English Reading of Pharmaceutical Botany

药用植物学英语阅读

史钰军 王慧中 主编

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前　言

英语是高等院校许多专业必修的重要公共课，对学生适应市场经济中的对外交流以及未来发展起着重要作用，也是人文素质教育的内容之一。英语教学应根据其专业特点和未来需要，进行教学内容选择和教学方法改革，以提高学生的综合素质，增强其迎接各种挑战的能力。

《药用植物学英语阅读》是“高等学校专门用途英语（ESP）系列教材”之一，是英语教学后续课程所使用的教材，是针对新时期大学英语教学的发展和新形势下我国人才培养目标对高等教育的要求而开发的。该系列教材旨在将大学英语教学与学生所学专业相结合，提高大学生的英语能力和专业英语水平，使生物学等专业的学生毕业后可以直接使用英语从事本专业工作，或者继续深造学习，为进行学术研究以及参加学术活动打下坚实的基础。

本书由杭州师范大学生命与环境学院王慧中教授和浙江工商大学外国语学院史钰军副教授主编，由浙江工商大学外国语学院史钰军、于静波、杨凡、郭宁，浙江工商大学杭州商学院来岚和杭州师范大学王慧中、卢江杰、冯尚国等老师编写。其中第一篇“药用植物和植物药概述”（中药资源学），由于静波、杨凡老师编写；第二篇“药用植物栽培”（中药栽培学），由来岚老师编写，第三篇“药用植物种质鉴定与品种选育”（中药鉴定学），由史钰军、王慧中、卢江杰、冯尚国老师编写，第四篇“药用植物资源的开发与利用”，由郭宁老师编写。本教材分为四个大单元，每单元围绕一个主题，再细化分为若干小主题，每个小主题有五篇阅读文章，各主题内容相互衔接，前后呼应，文章皆取材于最新的、前沿的、权威的论文、报纸杂志、网络媒体等。很好地完成本教材的学习后，生物学等专业学生使用英语进行专业学习和学术交流的能力会得到较全面的提升。

本书的出版得到了国家自然科学基金项目（编号：31470407、81503185）和浙江省科技计划项目（编号：2014C32090）的资助，在此表示衷心感谢。由于编者水平，而且成稿时间仓促，其中错误和缺点在所难免，恳切希望广大读者和各位同仁不吝赐教。

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Chapter One

Medicinal Plants and Phytomedicines

1. 1 Concepts of Medicinal Plants

Passage 1

Medicinal Plants

A great number of plants have been used throughout the world from time immemorial for the prevention or cure of sickness in humans and animals alike. Using plants for scientific medicine or folk medicine is known as phytotherapy. The medicinal attributes of plants are owing to their constituent components, such as alkaloids, glycosides, saponins, vitamins, organic acids, mineral salts, volatile oils, and antibiotics. The roots, tubers, bulbs, leaves, flowers, seeds, and bark of medicinal plants are selectively used in making teas, infusions, tonics, juices, tinctures, powders, and poultices. About 80 percent of the ingredients in drugs for heart disease, gastrointestinal or nervous disorders, and other grave illnesses are taken from medicinal plants.

During the First World War and the postwar period the disruption of imports resulted in an acute shortage of drugs in Ukraine. Intensive research on medicinal plants was conducted at the Ukrainian Institute of Applied Botany (1927-33; see *Agricultural Scientific Committee of Ukraine*), the Kharkiv Institute of Experimental Medicine (1935-7), and the Kharkiv Pharmaceutical Institute (1937-41). A research station in Lubny (est 1916, reorganized in 1931 as a branch of the All-Union Institute of Medicinal and Aromatic Plants) and the Acclimatization Garden in Kyiv (set up by *Mykola Kashchenko* in 1914) were responsible for introducing, testing, and cultivating new plants that eventually saw wide application in medical practice.

Since the Second World War over 20 research institutions connected with medical and pharmaceutical institutes and universities have conducted research on medicinal plants in Ukraine. The Kharkiv Pharmaceutical Institute, which concentrates mainly on isolating glucosides and using them in the preparation of new medicines, plays a leading role in this field. The gathering of wild plants and the cultivation of medicinal plants have expanded, and the research on new plants has led to the introduction of many foreign species and the adoption of many plants by official medicine.

