

Introduction

Global Population

2020 – 7.2 billion 2050 – 9.1 billion

Inadequate protein intake
1 bn people

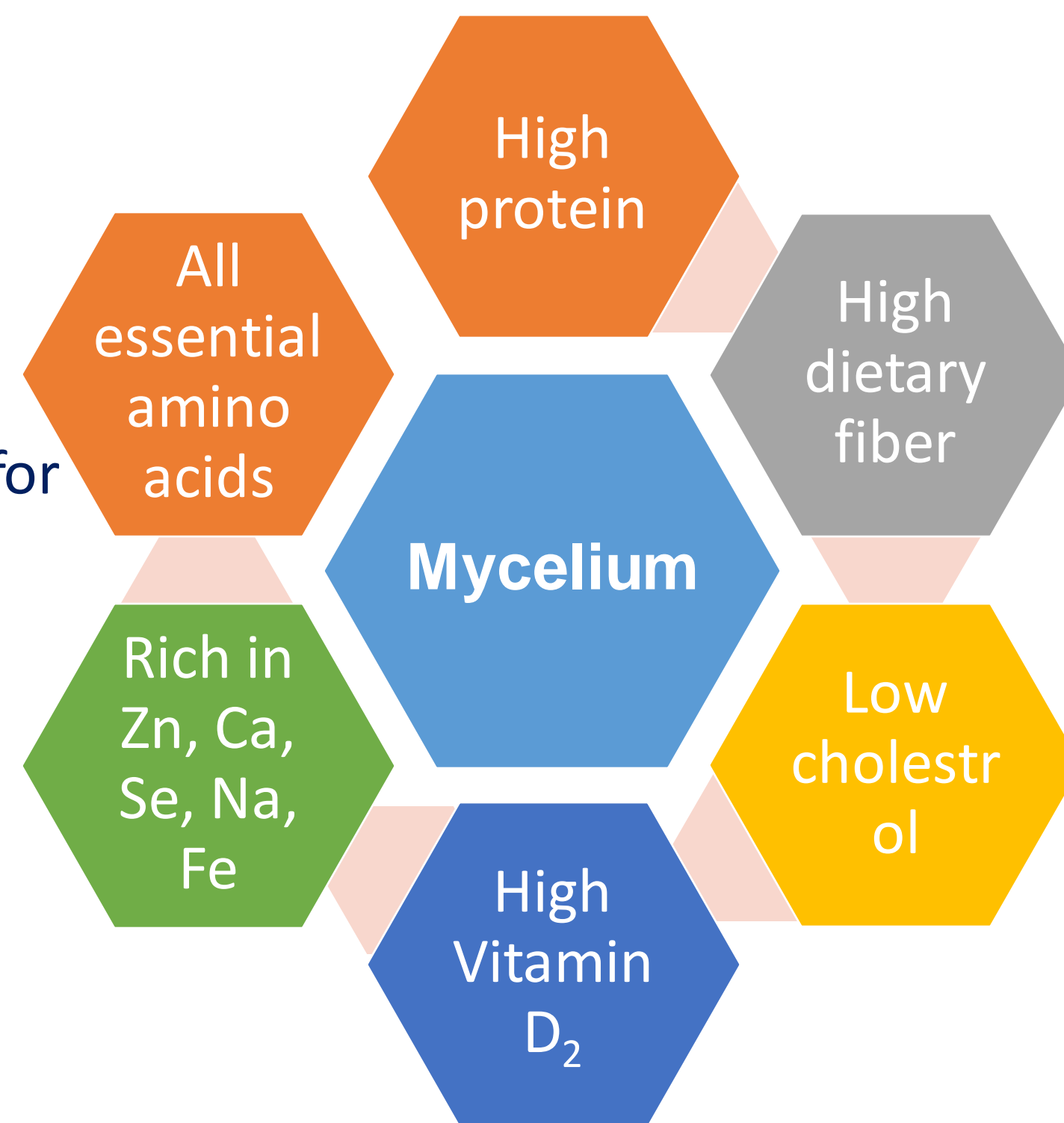
Demand increases without adequate supply

- Alternative sources are required due to limited resources and increasing population.
- Mycelium is a good alternative source which can be grown with minimum carbon footprint.

