

Paragraph

Parasitic Plants

- 1► Parasitic plants are plants that survive by using food from a host plant rather than producing their own food from the sun's energy. Because they do not need sunlight to survive, parasitic plants are generally found in shaded areas as opposed to areas exposed to direct sunlight. The plants can be classified in various ways; one of the most prevalent methods is by determining whether the plant depends wholly on its host (holoparasite) or has some degree of photosynthesis¹ ability (hemiparasite), which allows it to provide some of its own nutrients when necessary. Regardless of which classification a parasitic plant falls under, it does rely on a host plant for its primary means of sustenance. At times it may overtake its host, although the parasitic plant will rarely destroy the host entirely.
- 2► In addition to whether the parasite is a holoparasite or a hemiparasite, another important method of classification exists to differentiate various plants. This classification is used to recognize how the plant attaches itself to its host. A stem parasite connects to the host stem, often wrapping itself around the stem, whereas a root parasite joins with the root of the host. In both instances, the parasites attach themselves to the host plant by means of their own modified root system, a haustorium. The haustorium penetrates into the host plant and creates a vascular system that channels nutrients from the host plant to the parasite.
- 3► In order for the parasitic plant to have the opportunity to thrive, it has to germinate, or sprout seeds close to the host plant whose nutrients it wishes to draw from. This can happen in multiple ways. New seeds may drop from existing plants adjacent to current host plants and their seedlings, creating an expanding area for new parasitic plants to bloom. In some cases, insects, birds, or small animals may transport tiny seeds from the parasites to new regions, where they may end up in proximity to new host plants that they can attach to for survival.
- 4► Once the seeds are in the vicinity of a host plant, they also need a method to determine in which direction to grow to reach the host. Root parasitic plants generally use chemical clues dispersed into the soil by the host plant to determine the direction. For most root plants, they can only grow three to four millimeters without nutritional provision from the host plant, so it is imperative that root seeds fall in very close proximity to the host. Stem parasites, on the other hand, can grow several centimeters on their own, before requiring an attachment to the host plant. Thus, stem parasites do not need to sprout as close to the host as a root parasite does. In addition, while scientists have concluded that root parasites use chemical clues as a guide, they believe that stem parasites rely on odor and light to turn them in the appropriate direction.
- 5► Seeds from the dodder, a stem parasite, can remain dormant for up to five years before they look for a host plant. Once awakened, the seed germinates above ground and then rapidly sends out stems in search of a host. A dodder seed has enough autonomous resources within its seed to survive for about six days. During this time, its stems can branch out up to six centimeters to reach a host plant. After the host plant is located, the dodder stem wraps itself around the host stem, moving in an upward direction and attaching its haustoria to several locations along the host plant's stem. In experiments performed with dodders and a variety of compatible host plants, experts have suggested dodders have a means to seek out plants with higher levels of sugar in them, which raises the parasite plant's chances of survival.
- 6► There is an additional way in which parasitic plants can be categorized. Certain parasitic plants are considered generalists, attaching themselves to a diversity of host plants, while other parasites specialize in just a few, or even a single, type of host plants. The dodder is a generalist, choosing among several kinds of hosts. The world's heaviest

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flower, a species of rafflesia, is a specialist parasite that flourishes among, and lives off of, only the roots of jungle vines. Each of its ponderous blooms can weigh up to 15 pounds (7 kilograms) and can measure up to 3 feet (1 meter) across.

GLOSSARY

1. *photosynthesis*—a process in which green plants convert water and carbon dioxide into food when exposed to light

17. The phrase "as opposed to" in paragraph 1 is closest in meaning to
- (A) in conflict with
 - (B) instead of
 - (C) on the other side of
 - (D) away from
18. The word "sustenance" in paragraph 1 is closest in meaning to
- (A) sunlight
 - (B) protection
 - (C) maturity
 - (D) food
19. The word "channels" in paragraph 2 is closest in meaning to
- (A) carries
 - (B) penetrates
 - (C) creates
 - (D) prevents
20. The word "adjacent" in paragraph 3 is closest in meaning to
- (A) connected
 - (B) remote
 - (C) away
 - (D) near
21. The word "dispersed" in paragraph 4 could best be replaced by
- (A) contained
 - (B) limited
 - (C) spread
 - (D) dug
22. The phrase "branch out" in paragraph 5 could best be replaced by
- (A) decline
 - (B) collect
 - (C) modify
 - (D) extend
23. The word "compatible" in paragraph 5 could best be replaced by
- (A) suitable
 - (B) related
 - (C) inappropriate
 - (D) solid
24. The word "diversity" in paragraph 6 could best be replaced by
- (A) uniformity
 - (B) variety
 - (C) adaptation
 - (D) likeness