ORIGINAL RESEARCH PAPER Received: 2012.10.06 Accepted: 2012.11.04 Published electronically: 2012.12.03 Acta Soc Bot Pol 81(4):405-413 DOI: 10.5586/asbp.2012.044

# Wild food plants and wild edible fungi of Heihe valley (Qinling Mountains, Shaanxi, central China): herbophilia and indifference to fruits and mushrooms

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## Abstract

The aim of the study was to investigate knowledge and use of wild food plants and fungi in Han (i.e. Chinese) nationality villages in central China, including famine plants used in the respondents' childhood. A valley adjacent to the extremely species-rich temperate forest vegetation of the Taibai Nature Reserve was chosen. Eighty-two people from 5 villages took part in the study. Altogether, 159 wild food plant species and 13 fungi folk taxa were mentioned by informants. The mean number of freelisted wild foods was very high (24.8; median – 21.5). An average respondent listed many species of wild vegetables (mean – 17, median – 14.5), a few wild fruits (mean – 5.9 and median – 6) and very few fungi (mean – 1.9, median – 1), which they had eaten. Over 50% of respondents mentioned gathering the young shoots or leaves of *Celastrus orbiculatus, Staphylea bumalda* and *S. holocapra, Caryopteris divaricata, Helwingia japonica, Pteridium aquilinum, Pimpinella* sp., *Amaranthus* spp., *Matteucia struthiopteris, Allium* spp., *Cardamine macrophylla* and *Chenopodium album*. Only one species of fruits (*Schisandra sphenanthera*) and none of the mushrooms were mentioned by over half of the respondents. Although very diverse, it can be noted that the use of wild vegetables has decreased compared to the second half of the 20th century, as informants listed several plants which they had stopped using (e.g. *Abelia engleriana*) due to the availability of cultivated vegetables and other foodstuffs. On the other hand, the collection of the most well-known wild vegetables is maintained by selling them to tourists visiting agritourist farms, and restaurants.

Keywords: ethnobotany, ethnomycology, wild edible plants, non-timber forest products, mycophobia, food security

# Introduction

Wild food plant and fungi use in the world is very diverse. In many areas, mainly in urban centers or in the richest countries, few wild species are used, usually just a few wild fruits, mushrooms or green vegetables. However, in less developed countries wild food is still a significant component of nutrition. The use of wild greens and fungi shows a particularly interesting pattern as in some areas of the world these components of the diet are either avoided or little used (herbophobia and mycophobia, respectively), whereas in other areas they constitute an everyday part of nutrition [1]. For example in Amazonia and Eastern Europe wild greens are little used, in contrast to East Asia, India and parts of Africa [2]. Wild mushrooms are widely gathered in Italy, France, Catalonia, Slavic countries,

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This is an Open Access digital version of the article distributed under the terms of the Creative Commons Attribution 3.0 License (creativecommons.org/licenses/by/3.0/), which permits redistribution, commercial and non-commercial, provided that the article is properly cited. Turkey, Mexico and parts of Africa, but traditionally little used in England [3].

The country the most renowned for its wide contemporary use of wild components in the human diet is China. This stems from a few factors [4,5]:

(*i*) China frequently suffered severe food crises up until the 1960s, so the use of any natural resources was important to the inhabitants,

(*ii*) wild plants and animals are believed to contain more "qi" ("life energy"), so they are regarded as more nutritious and healthy,

(*iii*) Chinese culinary art likes indulging in a large number of, often strange, ingredients.

Although the research on potentially edible wild plants has been well developed in China (e.g. [5–10]), studies focused on documenting local traditions of wild plant and fungi use using the methodology of modern ethnobotany are relatively few, and the publications in international papers solely concern ethnic minorities, i.e. Mongolians [11,12], Shaxi in Sichuan [13,14], Miao in Hunan [15] and a variety of ethnic groups in Yunnan [9,10,16–18]. Two papers (in Chinese) concerning wild food resources in the Qinling Mounatins were published, but from a different part of these mountains [19,20]. The relatively short list of species given in them [19,20] suggests that only the most commonly used species were included. The ethnomycology of edible mushrooms in China is also under-developed (in spite of the extensive literature on the economic use of mushrooms in China), and particularly lacking are studies simultaneously oriented towards wild vegetables, mushrooms and fruits.

Paradoxically, little is known about wild food plant use patterns in north-central, central and eastern China where the dominant Han (i.e. "Chinese") population lives. The aim of our study was to fill this gap and to record wild food species in one little-developed, mountainous, rural area in the province of Shaanxi. For our study we chose probably the best-preserved forest complex in central China – the vicinity of the Taibai Nature Reserve, where the local population has a particularly rich choice of wild food plants and mushrooms.

The working hypothesis was that in an area of high biodiversity, in a country famous for the use of many species of wild foods, the farmers use a large number of wild vegetables, fruits and mushrooms in their nutrition, and this knowledge is widespread in the community. An additional aim was to elicit answers on the differences between present day use and use during the last widespread famine (1958–1960).

#### Study area

The study was located in the Heihe National Forest Park, on the southern edge of the Taibai Nature Reserve, with the highest peak of northern China in the center of the reserve (Mt Taibai 3767 m a.s.l.). The nature reserve protects a highly diverse flora - from warm temperate (with subtropical elements) to alpine at the top. The National Forest Park (a less strict protection regime) is the southern extension of it, and mainly protects species-rich forests. The area is completely covered by ancient forest vegetation and rocky outcrops. The river Heihe valley belongs to the Houzhenzi administrative unit [town, zhen (镇)], with an area of 822 km<sup>2</sup>. It is a very isolated place, which has vehicular access to the county town of Zhouzhi (where the post-office and schools are located) only via a 2.5 h drive through a winding precipitous gorge, often blocked for days by falling rocks. The whole valley is inhabited by 3500 people - ca. a thousand in the main settlement of Houzhenzi, and the rest in the hamlets scattered in the forest (Fig. 1).



**Fig. 1** A typical landscape in Houzhenzi valley – small fields in a valley surrounded by dense primary forest vegetation. Photograph by Łukasz Łuczaj.

The studied villages lie between 1000 and 1400 a.s.l. At these altitudes the climate is humid temperate, with daily temperatures in summer oscillating around 20–30°C and

winter temperatures around 10°C to -10°C. The mean annual temperature in Houzhenzi is 8.2°C, with high rainfall of nearly 1000 mm, out of which 44% is concentrated in the summer months [21]. The dominant vegetation is the species-rich *Quercus variabilis* and *Q. aliena* var. *acuteserrata* forest, with an admixture of *Pinus tabulaeformis*, and many deciduous tree species (e.g. *Acer* spp., *Tilia* spp.).

The majority of the local population are subsistence farmers who grow maize, potatoes, wheat and beans [21,22]. Sources of cash income are the orchards of zaopi (*Cornus officinalis*), walnuts (*Juglans regia*) and northern Sechuan pepper (*Zanthoxylum bungeanum*). Digging out medicinal roots and collecting medicinal herbs for wholesale buyers is also a very popular activity [21,22].

#### Methods

The field research was conducted in June and July 2011, as well as in August 2012, using transect walks and semistructured interviews with key informants, individual and group freelisting interviews (36 freelists were created), and cross-checking of the gathered herbarium specimens with key informants. Altogether, 82 people from five settlements (Houzhenzi, Diaoyutai, Huaerping, Jiangjiaping, Sanhe) took part in the study. The mean age of participants was 50 (from 16 to 83). The data were supplemented by participant observations by one of the authors (S. Y.) who had frequently visited the area, in 2007–2010, during all seasons of the year. During freelisting we separately asked, which species of wild vegetables (including underground organs), wild fruits and wild mushrooms were used. Making the three separate freelists enabled the comparison of the use of these categories and helped elicit answers from the respondents [23,24]. Freelists were made orally and written down on the spot by our team, including the Chinese-script version of the plant/fungi names.

The nine restaurants selling wild vegetables in Houzhenzi were also visited and menus were photographed in order to record the taxa sold and their price.

The study started from a few informants found using the snowball technique, but most interviewees were found by systematic walks through the village, visiting houses and asking the inhabitants if they wanted to take part in the study. We aimed at interviewing only one person from each household, only occasionally were two people from the same house interviewed, if there were signs that their knowledge differed (e.g. one of the spouses comes from another village, etc.). We also displayed some of our collections (mushrooms and some wild vegetables) in the main street of Houzhenzi, to observe the reactions and comments of people to the edible taxa shown.

Voucher specimens were collected from the specimens gathered during transect walks or supplied by informants, and are stored in the Department of Forestry, Northwest A&F University in Yangling.

#### Results

#### **General figures**

Altogether, 159 plant species from 59 families (classified as 139 folk taxa) and 13 fungi taxa were mentioned by the informants as eaten at least once, but only 128 plant species

and 12 fungi species were confirmed as eaten by more than one person (Tab. 1, Tab. 2, Tab. 3). The leaves and green parts of 104 species have been used, roots/rhizomes/tubers/bulbs of 18 species, flowers of 4 species and fruits of 36 species. Respondents mentioned wild vegetables most eagerly, and generally had problems listing wild fruits and fungi, stating that they are unimportant and are collected rarely. The gathering of young shoots of Celastrus orbiculatus and Staphylea spp. (mainly Staphylea bumalda, also S. holocarpa) was mentioned by nearly every respondent. Over 50% of respondents also mentioned gathering the young shoots or leaves of Caryopteris divaricata, Helwingia japonica, Pteridium aquilinum, Pimpinella sp., Amaranthus spp., Matteucia struthiopteris, Allium spp., Cardamine macrophylla and Chenopodium album (Fig. 2, Fig. 3). Six wild vegetables are served in most local restaurants (Tab. 3). Only one species of fruits (Schisandra sphenanthera) and none of the mushrooms were mentioned by over half of the respondents.