Why drying ?

- To increase its shelf life by lowering water activity.
- To convert it into usable form as a health supplement, for fortification.

Components	Dried <i>P. eryngii</i>	References
Protein (%)	24.52±0.53	Krüzselyi et al., 2016
Crude Fiber (%)	18.54±0.57	
Vitamin D ₂ (µg/g)	320±14	Singh et al., 2020

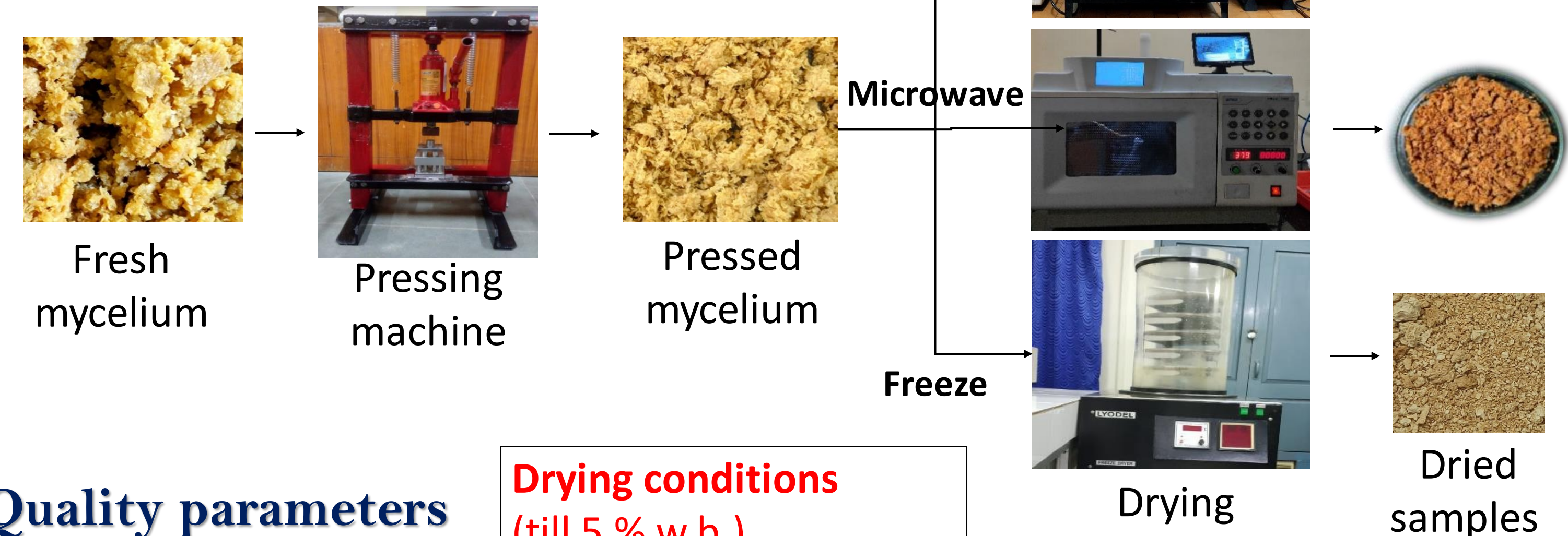


Objectives

To study the effect of pressing coupled with different drying techniques (freeze, microwave, & vacuum) on quality attributes and microstructure of *Pleurotus eryngii*.

Methodology

- Effect of pressing on microwave drying was observed in dry basis (% d.b.)
- Vacuum (VD), microwave (MD) and freeze (FD) drying were carried out after pressing for 30 s at 5 kN force.



