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The Orchid That Lives in the Dark: Ghost Orchid Reappears in Kinnaur After Several Decades

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It has no green leaves, no chlorophyll and no conventional way of making its own food. Hidden beneath the Himalayan forest floor, the elusive Ghost Orchid has resurfaced in Kinnaur—revealing yet another secret of the Western Himalaya.

Imagine walking through a Himalayan forest and finding a flower that seems almost too delicate to be real.

There are no broad green leaves announcing its presence. No lush foliage surrounds it. It does not turn its leaves towards the sunlight. For most of its existence, it remains hidden beneath the forest floor, invisible to the human eye.

And then, for a brief period, it appears.

This is the Ghost Orchid, *Epipogium aphyllum* Sw., one of nature's most unusual orchids. Recently, this elusive species was recorded again in Kinnaur, Himachal Pradesh, after several decades without a contemporary record from the region. The rediscovery was reported from the Rakchham area of the Rakchham–Chitkul Wildlife Sanctuary, where only four individuals were observed.

The discovery is remarkable not simply because the orchid is rare. It is remarkable because of how this plant lives.

It survives without chlorophyll.

It survives without photosynthesis.

And for much of its life, it remains hidden underground.

A flower that behaves like a ghost

The Ghost Orchid is a perennial terrestrial orchid with an extraordinary life strategy. Its above-ground shoot is delicate, pale and ephemeral, while its major phase of existence occurs beneath the soil.

According to the detailed biological account by Taylor and Roberts (2011), the plant has a highly reduced above-ground structure with leaves represented largely by small scales. Its subterranean rhizome is much more important to its survival than its short-lived flowering stem.

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Fig. 1: *Epipogium aphyllum* (Source: Pedra Espiga)

This is where the orchid's ghost-like character begins. For years, a forest may appear to contain no Ghost Orchids at all. Then, under suitable conditions, a slender flowering stem can suddenly emerge from the forest floor. The flowering itself is unpredictable. The species may remain unseen above ground for several successive years, and historical observations have documented remarkably long periods between appearances. Taylor and Roberts (2011) noted that *E. aphyllum* has even reappeared at some sites after decades of apparent absence.

The recent Kinnaur report similarly describes the flowering stem as visible for only around 10–12 days after which the plant disappears from view again. For a field botanist, therefore, finding the Ghost Orchid is almost a matter of timing. You have to be there when the ghost decides to appear.

The plant that does not need chlorophyll!

Perhaps the most fascinating question is also the simplest:

How does a plant survive without chlorophyll?

Chlorophyll is the green pigment that allows most plants to capture light energy and use photosynthesis to produce organic compounds from carbon dioxide and water. The Ghost Orchid has abandoned this conventional strategy.

Epipogium aphyllum is achlorophyllous and obligately mycoheterotrophic. In simple terms, it cannot photosynthesize and instead obtains its nutrition through fungi associated with its underground tissues. Taylor and Roberts (2011) describe the species as completely dependent on its fungal symbiont throughout its life cycle. This is not parasitism on decaying leaves, despite the older term "saprophytic orchid" sometimes being used for such plants. The distinction is important. The Ghost Orchid does not simply feed on dead organic matter. It obtains nutrients through a living fungal relationship. Its secret is hidden beneath the soil.

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The key to understanding the Ghost Orchid lies in the microscopic world beneath our feet.

Its rhizome is closely associated with fungi, particularly fungi belonging to the genus *Inocybe*. Roy et al. (2009) used molecular techniques to investigate the fungal partners of *E. aphyllum* and found strong associations with ectomycorrhizal *Inocybe* species. Their work demonstrated that the orchid's nutrition is intimately connected with its fungal partners.