Of the approx 12,000 species of medicinal plants worldwide, approximately 1,000 are

officially recognized as medicinal by the pharmacology field. In Ukraine there are approximately 1, 200 species of medicinal plants, including 68 wild and 52 cultivated officially recognized species. Medicinal plants are classified by (1) their chemical components, (2) their effect on the human organism, or (3) the pathogen or symptom of a specific illness. For cardiovascular disorders the medicinal plants commonly used are campion (*Adonis vernalis*; *Ukrainian*: *horytsvit vesnianyi*), lily of the valley (*Convallaria majalis*; *Ukrainian*: *konvaliia travneva*), periwinkle (*Vinca*; *Ukrainian*: *barvinok*), and belladonna (*Atropa belladonna*; *Ukrainian*: *beladonna likarska*). Belladonna, valerian, wild poppy (*Papaver rhoeas*; *Ukrainian*: *mak dykyi*, *samosii*), and jimson weed (*Datura stramonium*; *Ukrainian*: *durman*) are utilized as painkillers and sedatives. For skin disorders the medicinal plants applied are shrub aloe (*Aloe arborescens*; *Ukrainian*: *aloe*, *stolitnyk*), juniper (*Ukrainian*: *yalivets*), wormwood (*Artemisia absinthium*; *Ukrainian*: *polyn*), and plantain (*Plantago major*; *Ukrainian*: *podorozhnyk*). Bronchial and lung diseases are treated with thyme (*Thymus vulgaris*; *Ukrainian*: *chebrets*), linden (*Tilia cordata*; *Ukrainian*: *lypa sertseva*), sage (*Salvia officinalis*; *Ukrainian*: *shavliia likarska*); viburnum (*Viburnum opulus*; *Ukrainian*: *kalyna*), and mint (*Mentha piperita*; *Ukrainian*: *miata kholodna*). Hepatic and bilious disorders are treated with Saint-John's-wort (*Hypericum perforatum*; *Ukrainian*: *zvirobii*; also called 'the herb against 99 maladies'), yarrow (*Achillea millefolium*; *Ukrainian*: *derevii*), chicory (*Cichorium intybus*; *Ukrainian*: *tsykorii*), mint, and caraway (*Carum carvi*; *Ukrainian*: *kmyn*). Parsley (*Petroselinum sativum*; *Ukrainian*: *petrushka*), caraway, and juniper are diuretics. Medicinal plants used in gastrointestinal disorders are mint, caraway, yarrow, wormwood, aloe, and rosemary (*Rosmarinus officinalis*; *Ukrainian*: *rozmaryn*). Viburnum, yarrow, and nettle (*Urtica dioica*; *Ukrainian*: *kropyva dvodomna*) are used as coagulants or to stop hemorrhaging.

Medicinal plants are mentioned in Ukrainian folk songs and folktales. Folklore conferred special status and power on the men and women who knew how to use such plants. In the 20th century, medicinal plant lore is available for public use in books such as *M. and I. Nosal's Likars'ki roslyny i sposoby ïkh zastosuvannia v narodi* (Medicinal Plants and Methods of Their Popular Use, 1965) and *Vasyl Karkhut's Liky navkolo nas* (Medicines around Us, 1975).

Ukraine produced one-half of the medicinal plant harvest of the USSR in 1957, almost a half of which was grown in Khmelnytskyi oblast. Dnipropetrovsk oblast and the Crimea were also big producers.

Many wild-growing medicinal plants have been placed on the endangered species list. Efforts are being made by specific agrarian institutions and farm collectives to protect, cultivate, and preserve these valuable plants for posterity.

http://www.encyclopediaofukraine.com/display.asp?linkpath=pages%5CM%5CE%5CMedicinalplants.htm

