

## Foliar Pathogens in Guam: *Phomopsis* (*Diaporthe*)

Diseases: Phomopsis Blight, Leaf Spot

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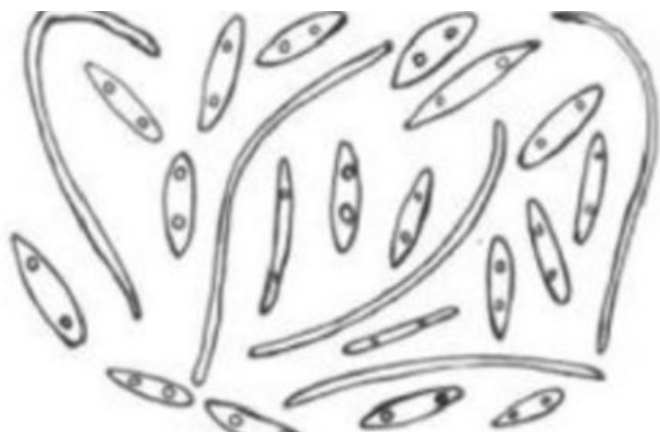


Figure 4. Alpha conidia (smaller, oval, with oil spots); and beta conidia (long and thin) of *Phomopsis vexans*

Source: [https://www.researchgate.net/publication/345980960\\_Phomopsis\\_blight\\_of\\_Solanum\\_melongena\\_-\\_BrinjalEggplant](https://www.researchgate.net/publication/345980960_Phomopsis_blight_of_Solanum_melongena_-_BrinjalEggplant)

### Introduction

*Phomopsis* is the name of the fungus that produces conidia within a fruiting body (pycnidium). It is closely related to *Phyllosticta*, *Phoma*, *Macrophoma*, and *Dendrophoma* because they all produce small, 1-celled, non-colored, ovoid conidia. However, *Phomopsis* differs in that it produces not only the ovoid conidia (alpha conidia), but also thin stylospores (beta conidia). *Phomopsis* is also referred to as *Diaporthe* because it produces ascospores (sexual spores) within a perithecia. Perithecia are not commonly found on Guam.

### Hosts

**PHOMOPSIS BLIGHT, PHOMOPSIS LEAF SPOT, and LEAF SPOT** diseases of eggplant are caused by the fungus *Phomopsis vexans*. It is a major disease of eggplant on Guam producing leaf, stem, and fruit symptoms. Leaf spots are clearly defined, gray to brown and numerous—eventually leading to entire leaf blight. Black fruiting bodies develop within leaf spots. Stems will develop cankers. The genus *Phomopsis* was mentioned as a foliar pathogen on 6 hosts in the Index of Plant Diseases on Guam. The most

important and common disease on Guam is *Phomopsis* blight of eggplant, but *Phomopsis* has also been found causing leaf spots on avocado, date palm, and siam weed, and causes citrus melanose (scab) of calamansi and lemon. Through molecular testing, *Diaporthe pseudomangiferae* has been identified on avocado on Guam. Neither *Phomopsis* nor *Diaporthe* were mentioned in the Diseases of Cultivated Crops in Pacific Island Countries.

### Morphology of *Phomopsis vexans*

Black, globe-shaped pycnidia are embedded in host tissue and erupt through the epidermis (Fig. 1). Pycnidia are 120-350 µm in diameter (Fig. 2) and have a small opening (ostiole) at the apex from which spores can be seen extruded in cream to yellow-colored spore tendrils under moist conditions. Spores are produced on simple or branched conidiophores which are septate, hyaline, 10-16 µm long, and line the inside of the pycnidium. Two types of spores are produced: alpha and beta conidia (Fig. 2, Fig. 4). Alpha conidia (pycnidiospores) are 2-3 x 5-8 µm, single-celled, oval to fusoid, colorless, and usually contain two or three visible oil droplets. Beta conidia (also referred to as stylospores) are colorless, septate, single-celled, long and thin (0.5-2 µm wide x 18-32 µm long), and generally curved. Beta conidia should be present to confirm *Phomopsis* identification, but often only alpha conidia are seen.

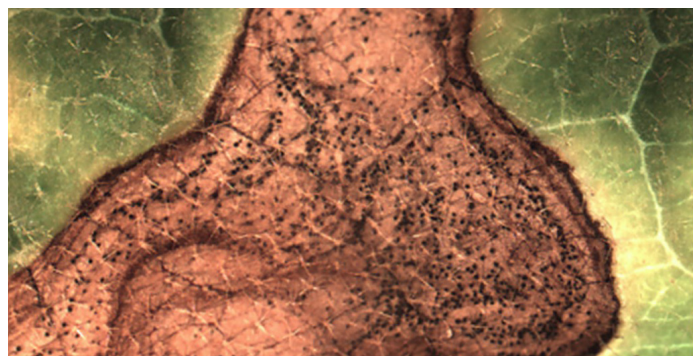


Figure 1. Through a hand lens, tiny black dot like structures of *P. vexans* can be seen  
Photo: B. Deloso

