

無花果屬植物會開花嗎？ Does Fig-plant have flowers?



漁農自然護理署
Agriculture, Fisheries and
Conservation Department

無花果屬或稱榕屬，是桑科的第一大屬，全球共有800餘種，主要分布於熱帶地區，其中有小灌木，也有攀援藤本（圖1）和附生植物，更有獨木成林、遮蔭數畝的大喬木（圖2）。儘管形態各異，它們都有一個共同的特點，即生出看不見花的榕果，俗稱“無花果”（圖3）。

The Fig-plants or the genus *Ficus*, containing about 800 species mostly distributed in the tropics, is the largest genus in Moraceae. It consists of small shrubs, scrambling climbers (fig.1), creepers and epiphytes. There are also large trees. A single individual sometimes covers hundreds yards of the ground around its base with its much branched and vertically flattened tortuous roots (fig. 2). In spite of the tremendous diversity of habit and morphological characters, all members of this genus are characterized by bearing "figs"(fig. 3).

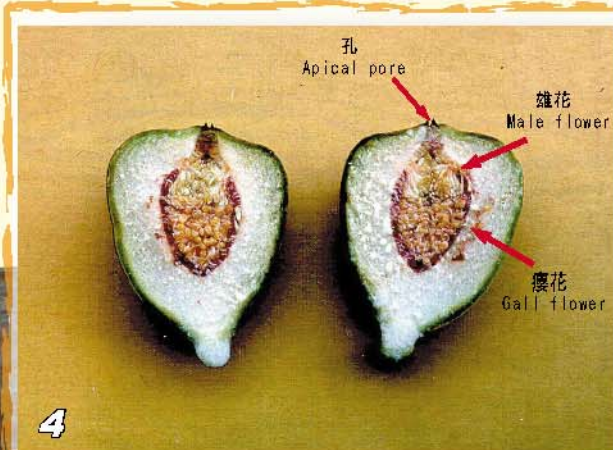


我們對許多無花果屬植物並不陌生，如常見的園林樹種細葉榕（*Ficus microcarpa*）、印度橡樹（*F. elastica*），野生的粗葉榕（*F. hirta*）、對葉榕（*F. hispida*）和攀援的薜荔（*F. pumila*）等。您有否留意，每年都有大量榕果從樹上落下，卻不見開花。“無花果”一名生動地表達了這一現象。

Many Fig-plants are not unfamiliar to us, such as the common garden plants Chinese Banyan (*Ficus microcarpa*), India-rubber Tree (*F. elastica*), and the wild plant Hairy Fig (*F. hirta*), Opposite-leaved Fig (*F. hispida*) and Creeping Fig (*F. pumila*). Have you noticed that every year we saw the fig-fruits drop down from the trees, but have never seen them in flower? The Chinese name "Wu Hua Guo", with the meaning of setting fruits without flowers, expresses vividly this special phenomenon.

無花果屬植物會開花嗎？答案是肯定的。那為什麼見不到它的花呢？原因是它的花著生於倒置的中空壺形花序托中。此壺形結構僅頂端有一小孔與外相通，花完全隱藏於其中。我們所見到的榕果，既不是果，也不是花，而是一個花序，植物學中稱之為“隱頭花序”。

Does Fig-plant have flowers? The answer is positive. But why can't we see the flowers? The reason is that each fig is made up of the flattened axis of the inflorescence, which becomes a hollow inverted urn with a small apical pore opening to the outside. The flowers are borne inside the urn and are completely concealed. So every fig is neither a fruit nor a flower but an inflorescence. In botanical terms, it is called "syconium".

