

Supplementary Material

HDAC1: An Essential and Conserved Member of the Diverse Zn²⁺-Dependent HDAC Family Driven by Divergent Selection Pressure

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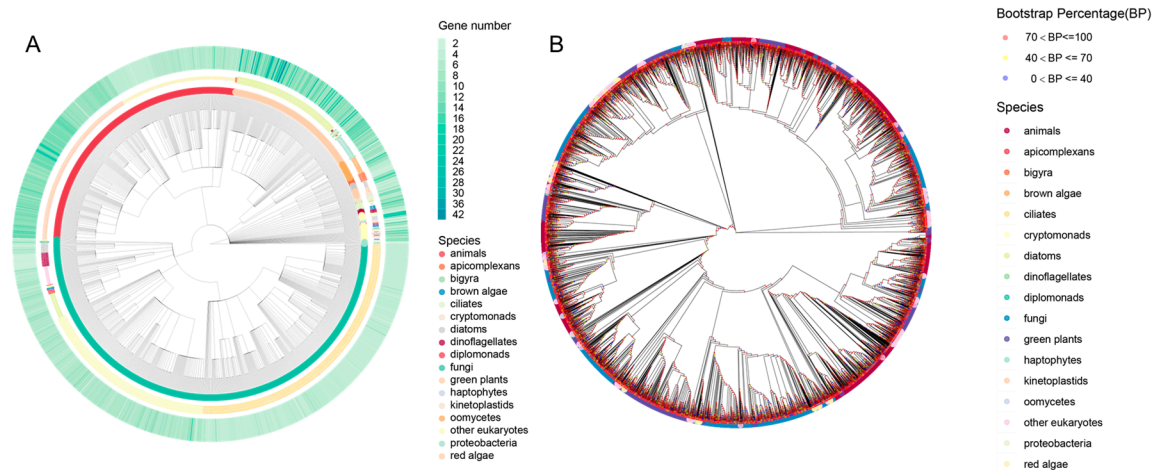


Figure S1. The repertoires and phylogenetic tree of HDACs from 1451 species. The statistical data for each class in these species is shown in Figure A. The corresponding detailed data is shown in Table S1 and Table S2. The common tree of the selected species was obtained from the NCBI database. These figures were prepared using the ggtree package in R programming. The Maximum Likelihood (ML) phylogenetic tree was built up using FastTree v1.4.3 (B).

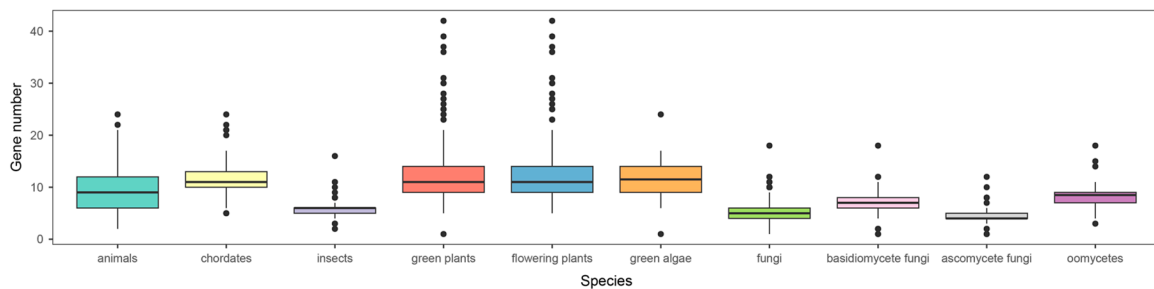


Figure S2. The boxplot for the *HDAC* gene numbers in the major groups of species.

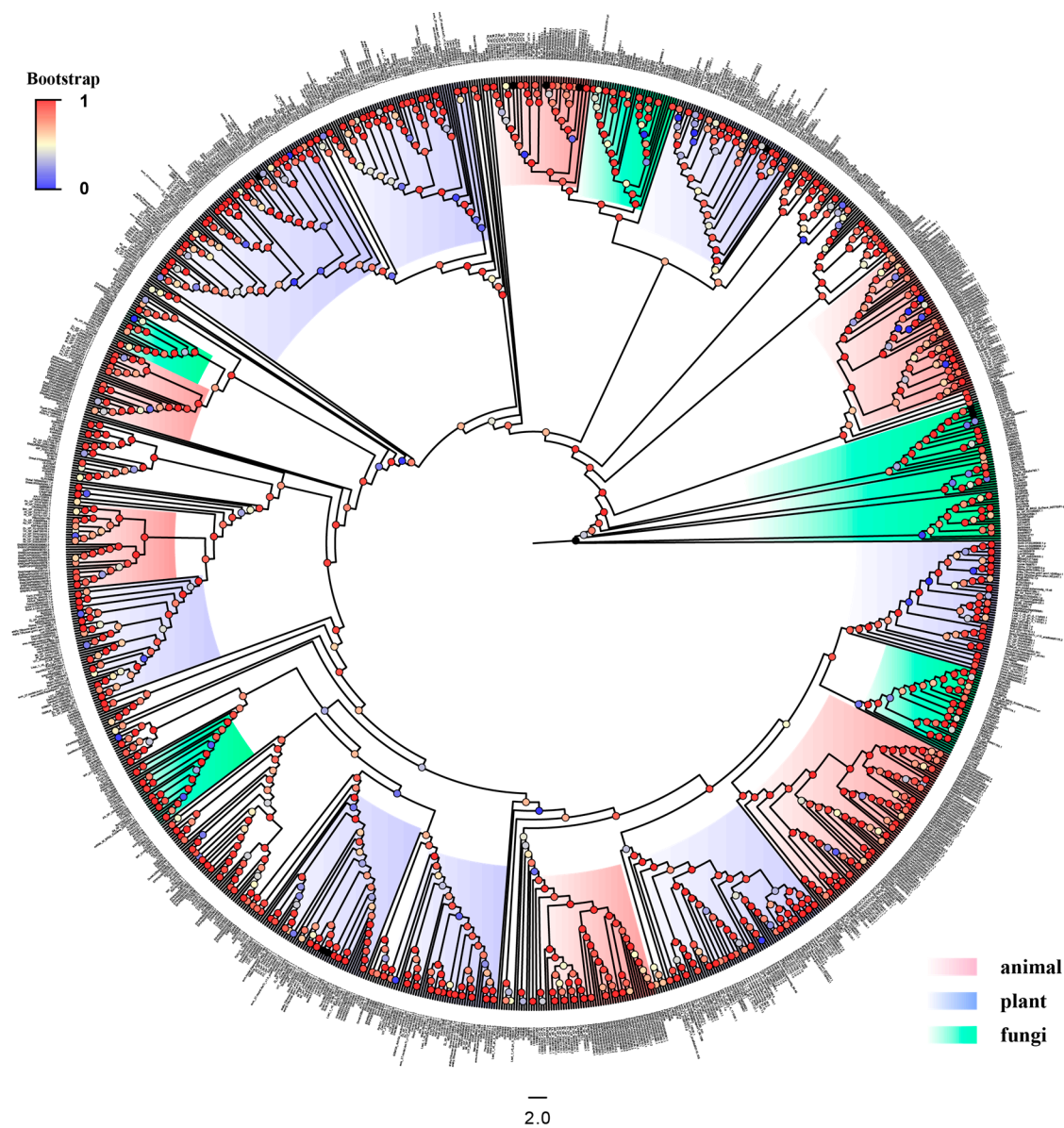


Figure S3. The phylogenetic tree of HDACs from the 142 selected species. The Maximum Likelihood (ML) phylogenetic tree was built up using FastTree v1.4.3. It was shown using FigTree v1.4.3.

