

BASIC SCIENCE SERIES

自然科学初级读物

9

LIVING THINGS -PLANTS

生物——植物

叶念伦 译



科学普及出版社

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出版：科学出版社

制印：外文印刷厂

发行：新华书店北京发行所

经售：各地新华书店

开本：787×1092 1/32

印数：1—100,000册 印张：5/4

1979年10月第一版

1979年10月第一次印刷

统一书号：13051·1040 本社书号：0044

每册定价：0.30元

出 版 说 明

当前，在实现四个现代化的新长征途中，广大青少年正在努力学习现代科学文化知识，为祖国的社会主义建设事业，增长才干，积蓄力量。编译出版《自然科学初级读物》的目的，就是为初学自然科学和英语的读者，提供一套浅近而有趣的参考书籍。

全套读物共有16个选题，细目见各书封底。英语部分采自 FEP INTERNATIONAL PRIVATE LIMITED 出版的 BASIC SCIENCE SERIES (修订版)。

为了便于阅读，对全书重新作了编排，绘制了插图，并附了参考译文。书中还配有相当数量的简单实验，使读者通过实验，加深理解有关科学内容。

由于编者水平所限，错误不当之处在所难免，请批评指正。

科学普及出版社 一九七九年三月

BASIC SCIENCE SERIES — BOOK 9

自然科学初级读物 — 第 9 册

LIVING THINGS — PLANTS

生物 —— 植物

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INTRODUCTION

Plants are very important living things. Life could not go on if there were no plants. This is because plants can make food from **air**, **water** and **sunlight**. Animals and Man cannot make food from air, water and sunlight. Animals get their food by eating plants and other animals. Man gets his food by eating plants and animals too. Therefore, animals and Man need plants in order to live. This is why we find that there are so many plants around us.



引言

植物是很重要的生物。假如没有植物，生命就不能继续下去。这是因为植物能利用空气、水和阳光制造养料，而动物和人则不能利用空气、水和阳光制造养料。动物靠吃植物和其他动物摄取养料。人也靠吃植物和动物摄取养料。因此，动物和人为了生存需要植物。这就是我们发现我们周围有那么多植物的原因。

There are many types of plants around us.

我们周围有很多种植物



TYPES OF PLANTS

If you look carefully at the plants around you, you will find that there are many types of plants. Some plants are large while others are small. Most plants are green.

There are two main types of plants:

1. **Flowering** plants and
2. **Non-flowering** plants.

Flowering plants have **roots, stems, leaves, flowers** and **fruits**. Almost all the trees around us are flowering plants. You can probably recognize some plants from their flowers or their fruits.

Non-flowering plants do not grow flowers. They include **coniferous trees, mosses, liverworts, algae** and **fungi**. You cannot see many non-flowering plants around you.

植 物 的 种 类

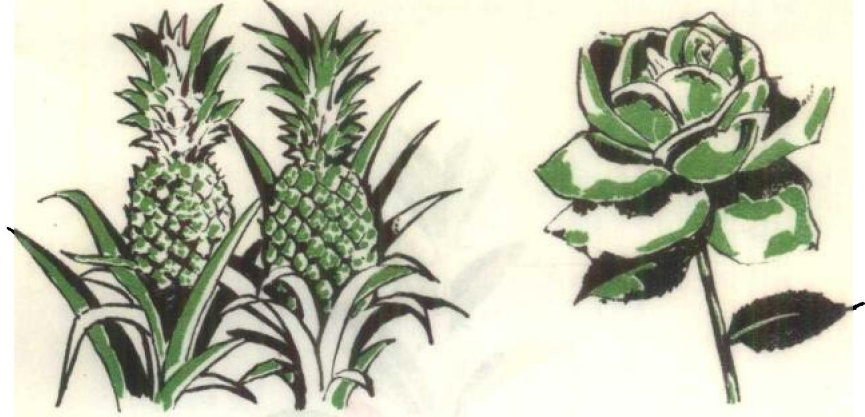
如果你仔细观察一下周围的植物，你就会发现有很多种植物。有些植物高大，有些矮小。大多数植物是绿色的。

