds. *Shizhi* is described as a thing without definite shape and color, sometimes looking like a mass of fat. It may be some of the species that grow beneath the ground, such as *Tuber sinense* and *Rhizopogon piceus*. *Muzhi* is described as the ‘tiny trees’ on *fuling*. I think the ‘tiny trees’ may be the fruiting bodies that grow out of the sclerotia. The description of *caozhi* has been studied above and was identified as *tianma* 天麻 (the orchid *Gastrodia elata*). As for *rouzhi* (which are described as weird toads, bats, tortoises, etc.) and *junzhi* (which are described as the things like palaces, carriages, horses, dragons, tigers, etc.), it is obvious that they are not macrofungi.


Lu Di (2009).
Conclusions

During the period from 220 to 589, up to eleven dynasties were founded successively on Chinese territory, not to mention numerous short-lived regimes independent of central government. Obviously, this was a period of political chaos. But if we review this period from a cultural angle, actually, nationwide political chaos can be thought of as having the function of a catalyst to shorten the process of cultural clashes and fusion. Without this period of political chaos over three centuries, it is doubtful whether the cultural diversity and prosperity of the Tang dynasty would have happened. One of the cultural features of this period is the development of Taoism, which begins to thrive in the upper classes and is accompanied by the appearance of many Taoist texts. The two Taoist monographs (*Zhongzhicao fa* 種芝草法 and *Taishang lingbao zhicaopin* 太上靈寶芝草品) included in the *Taoist Patrology* are of great significance for unveiling what the *zhi* 芝 in Taoist literature really refers to. Based on the above analysis, I think *zhi* in Taoist literature became a symbol representing supernatural effects, such as immortality, no longer simply a species of *Ganoderma*. However, in terms of science, although both titles seem to offer much promise, actually they are valueless in proving the truth of the methods of cultivating *zhi* or the reliability of the taxonomy of *zhi* of this period. Very different from the Taoist texts for studying ancient Chinese people’s knowledge of macrofungi during this period, the medical works (especially the herbal works) are really valuable reference works. Compared with the period before 220 AD, some more kinds of macrofungi are mentioned. The most important record is that of Tao Hongjing’s *Bencaojing jizhu* 本草經集註, which gives the first convincing account of the method of cultivating *fuling* 茯苓 (*Wolfiporia cocos*). In addition, Shen Ying’s *Linhai shuitu yiwuzhi* 臨海水土異物志 first mentions the custom of eating monkey head mushroom (*Hericium erinaceus*) in Taiwan Island, and Jia Sixie’s *Qimin yaoshu* 齊民要術 mentions the edible macrofungi used in Chinese food culture and several detailed methods of preparing macrofungi dishes. In literature, macrofungi (especially *zhi* and *fuling*) are not only glorified by poets, but also borrowed by them to represent virtues. Moreover, the story of *lingzhi* 靈芝 (*Ganoderma lucidum*) shows that macrofungi began to receive much more attention in this period.
Acknowledgements

I would like to express my deep sense of gratitude to Prof. Dr. Hans Ulrich Vogel and the anonymous referees for their constructive comments on this study, as well as their great patience with the editing process. As a junior scholar, it is a special honor for me to share some of my findings in East Asian Science, Technology, and Medicine.
Table 1. The relation between some names of the *zhi* and the theory of the Five Elements

