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INTRODUCING THE UNIQUE BEAUTY OF AMORPHOFALLUS TITANIUM AT UNIVERSITY ENGLISH LESSONS

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РОЗГЛЯД УНІКАЛЬНОЇ КВІТКИ AMORPHOFALLUS TITANIUM НА ЗАНЯТТЯХ З АНГЛІЙСЬКОЇ МОВИ В УНІВЕРСИТЕТІ

Abstract. Described the largest flower in the world – *Amorphofallus titanium*, its place of distribution, flowering, pollination, life cycle. The Formation of professionally oriented foreign language teaching environment for Biologie students, creating English presentations by students are considered one of the conditions for a successful future professional activity of specialists.

Key words: university, biologists, students, foreign language, *Amorphofallus titanium*.

Анотація. Описано унікальність найбільшої квітки у світі - *Amorphofallus titanium*, місця її поширення, цвітіння, опилення, життєвий цикл. Створення професійно орієнтованого іноземного навчального середовища для студентів, підготовка презентацій ІМ, розглядається однією з умов успішної майбутньої професійної діяльності фахівців.

Ключові слова: університет, біологи, студенти, іноземна мова, *Amorphofallus titanium*.

One of the wonders of nature is *Amorphofallus titanium* (Fig. 1). It is one of the most spectacular plants to be found in the wet tropics zone of Kew Gardens' Princess of Wales Conservatory. With its huge flowering structure (inflorescence) rising over 2.5m above the ground and its single immense leaf, it certainly is a giant among plants, as its name suggests. Coupled with its characteristic foul stench, and the rarity of flowerings, this plant has always hit the headlines (video [7]).



Fig. 1. Amorphophallus titanum



Fig. 2. Odoardo Beccari

Titan Arums are also known as *Corpse Flowers*, and have the scientific name *Amorphophallus titanum*. They are native to Sumatra and are becoming very rare in the wild due to human encroachment and deforestation.

The greatest botanist ever to study in Malesia **Odoardo Beccari** (1843–1920) was the first one who scientifically described the plant in 1878 during his stay in Sumatra (Fig. 2). The world of environmental biologists and naturalists mostly recognised O. Beccari as the man who discovered the corpse flower. *The corpse flower* or its scientific name *Amorphophallus titanum* is considered the world's largest unbranched inflorescence. The plant is called *bunga*. The plant is called *bunga bangkai* in Malay which means "corpse flower" due to its rotting smell (<https://kajomag.com/odoardo-beccari-the-man-who-discovered-the-corpse-flower/>).

On a short trip to central Sumatra in 1878, O. Beccari discovered the largest flower in the world – *the Amorphophallus titanum*, which he originally named *the Conophallus*. Other naturalists, including *Karl Ludwig Blume*, had worked with other members of the *Amorphophallus* tribe decades earlier, but none approached this species in size, rarity, or smell (Fig. 3).



Fig. 3. Flowering Titan arums

Although few details of his discovery are known, *O. Beccari* immediately sent reports and sketches back to European publications, and news of the stunningly animalistic flower was published in the weekly *Gardeners' Chronicle* that year. Beccari provided no acknowledgment of his Sumatran guides and made no reference to indigenous knowledge of the plant in his notes or publications. The first specimen

of *Amorphophallus titanum* bloomed at Kew, where *O. Beccari* had started his journey, in 1885, sparking wonder and spectacle as thousands of patrons traveled to see the giant, phallic flower that smelled like rotting flesh (Fig. 3). Its bloom cycle lasted for only three days, conjuring up even more excitement about the plant's extreme rarity [3].

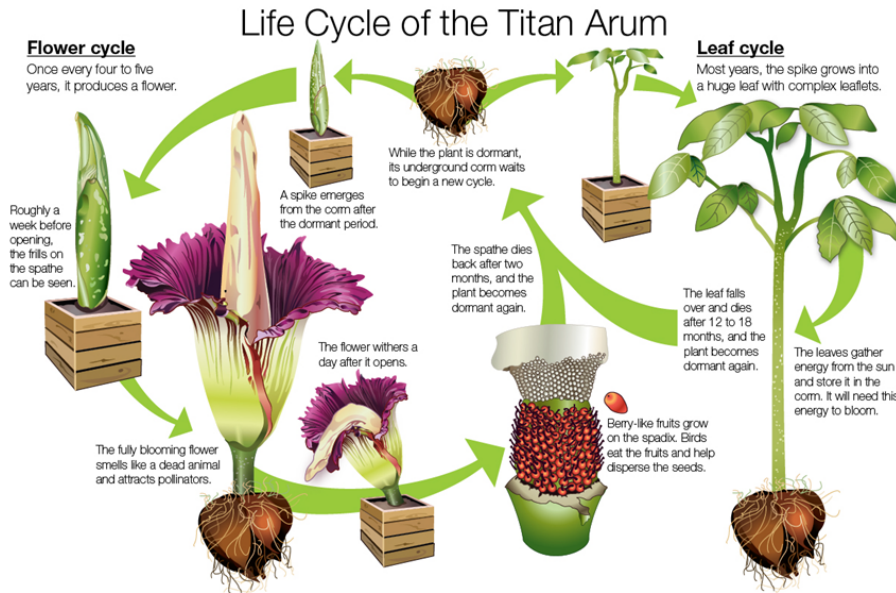


Fig. 4. Life Cycle of the Titan Arum. (Resource [1])

Amorphophallus – Tuberos perennial plant of the genus Aroid. When flowering releases up a long dark purple cob length from 15 to 100 cm. A dark-purple bedspread blooms around the inflorescence. The top of the ear does not form flowers – male and female beginnings are located in the lower part of the inflorescence.

