Plant Archives Vol. 25, Supplement 2, 2025 pp.1683-1686 e-ISSN:2581-6063 (online), ISSN:0972-5210

Plant Archives

Journal homepage: http://www.plantarchives.org
DOI Url : https://doi.org/10.51470/PLANTARCHIVES.2025.v25.supplement-2.212

HOST SPECTRUM EVALUATION OF *STAGONOSPOROPSIS CUCURBITACEARUM* ISOLATED FROM RIDGE GOURD ON CUCURBITACEOUS CROPS

Kottam Sushma[1*], K. Gopal[1], Ch. Ruth[1], K. Arunodhayam[1], Syed Sadarunnisa[2], V.V. Padmaja[3] and K. Sairam[1]

[1]Department of Plant Pathology, Dr.Y.S.R.H.U., Andhra Pradesh-516105, India
[2]Department of Horticulture, Dr.Y.S.R.H.U., Andhra Pradesh-516105, India
[3]Department of Plant Physiology, Dr.Y.S.R.H.U. Andhra Pradesh-516105, India
*Corresponding author E-mail: sushmakottam1927@gmail.com
(Date of Receiving : 14-05-2025; Date of Acceptance : 18-07-2025)

ABSTRACT

Gummy stem blight, caused by *Stagonosporopsis cucurbitacearum*, affects a wide range of cucurbits. This study tested its host range across nine cultivated species under natural and artificial inoculation. All tested cucurbits, including muskmelon, watermelon, cucumber, pumpkin, and ridge gourd, developed symptoms such as leaf yellowing, stem cankers, and fruit rot. Ridge gourd showed the fastest symptom onset (four days), while pumpkin had the longest (ten days). The results confirm a broad host range, highlighting the need for effective disease management. Future research should focus on host resistance, pathogen variability, and integrated control strategies.
***Keywords*:** Gummy stem blight, *Stagonosporopsis cucurbitacearum*, Cucurbitaceae, host range.

Introduction

Gummy stem blight (GSB) is a devastating fungal disease affecting cucurbit crops worldwide. Caused by *Stagonosporopsis cucurbitacearum* (formerly *Didymella bryoniae*), this pathogen leads to significant yield losses by damaging stems, leaves, and fruits (Mangala *et al*., 2018). The disease is characterized by dark, necrotic stem lesions that exude a gummy substance, leaf blighting and fruit rot. Severe infections can result in plant death, reducing both crop quality and marketability (Pandey and Pandey, 2003). GSB spreads through infected seeds, plant debris and airborne spores, making it difficult to control in open-field and greenhouse conditions (Keinath, 2013). The Cucurbitaceae family includes economically important crops such as muskmelon (*Cucumis melo*), watermelon (*Citrullus lanatus*), cucumber (*Cucumis sativus*), pumpkin (*Cucurbita pepo*) and various gourds all of which are susceptible to GSB. Understanding the host range of *S. cucurbitacearum* is essential for effective disease management, as the pathogen can infect multiple cucurbit species and persist in infected plant material. Studies have shown that isolates from one host can successfully infect other cucurbits, indicating the broad adaptability of this pathogen. This study aimed to evaluate the natural and artificial infection of *S. cucurbitacearum* across nine cultivated cucurbit species. Field surveys documented natural infections, while artificial inoculation confirmed cross-pathogenicity among different hosts. By identifying the disease's impact and host susceptibility, these findings provide crucial insights for developing integrated management strategies to mitigate GSB in cucurbit production.

Material and Methods

Cucurbit plant species *viz*., cucumber (*Cucumis sativus* L.), muskmelon (*Cucumis melo* L.), watermelon (*Citrullus lanatus* (Thumb.) Stendle], bottle gourd (*Lagenaria siceraria* (Molina) Stendle), sponge gourd (*Luffa cylindrica* L.) and pumpkin (*Cucurbita pepo* Poir) were tested for the host range of the pathogen isolated from ridge gourd under greenhouse conditions. The seedlings were grown in pots and inoculated at 3-4 true leaf stage. For conducting host range studies of the

isolated pathogen, seedling inoculation method was carried out. Cucurbit seeds were sterilized by immersing in sodium hypochlorite solution (1%) for 30 sec and later rinsed with sterilized distilled water. These seeds were then sown in the polybags contained sterilized soil. Spore suspension was prepared for artificial inoculation by flooding the fungal culture grown on PDA with sterilized distilled water and later suspension concentration was adjusted to 1×10^6 spores per millilitre by haemocytometer. When seedlings were at 3-4 true leaf stage the seedlings were inoculated by spraying the spore suspension on the leaves using a fine atomizer until the leaves were completely wet. Equal volume of sterile distilled water was used in case of control. After inoculation, seedlings were incubated at 25°-30°C and covered with polythene bags to maintain 90-100% relative humidity to promote infection and lesion expansion.

