

Botanical Partners on the Mall



Smithsonian
National Museum of Natural History



UNITED STATES
BOTANIC GARDEN

The Return of the Titan Arum

This gigantic plant, *Amorphophallus titanum* (commonly known as “titan arum”), is a true wonder of Nature. The renown of the titan arum comes from its great size -- it is reputed to have the largest known un-branched inflorescence (“flower structure”). The plant is native only to the tropical rainforests of Sumatra, Indonesia. The titan arum emerges from, and stores energy in, a huge underground stem called a “corm.” The plant blooms on an unpredictable schedule, when sufficient energy is accumulated, usually after several years. The developing inflorescence initially appears as a pale green, bud-shaped structure composed of a “spathe” enclosing a central spike-like “spadix.” At first hidden inside the spathe, the spadix is revealed as the entire structure swells. At full bloom, the spathe is fully unfurled to reveal a crimson interior. The ultimate height of the spadix depends on the energy accumulated in the corm, and the speed of the development depends on day and night temperatures. The average recorded height of an inflorescence is about 5 feet, and the largest one in cultivation was 9 feet, 2 inches. In their natural habitat, titan arums can grow up to 12 feet tall!

The titan arum is a member of the Aroid Family (Araceae) that includes skunk cabbage, calla lilies, caladiums, Jack-in-the-pulpit, and common houseplants such as philodendron and spathiphyllum (peace lily). There are an estimated 150-170 species in the *Amorphophallus* genus, all native to the Asian or African tropics.

Since the first recorded bloom in the United States in 1937, titan arums have been exhibited in this country on just a few occasions. Many will recall that a titan arum owned by the U.S. Botanic Garden (USBG) bloomed, for its second time, while on display here at the Conservatory in July 2003, generating an enormous response of about 10,000 visitors on the peak day. Then in November 2005 a titan arum owned by the Smithsonian National Museum of Natural History, Department of Botany, bloomed at the USBG. The specimen you see here today is yet another plant, also owned by the Department of Botany. As small seedlings, the three plants were given to the USBG and the Smithsonian in October 1993 by Maryland arum enthusiasts Craig and Fanny Phillips. The Phillipses had grown the plants from seed collected in 1991 by California physician James R. Symon, who had searched for the titan arum during several journeys to Sumatra. (Symon later traveled in Sumatra with Sir David Attenborough in 1993, finding the plant again for the filming of the BBC production “The Private Life of Plants.”)

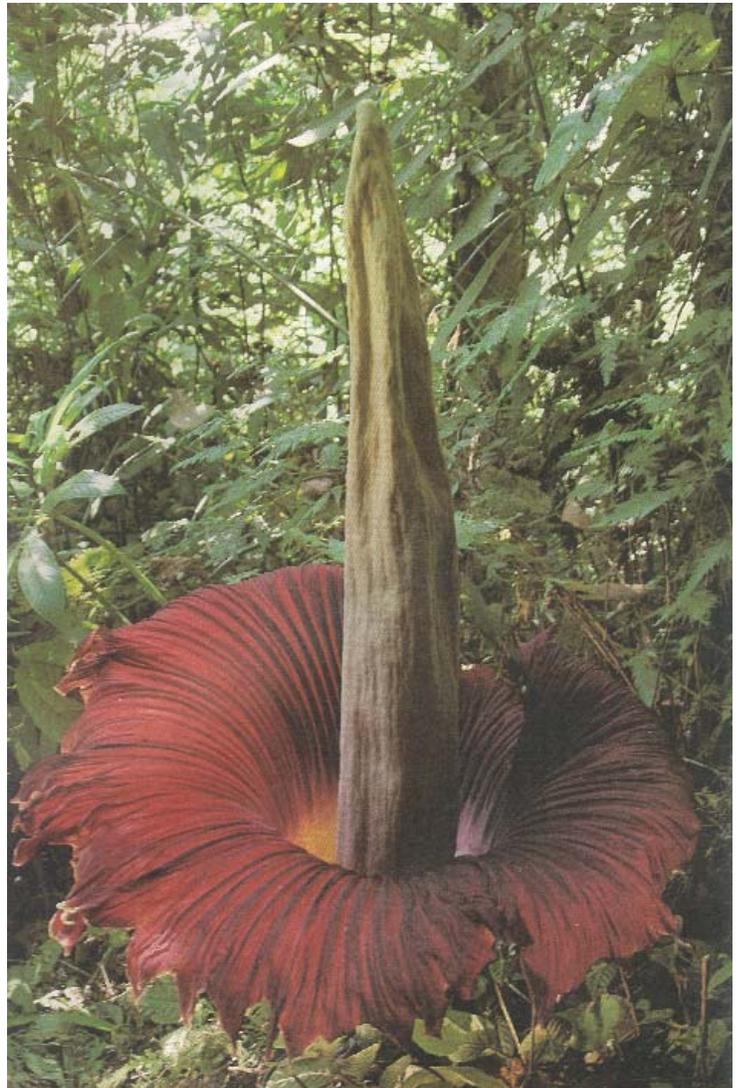
At full bloom the titan arum inflorescence is well known for smelling like rotting meat, hence its other common name, “corpse flower.” It is hypothesized, but not yet documented, that the primary pollinating insects of the flowers are



carrion beetles in the family Silphidae. These beetles typically excavate beneath bodies of dead animals, allowing the body to sink into the ground and burrowing into it to lay their eggs. The titan arum tricks these carrion beetles by mimicking rotting flesh with the dull red color of the bloom and intense odor of carrion. The outwitted beetles are in for a two-day visit: on the first day, the beetles are lured into the flowers by the smell and are trapped at the bottom of the big, funnel-like spathe by downward-pointing hairs. Imprisoned, they spend the night, pollinate the female flowers that open first in the inflorescence, and lay their eggs. On the second day, the male flowers open, and the beetles, dusted with pollen, make their escape. They crawl out of the spathe and fly to visit other flowers that are opening for the first time. This system has evolved in a number of different plants, including other aroids, wild gingers, and milkweeds. The titan arum seeds have been said to be dispersed by hornbills and other birds in the plant's native Sumatra.

Amorphophallus has edible corms that are used as a source of starch by local peoples. Some species are collected in the wild for this purpose, and at least one is cultivated as a crop. For now, none appear to be threatened because of over-collecting by local people. But the titan arum may be threatened in its native regions because of habitat loss and degradation resulting from human activities.

This specimen of *Amorphophallus titanum*, like that displayed in November 2005, is part of the living research collection of the Smithsonian National Museum of Natural History, Department of Botany. As “Botanical Partners on the Mall,” the Smithsonian and the U.S. Botanic Garden agree that the USBG Conservatory provides the optimal environment (very warm, bright, and humid) for titan arums to bloom. This plant was brought from the Smithsonian Department of Botany Research Greenhouses in Suitland, MD on the morning of Monday, June 25. This is the first time that this plant has bloomed. Predicting bloom time for a titan arum is not an exact science; like people, they are all different. Once fully open, the titan arum may remain in bloom for 24 to 48 hours, and then it will collapse quickly.



Photograph by David Attenborough, from his book *The Private Life of Plants* (Princeton University Press, 1995).