

AWARD

Study of the nutritional characteristics of previously analysed edible mushrooms as biofertilisers

ABSTRACT

Fungi are particularly valued as subsistence foods in many developing countries, where they make a significant food contribution in central and southern Africa during months of the year when the food supply is inadequate.

Like many soil microorganisms, they have physiological properties that allow them to feed on organic and inorganic soil substrates. As these properties are involved in the maintenance of soil fertility, these fungi could act as plant growth promoters.

Keywords : Developing the plant of the future, Agroecosystem, Genomics, intrans, Growth, Nitrogen, Organic agriculture, Rice, wheat, Tomato

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Flagship project : no

Project leader : Robin Duponnois

Project leader's institution : UPVD

Project leader's RU : LGDP

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Total budget allocated (including co-financing) : 10000 €

Funding : Labex

GOAL

From a collection of fungal strains isolated in Ghana and representing the genera *Lentinus*, *Pleurotus* and *Ganoderma*, the objectives of this study were the following:

To highlight certain physiological properties likely to be involved in the biological mechanisms promoting plant growth

To demonstrate under controlled conditions the effect of inoculation of the culture substrate by these strains on the growth of 2 plant species, tomato and durum wheat

ACTION

The fungal strains (7) were maintained on a nutrient medium of the "L-Broth" type and were subcultured on selective media in order to demonstrate the enzymatic activities of the esterase, chitinase and phosphatase types as well as their capacity to produce siderophores.

In a second phase, these strains were multiplied on a vermiculite substrate moistened with a nutrient medium of the "L-Broth" type. When the substrate was completely colonised by the fungal isolates, the inoculum produced was mixed with a culture substrate (atapulgit) where young tomato or durum wheat

seedlings were planted.

RESULTS

All strains tested have the ability to produce esterase enzymes, whereas only isolates from the genus *Lentinus* show chitinolytic activity. The production of siderophores was detected in strains belonging to the genera *Ganoderma* and *Lentinus* and in one strain of *Pleurotus* (strain PTR-K). The promoting effects of strain inoculation were also measured to varying degrees depending on the isolate in tomato after 6 weeks in the greenhouse

Fungal inoculation stimulated the growth of young durum wheat seedlings after one month of cultivation in the greenhouse with a maximum effect obtained with the SqW strain (*Lentinus* sp.) (Figure below).

PERSPECTIVES

The perspectives of this work will mainly consist in optimising the production of mushrooms AND their biofertilising properties by

Testing a greater diversity of edible fungi

Manipulating the composition of the culture substrate

The aim of the project will be to identify high-performance strains which, depending on an appropriate multiplication technique, will be able to offer significant production capacity but also proven biofertilising properties.