

# ONE NAME FOR FUNGI: EFFORTS TOWARD THE STANDARDIZATION OF THE NAMES OF PLANT PATHOGENS

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## INTRODUCTION

Accurate scientific names are critical for communicating about disease diagnoses and detection of pathogens and pests. The National Plant Diagnostic Network (NPDN) along with federal and state regulatory and inspection personnel have key roles in discovering high consequence fungal pathogens at ports of entry or in domestic locations through sample submissions and targeted surveys.

Finding correct names for fungi and oomycetes is often difficult due to sexual and asexual morph designations and numerous synonyms that can be found in literature. The International Code of Nomenclature for algae, fungi, and plants (ICN) adopted in 2013 ended dual nomenclature and mandated the use of one accepted name for a fungal species, with other names retained as synonyms.

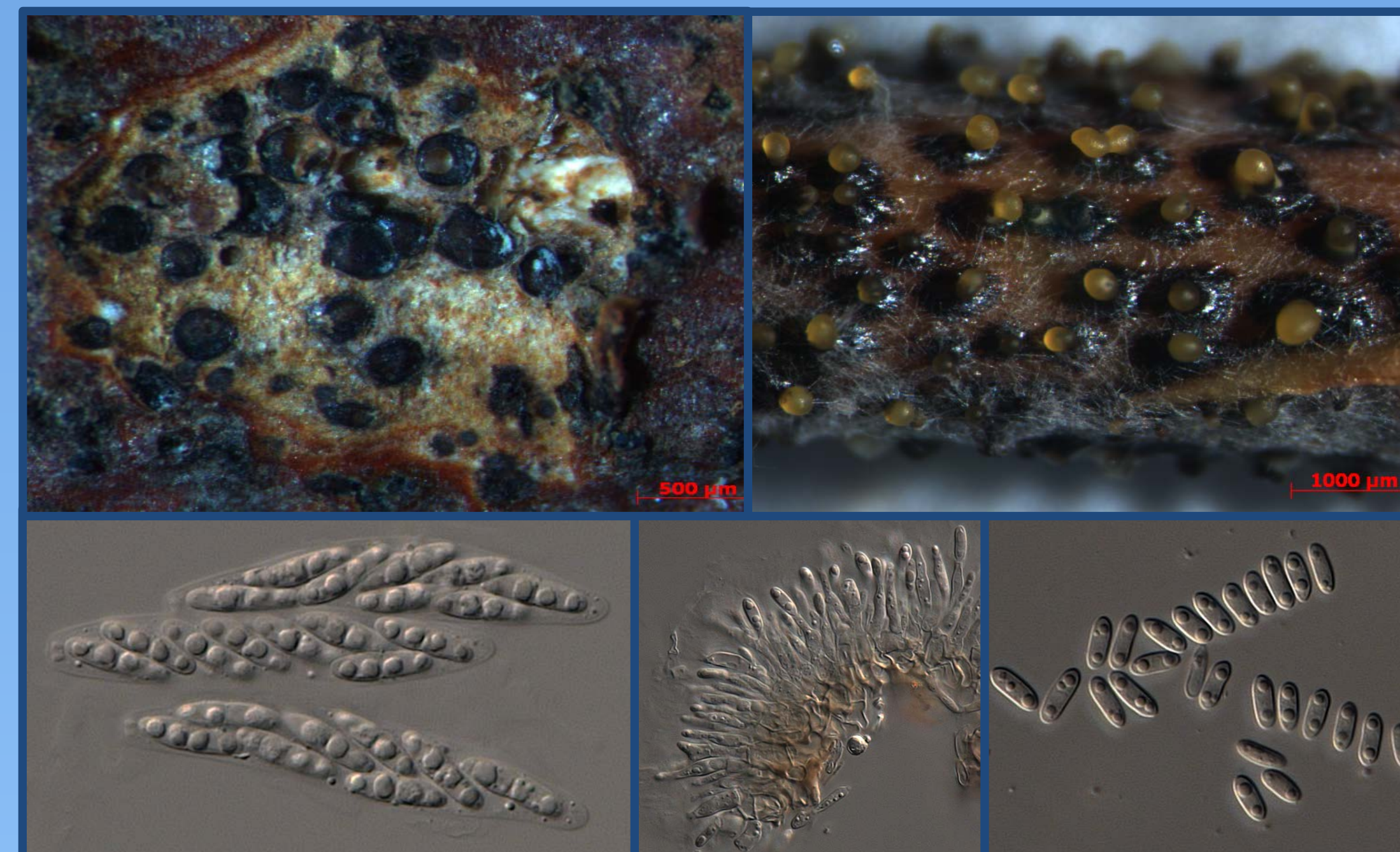
Various terms such as One Name for Fungi, One Fungus=One Name, and One Name, One Fungus have been used to describe the efforts of a group of diagnosticians, educators and researchers to transition to a single name and update existing databases and other resources.

