New Disease Reports

WILEY

NEW DISEASE REPORT OPEN ACCESS

Symptoms of Leaf Necrosis and Mosaic Associated With Groundnut Ringspot Virus Infection in *Laurus nobilis*

M. A. V. Alexandre[1] | L. M. L. Duarte[1] | A. L. R. Chaves[1] | A. F. Ramos[1] | R. Harakava[1] | J. A. A. Filho[2]

[1]Instituto Biológico, São Paulo, Brazil | [2]APTA Pólo Leste Paulista, Monte Alegre do Sul, Brazil

Correspondence: M. A. V. Alexandre (maria.alexandre@sp.gov.br)

Received: 17 February 2025 | **Accepted:** 7 August 2025

Funding: This work was funded under the PDIP-FAPESP (2017/50334-3) and CNPq (315737/2021-2).

Keywords: bay laurel | medicinal herb

Originally from Asia, *Laurus nobilis* (bay laurel, family Lauraceae) is grown widely throughout Europe and the Mediterranean region. It is a popular medicinal plant in many countries, and its chemical composition explains both its therapeutic and commercial values (Nabila et al. 2022). In Brazil, *L. nobilis* is cultivated in the south and southeast (Fernandez-Andrade et al. 2016) and, to the best of our knowledge, no viruses or viroids have been documented in the country.

Necrosis and mosaic symptoms were observed on bay laurel in different locations in Brazil and five leaf samples were collected: SP1, SP3 and SP4 were purchased from different markets in São Paulo city (23°14′06″S–46°62′70″W, 23°57′88″S–46°65′10″W, 23°60′36″S–46°61′53″W), SP5 and SP6 from private gardens in São Paulo city (23°62′15″S–46°62′21″W) and Monte Alegre do Sul City (22°41′46″S–46°40′20″W), respectively. Total RNA was extracted from the samples using Trizol Reagent (Life Technologies, USA) and RT-PCR was performed using universal primers BR60 and BR65, which target a conserved region of the nucleocapsid (N) gene of orthotospoviruses (Eiras et al. 2001). Fragments of c. 500 bp from SP1 and SP3, which showed necrosis and mosaic symptoms (Figure 1), respectively, were amplified and sequenced directly (forward and reverse). No amplicons were obtained from other samples. The nucleotide sequences were compared with those in GenBank using BLAST and aligned with the corresponding sequences of groundnut ringspot virus (GRSV) isolates. Despite having different symptoms and being sampled from different markets, samples SP1 and SP3 most likely originate from the same region, since they share 100% nucleotide identity in a portion of the N gene (Table 1). GRSV isolates from Argentina and Brazil showed the highest identities with SP1 and SP3. The sequences were deposited in GenBank (Accession Nos. PQ329198 and PQ329199) and subjected to maximum likelihood analyses using PAUP v. 4.0b10 after estimating nucleotide substitution and gamma distribution with Modeltest v. 3.06. The GRSV sequence from *L. nobilis* plants (SP1 and SP3), and homologous GRSV sequences available in GenBank, revealed a monophyletic group composed of isolates from Brazil and Argentina (Figure 2).

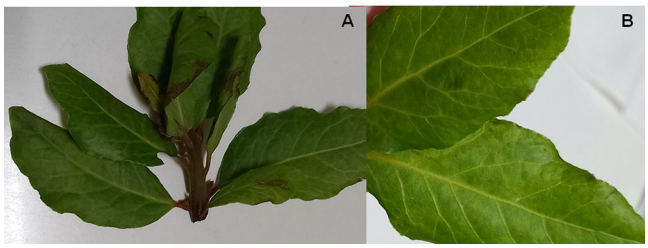


FIGURE 1 | *Laurus nobilis* leaves with necrosis and mosaic symptoms from a market in the city of São Paulo, Brazil: (A) sample SP1 and (B) sample SP3.

