植物保护专业英语导读

◎ 石明旺　孙喜兰　编著

中国农业科学技术出版社

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内容简介

进入21世纪以来，生命科学迅速发展，生物技术的发展更是突飞猛进，植物保护学科也出现前所未有的新局面，出现了许多惊人的新成果，引起了学术界的极大关注，同时在数字化的信息时代，由于英语作为一门国际性交流语言和工具，使得许多科技成果都要借助英语进行表述和交流，掌握和了解这些最新成果和应用前景，非常必要和重要。到目前为止，查新未见有正式的植物保护专业英语导读出版，为此我们编选了这本《植物保护专业英语导读》，以飨读者。

本书精选了植物保护学科植物病理学、昆虫学和植物化学保护三个方面不同深度专业论著或论文，深入浅出地阐述该技术领域基础知识和科研成果，有助于读者提高专业英语理解、阅读及写作水平，起到向导的作用。

为了更好地学习科学知识和科技英语，全书分为PART A、PART B和PART C三大部分，每一单元我们精选15篇左右材料，每篇附有详细的单词、短语注释和参考译文。本书适合研究生、本科学生作为专业英语教材使用，也是科技人员的重要参考资料。

本书是集体劳动的结晶，在编写本书时，我们采用专业教师和英语教师结合。专业教师负责文献取材，并与英语教师共同负责校对编排，文献翻译由专业教师和英语教师共同负责。既注重语言文字的流畅，又注重内容术语的准确，书中难免存在不足和疏漏，再版时纠正。除了编委人员外，还有许多朋友为此书的编写提供了帮助，在此表示感谢。

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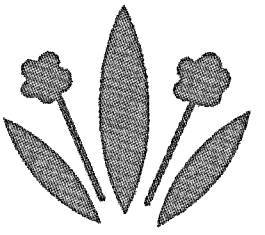

PART A

1. The Most Successful Life Form on the Planet

There are well over 1 million different known species of insects in the world, and some experts estimate that there might be as many as 10 million.

All these species are divided up into about 32 orders, depending on whose taxonomic system you use, of which, the largest is the beetles, or Coleoptera, with 125 different families and around 500 000 species. In fact, one in every four animal species on this planet is a beetle.

Well, everywhere on land anyway, very few insects have colonized the sea, though some like the marine flies (*Halobates* sp.) and the seashore collembolan, *Anurida maritma*, live on the surface. Also the larva of a small number of true flies (Diptera) and beetles (Coleoptera) live beneath the surface, mostly in rockpools.

On the land however there isn't anywhere you can go that you can't find some insects, even in the frozen extremes of Arctica and Antartica you will find some insects alive and active during the warmer months.

You will find that insects are ubiquitous, in the soil beneath your feet, in the air above your head, on and in the bodies of the plants and animals around you, as well as on and in you.

Some of the most adventurous insect are the brine flies (*Ephydra*), you can find them living in the strangest places including, the larva of *Ephydra hyans* in Mono Lake California which is nearly as salty as the Dead Sea, the larva of *Psilopa petrolei* in pools of crude oil also in California, and the adults and larva of *Scatella thermarum* in the hot springs of Iceland, the adults live on the mats of algae which float on the water's surface, and the larva live beneath the mats and in water, which is as hot as 48 degrees Celsius, which, for most people, is too hot to put your hand into.

There are several different ways of measuring the size of an insect, most people would consider the largest insect to be the bulkiest, in this case the champion insect is the acteon beetle (*Megasoma acteon*) from South America, the males of which can be 9cm long by 5cm wide by 4cm thick, however there is a serious challenges for heaviest insect in the world in the form of the true wetas from New Zealand. For instance a gravid female *Deinacrida heteracantha* can weigh as much as 70 grams.

Another competitor for the title is the extremely rare South American longhorn beetle *Titanus giganteus*, these giants can have a body length (not including antennae) of over 16cm (6.5ins), other longhorn beetles are nearly as large and may look even bigger because of their longer legs i. e. *Xixuthrus heros* from Fiji. Another beetle, *Dynastes hercules* is also well known for reaching 16cm in length, though it is not nearly a heavy.

