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Commentary

Rafflesia (Stinking Corpse Flower): A Living Parasite Host Interaction

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DESCRIPTION

There are 28 species of flower in the genus *Rafflesia*, the second-largest of which is *Rafflesia kerrii*. *Rafflesia*, also referred to as the corpse flower because of its offensive odour, is a parasite of the wild grapes of the *Tetrastigma* vine genus, which gives *Rafflesia* everything it needs to exist. *Rafflesia* grows by embedding strands of tissue into the host vine's cells; absorbing nutrients and water until the only portion of it that is visible from the outside are giant rubbery flowers that smell like rotten flesh that emerge from the host vines. They resemble fungi more than actual plants.

Life history

The largest and stinkiest bloom in the world is produced by the parasitic *Rafflesia* genus, which infects its host plants. Before emerging as dull, golf ball-sized buds, *Rafflesia* spends the majority of its lifespan as a tangle of strandlike cells, hiding covertly behind the bark of a woody vine known as *Tetrastigma*. These finally erupt into fleshy flowers that can grow up to 20 pounds in weight and three feet in diameter. They also have a rotten meat odour.

Rafflesia goes through this process once a year, when it reaches its maximum diameter and has five leathery, red-spotted petals encircling a bowl-shaped centre that feeds on flies and other insects. The transition from seed to pod to flower can take up to nine months, with the final, gigantic show blooming for only a few days. Nobody is certain of the precise timing of this process. Some say it's after a period of intense rain, while others claim it's in July.

Pollination in *Rafflesia*

Rafflesia is a plant that thrives in rainforests but is in danger of going extinct owing to habitat loss and poaching because its buds are taken and sold for their potential medical benefits. *Rafflesia* cannot develop in captivity, and pollination is infrequent because the majority of specimens only have male or female flowers. In order to transfer pollen to a female flower, a fly must first land on a male flower and avoid being eaten. If pollination does take place, the flower gives birth to a berry-shaped, smooth-skinned fruit with a diameter of around 5 inches. Fortunately, since squirrels and birds like this fruit, they can aid in seed dissemination.

Although male and female individuals may be close, flower bud mortality ranges between 80%-90% percent per site, reducing the likelihood of two individuals co-blooming. Additionally, because flowers only live for 5-7 days, pollination is hampered by a time constraint. The fact that present population distributions are scattered because of habitat loss complicates issues even more. Therefore, for sexual reproduction to occur, it must happen that both a male and a female bloom during the same 5-7 days and that a fly may transport pollen between the often dispersed populations.

Rafflesia lacks any discernible leaves, roots, or even stems, unlike many parasites that resemble regular plants. *Rafflesia* individuals, which are likened to mushrooms, develop as thread-like strands of tissue that are deeply enmeshed in and in close contact with the host cells that surround them and serve as a source of nutrition and water. The blooms are perhaps the sole characteristically plant-like feature of *Rafflesia*, but even these are peculiar due to their huge size (up to 3 ft in diameter), typical reddish-brown colour, and rotting flesh-like odour. Despite being parasitic, *Rafflesia* species often do not kill the hosts they parasitize, despite the resource loss they cause.

Rafflesia, in contrast to other parasites that are crucial to study because of the economic harm they do to crucial crops, generates income through ecotourism.

Challenges in researching *Rafflesia*

For the 180 years since its discovery, *Rafflesia* has remained challenging to research for a number of reasons. Individuals first become completely ensconced in the host plant that they parasitize. *Rafflesia* individuals only become apparent as flower buds when they emerge from the host body. Although more conventional techniques like anatomical sectioning may be used

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to investigate *Rafflesia*, doing so would probably lead to the death of both the host and the parasite.

Second, *Rafflesia* is a rare plant that is only found in Southeast Asia's isolated lowland forests. A large portion of its natural habitat in this area has been turned into farms or forest concessions, and in some areas of its distribution, the buds are collected and sold for their alleged therapeutic properties.

Third, even after *Rafflesia* individuals emerge as flowers, they only remain viable for a few days before rotting away. Due to all of these variables, it is challenging to even locate *Rafflesia* locations. Even when they are located, the sites are frequently not protected, making it uncertain whether they will be present in years to come.

CONCLUSION

This is why protecting *Rafflesia* habitats are of utmost importance as opposed to destroying current populations (as is the case for noxious parasitic plant weeds). The easiest and most straightforward strategy to conserve *Rafflesia* would be to preserve as much of its habitat as possible, but this is not currently feasible throughout its range. Therefore, it is necessary to look into important issues that will help determine priorities for *in-situ* (within natural habitat) breeding programmes, management of currently protected sites, and acquisition of unprotected sites. *Ex-situ* (not in natural habitat) propagation has only recently become possible for the first time in history.