Vocabulary

agrarian 英 [ə'greəriən] 美 [ə'greriən] *adj.* 土地的;农业的
alkaloids 英 ['ælkələɪdz] 美 ['ælkələɪdz] *n.* [医]半边莲属碱,类生物碱类,生物碱类
antibiotics 英 ['æntɪbaɪ'ɒtɪks] 美 [ˌæntɪbaɪ'ɒtɪks] *n.* (用作复数)抗生素
aromatic 英 [ˌærə'mætɪk] 美 [ˌærə'mætɪk] *adj.* 芳香的,有香味的
bark 英 [bɑ:k] 美 [bɑ:rk] *n.* 树皮
bilious 英 ['bɪliəs] 美 ['bɪliəs] *adj.* 胆汁的
campion 英 ['kæmpɪən] 美 ['kæmpɪən] *n.* 剪秋罗属植物
caraway 英 ['kærəweɪ] 美 ['kærəweɪ] *n.* 葛缕子干籽
cardiovascular 英 ['kɑ:diəʊ'væskjələ(r)] 美 ['kɑ:rdioʊ'væskjələ(r)] *adj.* 心血管的
coagulants *n.* 英 [kə'ʊægjʊlənts] 美 [kə'ʊægjʊlənts] [助剂]凝聚剂;凝结剂
diuretics 英 [daɪ'jʊəretɪks] 美 [daɪ'jʊəretɪks] *n.* [医]利尿剂(diuretic 的名词复数)
folklore 英 ['fəʊklɔ:(r)] 美 ['foʊklɔr] *n.* 民俗学;民间传说;民间风俗
gastrointestinal 英 [ˌgæstrəʊɪn'testɪn(ə)l] 美 [ˌgæstroʊɪn'testɪnl] *adj.* 胃肠的
glycoside ['glaɪkəˌsaɪd] 美 ['glaɪkəˌsaɪd] *n.* 配醣,配糖类
hemorrhag 英 ['heməɪdʒ] 美 ['heməɪdʒ] *n.* (尤指大量的)出血,失血 *vi.* 大出血
immemorial 英 [ˌɪmə'mɔ:riəl] 美 [ˌɪmə'mɔriəl] *adj.* 无法追忆的;远古的
phytotherapy 英 [faɪtəʊ'θerəpɪ] 美 [faɪtoʊ'θerəpɪ] *n.* 植物治疗法,本草疗法
hepatic 英 [hɪ'pætɪk]美 [hɪ'pætɪk] *adj.* 肝的;肝脏色的;治肝病的
juniper 英 ['dʒu:nɪpə(r)] 美 ['dʒunɪpər] *n.* 刺柏属丛木或树木;刺柏;杜松
linden 英 ['lɪndən] 美 ['lɪndən] *n.* 菩提树;[植]椴属
pharmacology 英 [ˌfɑ:mə'kɒlədʒi] 美 [ˌfɑ:rmə'kɑ:lədʒi] *n.* 药理学,药物学
periwinkle 英 ['periwɪŋkl] 美 ['periwɪŋkl] *n.* 长春花;玉黍螺(食用海螺)
plantain 英 ['plæntɪn] 美 ['plæntɪn] *n.* 车前草,香蕉之一种
poppy 英 ['pɒpi] 美 ['pɑ:pi] *n.* [植]罂粟(花)
poultice 英 ['pəʊltɪs] 美 ['poʊltɪs] *n.* 膏状药 *vt.* 敷膏状药于
saponin 英 ['sæpənɪn] 美 ['sæpənɪn] *n.* 皂角苷;皂素
sedative 英 ['sedətɪv] 美 ['sedətɪv] *n.* [医]镇静剂,止痛药
thyme 英 [taɪm] 美 [taɪm] *n.* (用以调味的)百里香(草)
tincture 英 ['tɪŋktʃə(r)] 美 ['tɪŋktʃər] *n.* 酊剂
tonic 英 ['tɒnɪk] 美 ['tɑ:nɪk] *n.* 滋补品;奎宁水
valerian 英 [və'lɪəriən] 美 [və'lɪriən] *n.* 缬草
viburnum 英 [vaɪ'bɜ:nəm] 美 [vaɪ'bɜ:nəm] *n.* 荚蒾属的植物
volatile 英 ['vɒlətaɪl] 美 ['vɑ:lətl] *adj.* 易变的,不稳定的;(液体或油)易挥发的
yarrow 英 ['jærəʊ] 美 ['jæroʊ] *n.* 西洋蓍草

Useful Expressions

(1) be officially recognized as 被官方认可为

Someone is officially recognized as a saint when he or she is canonized.

无论是谁，被封为圣徒之后，都就会被官方认定为圣人。

(2) play a leading role 发挥主导作用

They discussed the current situations in Iraq, holding that the UN should play a leading role in the reconstruction of Iraq.

双方讨论了伊拉克当前局势，认为联合国应在伊拉克战后重建中发挥主导作用。

(3) be responsible for 为……负责，形成……的原因；主管

Do you want to be responsible for your own life decisions?

你是否真的想要为你自己的人生决定负责？

Questions

(1) What is the definition of medicinal plants according to the encyclopedia?

(2) Who were responsible for introducing, testing, and cultivating new plants during the Second World War?

(3) How are medicinal plants categorized by their chemical components?

