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Portraits of a mycoparasitic fungus: *Calonectria hemileiae* – a newly discovered coffee leaf rust antagonist, with particular reference to it antifungal metabolites

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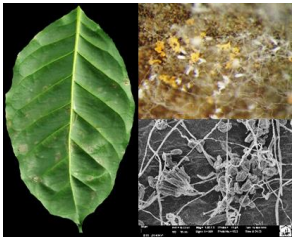
INTRODUCTION

- *Hemileia vastatrix (Hv)* is the etiological agent of the worst disease of coffee – coffee leaf rust (CLR)
- Devastated the coffee industry of Ceylon (Sri Lanka) in the 19th century
- In 2014: it caused a large epidemic in South America and Central America

Figura 1. Devastation of coffee plants by the fungus *H. vastatrix* causal agent of the worst coffee rust (CLR)



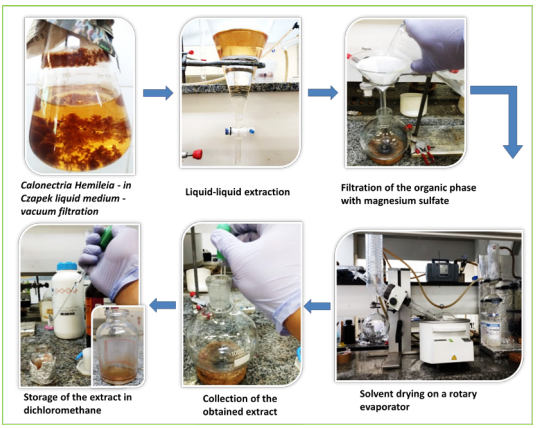
- World Coffee Research: financed research aimed at reviewing the use of natural enemies as biological control agents for *Hv.*
- focused its studies on fungi growing as mycoparasites on *H. vastatrix* pustules and endophytes.
- *Calonectria hemileiae (Ch):* the new species collected in Brazil on *H. vastatrix* pustules.

Figura 2. Biological control of the coffee leaf rust fungus *H. vastatrix* with an antagonistic species of *Ch* in planta

OBJECTIVE

Identify and evaluate the secondary metabolites produced by *Calonectria Hemileia*, aiming at obtaining new compost or biofungicides for or control of *H. vastatrix*.

MATERIAL AND METHODS



RESULTS

Filtrate: The filtrate obtained was capable of completely inhibiting urediniospore germination at 100%, but the inhibition dropped to 50% when the filtrate was diluted at 75% in water.

Dichloromethane Extract: The dichloromethane extract showed the highest level of inhibition of urediniospore germination. At concentration values of 1.0 mg ml-1, the extract completely inhibited the germination of *Hv.*

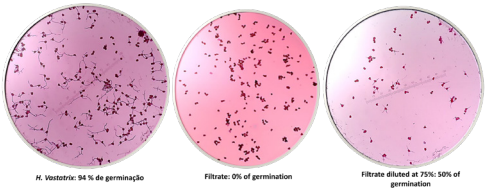


Figura 4. Percentage of germination of spores of *Hemileia Vastatrix* for or filtering of Calonectria in different concentration.

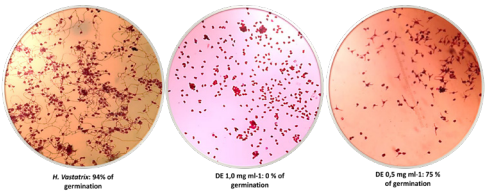


Figura 5. Percentage of germination of spores of *Hemileia Vastatrix* for the extract of dichloromethane (DE) in different concentration.

CONCLUSIONS

- *Calonectria hemileiae* have potential for direct use as a biocontrol agent against CLR
- *Calonectria hemileiae* produced metabolites which may prove useful as natural fungicides for controlling *H. vastatrix*.
- The dichloromethane extract in concentrarion of of 1.0 mg ml-1 showed the highest level of inhibition of urediniospore germination.

REFERENCES

Salcedo-Sarmiento, S., Aucique-Pérez, C.E., Silveira, P.R., Colmán, A.A., Silva, A.L., Corrêa Mansur, P.S., et al. (2021). Elucidating the interactions between the rust *Hemileia vastatrix* and a Calonectria mycoparasite and the coffee plant. iScience 24, 1–14

SUPPORT

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