



LfL

Bayerische Landesanstalt für Landwirtschaft

Chinese medicinal plants cultivated in Bavaria

**Monographs for quality and use
of herbal drugs for Traditional
Chinese Medicine**



Chinese medicinal plants cultivated in Bavaria

Since 1999, selected medicinal plants used in the phytotherapy of Traditional Chinese medicine (TCM) have been added to the list of species being studied at the Bavarian State Research Center for Agriculture (LfL), Germany. In addition to the common agricultural and breeding research, the botanical identity of the internationally purchased seed sources had to be controlled and the methods of pharmaceutical analysis transferred and adapted from the Chinese Pharmacopoeia. It was essential to evaluate the herb and root samples from agricultural trials and compare them with imported materia medica by medical doctors, pharmacists and laboratories. All of the work has been done as part of an interdisciplinary collaboration with the Ludwig-Maximilians-Universität München, the Universität Graz, the companies Phyto-Lab GmbH & Co. KG and Kräuter Mix GmbH, as well as the medical associations DECA (Association for the Documentation of Empirical Knowledge of Chinese Herbal Therapy DECA GmbH) and SMS (International Society of Chinese Medicine). In 2005, several farmers, who are specialized in herb production, started to cultivate Chinese medicinal plants on a commercial level in Bavaria.

The Bavarian TCM herbs are produced under the regime of the GAP guidelines (Good Agricultural Practice) in certified farms fulfilling complete documentation and traceability back to the field and to the seed of the correct species. Pesticides are not permitted for use in the production of TCM herbs in Germany. In fact, some of the herb growers are even certified organic farmers. Based on this, patients can be treated safely with TCM herbs from controlled production.

Commercial field production of Chinese medicinal herbs which considers the released seed sources and know-how developed by the research project will lead to herbal remedies that fully comply with the quality requirements of both the Chinese and the European Pharmacopoeia. Recognized TCM practitioners recommend the therapeutic application of these herbal remedies.

Ms. Mag. pharm Christine Bauer has thoroughly compiled the quality requirements and fields of applications for all Chinese plant species that are cultivated in Bavaria. Each monograph includes illustrations of the plants and the herbal remedy from Bavarian cultivation.

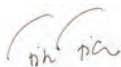


Dr. Heidi Heuberger

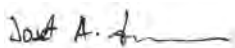
Head Working Group Medicinal and Aromatic Plants at the LfL

Phytotherapy using Chinese medicinal plants is becoming more and more popular in Germany. The herbal remedies required for TCM have to be imported from China. In the long run, Chinese farmers will be unable to meet the growing demand. A large number of important materia medica for Chinese medicine are now supplied from Bavarian cultivation thanks to the comprehensive research work of the project team centered around Ms. Dr. Heuberger and Mr. Prof. Bomme. Apart from the high quality, the controlled origin also importantly guarantees the efficacy of the Chinese phytotherapy. The high quality was confirmed by Chinese experts; the efficacy is proven by daily application in clinical practice and by therapeutic monitoring.

We gratefully acknowledge the work conducted by all of the partners of this exciting scientific project. This brochure illustrates the work and the results of the interdisciplinary research group and the farmers who are specialized in medicinal plants production. It may stimulate continued research in the field, lab and medical practice to further the welfare and wellbeing of the patients who profit from the virtue of the plants.