Passage 2

Medicinal Plants from Ancient Times to the Present

Plants have been used in treating human diseases for thousands of years. Some 60,000 years ago, it appears that Neanderthal man valued herbs as medicinal agents; this conclusion is based on a grave in Iran in which pollen grains of eight medicinal plants were found(*Solecki and Shanidar* 1975). One of these allegedly ancient medicinal herbs, yarrow, is discussed in this work as a modern medicinal plant.

Since prehistoric times, shamans or medicine men and women of Eurasia and the Americas acquired a tremendous knowledge of medicinal plants. All of the native plant species discussed in detail in this work was used by native people in traditional medicine. The fact that hundreds of additional species were also used by First Nations Canadians (*Arnason et al.* 1981) suggests that many of these also have important pharmacological constituents that could be valuable in modern medicine.

Up until the 18th century, the professions of doctor and botanist were closely linked. Indeed, the first modern botanic gardens, which were founded in 16th century Italy, in Pisa, Padova and Florence, were medicinal plant gardens attached to medical faculties or schools.

The use of medicinal plants is not just a custom of the distant past. Perhaps 90% of the world's population still relies completely on raw herbs and unrefined extracts as medicines (*Duke* 1985). A 1997 survey showed that 23% of Canadians have used herbal medicines. In addition, as much as 25% of modern pharmaceutical drugs contain plant

ingredients (Duke 1993).

The number of medicinal plants

There are a huge number of medicinal plants. In the US, almost 1800 medicinal plant species are commercially available (*Muller and Clauson* 1998). It has been estimated that about 13,000 species of plants have been employed for at least a century as traditional medicines by various cultures around the world (*Tyler* 1993*a*). A list of over 20,000 medicinal plants has been published (see details in *Deans and Svoboda* 1990), and very likely a much larger number of the world's flowering plant species have been used medicinally. Sometimes the figure of 70,000 medicinal plant species is cited, but this includes many algae, fungi, and micro-organisms that are not really plants as the word is understood by botanists. In any event, there is no other category of plants useful to man (with the possible exception of ornamental plants) that includes so many species, and the question naturally arises why such a staggering number of plants have useful medicinal properties.

http://www. agr. gc. ca/eng/science-and-innovation/science-publications-and-resources/resources/canadian-medicinal-crops/introduction-to-medicinal-plants/? id=1300832855227

Vocabulary

algae 英 ['ældʒi:] 美 ['ælgi:] *n.* 水藻;藻类

allegedly 英 [ə'ledʒɪdli] 美 [ə'ledʒɪdli] *adv.* 据说;依其申述

botanist 英 ['bɒtənɪst] 美 ['bɑ:tənɪst] *n.* 植物学家

fungi 英 ['fʌŋgi:] 美 ['fʌndʒaɪ] *n.* (fungus 的复数)真菌

pollen 英 ['pɒlən] 美 ['pɑ:lən] *n.* 花粉

ornamental 英 [ˌɔ:nə'mentl] 美 [ˌɔ:rnə'mentl] *adj.* 装饰的,装饰用的 *n.* 观赏植物;装饰物

shaman 英 ['ʃeɪmən] 美 ['ʃɑ:mən] *n.* 萨满教的道士(僧人、巫师)

Useful Expressions

(1) (be) attached to 附属于;爱慕;隶属于

Aid should be given to developing countries with no strings attached.

应该不带任何附加条件地向发展中国家提供援助。

(2) rely completely on 完全依赖于

The houses which rely completely on solar energy must be beautifully designed so that they may look appealing to buyers.

完全依赖太阳能的房子一定要设计漂亮,才能吸引购买者。

(3) be commercially available 商用,上市

The STAR System will be commercially available in the United States later this year.

恒星系统将于今年晚些时候在美国面市。

Questions

(1) What is mainly discussed in the passage?

(2) How many species of plants have been used as traditional medicines for nearly a hundred of years globally according to the passage?

(3) Why do we say the figure of 70,000 medicinal plant species is not correctly cited?

Passage 3

Background of Agricultural and Collection Practices for Medicinal Plants

Interest in traditional systems of medicine and, in particular, herbal medicines, has increased substantially in both developed and developing countries over the past two decades. Global and national markets for medicinal herbs have been growing rapidly, and significant economic gains are being realized. According to the *Secretariat of the Convention on Biological Diversity*, global sales of herbal products totalled an estimated US$ 60,000 million in 2000. As a consequence, the safety and quality of herbal medicines have become increasingly important concerns for health authorities and the public alike.