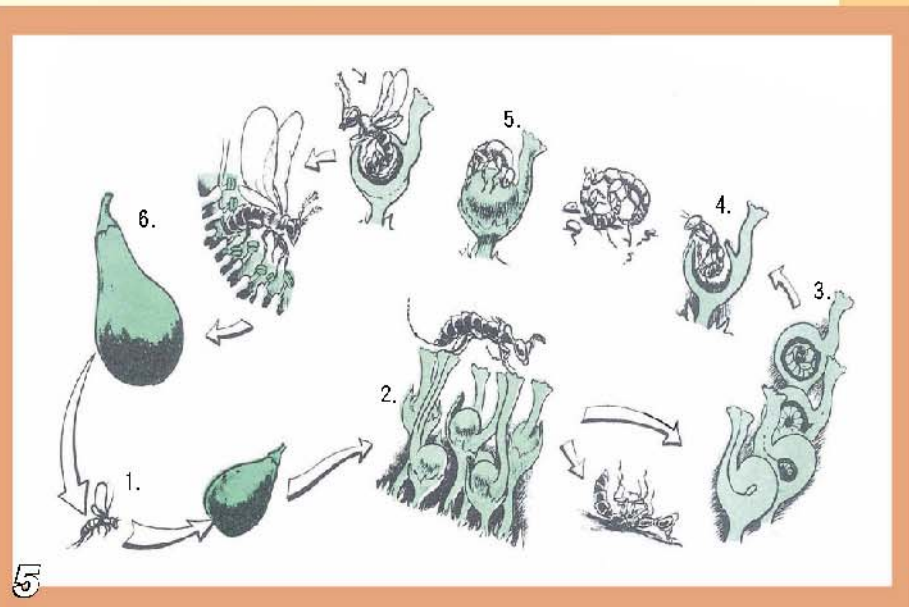


無花果屬植物花的傳粉過程與昆蟲（一種寄生蜂）緊密相關，極為有趣。以薜荔為例，它具有兩種榕果，分別長在不同的植株上：一種在頂端孔口周圍生有雄花，下部生有敗育的雌花，又稱作“瘿花”（圖4）；另一種僅生有正常的雌花。前者只產生花粉和供寄生蜂繁育，不能結種子，因此可稱為雄株；後者只生產種子，可稱作雌株。此二種榕果在外形上不可區分，只有剖開後才能鑒別。

4

The pollination of fig-flower is perhaps the most interesting relationship between plants and insects. Let us take *Ficus pumila* as an example. It has two kinds of figs on different plants: one containing male flowers mainly around the apical pore, and abortive female "gall" flowers lower down (fig.4); the other containing only normal female flowers. Of this species we may therefore consider those as male-plants and female-plants. The figs of the male-plants produce only pollens and breed wasps, but are incapable of forming seeds; the figs of the female-plants produce only seeds. But there is no external morphological difference between the two kinds. We must cut and open their figs to see what they are.

其傳粉過程是這樣的：當成熟的雌寄生蜂進入一具有瘿花的新榕果時（圖5-1），由於瘿花的花柱短，頂端盤狀，寄生蜂可將產卵器深入到子房，每一子房產卵一粒（圖5-2），幼蟲在其中孵化、進食成長（圖5-3）。雄性幼蟲先羽化（圖5-4），咬破子房壁而出並尋找尚在子房中的雌蟲交尾（圖5-5），旋即死去。此時在榕果頂孔周圍的雄花也成熟散粉。已受精的雌蜂從孔口爬出（圖5-6），身上沾滿花粉飛向新的榕果。如果它進入榕果是具有瘿花者，則將重複上述生活周期，繁殖新一代寄生蜂。如果它進入的是僅具雌花的榕果，則由於雌花具有長花柱，其產卵器無法深入子房。雌蜂輾轉其中找尋適合的產卵處，同時亦將花粉傳到眾多雌花的柱頭，使之受精結種子。因此，無花果屬植物的有性繁殖完全有賴於寄生蜂的存在，同時寄生蜂又依賴無花果植物以維繫生存。這種植物與動物間的奇妙結合，是自然界一種互利共生現象。



5

The pollination process is as follows: When mature female wasp enter the fig with gall-flowers (fig.5-1), which have short, funnel-shaped style, the ovipositor of the wasp can easily pass down the short style and reach the ovary. They deposit a single egg in each ovary next to the ovule (fig.5-2); here the larva hatches out, feeds, grows, and undergoes metamorphosis (fig.5-3). The male wasps first gnaw their way out (fig.5-4), locate the gall-flowers containing females, pierce the wall of the ovary, and fertilize the female inside (fig.5-5). The male wasps then die without leaving the fig. By this time, the fig is ripe and the male flowers are shedding their pollen. The gravid female wasps crawl out through the apical pore of the fig, and are dusted with pollen on the way out (fig.5-6), and fly to a young fig. If these wasps enter a gall-fig, they will repeat the life cycle. But if the female wasp enters a female-fig, which containing only normal female flowers with long styles, she wanders in the fig to find a suitable place to lay her eggs but in vain, because her ovipositor cannot pierce down the long style to reach the ovules. But in doing so, she deposits pollen on the stigmas of the female flowers and fertilizes the ovule, which will develop into the seed. The Fig-plants are absolutely dependent on the wasps for their reproduction, and the wasps, in turns, are relying on the Fig-plants for livelihood. This curious relationship between plants and animals is a mutualistic symbiosis in nature.

文：胡啟明（華南植物園）
Text: Hu Qi-ming (South China Botanical Garden)