The Center for Environmental and Regulatory Information Systems (CERIS) maintains the NPDN National Repository and the USDA ARS Systematic Mycology & Microbiology Laboratory (SMML) maintains the U.S. National Fungal Collections (USNFC) Fungal Databases website. Both are important resources for mycologists and plant pathologists seeking correct names for fungi.

Accomplishments described here involve these two curated resources that provide the scientific community with accurate names for fungi.

## METHODS

- Approximately 3000 fungal names in the NPDN data repository were evaluated for accuracy.
- New mycological literature was reviewed for new or updated taxonomy/nomenclature.
- In all cases, ICN rules pertaining to priority, spelling and conservation were applied.
- If the oldest epithet was not in the correct genus this was noted and in some instances published as a new combination.
- Records were updated in the USNFC Fungal Databases and the NPDN Data Repository.



*Diaporthe eres*: Sexual (L) and asexual (R) states formerly referred to *Diaporthe eres* and *Phomopsis oblonga*, respectively. Under 1N=1F, the correct name is *Diaporthe eres*. Photo credits: D. Udayanga (2015).

\*\*\*Tell us why you value the fungal databases\*\*\*  
**Diaporthe eres** Hitchc. ex F. (Ascomycota, Diaporthales)  
 = *Phomopsis castanea-mollisima* S.X. Jang & H.B. Ma 2010  
 = *Diaporthe castanea-mollisima* (S.X. Jang & H.B. Ma) Udayanga, Crous & K.D. Hyde 2012  
 = *Phomopsis cotoneastri* Purith. 1973  
 = *Diaporthe cotoneastri* (Purith.) Udayanga, Crous & K.D. Hyde 2012  
 = *Phyllosticta fraxini* Ellis & G. Martin 1954  
 = *Sphaeria fraxincola* Curt. 1859  
 = *Phyllosticta fraxincola* (Curt.) Ellis & Everh. 1984  
 = *Phomopsis fulvulii* Tarasol & S. Ender 1927  
 = *Diaporthe hydrangae* Ellis & Everh. 1890  
 [= *Diaporthe mali* Miura 1916 - illegitimate later homonym, not included in search]  
 = *Phoma oblonga* Desm. 1853  
 = *Phomopsis oblonga* (Desm.) Traverso 1905  
 = *Diaporthe pilysa* Sacc. 1975  
**Notes:** Type of the genus *Diaporthe*. Considered by some authors to be a species complex. Wehmeyer (1933) based his species concept on morphology rather than host distinction and listed an extensive number of synonyms (see there); *Phoma oblonga*, *Phomopsis oblonga*, *Diaporthe cotoneastri*, *Diaporthe cotoneasteri*, *Phomopsis castanea-mollisima*, *Diaporthe castanea-mollisima*, and *Phomopsis fulvulii* verified as synonyms by sequence data by Udayanga et al. (2014).  
**Distribution:** Asia, Europe, North America, Africa (Zambia), New Zealand.  
**Substrate:** Leaves, petioles, twigs, branches, stems, flowers, fruits.  
**Disease Note:** Canker, fruit rot, leaf spot; also an endophyte and saprobe.  
**Host:** Multiple families.  
**Supporting Literature:**  
 C.M.L. 1950. *Diaporthe mali*. *Distrib. Maps Pl. Dis.* 618: 1-2.  
 Dissanayake, A.J., Liu, M., Zhang, W., Chen, Z., Udayanga, D., Chulastrote, E., Li, X.-H., Yan, J.-Y., and Hyde, K.D. 2015. Morphological and molecular characterization of *Diaporthe* species associated with grapevine trunk disease in China. *Fung. Biol.* 119: 253-264.  
 Gomez, R.R., Glanka, C., Vidars, B.L.R., Lombard, L., Gronwald, J.Z., and Crous, P.W. 2013. *Diaporthe*: a genus of endophytic, saprobic and plant pathogenic fungi. *Persoonia* 31: 1-41.  
 Kanematsu, S., Kobayashi, T., and Kusio, A. 1990. Corridal morphology, pathogenicity and culture characteristics of *Phomopsis* isolates from peach, Japanese pear and apple in Japan. *Ann. Phytopathol. Soc. Japan* 65: 254-273.  
 Kanematsu, S., Minaka, N., Kobayashi, T., Kato, A., and Ohtsu, Y. 2000. Molecular phylogenetic analysis of ribosomal DNA internal transcribed spacer regions and comparison of host specificity in *Phomopsis* isolates from fruit trees. *J. Gen. Pl. Pathol.* 69: 191-201.  
 Tanaka, T. 1916. New Japanese Fungi Notes and Translations VII. *Mycologia* 11: 148-154.  
 Van Der AA, H.A., and Neeuw, B. 2002. A revision of the species described in *Phyllosticta*. *Centraalbureau voor Schimmelcultures*, Utrecht, 510 pages.  
 Wehmeyer, L.E. 1933. The genus *Diaporthe* Hitchc. and its segregates. *Univ. Michigan Stud., Sci. Ser.* 9: 1-349.  
 Updated on May 20, 2015