Some reported adverse events following the use of certain herbal medicines have been associated with a variety of possible explanations, including the inadvertent use of the wrong plant species, adulteration with undeclared other medicines and/or potent substances, contamination with undeclared toxic and/or hazardous substances, over dosage, inappropriate use by health-care providers or consumers, and interaction with other medicines, resulting in an adverse drug interaction. Among those attributable to the poor quality of finished products, some clearly result from the use of raw medicinal plant materials that are not of a sufficiently high quality standard.

The safety and quality of raw medicinal plant materials and finished products depend on factors that may be classified as intrinsic (genetic) or extrinsic (environment, collection methods, cultivation, harvest, post-harvest processing, transport and storage practices). Inadvertent contamination by microbial or chemical agents during any of the production stages can also lead to deterioration in safety and quality. Medicinal plants collected from the wild population may be contaminated by other species or plant parts through misidentification, accidental contamination or intentional adulteration, all of which may have unsafe consequences.

The collection of medicinal plants from wild populations can give rise to additional concerns related to global, regional and/or local over-harvesting, and protection of endangered species. The impact of cultivation and collection on the environment and ecological processes, and the welfare of local communities should be considered. All intellectual property rights with regard to source materials must be respected. WHO has

cooperated with other United Nations specialized agencies and international organizations in dealing with the above-mentioned issues. Such cooperation will be further strengthened through the development and the updating of relevant technical guidelines in these areas.

Safety and quality assurance measures are needed to overcome these problems and to ensure a steady, affordable and sustainable supply of medicinal plant materials of good quality. In recent years, good agricultural practices have been recognized as an important tool for ensuring the safety and quality of a variety of food commodities, and many Member States have established national good agricultural practice guidelines for a range of foods. However, quality control for the cultivation and collection of medicinal plants as the raw materials for herbal medicines may be more demanding than that for food production; possibly for this reason, only China, the European Union, and Japan have recently developed guidelines on good agricultural practices for medicinal plants. Since their guidelines were established to meet the requirements of specific regions or countries, they may not be universally applicable or acceptable.

At a WHO Informal Meeting on Methodologies for Quality Control of Finished Herbal Products, held in Ottawa, Canada from 20 to 21 July 2001, the entire process of production of herbal medicines, from raw materials to finished herbal products, was reviewed. It was recommended that WHO should give high priority to the development of globally applicable guidelines to promote the safety and quality of medicinal plant materials through the formulation of codes for good agricultural practices and good collection practices for medicinal plants. It was envisaged that such guidelines would help to ensure safety and quality at the first and most important stage of the production of herbal medicines.

https://hui09.info/b/http://apps.who.int/medicinedocs/en/d/Js4928e/3.html

Vocabulary

adverse 英 ['ædvɜːs] 美 ['ædvɜːrs] *adj.* 不利的；有害的；逆的；相反的
inadvertent 英 [ˌɪnəd'vɜːtənt] 美 [ˌɪnəd'vɜːtənt] *adj.* 不经意的，出于无心的；疏忽的
adulteration 英 [əˌdʌltə'reɪʃn] 美 [əˌdʌltə'reɪʃn] *n.* 掺假；掺杂，掺假货
contamination 英 [kənˌtæmɪ'neɪʃən] 美 [kənˌtæmə'neɪʃən] *n.* 污染；弄脏；毒害
envisage 英 [ɪn'vɪzɪdʒ] 美 [ɪn'vɪzɪdʒ] *vt.* 想象，设想；正视，面对；观察，展望
intrinsic 英 [ɪn'trɪnsɪk] 美 [ɪn'trɪnsɪk, -zɪk] *adj.* 固有的；内在的；本质的
extrinsic 英 [eks'trɪnsɪk] 美 [ek'strɪnsɪk, -zɪk] *adj.* 非本质的；外在的；外来的
microbial 英 [maɪ'krəʊbɪəl] 美 [maɪ'kroʊbɪəl] *adj.* 微生物的，由细菌引起的
deterioration 英 [dɪˌtɪərɪə'reɪʃn] 美 [dɪˌtɪrɪə'reɪʃən] *n.* 恶化；变坏；退化；堕落

Useful Expressions

(1) be associated with 和……联系在一起；与……有关
Youku is betting the new fingerprint system will help it improve its reputation among

advertisers who don't want to be associated with piracy.