Results and Discussion

Under natural conditions

During the survey, symptoms of gummy stem blight were observed in all nine plant species under natural conditions. These species included muskmelon (*Cucumis melo* L.), watermelon (*Citrullus lanatus* (Thumb) Stendle), bitter gourd (*Momordica charantia* Poir) cucumber (*Cucumis sativus* L.), bottle gourd (*Lagenaria siceraria* (Molina) Stendle), pumpkin (*Cucurbita pepo* Poir) and ridge gourd (*Luffa acutangula* (L.) Roxb.).

Muskmelon: Yellowing and wilting of leaves, starting from older foliage. Dark brown to black streaks on stems with gummy exudation. Fruit lesions appear as dark, water-soaked spots that enlarge and crack. Severe infections may cause fruit rot and plant death.

Watermelon: Small, circular, water-soaked lesions on leaves, later turning brown. Stems and vines show elongated, black lesions with gummy exudate. Fruits develop large, soft, black, rotting patches with fungal spores.

Bitter gourd: Rapid yellowing and drying of leaves. Stem lesions that exude gummy substances, leading to cracking. Fruits develop sunken, brownish-black spots with fungal growth. Weak vines prone to breakage and reduced fruit set.

Cucumber: Causes brown leaf spots, dark stem cankers with gum oozing and sunken fruit lesions. Vines may wilt and black fungal fruiting bodies appeared at the diseased portions.

Bottle gourd: Water-soaked, circular to irregular brown lesions on leaves. Stem cankers that exude a gummy, amber-colored resin. Premature defoliation and wilting of vines. Sunken, dark brown lesions on fruits, often leading to rotting.

Pumpkin: Dark brown to black necrotic lesions on stems and leaf petioles. Sticky, amber-colored ooze from infected areas. Leaves develop circular brown spots with concentric rings. Infected fruits show soft, sunken lesions that later turn black.

The artificial inoculation of the test plant species with *Stagonosporopsis cucurbitacearum*, isolated from ridge gourd, resulted in successful infection across all the tested host plants. The incubation period for symptom development varied, with the shortest being four days for ridge gourd and six days for sponge gourd. Cucumber, bottle gourd, and bitter gourd showed symptoms after 7 days. Muskmelon and watermelon showed symptoms after 8 days, while pumpkin had the longest incubation periods, taking 10 days for symptom expression.

Host range studies revealed that *Stagonosporopsis cucurbitacearum* was not restricted to only ridge gourd. The isolate can also induce characteristic disease symptoms on a variety of other cucurbit species, both under natural and controlled conditions. These findings are consistent with those of Bala and Hosein (1986), who reported that *D. bryoniae* isolates from watermelon were highly pathogenic to several cucurbit species, including watermelon, cucumber, squash, sponge gourd, ridge gourd, pumpkin, bitter gourd and muskmelon. A similar study by Lee *et al*. (1984) found that *D. bryoniae* isolate from cucumber was pathogenic to both pumpkin and watermelon. They also observed the isolate causing more pronounced symptoms in cucumbers than other cucurbits. Similar findings were also observed by Furukawa *et al*. (2007) in cross-inoculation studies with *Didymella bryoniae* isolates from pumpkin, cucumber, and muskmelon. All of which caused symptoms of bitter gourd. Conversely, the bitter gourd isolate was pathogenic to pumpkin, cucumber and muskmelon. The disease progression and symptom characteristics were consistent across all evaluations. Jeong *et al*. (2022) investigated the pathogenicity of *S. citrulli*, *S. caricae* and an unidentified *Stagonosporopsis* species on watermelon and muskmelon. Their findings confirmed that these species are capable of causing gummy stem blight on both watermelon and muskmelon.