GRSV was first identified in South Africa in infected groundnut and is a widespread virus that causes economic losses in Argentina, Brazil, South Africa and the United States (Dewey et al. 1995; Webster et al. 2010). In Brazil, GRSV has been reported for several species of ornamental plants, in addition to vegetables such as cucumber, lettuce, pepper and tomato (Kitajima 2020). However, this is the first report of GRSV in bay laurel in Brazil and worldwide.

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2025 The Author(s). *New Disease Reports* published by British Society for Plant Pathology and John Wiley & Sons.



FIGURE 2 | Maximum likelihood tree constructed with partial nucleocapsid sequences of groundnut ringspot virus (GRSV) isolates from *Laurus nobilis* plants from Brazil (SP1 and SP3) and different geographic regions, constructed using PAUP program with HKY substitution model and gamma-distributed rate (G = 0.2883). Tomato chlorotic spot virus (TCSV) isolate (AF521102) was used as an outgroup.

TABLE 1 | Identity percentages between nucleocapsid protein gene of groundnut ringspot virus (GRSV) isolated from two samples of *Laurus nobilis*, SP1 (PQ329198) and SP3 (PQ329199), compared with other GRSV isolates at the nucleotide level, determined by PAUP v. 4.0b10.

	PQ329198	PQ329199
PQ329198	—	100
PQ329199	100	—
MG797643[a]—BRA	98.4	98.4
MN364668—BRA	98.4	98.4
U49702—ARG	98.0	98.0
MK501381—BRA	97.2	97.2
MH686229—BRA	97.2	97.2
GQ455453—ARG	97.2	97.2
MT215222—BRA	96.9	96.9
MW467981—BRA	96.9	96.9
KY400110—BRA	96.9	96.9
MK820663—BRA	96.9	96.9
OK539546—BRA	96.9	96.9
AY380780—BRA	96.4	96.4
MK140507—PRY	96.4	96.4
MH742958—ZAF	95.7	95.7
HQ644140—USA	95.7	95.7
AF487517—ZAF	95.3	95.3

Note: ARG = Argentina, BRA = Brazil, PRY = Paraguay, USA = United States of America, ZAF = South Africa.
[a]Amplified from thrips (vector).

Acknowledgements

This work was funded under the PDIP-FAPESP (2017/50334-3 and CNPq (315737/2021-2).

References

Dewey, R. A., L. Semorile, O. Grau, A. C. De Avila, and E. W. Kitajima. 1995. "Characterization of the N Gene of a Groundnut Ringspot Virus (GRSV) Isolate From Argentina." *Journal of Phytopathology* 143: 713–717. http://doi.org/10.1111/j.1439-0434.1995.tb00228.x.

Eiras, M., R. O. Resende, A. A. Missiaggia, and A. C. De Ávila. 2001. "RT-PCR and Dot Blot Hybridization for a Universal Detection of Tospoviruses." *Fitopatologia Brasileira* 26: 170–175. http://doi.org/10.1590/S0100-41582001000200009.

Fernandez-Andrade, C. M. M., M. F. da Rosa, E. Boufleuer, et al. 2016. "Chemical Composition and Antifungal Activity of Essential Oil and Fractions Extracted From the Leaves of *Laurus nobilis* L. Cultivated in Southern Brazil." *Journal of Medicinal Plants Research* 10: 865–871. https://doi.org/10.5897/JMPR2016.6291.

Kitajima, E. W. 2020. "An Annotated List of Plant Viruses and Viroids Described in Brazil (1926–2018)." *Biota Neotropica* 20: e20190932. https://doi.org/10.1590/1676-0611-bn-2019-0932.

Nabila, B., A. Piras, B. Fouzia, et al. 2022. "Chemical Composition and Antibacterial Activity of the Essential Oil of *Laurus nobilis* Leaves." *Natural Product Research* 36: 989–993. https://doi.org/10.1080/14786419.2020.1839450.

Webster, C. G., K. L. Perry, X. Lu, et al. 2010. "First Report of Groundnut Ringspot Virus Infecting Tomato in South Florida." *Plant Health Progress* 11: 1. https://doi.org/10.1094/PHP-2010-0707-01-BR.