优酷网希望新的指纹系统能够帮助公司提高在广告客户中的声誉，这些广告客户不希望与盗版有牵连。

(2) with regard to 关于；就；在……方面

One outstanding characteristic of these firms is their extreme ambition with regard to global market leadership.

这些企业的一个突出特点，是在全球市场领导权方面有极为远大的抱负。

(3) give high priority to

And other studies suggest women assign a higher priority to charity.

而其他研究也表明女性对慈善看得更重。

Questions

(1) Why have the safety and quality of herbal medicines become increasingly important concerns for health authorities and the public alike?

(2) What factors the safety and quality of raw medicinal plant materials and finished products depend on?

(3) What measures do we need to take to ensure a steady, affordable and sustainable supply of medicinal plant materials of good quality as mentioned in the passage?

Passage 4

African Medicinal Plants

Sustainable management of traditional medicinal plant resources is important, not only because of their value as a potential source of new drugs, but due to reliance on traditional medicinal plants for health. The vast majority (70%—80%) of people in Africa consult traditional medical practitioners (TMPs) for health care. With few exceptions, traditional medicinal plants are gathered from the wild. Although reliance on TMPs may decline in the long term as alternative health care facilities become available, increasing demand for popular herbal medicines is expected in the foreseeable future. Over the same period, certain vegetation types that were sources of supply of traditional medicines will drastically decline due to forest clearance for agriculture, forestation of montane grasslands, uncontrolled burning and live-stock grazing. Exclusion from core conservation areas adversely affects TMPs who previously gathered medicinal plants in those sites. In addition, supplies of herbal medicines to TMPs are affected by competing resource uses such as timber logging, commercial harvesting for export and extraction of pharmaceuticals, and use for building materials and fuel. This creates a growing demand for fewer resources, in some cases resulting in local disappearance of favoured and effective sources of traditional medicine and reduced species diversity.

The most vulnerable species are popular, slow growing or slow to reproduce, or species with specific habitat requirements and a limited distribution. Although in theory, sustainable use of bark, roots or whole plants used as herbal medicines is possible, the high levels of money and manpower required for intensive management of slow growing species in multiple-species systems are unlikely to be found in most African countries. The cultivation of alternative sources of supply of popular, high conservation priority species outside of core conservation areas is therefore essential. However, commercial cultivation of such species is not a simple solution and at present is unlikely to be profitable due to the slow growth rates for most tree species and low prices paid for traditional medicines. These slow growing species are a priority for ex situ conservation and strict protection in core conservation areas. By contrast, the high price paid for some species does make them potential new crop plants for agro-forestry systems or agricultural production. Pilot studies on these species are needed.

Priority areas for cooperative action between health care professionals and conservationists are rapidly urbanizing regions with a high level of endemic taxa, particularly West Africa; south-eastern Africa (*South Africa*, *Swaziland*). The most threatened vegetation types are Afro-montane forest and coastal forests of the Zanzibar-Inhambane regional mosaic.

Cunningham, A. B. (1993). *African medicinal plants: setting priorities at the interface between conservation and primary health care.*

Vocabulary

drastically 英 ['drɑːstɪkli] 美 ['dræstɪkli] *adv.* 大大地,彻底地;激烈地
montane 英 ['mɒnteɪn] 美 ['mɑːnteɪn] *n.* 山地
endemic 英 [en'demɪk] 美 [en'demɪk] *adj.* 某地特有的;(尤指疾病)地方性的
ex situ 非原位;天然状态外
forestation 英 [ˌfɒrɪs'teɪʃən] 美 [ˌfɔrɪs'teɪʃən] *n.* 造林
pharmaceutical 英 [ˌfɑːmə'sjuːtɪkl] 美 [ˌfɑːmə'sjuːtɪkəl] *n.* 医药品;药物
taxa 英 ['tæksə] 美 ['tæksə] *n.* 分类(taxon 的复数)
vulnerable 英 ['vʌlnərəbl] 美 ['vʌlnərəbəl] 脆弱的;易受攻击的;易受伤的

Useful Expressions

(1) live-stock 家畜,牲畜,畜牧业
Next in line is methane from livestock and manure.
排名第二的是牲畜和粪肥产生的甲烷。
(2) agro-forestry systems 农林复合系统
This is a locally developed agro-forestry system, combining forest conservation with cash crop production.
这是一个在当地发展的农林复合系统,将森林保护与经济作物生产相结合。