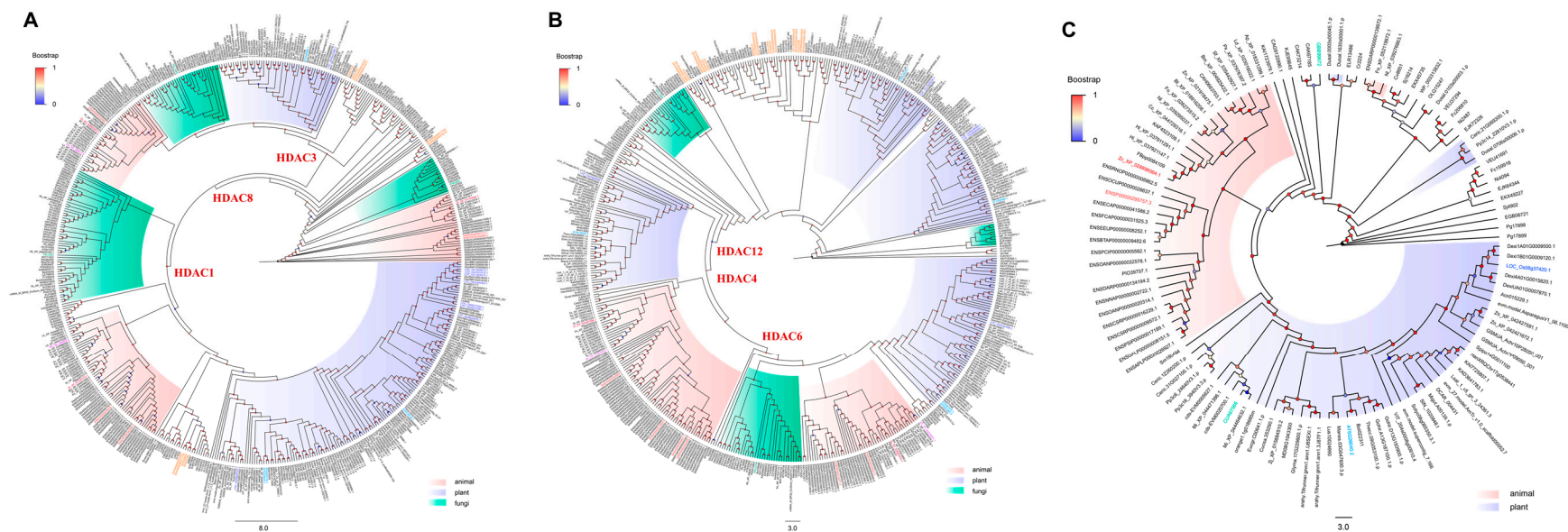


Figure S4. The phylogenetic trees of HDACs from the 142 selected species. These Maximum Likelihood (ML) phylogenetic trees were built up by PhyML v3.0 based on Q.pfam +R, VT +R, and Q.pfam +R models using the Class I, Class II, and Class IV sequences, respectively. The taxa of *H. sapiens*, *A. mellifera*, *S. cerevisiae*, *P. sojae*, *A. thaliana*, and *O. sativa* are colored red, pink, green, orange, cyan, and slate, respectively. They were prepared through FigTree v1.4.3.

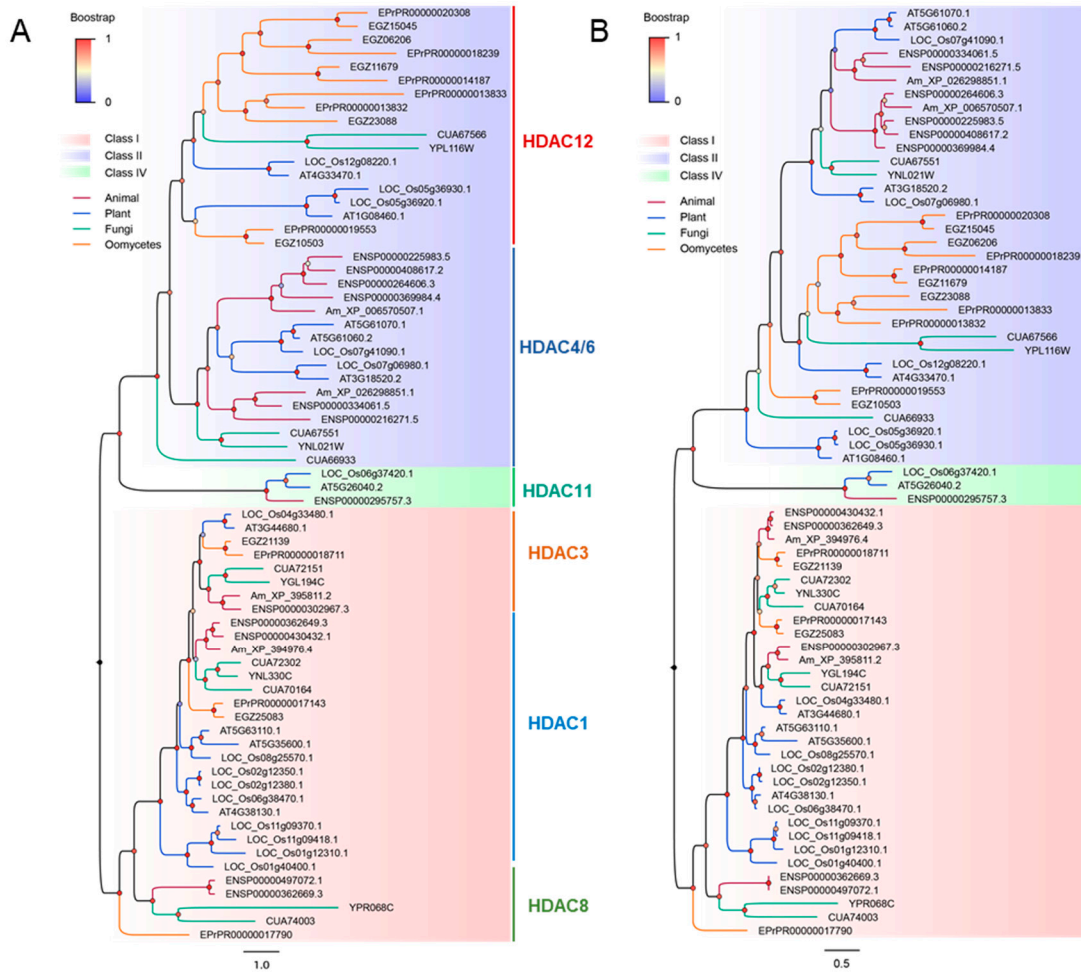


Figure S5. The phylogenetic trees of HDACs from the eight representative species. These Maximum Likelihood (ML) phylogenetic trees were built up by PhyML v3.0 based on VT +R (A) and LG +R (B) models using the whole sequences (A) and the Hist_deacetyl domain sequences (B), respectively. They were prepared through FigTree v1.4.3.

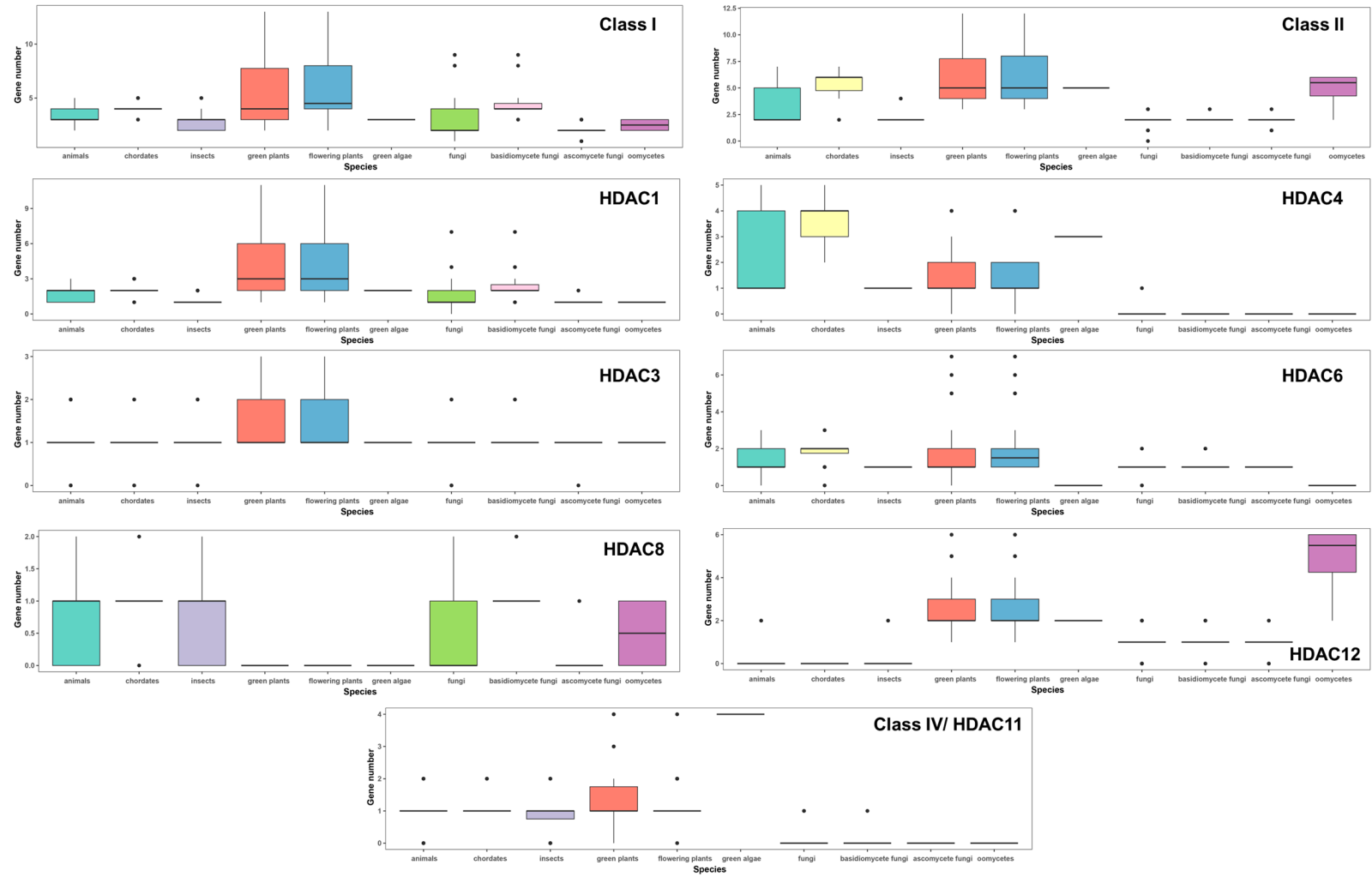


Figure S6. The boxplots for the different types of *HDAC* gene numbers in the major groups of species.