The mean number of freelisted wild foods was 24.8 (median – 21.5). An average respondent listed many species of wild vegetables (mean – 17, median – 14.5), a few wild fruits (mean – 5.9 and median – 6) and very few fungi (mean – 1.9, median – 1) as eaten.

The domination of wild vegetables in foraging activities is also confirmed by the fact that they are the only category of wild food stored for winter. Drying is a very common preserving technique (Fig. 4). Households dry between 1-5 species each year, usually a few kg of dry shoots and leaves, but some households who host tourists [so called "nong jia le" (农家乐)] can even dry a few dozen kg of dry "ye cai" (wild vegetables). Particularly large amounts of Chenopodium album are dried, as they are often used as winter fodder for pigs as well. Other commonly dried foods include Staphylea spp., Helwingia japonica, Celastrus orbiculatus, Toona sinensis and Cardamine macrophylla. Also, plants which are usually not treated as "ye cai", but as pig food (e.g. Artemisia subdigitata), are dried for the animals. In 2011 and 2012 dried Staphylea shoots were sold at the local food shop in Houzhenzi at 40 ¥/kg. Dried Chenopodium was, in 2011, sold to tourists a few km before entering the village, along with dried Auricularia and Lentinula mushrooms. Most families dry 1-5 species of wild vegetables outside on the concrete, on mats or inside the house on newspapers. Formerly wild vegetables were lacto-fermented, but now this is done very rarely.

Forest species, species of grasslands and forest edges as well as ruderal species are well represented in the list of collected taxa (however typical forest species dominate with 44% taxa, only 15% taxa are ruderal species, the rest are ubiquitous species or species of intermediate successional stages). The ruderal species are collected near homesteads. Their growth is often promoted. For instance when a farmer sprays their *Cornus officinalis* plantation with glyphosphate, they leave a clump of wild vegetables unsprayed. One of the most protected species is *Chenopodium album*, which is harvested and dried at the turn of May and June. Some forest species are harvested up to 5 km from the villages, up to the altitude of 1800 m a.s.l. At even higher altitudes, wild plants are only harvested while collecting medicinal herbs, which grow even higher.

All the older informants were asked about plants eaten during the severe food shortages that plagued China until the last case of famine in 1958–1960. The usual response was that they ate the same species but in larger quantities. They said that they were lucky having so many wild vegetables around, as some people from other, more populated areas had to take refuge in

#### Tab. 1 Most commonly freelisted species in the study.

Species	Category	N = 36
Celastrus orbiculatus	v	35
Staphylea spp.	v	33
<i>Caryopteris divaricata</i>	v	27
Helwingia japonica	v	27
Pteridium aquilinum	v	26
Pimpinella sp.	v	24
Amaranthus spp.	v	24
Matteucia struthiopteris	v	23
Cardamine macrophylla	v	22
Schisandra sphenanthera	f	22
Chenopodium album	v	22
Allium spp.	v	20
Toona sinensis	v	18
Akebia trifoliata	f	18
Rubus spp.	f	17
Prunus salicina	f	15
Chrysosplenium biondianum	v	15
Saussurea dolichopoda	v	14
Decaisnea fargesii	f	14
Adenophora spp.	v	13
Cantharellus cibarius	m	13
Allium paepalanthoides	v	12
Sedum amplibracteatum	v	11
Eleagnus umbellata	f	11
Tricyrtis macropoda	v	11

f – fruit; m – mushroom; N – number of freelists; v – green vegetable.

#### Tab. 2 Wild food plants sold in the restaurants in Houzhenzi.

Species	Ν
Staphylea spp. (mainly S. bumalda)	9
Toona sinensis	8
Chenopodium album	7
Matteucia struthiopteris	6
Pteridium aquilinum	6
Celastrus orbiculatus	6
Helwingia japonica	2
Medicago sativa	1
Cardamine macrophylla	1
Caryopteris divaricata	1
<i>Pimpinella</i> sp.	1
Lychnis senno	1

N – No. of restaurants selling wild food plants (total = 9).

their mountains to avoid starvation. However, asking questions about the last time the particular species was used revealed that there is a group of taxa which could clearly be called famine plants – species, which were used in this area until the mid-20th century and are not used any more. These include: the leaves of *Abelia engleriana*, the rhizomes of *Pueraria lobata*,

## Tab. 3 The list of wild edible plants and fungi confirmed by at least two respondents.

Scientific name	Family (according to APGIII [31])	Part used	Frequency	Local name in pinyin	Local name in Chinese
Vascular plants	Linnescese (formerly	aarial parts	***	shen vian dau fu	油仙百麼
Abenu engleriunu Kendel	in Caprifoliaceae)	aeriai parts		sheli xiali uou iu	竹竹山立肉
A charanthas hidentata Blume	A marantha casa	aerial parts	*	niu vi	生膝
Actividia chinencis Danch	Antinidiaceae	fruit	***	nu xi	甲游游游州
Admothera opp (A capillaris Homel A polyantha	Componulo cono	ii uii whole plent	***	ye iii iiong coi	却亦供你
Nakai)	Campanulaceae	whole plant		nai jiang cai	刘永米
Akebia trifoliata (Thunb.) Koidz.	Lardizabalaceae	fruit	****	ba yue gua, ba yue zha	奶浆菜,八月炸
Allium ovalifolium HandMazz., A. cf. victorialis L.	Amaryllidaceae (formerly in Liliaceae)	whole plant	*	ge jiu, ye jiu	茗韭,野韭
Allium paepalanthoides Airy Shaw	Amaryllidaceae (formerly in Liliaceae)	whole plant	***	tian suan	天蒜
Allium spp. (A. cf. senescens L., A. macrostemon	Amaryllidaceae	aerial parts	****	ai jiu cai, ai suan, ye	崖韭菜,
Bunge)	(formerly in Liliaceae)	1		suan, yong bao tou, luo	崖蒜,野蒜,
				er jiu, zong bao tou, ye	罗儿韭,
				iiu cai	棕包头,野韭菜
Amaranthus caudatus L.	Amaranthaceae	aerial parts	**	tian xi mi	甜菥蓂
Amaranthus retroflexus [, A. paniculatus [, A.	Amaranthaceae	aerial parts	****	han cai, ren han cai	汉菜.人汉菜.
viridis L.					0010700010
Anaphalis aureopunctata Lingelsh et Borza	Asteraceae	aerial parts	*	shi qu cao	鼠曲草
Anaphalis margaritacea Benth. & Hook. f.	Asteraceae	aerial parts	*	qing ming cai	清明菜
Aralia chinensis L.	Araliaceae	tender buds	**	ci long pao	刺龙袍
Arctium lappa L.	Asteraceae	leaf stalks,	*	niu bang zi	牛蒡子
		underground parts			
Artemisia subdigitata Mattf.	Asteraceae	aerial parts	*	ai	艾
Asarum himalaicum Hook. f. & Thomson ex Klotzsch	Aristolochiaceae	whole plant (as spice)	*	mao xi xin	毛细辛
Asarum sieboldii Mig.	Aristolochiaceae	whole plant (as	*	xi xin	细辛
	1110toro ennaceae	spice)			
Begonia sinensis A DC	Begoniaceae	aerial parts	*	vi kou vie	一口血
Berchemia sinica Schneid	Rhamnaceae	fruit	*	va gu teng gou er cha	亚古藤、勾
Berenenia onnea ocinicia.	Talalinaceae	-		ya ga teng, gou er ena	儿茶
Boehmeria gracilis C. H. Wright	Urticaceae	aerial parts	*	hong he ma	红河林
Boehmeria tricuspis Makino	Urticaceae	aerial parts	*	he ma	河麻
Broussonetia papyrifera (L.) Vent.	Moraceae	leaves	*	gou shu guo, gou ye	构树果,构 叶
Cacalia roborowskii (Maxim.) Y. Ling	Asteraceae	aerial parts	*	xiong er duo	熊耳朵
Capsella bursa-pastoris Medik.	Brassicaceae	aerial parts	***	di di cai	地地菜
Cardamine macrophylla Willd.	Brassicaceae	aerial parts	***	shi jia cai	石夹菜
Cardamine spp. (other smaller species e.g. C. flexuosa With., C. hirsuta L.)	Brassicaceae	aerial parts	*	xiao shi jia cai	小石夹菜
Caryopteris divaricata Maxim.	Lamiaceae (formerly in Verbenaceae)	aerial parts	****	chou lao han, lao han xiang	臭老汉/老汉香
<i>Castanea mollissima</i> Blume	Fagaceae	fruit	**	ve mao li, ve ban li	野毛栗,野板栗
Celastrus orbiculatus Thunb.	Celastraceae	aerial parts	****	bai wan ve	白蔓叶
Cephalotaxus sinensis (Rehder & E. H. Wilson) H.	Cephalotaxaceae	pseudo-fruit	*	bai gai guo, bi zi shu,	白盖果、篦子
Chenopodium album L., also C. giganteum D. Don	Amaranthaceae (formerly	aerial parts	****	hui hui cai	柄、小柏松米 灰灰菜
	(lormeny Chenopodiaceae)				
Chrysosplenium biondianum Engl	Savifragaceae	aerial parts	***	hong jin caj	红筋壶
Circium arvense var setosum (Willd) C A Mey	Asteraceae	aerial parts	**	hong hua miao ci ji	红茄菜 却蓟
Cirsium spp. eg Cirsium botryoides Petrak ex	Asteraceae	aerial parts	*	xiaoji	小蓟
HandMzt.	Lamiacene	aerial parts	*	chou mu dan chou	自中中自
Cierouenarum iriciiolomum Illund.	Laimaceae	aerrar parts		lao han	ズロノノ、 来 老汉
Commelina benghalensis L.	Commelinaceae	aerial parts	*	dan zhu ye, zhu ye cao, mian da zi	淡竹叶、竹叶 草、面达子
Cornus kousa Bürger ex Miq.	Cornaceae	fruit	***	shi zao	石枣

