

***Grifola frondosa* (Dicks.: Fr.) S. F. Gray: Optimization of Basidiocarp Formation and Study of Its Biological Activities**

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Of five *Grifola frondosa* (Dicks.: Fr.) S. F. Gray wild strains, the GF3 was selected for culture development.

In a 100% straw substrate this strain fructified in 13% of identical trials with an average yield of only 6.25%.

To optimize the yield, several different pasteurized substrates were tested. The best fructification results were obtained with a substrate based on straw, wood, and sawmill wastes, with an added complement of vitamins, mineral salts, and nitrogen.

In collaboration with industry, 2300 trials in controlled-climate rooms allowed refinement of the substrate composition as well as determination of cycles of humidity, temperature, and CO₂ levels needed for incubation, initiation, and fruiting body maturation. This study led to the design of an industrial substrate and a mushroom culture technique with a success of more than 95% fructification and an average yield of 29%.

At this stage we tested four other industrial and wild strains in optimized substrate and culture conditions. Strong interstrain variation was

observed, showing that the developed process is designed only for the selected strain.

The lyophilized fructifications of the GF3 strain were extracted with DCM and MeOH and tested (thanks to Prof. Hostettmann) against the Gram-positive bacterium *Bacillus subtilis*, the opportunist human pathogen *Candida albicans* (C. P. Robin) Berkhout, the plant pathogen fungus *Cladosporium cucumerinum* Ellis et Arthur, the yellow fever vector *Aedes aegyptii* at the larval stage, the bilharzia intermediate host *Biomphalaria glabrata* mollusk, and the DPPH radical. Other tests still remain to be done.

The DCM extract was active against *B. subtilis*, *Cladosporium cucumerinum*, and *Biomphalaria glabrata* and in reducing the DPPH radical.

The active molecule (structure not yet elucidated) against *C. cucumerinum* is not always found. Further study is being done to determinate the factors influencing its presence and its correlation with the resistance of fructifications to different mushroom contaminants.