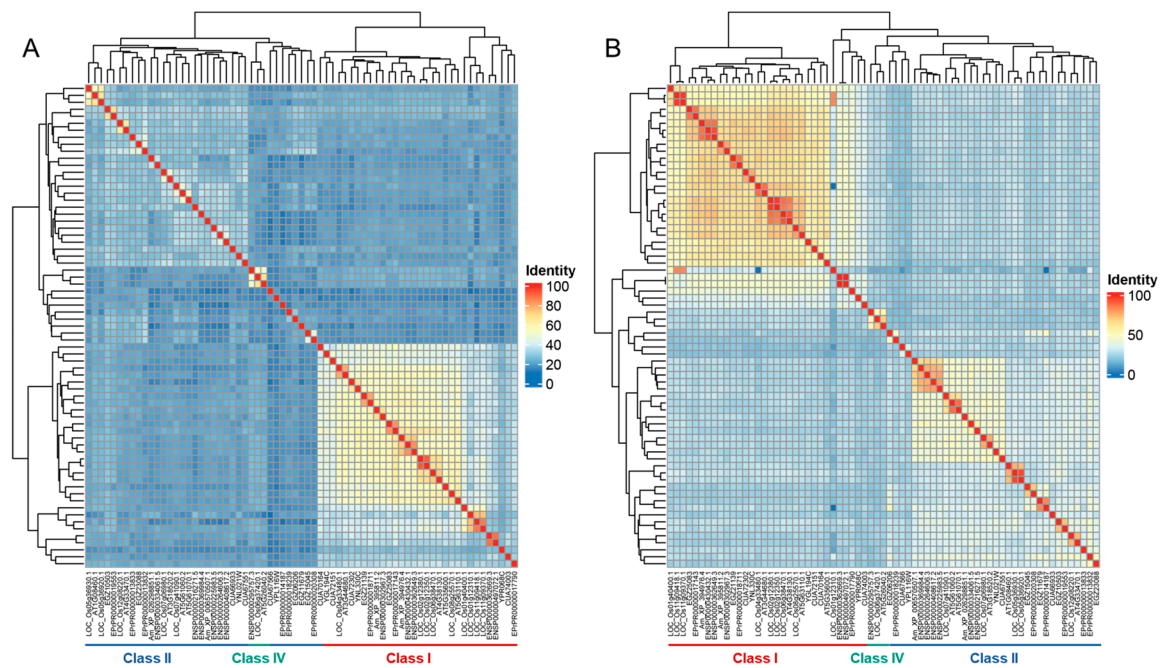


Figure S8. The heatmaps of sequences identity of HDACs from the eight representative species. The heatmaps of whole sequences identity (A) and the Hist_deacetyl domain sequences identity (B) were generated using the pheatmap package in R programming.

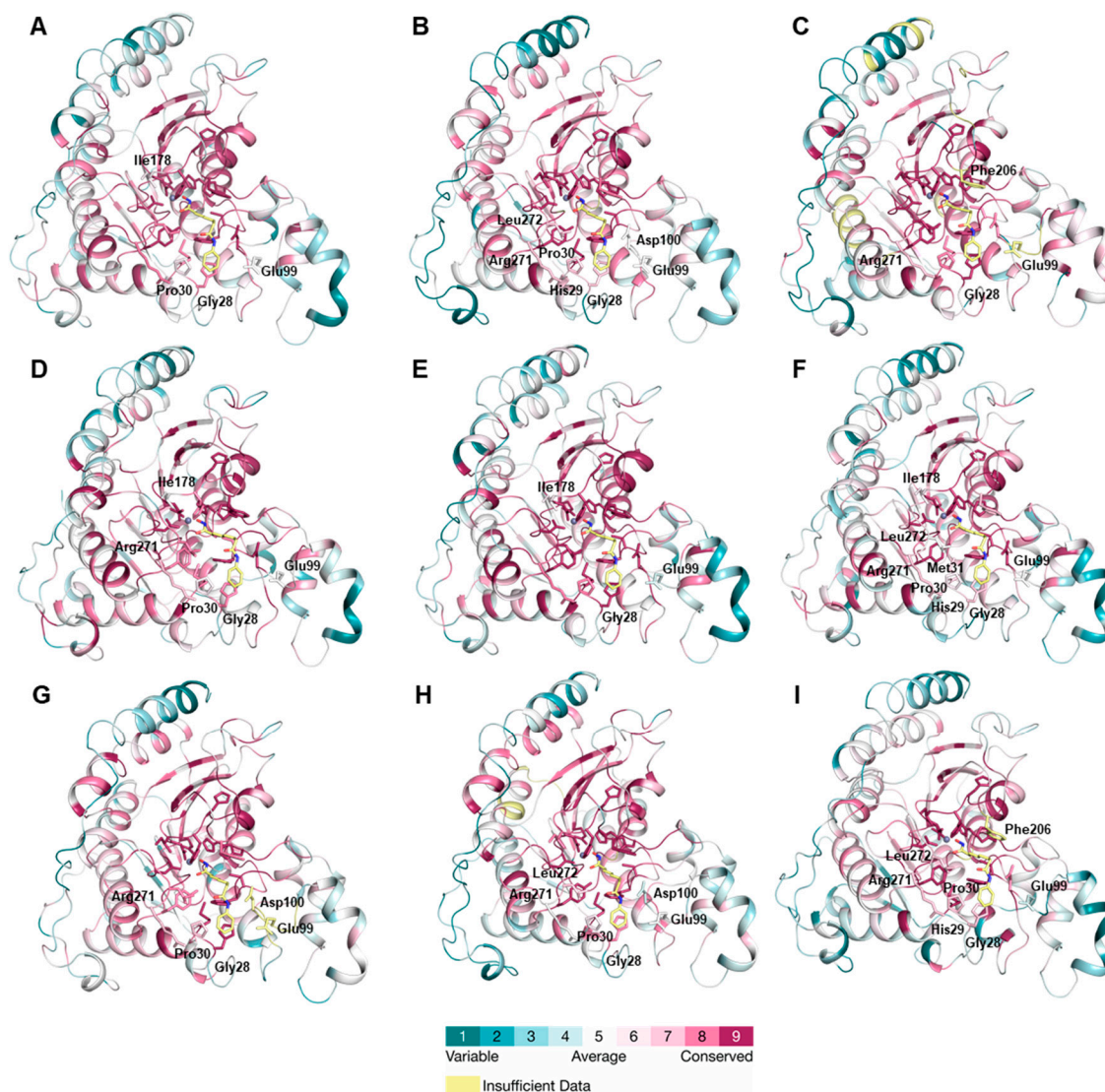


Figure S9. The 3D structure of human HDAC2 showing sequence conservation. The conservations (ConSurf grades) of residues were calculated using Class I (A), Class II (B), Class IV (C), HDAC1 (D), HDAC3 (E), HDAC8 (F), HDAC4 (G), HDAC6 (H), and HDAC12 (I) sequences from 1451 species. The human HDAC2 crystal structures complex with vorinostat (PDBID: 4lxz) are colored according to ConSurf grade from blue (low grade) to red (high grade). The complexed vorinostat and residues contacting the Zn atom and vorinostat are shown in sticks. The residues within the 6 Å distance to vorinostat with low ConSurf grade (≤ 7) are also shown in sticks.

