

Solar energy is one of the key renewable sources for achieving a carbon emission-free Europe. The formation of subaerial biofilms, which significantly impact power production, is an underresearched phenomenon. Extremophilic fungi are among the primary biofilm forming microorganisms on solar panels. In our project **FungiMET**, we aim to develop metrologically sound procedures for the rapid identification of biofilm-forming fungi using nucleic acid-based quantification methods.

IMPACT

The designed methods could be used for biofilm monitoring and contribute to the design of novel cleaning agents and materials for the effective mitigation of biofilms.

SAMPLING

Five polycrystalline solar panels were sampled in Ljubljana, Slovenia.

Sampling with swabs and scraping/taping



Figure 1: Sampling site

REFERENCE MATERIALS

We evaluated two DNA extraction kits on lyophilized fungal isolates.

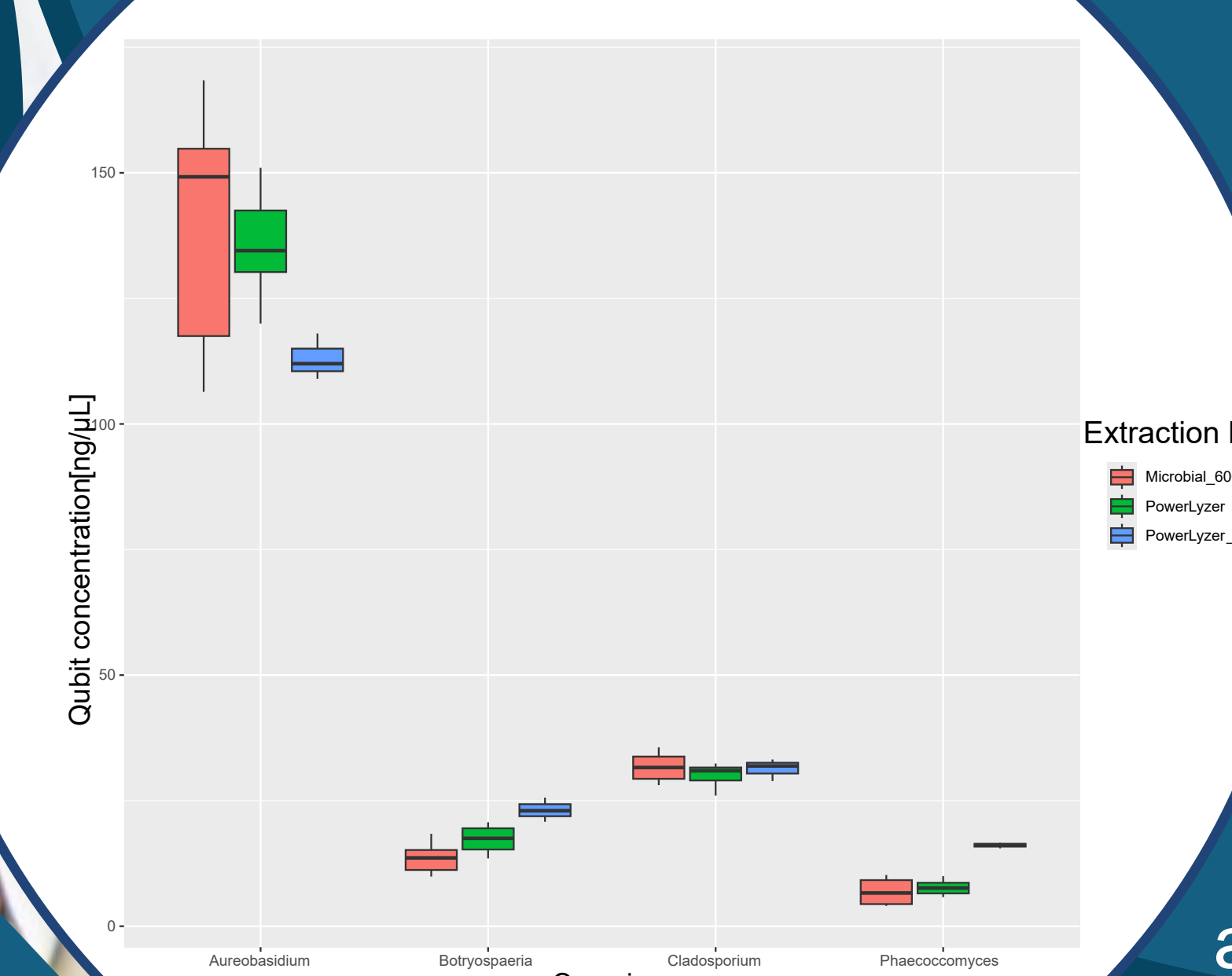


Figure 3: Comparison of DNA extraction yields for tested kits and each organism.

