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Credible leads to Incredible®

ATCC's Collection of Plant Pathogenic Fungi

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Background

As a leading developer and supplier of authenticated biological materials, ATCC® provides the scientific community with access to an expansive collection of credible materials needed to support research and development applications. ATCC® has more than thirty thousand fungal strains encompassing over 1,850 different genera that can be utilized in various industrial applications. We have also recently initiated a project to further characterize the utility of our mycology collection by providing in-depth whole-genome sequencing data.

Our mycology portfolio contains more than 1,400 species of fungal and oomycete plant pathogens encompassing 340 genera, many of which are reference strains that can be used as plant pathogen standards. We also have fungi with reported activities across a wide range of commercially important areas such as biocontrol and plant growth promotion. Plant pathogen standards serve as reference strains for comparing and standardizing experimental research or diagnostic assays. Fungal pathogen standards are necessary for:

- Validation of assays
- Providing reproducible source of authenticated materials with published assay data to be used for QC of assays
- Diagnostic accuracy

Developing plant pathogen standards involves a comprehensive process that includes isolation, authentication, characterization, quality control, long-term preservation, and distribution. This poster will highlight the diversity and importance of our collection of plant pathogenic fungi and oomycetes and will provide examples of its use as a valuable resource for the scientific community.

Results

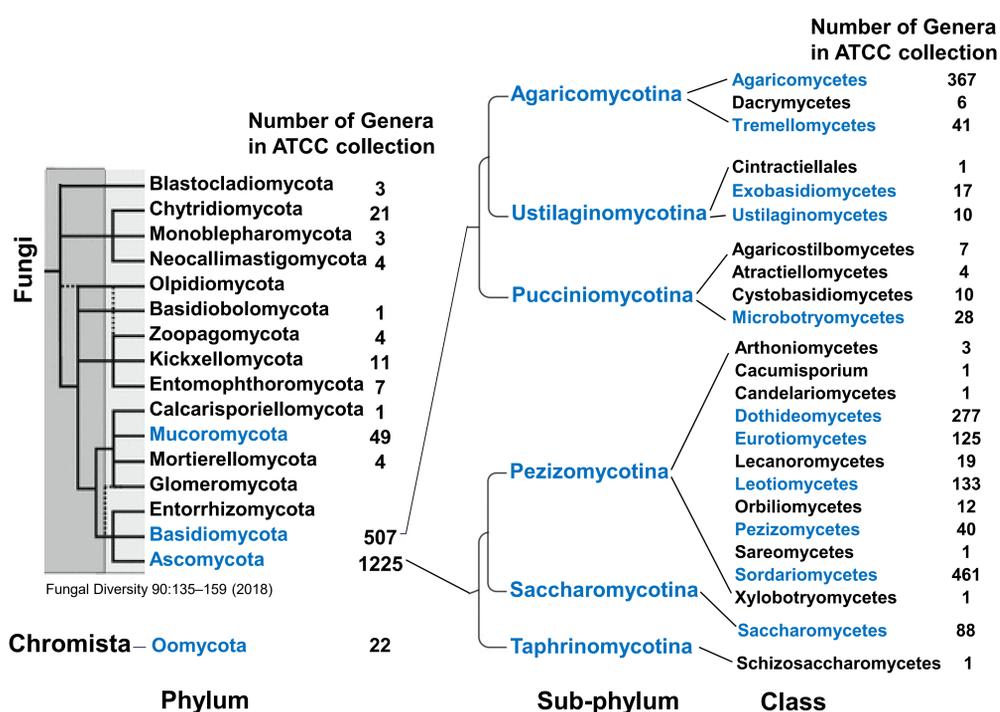


Figure 1: Diversity of the mycology collection at ATCC®. Taxonomic classifications of every isolate were obtained from MycoBank (https://www.mycobank.org/) and number of genera was counted manually using Excel. Taxa in blue include potential plant pathogens.