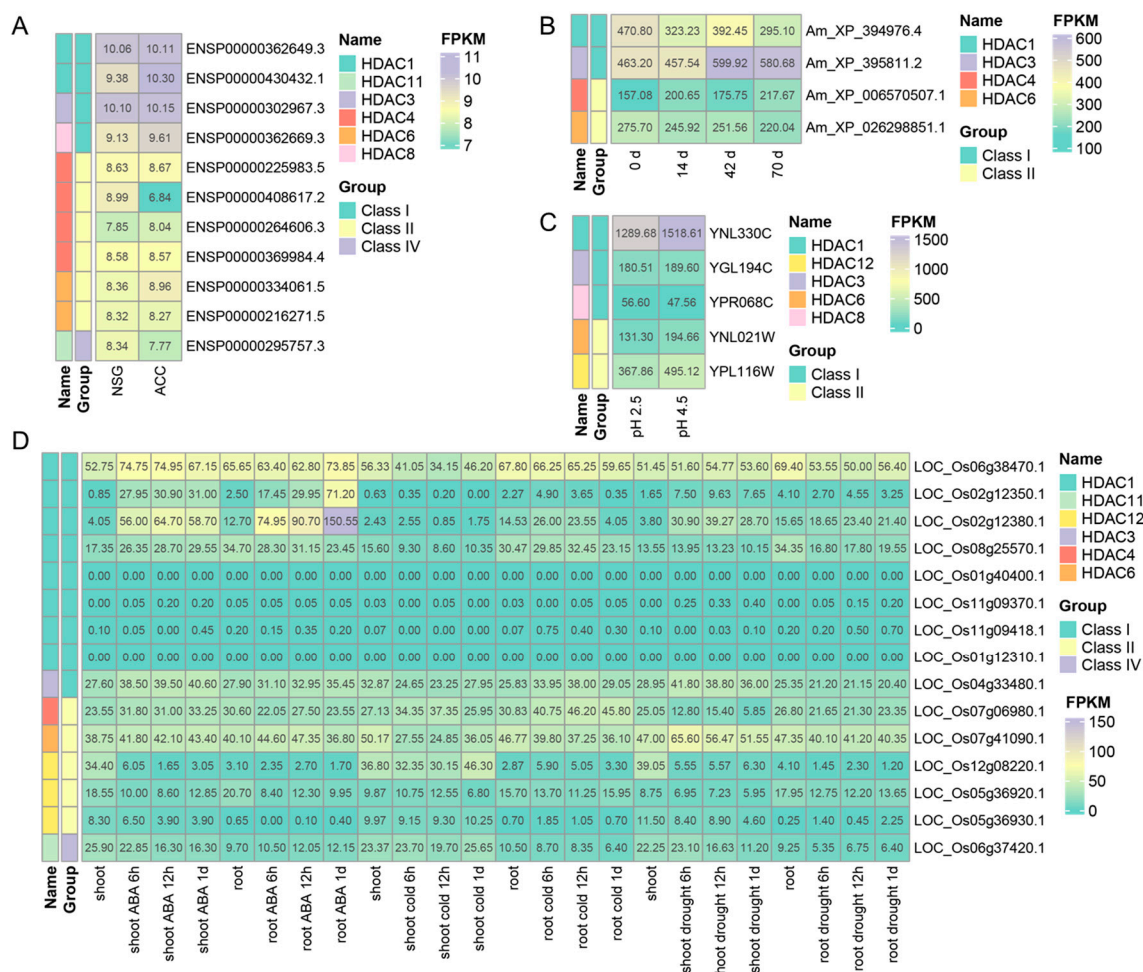


Figure S10. The gene expressions of HDACs in *H. sapiens*, *A. mellifera*, *S. cerevisiae*, and *O. sativa*. The data in normal salivary gland tissue (NSG)/adenoid cystic carcinoma (ACC) of *H. sapiens*, in *A. mellifera* installed into eggplant greenhouses after 0 days, 14 days, 42 days, and 70 days, in *S. cerevisiae* treated with pH 2.5 and pH 4.5, and in *O. sativa* under ABA, cold, and drought treatment in different tissues are shown with heatmap.

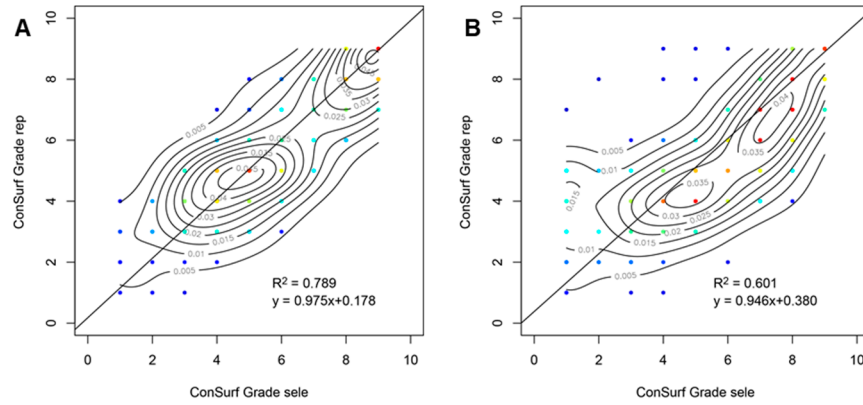


Figure S11. The correlation of sequence conservation of the eight representative species and the 142 selected species. The conservations (ConSurf grades) of residues were calculated using Class I (A) and Class II (B) sequences from the 142 selected species (x-axis) and the eight representative species (y-axis). The points are colored based on the densities from blue (low) to red (high).

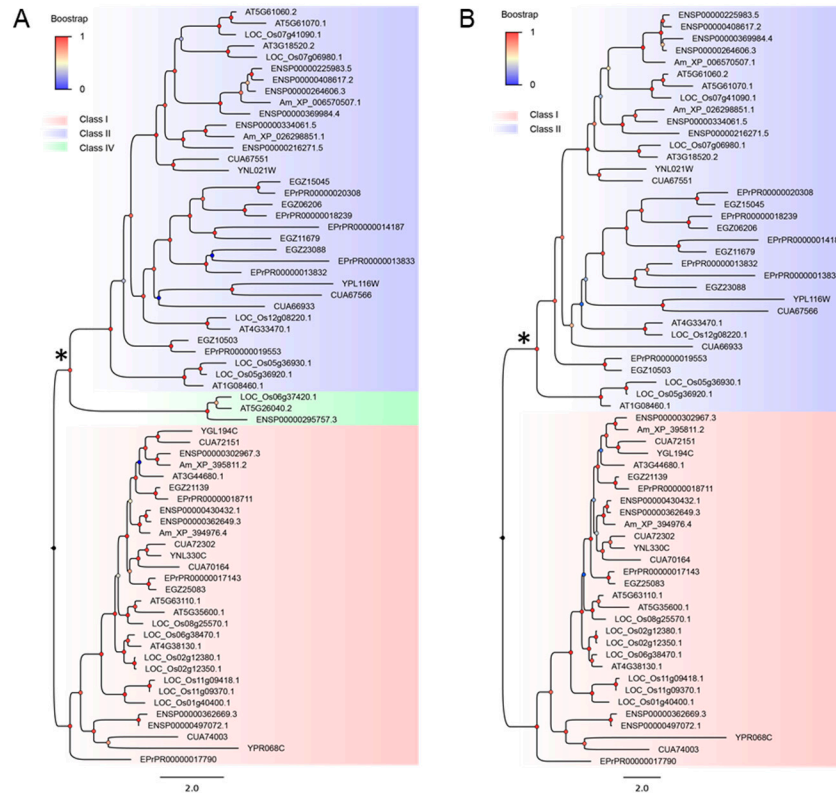


Figure S12. The phylogenetic trees of HDACs used for the positive selection (PS) and functional divergence (FD) analysis. These Maximum Likelihood (ML) phylogenetic

trees were built up by PhyML v3.0 based on VT +R and Q.pfam +R models using the sequences of Class I, II, and IV and Class I and Class II, respectively. The short sequences (LOC_Os04g33480.1 and LOC_Os01g12310.1) were deleted in this work. The nodes for two ω values in Two-ratio model calculations are labeled using black. The cds sequences of proteins were used for further PS and FD analysis (A). These trees were prepared through FigTree v1.4.3.