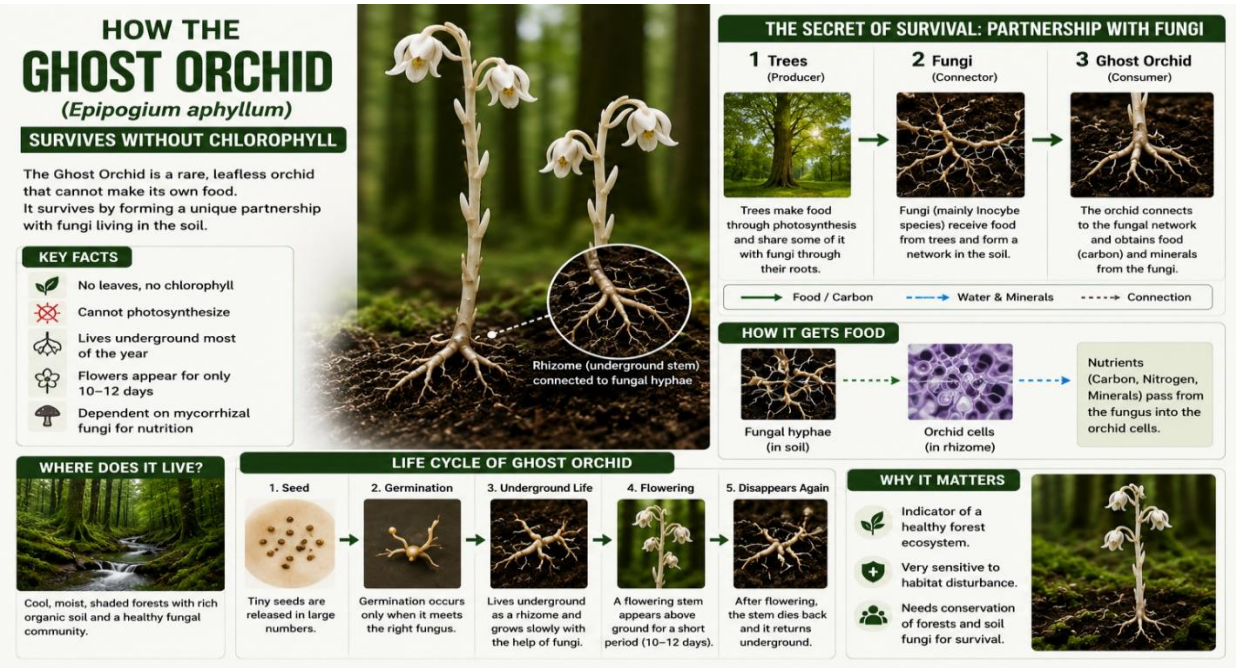


Fig. 2: The survival mechanism of *Epipogium aphyllum*

The exact ecological pathway is more complicated than this simplified diagram suggests, but the central idea is fascinating: the Ghost Orchid obtains organic carbon and mineral nutrients through its fungal association rather than producing its own carbon through photosynthesis.

Modern research on mycoheterotrophic orchids shows that this evolutionary transition from photosynthesis to fungal dependence involves major changes in plant metabolism and genome function. *E. aphyllum* is one of the completely mycoheterotrophic orchids investigated in this context. In other words, the Ghost Orchid has not merely lost its green colour. It has evolved an entirely different way of living.

The forest is more than what we see! This unusual lifestyle also changes the way we should think about conservation. When we look at a forest, we see trees, shrubs, herbs and flowers. But beneath that visible landscape exists another ecosystem, the one made up of roots, fungi, microorganisms, organic matter and complex nutrient exchanges.

The Ghost Orchid belongs to this hidden ecosystem. Its survival therefore depends on more than protecting the four flowering plants observed in Kinnaur. The forest habitat and the underground

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fungal community that support the species are equally important.

Taylor and Roberts (2011) suggested that the availability of suitable fungal partners may be a critical factor controlling the establishment and persistence of *E. aphyllum*. They also highlighted the vulnerability of these relationships to habitat fragmentation and environmental change. This makes the orchid a powerful reminder that conservation is not always about protecting what we can see. Sometimes, it means protecting what we cannot see.

