

Reaction of jaboticaba trees cv. ‘Sabará’ to the species of gall forming nematodes

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ABSTRACT

Marques, M.L.S.; Jesus, J.M.I.; Oliveira, M.F.; Texeira, R.A.; Santos, P.R.R.; Santos, G.R.; Rocha, M.R. Reaction of jaboticaba trees cv. ‘Sabará’ to the species of gall forming nematodes. *Summa Phytopathologica*, v.46, n.4, p.342-344, 2020.

Tropical and subtropical fruit production plays an important role in the country’s economic scenario and has been affected by root-knot nematode. The jaboticaba tree is a plant widely cultivated in Brazil, and among the problems of the crop is the root-knot nematode of the genus *Meloidogyne*. This study aimed to evaluate the hostability of jaboticaba tree cv. ‘Sabará’, in different inoculum concentrations of *Meloidogyne incognita* and *Meloidogyne*

javanica. The inoculum used in the experiment was obtained from the roots of tomato cv. ‘Santa Cruz’. Jaboticaba trees were subjected to inoculation with concentrations of 0, 2000, 4000, and 8000 eggs + juvenile plant¹, for both species of nematodes. The plants of jaboticaba cv. ‘Sabará’ showed resistance concerning the development of *M. incognita* and *M. javanica* root-knot nematode with Reproduction Factor (RF) <1.

Keywords: *Meloidogyne incognita*, *Meloidogyne javanica*, Myrtaceae.

RESUMO

Marques, M.L.S.; Jesus, J.M.I.; Oliveira, M.F.; Texeira, R.A.; Santos, P.R.R.; Santos, G.R.; Rocha, M.R. Reação da jaboticabeira cv. ‘Sabará’ à espécies de nematóides formadores de galhas. *Summa Phytopathologica*, v.46, n.4, p.342-344, 2020.

A fruticultura tropical e subtropical tem um papel relevante no cenário econômico do país, e vem sendo prejudicada pelo nematoide das galhas. A jaboticabeira é uma planta bastante cultivada no Brasil e entre os problemas da cultura, estão os nematóides do gênero *Meloidogyne*. Este trabalho objetivou avaliar a hospedabilidade da jaboticabeira cv. Sabará, em diferentes concentrações de inóculos de *Meloidogyne incognita* e *Meloidogyne javanica*.

Os inóculos utilizados no experimento foram obtidos a partir de raízes de tomateiro cv. Santa Cruz. As jaboticabeiras foram submetidas à inoculação com as concentrações de 2000, 4000 e 8000 ovos + juvenis planta¹, para ambas as espécies dos nematóides. As plantas de jaboticaba cv. Sabará demonstraram resistência em relação ao desenvolvimento dos nematóides de galhas *M. incognita* e *M. javanica* com Fator de Reprodução (FR) <1.

Palavras-chave: Termos para indexação: *Meloidogyne incognita*, *Meloidogyne javanica*, Myrtaceae.

The jaboticaba tree, *Myrciaria jaboticaba* (Vell.) Berg, is a native species from Brazil, belonging to the Myrtaceae family, and the cultivar ‘Sabará’ is the most cultivated in the country (5), found most frequently in the states of Goiás, Minas Gerais, and São Paulo (4). Fruits are highly appreciated, and the economic potential of this species covers the fresh or industrialized fruit market (9).

Nematodes are important factors limiting the cultivation of several agricultural species, including fruit species. The root-knot nematode (*Meloidogyne* sp.) is the most common genus, causing severe losses in agricultural production (6), however, little is known about the effects of these nematodes’ parasitism on the jaboticaba tree. Therefore, the study aimed to evaluate the tolerance of jaboticaba tree cv. ‘Sabará’, under increasing concentrations of the root-knot nematode inoculum, *Meloidogyne incognita* (Kofoid & White) and *Meloidogyne javanica* (Treub) Chitwood.

A completely randomized design (CRD) in a 4x2 factorial scheme (concentrations of inoculum x nematodes) was used in the research. The experimental plot was represented by one plant per pot, and each concentration consisted of eight replications, totaling 56 jaboticaba seedlings, cultivar ‘Sabará’. As a susceptibility pattern (positive control), eight tomato plants, cultivar ‘Santa Cruz Kada’, were used. The nematode inoculum used was obtained from the tomato roots of the cultivar ‘Santa Cruz Kada’, processed by the technique proposed by Coolen; D’Herde (3). The nematode species were previously identified using morphological characters from the female perineal region and by confirming the *Meloidogyne* species, using the isoenzyme electrophoresis technique (2).

The certified jaboticaba seedlings of cultivar ‘Sabará’ were purchased from a commercial nursery. To produce tomato seedlings (positive control), sowing was carried out in polyethylene trays, the

commercial substrate was used. The eight-month-old jaboticaba seedlings and the tomato seedlings after 21 days after sowing were transplanted into polypropylene pots (2 L), containing soil previously autoclaved at 120 °C for 20 minutes, in the proportion of 1:1 (soil:sand). Inoculations were performed one week after transplantation, pouring 5 mL of each nematode suspension into three holes made in the substrate, 2 cm from the plants.

The concentrations used in each suspension were: 0 (control), 2,000, 4,000, and 8,000 eggs + juveniles of the second stage (J2) of *M. incognita* and *M. javanica* per jaboticaba seedling. The inoculation of the nematode suspension in tomato was with a concentration of 3,000 eggs + juveniles of the second stage (J2) of *M. incognita* and *M. javanica*. The positive control (tomato seedlings) was used only to verify the viability of the inoculum. Hostability assessment was carried out 90 days after inoculation (DAI) of the plants. The root system of each plant was carefully washed under running water, then weighed on an analytical balance and processed according to the methodology described above. The reproduction factor was calculated using the equation $RF = Fp/Ip$, where: RF - reproduction factor, Fp - final population density, and Ip - initial population density (7).