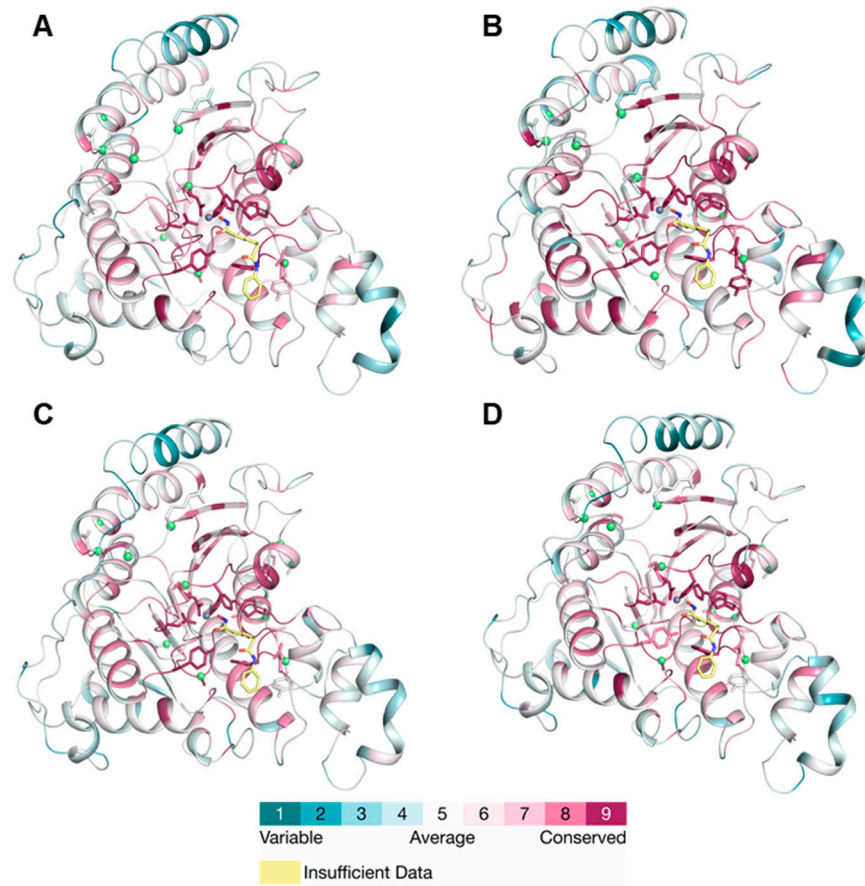
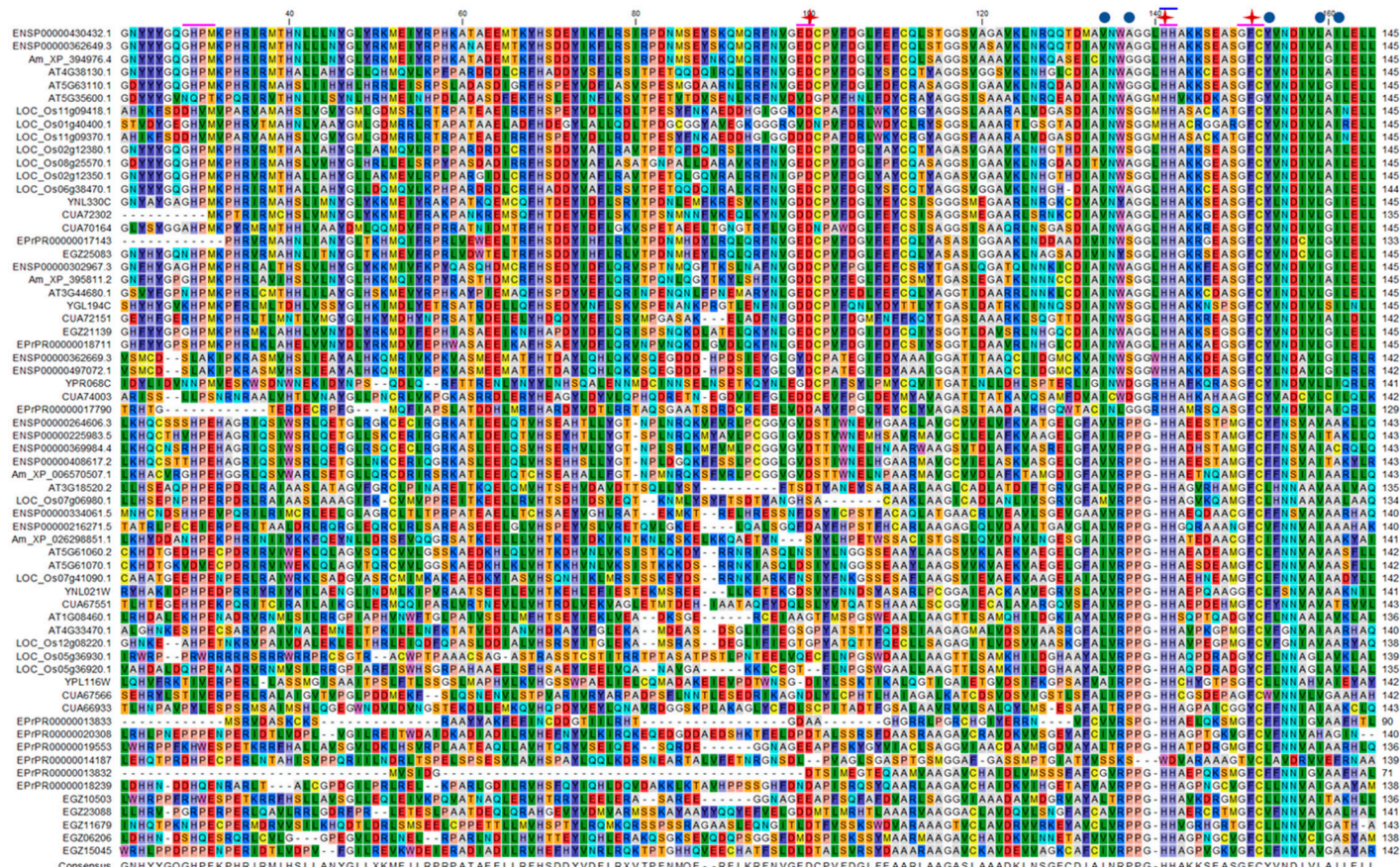


Figure S13. The 3D structure of human HDAC2 showing sequence conservation and functional divergence (FD) I sites. The conservations (ConSurf grades) of residues were calculated using all (A), Class I (B), Class II (C), and Class II and Class IV (D) sequences of eight representative species. The CA atoms of residues involved in FD among Class I and Class II are shown as green balls. The human HDAC2 crystal structures complex with vorinostat (PDBID: 4lxz) are colored according to ConSurf grade from blue (low grade) to red (high grade). The complexed vorinostat and important residues are shown in sticks.



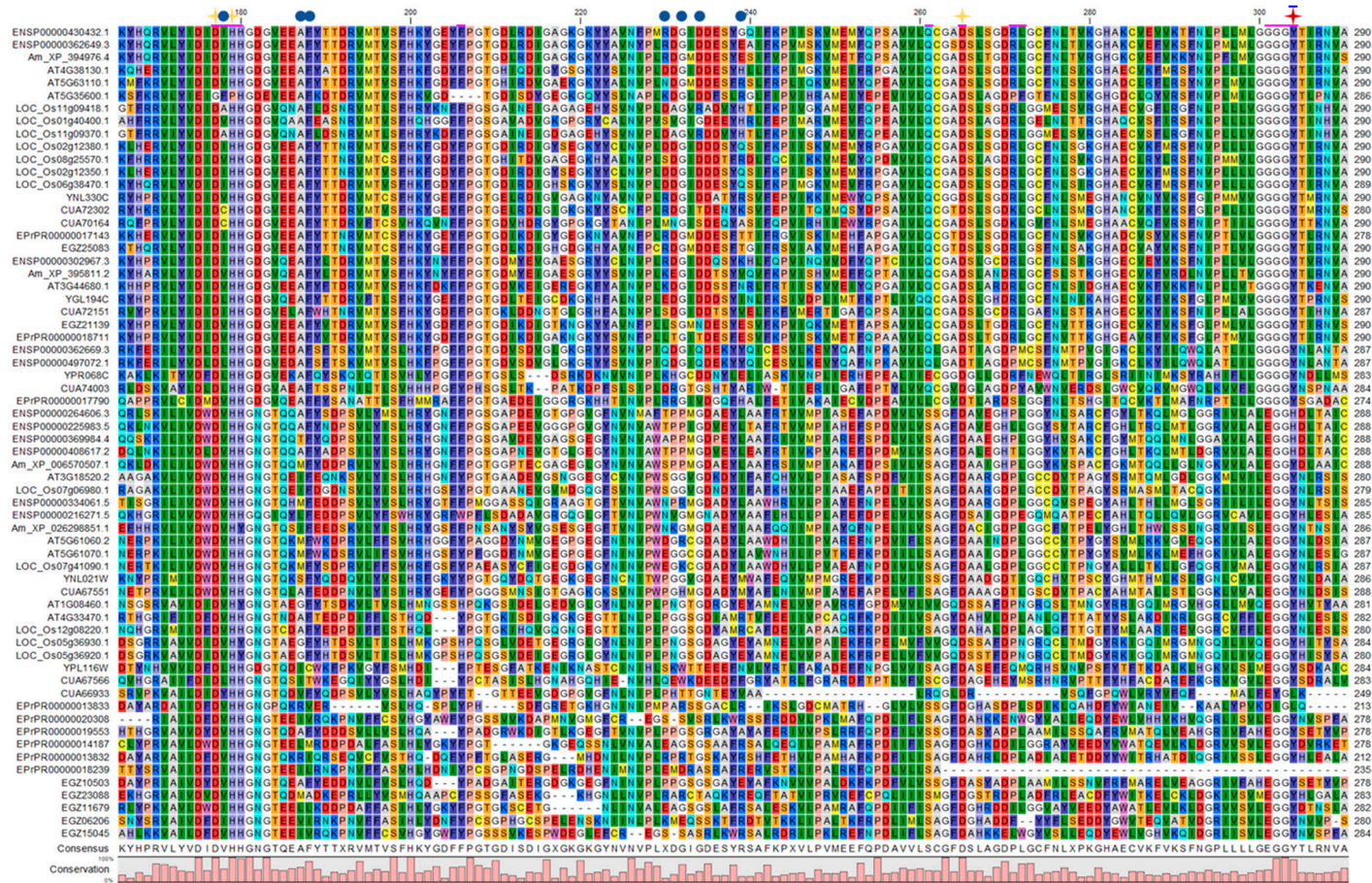


Figure S14. Sequence alignments of HDACs in Class I and Class II from eight selected representative species with the ENSP00000430432.1 (HDAC2) of *H. sapiens*. The amino acids within the 6 Å distance to the vorinostat are marked with pink lines. The residues coordinating with the Zn atom and contacting with vorinostat are marked with orange stars and red stars. The catalytic amino acids are marked with blue lines. The residues under FD are marked with blue circles.