#### Tab. 3 (continued)

Scientific nume         APGull [51]         Part used         Fortused         Fortused <thfortused< th="">         Fortused         Fortused<!--</th--><th colspan="6">Family (according to Local</th></thfortused<>	Family (according to Local					
Crypto heterophyla Fisch, ex BesserCrystecarefruitrstart, mio h, mao h raid, wina xiang al barCrintages hydronist Sarg, Crynolang grinto Hask, Conschurg grinto Satter, Donathang Satter, Satte	Scientific name	<b>APGIII</b> [31])	Part used	Frequency	Local name in pinyin	Chinese
change hupdennis Sarg.SincefmithSiys Jano hanFill (1) (2) jano hanFill (2) (2) jano hanFill (2) (2) (2) (2) (2) (2) (2) (2) (2)TimeSinceSinceFill (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2)TimeSinceSinceFill (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2)TimeSinc	Corylus heterophylla Fisch. ex Besser	Corylaceae	fruit	*	zhen zi, mao li, mao li	
Catalogn (applensis Sang.Rosecnefruit··ye shan And991.0%Contained (appletanis grandin Schutz.Aschpiadiaceaeunderground parts·ye sina sizeWill'sContained (applet) Franch.Lactalolaceaerut·mass lau, ye xiang.Will'sWill'sDenotrated (applet) Franch.Lactalolaceaeentel parts·vill'sMill'sMill'sDenotrated (applet) Franch.Denotrate (applet) Franch.·vill'sMil					zi shu, xiao xiang zi shu	
Cryptokensing inponie Hask.Apiacemearial parts··	Crataegus hupehensis Sarg.	Rosaceae	fruit	*	ye shan zha	野山楂
Cynantong graduli Schuit.Aschepindineerrud ger sun yave yau ger streng Str. J#3%rud sun yave yau ger streng Str. J#3%Rud St. J#3%Descentrois negation function.Insecret end parts'' <td< td=""><td>Cryptotaenia japonica Hassk.</td><td>Apiaceae</td><td>aerial parts</td><td>*</td><td>ya jiao ban</td><td>鸭脚板</td></td<>	Cryptotaenia japonica Hassk.	Apiaceae	aerial parts	*	ya jiao ban	鸭脚板
Decision injegoi Franch.LandrabalaceseFruit""moo shi gaps evaluesSet, SFE SEDecominis sophis (L) webb ex Prand (?)Brassicacceaenderground parts*its han yaoUKS, SEDecorron battan Decon.Decorron battan Many NoUKS**yang mai 7, nin and it#507, 4907, 5907Prangeria sopp (E corymbosa Losinsk, E perturptionRecorreca Martan Many No***ye shang hand#52, 890, 590Behoring (i geonia (Thurk) F. Dietr.Hehoring (i accorr that Many No#52, 890, 590#52, 890, 590Hohoring (i geonia (Thurk) F. Dietr.Hehoring (i accorr that Many No#52, 890, 590, 590, 590, 590, 590, 590, 590, 5	Cynanchum giraldii Schltr.	Asclepiadiaceae	underground parts	*	ge shan xiao	隔山消
Decoming sophia (L) Webb ex Prand (?) Decoverabation sophia (L) Webb ex Prand (?) Decoverabation Decove. Decoverabation Decove. Decoverabation Decove. Decoverabation Decove. Decoverabation Decove. Decoverabation Decove. Decoverabation Decove. Decoverabation Decove. Decoverabation Decove. Decoverabation Decove. The Decoverabation Decove. Decoverabation Decove. Decoverabation Decove. Decoverabation Decove. Decoverabation Decove. Decoverabation Decove. Decoverabation Decover. Decoverabation Decover. Decover Decover Decover. Decover Decover Decover. Decover Decover Decover. Decover	Decaisnea fargesii Franch.	Lardizabalaceae	fruit	***	mao shi gua, ye xiang jiao	猫屎瓜,野香蕉
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Elacogna anabelian Tumb.EleganceseFutt"**agen aig. aig. aig. 347, 4897, 4897, 4807, 48	Dioscorea batatas Decne.	Dioscoreaceae	underground parts	*	shan yao	山药
Frageriery (f. carymbosa Losinsk, F. pentaphyliRoaceaeFradiFradeFradeConstructionFrade (Ed.)ConstructionFrade (Ed.)ConstructionKalka FradeLosinskyLobinsky (J. domoriteri) C. Morren, J.Lebevigaceaeleaves****ye hang hanaNI-ERLinemoroulis spp. (Li. domoriteri) C. Morren, J.Mathorotheoceaeactal parts?***kana (and)TriggeInperitor notolopha Maxim.Materacceaeactal parts?**kana (and)TriggeInperitor notolopha Maxim.Materacceaeactal parts?**kana (and)TriggeInperitor notolopha Maxim.Materacceaeactal parts?**ties abaWith 2000Kohina coparia (L) Schnd.(Gromelyactal parts?**ties abaWith 2000Kohina coparia (L) Schnd.(Gromelyactal parts?**ties abaWith 2000Latus servida I.Ateracceaeactal parts?**ties abaWith 2000Latus servida I.Ateracceaeactal parts?**ties abaXith 2000Latus servida I.Lilacceaeactal parts?**ties abaXith 2000 </td <td><i>Elaeagnus umbellata</i> Thunb.</td> <td>Eleagnaceae</td> <td>fruit</td> <td>***</td> <td>yang nai zi, niu nai zi</td> <td>羊奶子,牛奶子</td>	<i>Elaeagnus umbellata</i> Thunb.	Eleagnaceae	fruit	***	yang nai zi, niu nai zi	羊奶子,牛奶子
Loamstrikpp samp pape地地域系统Halvingia japonica (Lumb) E. Dietr.Heldvingiaceaeflowers''''ye shang hua11-£Handrigui japonica (Lumb) E. Dietr.Kurner') (Lineacea)'''ye huang hua11-£Heneracoalis go, L.I. dumortieria C. Morren, H.XanthorThocaccaeerial parts'''ku mai cai''''Ibratica motolopha Maxim.Balaaminaccaaerial parts'''do loan no	Fragaria spp. (F. corymbosa Losinsk., F. pentaphylla	Rosaceae	fruit	***	cao mei, di pao, di di	草莓, 地泡,
Heivingia japonica (Thanh.) F. Diet.     Heivingia japonica (Thanh.) F. Diet.     Yen and Yen of the second in the secon	Losinsk.)				pao xiang pao	地地泡,香泡
Hennecodils spp. (H. dumortieri C. Morren, H. (formerly Liliacea)Kuntherrichesceaederial parts**ye heang head        <td>Helwingia japonica (Thunb.) F. Dietr.</td> <td>Helwingiaceae</td> <td>leaves</td> <td>****</td> <td>ye shang hua</td> <td>叶上花</td>	Helwingia japonica (Thunb.) F. Dietr.	Helwingiaceae	leaves	****	ye shang hua	叶上花
jahva L.)     (formerly Lilaceae)     aterial parts     ?     ku mai cai     苦菜菜       Hieractims ng, inspatiens notolopha Maxim,     Balauminaceae     aerial parts     **     ku mai cai     苦菜菜       Lorets sondrighta Hance     Asteraceae     aerial parts     **     ku mai cai     苦菜菜       Jaglans cathayensis Dode     Juglandaceae     firuit     **     ku mai cai     苦菜菜       Kochia scoperia (L.) Schrad.     Asteraceae     aerial parts     *     tie sao bai Jiang, stao ku     ylä ži       Kochia scoperia (L.) Schrad.     Asteraceae     aerial parts     *     tie sao bai Jiang, stao ku     ylä ži, zia       Leonitopolium isponicum Miq.     Asteraceae     aerial parts     *     sha bai jiang, stao ku     ylä ži, zia       Liliuor gigonteon Walt.     Asteraceae     aerial parts     *     shaj ue cao     dinij Liliuor gigonteon Walt.       Liliuor gigonteon Walt.     Liliaceae     underground parts     **     shai bai he     xEG       Liliuor gigonteon Walt.     Liliaceae     inderground parts     **     shai bai he     xEG       Liliuor gigonteon Walt.     Liliaceae     inderground parts     **     shai bai he     xEG       Liliuor gigonteon Walt.     Liliaceae     inderground parts     *     shai bai he     xEG	Hemerocallis spp. (H. dumortierii C. Morren, H.	Xanthorrhoeaceae	flowers	**	ve huang hua	野黄花
Heracium sp.Asteraceaerial parts??ku mai cai苦茨菜impleine notolophu Maxim.Balsaminaceaerial parts**daolaon nen.当老孩kurs sondipfols HanceAsteraceeaerial parts**ku mai cai苦艾菜lagions cubayenss DodeUglandaceaefruit**ye he tao野核kKalmeris pinnatifida (Maxim) Kitam.Asteraceeaerial parts*ma han too>====Kochia scoparia (L.) Schrad.Amaranthaceeaerial parts*ma han too>====(formerytite soo bai jiang, xiao ku.ht===.ft===Lactuca seriala 1.Asteraceaeaerial parts*shai pa caoTaft==Lactuca seriala 1.Asteraceaeaerial parts*shai bai ba.ft==Lagueticum sinens Oliv, ChuanhsingApiaceaeaerial parts*shai bai ba.ft==Latium giganteum Wall.Liliceaeunderground parts**shai bai ba.ft==Latium signateum Vall.Liliceaeanderground parts**shai bai ba.ft==Lactura straftsprist (L.) Tod.Canyophyllaceaestraft parts*ku tang paoT##Lowitzu 2.Lacturatius traftsprist (L.) Tod.Canyophyllaceaestraft parts*ku tang paoT##Ladius sp.ft (D. acturatius 1.Lacturatius traftsprist (L.) Tod.Conclaceaeft=1mati astraft parts*ku tang paoLatium sigantariaKu tang paoT##ft=2Ku ta	fulva L.)	(formerly Liliaceae)			7	