After 90 days of inoculation of jaboticaba trees and tomato, it was possible to observe the presence of nematodes in the root system of plants inoculated with *M. incognita*. The final population density (eggs + juveniles) in 10 g of roots of jaboticaba seedlings showed a maximum

increase of up to 4350 eggs + juvenile in 5 mL (Figure 1) according to the increasing dose of *M. incognita* inoculum. From this period, there was a marked decrease in the population density of nematodes due to the deficiency of food at the feeding site, leading to less population growth.

As for the species *M. javanica*, there was a maximum increase in the population with the dosage of 7070 eggs + juvenile/5 mL. From that level, the population decrease verified in 10 g of roots started (Figure 1). The reaction of the jaboticaba seedlings to the species *M. incognita* and *M. javanica* proved to be tolerance, according to the criterion of Oostenbrink (7), in all inoculation levels that were submitted, as they presented $RF < 1.0$. In this case, the plants presented the nematodes internally in their roots; however, there was a reduction in their multiplication, being the jaboticaba tree cv. 'Sabará', considered a plant resistant to these phytonematodes.

Although *M. javanica* has a low population density when compared to *M. incognita*, under the same inoculated concentrations, the correlation coefficient showed an $r = 0.99$, evidencing that there was a correlation close to 1, and the variation coefficient (CV) of 30.29%. The formation of galls outside the plant roots was not observed in the root samples of the jaboticaba trees, probably due to root lignification, which may have hindered the formation of galls during the evaluation period of the experiment (90 days after inoculation).

The lowest multiplication rate among all tested levels was at the dosage of 8000 eggs + juvenile /5 mL of *M. incognita*, with an $RF =$

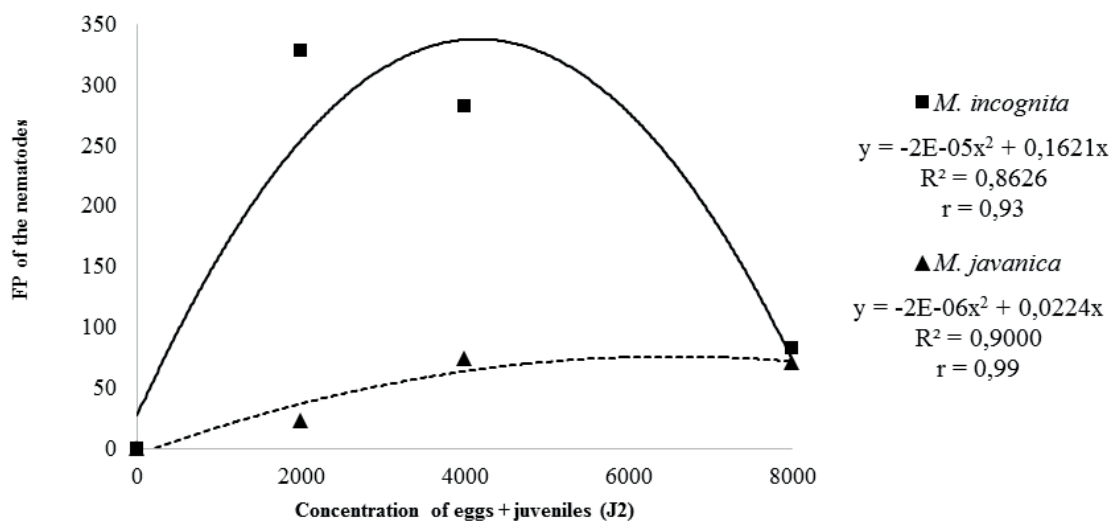


Figure 1. Relationship of the final population density (FP) of the nematode *Meloidogyne incognita* and *Meloidogyne javanica* in jaboticaba seedlings under different concentrations of inoculum

Table 1. Root fresh mass (RFM), final population density (FP) of nematodes in 10 g of roots, and reproduction factor (RF) of *Meloidogyne javanica* and *Meloidogyne incognita* in jaboticaba trees roots, after 90 days of inoculation.

Inoculation	<i>Meloidogyne javanica</i>			<i>Meloidogyne incognita</i>		
	RFM (g)	FP (10 g root)	RF	RFM (g)	FP (10 g root)	RF
2000	4.23 a*	68 b	0.03 a	3.64 a	1217 a	0.60 b
4000	4.21 a	511 a	0.14 c	3.16 a	444 b	0.11 a
8000	4.19 a	596 a	0.06 b	3.55 a	83 c	0.01 a
CV (%)	27.69	30.29	70.76	12.70	31.87	76.93

* Means followed by the same lowercase letter in the columns do not differ by the Tukey test at 5% probability.

0.01 (Table 1). Regarding the root fresh mass, there was no statistical difference between the treatments evaluated for both species of nematodes. However, when compared with the controls, lower values for root mass were found for both phytonematodes. In the literature, there are several fruit trees of subtropical and temperate climate that showed resistance reaction to *M. incognita* and *M. javanica* (1, 8).

According to the results obtained in the present study, it can be said that the jaboticaba tree cv. 'Sabará' did not offer favorable conditions for the population increase of the studied nematode species, thus presenting tolerance behavior to *Meloidogyne incognita* and *Meloidogyne javanica*.

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