植物的主要类型有二：

- 一、**显花植物**；
- 二、**隐花植物**。

显花植物具有**根、茎、叶、花和果实**。我们周围的树木几乎都是显花植物。你大概能从它们的花或果实辨认出一些植物。

隐花植物不长花。隐花植物包括**针叶树、苔藓、地钱、藻类和真菌**。你在你周围看不到多少隐花植物。



PARTS OF A FLOWERING PLANT

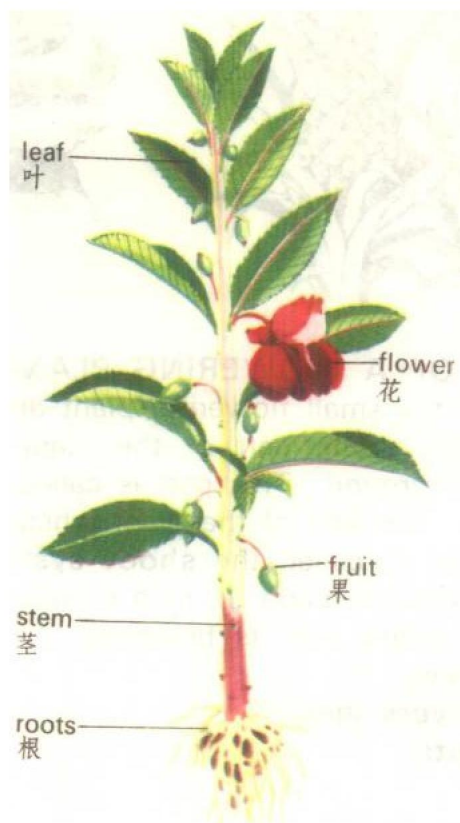
Pull out a small flowering plant and look at it carefully. One part of the plant is found under the ground. This part is called the **root system**. The part of the plant which is above the ground is called the **shoot system**. The shoot system is made up of a number of parts:

- (a) the **stem** and its branches,
- (b) **leaves**,
- (c) **flowers** and
- (d) **fruits**.

显花植物的各个部分

拔出一株小的显花植物，仔细地加以观察。这株植物的一个部分长在地下。这个部分叫**根轴系**。植株长在地上的部分叫**茎轴系**。茎轴系由几部分组成：

- 一、茎和枝；
- 二、叶；
- 三、花；
- 四、果实。



The picture shows all the different parts of a plant. Most plants have these parts. Now let us look carefully at the roots, stems, leaves, flowers and fruits of many types of plants.

上图表示植物的各个部分。大多数植物都具有这几个部分。现在让我们仔细观察多种类型植物的根、茎、叶、花和果实。

PLANTS HAVE DIFFERENT TYPES OF LEAVES

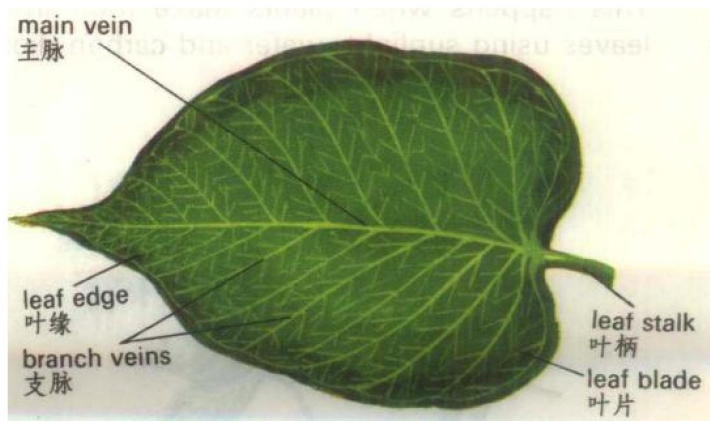
This is a picture of a leaf. What is its colour and shape?

It has a **leaf stalk**. The leaf stalk is the part that is joined to the stem. The **leaf blade** is flat and smooth. In the middle of the leaf is the **main vein**. **Branch veins** grow from the main vein. The main vein and branch veins bring water to the leaf from the roots. They also carry the food made by the leaves to the other parts of the plant.

植物有不同类型的叶

这是叶的图画。叶的颜色和形状是什么样的呢？

叶有叶柄。叶柄是和茎相连接的部分。叶片扁平又光滑。叶的中部是主脉。从主脉分出支脉。主脉和支脉把水分从根输送到叶。它们也把叶制造的养料输送到植物的其他部分。



Some plants have many small leaves. Others have only a few large leaves. There are many kinds of leaves. Leaves are of different shapes and colours.

Besides having different shapes and colours, leaves are also different in other ways. Some leaves have short leaf stalks while others have long leaf stalks. Still others have no stalks at all. The edges of leaves are also different. Some leaves have smooth edges. Some have wavy edges. Others have edges like the teeth of a saw.

There are **simple leaves** and **compound leaves**. When there is only one leaf growing on a leaf stalk, it is called a simple leaf. When there are two or more leaves growing on a single leaf stalk it is a compound leaf.