However other insects are larger in other ways, the longest insect in the world is the stick-insect *Pharnacia kirbyi*, the females of which can be over 36cm long. Some living Lepidoptera have

wingspans as great as 32cm and an area of over 300cm^2.

There are an incredible number of very small insects in the world, far more than there are giants. Many beetles are less than one millimeter in length, and the North American feather-winged beetle *Nanosella fungi*, at 0.25mm, is a serious contender for the title of smallest insect in the world. Other insect orders which contain extremely small members are the Diptera (true flies) and the Collembola (springtails).

There are also many small Hymenoptera, especially in the Superfamily Chalcidoidea, such as the fairy flies, of the family Myrmaridae, of which *Alaptus magnanimus*, at 0.21mm long, was once thought to be the smallest insects in the world. However another Hymenopteran parasite now holds the record. *Megaphragma caribea* from Guadeloupe, measuring out at a huge 0.17mm long, is now probably the smallest known insect in the world.

The incredible size of individual species of insects is only dwarfed by the incredible numbers they sometimes occur in. In 1943 professor Salt found that an acre of British pasture land near Cambridge supported over 1 000 000 000 arthropods of which nearly 400 000 000 were insects and 666 000 000 were mites the remaining 38 000 000 were myriapods (centipedes and millipedes).

Some scientists have recorded the otherwise inconspicuous springtails at densities as high 100 000 000 per square metre in the ordinary farm soil of Iowa U. S. A. In Africa swarms of Orthoptera (desert locusts *Schistocerca gregaria*) may contain as many as 28 000 000 000 individuals. Although each locust only weighs about 2.5grams when they are all added up together this comes to 70 000 tons of locust. Ants are social animals and live in colonies, sometimes these colonies may contain only 50 or so individuals, but, one supercolony of *Formica yessensis* on the coast of Japan is reported to have had 1 080 000 queens and 306 000 000 workers in 45 000 interconnected nests. Some scientists think that 30% of the animal biomass of the Amazon Basin is made up of ants, and that: —10% of the animal biomass of the world is ants, furthermore they believe another 10% is composed of termites. This means that "social insects" could make up an incredible 20% of the total animal biomass of this planet.

From http: //www. earthlife. net

New Words and Expressions

taxonomic [tæk sə'nɔmik] a. 分类学的
incredibly [in'kredəbli] ad. 难以置信地
ubiquitous [ju:'bikwitəs] a. 到处存在的，遍在的
adventurous [əd'ventʃərəs] a. 爱冒险的，大胆的，危险的
mat [mæt] n. 垫，丛，衬边
algae ['ældʒi:] n. 水藻，海藻
Celsius ['selsjəs] a. 摄氏的
bulky ['bʌlki] a. 庞大的
champion ['tʃæmpjən] n. 冠军，拥护者；v. 保卫，拥护
gravid ['grævid] a. 怀孕的，妊娠的
contender [kən'tendə (r)] n. 竞争者
collembolan [kə'lembələn] n. 弹尾虫
dwarf [dwɔ:f] n. 矮子，侏儒；v. 矮化

inconspicuous [ˌinkən'spikjuəs] a. 不显眼的，难以觉察的
springtail ['spriŋteil] n. 跳虫
supercolony ['sju:pəˌkɔləni] n. 超级蚁群
biomass ['baiəuˌmæs] n. 生物量
wingspan ['wiŋspæn] n. 翅展

Phrases

marine flies 海黾
feather-winged beetle 缨甲
fairy flies 缨小蜂
acteon beetle 犀金龟
true wetas 沙螽
longhorn beetle 天牛
true flies 双翅类昆虫
brine flies 水蝇
social insects 社会性昆虫
desert locusts 沙漠蝗

Affixes

bio-“生物的”之义，如：biology，生物学；biomass，生物量
super-“超级的”之义，如：supermarket，超级市场；supercolony，超级蚁群
ad-“向……”之义，如：adventure，冒险；advance，前进，进步

Notes

1. All these species are divided up into about 32 orders, depending on whose taxonomic system you use, of which, the largest is the beetles, or Coleoptera, with 125 different families and around 500 000 species.