Dr. med. Fritz Friedl
Klinik Silima and DECA



Dr. med. Josef Hummelsberger
SMS

德国巴伐利亚州种植的中国草药

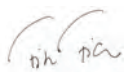
1999年以来，巴伐利亚州农业局的植物种植与培育研究所研究了传统中医本草疗法在德国选用的各种草药作物。除了种植与培育植物以外，研究所还要对全球采用的种子做植物标识方面的检测、援用并调整中国药典中的药物检查方法。此外，还需要医生、药剂师和化验室共同评审试验种植的草药和根茎，并与进口产品做比较。这一切由路德维希-马克西米利安-慕尼黑大学、奥地利格拉茨大学、本草化验公司和药草混合公司以及中草药经验文献协会和国际中医协会两个医生协会跨学科合作进行。2005年，一些巴伐利亚州专门从事草药种植的农业企业终于着手商业化种植中草药。与从中国进口的产品相比，德国巴伐利亚州本土种植的传统中草药有很大的优点：这些中草药的生产遵循“良好农业规范”的原则，种植过程中进行监控并全程做培育记录。这样，产品可以一直可追溯到田头和种子。此外，德国种植的中医草药不使用农药，因为德国根本没有允许用于草药作物的农药，病人治病时可以毫无顾虑地使用由监控种植的草药制成的药品。由于认知水平高、种子来源经过检验，所以农田生产的医疗药品既符合中国药典、也符合欧洲药典的质量要求，受到有行业许可的中医医生推荐。这本小册子中的配置文件中，药学硕士克里斯汀·鲍尔女士收集了巴伐利亚州种植的中国草药的质量要求和范围，并对巴伐利亚州种植的草药和药品的外形分别配发了照片。



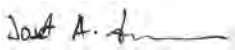
巴伐利亚州农业局药草和调味植物工作处处长
海蒂·豪伊贝格博士

用中草药治病在德国越来越广泛，但所需的草药必须从中国进口。长此以往，中国的农业难以为继。以博士豪伊贝格女士和波迈教授为中心的项目小组经过全面工作，成功地建立了供应系统，供应巴伐利亚州种植的许多重要的中医草药。来源处于监控之下的草药不仅具有高质量，而且对病人和医生来说，也是以中医进行有效治疗的最重要保障。中国的专家已确认了它的高质量，日常使用的结果以及对治疗过程的不断观察也证实了其有效性。

我们感谢参与这项令人兴奋的科学项目的全体人员。这本小册子展示了跨学科研究小组和草药种植专业户的工作和成果，希望它成为激励农户、试验室和诊所为病人的福祉不断开展研究工作的动力，使病人受益于草药的疗效。



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斯里玛医院、中草药经验文献协会



医学博士约瑟夫·胡梅尔贝格
国际中医协会



***Angelica dahurica* (HOFFM.) BENTH. & HOOK. f.¹
ex Franck. & Sav.**

English name: Angelica, Chinese Angelica, Dahurian Angelica

Family: Apiaceae, Umbelliferae

Plant part used: Roots

Drug name (PhEur): Angelicae dahuricae radix

Chinese drug name: Baizhi, 白芷

Origin: Chinese provinces of Sichuan and Zhejiang

Constituents:

Furanocoumarins, essential oil

Content (PhEur): min. 0.08% imperatorin

Medical applications:

In **Chinese medicine** according to syndrome patterns and individual Chinese diagnosis; western common diagnosis are acute and chronic rhinitis and sinusitis, allergic rhinitis, anosmia, inflammatory skin diseases.



Angelicae dahuricae radix from Bavarian cultivation



2

***Artemisia scoparia* WALDST. et KIT.
Artemisia capillaris THUNB.**

English name: Virgate wormwood

Family: Asteraceae, Compositae

Plant part used: Aerial parts

Drug name (PhPRC/DAB): Artemisiae scopariae herba

Chinese drug name: Yinchen 茵陈 bzw. Yinchenhao 茵陈蒿

Origin: Chinese provinces of Hebei and Shandong; Northeast China and Hong Kong

Constituents:

Essential oil, phenolic compounds (eugenol), coumarin (scoparone), flavonoids, derivatives of caffeic acid (chlorogenic acid), beta-sitosterol

Content (DAB): min. 0.20% chlorogenic acid

Content (PhPRC 2010): Mianyinchen (harvested in spring): min. 0.50%; Huayinchen (harvested in autumn): min. 0.20% scoparone

Medical applications:

In **Chinese medicine** according to syndrome patterns and individual Chinese diagnosis; western common diagnosis are scanty and dark urine, icteric complexion and jaundice, acute and chronic hepatitis, gall bladder diseases, also in cases of acute febrile diseases with chills.



