FUNGICIDAL ACTIVITY OF EUGLENA CANTABRICA WATER EXTRACT AGAINST BOTRYTIS CINEREA

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Introduction

Microalgae are photoautotrophic microorganisms that produce a wide range of bioactive compounds with several activities such as antifungal. Since few reports (studies) are available on the activity of Euglena cantabrica against fungal plant pathogens, the aim of this research was to study the activity of the green microalgae water extract against the pathogenic fungus Botrytis cinerea in vitro and in vivo on strawberry fruits.

Materials and Methods

1. Water suspension of E. cantabrica fresh paste
2. Heating and stirring for overnight
3. Filtration of water extract
4. Water extract (WE)

Pathogen material
Grey mold symptoms on strawberry fruit

Plant material
Grey mold symptoms on strawberry fruit

Water extraction (Robert et al., 2016)

Activity on fungal colony growth
Botrytis cinerea colonies
Pathogen treatment

Activity on fungal spore germination
E. cantabrica WE
10⁸ spores/ml

PRE-HARVEST TREATMENT

1st Day: Fruits treatment by dipping in Ps suspension
2nd Day: Fruit harvesting + pathogen inoculation 10⁸ spores/ml

Strawberry fruit treatment and pathogen inoculation

Fruit incubation in a plastic box at ambient temperature.

WE concentration tested: 2.5·10⁻¹ and 1.25·10⁻³ g/ml.

Disease symptoms recorded: fruit infected area (%) after 6 day of incubation.

Results

Activity on fungal colony growth
Botrytis cinerea colony growth

Activity on fungal spore germination

PRE-HARVEST TREATMENT

INHIBITION of Botrytis cinerea symptoms by E. cantabrica WE

Water control
2.5·10⁻¹ g/ml

2.5·10⁻¹ g/ml Inhibition: 42%

2.5·10⁻¹ g/ml
No antifungal activity

Conclusions

The activity in reducing both colony growth in vitro and B. cinerea symptoms in pre-harvest treatment by Euglena cantabrica water extract suggests to continue the research for exploitation of its results in order to consider the microalgae as a potential useful tool for the disease management in sustainable agriculture.

Further research is needed to better understand the activity of the E. cantabrica water extract and which compound/s has/have the major antifungal activity.

References:

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