Inpatiens motolopha Maxim.Balsaminaceaeaerial parts**daol aon nen.男子教Larris sothofiola HanceAsteraceaeaerial parts***k ma lan cia.貴天教Radimeris pinnarifyida (Maxim.) Kitam.Asteraceaeaerial parts*is and no uo.受三炎Kachia soparia (L.) Schrad.Maraminhaceaaerial parts*is ao baj jiang, xiao ku小学家 xiaoLactura serriola L.Chenopodiaceae)rsiao kara caeaeaerial parts*is ao baj jiang, xiao ku小学家 xiaoLactura serriola L.Asteraceaeaerial parts*is abia jiang, xiao kuMy xiao ku#Latima ggionteum Mali.Liliaceaeaerial parts*is hua kiaoMy xiaoLiliaring ggionteum Wali.Liliaceaeunderground parts*is hua kiao#Gavi.)Liliariceaeinderground parts*is hua kiao#Gavi.)Liliaceaewolderground parts*is part ait apr xiaois part ait apr xiaois part ait apr xiaoLiliari ggionteum Wali.Liliaceaewolderground parts*is uan que xiao##Liliari ggionteum Wali.Liliaceaewolderground parts*is uan que xiao##Lowinds son bichold & Zucc.Caryophilaceaewolderground parts*is uan que xiao##Lowinds son bichold & Zucc.Son Caryophilaceawolderground parts*is uan que xiao##Lowinds son bichold & Zucc.Son Caryophilac	Hieracium sp.	Asteraceae	aerial parts	*?	ku mai cai	苦荬菜
Deris sonch ifold HanceAsteraceaeaerial parts***ku mai cai営業業iggins cathagensis DodeJuglandaceaefruit***ye he tao更Hk@LKalmeris pinnatifidi (Maxim), Kitam.Asteraceaeaerial parts**tie sao ba装具北Kochia scoparia (L.) Schrad.Amaranthaceaeaerial parts*'tie sao batie sao batie sao batie sao baLactice serviola L.Asteraceaeaerial parts*'shoi bai jiang, xiao ku\n^\ne\ne\ne\ne\ne\ne\ne\ne\ne\ne\ne\ne\ne\	Impatiens notolopha Maxim.	Balsaminaceae	aerial parts	*	dao laon nen	到老嫩
Andre somolynim introductIntroductIntroductIntroductIntroductKalineris pirmatifida (Maxim.) Kitam.Asteraceaeaerial parts*ma lan tou与兰头.Kachia scoparia (L.) Schrad.Asteraceaeaerial parts*ma lan tou与兰头.Chenropoditaceae)LChenropoditaceaesteral parts*xiao bai jiang, xiao kury žgx.Louttac serriola L.Asteraceaeaerial parts*siao bai jiang, xiao kury žgx.ry žgx.Lontopoditam japonicum Miq.Asteraceaeaerial parts*shui bai hexEGLiliur gigantecum Wall.Liliaceaeunderground parts**shui bai hexEGLiliur gigantecum Wall.Liliaceaeunderground parts**shui bai hexEGLowits sumo Stebid & Zucc.Caryophyllaceaewhole plant*huang hua cai#ER%Lychnis semo Stebid & Zucc.Caryophyllaceaeaerial parts*ye bai ca#ER%Lychnis semo Stebid & Zucc.Caryophyllaceaeaerial parts*sang pao, sang shu#ER%Matteuids struthiopteris (L.) Tod.Babaceaeaerial parts*sang pao, sang shu#ER%Matteuids struthiopteris (L.) Tod.Pabaceaeaerial parts*sang pao, sang shu#ER%Mateuids struthiopteris (L.) Tod.Asteraceaeaerial parts*sang pao, sang shu#ER%Mateuids struthiopteris (L.) Tod.Marcaeeaerial parts*sang pao, sang shu#ER%Mat	Ixeris sonchifolia Hance	Asteraceae	aerial parts	***	ku mai cai	苦荬荬
Japane Landy Case Name Journal of Landy La	Juglans cathavensis Dode	Juglandaceae	fruit	**	ve he tao	日 久 小 野 核 桃
Number prinning in (Nation):         Assess cackate         and the faits         in a fait faits         it is as ba         使Like           Kehin scoparia (L.) Schrad.         Amaranthaceae         arial parts         't         tis as ba ijang, siao ku         hör ggk, šä           Lactaca serriola L.         Asteraceae         aerial parts         ''         siao bai jiang, siao ku         hör ggk, šä           Ligusticum sinense Oliv, Chuanhsiung         Asteraceae         aerial parts         ''         shiu bai he $K T \oplus G$ Lillum spie, (L. leichtliniti Hook, f. L. tigrimum Ker         Isliaceae         underground parts         ''         ye bai he $K \oplus G$ Gavi.)         Lonicera standishti Carr.         Capriofilaceae         fruit         '         ku tang pao         É B ±           Loychris semo Steold & Zacc.         Carryophyllaceae         serial parts         ''         ye bai cai, ze lan         #fiex, %H           Mattucia struthiopteris (L.) Tod.         Onocleaceae         terial parts         ''         sana cao, suan cai, suan         @fiex, %H           Moris outrudis Foit.         Jamarant Mee         Afex, %H	Kalimaris pinnatifida (Maxim ) Kitam	Asteraceae	aerial parts	*	ma lan tou	马长礼.
Amin stoppen (L.) Schnar. Anna nuncee arian parts end book (First) (formerly Lactuca serriola L. Serracee aerial parts * xiao bai jiang, xiao ku 小苦荬菜, 芳 ma cai, ku ma cai 葉菜 Leontopodium japonicum Miq. Asteracee aerial parts * shu bai he 水 百合 Ligusticum sinense Oliv, Chuanhsiung Apiacea aerial parts * shu bai he 水 百合 Lilium signetum Wall. Lilaiceae underground parts * shu bai he 水 百合 Lilium signetum Wall. Lilaiceae underground parts * shu bai he 水 百合 Lilium signetum Wall. Lilaiceae underground parts * shu bai he 水 百合 Lilium signetum Wall. Lilaiceae underground parts * ku tang pao 芥醋酸 Lychnis semo Siebold & Zucc. Caryophyllaceae tender shoots **** je bai aka ze lan 野白菜, 洋鱼 Mateucia struthiopter is (L.) Tod. Onoleaceae tender shoots ***** ji tou cai 西菜, 洋鱼 Mateucia struthiopter is (L.) Tod. Onoleaceae tender shoots ***** ji tou cai Ear Morus australis Poir. Onoleaceae tender shoots ***** ji tou cai 西菜, 洋鱼 Mateucia struthiopter is (L.) Tod. Onoleaceae tender shoots ***** ji tou cai Ear Morus australis Poir. Onoleaceae tender shoots ***** ji tou cai Ear Morus australis Poir. Onoleaceae tender shoots ***** ji tou cai Ear Morus australis Poir. Onoleaceae aerial parts * suan cao, suan cai, suan (Ref., RER, Corricidata L.) Pieris hienacioides L. Piakeae aerial parts * suan cao, suan cai, suan (Ref., RER, Pieris hienacioides L. Urticaceae aerial parts * shui qin cai, sha qin cai *#7, ½/5, Pielae mongolica Wedd. Urticaceae aerial parts * shui qin cai, sha qin cai *#7, ½/5, Pielae mongolica Wedd. Urticaceae aerial parts * suan cao ten #7, £7, Phologonatum magnhyllum P. Y. Li and Asparagaceae underground parts * gi aon mai tou Payogonatum odoratum L. (formerf) in Liliaceae Phologonatum odoratum L. (formerf) in Liliaceae Phologonatum odoratum L. Phologonatum odoratum L. Phologonatum odoratum L. Phologonatum odoratum L. Phologonatum odoratum L. Phologonatum odoratum L. Phonse ci, phylicita Kohne Rosaceae fruit ** ye xing ∰réf. Prunus ci, phylicita Kohne Rosaceae fruit ** ye nita to Piet	Kaumeris pinnaujua (Maxim.) Kitam.	Ameranthaceae	aerial parts	*	tia saa ba	<b>马二</b> 天 