Artemisiae scopariae herba from Bavarian cultivation



3

***Astragalus mongholicus* var. *mongholicus* und
A. mongholicus var. *dahuricus* (DC.) Podlech**

English name: Astragalus, Milkvetch

Family: Fabaceae, Legumes

Plant part used: Roots

Drug name (PhPRC/PhEur): Astragali mongholicici radix

Chinese drug name: Huangqi, 黄芪

Origin: Chinese provinces of Shanxi, Gansu, Inner Mongolia;
North-East China

Constituents:

Triterpenoid saponins (i. a. astragaloside IV derivatives), flavonoids, coumarin, polysaccharides, amino acids, folic acid, beta-sitosterol

Content (PhEur): min. 0.040%

Medical applications:

In **Chinese medicine** according to syndrome patterns and individual Chinese diagnosis; western common complaints are fatigue, general weakness, no appetite, insomnia, palpitations, anxiety, anemia, easy to catch cold, aversion against wind, spontaneous sweating, and prolapse of rectum or uterus.



Astragali mongholicici radix from Bavarian cultivation



4

***Leonurus japonicus* HOUTT.**

English name: Chinese motherwort

Family: Lamiaceae, Labiatae

Plant part used: Herb

Drug name (PhPRC/DAB): Leonuri japonici herba

Chinese drug name: Yimucao, 益母草

Origin: Throughout China including Hong Kong

Constituents:

Alkaloids, stachydrinhydrochlorid, leonurine, flavonoids, diterpenes, essential oil, organic acids, iridoids

Content (DAB): min. 0.3% flavonoids, calculated as hyperoside; **Content (PhPRC 2010):** min. 0.050% leonurine hydrochloride, min. 0.50% stachydrine hydrochloride

Medical applications:

In **Chinese medicine** according to syndrome patterns and individual Chinese diagnosis; western common complaints are all kind of irregularities of the menstruation: pain, irregularities, premenstrual syndrome; pain after birth, myoma, infertility, ovarian cysts, endometriosis, urinary tract infections, edema.

Caution: Avoid or use very carefully during pregnancy and child birth



Leonuri japonici herba from Bavarian cultivation



5

***Paeonia lactiflora* PALL., *Paeonia veitchii*
LYNCH**

English name: Peony

Family: Ranunculaceae, buttercup family

Plant part used: Roots

Drug name (PhPRC 2010): Paeoniae radix rubra

Chinese drug name: Chishao, 赤芍

Origin: Inner Mongolia, Hebei, Shaanxi, Shanxi, Gansu and Northeast China

Constituents:

Phenols and phenolic glucosides (paeoniflorin), sterols

Content (PhPRC 2010): min. 1.8% paeoniflorin

Medical applications:

In **Chinese medicine** according to syndrome patterns and individual Chinese diagnosis; western common complaints are febrile infections, red tongue, hemoptysis, petechiae, acne and furunculosis, post-traumatic pain and swelling, dysmenorrhea, abdominal pain, red and swollen eyes.



Paeoniae radix rubra from Bavarian cultivation



6

***Prunella vulgaris* L.**

English name: Common self-heal, Heal-all

Family: Lamiaceae, Labiatae

Plant part used: Spikes

Drug name (PhPRC 2010): Prunellae spica

Chinese drug name: Xiakucao, 夏枯草

Origin: Jiangsu, Anhui and Henan

Constituents:

Triterpenes, flavonoids, phenolic acids, ursolic acid, coumarins, essential oil, prunellin

Content (PhEur 7.6): min. 0.12% ursolic acid and oleanic acid (not less than 75% ursolic acid)

Content (PhPRC 2010): min. 0.20% rosmarinic acid

Medical applications:

In **Chinese medicine** according to syndrome patterns and individual Chinese diagnosis; western common complaints are red, painful, swollen eyes, photophobia, visual disturbances and loss, head ache, sore and swollen throat, painful lumps, knots nodes at the neck and throat.