Leaves are very useful to plants. On the surfaces of leaves are many tiny openings called **stomata**. Plants take in and give out gases like carbon dioxide and oxygen through the stomata. This happens when plants make food in their leaves using sunlight, water and carbon dioxide.

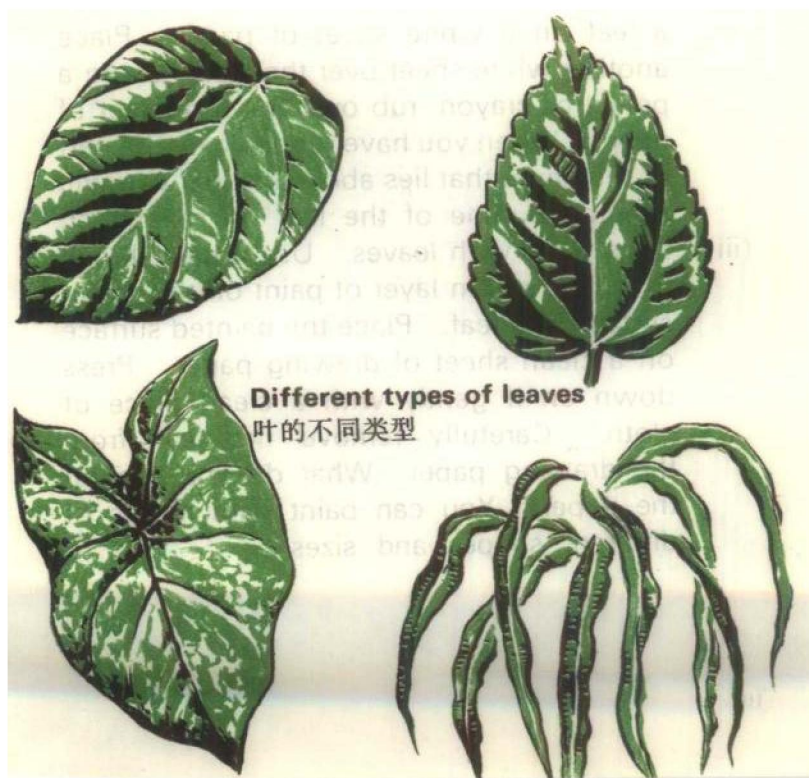


有些植物有很多小叶，另一些植物只有几片大叶。叶的种类很多，其形状和颜色各不相同。

叶子除具有不同的形状和颜色外，其他方面也不一样。有些叶子具有短叶柄，而另一些则具有长叶柄。还有一些叶根本没有叶柄。叶的边缘也不同。有些叶具有平滑的边缘。有些具有波浪形的边缘。另一些则具有锯齿形的边缘。

叶有单叶和复叶。一根叶柄上只长一片叶时，这种叶叫单叶。一根叶柄上长两片或两片以上叶时，这种叶是复叶。

叶对植物非常有用。叶的表面上有许多叫做气孔的小孔。植物通过气孔吸入和呼出二氧化碳和氧之类气体。这种现象发生在植物利用阳光、水和二氧化碳在叶中制造养料的时候。



Things to Do

- (i) Collect as many different kinds of leaves as you can find from various plants growing near your school or house. Bring along a plastic bag to keep your leaf collection.
Sort the leaves into simple and compound leaves. Look at the different parts of each leaf under a hand lens. Count the veins of each simple leaf and the number of leaflets of each compound leaf. Next draw each leaf. Label the different parts and talk about its shape and colour.
- (ii) You can make leaf prints in this way. Place a leaf on a white sheet of paper. Place another white sheet over the leaf. Using a pencil or crayon, rub over the top sheet of paper. When you have rubbed over the part of the paper that lies above the leaf you will see the outline of the leaf on the paper.
- (iii) Let's paint with leaves. Use a paint brush to spread a thin layer of paint on the upper surface of a leaf. Place the painted surface on a clean sheet of drawing paper. Press down on it gently with a clean piece of cloth. Carefully remove the leaf from the drawing paper. What do you see on the paper? You can paint with leaves of different shapes and sizes.

