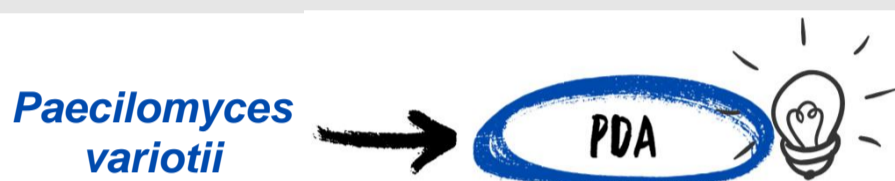


Suitability of culture media for the production of ascospores of *Paecilomyces variotii* and *Talaromyces trachyspermus*

Motivation

Heat-resistant molds are common spoilage fungi in heat-processed fruit products, with key species being *Paecilomyces variotii* and *Talaromyces trachyspermus*. Their heat resistance is attributed to ascospores, sexually produced spores formed within asci, some of which are enclosed in an ascocarp.

As certain culture media favor sexual reproduction and ascospore formation, while others promote vegetative growth, three culture media - potato dextrose agar (PDA), malt extract agar (MEA) and oatmeal agar (OA) - were tested to determine their ability to support ascospore production. **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.**



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

- Colonies on MEA 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).

Results

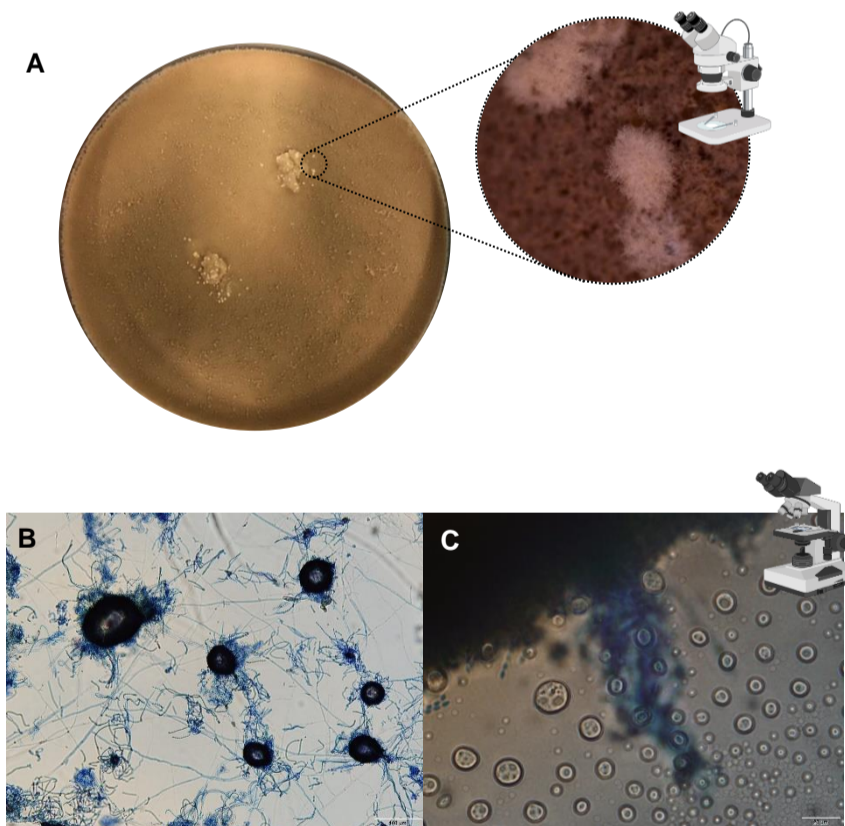


Fig. 1: (A) Mature ascocarps observed under a stereomicroscope after 14 days of incubation at 25°C on PDA. (B) Developing ascocarps and (C) ascospores within asci observed under the microscope after 28 days of incubation under the same conditions.

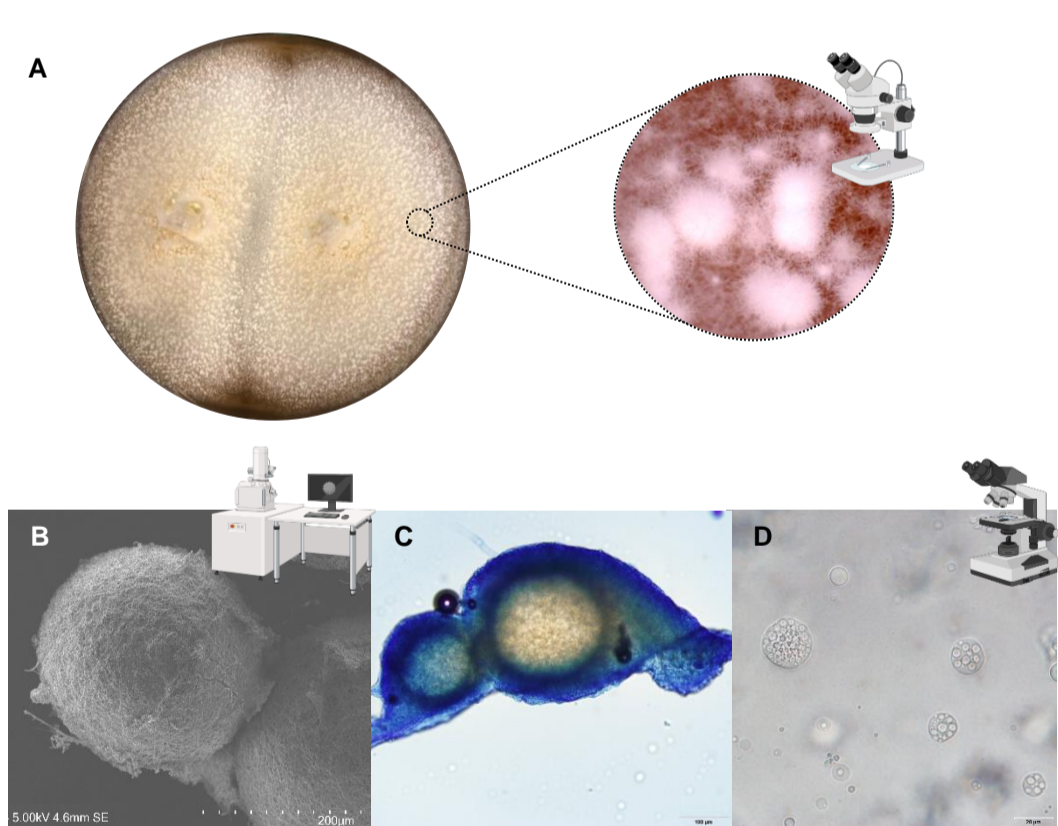


Fig. 2: (A) Mature ascocarps observed under a stereomicroscope after 28 days of incubation at 25°C on MEA. (B) Ascocarps under scanning electron microscope. (C) Developing ascocarps and (D) ascospores within asci observed under the microscope after 14 and 28 days of incubation, respectively, under the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

Conclusion

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).

These results will guide future ascospore inactivation assays, ensuring that PDA is used for *P. variotii* and MEA for *T. trachyspermus* to achieve consistent and optimal ascospore production.