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IN VIVO ANTAGONISTIC ACTIVITY OF *Trichoderma* sp. LBM202 AGAINST *Ceratobasidium niltonsouzanum* ACC1 IN YERBA MATE

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The yerba mate industry is vital to the economy of Misiones, Argentina, which is the leading global producer and exporter of this crop. However, poor management of yerba mate monocultures, exacerbated by high temperatures, soil nutrient deficiencies, and high humidity, encourages the development of white thread blight, a fungal disease caused by *Ceratobasidium niltonsouzanum*. This disease negatively impacts the yield, quality, and productivity of yerba mate crops. The use of biological control agents, such as fungi from the *Trichoderma* genus, presents a promising alternative to chemical fungicides due to their strong antagonistic properties against various phytopathogenic fungi. The study aimed to evaluate the *in vivo* biocontrol potential of the native *Trichoderma* sp. LBM202 strain from Misiones compared to copper sulfate, specifically against the *Ceratobasidium niltonsouzanum* ACC1 strain. The LBM202 strain had previously demonstrated effective antagonistic properties *in vitro* against ACC1. For the *in vivo* evaluation, a fully randomised experiment was designed, treating the ACC1 pathogen with both the LBM202 strain and copper sulfate across two blocks. Each block included three treatments, performed in quadruplicate, with control groups of inoculated seedlings using sterile toothpicks and treated seedlings without inoculation. The blocks were incubated for 45 days at 26°C under two different relative humidity (RH) conditions: 40% and 95%. Observations were made at intervals of 15, 30, and 45 days, recording plant height, number of leaves, severity class, total chlorophyll content, PSA, and PSR. The data obtained were analyzed with InfoStat software using ANOVA and the comparison of means by the Fisher LSD method. The results showed that seedlings inoculated with ACC1 and incubated at 40% RH displayed lower disease severity compared to those at 95% RH. Moreover, seedlings treated with the LBM202 strain exhibited significantly lower severity, class 1, compared to those treated with copper sulfate, which showed severity class 4 by day 45. Total chlorophyll content was also significantly higher in seedlings treated with LBM202 under both humidity conditions than in those treated with Phyton. At 40% RH, the LBM202 strain promoted yerba mate growth, resulting in statistically significant increases in plant height and leaf number compared to Phyton-treated seedlings. However, at 95% RH, the severe impact of the disease negated significant differences between treatments, as reflected in PSA and PSR measurements. These findings suggest that the *Trichoderma* LBM202 strain is the most

promising and effective biological control agent for managing white thread blight in yerba mate crops in Misiones.

Palabras clave: white thread blight - *Ilex paraguariensis* - biological control - phytopathology