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## ABSTRACTS

KEYNOTE LECTURES, COMMUNICATIONS, POSTERS

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**Intraspecific variability in *Fomes fomentarius*: can culture imaging successfully integrate growth profiles?**

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*Fomes fomentarius* (L.) Fr. is a widespread fungus causing intense wood decay in several broadleaf hosts. Formally reported to have holarctic distribution, it has been increasingly proposed to represent a species complex, although only *F. inzegae* (Ces. & De Not.) Cooke has been to date accepted as a distinct species (1). Notwithstanding, no ratio has been to now definitely proposed to disentangle the intraspecific variability of *F. fomentarius* either from the phylogenetic or ecological point of view (2).

The MicUNIPV Research Culture Collection currently counts about 600 strains of more than 120 wood decay species from Italy and other European Countries; namely, 31 strains of *F. fomentarius* are included (3).

Aim of this work was to test some cultural features as possible markers of intraspecific variability and strain characterization by comparing populations in Italy and Europe from different environments and climates.

This work therefore included 10 strains: 1 from Halden (Norway); 3 from Zwierzyński Forest (Białystok, Poland), 2 from Białowieża Forest (Poland), 2 from the State Strict Natural Reserve Bosco Siro Negri (Zerbolò, Italy), 1 from Castel San Giovanni (Italy) and 1 from Lame Pass in Aveto Regional Park (Italy).

Growth profiles in Petri plates (MEA) were obtained at 15 °C, 24 °C and 30 °C in triplicate until full colonization (9 cm diameter from lateral inoculum). Images from both the colony front and back sides were acquired and profiles analyzed by ImageJ software to record the pixel intensity in RGB components along the diameter. PCA factors were extracted by SPSS21 from the overall set of RGB profiles of each replicate per each temperature and locality. PCA factors were subsequently concatenated to achieve cumulative explained variance over 99%. Clusterization of such cumulative profiles was examined by neighbor joining method and the distance between groups; no standardization and Z-scores standardization were cross-applied to both the methods.

Results show that strains from different localities are quite variable in growth rate as well as in melanization and tridimensional growth patterns, as clearly observable in the original front and back side images. Notwithstanding, strains do not cluster based on a geographical ratio, nor based on the plant host systematics (from species to order). Even strains from the same locality - e.g. within Bosco Siro Negri, Zwierzyński Forest and Białowieża Forest - do not consistently cluster together at any temperature. This trend was also confirmed by examining the front side separately. Cumulative PCA factors indeed reveal that such an unpredictable clusterization reflects the intrinsic strain-specific variability. Thus, low variance is explained by fewer PCA factors and records, resulting in shorter cumulative profile. Profiles can moreover depict peculiar peaks related to melanization and tridimensional growth, despite it is not possible now to relate this with environmental adaptation.

More interestingly, the growth rates show that 30 °C results in fastest growth in all the strains except for Lame Pass, where 24 °C is significantly favoured. The gap between growth rates at 24 °C and 30 °C is lowest in Polish strains and highest in Italian strains from the Po Plain (Bosco Siro Negri and Castel San Giovanni), whereas the gap between growth rate at 15 °C and 24-30 °C is highest in Halden and Lame Pass strains. As a whole, this may indicate adaptation to different temperature ranges in continental climates (the Po Plain one and the North-Eastern Poland one) as well as adaptation to oceanic climates (Lame Pass and Halden). The latter two are apparently consistent in higher “activation” threshold at 15 °C possibly to escape the negative affect of the frequent rainfall/snowfall events in these areas.

In conclusion, PCA-cluster analysis applied to RGB profiles can be an useful tool to explore the intrinsic strain-specific variability for applied and ecological studies, but is not suitable for population studies. On the other hand, the analysis of growth rates at different temperatures provides a glimpse on possible local trends in populations and thus opens to further studies on the ecotype concept in wood-decay fungi.

1) U. Peintner, R. Kuhnert-Finkernagel, V. Wille, F. Biasioli, A. Shiryaev, C. Perini (2019) IMA Fungus, 10(17), 1-21

2) M. Tomšovský, S. Kaeochulsri, T. Kudláček, L.B. Dálya (2023) Mycol. Prog., 22(79), 1-13

3) C.E. Girometta, S. Buratti, A. Bernicchia, A. Desiderio, L. Goppa, C. Perini, E. Salerni, E. Savino (2024) Ital. J. Mycol., in press