参考译文：依据你所采用的分类系统，所有这些种类可以分成32个目，其中，甲虫，即鞘翅目是最大的目，有125个科和约50万个种。

2. You will find that insects are ubiquitous, in the soil beneath your feet, in the air above your head, on and in the bodies of the plants and animals around you, as well as on and in you.

参考译文：你就会发现昆虫无处不在，在你脚下的土中，你头上天空中，你身边植物和动物身体表面和里面，也包括你自己的表面和里面。

3. Some of the most adventurous insect are the brine flies (*Ephydra*), you can find them living in the strangest places including, the larva of *Ephydra hyans* in Mono Lake California which is nearly as salty as the Dead Sea, the larva of *Psilopa petrolei* in pools of crude oil also in California, and the adults and larva of *Scatella thermarum* in the hot springs of Iceland, the adults live on the mats of algae which float on the water's surface, and the larva live beneath the mats and in water, which is as hot as 48 degrees Celsius, which, for most people, is too hot to put your hand into.

参考译文：最冒险的昆虫是水蝇，你会发现它们生活在最奇特的地方，*Ephydra hyans* 的幼虫生活在加利福尼亚 Mono 湖里，那里的咸水和死海一样咸，在加利福尼亚还有 *Psilopapetrolei* 的幼虫生活在原油油坑里，在冰岛有 *Scatella thermarum* 的成虫和幼虫生活在热

泉水里，其成虫生活在漂浮在水面水藻丛中，幼虫生活在水藻丛下以及水里，水温足有48摄氏度，手放进去，多数人会热得受不了。

4. Another beetle, *Dynastes hercules* is also well known for reaching 16cm in length, though it is not nearly a heavy.

参考译文：另一种甲虫，*Dynastes hercules*（一种龙虱，译者注）也很有名，体长可达16厘米，但不是那么的重。

5. There are also many small Hymenoptera, especially in the superfamily Chalcidoidea, such as the fairy flies, of the family Myrmaridae, of which *Alaptus magnanimus*, at 0.21mm long, was once thought to be the smallest insects in the world.

参考译文：也有许多膜翅目昆虫，特别是小蜂总科的，如缨小蜂，属柄翅卵蜂科，其中的 *Alaptus magnanimus* 长度有0.21mm，曾被认为是世界上最小的昆虫。

6. *Megaphragma caribea* from Guadeloupe, measuring out at a huge 0.17 mm long, is now probably the smallest known insect in the world.

参考译文：瓜德罗普岛的 *Megaphragma caribea*（一种昆虫，属纹翅小蜂科 Trichogrammatidae，译者注）测量后体长0.17 mm，很有可能是现在世界上已知最小的昆虫。

7. In Africa swarms of Orthoptera (desert locusts *Schistocerca gregaria*) may contain as many as 28 000 000 000 individuals.

参考译文：非洲的蝗虫（沙漠蝗，*Schistocerca gregaria*）迁飞群有时可以多达280亿只。

8. Some scientists think that 30% of the animal biomass of the Amazon Basin is made up of ants, and that: —10% of the animal biomass of the world is ants, furthermore they believe another 10% is composed of termites.

参考译文：有些科学家认为亚马逊盆地的动物生物量的30%是蚂蚁，还认为全世界动物生物量的10%是蚂蚁，同时认为白蚁也得占10%。

2. What is a Locust

Locusts are a type of insect that can be devastating pests of agriculture due to their ability to form into dense and highly mobile swarms. In Australia, the three main pest species of locusts are: the Australian plague locust (*Chortoicetes terminifera*), the spur-throated locust (*Austracris guttulosa*), and the migratory locust (*Locusta migratoria*). All three species are native to Australia. Locusts belong to the same order of insects as grasshoppers, katydids and crickets—the Orthoptera.

What is the Difference between a Locust and a Grasshopper?