IDENTIFICATION

DNA barcoding

Mass spectrometry (MALDI-TOF)

We selected four most representative fungi (two species and two genera).

QUANTIFICATION

Digital PCR (dPCR) is an SI-traceable method for nucleic acid quantification.

We will design and validate novel dPCR assays for the quantification of selected model organisms.

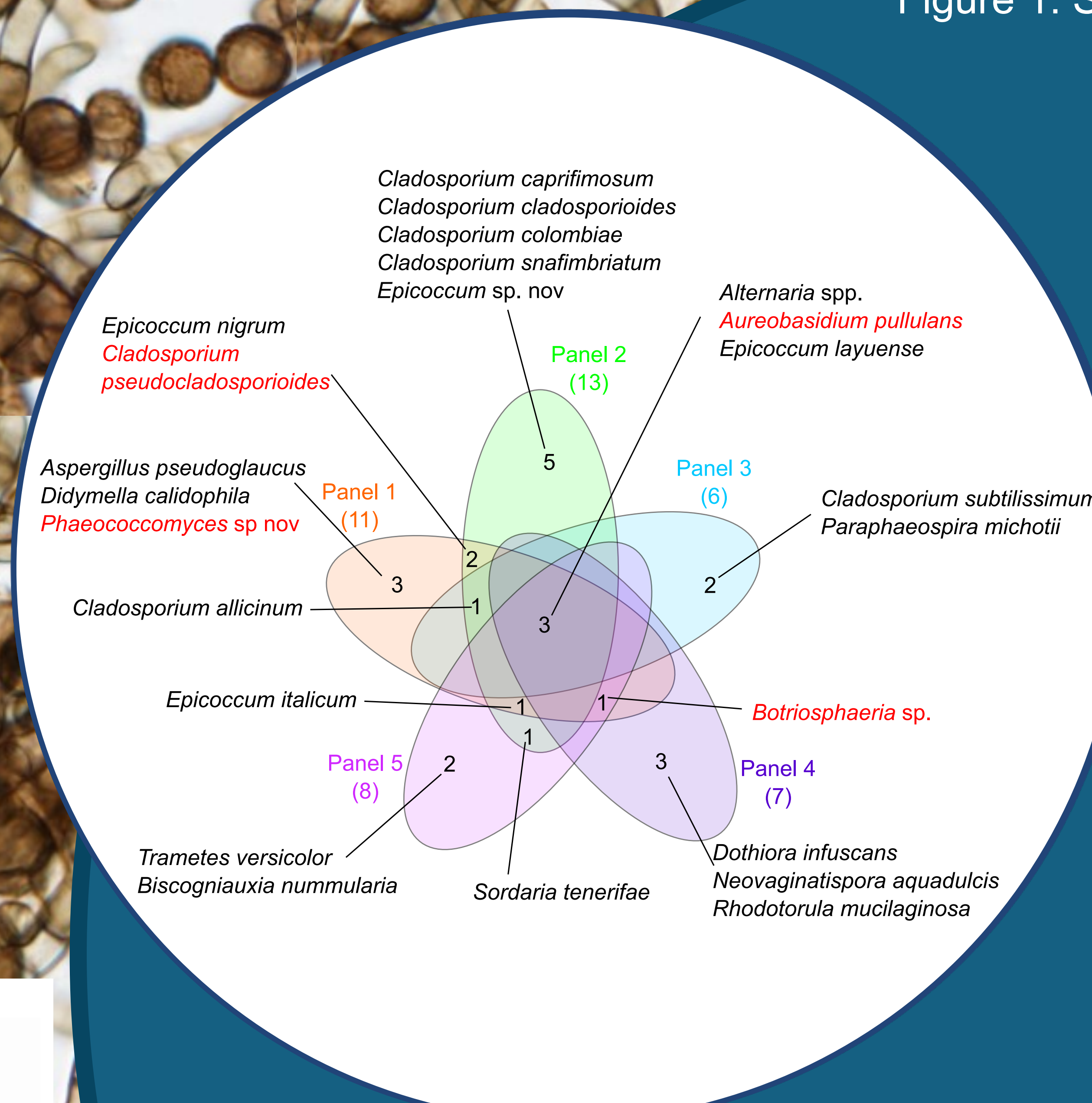


Figure 2: Venn diagram of isolated fungal species from the 5 sampled panels.