

Introduction

Pigments are widely used in the food, textile, cosmetic, and pharmaceutical industries. Although synthetic pigments are currently stable and inexpensive, concerns about their long-term toxicity such as allergies, mutagenicity, carcinogenicity, and environmental issues have increased awareness of their potential risks. As a result, there is growing interest in replacing synthetic pigments with natural alternatives. Natural pigments, derived from plants, microorganisms, or certain animals, are generally non-toxic, safe, and biodegradable. They can produce color in small areas, are environmentally friendly, and can develop in various environments, influencing shade formation. Microorganism-derived pigments are secondary metabolites that can be studied for their biological properties, including anticancer, antioxidant, antimicrobial, antimutagenic, and immunosuppressive activities. Although natural pigments can be produced by a variety of organisms, this research focuses on investigating the growth and production of red pigments by two isolates of *Collophorina*-like fungi maintained in laboratory room 2812. The study aims to provide fundamental insights that may lead to the discovery of new red pigments and to determine the optimal conditions for their production, facilitating further applications.

Objectives

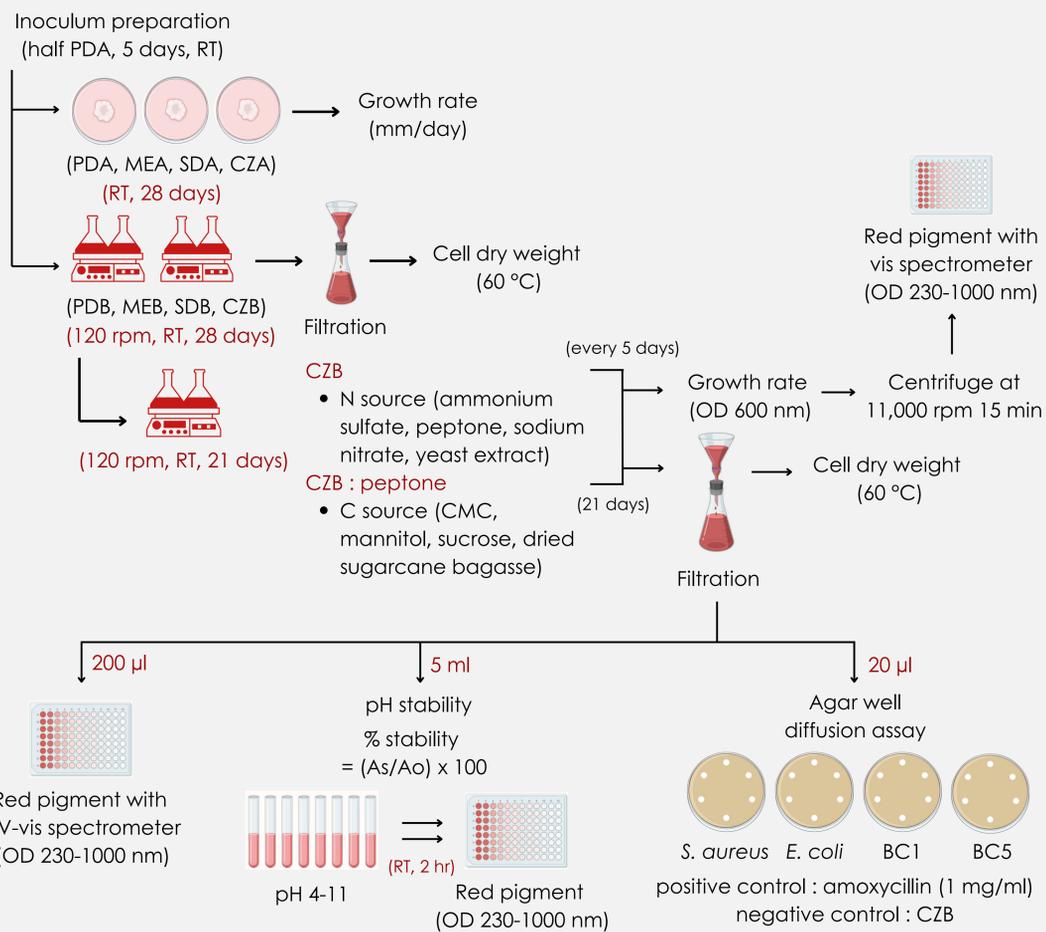
- 01 To optimize red pigment production from *Collophorina*-like fungi.
- 02 To characterize red pigment production from *Collophorina*-like fungi.