Significance of the ATCC® plant pathogen collection

- More than 8,000 strains from 1,458 species encompassing 340 genera (Figure 2A).
- Strains are authenticated based on morphological and/or sequence-based characterization and produced under ISO 9001 standards.
- Whole genomes of our strains are regularly being added to the ATCC® Genome Portal at genomes.atcc.org.
- Associated metadata for most strains are available (Figure 2B).
- Identified 126 major pathogens that can be used as standards for research & diagnostics purpose (Figure 2C).
- Assurance of long-term preservation and global distribution.

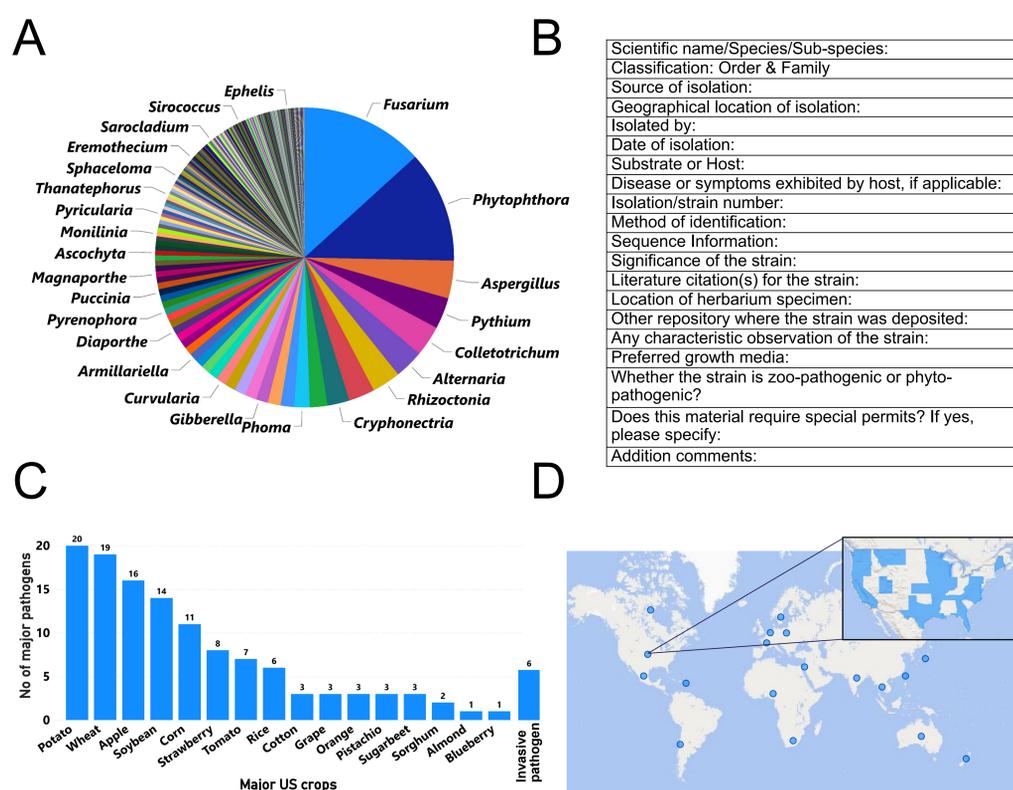


Figure 2: Using a comprehensive (automated and manual) literature search and metadata, 8,355 fungal strains from ATCC® collection were selected as potential plant pathogens. (A) Distribution of the 8,355 fungal strains among major genera (B) Some of the metadata associated with the present and historic deposit forms that are available for most of the ATCC® strains. (C) 126 major pathogens for some of the major crops and major invasive pathogens that can be used as standards. (D) Blue circles and highlights indicate the country of origin and state of origin within the United States for the 126 selected plant pathogens. Figures were generated using Power BI Desktop.

Conclusions

- ATCC® recognizes the importance of plant pathogen standards and continues to expand its collection in this area.
- We are actively working toward acquiring and authenticating microbial plant pathogens to meet the needs of the scientific community.
- We are open to collaborating with other organizations and researchers to develop and distribute plant pathogen standards.