动手做

一、从你学校或你家附近生长的植物中，尽可能多地采集一些种类不同的叶。随身带一个塑料袋以盛放采集到的叶。

把这些叶按单叶和复叶分类。用放大镜观察每片叶的各个部分。数数每片单叶叶脉的数目和每片复叶的小叶的数目。然后画下每片叶。标上各部分的名称，说说它的形状和颜色。

二、你可以用下述方法印下叶痕。把叶放在一张白纸上。把另一张白纸覆盖在叶上。用铅笔或蜡笔涂抹上面那张纸。当你涂完位于叶上面的那一部分纸时，你就会在纸上看到叶的轮廓。

三、让我们拓印叶。用颜料刷子在叶的正面涂上薄一层颜料。把涂了颜料的那一面放在一张干净的画图纸上。用一块干净布轻轻地把它压在纸上。小心地把叶从画图纸上揭下。你在纸上看到了什么？你可以拓印各种形状和大小的叶。

A creeping stem 匍匐茎



A climbing stem 攀援茎



PLANTS HAVE DIFFERENT TYPES OF STEMS

Some plants have stems which are strong and upright. Others have stems which are thin and weak. Some of these weak stems creep on the ground. Others climb up sticks or other larger plants.

There are certain stems which remain underground. Sometimes these stems become swollen. This is because the plant uses these stems as a store-house. The plant stores all its extra food here. Therefore, the stem becomes swollen. Potatoes, onions and water chestnuts are good examples of stems that store food. Another example is the ginger. Some stems which grow above the ground also store food. An example is the sugar cane. The sugar cane stem stores sugar.

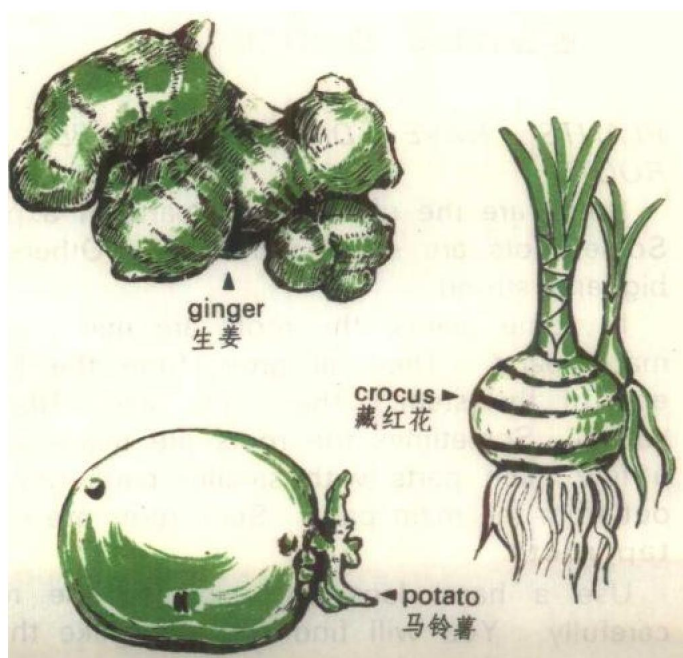
The stem holds the plant upright. The branches of the stem also hold the leaves up in such a way so that the leaves can get plenty of sunlight. In the stem, there are lots of little tubes which carry water and salts from the roots to the leaves. The leaves use the water and salts for making food when the sun is shining.

植物有不同类型的茎

有些植物具有结实又挺拔的茎。另一些则具有纤细又软弱的茎。有些软弱的茎在地上蔓延。另一些则顺着竿子或其他较大的植物向上爬。

某些茎长在地下。有时这些茎变得很饱满。这是因为植物利用这些茎作为储存室。植物把它多余的全部养料储存在这里。因此，茎就变得饱满了。土豆、洋葱和荸荠就是储存养料的茎的好例子。另一个例子是生姜。有些长在地上的茎也储存养料。甘蔗就是一例。甘蔗的茎储存糖分。

茎使植物保持挺拔。茎的分枝也使叶子展开，以便使叶子能得到充分的阳光。茎内有许多小管，把水和盐分从根部输送到叶。在太阳照耀着的时候，叶用水和盐分制造养料。



Things to Do

Collect for your nature table different types of stems. Sort them out into three groups:

- (a) strong and upright stems,
- (b) weak, creeping or climbing stems and
- (c) storage stems.

Draw and talk about them.

动手做

为你的植物标本集采集不同类型的茎。把它们分成三类：

- 一、结实挺拔的茎；
- 二、软弱的匍匐茎或攀援茎；
- 三、储存茎。

把它们画下来，说说它们的特点。

PLANTS HAVE DIFFERENT TYPES OF ROOTS

Roots are the underground parts of a plant. Some roots are small and weak. Others are big and strong.

In some plants, the roots are made up of many parts. They all grow from the lower end of the stem. These are called **fibrous roots**. Sometimes the roots are made up of a few main parts with smaller parts growing out from the main parts. Such roots are called **tap roots**.

Use a hand lens and examine the roots carefully. You will find small hair-like things