



## Crown gall caused by *Agrobacterium tumefaciens* species complex: a novel nursery disease of *Tectona grandis* in Brazil

Rafaela C. F. Borges<sup>1</sup> · Maurício Rossato<sup>1</sup> · Greecy Mirian R. Albuquerque<sup>2</sup> · Maria A. Ferreira<sup>3</sup> · Ana C. M. Brasileiro<sup>4</sup> · Maria Esther N. Fonseca<sup>5</sup> · Leonardo Silva Boiteux<sup>5</sup>

Received: 3 September 2018 / Accepted: 27 November 2018 / Published online: 12 December 2018  
© Società Italiana di Patologia Vegetale (S.I.Pa.V.) 2018

**Keywords** Teak · Tumors · Pathogenicity

Symptoms of crown gall were observed in *Tectona grandis* (teak) in a clonal mini-nursery (~30% incidence), June 2017 in Brazil. The tumors were located mainly above the cutting point. Isolation procedures were carried in semi-selective MD1 medium using gall fragments and stem tissue near it. Four isolates were isolated and identified as RhizTeca (01–04). Pathogenicity tests were carried out by inoculating three plants of teak, *Datura stramonium*, *Capsicum annuum*, *C. chinense*, and tomato, by wounding the stem base of each plant with a needle previously immersed into the suspension ( $10^8$  CFU mL<sup>-1</sup>). Twenty days after inoculation the emergence of bacterial galls was observed in the inoculation sites. The teak isolates were re-isolated from all hosts 40 days after inoculation. The crown gall teak isolates were positive for 3-ketolactose from lactose (Moore et al. 2001). The molecular identification of the isolates was carried by multiplex PCR analysis for *A. tumefaciens* species complex and related species that cause crown galls, as *Rhizobium rhizogenes*,

*Allorhizobium viti*, and *A. rubi* (Puławska et al., 2006). All teak isolates amplified the specific 184 base pairs (bp) amplicon and were identified as part of the *A. tumefaciens* species complex. Bayesian inference (GTR + G + I model), of 1285 bp of 16S rRNA sequences (GenBank accession Nos. MF967403 and MF967402), from two putative teak isolates (RhizTeca01 and RhizTeca03) with several bacterial type strains of plant pathogenic bacteria was made. The phylogenetic tree formed a clade with both RhizTeca isolates and the type strain of *A. tumefaciens* [ATU16SRDF (GenBank D14500)] with “1” of posterior probability. This is the first report of *A. tumefaciens* biovar 1 infecting teak in Brazil, which could emerge as a novel and significant nursery disease.

## References

- Moore LW, Bouzar H, Burr T (2001) Gram-negative bacteria: *Agrobacterium*. In: Schaad NW (ed) Laboratory Guide for Identification of Plant Pathogenic Bacteria. APS Press, St. Paul, pp 15–34
- Puławska J, Willems A, Sobiczewski P (2006) Rapid and specific identification of four *Agrobacterium* species and biovars using multiplex PCR. Syst Appl Microbiol 29:470–479

✉ Rafaela C. F. Borges  
rafaelafal@hotmail.com

<sup>1</sup> Department of Plant Pathology, Instituto de Ciências Biológicas, Universidade de Brasília, Brasília, DF 70910-900, Brazil

<sup>2</sup> Department of Agronomy, Universidade Federal Rural de Pernambuco, Recife, PE 52171-900, Brazil

<sup>3</sup> Department of Plant Pathology, Universidade Federal de Lavras, Lavras, MG 37200-000, Brazil

<sup>4</sup> Embrapa Cenargen, Brasília, DF 70770-917, Brazil

<sup>5</sup> Plant Breeding Lab, Embrapa Vegetable Crops, Brasília, DF 70275-970, Brazil