EU Green Week

PARTNER EVENT

La giornata green del dottorato | Acqua, resilienza ed oltre

@Distal multicampus

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#WaterWiseEU

New technologies of morel/truffle breeding and cultivation based on protoplast fusion

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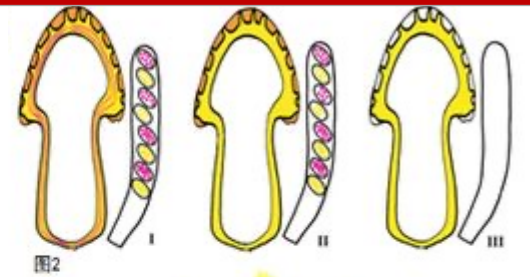
Research topic of : Truffle ecology and cultivation

- new biotechnologies applied to truffle cultivation

Background and Objectives

For morel and truffle

The life cycle: Some stages not fully studied
The cultivation technology: not mature
The cost of cultivation: extremely high



Yang *et al.* 2018

- Morel cultivation need exogenous nutrients
- Open-field cultivation has a impact on local soil and water

* Mature technologies for truffle remain at the mycorrhizal synthesis stage

Rare
Difficult-to-cultivate
High cultivation/market risks

Background and Objectives

Difficult-to-cultivate mushrooms

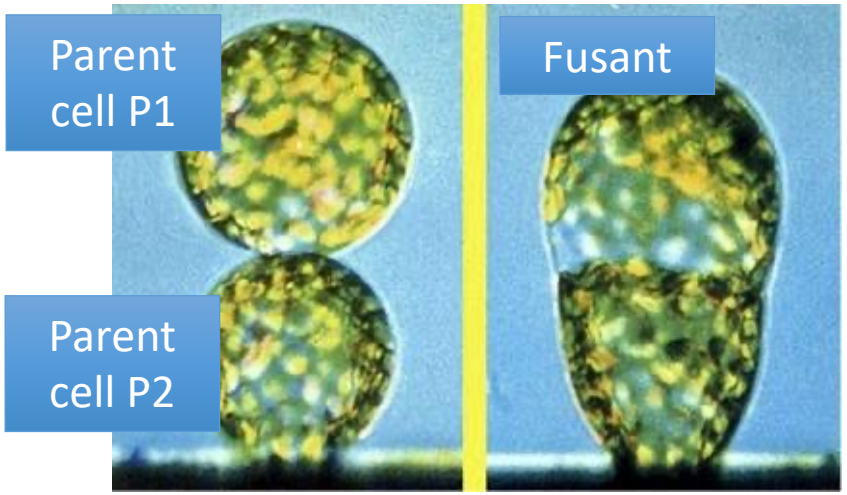
New biotechnologies
(Protoplast fusion)
(Exogenous nutrition bag indoor)
(…)

* Better strains
* Shortened cycle of cultivation
* Easier cultivation
* Indoor cultivation with 0 environmental impact

Experimental approach and main results

Successful cultivation techniques for some common commercial mushrooms like *Agaricus*, Shiitake and *Pleurotus*

Protoplast fusion technology



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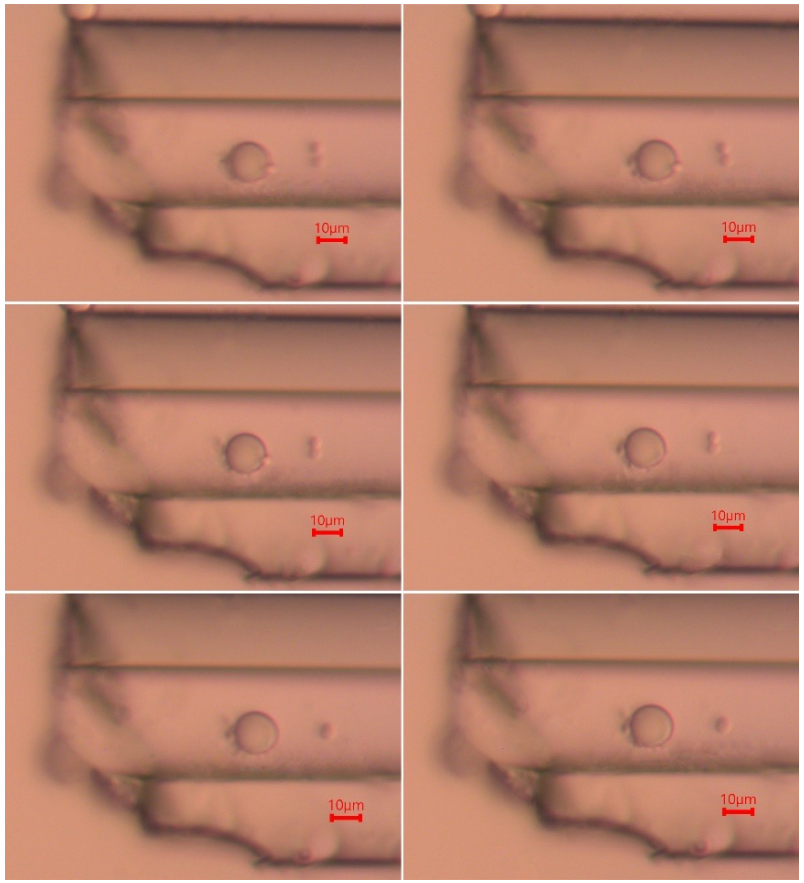
Exogenous nutrition bag technology