Latuca serriola L     Asteracea     arial parts     *i     xiao bai jiany xiao ku     小苦菜菜 許       Loontopodium japonicum Miq.     Aplacea     arial parts     *i     shiu cao     Tait       Lijuuri cum sinerse Oliv, Chuanshiung     Aplacea     arial parts     *i     shui bai he     KTa 6       Lijuur sigenteum Wal.     Lilaiceace     underground parts     *i     shui bai he     KTa 6       Liluur sigenteum Val.     Lilaiceace     underground parts     *i     ku tang pao     Hä       Lorient standishii Car.     Caryophilacea     fruit     *i     ku tang pao     Hä       Lyohnis semo Siebold & Zaccc.     Caryophilacea     arial parts     *i     yebai ca; zelan     HE       Lyopous luiduka Turcz, ex Benth.     Imaiceace     arial parts     iii to cai     Bä       Matteucia struthiopteris (L) Tod.     Onocleacea     arial parts     iii to cai     Bä       Moris autstähls Poir.     Moracea     arial parts     iii to cai     Bä       Carlis spi, (O griffithii Edgew, & Hook, f., O.     Oxalidacea     arial parts     iii au nai cai     Tä       Piris hieraciolides L     Asteracea     arial parts     iii au nai cai     tä       Piris hieraciolides L     Asteracea     arial parts     iii au nai cai     tä <tr< td=""><td>Kochia scoparia (L.) schrad.</td><td>(formerly Chenopodiaceae)</td><td>aeriai parts</td><td></td><td>tie sao ba</td><td>伏归江</td></tr<>	Kochia scoparia (L.) schrad.	(formerly Chenopodiaceae)	aeriai parts		tie sao ba	伏归江
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Leontopolum Juponicum MupAsteraceaeaeraia parts·sin qu cao合目標年Ligustum sinesco Div, ChuahsiungApiaceaeaerial parts·chuan xiong川弓Liliuon giganteum Wall.Liliaceaeunderground parts**shui bai he水百合Liliuon siganteum Wall.Liliaceaeunderground parts**ye bai he野百合Gawl.)-Caprifoliaceaefruit·ku tang pao営幣泡Lychnis senno Siebold & Zucc.Caryophyllaceaewhole plant·huang hua cai黄花菜Lycopus lucidus Turcz, ex Benth.Lamiaceaeaerial parts·run xi cai首畜菜Matteucia struthippetris (L.) Tod.Oncoleaceaetender shoots****ip tou caimöt, RäMatteucia struthippetris (L.) Tod.Oncoleaceaetender shoots****ip tou caimöt, RäMatteucia struthippetris (L.) Tod.Oncoleaceaetender shoots****is uan cao, sang nauRäCoalis sp. (C.) griffihit Edgew. & Hook, f., O.Oxalidaceaeaerial parts·sang nao, sang nauRäCoalis sp. (C.) griffihit Edgew. & Hook, f., O.Oxalidaceaeaerial parts·ku mai caiTäPiris Interactioldis L.Virtiaceaeaerial parts·ku mai caixf XPiris Interactioldis L.Virtiaceaeaerial parts·ku mai caixf XPinpinella arguta Diels and P. rhomboidea DielsVirtiaceaeaerial parts·ku iq nai, sha qi caixf XPolygona		A .	. 1	*		头米 丁 曲 苔
Lgusticum sines Oliv, ChuansungApiaceaeaerial parts··chuan xiong川弓Lilium gioanteum Wall.Liliaceaeunderground parts**shu bai he水百合Lilium spin (L. leichilmii Hook, f., L. tigrinum KerLiliaceaeunderground parts**ye bai he野百合Gawl.) </td <td>Leontopoaium japonicum Miq.</td> <td>Asteraceae</td> <td>aerial parts</td> <td>1</td> <td>shi qu cao</td> <td><b>有</b>田早</td>	Leontopoaium japonicum Miq.	Asteraceae	aerial parts	1	shi qu cao	<b>有</b> 田早
Lilian geanteum Wall.Liliaceaeunderground parts**shui bai he水日谷 野百合Lilium spp. (L. leichtlinii Hook. f., L. tigrimum KerLiliaceaeunderground parts**yeb ai he野百合Lonicera standishii Carr.Caprifoliaceaefruit*ku tang pao蓄糖泡Lychnis senno Siebold & Zucc.Caryophyllaceaewhole plant*huang pua cai黄花梁Lycopus lucidus Turcz, ex Benth.Lamiaceaeaerial parts*yebai cai, ze lan野百余Matteucia struhiopteris (L.) Tod.Onocleaceaetender shoots*****ji tou cai萬袋, 案Medicago sativa L.Fabaceaeaerial parts*mu xi cai首 蕃菜Morus australis Poir.Moraceaefruit*sang pao, sang shu桑泡, 条树Oxalis spp. (O. griffithii Edgew. & Hook, f., O.Oxalidaceaeaerial parts*dao lao nenji 2kwPicris hieracioides L.Asteraceaeaerial parts*dao lao nenji 2kwPinpinella argut au Diels and P. rhomboidea DielsPinpinella argut and tei and P. rhomboidea Diels*yu zhu, yu zhu shenxFr, 2k <sup>3</sup> /Fr, 2kPolygonatum odoratum L.(formerly in Liliaceae)aerial parts*giao mai toou% 2k, 2kPolygonatum odoratum L.(formerly in Liliaceae)aerial parts*giao mai toou% 2k, 2kPolygonatum odoratum L.(formerly in Liliaceae)aerial parts*giao mai toou% 2k, 2kPolygonatum odoratum L.(formerly in Liliaceae)fruit	Ligusticum sinense Oliv., Chuanhsiung	Apiaceae	aerial parts	*	chuan xiong	川弓
Lilian spp. (L. leichilinii Hook, f., L. tigrimum Ker Liliaceae underground parts * ye bai he 野白合 Gawl.) Lonicern standishii Carr. Caprifoliaceae fruit * ku tang pao 苦機泡 Lychnis senno Siebold & Zucc. Caryophyllaceae aerial parts * ye bai cai, ze lan 野白菜, 菜 Matteucia struthiopteris (L.) Tod. Concleaceae aerial parts * ye bai cai, ze lan 野白菜, 菜 Matteucia struthiopteris (L.) Tod. Concleaceae aerial parts * mu xi cai 首着菜 Matteucia struthiopteris (L.) Tod. Concleaceae aerial parts * mu xi cai 首着菜 Marteucia struthiopteris (L.) Tod. Concleaceae aerial parts * mu xi cai 首着菜 Morus australis Poir. On Calidaceae aerial parts * suan cao, suan cai, suan (D. griffithi Edgew, & Hook, f., O. Coalidaceae aerial parts * suan cao, suan cai, suan (D. griffithi Edgew, & Hook, f., O. Coalidaceae aerial parts * ku mai cai 苦荬菜 Pilea mongolica Vedd. Urticaceae aerial parts * ku mai cai * ± Piris hieracioides L. Asteraceae aerial parts * kao lao nen 到老嫩 Pimpinella sp. (probably a new taxon related to Apiaceae aerial parts * kai men ye, che qian $\chi r k x k x k x k x k x k x k x k x k x k$	Lilium giganteum Wall.	Liliaceae	underground parts	**	shui bai he	水白合
Londera standishii Carr.CaprifoliaceaeFruit**Ist ang pao營營Lychis senno Stebold & Zucc.Caryophyllaceaewhole plant*Iuang huan cai要要Lycopus lucidus Turcz. ex Benth.Lamiaceaeencial parts**Ig beai cai, ze lan要要Matteucia struthiopteris (L,) Tod.Fabaceaeencial parts**Iu nu si caiEfa \$Mateucia struthiopteris (L,) Tod.Oxaliaceaeaerial parts*sang apo, sang shu&&Oralis spo, (D griffithi Edges. & Hook, f., O.Oxaliaceaeaerial parts?suna cao, suna cais@@Oralis spo, (D griffithi Edges. & Hook, f., O.Oxaliaceaeaerial parts?suna cao, suna cais@@@Oriticata L.Asteraceaaerial parts?suna cao, suna cais##%%<	<i>Lilium</i> spp. ( <i>L. leichtlinii</i> Hook. f., <i>L. tigrinum</i> Ker Gawl.)	Liliaceae	underground parts	**	ye bai he	野百合
Lychnis senno Siebold & Zucc.Caryophyllaceaewhole plant*huang hua cai费花菜Lycopis lucidus Turc, ex Benth.Lamiaceaeaerial parts*yebia cai, ze lan野白菜, 洋兰Matteucia struthiopteris (L) Tod.Onocleaceaetender shoots***ji tou cai万余果Madciago sativa L.Fabaceaeaerial parts*sang pao, sang shu養泡、柔科Oxalis spp. (O. griffithii Edgew. & Hook. f., O.Oxalidaceaeaerial parts*suan cao, suan cai, suan酸酸草Oralidat LPicris hieraciodes LPicris hieraciodes LPila mongolica WeddPilata moglica aguta Diels and P. rhomboidea Diels<	Lonicera standishii Carr.	Caprifoliaceae	fruit	*	ku tang pao	苦糖泡
Lycopus lucidus Turcz. ex Benth.Lamiaceaeaerial parts*yebai cai, ze lan野白菜, 泽兰Matteucia struthiopteris (L.) Tod.Onocleaceaetender shoots*****ji tou cai冯泉菜Medicago sativa L.Fabaceaeaerial parts*mux i caimeria partssang pao, sang shu秦纪, 秦州Morus australis Poir.Oxalidaceaeaerial parts*suan cao, suan cai, suanRev Rev Rev Rev Rev Rev Rev Rev Rev Rev	Lychnis senno Siebold & Zucc.	Caryophyllaceae	whole plant	*	huang hua cai	黄花菜
Matteucia struthiopteris (L.) Tod.Onocleaceaetender shoots****ji tou cai湾头菜Medicago sativa L.Fabaceaeaerial parts*nu xi cai首着菜Mora sustralis Poir.Moraceaefruit*sang pao, sang shu桑池 < & Agt	Lycopus lucidus Turcz. ex Benth.	Lamiaceae	aerial parts	*	ye bai cai, ze lan	野白菜、泽兰
