CIÊNCIA 2024
ENCONTRO COM A CIÊNCIA E A TECNOLOGIA EM PORTUGAL

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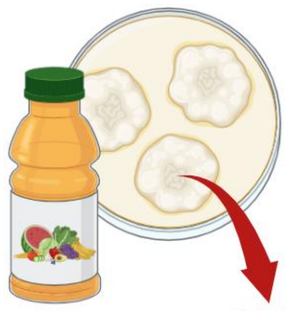
Induction of Ascocarp Production in *Paecilomyces variotii* and *Talaromyces trachyspermus*

Introduction

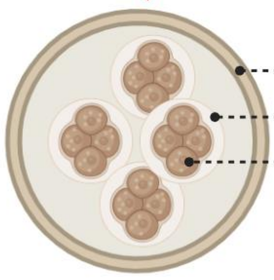
Heat-resistant molds (HRMs) are common spoilage fungi in heat-processed fruit products.



HRMs isolated from samples of fruit juices:

- ***Paecilomyces variotii***
- ***Talaromyces trachyspermus***

Their **heat resistance is attributed to ascospores**, sexually produced spores formed within asci, some of which are enclosed in an ascocarp (pl.: ascomata).



Objectives

Certain culture media favor sexual reproduction and ascospore formation, while others promote vegetative growth.

Three culture media were tested to determine their ability to support ascospore production:

- **Potato dextroxe agar (PDA)**
- **Malt extract agar (MEA)**
- **Oatmeal agar (OA)**

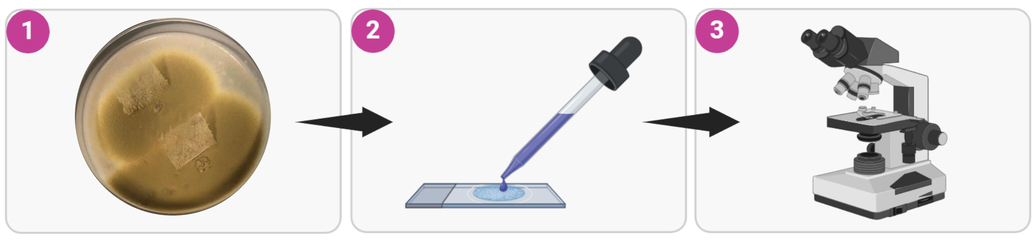
Future goals:

This study is essential for advancing future research on the inactivation of heat-resistant structures known as ascospores, which pose a significant challenge in fruit juice industry.

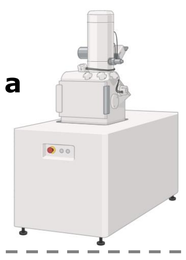
Methods and Results

Observation of ascocarp using the stereomicroscope

Technique of culture on cover glass



Observation using a Scanning Electron Microscope



Paecilomyces variotii

- Colonies rapidly cover the Petri dish in 7 days with a powdery yellow-brown appearance due to dense conidiophores.
- Ascomata vary in size by developmental stage, some reaching ~0.25 mm (Fig. 1A, 1B).
- Ascospores are approximately 3-5 µm in diameter (Fig. 1C).

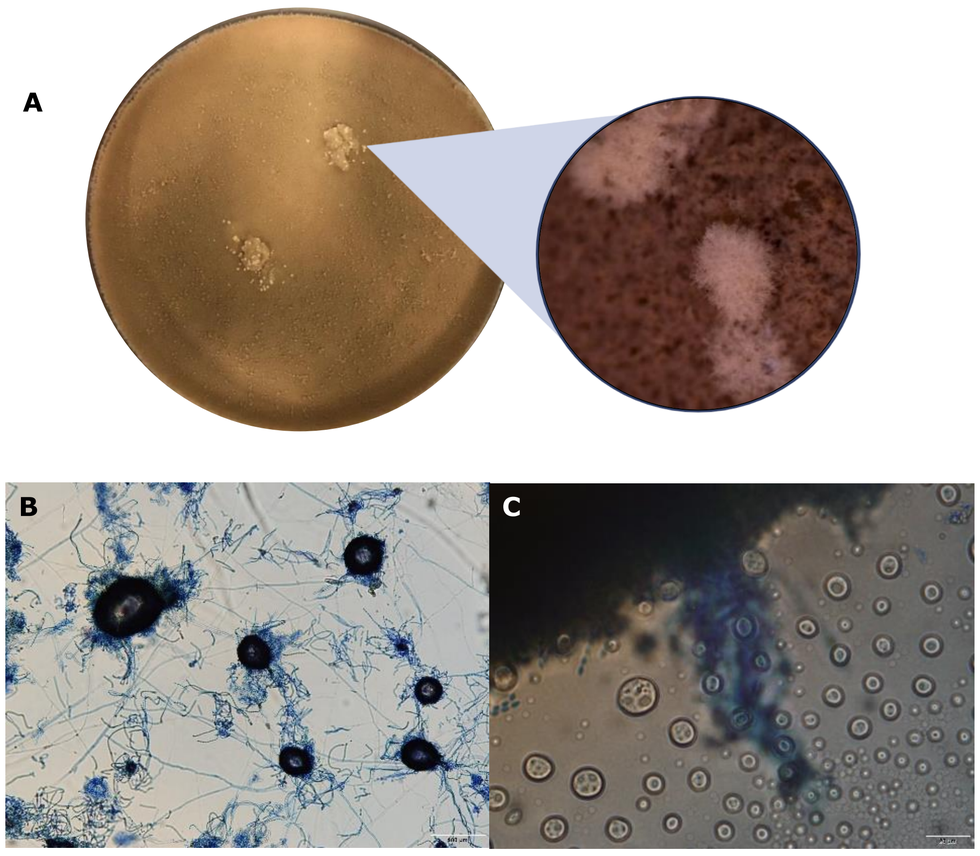


Fig. 1: (A) Mature ascomata observed under a stereomicroscope after 14 days of incubation at 25°C on PDA. (B) Developing ascomata and (C) ascospores within asci observed under the microscope after 28 days of incubation, under the same conditions.