Quality parameters



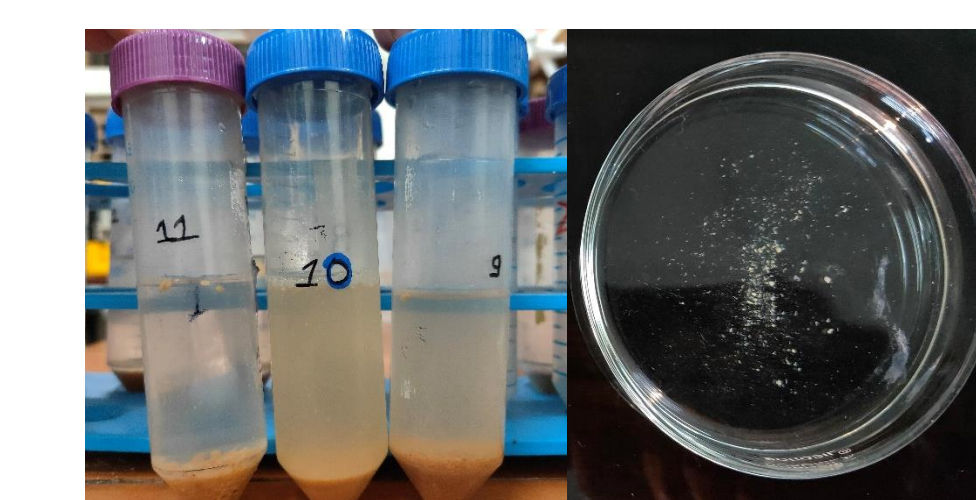
Color



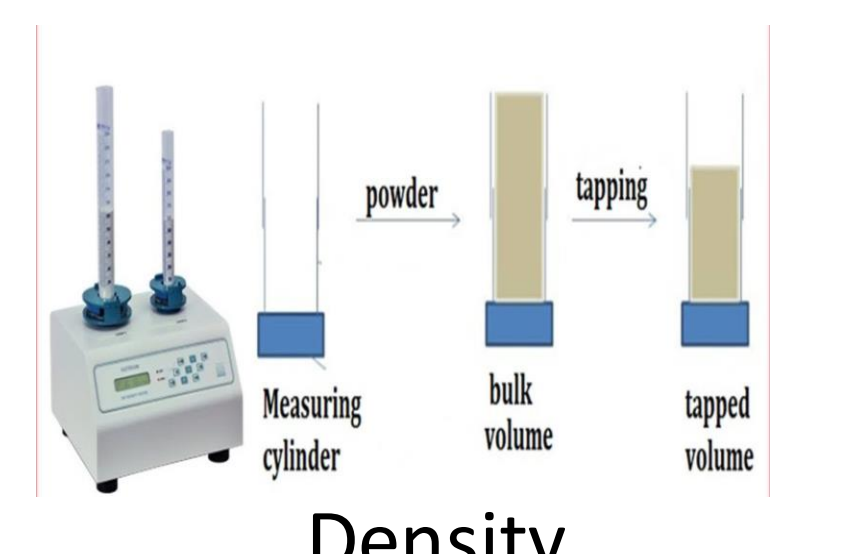
SEM

Drying conditions (till 5 % w.b.)

VD: 60 °C, 60 mmHg
MD: 400 W
FD: -50 °C, 1mbar



Water Solubility Index (WAI) & Water Absorption Index (WAI)