Medicago sativa L.Fabaceaeaerial parts*mux i cai苜蓿菜Morus australis Poir.Moraceaefruit*sang pao, sang shu秦泡、 秦树Oxalis spp. (O. griffithii Edgew. & Hook. f., O.Oxalidaceaeaerial parts*suan cao, suan cai, suan酸草、酸菜、 suan cao酸酸草Picris hieracioides L.Asteraceaeaerial parts*dao lao nen到老嫩Pilea mongolica Wedd.Urticaceaeaerial parts*dao lao nen到老嫩Pimpinella sp. (probably a new taxon related to Pimpinella arguta Diels and P. rhomboidea Diels)Plantaginaceaeaerial parts*kai men ye, che qian yu zhu, yu zhu shenTrihr, 车前 çao, che qian ziPolygonatum megaphyllum P.Y. Li andAsparagaceaeunderground parts*qiao mai tou素麦头 polygonatum odoratum L.fruit*qiao mai tou素麦头Polygonum cilinerve (Nakai) OhwiPolygonaceaeunderground parts*qiao mai tou素麦头Prunus canescens Bois, P. plosiuscula KoehneRosaceaefruit*ye xing野香Prunus cf. polytricha KoehneRosaceaefruit*ye tao zi野桃子Prunus salicina Lindl.Rosaceaefruit*ye tao zi野桃子Prunus salicina Lindl.Rosaceaefruit**ye tao zi野桃子Prunus salicina Lindl.Bensaceaefruit**ye tao zi野桃子Prunus salicina Lindl.Dennstaedtiaceaefruit**ye tao zi野桃子Prunus salicina Lindl. <td>Matteucia struthiopteris (L.) Tod.</td> <td>Onocleaceae</td> <td>tender shoots</td> <td>****</td> <td>ji tou cai</td> <td>鸡头菜</td>	Matteucia struthiopteris (L.) Tod.	Onocleaceae	tender shoots	****	ji tou cai	鸡头菜
Morus australis Poir.Moraceaefruit*sang pao, sang shu桑泡、桑树Oxalis spp. (O. griffithii Edgew. & Hook, f., O.Oxalidaceaeaerial parts*suan cao, suan cai, suan酸草、 酸菜、 suan caoPicris hieracioides L.Asteraceaeaerial parts*?ku mai cai苦荬菜Pilea mongolica Wedd.Urticaceaeaerial parts*dol on en到老嫩Pimpinella sp. (probably a new taxon related to Pimpinella arguta Diels and P. rhomboidea Diels)Plantaginaceaeaerial parts*kai men ye, che qianT/I''', * # # # # # # # # # # # # # # # # # #	Medicago sativa L.	Fabaceae	aerial parts	*	mu xi cai	苜蓿菜
Oxalis spp. (O. griffithii Edgew. & Hook. f., O. Oxalid sequeOxalidaceaeaerial parts*suan cao, suan cai, suan酸草、酸菜、 swan caoPicris hieracioides L. Pieris hieracioides L.Asteraceaeaerial parts*ku mai cai苦荬菜Pile a mongolica Wedd.Urticaceaeaerial parts*dao lao nen到老嫩Pimpinella sp. (probably a new taxon related to Pimpinella arguta Diels and P. rhomboidea Diels)Apiaceaeaerial parts*kai men ye, che qian $T/T)rh, $\nt p\vec n\vec r\vec n\vec r\vec w\vec r\vec r\$	Morus australis Poir.	Moraceae	fruit	*	sang pao, sang shu	桑泡、桑树
corniculata L.)sua acao酸酸草Picris hieracioides L.Asteraceaeaerial parts*ku mai cai苦荬菜Pilea mongolica Wedd.Urticaceaeaerial parts*dao lao nen到老嫩Pimpinella sp. (probably a new taxon related toApiaceaeaerial parts****shui qin cai, sha qin cai水芹菜, 沙芹菜Pimpinella arguta Diels and P. rhomboidea Diels)Plantaginaceaeaerial parts****kai men ye, che qian开门叶、车前 cao, che qian zi菜 车前子Polygonatum megaphyllum P. Y. Li andAsparagaceaeunderground parts*yu zu, yu zu su shen玉竹. 玉竹多Polygonum cilinerve (Nakai) OhwiPolygonaceaeunderground parts*qiao mai tou荞麦头Potentilla arbuscula D. Don var. veitchii ( E. H.Rosaceaeaerial parts*giao mai tou荞麦头Prunus armeniaca L.Rosaceaefruit*ye xing野香Prunus cancescens Bois, P. pilosiuscula KoehneRosaceaefruit*ye ying tao野酸,Prunus cancescens Bois, P. pilosiuscula KoehneRosaceaefruit*ye tao zi野桃子Prunus salicina Lindl.Rosaceaefruit*ye tao zi野桃子Prunus salicina Lindu.Rosaceaefruit**ye lai zi, ze mail, huo liye ji zi, ze mail, huo liPreridium aquilinum (L.) KuhnDennstaedtiaceaetender shoots and undeground parts****jue cai, jue gen, long蕨菜, 蕨根,Puntus salicina LinduDennstaedtiaceaetender shoots and undeground parts<	Oxalis spp. (O. griffithii Edgew. & Hook, f., O.	Oxalidaceae	aerial parts	*	suan cao, suan cai, suan	酸草、酸菜、
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Impartine of Proceeds of a revealed to the partsarticle partsarticle partssind qin ear, sind qin e	Pimpinella sp. (probably a new taxon related to	Aniaceae	aerial parts	****	shui ain cai sha ain cai	水芹茎 沙芹茎
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Polygonatum megapnylum P.Y.Li andAsparagaceaeunderground parts*yu zhu, yu zhu shen玉竹, 玉竹, 金竹Polygonatum odoratum L.(formerly in Liliaceae) </td <td></td> <td></td> <td>1 1 (</td> <td></td> <td>cao, che qian zi</td> <td>早、干削丁 工佐 工佐会</td>			1 1 (		cao, che qian zi	早、干削丁 工佐 工佐会
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Polygonum ciliinerve (Nakai) OhwiPolygonaceaeunderground parts*qiao mai tou养麦头Potentilla arbuscula D. Don var. veitchii (E. H.Rosaceaeaerial parts*guan yin cha观音茶Wilson) Liou </td <td>Polygonatum odoratum L.</td> <td>(formerly in Liliaceae)</td> <td></td> <td></td> <td></td> <td></td>	Polygonatum odoratum L.	(formerly in Liliaceae)				
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Pranus armeniaca L.Rosaceaefruit**ye xing野杏Pranus canescens Bois, P. pilosiuscula KoehneRosaceaefruit**ye ing tao野樱桃Pranus cf. polytricha KoehneRosaceaefruit*chuan tao川桃Prunus persica (L.) BatschRosaceaefruit**ye tao zi野桃子Prunus salicina Lindl.Rosaceaefruit***ye li zi, ze maili, hub i野李子, 大李子, 大李, 野麦李Pteridium aquilinum (L.) KuhnPennstaedtiaceaetender shoots and underground parts****ju cai, jue gen, long tua蕨菜, 蕨根, 太/菜	Potentilla arbuscula D. Don var. veitchii ( E. H. Wilson) Liou	Rosaceae	aerial parts	*	guan yin cha	观音茶
Prunus canescens Bois, P. pilosiuscula KoehneRosaceaefruit**ye ying tao野樱桃Prunus cf. polytricha KoehneRosaceaefruit*chuan tao川桃Prunus persica (L.) BatschRosaceaefruit**ye tao zi野桃子Prunus salicina Lindl.Rosaceaefruit***ye li zi, ze maili, huo li野李子, 正, huo li, ye mai liPteridium aquilinum (L.) KuhnDennstaedtiaceaetender shoots and underground parts****jue cai, jue gen, long zhua蕨菜, 蕨根, 龙爪菜	Prunus armeniaca L.	Rosaceae	fruit	**	ye xing	野杏
Prunus cf. polytricha KoehneRosaceaefruit*chuan tao川桃Prunus persica (L.) BatschRosaceaefruit**ye tao zi野桃子Prunus salicina Lindl.Rosaceaefruit***ye li zi, ze maili, huo li野李子, zi, huo li, ye mai li火李子, 火李, 野麦李Pteridium aquilinum (L.) KuhnDennstaedtiaceaetender shoots and underground parts****jue cai, jue gen, long zhua蕨菜, 蕨根, 龙爪菜	Prunus canescens Bois, P. pilosiuscula Koehne	Rosaceae	fruit	**	ye ying tao	野樱桃
Prunus persica (L.) Batsch       Rosaceae       fruit       **       ye tao zi       野桃子         Prunus salicina Lindl.       Rosaceae       fruit       ***       ye li zi, ze maili, huo li       野李子, zi, huo li, ye mai li       火李子, 火李, 野麦李         Pteridium aquilinum (L.) Kuhn       Dennstaedtiaceae       tender shoots and underground parts       ****       jue cai, jue gen, long 炭菜, 蕨根, źhua       炭爪菜	Prunus cf. polytricha Koehne	Rosaceae	fruit	*	chuan tao	川桃
Prunus salicina Lindl.     Rosaceae     fruit     ***     ye li zi, ze maili, huo li     野李子, zi, huo li, ye mai li       Pteridium aquilinum (L.) Kuhn     Dennstaedtiaceae     tender shoots and underground parts     ****     jue cai, jue gen, long 蕨菜, 蕨根, zhua	Prunus persica (L.) Batsch	Rosaceae	fruit	**	ve tao zi	野桃子
Pteridium aquilinum (L.) Kuhn     Dennstaedtiaceae     tender shoots and     ****     jue cai, jue gen, long     蕨菜, 蕨根, underground parts	Prunus salicina Lindl	Rosaceae	fruit	***	ve li zi, ze maili huo li	野李子.
Pteridium aquilinum (L.) Kuhn     Dennstaedtiaceae     tender shoots and     ****     jue cai, jue gen, long     蕨菜, 蕨根,       underground parts     zhua     龙爪菜					zi, huo li, ye mai li	火李子,火李, 野麦李
underground parts zhua 龙爪菜	<i>Pteridium aquilinum</i> (L.) Kuhn	Dennstaedtiaceae	tender shoots and	****	jue cai, jue gen. long	蕨菜,蕨根.
			underground parts		zhua	龙爪菜