Locusts and grasshoppers are identical in appearance—how they differ is in their behaviour. Locusts can exist in two different behavioural states (solitary and gregarious) whereas grasshoppers generally do not. When the population density is low, locusts behave as individuals, much like grasshoppers. However, when locust population density is high they form into gregariously behaving bands of nymphs or swarms of adults. It is this change from one behavioural state to another, known as phase change, that makes locusts such devastating pests.

In addition to changes in behaviour, phase change may be accompanied by changes in body shape and colour, and in fertility, survival and migratory behaviour. These changes are so dramatic in many species that the swarming and non-swarming forms were once considered to be different species.

However, that the distinction between locusts and grasshoppers is not clear-cut. The migratory locust has all of the features associated with phase change: changes in body shapes and colour, in fertility and in forming dense bands and swarms. The Australian plague locust has all of the locust features except there is little change in body colour while the spur-throated locust rarely forms bands though does form dense swarms and migrates.

Some species of grasshoppers (e. g. *Austroicetes cruciata*, *Oedaleus australis* and *Peakesia* spp.) can behave gregariously but these species do not tend to undergo long distance migration as dense swarms like true locusts do.

Lifecycle of a Locust

Locusts are a type of insect that undergo incomplete or direct metamorphosis i. e. there is no pupal stage unlike in insects such butterflies or moths.

There are three main stages of development: egg, nymph and adult. The nymph or hopper stage can be further divided into growth stages called instars. There are five instars during the hop-

per stage in the life cycle of the Australian plague locust.

Locust eggs are laid in the soil. The female drills a hole into the ground using her ovipositor and lays a "pod" of eggs which is sealed with froth. The froth plug helps to protect the eggs from dessication, diseases and predation.

After completing each instar the locust nymph must shed or moult its skin in order to continue to grow. On hatching the nymph is wingless but on each successive moult the developing wing buds can be seen to increase in size and can be used to determine which growth stage a nymph is in.

The final moult into the adult stage is known as fledging and is when the locust develops fully formed wings for flying. The young adult locust is called a fledgling and in most species it takes a few weeks for it to become sexually mature.

Rainfall, which produces green vegetation, is necessary for nymphal and adult survival, adult migration and/or egg development. Egg laying usually follows either migration or rainfall.

How long it takes for a locust to reach maturity depends on the species, conditions of the habitat and on temperature. In cool weather, nymphs and adults often attempt to increase their body temperature by basking in the sun.

Identifying of Wingless and Winged Species

As in all insects, the development of juvenile locusts occurs in discrete stages called instars. Juvenile locusts, no matter what their instar, are called nymphs or hoppers. Unlike insects such as butterflies, moths, bees, wasps, ants and flies, juvenile locusts exhibit what is termed "partial metamorphosis". That is, the juvenile stages bear a superficial resemblance to the adults. (In insects such as butterflies, moths, bees, wasps, ants and flies, which exhibit "complete metamorphosis", the juvenile stages bear no resemblance to the adults, for example, caterpillars look nothing like butterflies or moths.)

One characteristic feature of all adult insects is the presence of wings. In grasshoppers and locusts, the developing wings are referred to as "wingbuds" and are visible on the second and third segments of the thorax—called the mesothorax (middle) and metathorax, respectively. These segments lie behind the pronotum which is labelled on how to determine which growth stage a locust nymph is in. Wingbuds cannot be used for flight. The transformation of the wingbuds into functional wings for flight is only complete when a hopper reaches adulthood. The forewings (not used for flight) arise from the mesothorax and the hind wings (the flying wings) arise from the metathorax. (The middle pair of legs also arise from the mesothorax; the hind pair of legs from the metathorax.)

In some species of grasshoppers, however, the adults possess wings that resemble wingbuds of hoppers. Two such species of grasshopper include the stripe-winged meadow grasshopper and the wingless grasshopper. When wingless grasshopper species co-occur with locust and grasshopper nymphs (in particular late-instar nymphs) it can result in mis-identification of species and overestimation of the density of populations. For example, wingless grasshopper can be found in asso-

ciation with yellow winged locust, eastern plague locust and occasionally Australian plague locust.

