

## Novel biotechnological approaches to grow Medicinal Mushrooms (MMs) on maize residues

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**Background:** maize landraces, an important source of genetic variants for adaptation to specific environment, are characterized by high nutritional value. Their cultivation in small-scale farming allows the exploitation of residual corncoobs for alternative uses.

Medicinal mushrooms (MMs) are gaining attention for their content of bioactive compounds relevant for human health.

**Objectives:** the research aims at developing high value-added ingredients with nutritional properties by growing MMs on corncoobs of traditional Lombard varieties. Investigation will highlight whether and to what extent MMs bioactivities are maintained up to the production of the functional ingredient.

**Methods:** maize varieties of different cob colour (Spinato di Gandino, Rostrato Rosso di Rovetta, Spinoso Nero Valle Camonica, Fiorine di Clusone) and the B73 inbred line were grown; harvested coobs were characterized for fiber and secondary metabolites contents, then used. Solid State Fermentations (SSFs) were set-up employing the MMs *Pleurotus ostreatus*, *Ganoderma annularis*, *Flammulina velutipes* and *Lentinula edodes*: trials were first carried out in small jars and subsequently in boxes equipped with a semipermeable gas membrane. Fungal growth was measured acquiring the SSF surface image, applying a pre-processing step.  $\beta$ -glucans were determined through the Mushroom-Yeast  $\beta$ -glucan assay kit (Megazyme).

**Results:** *Pleurotus* and *Ganoderma* proved the best growing performances on investigated corncoobs. Image analysis highlighted that 50 and 80% of corncob surface of Spinoso Nero was covered by *Pleurotus* in 10 and 40 days incubation, respectively. Higher  $\beta$ -glucans content was detected in isolated *P. ostreatus*, however their amount in the final ingredient will strictly depend on mycelial extension onto corncoobs.