# Tab. 3 (continued)

Family (according to					Local name in
Scientific name	APGIII [31])	Part used	Frequency	Local name in pinyin	Chinese
Pueraria lobata (Willd ) Obwi	Fabaceae	underground parts	**	ge gen	葛根
Pyrola decorata Andres	Ericaceae	aerial parts (spice	*	hong ru, shou cha	红茹、寿茶
Pyrola rotundifolia L.	Ericaceae	aerial parts (spice	*	bairu, shou cha	白茹、寿茶
<i>Pyrus xerophila</i> T. T. Yu	Rosaceae	fruit	***	ye li, ma li, shan li	野梨,麻梨, 山犁
Rhus verniciflua Stokes	Anacardiaceae	aerial parts	*	ai shu	漆树
Robinia pseudoacacia L.	Fabaceae	flowers	*	huai hua	槐花
Rorippa montana Small	Brassicaceae	aerial parts	*	man jing cai, la la cai	蔓茎菜,辣辣菜
Rosa sp.	Rosaceae	young shoots	*	ci mei hua	刺玫花
Rubus coreanus Miq.	Rosaceae	fruit	**	ci pao, di pao, fu pen zi	刺泡, 地泡、 覆盆子
Rubus flosculosus Focke	Rosaceae	fruit	**	cai zi pao	菜子泡
Rubus pungens Cambess.	Rosaceae	fruit	**	huang ci pao	黄刺泡
Rubus spp.	Rosaceae	fruit	***	duan yang pao, xuan gou zi	端阳泡,悬钩子
Rumex crispus L.	Polygonaceae	aerial parts	**	niu she tou, ye da huang	牛舌头
Sabia shensiensis H. Y. Chen	Sabiaceae	aerial parts	*	qing teng cai, teng er cai	青藤菜,藤儿菜
Saussurea dolichopoda Diels	Asteraceae	aerial parts	***	kong tong cai, kong xin cai	空筒菜,空心菜
Schisandra sphenanthera Rehder & E. H. Wilson	Schisandraceae	fruit	****	wu wei zi	五味子
Sedum aizoon L., S. sarmentosum Bunge, S. pampaninii RaymHamet, S. lineare Thunb.	Crassulaceae	aerial parts	**	gou ya ban, gou za cai, machijie, da bu si, chui	狗牙瓣,打不死
				pen cao	
Sedum amplibracteatum K. T. Fu	Crassulaceae	aerial parts	***	hua qiao man, la zi miao, la jiao miao, ye	花荞蔓,野辣 子苗苗,
				la cai	辣椒苗,叶辣菜
Silene conoidea L.	Caryophyllaceae	aerial parts	*	mai pian cai	麦片菜
Sinacalia tangutica (Maxim.) B. Nord.	Asteraceae	underground parts	*	shui luo bo	水萝卜
Smilacina japonica A. Gray, Smilacina henryi (Baker) Hara	Asparagaceae (formerly in Liliaceae)	aerial parts	*	pian tou cai	偏头菜
Stachys affinis Bunge	Lamiaceae	underground parts	*	di gu niu	地牯牛
Staphylea bumalda DC., S. holocarpa Hemsl.	Staphyleaceae	aerial parts, flowers	****	shu hua cai	树花菜
<i>Stellaria media</i> (L.) Vill.	Caryophyllaceae	aerial parts	*	e er chang	鹅儿肠
Taraxacum mongolicum HanMzt	Asteraceae	aerial parts	**	pu gong ying, ku mai	浦公英、古实
Thlasti arvense L	Brassicaceae	aerial parts	***	ii dan huang	鸡蛋黄
Toona sinensis (Juss.) M. Roem.	Meliaceae	tender leaf shoots	****	xiang chun	香椿
Tricyrtis macropoda Miq.	Liliaceae	aerial parts	***	huang gua cai	黄瓜菜
Ulmus bergmanniana C. K. Schneid., U. propinqua	Ulmaceae	leaves, bark,	**	yu shu	榆树
Koidz., <i>U. pumila</i> L.		immature fruit			
Urtica fissa E. Pritz. ex Diels	Urticaceae	aerial parts	*	bai he ma	白河麻
Vicia cracca L.	Fabaceae	aerial parts	*	ye wan dou jian	野豌豆尖
Vitis ficifolia Bunge	Vitaceae	fruit	***	ye pu tao	野葡萄
Zanthoxylum bungeanum Maxim.	Rutaceae	fruits, aerial parts	*	ye hua jiao	野花椒
Fungi					4L HT
Boletus spp.	Boletaceae		**	niu gan jun, da jiao gu	午肝菌,大脚菇 生旺蕈
Cantharellus cibarius Fr.	Cantharellaceae		***	nuang si jun	午 / f 困 (本 女 志
Grijola umbellata (Pers.) Pilat	Meripilaceae		***	znu ling jun	/伯令困 促生苗
nerutum sp.	Delumeraceae		*	ii guan iya	)(K)大困 
Laeuporus suppureus (Bull.) Murrill (??)	Marasmiacaac		*	ji guan jun	<i>哈</i> 厄困 昭委莊
cultivated)	wiai asiillaceae			ye xiang gu	王) TET YEL
Morchella sp.	Morchellaceae		**	yang que jun	羊雀菌

#### Tab. 3 (continued)

	Family (according to				Local name in
Scientific name	APGIII [31])	Part used	Frequency	Local name in pinyin	Chinese
Pleurotus sp.	Pleurotaceae		*	dong jun	冻菌
Ramaria spp.	Gomphaceae		**	shua ba jun	刷把菌
Unidentified terrestrial gilled mushroom	?		**	ban li jun	板栗菌
Unidentified mushroom	?		*	bao gu jun	包谷菌
Unidentified mushroom	?		*	qiao mian jun	荞面菌

Frequency: \*\*\*\* > 50% of respondents; \*\*\* > ¼ of respondents; \*\* > ½ of respondents; \* 1% of respondents or less, but at least 2 respondents.

*Pteridium aquilinum, Polygonatum* spp., *Sinacalia tangutica*, the bulbs of *Lilium giganteum* and other *Lilium* species, and the bark of *Ulmus* spp. Nowadays the consumption of underground organs of plants has practically ceased and is restricted to the occasional use of *Lilium* spp. and *Stachys affinis*.

Wild vegetables are eaten in any of the daily three meals. The commonest preparation technique is boiling, then straining and sprinkling them with some oil in which Sechuan pepper, garlic, and sometimes ginger, was fried. Then they are served, warm or cold. This is a side dish, called "liang ban", accompanied by home-made wheat bread ("bing"), rice or other stir-fried foods. Sometimes wild vegetables are also put into broad, home-made noodles served in spicy and sour soup. They are also, rarely, lacto-fermented. Dried vegetables are first soaked in water for a few minutes or hours and then used like fresh vegetables. Some respondents say that in the case of *Staphylea* shoots, drying even improves their taste and digestibility. Wild vegetables are also sold in all the local restaurants (Tab. 2), and every agritourist farm has them on their menu.

Fruits are and have always been less appreciated than wild greens. They are sometimes collected for fun by children or grown-ups going to the forest to collect wild greens, medicinal herbs or wood. They have never been stored for winter and are not used in any dishes by anyone, apart from dried *Schisandra* and *Akebia* fruits, used medicinally. In spite of this, most people easily mentioned a few species of wild fruits they had eaten.

Few fungi species are used, as most of them are generally feared. We found only one inhabitant of the valley, who had a hobby of collecting wild edible mushrooms, which he developed after gathering Boletus species for sale a few years ago. Others never go to the forest with the purpose of collecting mushrooms, apart from going to collect cultivated Auricularia and Lentinula edodes grown on piles of logs located in the woods. The only mushrooms relatively more widely known and accepted are Cantharellus cibarius, an unidentified Agaricales (called "banlijun", i.e. "chestnut mushroom"), Ramaria spp. (and possibly Clavaria spp.) treated by locals as one folk taxon "shuabajun" (i.e. "brush mushroom") and Grifola umbellata, whose sclerotia are collected for medicinal purposes, although fruiting bodies are occasionally eaten as well. However, only a third of the respondents have ever eaten the most commonly listed mushroom, Cantharellus cibarius. More than half of the respondents had never collected wild fungi in the forest. A few people who eat Boletus spp. species started doing so after taking part in commercial mushroom collecting a few years ago.

#### Discussion

The large number of used wild greens in this study is one of the highest recorded on such a small scale in the history of ethnobotanical studies. The only comparable study, by Zou [15], recorded the use of 335 taxa of wild vegetables, belonging to 87



**Fig. 2** *Staphylea bumalda* flowering shoots, boiled, strained and sprinkled with oil, Houzhenzi, 2011. Photograph by Łukasz Łuczaj.



**Fig. 3** *Pteridium aquilinum* shoots, boiled, strained and sprinkled with oil, Houzhenzi, 2011. Photograph by Łukasz Łuczaj.



**Fig. 4** Drying wild vegetables (*Chenopodium album* and *Staphylea bumalda*) on a farm in Diaoyutai in early June 2011. Photograph by Łukasz Łuczaj.

families and 119 genera in 10 villages of Hunan, however the latter study concerned a larger and more heterogenous area. Ghorbani [16] recorded the use of 173 wild food plants from 485 informants of four ethnic groups of Xishuanbanna valley, out of which only around a third were wild greens. However, his study concerned an area which was very heterogenous in terms of elevation, inhabitants and vegetation. The average number of wild food plants listed by one informant was only around 10 species, whereas in this study we documented a much higher rate of use per person (mean – over 24 species), with probably the highest average number of wild green vegetables listed per person (mean – 17 species) using freelisting techniques in any ethnobotanical study to date.

Knowledge of wild vegetables in China is additionally encoded in the language. Most wild vegetables have the word "cai", i.e. vegetable, so it is enough to know the name and to be able to recognize the plant to be able to presume its use, i.e. if it is a "cai" (vegetable) or "cao"/"yao" (medicinal plant).

The relatively high geographical diversity of the use of "ye cai" in China should be emphasized. For example none of the articles on wild vegetables of Qinling Mts mention the use of *Staphylea* spp. nor *Pimpinella* sp. – locally important vegetables [19,20].

The widespread phenomenon of drying wild vegetables is worth attention. This ancient preservation technique is nowadays rarely used for wild vegetables across the globe. Storing a particular food for winter may mean that this is a culturally significant item.

Several taxa are semi-domesticated, and undergo varying degrees of active protection. Some are increasingly brought from the forest to be planted in gardens (*Toona sinensis*, *Staphylea bumalda, Asarum sieboldii*). The two species of mushrooms widely cultivated using tree logs left in the garden or in the forest, *Auricularia* sp. and *Lentinula edodes*, were mentioned by some respondents as wild vegetables as well. This shows that, similarly to other geographic areas, the distinction between the wild and the cultivated is not usually sharp [2,25,26].