Fortunately, it is relatively easy to separate adults and nymphs of these sorts of species— the pattern of venation is the key. The pattern of wing venation of wingless (or "brachypterous") grasshoppers is either parallel or net-like. The pattern of wingbud venation in nymphs of fully winged (or "macropterous") locusts and grasshoppers is roughly fan-shaped with the veins radiating out from along the top and base of the wingbud.

How to Tell the Difference Between a Male and a Female Locust

Adult male and female locusts are readily distinguished by the shape of the tip of the abdomen. The end of the abdomen of the male locust is rounded due to the sub-genital plate which conceals the reproductive organs (in some species of grasshopper this sub-genital plate may be more pointed in shape). The end of the abdomen of the female locust is jagged due to the upper and lower jaws of the ovipositor.

On average, adult male locusts are smaller and more slender than adult females of the same species. However, size is not a reliable character to use to determine the sex of a locust as it varies according to the quality and abundance of food received during the nymphal stage. Otherwise, males and females are very similar in markings and colouration.

From http: //www. daff. gov. au

New Words and Expressions

devastating ['devəsteitiŋ] a. 破坏性的
mobile ['məubail] a. 可移动的; n. 活动装置
swarms [swɔ:m] n. 聚集群
plague [pleig] n. 瘟疫, 灾祸; v. 折磨, 使……苦恼, 灾害
grasshopper ['grɑ:shɔpə (r)] n. 蚱蜢
katydid ['keitidid] n. 螽蟖
cricket ['krikit] n. 蟋蟀
Orthoptera n. 直翅目
behavioural [bi'heivjər (ə) l] a. 行为的
solitary ['sɔlitəri] a. 散居的
gregarious [gre' gɛəriəs] a. 社交的, 群集的
population [pɔpju'leiʃən] n. 人口, 种群
gregariously [gre' gɛəriəs] a. 社交的, 群居的
fertility [fə:'tiliti] n. 肥沃, 生殖力
survival [sə'vaivəl] n. 生存
migratory ['maigrətəri, mai'greitəri] a. 迁移的
undergo [ˌʌndə'gəu] v. 遭受, 进行
lifecycle n. 生活史
pupal a. 蛹的
metamorphosis [ˌmetə'mɔ:fəsis] n. 变态
nymph [nimf] n. 蛹, 若虫
adult [ədʌlt] n. 成虫
instar [in'stɑ:] n. 虫龄
drill [dril] n. 钻孔机, 钻子, 钻
ovipositor [ˌəuvi'pɔzitə(r)] n. 产卵器

pod [pɔd] n. 卵囊
plug [plʌg] n. 塞子，消防栓，电插头；v. 插入，塞住，接插头
dessication ['desikeit] n. 干燥
predation [pri'deiʃən] n. 捕食
shed [ʃed] n. 车棚，小屋，脱落之物；v. 使……流出，脱毛，蜕皮
moult [məult] v. 换羽毛，蜕皮
successive [sək'sesiv] a. 连续的，紧随的
fledging [fledʒiŋ] v. 迁飞
fledgling ['fledʒliŋ] n. 刚会飞的幼鸟待迁飞个体
habitat ['hæbitæt] n. （动植物的）产地，栖息地
bask [ba:sk] v. 晒太阳
juvenile ['dʒu:vinail] a. 未成熟的
discrete [dis'kri:t] a. 不连续的，离散的
bear [beə (r)] v. 拥有
superficial [sju:pə'fiʃəl] a. 表面的，肤浅的
resemblance [ri'zembləns] n. 相像，相似
caterpillar ['kætəpilə] n. 毛毛虫
mesothorax [ˌmesəu'θɔ:ræks] n. 中胸
metathorax [ˌmetə'θɔ:ræks] n. 后胸
transformation [ˌtrænsfə'meiʃən] n. 变形，变质
functional ['fʌŋkʃənl] a. 起作用的
adulthood ['ædʌltˌhud] n. 成年，成熟
resemble [ri'zembl] v. 相似，类似，像
possess [pə'zes] v. 持有，克制
meadow ['medəu] n. 草地
venation [vi:'neiʃən] n. 叶脉，翅脉
pattern ['pætən] n. 图案，典范；v. 仿造，模仿
brachypterous a. 短翅的
parallel ['pærəlel] a. 平行的
macropterous [mæ'krɔptərəs] a. 有长翅的
fan-shaped ['fænʃeipt] a. 扇形的
distinguish [dis'tiŋgwiʃ] v. 区分
abdomen ['æbdəmən] n. 腹部
pointed ['pɔintid] a. 尖的，锐利的
conceal [kən'si:l] v. 隐藏
jagged ['dʒægid] a. 夹状的
reliable [ri'laiəbl] a. 可靠的
nymphal [nimfl] n. 若虫的
markings ['mɑ:kiŋz] n. 斑纹
colouration [ˌkʌlə'reiʃən] n. 着色，色泽