The most common type of *Amorphophallus* is *cognac* (Fig. 1).

The Scientists of Chicago Botanic Garden and Bonn Botanic Garden describe in their publications the Life Cycle of the Titan Arum [1; 2] (Fig. 4).

Titan arums are a rare sight in botanic gardens. Worldwide, about 70 plants have flowered in gardens since their discovery [2].

The first successful bloom of *the Corpse Flower* was at the Royal Botanic Gardens at Kew in London in 1889 which has enjoyed over 100 cultivated blooms since. In the United States the first bloom was in 1937 and 1939 at New York's Botanical Garden. The corpse flower became the official flower of the Bronx in 1939 only to be replaced by the day lily in 2000. In 2003 Germany's Botanical Garden at the University of Bonn achieved the tallest cultivated bloom measuring 8 feet 11 inches or 2.74 meters tall. This record was broken a few more times has horticulturists have become more experience with the flower. It'll open up at night time which draws in carcass eating insects, mainly beetles and flies these insects will pollinate the inflorescence, that white spike in the middle for 2 days until it closes back up. The tiny flowers or inflorescence will heat up during the bloom which releases the rotting flesh smell, this heating process is designed to help spread the horrid smell and attract pollinators. The reason for this scent is a sulfur based compound but luckily it only lasts 8 hours of the 2 day bloom. When cultivated it takes 7–9 years to produce a flower.

The leaves of this flower are green, tripartite, dissected, at the tips – with a slight sharpening. Under natural conditions, the leaves of *Amorphophallus* reach 1.3 meters in length. Externally, the leaves resemble a palm tree. *Amorphophallus* belong to *light-loving plants*.

The formation of the root system of *Amorphophallus* begins in the upper part of the tuber, therefore, when planting, the bulb is deepened [Fig 5]. The growth of the roots is intense and is slowed down only when the top of the flower or leaves appears. (<https://en.yellowbreadshorts.com/3280-how-to-grow-amorphophallus-at-home.html>)



Fig. 5. Amorphophallus kids



Fig. 6. The male (top), female(bottom) flowers inside

The roots of *Amorphophallus* contain many useful elements and vitamins, and a high concentration of amino acids and fiber helps to reduce the sugar and cholesterol levels in the blood (<https://en.yellowbreadshorts.com/3280-how-to-grow-amorphophallus-at-home.html>).

The scent lasts for a few hours, and is often strongest in the wee hours of the morning. The odor is produced by the spadix, and can be detected by pollinators up to an acre away. By daybreak, it begins to dissipate, as the 450 to 5,000 male flowers (in a ring above the female flowers) (Fig. 6) open, releasing the pollen that covers the unsuspecting insects that have gathered during the night [1].

At night carrion beetles and flesh flies are active and crawling about. Inside the tightly wrapped spathe, the plant uses stored energy from the corm to heat up internally to more than 90 degrees Fahrenheit. The area of the spadix that is smelly, the appendix, is above all of the flowers (male and female) (video [12]) and is the part that sticks out of the spathe before it opens.

Some scientists hypothesize that when the spadix heats up, the rising heat acts to draw the air up from below. This convection of smelly air above the plant then spreads the scent though the forest into the canopy, towards pollinators [1].

Roughly 12 hours after the female flowers have been pollinated and the top of the spadix cools, the male flowers (which also heat up during the process) begin exuding long strands of pollen. When the male flowers reached 82.6 degrees Fahrenheit, they began to exude pollen. About two hours after pollen production began, the scientists use tools to collect the pollen and place it in containers to freeze for storage. Some of the pollen will be banked here at the Garden, and some will be sent to other institutions to pollinate their titan arums. A small amount is kept for

research into the structure of the grains, and to research precisely how pollination works in these amazing plants [1].

If a Titan arum is lucky enough to be pollinated, it will develop a seed cylinder within the slumped-over remains of the flower. The fruits are olive-shaped, red-orange berries (Fig. 7), much prized by rhinoceros



Fig. 7. Seeds

hornbills, which feast on them, thus spreading the seeds around their native rainforest habitat. Yellow fruit starts to form four to seven or more weeks after pollination, and continues to ripen for several more months. Roughly nine months after pollination, the fruit has darkened to a bright red and is ready to be harvested. The seed of the fruit can be planted to produce a new corm [1].

We can watch video [9] as David Attenborough explains the pollination of the titan arum and hand pollinating (cutting into the flower in order to hand pollinate it. Pollen imported from New York was brushed on to the stigma) [10; 11].

Thus, learning English as a foreign language is not a linear process.

Our Biology-students study English in professionally oriented way in the process of learning in the conditions of university. It has been described in our scientific works [6; 8; 14;15]

For students there are some questions [1] about *Amorphofallus titanium*:

1. The Garden has had several corpse flowers that had the potential to bloom in the last few years. What makes it a rare event?

2. How do you know when the bud is going to bloom?

3. How long does the plant bloom?

4. How frequently does it bloom?

5. How big does this plant really get?

6. Did the Garden grow these plants from seed or buy the corms? Where did the Garden get them?

7. How endangered are the corpse flowers?

8. Will this plant bloom die after blooming?

9. What does it look like when it's not flowering?

10. What is that awful smell, and why does it make that awful smell?

11. Is the smell very bad? Will we feel sick smelling the plant?

12. Why do most bloom at night?
13. What do you do with the pollen made by the male flowers?
14. What do the seeds look like? Will you leave the plant on display while they grow?

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