The local population utilizes a large proportion of the local edible flora. However, strong cultural biases can be seen even in such a herbophilous community. Some edible wild vegetables, e.g. *Galinsoga* sp., *Reynoutria japonica*, most *Polygonum* species and *Lamium barbatum* are not used, the common *Stellaria media*, is also eaten rarely and only by a few individuals.

Over half wild vegetables come from the forest. This is in contrast with some studies showing that human populations, even in wooded areas, tend to over-utilize the ruderal flora [27,28]. Here, at least two explanations are possible:

(*i*) the fields' area is relatively small, so in the past the volume of wild vegetables from ruderal sites may not have been sufficient,

(*ii*) many edible ruderal taxa are regarded here as pig food, and we observed some degree of separating wild vegetables for human consumption and pig food (the exception here is *Chenopodium*, eaten both by humans and pigs).

What is interesting is the large domination of wild greens over fruits and fungi. A typical answer of a respondent to the question about what wild veg they had eaten was: "ye cai hen duo" (there are many wild vegetables). On the other hand, the same question about fruits or fungi resulted in the opposite answer, e.g. "ye mogu/junzi hen shao" (there are very few wild fungi).

Wild vegetables are intentionally collected here, they are well known to everyone and dried for winter in most houses. Fruits are something unimportant, play objects, something one finds on a forest walk to collect herbs, something only eaten raw. They are never cooked or dried or added to any dishes. The only exceptions are the fruits of *Schisandra*, which are dried and sold as medicine. The lack of interest in mushrooms is puzzling, as China is usually regarded as a mycophilous part of the world [3,29,30].

#### Conclusions

The studied community displays one of the highest levels of herbophilia known in human cultures. On the other hand the community shows relative indifference to wild fruits and fungi, which are rarely collected, and only as an additional activity.

The results of this study show that further in-depth ethnobotanical research is needed to determine patterns in wild food plant and fungi use in different parts of China, as locally these patterns may be extremely variable.

## Acknowledgments

Many thanks to the inhabitants of the studied villages for their generous help in sharing information on the use of the species. The program was financially supported by the Forestry Research Foundation for the Public Service Industry of China (2009,04004) and by the University of Rzeszów (Institute of Biotechnology and Basic Sciences, as well as a special grant from the rector of the University). We are also grateful to Prof. Khasbagen (Hohhot, China) for his help in literature search.

## References

 Łuczaj Ł. Changes in the utilization of wild green vegetables in Poland since the 19th century: a comparison of four ethnobotanical surveys. J Ethnopharmacol. 2010;128(2):395–404. http://dx.doi.org/10.1016/j. jep.2010.01.038

- Turner NJ, Łuczaj ŁJ, Migliorini P, Pieroni A, Dreon AL, Sacchetti LE, et al. Edible and tended wild plants, traditional ecological knowledge and agroecology. Crit Rev Plant Sci. 2011;30(1–2):198–225. http://dx.doi.org /10.1080/07352689.2011.554492
- 3. Boa ER. Wild edible fungi: a global overview of their use and importance to people. Rome: FAO; 2004.
- 4. Anderson EN. The food of China. New Haven: Yale University Press; 1988.
- 5. Hu SY. Food plants of China. Hong Kong: Chinese University Press; 2005.
- 6. Long CL. Strategies for agrobiodiversity conservation and promotion: a case from Yunnan, China. Biodivers Conserv. 2003;12(6):1145–1156.
- Wu X. "Turning waste into things of value": marketing fern, Kudzu, and Osmunda in Enshi Prefecture, China. J Dev Soc. 2003;19(4):433–457. http://dx.doi.org/10.1177/0169796X0301900401
- Wang X, Du X. Recent status of the development and strategies of exploitation of non wood forest products in China. Lin Ye Ke Xue Yan Jiu. 1997;10(2):199–205.
- You-Kai X, Guo-Da T, Hong-Mao L, Kang-La Y, Xiang-Sheng D. Wild vegetable resources and market survey in Xishuangbanna, southwest China. Econ Bot. 2004;58(4):647–667. http://dx.doi. org/10.1663/0013-0001(2004)058[0647:WVRAMS]2.0.CO;2
- Zhang XP, Wu JL, Li Y, Liu F, Wang JQ. Investigation on species resources and utilization of wild vegetable in nabanhe watershed nature reserve, Xishuangbanna. Journal of Southwest Forestry College. 2004;24:21–24.
- Huai KHY, Pei SJ. Wild plants in the diet of Arhorchin Mongol herdsmen in inner Mongolia. Econ Bot. 2000;54(4):528–536. http://dx.doi. org/10.1007/BF02866550
- Wujisguleng W, Khasbagen K. An integrated assessment of wild vegetable resources in Inner Mongolian Autonomous Region, China. J Ethnobiol Ethnomed. 2010;6(1):34. http://dx.doi.org/10.1186/1746-4269-6-34
- Weckerle CS, Huber FK, Yongping Y, Weibang S. Plant knowledge of the Shuhi in the Hengduan mountains, Southwest china. Econ Bot. 2006;60(1):3-23. http://dx.doi. org/10.1663/0013-0001(2006)60[3:PKOTSI]2.0.CO;2
- Huber FK, Ineichen R, Yang Y, Weckerle CS. Livelihood and conservation aspects of non-wood forest product collection in the Shaxi Valley, southwest China. Econ Bot. 2010;64(3):189–204. http://dx.doi.org/10.1007/ s12231-010-9126-z
- Zou X, Huang F, Hao L, Zhao J, Mao H, Zhang J, et al. The socioeconomic importance of wild vegetable resources and their conservation: a case study from China. Kew Bull. 2011;65(4):577–582. http://dx.doi. org/10.1007/s12225-010-9239-7
- Ghorbani A, Langenberger G, Sauerborn J. A comparison of the wild food plant use knowledge of ethnic minorities in Naban River Watershed National Nature Reserve, Yunnan, SW China. J Ethnobiol Ethnomed. 2012;8(1):17. http://dx.doi.org/10.1186/1746-4269-8-17
- Ghorbani A, Langenberger G, Liu JX, Wehner S, Sauerborn J. Diversity of medicinal and food plants as non-timber forest products in Naban River

Watershed National Nature Reserve (China): implications for livelihood improvement and biodiversity conservation. Econ Bot. 2012;66(2):178–191. http://dx.doi.org/10.1007/s12231-012-9188-1

- Jin C, Yin-Chun S, Gui-Qin C, Wen-Dun W. Ethnobotanical studies on wild edible fruits in southern Yunnan: folk names; nutritional value and uses. Econ Bot. 1999;53(1):2–14. http://dx.doi.org/10.1007/BF02860785
- Ma X, Zhang J, Lu S, Cui Z, Zhao H, Zheng J. The survey of the distribtion of wild vegetables in the northern slope of the Qinling Mountains. Quaterly of Forest By-Product and Speciality in China. 2002;61(2):49–50.
- Ma X, Hu P, Wu J, Zhang J, Cui Z. The habitat, development and utilization of wild vegetables in the northern slope of the Qinling Mountains. Special Economic Animal. 2002;2:37–38.
- 21. Economic survey of the Zhouzhi County Houzhenzi town, protected areas from 2007 [Internet]. 2007 [cited 2012 Sep 20]; Available from: http://wwf. nwsuaf.edu.cn/article/2007/0912/news\_219.html
- Kang Y, Łuczaj ŁJ, Ye S. The highly toxic Aconitum carmichaelii Debeaux as a root vegetable in the Qinling Mountains (Shaanxi, China). Genet Resour Crop Evol. 2012;59(7):1569–1575. http://dx.doi.org/10.1007/ s10722-012-9853-3
- Quinlan M. Considerations for collecting freelists in the field: examples from ethobotany. Field Methods. 2005;17(3):219–234. http://dx.doi. org/10.1177/1525822X05277460
- 24. Sutrop U. List task and a cognitive salience index. Field Methods. 2001;13(3):263-276. http://dx.doi.org/10.1177/1525822X0101300303
- McClatchey WC. Wild food plants of Remote Oceania. Acta Soc Bot Pol. 2012;81(4):371–380. http://dx.doi.org/10.5586/asbp.2012.034
- 26. Łuczaj Ł, Pieroni A, Tardío J, Pardo-de-Santayana M, Sõukand R, Svanberg I, et al. Wild food plant use in 21st century Europe: the disappearance of old traditions and the search for new cuisines involving wild edibles. Acta Soc Bot Pol. 2012;81(4):359–370. http://dx.doi.org/10.5586/asbp.2012.031
- Voeks RA. Disturbance pharmacopoeias: medicine and myth from the humid tropics. Ann Assoc Am Geogr. 2004;94(4):868–888. http://dx.doi. org/10.1111/j.1467-8306.2004.00439.x
- Sõukand R, Kalle R. Change in medical plant use in Estonian ethnomedicine: a historical comparison between 1888 and 1994. J Ethnopharmacol. 2011;135(2):251–260. http://dx.doi.org/10.1016/j.jep.2011.02.030
- Yamin-Pasternak S. Ethnomycology: fungi and mushrooms in cultural entanglements. In: Anderson EN, Pearsall D, Hunn E, Turner N, editors. Ethnobiology. Hoboken NJ: Wiley and Sons; 2011. p. 213–230. http:// dx.doi.org/10.1002/9781118015872.ch13
- Arora D. The houses that matsutake built. Econ Bot. 2008;62(3):278–290. http://dx.doi.org/10.1007/s12231-008-9048-1
- The Angiosperm Phylogeny Group. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG III. Bot J Linn Soc. 2009;161(2):105–121. http://dx.doi. org/10.1111/j.1095-8339.2009.00996.x