Density



Water activity

Results & Discussion

Pressing

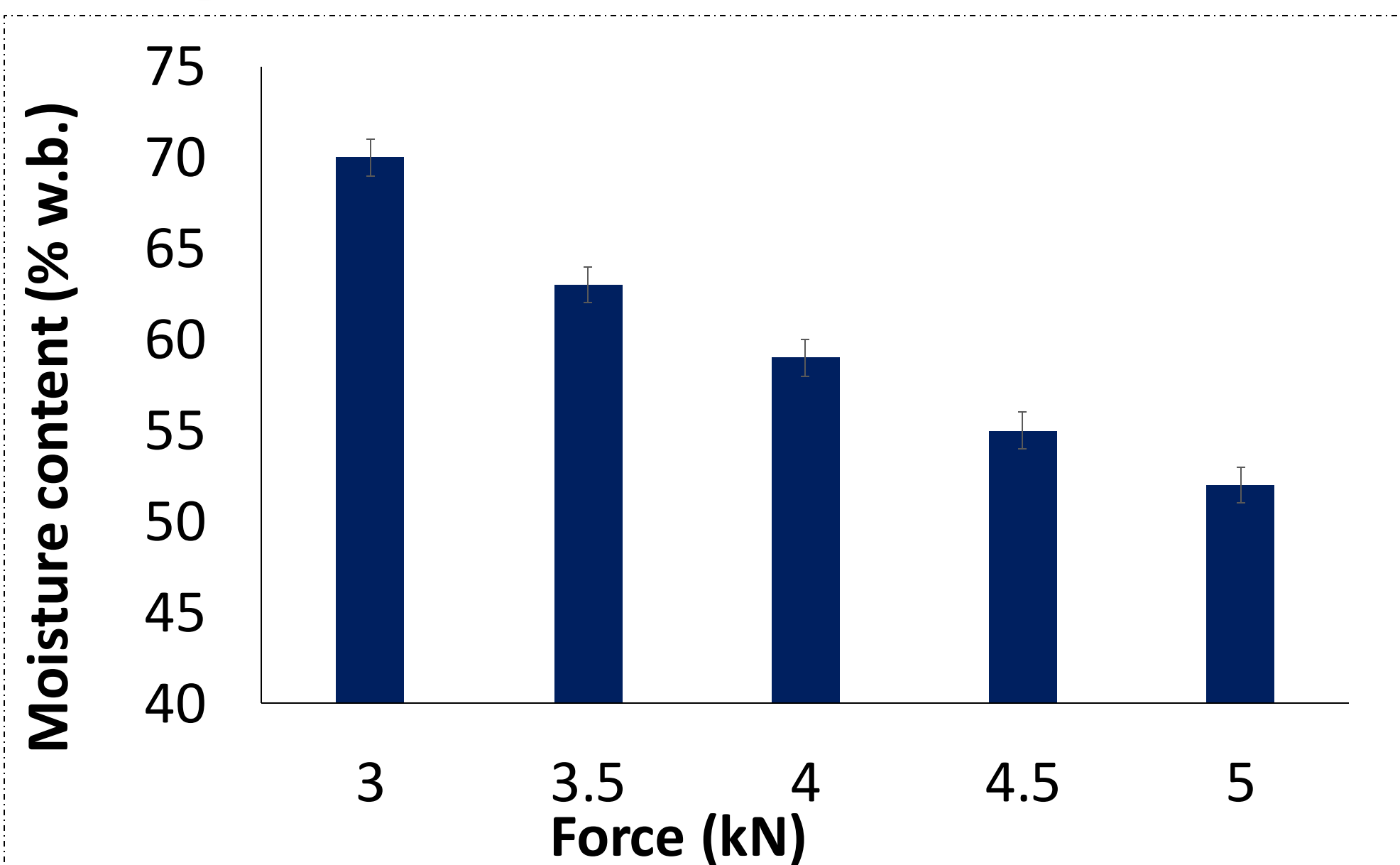


Fig. 1: Effect of force on