<table>
<thead>
<tr>
<th>Five Elements</th>
<th>Metal</th>
<th>Wood</th>
<th>Water</th>
<th>Fire</th>
<th>Earth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Names of <em>zhi</em></td>
<td>白玉芝 (No. 4)</td>
<td>青玉芝 (No. 1)</td>
<td>黒玉芝 (No. 5)</td>
<td>赤玉芝 (No. 2)</td>
<td>黃玉芝 (No. 3)</td>
</tr>
<tr>
<td></td>
<td>白帝玉芝 (No. 10)</td>
<td>青帝玉芝 (No. 7)</td>
<td>黒帝玉芝 (No. 11)</td>
<td>赤帝玉芝 (No. 8)</td>
<td>黃帝玉芝 (No. 9)</td>
</tr>
<tr>
<td></td>
<td>西方芝 (No. 15)</td>
<td>東方芝 (No. 12)</td>
<td>北方芝 (No. 16)</td>
<td>南方芝 (No. 13)</td>
<td>中央芝 (No. 14)</td>
</tr>
<tr>
<td></td>
<td>銅芝 (No. 39)</td>
<td>木芝 (No. 87)</td>
<td>水芝 (No. 99)</td>
<td>火芝 (No. 97)</td>
<td>土芝 (No. 36)</td>
</tr>
<tr>
<td></td>
<td>金精芝 (No. 21)</td>
<td>木精芝 (No. 120)</td>
<td>水精芝 (No. 121)</td>
<td>火精芝 (No. 27)</td>
<td>石精芝 (No. 67)</td>
</tr>
</tbody>
</table>

*Note:* Notice the Chinese characters in bold: 白 means white; 西 means west; 銅 means copper; 金 means gold; 青 means green; 東 means east; 木 means wood; 黒 means black; 北 means north; 水 means water; 赤 means red; 南 means south; 火 means fire; 黃 means yellow; 中 means middle; 土 means earth; 石 means stone. According to the theory of the Five Elements, white, west, copper and gold belong to the Metal element; green, east and wood belong to the Wood element; black, north and water belong to the Water element; red, south and fire belong to the Fire element; yellow, middle, earth and stone belong to the Earth element.

The number in the brackets refers to the serial number of the corresponding kind of *zhi* in *A Treatise of Zhi of the Supreme Numinous Treasure.*
Figures

Figure 1. The first printed page of Methods of Cultivating Zhi

Figure 2. The first printed page of A Treatise of Zhi of the Supreme Numinous Treasure
Figure 3. Single umbrella-shaped macrofungi (34 kinds)

Note: The numbers on the top left corner of the illustrations are added in order to facilitate cataloging and comparing the 127 kinds of zhi. Illustrations in Figure 3-8 are all from A Treatise of Zhi of the Supreme Numinous Treasure.
Figure 4. Umbrella-shaped macrofungi in clusters (8 kinds)

Figure 5. Umbrella-shaped and cup-shaped macrofungi with branches on a stalk (12 kinds)
Figure 6. Umbrella-shaped macrofungi in layers (18 kinds)
Figure 7. Strange umbrella-shaped and cup-shaped macrofungi (29 kinds)
Figure 8. Non-macrofungi (26 kinds)
References

Primary Sources in Chinese:

*Baopuzi neipian* 抱朴子内篇 (The Inner Chapters of the Book of Master Baopu), by Ge Hong 葛洪 (c. 284-c. 363), collated and annotated by Wang Ming 王明, Beijing: Zhonghua shuju, 1996.


*Chuci* 楚辭 (Elegies of Chu), by Qu Yuan 屈原 (c. 340-278 BC) et al., annotated by Ma Maoyuan 馬茂元, Wuhan: Wuhan Renmin chubanshe, 1999.

*Chuci buzhu* 楚辭補註 (Supplementary Commentary on the Elegies of Chu), by Hong Xingzu 洪興祖 (1090-1155), Beijing: Zhonghua shuju, 1983.


Lu Di: Ancient Chinese People's Knowledge on Macrofungi


Leigong paozhilun 雷公炮炙論 (Master Lei’s Treatise on Preparing Medicinal Materials), by Lei Xiao 雷敩 (active in the period 420-479), collected by Wang Xingfa 王興法, Shanghai: Shanghai zhongyi xueyuan chubanshe, 1986.


Linhai shuitu yiwuzhi 臨海水土異物志 (Record of the Strange Productions of Linhai’s Soils and Waters), by Shen Ying 沈瑩 (active in the third century), collected and collated by Zhang Chonggen 張崇根, Beijing: Nongye chubanshe, 1981.


Lushi chunqiu 吕氏春秋 (Master Lü’s Spring and Autumn Annals), by Lü Buwei 呂不韋 (c. 290-235 BC); critical reprint with annotations, Shanghai: Shanghai guji chubanshe, 2001.