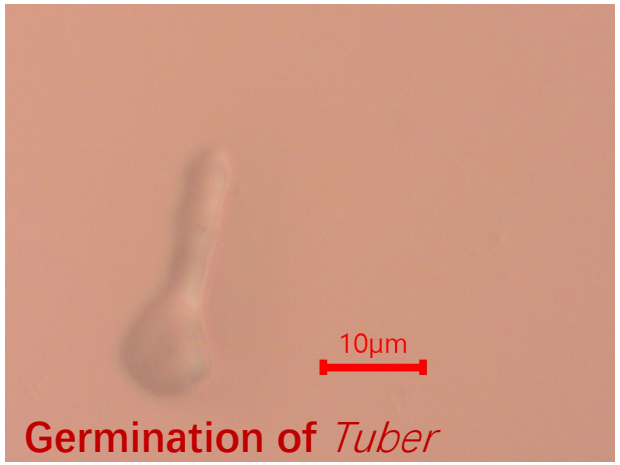
Application

On truffle and morel

Experimental approach and main results

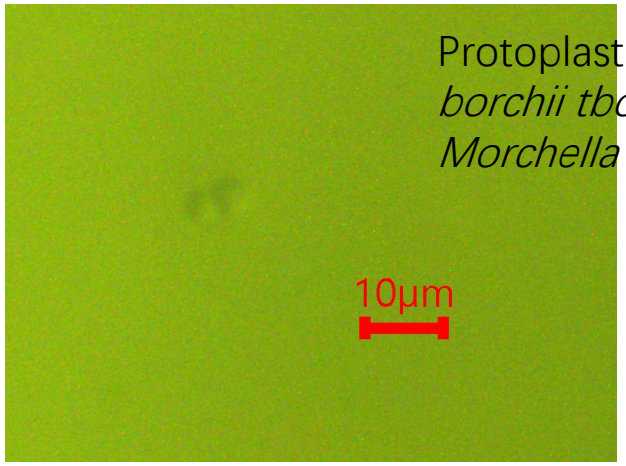


Research progress

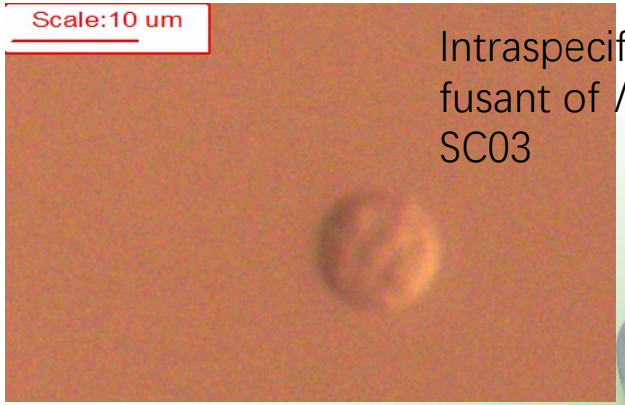


Germination of *Tuber borchii* tbo5005 protoplast

Protoplast fusion of *Morchella eximia* MD05 and *Morchella sextelata BG07*



Protoplast fusion of *Tuber borchii tbo3840* and *Morchella eximia MD01*



Intraspecific protoplast fusant of *M. sextelata* SC02-SC03

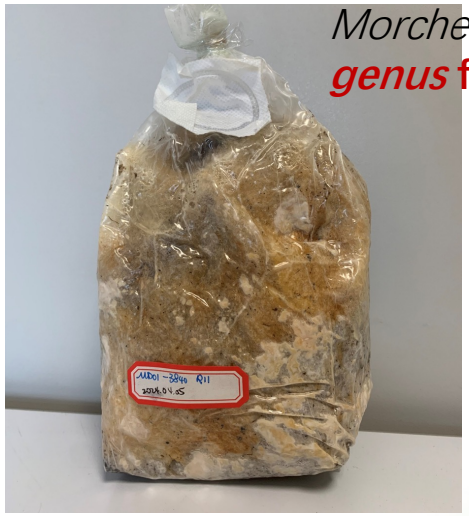
Experimental approach and main results

Indoor soil-covering cultivation of the *Morchella* spp. interspecifically fused strains – showing abundant mycelium and sclerotia within 30 days

Exogenous nutrition bottle

The use of exogenous nutrients in fusant fruiting **Abundant sclerotia** is an important sign of fruiting

30 days *Tuber borchii* - *Morchella eximia* **cross-*genus* fusion spawn**



Expected outcomes (what for?)

+ Yield determination, improvement of nutritional and medicinal properties (Antioxidant capacity and polyphenolic content, total amino acid content, *etc.*) …

* Better strains of morels and truffles √
* Easier cultivation √
* Indoor cultivation with smaller environmental impact √
* Shortened cycle of cultivation ?
* Production ?