*Diaporthe eres* nomenclature report from the USNFC Fungal Databases. <http://nt.ars-grin.gov/fungal-databases/>

NPDN Dictionary Updates

Number of Updates: 2,483 (834 added, 1,649 modified, 0 deleted)

Search Criteria

Table

Dates: 2014-12-23 to 2014-12-23

< Prev 1 2 3 4 5 6 ... 25 Next >

Results per page: 100

Date	Action	Code	Syn #	Common Name	Scientific Name
2014-12-23 09:30:59	Modify	FAAAAJZ		Hornbeam Anthracnose	Apiosporopsis carpinea
2014-12-23 09:30:59	Modify	FAAAANC		Anthracnose	Apiognomonia sp./spp.
2014-12-23 09:30:59	Modify	FAAAAGO		Anthracnose	Asteroma inconspicuum
2014-12-23 09:41:35	Modify	FAAACWY		Cyclamen Anthracnose	Cryptocline cyclaminis
2014-12-23 09:43:35	Add	FAAAGAU	1	Ash Anthracnose	Gnomoniella fraxini
2014-12-23 09:43:35	Modify	FAAAGAU		Ash Anthracnose	Plagiostoma fraxini
2014-12-23 09:43:35	Add	FAAAGBO	1	Maple Anthracnose	Gloeosporium apocryptum
2014-12-23 09:43:35	Modify	FAAAGBO		Maple Anthracnose	Aureobasidium apocryptum
2014-12-23 09:43:35	Add	FAAAGBT	1	Euonymus Anthracnose	Gloeosporium frigidum
2014-12-23 09:43:35	Modify	FAAAGBT		Euonymus Anthracnose	Neofabraea alba
2014-12-23 09:43:35	Add	FAAAGBU	1	Lime Witherip Anthracnose	Gloeosporium limeticola
2014-12-23 09:43:35	Modify	FAAAGBU		Lime Witherip Anthracnose	Colletotrichum limeticola
2014-12-23 09:43:35	Add	FAAAGBV	1	Banana Anthracnose	Gloeosporium musarum
2014-12-23 09:43:35	Modify	FAAAGBV		Banana Anthracnose	Colletotrichum musae
2014-12-23 09:43:35	Modify	FAAAGBY		Tulip Anthracnose	Gloeosporium thamenis
2014-12-23 09:43:35	Modify	FAAAGCF		Anthracnose	Gnomonia canyae

NPDN Dictionary update examples Provided by M. Hill (CERIS).  
<http://ceris.purdue.edu/ceris/index.html>  
<http://www.npdn.org/>

NPDN Pest Dictionary

Date of Search: 02/20/2015 01:17:04 pm EST

Number of Pests: 5

Search Criteria

Keyword(s): ash anthracnose

Keyword Type: contains all of the keywords

Include Synonyms: Yes

Code	Syn #	Type	Common Name	Scientific Name	Classification
Plagiostoma fraxini (G006919)					
FAAAGAU		Pest	Ash Anthracnose	Plagiostoma fraxini	Fungi
FAAAGAU	001	Synonym	Ash Anthracnose	Gnomoniella fraxini	Fungi
FAAAGDT		Pest	Ash Anthracnose	Plagiostoma fraxini	Fungi
FAAAGDT	001	Synonym	Ash Anthracnose	Gloeosporium aridum	Fungi

Example of Updated Entry in NPDN Pest Dictionary for Ash Anthracnose Pathogens. Synonyms highlighted in yellow. Provided by M. Hill (CERIS)

## RESULTS

During the first year of USDA APHIS Farm Bill funding, personnel at SMML reviewed and updated 1038 records in the NPDN dictionary based on literature available at that time. Of these 861 were identified to species.

The second year of funding added personnel from USDA APHIS National Identification Services and Science and Technology Risk Analysis who address urgent regulatory nomenclature issues. 915 NPDN dictionary names were reviewed and updated by CERIS and SMML personnel. A total of 7,322 names were updated in the USNFC Fungal Databases, with many newly added from publications and voucher specimens, in the first and second years.

In the third year of funding, 342 NPDN dictionary names were reviewed and updated as needed. Approximately 100 species names and 364 records identified only to genus remain to be reviewed.

At CERIS, approximately 3,000 name records have been reviewed. 1649 records were modified for the NPDN National Repository and 834 synonyms were added. The NPDN Database Committee served as content reviewers.

To date during the fourth year of this work, 11,737 total fungal names have been evaluated in the USNFC Fungal Databases. This represents the largest actively curated database for the nomenclature of agriculturally important fungi in the world.

## ACKNOWLEDGMENTS

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