Methodology

Morphological study



Optimization and Characterization



Conclusion

- *Collophorina* PP5 and *Collophorina* PP18 produced red pigment on PDA, especially when conidioma formed (7, 10 d) and also produced red pigment in CZB supplemented with peptone and mannitol (5, 7 d).
- The wavelength of maximum absorbance (vis and UV-vis spectroscopy) of the red pigment in supernatant was observed at 510 nm.

Results

Morphology investigation

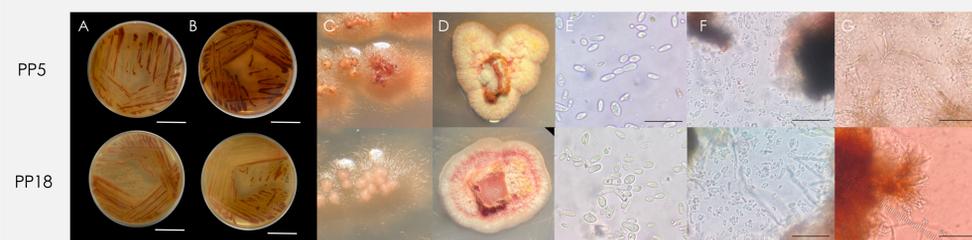


Figure 1 Fungal colonies on half PDA. A: RT, 5d. B: 10°C, 5d and RT, 5d. C, D: Fungal colonies. E: Yeast cells. F: Conidia. G: Mycelia.

Growth and red pigment production in solid and liquid media

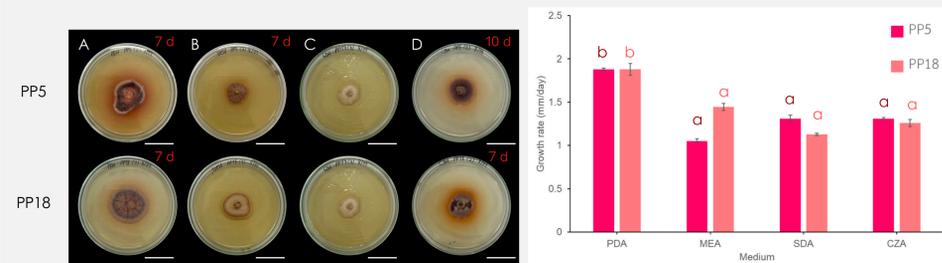


Figure 2 Fungal colonies and growth rate on different medium, 21 d. A: PDA. B: MEA. C: SDA. D: CZA.

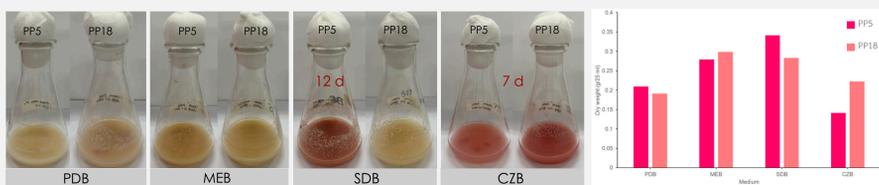


Figure 3 Cultures and dry weight in different medium, 28 d.

