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GROWTH ENHANCEMENT IN ENDOPHYTIC *SPORORMIELLA* SP. AS A SOURCE OF BIOLOGICALS

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GOAL

Use of an endophytic fungus as biologicals source in disease supression caused by *Botrytis cinerea*

OBJECTIVE

Growth optimization and morphological characterization of the strain HTF58 depending on nutrient sources

INTRODUCTION

By far, several species of *Sporormiella* have been mentioned as producers of antifungal compounds like sporovexins, terezines and other novel products. The endophytic fungus *Sporomiella* sp. isolated from *Artemisia thuscula* is an important source of bioactive molecules against *Botrytis cinerea*. Thus, biomass optimization and characterization of the strain is essential

MATERIAL & METHODS

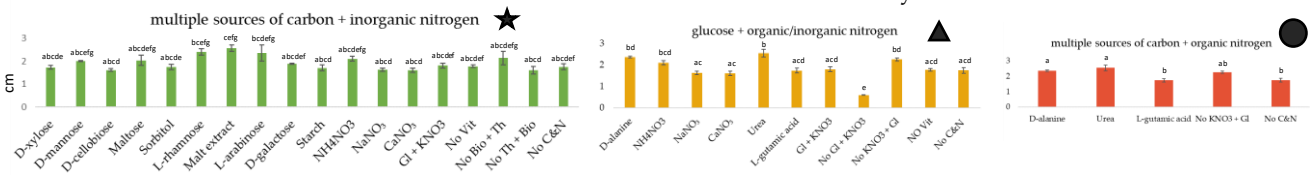
For the nutrient complex experiment different carbon (C) and nitrogen (N) sources, a basic synthetic medium was used. Glucose and KNO3 were substituted for other sources. Three groups of different sources complexes were selected to analyse the effect on colony diameter and morphology: i) multiple sources of carbon + organic nitrogen, ii) multiple sources of carbon + inorganic nitrogen, iii) glucose + organic/inorganic nitrogen. To determine differences within nutrient complex groups and their effects on growth, one-way analysis of variance (ANOVA) with JASP v. 0.15, with multiple comparisons according to Tukey ($p < 0.05$) was performed. Morphological features were observed to change according to nutrient dynamics like: circular colony extremity, lax growth, lobular growth, irregular growth, pigments production and tree-like growth. Correspondence analysis (CA) and Spearman correlation with PAST v. 3.18 were used to compare associations and to measure the strength of the relationship between paired data among nutrient complex groups and their effect on colony morphology.

Circular colony extremity | Irregular growth | Lax growth | Lobular growth | Pigments production | Tree like

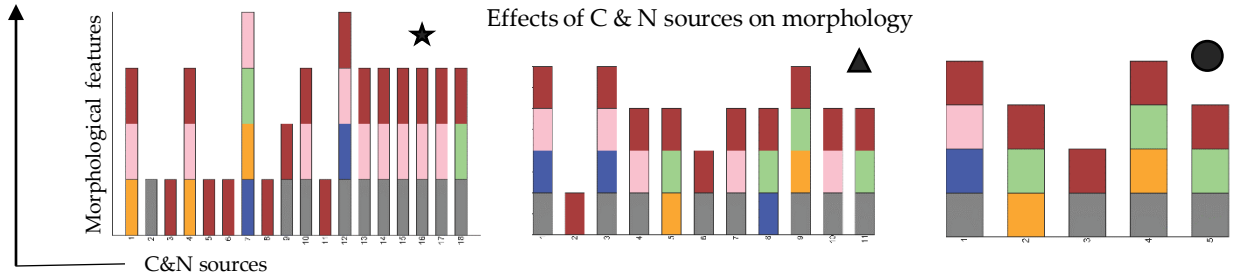
RESULTS

In the nutrient complex group "multiple sources of carbon + inorganic nitrogen", malt extract and L-rhamnose determined the highest growth of colony diameter ($p < 0.001$). In the nutrient complex group "multiple sources of carbon + inorganic nitrogen", adding D-alanine to the basic medium increased up to 36% the colony diameter, considering basic medium ($p < 0.001$). When the only source of carbon was glucose (i.e. irrespective of the type of nitrogen —organic or inorganic), urea determined an increase in colony growth of 46%, compared to basic medium ($p < 0.001$). In terms of morphology, colonies with lobules, pigments and irregular growth were grouped in the correspondence analysis

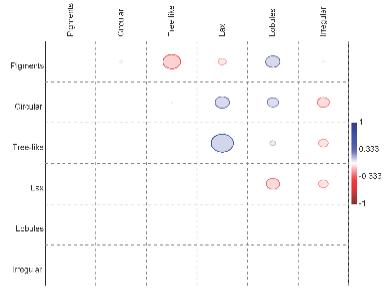
Effects of C & N sources on colony diameter



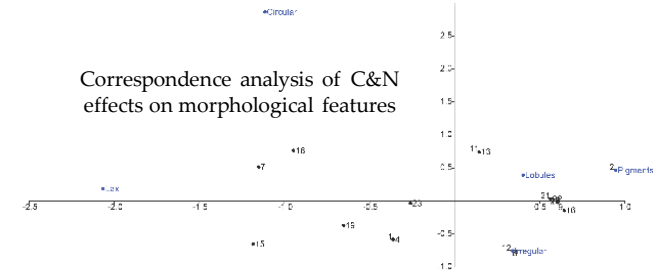
Effects of C & N sources on morphology



Spearman correlation of C&N effects on morphological features



Correspondence analysis of C&N effects on morphological features



CONCLUSIONS

When organic N is present, irrespective of C source, 80% of the fungal colonies produce pigments. Using glucose combined with any inorganic N source, the pigmented, irregular and lobulated morphological features were prevalent. Addition of N sources like D-alanine and urea increase biomass of the strain HTF58 and therefore may positively affect the production of antifungal compounds. Our previous preliminary data showed that production quality of the specific metabolites is not affected by changing N or C sources

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