Kinnaur's botanical secret

The recent Kinnaur observation is particularly significant because the documented history of *E. aphyllum* in Himachal Pradesh is limited. The 2026 reports state that historical records include a report from Fagu in Shimla district by Henry Collett in 1921, a collection by Dr Rau in 1959 and another collection attributed to Dr. Vaid from the 1980s, although the date of the latter record is reportedly still being verified. The new Kinnaur record therefore adds another important location to the state's botanical history.

A discovery that expands the map

The importance of the Kinnaur record goes beyond adding one more orchid to a species list. A recent 2026 checklist of orchids of Himachal Pradesh documents *Epipogium aphyllum* among the state's unusual leafless mycoheterotrophic orchids and records the remarkable diversity of orchids across the region. The checklist documents 97 orchid species in Himachal Pradesh, highlighting the state's substantial but still incompletely understood orchid diversity. (Verma et al., 2026).

The Kinnaur finding therefore fits into a much larger story. The Western Himalaya still holds many botanical secrets with plants that are rare, flower only briefly, remain hidden underground or depend on microscopic organisms that often go unnoticed. The Ghost Orchid belongs to all these categories, making its rediscovery a remarkable reminder of the hidden botanical diversity that still exists within the Himalayan forests.

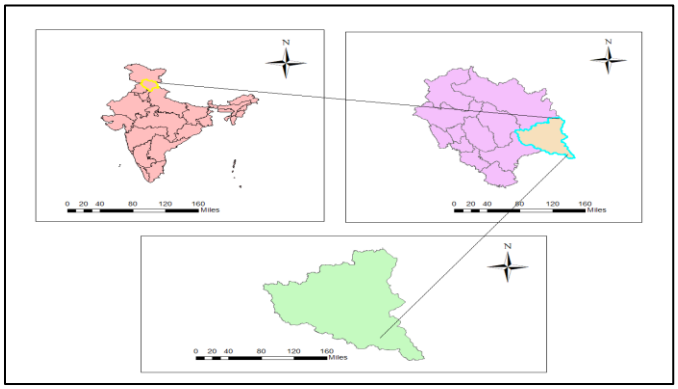


Fig 3. Location map of Kinnaur district

Why this discovery matters

Finding only four individuals might sound disappointing. For conservationists, it is the opposite. Four plants are evidence that the species persists in the landscape. They provide an opportunity to document its habitat, flowering period, associated vegetation and fungal relationships. They also provide a starting point for future surveys. The appropriate response to such a discovery, however, is not to collect the plants or disturb their habitat. It is to observe, document and protect.

Photographic records, GPS-based observations, phenological monitoring and repeated surveys can help scientists understand the species without removing it from its natural habitat. The 2026 field team itself encountered the orchid during routine monitoring and photographed the plants in their natural surroundings. That is precisely how rare species should increasingly be studied.

The Himalaya still has secrets

The rediscovery of the Ghost Orchid offers a humbling lesson. We often imagine that discovering a new species or rediscovering a rare one requires travelling to an untouched corner of the planet. But sometimes the secret is already there. It is simply hidden. A plant may spend years beneath the soil. A fungus may form an invisible network around roots. A flowering stem may emerge for little more than a week and then disappear. The forest continues functioning whether or not we notice. And every now and then, it gives us a glimpse.

In Kinnaur, that glimpse came in the form of four pale, delicate Ghost Orchids rising from the forest floor. They cannot make their own food. They do not remain visible for long. They may disappear for years. Yet they survive. Perhaps that is the most remarkable thing about the Ghost Orchid. It reminds us that absence is not always disappearance and that some of nature's most extraordinary stories are happening where we cannot see them.

The ghost beneath our feet

The next time we walk through a Himalayan forest, it may be worth looking beyond the obvious. The tallest tree may not be its most fascinating resident. The brightest flower may not be its rarest. And the greenest plant may not be the one with the most extraordinary story. Somewhere beneath the forest floor, connected to a world of fungi and roots, a Ghost Orchid may be waiting. It waits for the right season, the right conditions, and the perfect moment to appear. And when it does, the forest may reveal its ghost for only a few days before quietly taking it back into the darkness.

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