moisture content during pressing for 30 s

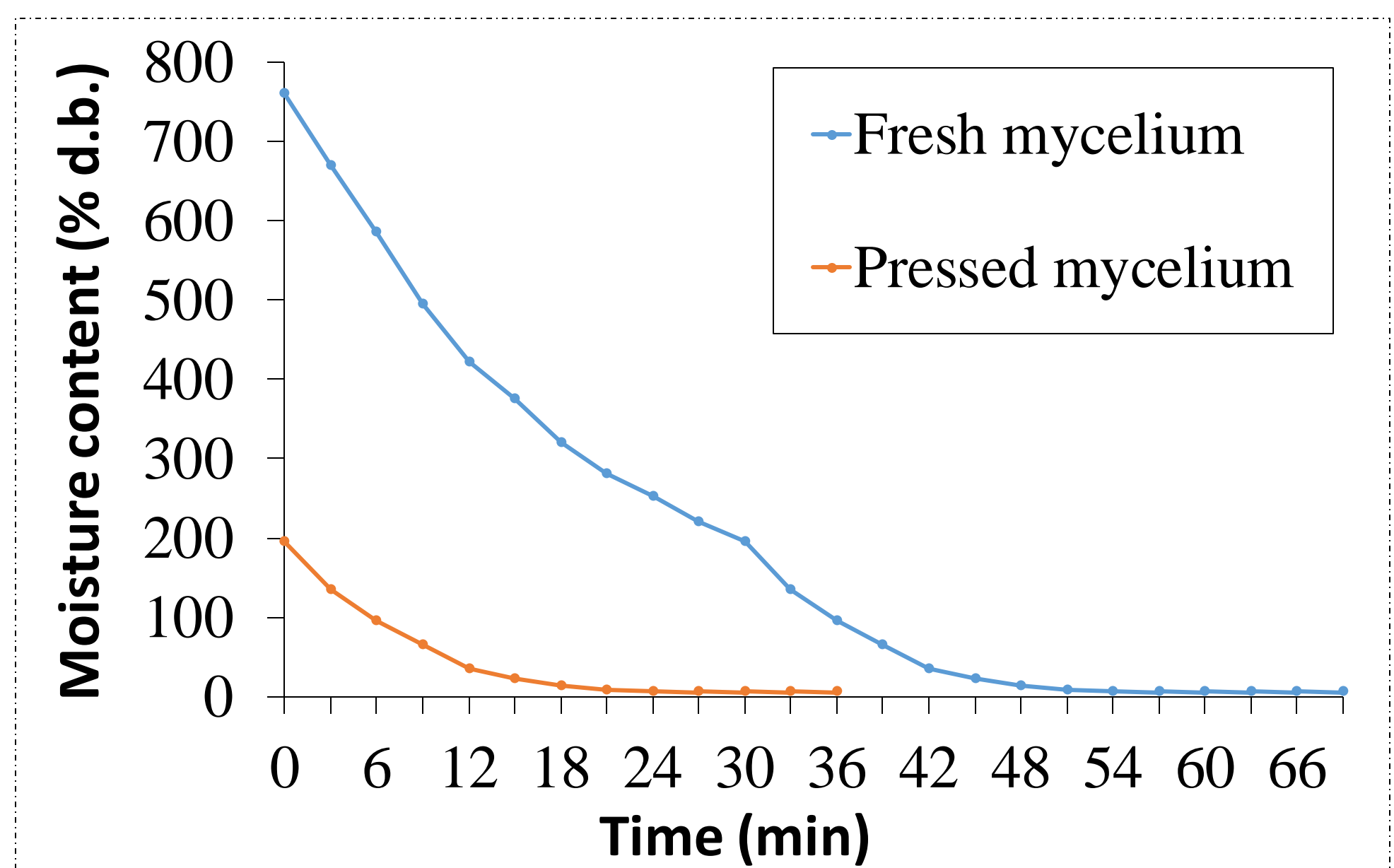


Fig. 2: Effect of pressing on microwave drying at 400W