Phrases

due to 由于
incomplete metamorphosis 不完全变态
direct metamorphosis 完全变态
wing buds 翅芽
partial metamorphosis 不完全变态
complete metamorphosis 完全变态
stripe-winged 条斑翅的
radiating out 辐射（状）发出
be referred to as 被称为

Affixes

sub-“在……之下的，次的”之义，如：subgenital plate，下生殖板；subbranch，分支机构

over-“在……之上的，过的”之义，如：overestimation，高估；oversleeping，睡懒觉的

mis-“错误的”之义，如：misidentification，错误鉴定；misunderstanding，误解

Notes

1. Locusts are a type of insect that can be devastating pests of agriculture due to their ability to form into dense and highly mobile swarms.

参考译文：蝗虫由于可以形成密集且有显著迁飞能力的集群，是一类能造成巨大灾害的农业害虫。

2. Locusts belong to the same order of insects as grasshoppers, katydids and crickets-the Orthoptera.

参考译文：和蚱蜢、螽蟖、蟋蟀一样，蝗虫属于同一个目：直翅目。

3. In addition to changes in behaviour, phase change may be accompanied by changes in body shape and colour, and in fertility, survival and migratory behaviour.

参考译文：除了行为上的变化，居型变化还伴随体型、体色、繁殖力、一般生存行为和迁飞行为。

4. The female drills a hole into the ground using her ovipositor and lays a “pod” of eggs which is sealed with froth.

参考译文：雌虫用产卵器在土中钻出一个洞，并往里产一个卵囊，其中封存许多卵粒。

5. Rainfall, which produces green vegetation, is necessary for nymphal and adult survival, adult migration and/or egg development.

参考译文：产生绿色植被的降雨对幼期和成虫的存活、成虫迁飞和/或卵的发育是必需的。

6. Unlike insects such as butterflies, moths, bees, wasps, ants and flies, juvenile locusts exhibit what is termed “*partial metamorphosis*”.

参考译文：和蝴蝶、蛾子、蜜蜂、胡蜂、蚂蚁、双翅昆虫不同，幼期蝗虫经历的为不完全变态。

7. In insects such as butterflies, moths, bees, wasps, ants and flies, which exhibit “complete metamorphosis”, the juvenile stages bear no resemblance to the adults, for example, caterpillars look nothing like butterflies or moths.

参考译文：像蝴蝶、蛾子、蜜蜂、胡蜂、蚂蚁和双翅类这些昆虫属完全变态，幼虫和成虫很不相似，比如，毛毛虫一点也不像蝴蝶或蛾子。

8. In grasshoppers and locusts, the developing wings are referred to as “wingbuds” and are visible on the second and third segments of the thorax—called the mesothorax (middle) and metathorax, respectively.

参考译文：对蚱蜢和蝗虫，正在发育的翅叫翅芽，在胸部第2和第3节（分别叫做中胸和后胸）上可见。

9. When wingless grasshopper species co-occur with locust and grasshopper nymphs (in particular late-instar nymphs) it can result in mis-identification of species and over-estimation of the