



MICROFUNGI ISOLATED FROM A 70-YEARS OLD MALE CADAVER

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BACKGROUND

Forensic mycology

Forensic mycology examines the role of fungi in providing trace evidence, estimating time since death (post-mortem interval), ascertaining time of deposition, investigating cause of death, hallucinations/poisonings, locating buried corpses as well as biological warfare. Despite its relevance, cadaver-associated fungal communities remain largely understudied, especially regarding culturable species, as of today only 110, and their long-term preservation.

Aim of the study

To investigate fungal diversity on a cadaver found in the putrefaction stage in a basement.

METHODS

Isolates sampling

Samples were taken from a 70-year-old male human corpse in the putrefaction stage. The cadaver was sampled in three different places, namely the left hand, left cheek, and right calf. The sampling areas were selected after observing fungal colonies already developing on the skin, as shown in Figure 1. The cause of death is unknown. To protect the researchers' personal protective equipment, including masks, disposable caps, gowns, gloves, and protective footwear, was worn throughout the sampling procedure.

Axenic isolation

Colonies were collected using swabs and sterile scalpels and then plated on Sabouraud agar (SBA) and Rose Bengal Agar (RBA). Once fungal colonies developed sufficiently, serial subcultures were performed until axenic isolates were obtained. The colony growth pattern, colour, as well as the reverse colour were recorded for each isolate.

The micromorphological features were also observed under a microscope, using fragments collected from the margin of the conidiating area of axenic colonies.



Figure 1. Fungal colonies growing on cadaver. (a) Elbow/forearm (b) Back of the hand.

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RESULTS

Morphological identification of the isolates

Four fungal species were isolated: *Penicillium cf. brevicompactum* (left hand), *Penicillium cf. chrysogenum*, and *Mucor* sp. (left cheek), and *Aspergillus cf. versicolor* (right calf), as shown in Figure 2. Notably, to our knowledge, *A. cf. versicolor* may represent a first report from a human cadaver in the putrefaction stage, highlighting the potential forensic relevance of this species. Molecular identification by DNA barcoding is planned to confirm the morphological identifications.

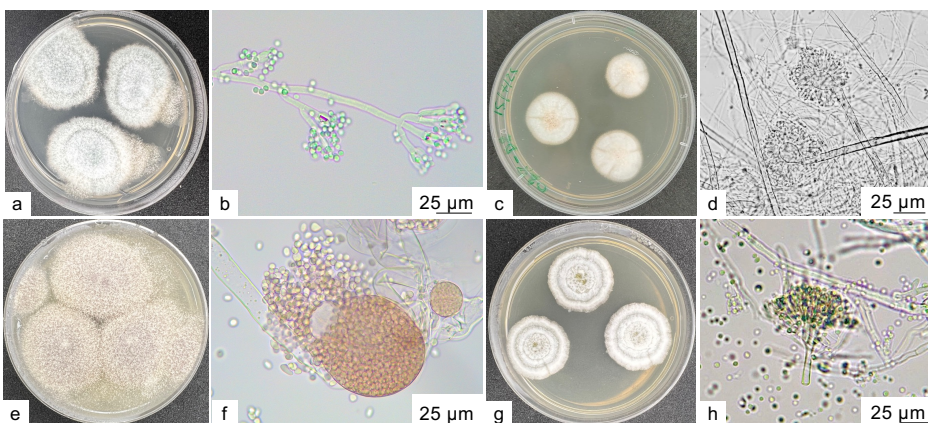


Figure 2. Axenic 7-days-old fungal colonies growing on MEA and micrographs. (a-b) *Penicillium cf. chrysogenum* (c-d) *Aspergillus cf. versicolor* (e-f) *Mucor* sp. (g-h) *Penicillium cf. brevicompactum*.

Preservation of the isolates

All isolates were deposited in the CoID UNIGE MIRRI-ERIC, collection at the University of Genoa's Laboratory of Mycology, contributing to the forensic subset of the SUS-MIRRI.IT initiative. All the isolates are preserved in the CoID-UNIGE for long term storage at -80 C°. Figure 3 below provides key passages in the preservation process. This preservation effort supports future research and reference material development.

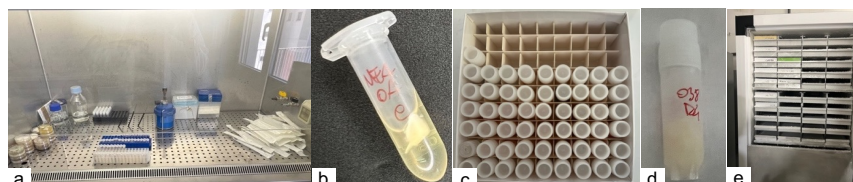


Figure 3. Axenic techniques workflow used to preserve all the fungal isolates. (a) Key sterile passages under the flowhood (b-d) piece of mycelium in cryo solution (c-d) Example of box with several cryovials with fungal samples (e) Freezer -80 C° where the isolates are stored.

CONCLUSION

Forensic mycological collections primarily serve as *ex situ* repositories for the preservation of fungal specimens and strains. Such culture collections may play a significant role in forensic science when they include a dedicated subsection focused on forensic investigations. Beyond supporting research on cadaver-associated mycodiversity, they can provide valuable data on environmental conditions, post-mortem interval (PMI), and potential body movement. Moreover, they represent an important resource for studying the role of fungi in the degradation of organic and inorganic matter, with implications for decomposition processes, biodeterioration, and forensic taphonomy. The deposition of *Penicillium cf. brevicompactum*, *Penicillium cf. chrysogenum*, *Mucor* sp., and *Aspergillus cf. versicolor* strains in CoID-UNIGE MIRRI-ERIC contributes to the development of reference material for these research areas.

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