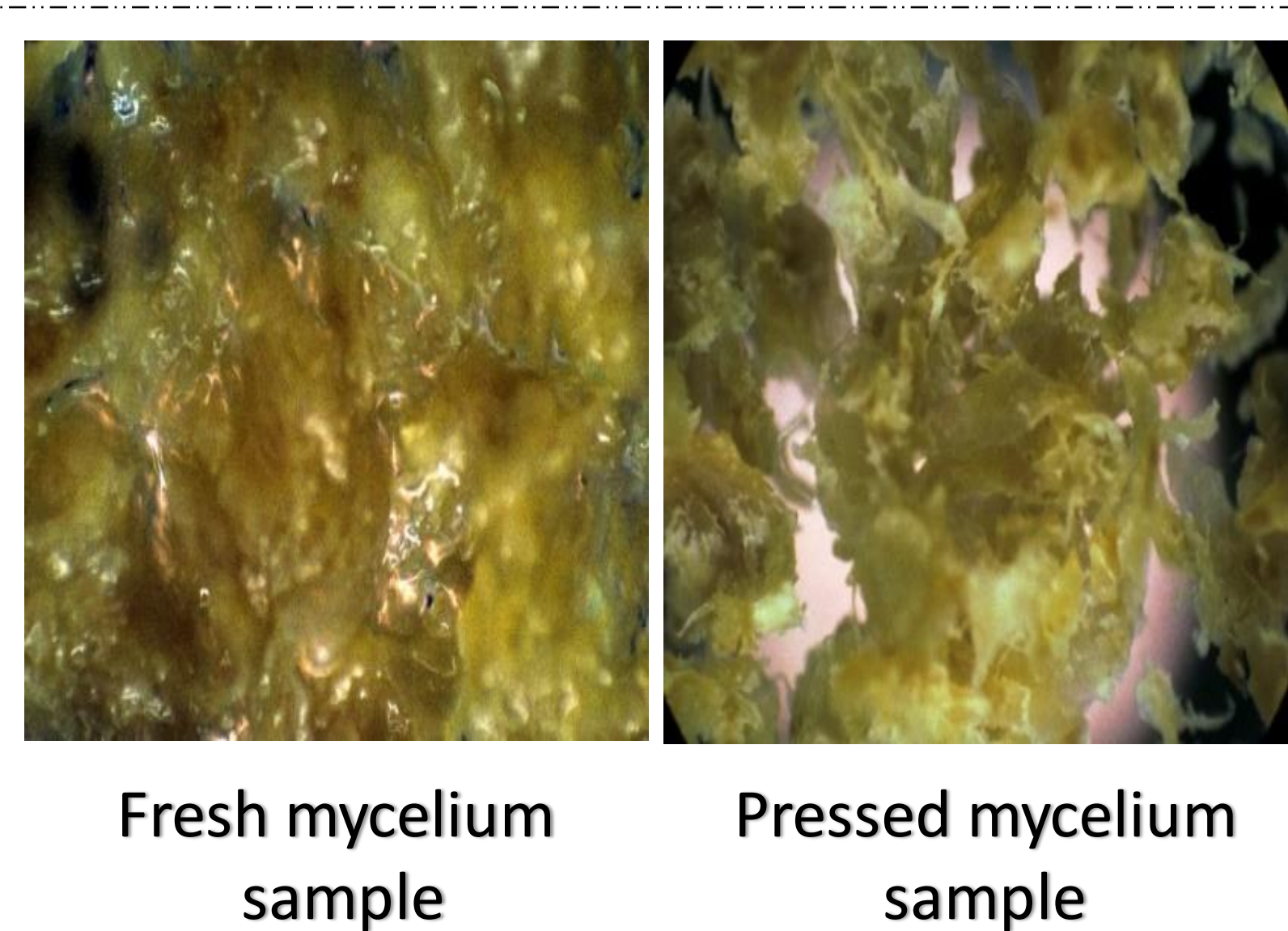


Fig. 3: Optical microscopy of fresh and pressed mycelium

Quality attributes