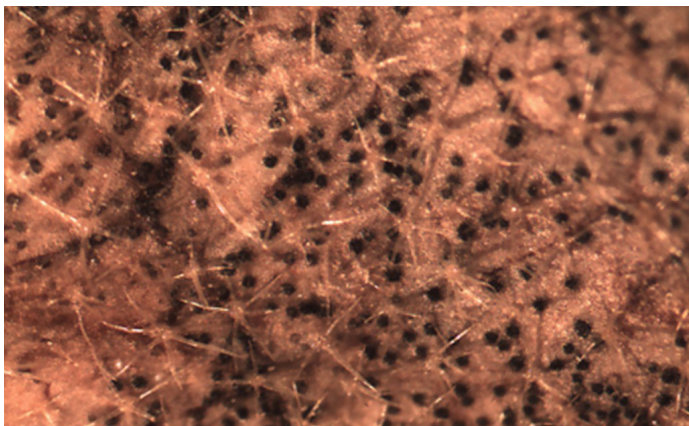


Figure 2. Pycnidia of *P. vexans* on eggplant, as seen through a dissecting microscope  
Photo: B. Deloso



Figure 3. Alpha conidia of *P. vexans* on eggplant, as seen through a compound microscope  
Photo: B. Deloso

### Visibility of *Phomopsis vexans*

- **With the unaided eye:** leaf spots are light brown, often with torn-out holes. Upon closer examination, black fruiting bodies are sometimes visible (Fig. 5, Fig. 6).
- **With a 14X coddington hand lens:** tiny black fruiting bodies are visible within spots (Fig. 1).
- **With a dissecting microscope:** fruiting bodies are clearly seen but individual spores are not visible (Fig. 2). Extruded spore masses can sometimes be seen under moisture chamber conditions.
- **With a compound microscope:** individual alpha and beta conidia can be seen in detail (Fig. 3).

### Disease Development on Guam

*Phomopsis* lives from one crop to another in infected plant debris, on seeds, and possibly as spores and mycelium in soil. Guam is the perfect climate for *Phomopsis*, since it requires hot and humid conditions for infection and disease development, with an optimum temperature of 28°C (82.4°F) and relative humidity 55% and above.

The pathogen releases hundreds of spores from fruiting bodies during moist conditions. These spores are carried by splashing rain, insects, and man or farm equipment, attacking lower leaves first. Spores can germinate and infect a plant within 12 hours, showing symptoms 7-10 days later.



Figure 5. Symptoms of *Phomopsis* blight on eggplant leaf  
Photo: J. Hudson

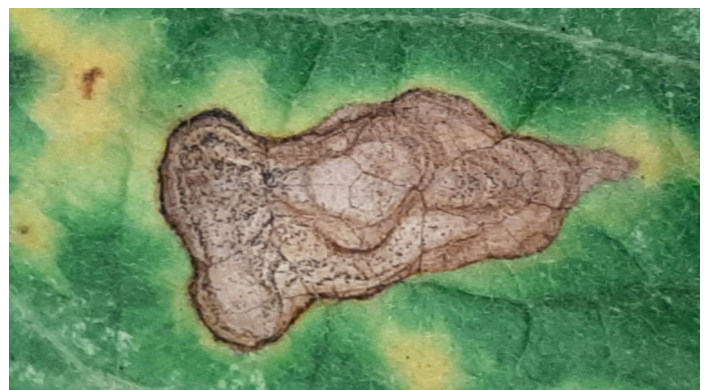


Figure 6. Pycnidia of *Phomopsis vexans* barely visible within a leaf spot on eggplant  
Photo: B. Deloso



Figure 7. Symptoms of *Phomopsis* blight on fruit and stem of eggplant  
Source: [https://www.semanticscholar.org/paper/Phomopsis-vexans-\(Sacc.-%26-Syd.\)-Harter%3A-Current-Mahadevakumar-Gr/54c79b68f94b949b909197ecb88590871c6f59da/figure/0](https://www.semanticscholar.org/paper/Phomopsis-vexans-(Sacc.-%26-Syd.)-Harter%3A-Current-Mahadevakumar-Gr/54c79b68f94b949b909197ecb88590871c6f59da/figure/0)

## Foliar Symptoms

Leaf spots are clearly defined, gray to brown with light centers, and generally are less than 1 cm in diameter. When leaves are badly affected, they become torn, yellow, and withered. Old spots may contain numerous small black dots which are the fungus' fruiting bodies (Fig. 6). When leaf spots are numerous, they may coalesce and cause a leaf blight symptom (Fig. 5). *Phomopsis* can also be identified by dry, sunken cankers on stems and soft, sunken areas on fruits (Fig. 7).

## For further information

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