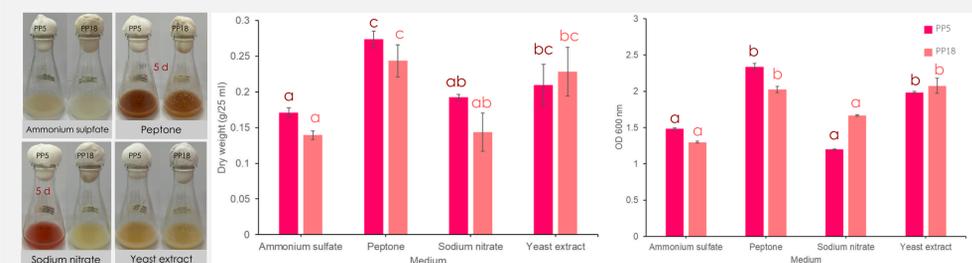


Figure 4 Cultures, dry weight and growth rate (OD 600nm) in CZB (different N sources), 21 d.

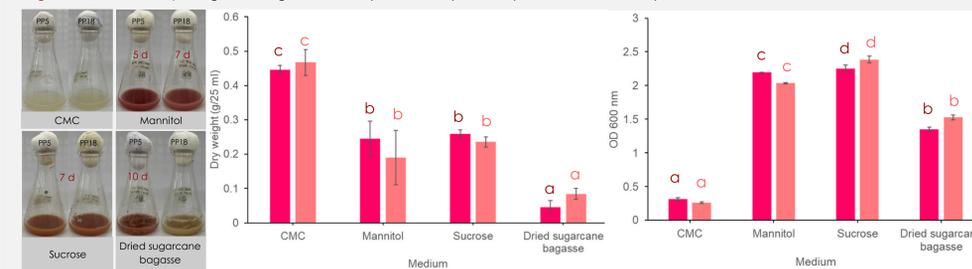


Figure 5 Cultures, dry weight and growth rate (OD 600nm) in CZB (peptone and different C sources), 21 d.

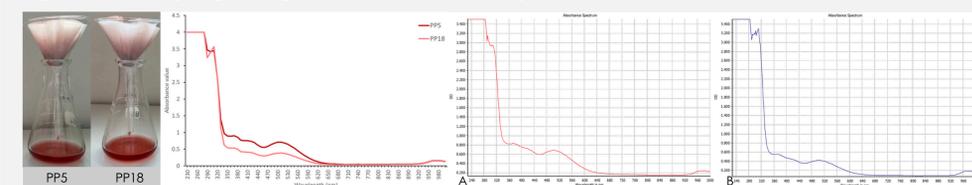


Figure 6 Red pigment, spectroscopy scanning absorbance of vis and UV-vis (230-1000 nm) of culture filtrates from CZA (peptone and mannitol), 21 d. A: PP5. B: PP18.

Acknowledgment

- 2812 Laboratory members, Microbiology Division, Department of Biology, Faculty of Science, Chiang Mai University
- Mr. Nattakorn Yuayuan, 2807 Laboratory, Microbiology Division, Department of Biology, Faculty of Science, Chiang Mai University

References

- Barreto, J.V.O., Casanova, L.M., Junior, A.N., Reis-Mansur, M., & Vermelho, A. B. (2023). Microbial pigments: major groups and industrial applications. *Microorganisms*, 11(12), 1-38.
- de Oliveira, L. A., Segundo, W., de Souza, E. S., Peres, E. G., Koolen, H. H. F., & de Souza, J. V. B. (2022). Ascomycota as a source of natural colorants. *Braz J Microbiol*, 53(3), 1199-1220.
- Suwannarach, N., Kumla, J., Nishizaki, Y., Sugimoto, N., Meerak, J., Matsui, K., & Lumyong, S. (2019). Optimization and characterization of red pigment production from an endophytic fungus, *Nigrospora aurantiaca* CMU-ZY2045, and its potential source of natural dye for use in textile dyeing. *Applied microbiology and biotechnology*, 103(17), 6973-6987.