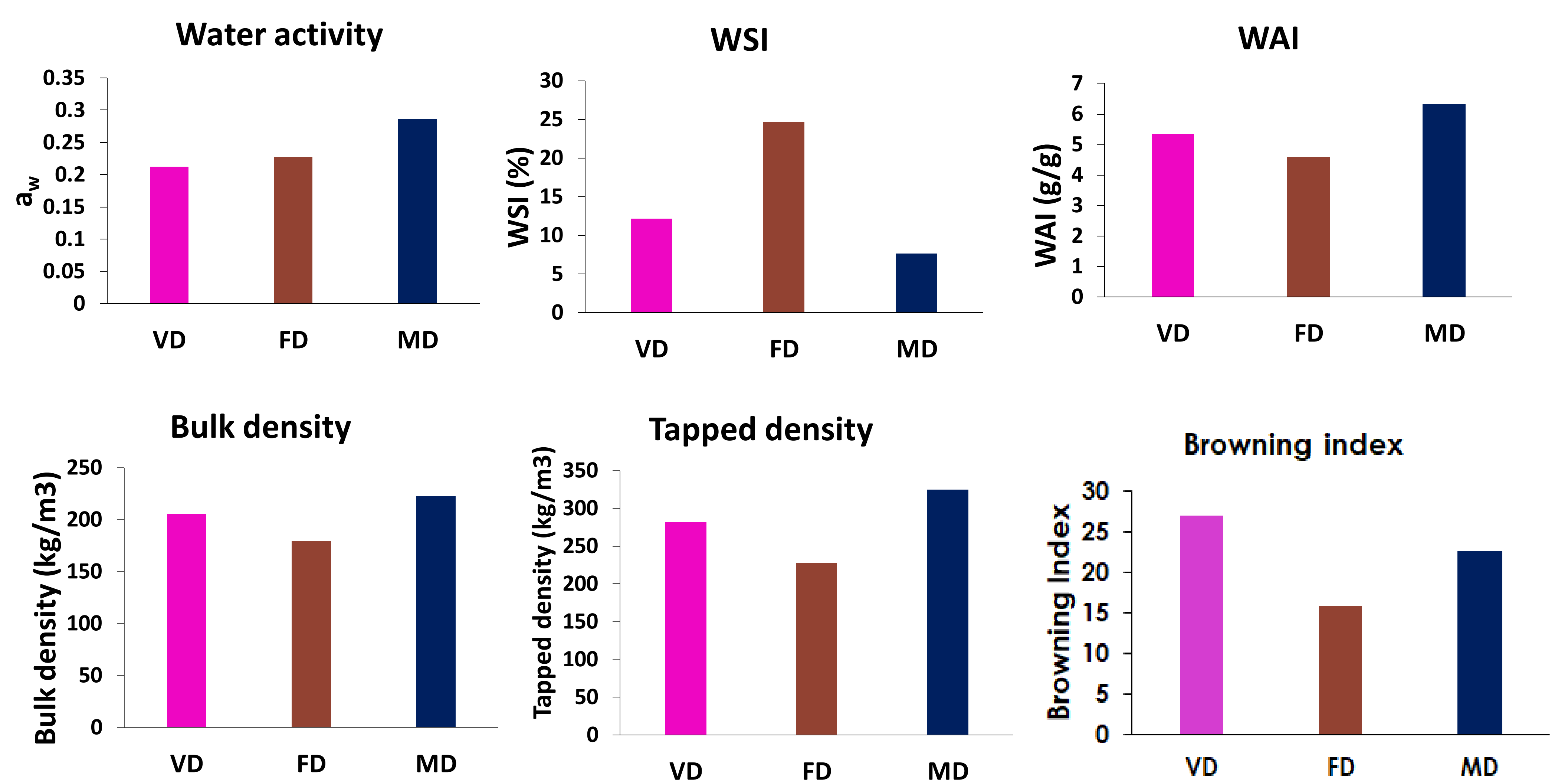


Fig. 4: Comparison of vacuum (VD), freeze (FD), and microwave (MD) drying techniques