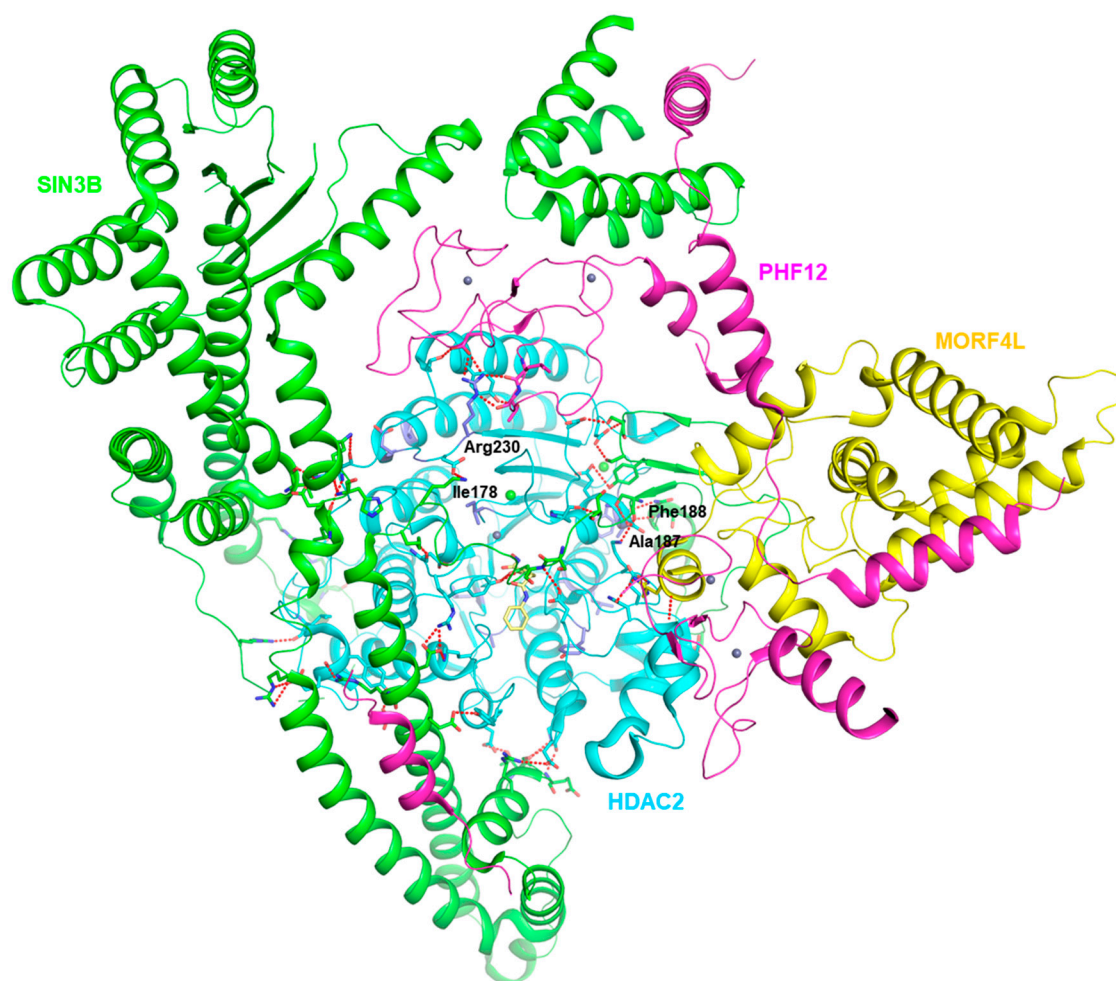


Figure S15. The crystal structure of the human SIN3B HDAC2 complex. This 3D structure (PDBID: 8c60) is downloaded from the PDB database. Chains are shown as cartoons. The chains of HDAC2, paired amphipathic helix protein Sin3b (SIN3B), PHD finger protein 12 (PHF12), and mortality factor 4-like protein 1 (MORF4L) are colored in cyan, green, magenta, and yellow, respectively. The residues responsible for FD I are shown in sticks and colored in slate. The critical residues among them are labeled with residue names. The hydrogen bonds are shown as red dashes.

Table S1. The HDAC repertoires of 1451 species were determined in this study.

| Tax name | Gene | Protein | Subphyla | Species |
|---|------|---------|---------------------|------------------|
| <i>Acanthamoeba castellanii</i> str. Neff | 7 | 7 | other eukaryotes | other eukaryotes |
| <i>Vitrella brassicaformis</i> CCMP3155 | 12 | 12 | other eukaryotes | other eukaryotes |
| <i>Chromera velia</i> CCMP2878 | 9 | 9 | chromeraceae | other eukaryotes |
| <i>Bigelowiella natans</i> CCMP2755 | 12 | 12 | cercozoans | other eukaryotes |
| <i>Fonticula alba</i> | 7 | 8 | rotosphaerida | other eukaryotes |
| <i>Sphaeroforma arctica</i> JP610 | 8 | 8 | ichthyosporea | other eukaryotes |
| <i>Capsaspora owczaraki</i> ATCC 30864 | 6 | 8 | filasterea | other eukaryotes |
| <i>Ochromonadaceae</i> sp. CCMP2298 | 14 | 14 | synurophyceae | other eukaryotes |
| <i>Thecamonas trahens</i> ATCC 50062 | 5 | 5 | apusomonadida | other eukaryotes |
| <i>Salpingoeca rosetta</i> | 4 | 4 | choanoflagellates | other eukaryotes |
| <i>Monosiga brevicollis</i> MX1 | 2 | 2 | choanoflagellates | other eukaryotes |
| <i>Perkinsus marinus</i> ATCC 50983 | 12 | 15 | perkinsozoa | other eukaryotes |
| <i>Tritrichomonas foetus</i> | 5 | 5 | parabasalia | other eukaryotes |
| <i>Trichomonas vaginalis</i> G3 | 9 | 9 | trichomonads | other eukaryotes |
| <i>Tribonema minus</i> | 15 | 15 | yellow-green algae | other eukaryotes |
| <i>Nannochloropsis gaditana</i> | 10 | 10 | eustigmatophyceae | other eukaryotes |
| <i>Reticulomyxa filosa</i> | 11 | 11 | forams | other eukaryotes |
| <i>Pelagophyceae</i> sp. CCMP2097 | 11 | 11 | pelagophytes | other eukaryotes |
| <i>Aureococcus anophagefferens</i> | 7 | 7 | pelagophytes | other eukaryotes |
| <i>Hyphochytrium catenoides</i> | 16 | 16 | hyphochytriomycetes | other eukaryotes |
| <i>Ochromonas</i> sp. CCMP1393 | 16 | 16 | golden algae | other eukaryotes |
| <i>Paraphysomonas imperforata</i> | 9 | 9 | golden algae | other eukaryotes |
| <i>Plasmodiophora brassicae</i> | 4 | 4 | endomyxa | other eukaryotes |
| <i>Pavloales</i> sp. CCMP2436 | 10 | 10 | haptophytes | haptophytes |
| <i>Emiliana huxleyi</i> CCMP1516 | 27 | 27 | haptophytes | haptophytes |
| <i>Chrysochromulina parva</i> | 18 | 18 | haptophytes | haptophytes |
| <i>Phaeocystis globosa</i> | 18 | 18 | haptophytes | haptophytes |
| <i>Phaeocystis antarctica</i> | 23 | 23 | haptophytes | haptophytes |
| <i>Fistulifera solaris</i> | 18 | 18 | diatoms | diatoms |
| <i>Seminavis robusta</i> | 14 | 14 | diatoms | diatoms |
| <i>Phaeodactylum tricornutum</i> CCAP 1055/1 | 12 | 12 | diatoms | diatoms |
| <i>Nitzschia inconspicua</i> | 8 | 8 | diatoms | diatoms |
| <i>Fragilariopsis cylindrus</i> | 10 | 10 | diatoms | diatoms |
| <i>Pseudo-nitzschia multistriata</i> | 8 | 8 | diatoms | diatoms |
| <i>Minidiscus variabilis</i> | 13 | 13 | diatoms | diatoms |
| <i>Thalassiosira oceanica</i> | 8 | 8 | diatoms | diatoms |
| <i>Cyclotella cryptica</i> | 11 | 11 | diatoms | diatoms |
| <i>Labyrinthula</i> sp. | 6 | 6 | labyrinthulida | bigyra |
| <i>Hondaia fermentalgiana</i> | 12 | 12 | thraustochytrida | bigyra |
| <i>Schizochytrium aggregatum</i> ATCC 28209 | 12 | 12 | thraustochytrida | bigyra |
| <i>Aurantiochytrium limacinum</i> ATCC MYA-1381 | 12 | 12 | thraustochytrida | bigyra |

