THE PHYSIOLOGY OF PARASITIC PLANTS

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Abstract: Parasitic plants, their life, types of parasitic plants, living places of parasitic plants, The impact of parasitic plants on other plants.

Key words: parasitic, physiology, impact with other plants.

Parasitic plants are a unique group of plants that depend on other plants for nutrients and water. They attach to the host plant using specialized structures called haustoria. These plants can negatively affect the growth and productivity of their hosts. Some parasitic plants are completely dependent on their hosts, while others can perform partial photosynthesis. Understanding their physiology and impact on ecosystems is important for agriculture and biodiversity conservation.

Parasitic plants inhabit a wide range of ecosystems, including forests, grasslands, and agricultural fields. They thrive in diverse environmental conditions, from temperate to tropical regions, depending on their host plant availability**.** These plants can be classified as obligate or facultative parasites based on their dependence on the host. Obligate parasites rely entirely on their host for water and nutrients, whereas facultative parasites can survive independently under certain conditions. Their external structure includes specialized organs such as haustoria, which penetrate the host tissue to extract nutrients**.** The internal structure of parasitic plants is adapted for resource acquisition, with modified vascular systems facilitating the transport of water and nutrients from the host. Some species, like Cuscuta (dodder), lack chlorophyll and depend completely on their host for survival. Others, such as Striga (witchweed), possess limited photosynthetic ability but still rely on their host for essential resources**.** Parasitic plants significantly impact host physiology, often leading to stunted growth and reduced crop

yields**.** Studying their structural adaptations and ecological interactions is crucial for developing effective management strategies in agriculture and conservation.

Rafflesia is a genus of parasitic flowering plants found primarily in the rainforests of Southeast Asia, particularly in Malaysia, Indonesia, Thailand, and the Philippines. This plant is famous for producing the world's largest individual flowers, which can grow up to 1 meter (3 feet) in diameter and weigh up to 10 kilograms (22 pounds)

Unlike most plants, Rafflesia lacks leaves, stems, and roots. Instead, it lives entirely as a parasite, drawing nutrients and water from the host plant, typically a Tetrastigma vine, which belongs to the grape family. Since it has no chlorophyll, it cannot photosynthesize and completely depends on its host for survival.

Corpse-Like Smell: The flower emits a strong, foul odor similar to rotting flesh, which attracts carrion flies for pollination.

Ephemeral Bloom: The flowers take months to develop but only last for a few days before wilting.

Rare and Endangered: Due to habitat destruction and its complex life cycle, Rafflesia species are considered endangered.

Rafflesia remains one of the most mysterious and fascinating plants in the world, symbolizing the incredible diversity of tropical ecosystems. Parasitic plants are a unique group of plants that depend on other plants for water, nutrients, and sometimes photosynthesis. They have evolved specialized physiological mechanisms to extract resources from their host plants. Based on their dependency, parasitic plants are classified as obligate parasites, which cannot survive without a host, and facultative parasites, which can grow independently but benefit from parasitism. Parasitic plants have developed specialized structures called haustoria, which penetrate the host plant’s vascular system to extract water and nutrients. They mainly connect to the xylem for water and minerals and sometimes to the phloem for organic compounds like sugars. Obligate holoparasites (e.g., *Orobanche* and *Cuscuta*) entirely rely on their host and lack

chlorophyll, meaning they cannot perform photosynthesis. Hemiparasites (e.g., *Striga* and *Viscum album*) can conduct partial photosynthesis but still depend on their host for essential nutrients. Parasitic plants exhibit various physiological changes to enhance their survival and efficiency:

Haustorial development – The haustorium is a highly specialized organ that invades host tissues and facilitates nutrient transfer.

Hormonal manipulation – Parasitic plants can alter host plant hormone levels. For example, *Striga* responds to strigolactones released by the host's roots, which trigger its seed germination.

Altered photosynthesis – Some parasitic plants have reduced chlorophyll levels, leading to low or no photosynthetic activity.

Parasitic plants significantly impact the physiology of their host plants:

Reduced growth and yield – They deprive the host of nutrients, water, and energy, often causing stunted growth and lower crop production.

Increased metabolic stress – The host experiences physiological stress due to nutrient loss and competition.

Defense mechanisms – Some host plants develop resistance by producing secondary metabolites or strengthening their cell walls to prevent haustorial penetration.

The physiology of parasitic plants is closely linked to their mode of survival and interaction with their hosts. Understanding these physiological mechanisms is essential for developing effective strategies to control harmful parasitic species in agriculture and ecosystems.