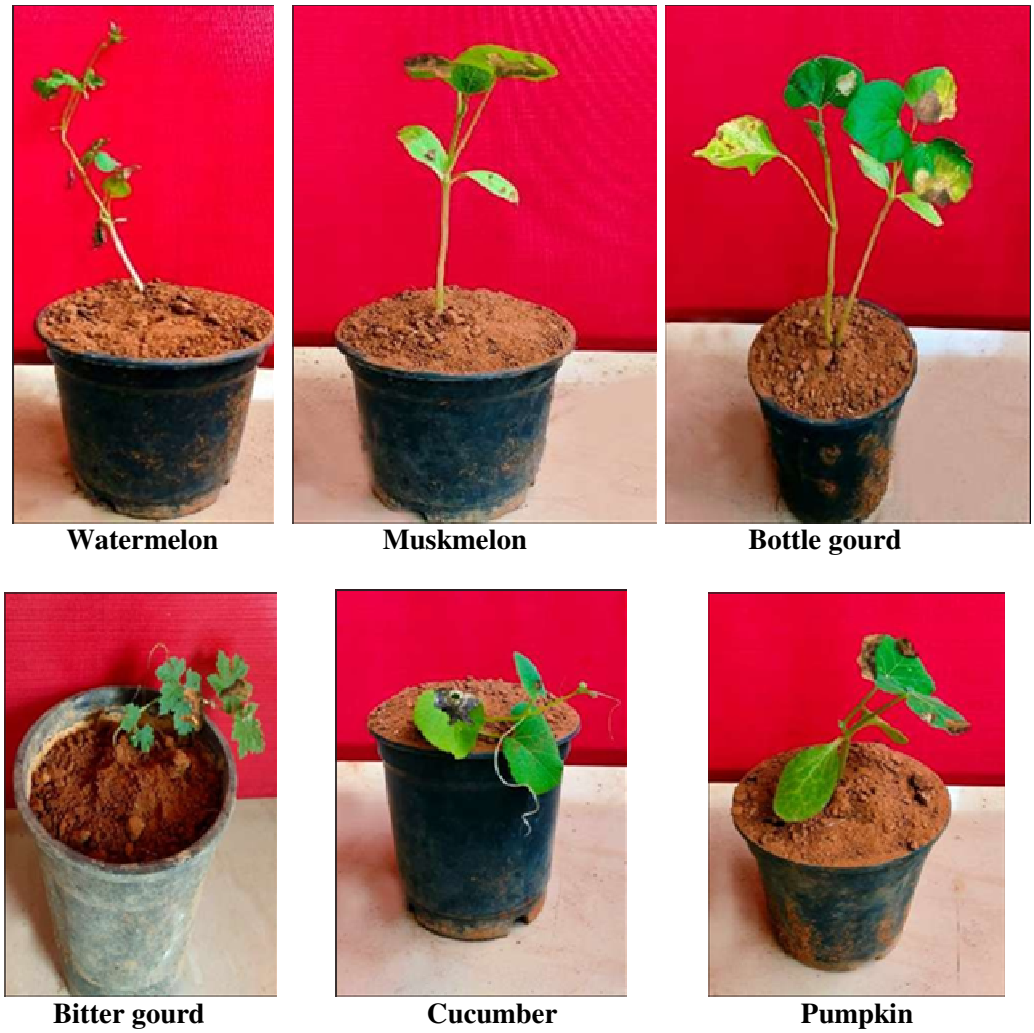

Plate 1: Host range of *Stagonosporopsis cucurbitacearum*

Table 1 : Host range of *Stagonosporopsis cucurbitacearum* under natural and artificial inoculation conditions

Host plant	Natural infection in field	Artificial inoculation
Muskmelon (*Cucumis melo* L.)	+	+
Watermelon (*Citrullus lanatus*(Thunb.) Mansf.)	+	+
Bitter gourd (*Momordica charantia* L.)	+	+
Cucumber (*Cucumis sativus* L.)	+	+
Bottle gourd (*Lagenaria siceraria* (Molina) Standl.)	+	+
Pumpkin (*Cucurbita pepo*)	+	+
Ridge gourd (*Luffa acutangula* (L.) Roxb)	+	+

+ Infected

Conclusion

This study confirms the broad host range of *Stagonosporopsis cucurbitacearum*, affecting multiple cucurbits with varying symptom severity. Ridge gourd showed the fastest disease progression, while pumpkin had the longest incubation period. The findings highlight the need for effective disease management through resistant cultivars, pathogen monitoring and integrated control strategies to protect cucurbit production.

Acknowledgements

My heartfelt thanks to the advisory committee for their constant support and guidance during the course of this research. I am also thankful to the department of Plant Pathology, College of Horticulture, Anantharajupeta, Dr. YSRHU, for providing necessary

resources and facilities for the completion of this project.

References

Keinath, A.P. (2014). Differential susceptibility of nine cucurbit species to the foliar and crown canker phases of gummy stem blight. *Plant Disease,* **98**, 247-254.

Bala, G. and Hosein, F. (1986). Studies on gummy stem blight disease of cucurbits in Trinidad. *Tropical Agriculture*, 63, 195-97.

Furukawa, T., Ono, Y. and Kishi, K. (2007). Gummy stem blight of balsam pear caused by *Didymella bryoniae* and its anamorph *Phoma cucurbitacearum. Journal of General Plant Pathology,* **73**, 125-28.

Jeong, Y.J., Kwon, O.K., Jeong, A.R., Lee, H., Moon, H., Lee, O.N., Hong, J.K. and Park, C.J. (2022). Population Structure of *Stagonosporopsis* Species Associated with Cucurbit Gummy Stem Blight in Korea. *Journal of Plant Pathology*, **38**(5), 522-32.

Lee, D., Mathur, S.B. and Neergaard, P. (1984). Detection and location of seed borne inoculum of *Didymella bryoniae* and its transmission in seedlings of cucumber and pumpkin. *Phytopathology*. **109**, 301- 08.

Mangala, G., Rajkumar, K. and Garampalli, H. (2018). Efficacy of fungicides and culture filtrate of native bioagents against *Didymella bryoniae* causing gummy stem blight disease in gherkin. *International Journal of Pure and Applied Bioscience,* **6**(1), 1122-32.

Pandey, K.K. and Pandey, P.K. (2003). First report of some new fungal diseases on wax gourd (*Benincasa hispida*) in the world from India*. Journal of Mycology and Plant Pathology*, **33***, 439-41.*

Keinath, A.P. (2013). Diagnostic guide for gummy stem blight and black rot on cucurbits. *Plant Health Progress,* **14**(1), 35.