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|---|----|----|------------------|---------|
| <i>Aplanochytrium kerguelense</i> PBS07 | 13 | 13 | thraustochytrida | bigyra |
| <i>Cafeteria roenbergensis</i> | 6 | 6 | bicosoecida | bigyra |
| <i>Blastocystis hominis</i> | 4 | 4 | opalinata | bigyra |
| <i>Erpetoichthys calabaricus</i> | 11 | 18 | chordates | animals |
| <i>Pteropus vampyrus</i> | 11 | 11 | chordates | animals |
| <i>Rhinolophus ferrumequinum</i> | 10 | 30 | chordates | animals |
| <i>Myotis lucifugus</i> | 14 | 14 | chordates | animals |
| <i>Tupaia belangeri</i> | 9 | 9 | chordates | animals |
| <i>Monodelphis domestica</i> | 9 | 20 | chordates | animals |
| <i>Nannospalax galili</i> | 11 | 15 | chordates | animals |
| <i>Jaculus jaculus</i> | 13 | 26 | chordates | animals |
| <i>Chinchilla lanigera</i> | 11 | 27 | chordates | animals |
| <i>Castor canadensis</i> | 11 | 17 | chordates | animals |
| <i>Fukomys damarensis</i> | 11 | 15 | chordates | animals |
| <i>Heterocephalus glaber</i> | 16 | 28 | chordates | animals |
| <i>Octodon degus</i> | 13 | 22 | chordates | animals |
| <i>Cavia aperea</i> | 8 | 20 | chordates | animals |
| <i>Cavia porcellus</i> | 11 | 19 | chordates | animals |
| <i>Rattus norvegicus</i> | 13 | 16 | chordates | animals |
| <i>Mus musculus</i> | 11 | 53 | chordates | animals |
| <i>Meriones unguiculatus</i> | 10 | 23 | chordates | animals |
| <i>Peromyscus maniculatus bairdii</i> | 12 | 18 | chordates | animals |
| <i>Microtus ochrogaster</i> | 12 | 21 | chordates | animals |
| <i>Mesocricetus auratus</i> | 12 | 26 | chordates | animals |
| <i>Cricetulus griseus</i> | 14 | 28 | chordates | animals |
| <i>Dipodomys ordii</i> | 11 | 22 | chordates | animals |
| <i>Spermophilus dauricus</i> | 12 | 14 | chordates | animals |
| <i>Sciurus vulgaris</i> | 11 | 27 | chordates | animals |
| <i>Ictidomys tridecemlineatus</i> | 11 | 19 | chordates | animals |
| <i>Urocitellus parryi</i> | 10 | 21 | chordates | animals |
| <i>Marmota marmota marmota</i> | 12 | 18 | chordates | animals |
| <i>Oryctolagus cuniculus</i> | 10 | 48 | chordates | animals |
| <i>Ochotona princeps</i> | 9 | 9 | chordates | animals |
| <i>Procavia capensis</i> | 10 | 10 | chordates | animals |
| <i>Equus caballus</i> | 11 | 58 | chordates | animals |
| <i>Loxodonta africana</i> | 11 | 20 | chordates | animals |
| <i>Cervus hanglu yarkandensis</i> | 14 | 47 | chordates | animals |
| <i>Moschus moschiferus</i> | 16 | 34 | chordates | animals |
| <i>Catagonus wagneri</i> | 11 | 25 | chordates | animals |
| <i>Phocoena sinus</i> | 13 | 36 | chordates | animals |
| <i>Bison bison bison</i> | 8 | 14 | chordates | animals |
| <i>Ovis aries</i> | 11 | 12 | chordates | animals |
| <i>Capra hircus</i> | 12 | 28 | chordates | animals |
| <i>Bos taurus</i> | 11 | 34 | chordates | animals |
| <i>Vicugna pacos</i> | 5 | 5 | chordates | animals |
| <i>Camelus dromedarius</i> | 11 | 33 | chordates | animals |

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|--|----|-----|-----------|---------|
| <i>Sus scrofa</i> | 11 | 58 | chordates | animals |
| <i>Balaenoptera musculus</i> | 12 | 34 | chordates | animals |
| <i>Physeter catodon</i> | 12 | 37 | chordates | animals |
| <i>Monodon monoceros</i> | 12 | 30 | chordates | animals |
| <i>Delphinapterus leucas</i> | 13 | 39 | chordates | animals |
| <i>Tursiops truncatus</i> | 11 | 11 | chordates | animals |
| <i>Suricata suricatta</i> | 11 | 45 | chordates | animals |
| <i>Zalophus californianus</i> | 12 | 49 | chordates | animals |
| <i>Lynx canadensis</i> | 11 | 43 | chordates | animals |
| <i>Panthera leo</i> | 10 | 31 | chordates | animals |
| <i>Felis catus</i> | 11 | 42 | chordates | animals |
| <i>Neogale vison</i> | 12 | 35 | chordates | animals |
| <i>Mustela putorius furo</i> | 11 | 11 | chordates | animals |
| <i>Ailuropoda melanoleuca</i> | 10 | 11 | chordates | animals |
| <i>Ursus maritimus</i> | 9 | 22 | chordates | animals |
| <i>Vulpes vulpes</i> | 11 | 47 | chordates | animals |
| <i>Canis lupus familiaris</i> | 10 | 33 | chordates | animals |
| <i>Carlito syrichta</i> | 12 | 24 | chordates | animals |
| <i>Prolemur simus</i> | 12 | 36 | chordates | animals |
| <i>Propithecus coquereli</i> | 10 | 33 | chordates | animals |
| <i>Nomascus leucogenys</i> | 11 | 33 | chordates | animals |
| <i>Aotus nancymae</i> | 10 | 43 | chordates | animals |
| <i>Otolemur garnettii</i> | 10 | 10 | chordates | animals |
| <i>Microcebus murinus</i> | 11 | 37 | chordates | animals |
| <i>Homo sapiens</i> | 12 | 170 | chordates | animals |
| <i>Pongo abelii</i> | 12 | 13 | chordates | animals |
| <i>Pan paniscus</i> | 11 | 44 | chordates | animals |
| <i>Gorilla gorilla gorilla</i> | 11 | 46 | chordates | animals |
| <i>Ptilocolobus tephrosceles</i> | 17 | 50 | chordates | animals |
| <i>Colobus angolensis palliatus</i> | 14 | 48 | chordates | animals |
| <i>Rhinopithecus bieti</i> | 16 | 47 | chordates | animals |
| <i>Chlorocebus sabaeus</i> | 13 | 13 | chordates | animals |
| <i>Mandrillus leucophaeus</i> | 12 | 38 | chordates | animals |
| <i>Theropithecus gelada</i> | 14 | 45 | chordates | animals |
| <i>Papio anubis</i> | 14 | 47 | chordates | animals |
| <i>Macaca fascicularis</i> | 15 | 50 | chordates | animals |
| <i>Cercocebus atys</i> | 12 | 48 | chordates | animals |
| <i>Cebus imitator</i> | 14 | 42 | chordates | animals |
| <i>Saimiri boliviensis boliviensis</i> | 15 | 50 | chordates | animals |
| <i>Callithrix jacchus</i> | 13 | 52 | chordates | animals |
| <i>Echinops telfairi</i> | 10 | 10 | chordates | animals |
| <i>Sorex araneus</i> | 6 | 6 | chordates | animals |
| <i>Erinaceus europaeus</i> | 10 | 10 | chordates | animals |
| <i>Dasyopus novemcinctus</i> | 10 | 15 | chordates | animals |
| <i>Choloepus hoffmanni</i> | 6 | 6 | chordates | animals |
| <i>Phascolarctos cinereus</i> | 11 | 28 | chordates | animals |