Mozi 墨子 (The Book of Master Mo), by Mo Di 墨翟 (active in late forth and early fifth centuries BC); critical reprint with annotations, Beijing: Zhonghua shuju, 1993.

Nanyuezhi 南越志 (Record of Nanyue), by Shen Huaiyuan 沈懷遠 (active in the fifth century), in Han Wei Liuchao Lingnan zhiwu “zhilu” jishi 漢魏六朝嶺南植物“志錄”輯釋 (Monographs on Plants in Lingnan District from the Han Dynasty to the Six Dynasties), Beijing: Nongye chubanshe, 1990.
Qimin yaoshu 齊民要術 (Important Arts for the People’s Welfare), by Jia Sixie 賈思勰 (active in the sixth century), collated and annotated by Miao Qiyu 繆啟愉, Beijing: Nongye chubanshe, 1982.

Qu Yuan fu 屈原賦 (Qu Yuan’s Rhapsody), by Qu Yuan 屈原 (c. 340-278 BC), translated by Guo Moruo 郭沫若, Beijing: Renmin chubanshe, 1981.

Sanguozhi 三國志 (History of the Three Kingdoms), by Chen Shou 陳壽 (233-297), annotated by Pei Songzhi 裴松之, Beijing: Zhonghua shuju, 1964.

Shanhaijing 山海經 (Classic of the Mountains and Rivers), by Anonymous, finalised before the western Han dynasty (206 BC-9 AD), collated and annotated by Yuan Ke 袁珂, Shanghai: Shanghai guji chubanshe, 1980.


Shuijing zhuan 水經注 (Commentary on the Waterways Classic), by Li Daoyuan 郦道元 (c. 470-527), collated by Wang Xianqian 王先謙, Chengdu: Bashu shushe, 1985.

Shuowen jiezi 說文解字 (Commenting on the Wen [character consisting of only single graphic elements], Analyzing the Zi [character made up of more than one graphic component]), by Xu Shen 許慎 (c. 58-c. 147), annotated by Duan Yucai 段玉裁, Shanghai: Shanghai guji chubanshe, 1992.

Taiping guangji 太平廣記 (Extensive Records of the Taiping Reign Period), by Li Fang 李昉 (925-996) et al., Beijing: Zhonghua shuju, 1960.


Wenxuan 文選 (General Anthology of Prose and Verse), by Xiao Tong 蕭統 (501-531), annotated by Li Shan 李善 (630-689), Beijing: Zhonghua shuju, 1977.
Lu Di: Ancient Chinese People’s Knowledge on Macrofungi

Wu Pu bencao 吳普本草 (Wu Pu’s Pharmaceutical Natural History), by Wu Pu 吳普, finalized c. 235, collected and collated by Shang Zhijun 尚志鈞, Beijing: Renmin weisheng chubanshe, 1987.

Xianqin Han Wei Jin Nanbeichao shi 先秦漢魏晉南北朝詩 (Poems of the Period from the Pre-Qin, Han, Wei, Jin and the Northern and Southern Dynasties), compiled by Lu Qinli 遼欽立, Beijing: Zhonghua shuju, 1983.

Xiangyang qijiuji 襄陽耆舊記 (Record of Venerable Men in Xiangyang), by Xi Zaochi 習鑿齒 (?-383), collated and annotated by Shu Fen 舒焚 and Zhang Linchuan 張林川, Wuhan: Jingchu shushe, 1986.


Zilin 字林 (The Forest of Characters), by Lü Chen 呂忱 (living in the Jin dynasty [265-420]), collected by Ren Dachun 任大椿 and Tao Fangqi 陶方琦, Nanjing: 1891.

Primary Sources in Western Languages:


Dioscorides, Pedianos (1829), Pedanii Dioscoridis Anazarbei De Materia Medica Libri Quinque (liber 1), translated by Curtius Sprengel, Lipsiae: prostat in officina Libraria Car. Cnoblochii.


**Secondary Sources:**