Prunellae spica from experimental cultivation



7

***Rheum palmatum* L., *Rheum tanguticum* MAXIM. Ex ALF, *Rheum officinale* BAILL**

English name: Rhubarb

Family: Polygonaceae

Plant part used: Roots and rhizome

Drug name (PhPRC 2010): Rhei radix et rhizoma)

Chinese drug name: Dahuang, 大黄

Origin: Qinghai, Gansu und Sichuan

Constituents:

Anthraquinone glycosides and anthraquinones (emodin, aloemodin, chrysophanol, rhein, sennidin A, C), tannins, phenylbutanone glycosides, naphthol glycosides, rutoside

Content (PhPRC 2010): min. 1.5% anthrachinones

Content (PhEur): min. 2.2% hydroxyanthracene derivatives, calculated as rhein (colorimetric analysis)

Medical applications:

In **Chinese medicine** according to syndrome patterns and individual Chinese diagnosis; western common complaints are constipation, diarrhea with “heat”-signs (bloody, foul smelling stools), jaundice, painful abdomen, blood in stool, dysmenorrhea and amenorrhea, fixed pain, also after injuries, external and internal use.



Rhei radix et rhizoma from experimental cultivation



8

***Salvia miltiorrhiza* Bunge**

English name: Danshen, Red sage, Chinese sage

Family: Lamiaceae, Labiatae

Plant part used: Roots and rhizome

Drug name (PhPRC 2010): *Salviae miltiorrhizae* radix et rhizoma

Chinese drug name: Danshen, 丹参

Origin: Chinese provinces of Anhui, Jiangsu, Shandong and Sichuan and Japan

Constituents:

Phenanthrofuranoquinone derivatives (i.a. tanshinone IIA), caffeic acid derivatives (i. a. salvianolic acid B), diterpene lactones, phenols, beta-sitosterol

Content (PhEur 7.7): min. 0.12% tanshinone IIA and min. 3.0% salvianolic acid B

Content (PhPRC 2010): min. 0.20% tanshinone IIA and min. 3.0% salvianolic acid B

Medical applications:

In **Chinese medicine** according to syndrome patterns and individual Chinese diagnosis; western common complaints are menstrual disorders, abdominal pain, myoma, ulcers and carbuncles, restlessness, sleeping disorders, palpitation and chest pain.



Salviae miltiorrhizae radix et rhizoma from Bavarian cultivation



9

***Saposhnikovia divaricata* (TURCZ.) SCHISCHK.**

English name: Saposhnikovia

Family: Apiaceae, Umbelliferae

Plant part used: Roots

Drug name (PhPRC 2010): Saposhnikoviae radix

Chinese drug name: Fangfeng, 防风

Origin: Eastern Inner Mongolia and Northeast China

Constituents:

Dihydrofuranochromones, dihydropyranochromones, coumarin, essential oil, polysaccharides

Content (PhPRC 2010): Total amount of prim-O-glucosyl-cimicifugin and 5-O-methylvisamminoside min. 0.24%

Medical applications:

In **Chinese medicine** according to syndrome patterns and individual Chinese diagnosis; western common complaints are headache, neck stiffness, fever, shivering, joint pain, epistaxis, urticaria and other skin diseases, tremor of hands and feet, convulsions, migraine, immunologic instability.



Saposhnikoviae radix from Bavarian cultivation



10

***Scutellaria baicalensis* GEORGI**

English name: Baical-Skullcap

Family: Lamiaceae, Labiatae

Plant part used: Roots

Drug name PhEur: Scutellariae baicalensis radix

Chinese drug name: Huangqin, 黄芩

Origin: Hebei, Shanxian, Liaoning and Inner Mongolia

Constituents:

Flavonoids: baicalein, wogonin, baicalin and wogonoside

Content (PhEur 7.1 and PhPRC 2010): min. 9.0% baicalin

Medical applications:

In **Chinese medicine** according to syndrome patterns and individual Chinese diagnosis; western common complaints are fever, cough, acute bronchitis, pneumonia, infections of respiratory tract, tonsillitis, intestinal infection, diarrhea, colitis and Crohn's disease, painful bladder dysfunction, bleedings out of mouth and nose, blood in stool and urine, headache, irritability, red eyes, bitter taste, nausea, vomitus, loss of appetite caused by stress, eczema and skin diseases.