Talaromyces trachyspermus

- Colonies reach 40-45 mm in diameter after 7 days at 25°C. They consist of a basal felt where ascomata develop. The reverse is yellow.
- Ascomata are globose, varying in size by developmental stage, some reaching ~0.6 mm (Fig. 2A, 2B, 2C).
- Ascospores are approximately 3-5 µm in diameter (Fig. 2D).

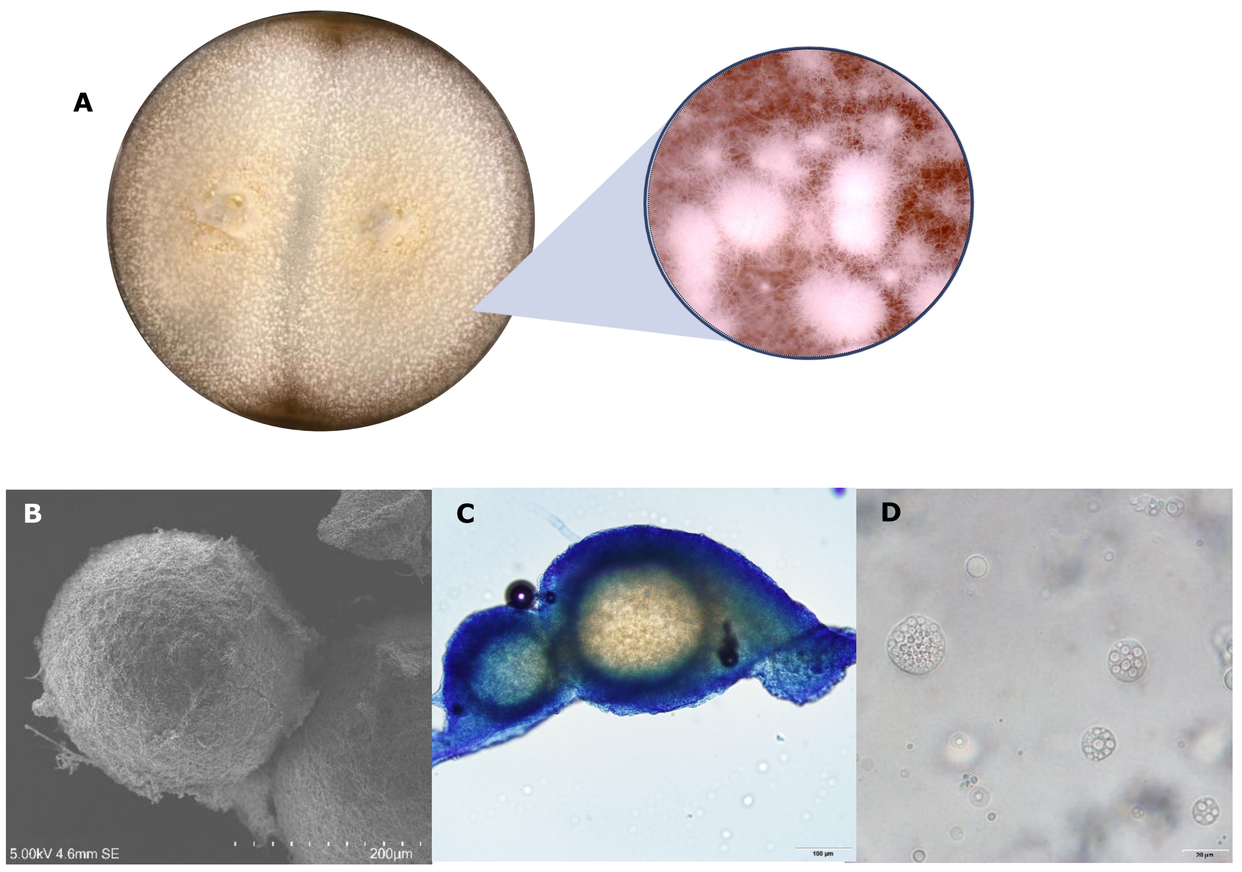


Fig. 2: (A) Mature ascomata observed under a stereomicroscope after 28 days of incubation at 25°C on MEA. (B) Ascocarps under scanning electron microscope. (C) Developing ascomata and (D) ascospores within asci observed under the microscope after 14 and 28 days of incubation, respectively, under the same conditions.

Conclusions

After conducting observations using both **macroscopic and microscopic techniques** to identify the presence of ascospores, this study concluded that:

- ✓ **PDA is the most effective medium for ascospore production in *P. variotii*** (visible in 7 days);
- ✓ **MEA is optimal for *T. trachyspermus*** (ascospores observed in 14 days).

This study was supported by the Portuguese Foundation for Science and Technology (FCT) under the scope of the strategic funding of UIDB/04469/2020 unit, with DOI 10.54499/UIDB/04469/2020, by LABBELS - Associate Laboratory in Biotechnology, Bioengineering and Microelectromechanical Systems, LA/P/0029/2020, by the National Institute for Agrarian and Veterinary Research (INIAV), and by Colab4Food. Diana Sousa also acknowledges FCT for the fellowship 2023.04050.BDANA.

Fundação para a Ciência e a Tecnologia
Universidade do Minho Escola de Engenharia
CENTRO DE ENGENHARIA BIOLÓGICA
COLAB 4FOOD
iniav Instituto Nacional de Investigação Agrária e Veterinária, I.P.