Microstructure

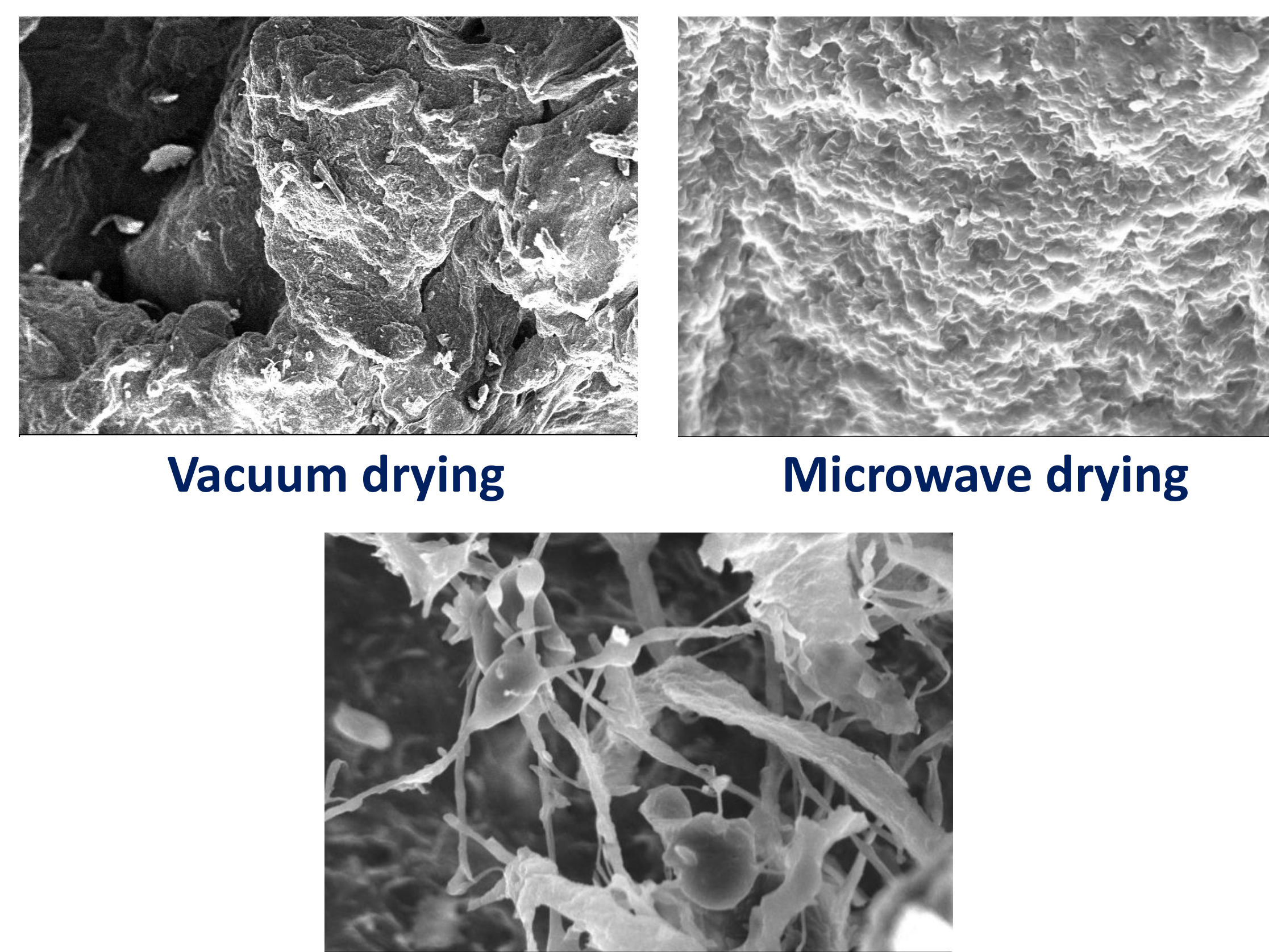


Fig. 5: Microstructure of *P. eryngii* in different drying at 1000X

Conclusions

- Cold pressing could be recommended as a pretreatment to reduce the cost and drying time by 50-55 %.
- Freeze dried showed the best results in terms of WAI (g/g), WSI (%), browning index, density followed by VD and MD.
- Due to its high vitamin D₂ content, mycelium could also be utilized as a natural fortificant of vitamin D₂.
- Mycelium can be regarded as a novel and sustainable future food.