Scutellariae baicalensis radix from Bavarian cultivation



11

***Sigesbeckia orientalis* L., *S. pubescens* MAKI-
NO, *S. glabrescens* MAKINO**

English name: Siegesbeckia

Family: Asteraceae, Composite

Plant part used: Herb

Drug name (PhPRC 2010): Siegesbeckiae herba

Chinese drug name: Xixiancao, 豨莶草

Origin: Hunan, Hubei, and Jiangsu

Constituents:

Diterpenes and diterpene glycosides: siegesbeckioside, siegesbeckiol, siegesbeckia acid and grandifloric acid; kirenol

Content (PhPRC 2010): min. 0.050% kirenol

Medical applications:

In **Chinese medicine** according to syndrome patterns and individual Chinese diagnosis; western common complaints are rheumatic joint pain, half-page paralysis, stiff and aching muscles after apoplexy, numbness and weakness in back and legs, facioplegia, eczema and itching, weeping exanthema, ulcer, restlessness, irritability, sleeping disorders, headache and vertigo.



Sigesbeckiae herba from Bavarian cultivation



12

***Xanthium sibiricum* PATR. (Canger)**

English name: Siberian cocklebur

Family: Asteraceae, Composite

Plant part used: Fruits

Drug name (PhPRC 2010): Xanthii fructus

Chinese drug name: Cangerzi, 苍耳子

Origin: Throughout China incl. Hong Kong

Constituents:

Fatty oil, essential oil, sesquiterpenes, triterpenes, glycoside, organics acids, amino acids, phenolic acids, proteins

Medical applications:

In **Chinese medicine** according to syndrome patterns and individual Chinese diagnosis; western common complaints are allergic rhinitis, sinusitis, headache with running or congested nose, anosmia, rheumatic joint pain, spasms, paralysis, skin diseases, itching exanthema.



Xanthii fructus, roasted, from Bavarian cultivation

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Abbreviations

| | |
|-------|--|
| DAB | German Pharmacopoeia |
| DECA | Association for the Documentation of Empirical Knowledge of Chinese Herbal Therapy |
| GACP | Good Agricultural and Collection Practice (Guideline) |
| LfL | Bavarian State Research Center for Agriculture |
| PhEur | European Pharmacopoeia |
| PhPRC | Chinese Pharmacopoeia |
| SMS | Societas Medicinae Sinensis |
| TCM | Traditional Chinese Medicine |

Disclaimer:

The information on the medicinal application of the materia medica is not to be understood as a recommendation for self-medication. Phytotherapy, especially Chinese herbal medicine, is founded on the diagnosis and drug administration by a qualified practitioner. Neither the publisher, nor the authors can accept any legal responsibility or liability for any errors or omissions that may be made or for health damages which may occur due to improper use of the described materia medica.

List of TCM-herbs, in sequence of Chinese drug names

| Pinyin | Chinese | Latin | p. |
|-----------|---------|---|----|
| Baizhi | 白芷 | <i>Angelicae dahuricae radix</i> | 1 |
| Cangerzi | 苍耳子 | <i>Xanthii fructus</i> | 12 |
| Chishao | 赤芍 | <i>Paeoniae radix rubra</i> | 5 |
| Dahuang | 大黄 | <i>Rhei radix et rhizoma</i> | 7 |
| Danshen | 丹参 | <i>Salviae miltiorrhizae radix et rhizoma</i> | 8 |
| Fangfeng | 防风 | <i>Saposhnikoviae radix</i> | 9 |
| Huangqi | 黄芪 | <i>Astragali radix</i> | 3 |
| Huangqin | 黄芩 | <i>Scutellariae baicalensis radix</i> | 10 |
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Imprint

Editor: Bavarian State Research Center for Agriculture (LfL)
Vöttinger Straße 38, 85354 Freising-Weißenstephan
www.LfL.bayern.de

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Edition: September 2014

Pictures: C. Bauer und LfL

Print: **diedruckerei.de**, 91413 Neustadt a. d. Aisch

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