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|-------------------------------------|----|----|-----------|---------|
| <i>Vombatus ursinus</i> | 12 | 16 | chordates | animals |
| <i>Notamacropus eugenii</i> | 10 | 10 | chordates | animals |
| <i>Sarcophilus harrisii</i> | 12 | 12 | chordates | animals |
| <i>Ornithorhynchus anatinus</i> | 10 | 10 | chordates | animals |
| <i>Struthio camelus australis</i> | 9 | 26 | chordates | animals |
| <i>Buteo japonicus</i> | 9 | 15 | chordates | animals |
| <i>Aquila chrysaetos chrysaetos</i> | 10 | 15 | chordates | animals |
| <i>Accipiter nisus</i> | 11 | 21 | chordates | animals |
| <i>Calidris pugnax</i> | 10 | 37 | chordates | animals |
| <i>Falco tinnunculus</i> | 9 | 24 | chordates | animals |
| <i>Nothoprocta perdicaria</i> | 9 | 12 | chordates | animals |
| <i>Strix occidentalis caurina</i> | 10 | 17 | chordates | animals |
| <i>Otus sunia</i> | 8 | 14 | chordates | animals |
| <i>Athene cunicularia</i> | 9 | 13 | chordates | animals |
| <i>Bubo bubo</i> | 9 | 14 | chordates | animals |
| <i>Strigops habroptila</i> | 11 | 27 | chordates | animals |
| <i>Amazona collaria</i> | 9 | 15 | chordates | animals |
| <i>Melopsittacus undulatus</i> | 10 | 17 | chordates | animals |
| <i>Malurus cyaneus samueli</i> | 8 | 11 | chordates | animals |
| <i>Zosterops lateralis melanops</i> | 8 | 15 | chordates | animals |
| <i>Corvus moneduloides</i> | 11 | 27 | chordates | animals |
| <i>Manacus vitellinus</i> | 9 | 17 | chordates | animals |
| <i>Lepidothrix coronata</i> | 9 | 11 | chordates | animals |
| <i>Cyanoderma ruficeps</i> | 7 | 10 | chordates | animals |
| <i>Catharus ustulatus</i> | 10 | 22 | chordates | animals |
| <i>Ficedula albicollis</i> | 9 | 9 | chordates | animals |
| <i>Lonchura striata domestica</i> | 8 | 14 | chordates | animals |
| <i>Taeniopygia guttata</i> | 12 | 27 | chordates | animals |
| <i>Camarhynchus parvulus</i> | 10 | 16 | chordates | animals |
| <i>Geospiza fortis</i> | 10 | 13 | chordates | animals |
| <i>Chloebea gouldiae</i> | 11 | 19 | chordates | animals |
| <i>Zonotrichia albicollis</i> | 7 | 23 | chordates | animals |
| <i>Junco hyemalis</i> | 11 | 21 | chordates | animals |
| <i>Cyanistes caeruleus</i> | 10 | 16 | chordates | animals |
| <i>Parus major</i> | 10 | 26 | chordates | animals |
| <i>Serinus canaria</i> | 9 | 11 | chordates | animals |
| <i>Coturnix japonica</i> | 9 | 19 | chordates | animals |
| <i>Chrysolophus pictus</i> | 8 | 20 | chordates | animals |
| <i>Phasianus colchicus</i> | 9 | 17 | chordates | animals |
| <i>Pavo cristatus</i> | 9 | 28 | chordates | animals |
| <i>Gallus gallus</i> | 10 | 16 | chordates | animals |
| <i>Numida meleagris</i> | 9 | 18 | chordates | animals |
| <i>Cairina moschata domestica</i> | 10 | 19 | chordates | animals |
| <i>Anser cygnoides</i> | 7 | 16 | chordates | animals |
| <i>Anas platyrhynchos</i> | 9 | 26 | chordates | animals |
| <i>Apteryx haastii</i> | 9 | 15 | chordates | animals |

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|--------------------------------------|----|----|-----------|---------|
| <i>Dromaius novaehollandiae</i> | 10 | 18 | chordates | animals |
| <i>Pogona vitticeps</i> | 11 | 31 | chordates | animals |
| <i>Salvator merianae</i> | 11 | 21 | chordates | animals |
| <i>Podarcis muralis</i> | 11 | 36 | chordates | animals |
| <i>Varanus komodoensis</i> | 11 | 25 | chordates | animals |
| <i>Anolis carolinensis</i> | 11 | 11 | chordates | animals |
| <i>Naja naja</i> | 11 | 26 | chordates | animals |
| <i>Pseudonaja textilis</i> | 11 | 23 | chordates | animals |
| <i>Notechis scutatus</i> | 11 | 21 | chordates | animals |
| <i>Laticauda laticaudata</i> | 10 | 17 | chordates | animals |
| <i>Sphenodon punctatus</i> | 11 | 13 | chordates | animals |
| <i>Crocodylus porosus</i> | 8 | 24 | chordates | animals |
| <i>Pelusios castaneus</i> | 11 | 37 | chordates | animals |
| <i>Chelonoidis abingdonii</i> | 11 | 30 | chordates | animals |
| <i>Gopherus agassizii</i> | 11 | 36 | chordates | animals |
| <i>Pelodiscus sinensis</i> | 10 | 12 | chordates | animals |
| <i>Terrapene carolina triunguis</i> | 9 | 25 | chordates | animals |
| <i>Chrysemys picta bellii</i> | 11 | 34 | chordates | animals |
| <i>Chelydra serpentina</i> | 12 | 21 | chordates | animals |
| <i>Leptobrachium leishanense</i> | 11 | 28 | chordates | animals |
| <i>Lithobates catesbeianus</i> | 6 | 10 | chordates | animals |
| <i>Xenopus tropicalis</i> | 9 | 67 | chordates | animals |
| <i>Myripristis murdjan</i> | 13 | 55 | chordates | animals |
| <i>Sphaeramia orbicularis</i> | 14 | 64 | chordates | animals |
| <i>Larimichthys crocea</i> | 14 | 74 | chordates | animals |
| <i>Parambassis ranga</i> | 13 | 76 | chordates | animals |
| <i>Gouania willdenowi</i> | 13 | 55 | chordates | animals |
| <i>Salarias fasciatus</i> | 12 | 55 | chordates | animals |
| <i>Paramormyrops kingsleyae</i> | 13 | 25 | chordates | animals |
| <i>Scleropages formosus</i> | 12 | 80 | chordates | animals |
| <i>Hippocampus comes</i> | 13 | 15 | chordates | animals |
| <i>Stegastes partitus</i> | 14 | 27 | chordates | animals |
| <i>Amphiprion ocellaris</i> | 15 | 26 | chordates | animals |
| <i>Acanthochromis polyacanthus</i> | 13 | 22 | chordates | animals |
| <i>Betta splendens</i> | 13 | 70 | chordates | animals |
| <i>Anabas testudineus</i> | 13 | 23 | chordates | animals |
| <i>Labrus bergylta</i> | 15 | 27 | chordates | animals |
| <i>Cynoglossus semilaevis</i> | 12 | 24 | chordates | animals |
| <i>Scophthalmus maximus</i> | 14 | 26 | chordates | animals |
| <i>Periophthalmus magnuspinnatus</i> | 11 | 18 | chordates | animals |
| <i>Neogobius melanostomus</i> | 9 | 24 | chordates | animals |
| <i>Mastacembelus armatus</i> | 14 | 30 | chordates | animals |
| <i>Monopterus albus</i> | 13 | 25 | chordates | animals |
| <i>Echeneis naucrates</i> | 12 | 71 | chordates | animals |
| <i>Seriola dumerili</i> | 14 | 20 | chordates | animals |
| <i>Mola mola</i> | 13 | 14 | chordates | animals |

| | | | | |
|---------------------------------|----|-----|-----------|---------|
| <i>Tetraodon nigroviridis</i> | 13 | 16 | chordates | animals |
| <i>Takifugu rubripes</i> | 13 | 59 | chordates | animals |
| <i>Dicentrarchus labrax</i> | 13 | 71 | chordates | animals |
| <i>Lates calcarifer</i> | 16 | 66 | chordates | animals |
| <i>Sparus aurata</i> | 14 | 80 | chordates | animals |
| <i>Pundamilia nyererei</i> | 14 | 20 | chordates | animals |
| <i>Maylandia zebra</i> | 14 | 20 | chordates | animals |
| <i>Amphilophus citrinellus</i> | 13 | 14 | chordates | animals |
| <i>Neolamprologus brichardi</i> | 14 | 21 | chordates | animals |
| <i>Astatotilapia calliptera</i> | 13 | 26 | chordates | animals |
| <i>Haplochromis burtoni</i> | 14 | 28 | chordates | animals |
| <i>Oreochromis niloticus</i> | 13 | 71 | chordates | animals |
| <i>Sander lucioperca</i> | 13 | 63 | chordates | animals |
| <i>Gasterosteus aculeatus</i> | 12 | 17 | chordates | animals |
| <i>Cottoperca gobio</i> | 10 | 57 | chordates | animals |
| <i>Cyclopterus lumpus</i> | 13 | 57 | chordates | animals |
| <i>Oryzias sinensis</i> | 12 | 41 | chordates | animals |
| <i>Oryzias latipes</i> | 14 | 33 | chordates | animals |
| <i>Nothobranchius furzeri</i> | 11 | 49 | chordates | animals |
| <i>Kryptolebias marmoratus</i> | 12 | 20 | chordates | animals |
| <i>Cyprinodon variegatus</i> | 14 | 28 | chordates | animals |
| <i>Gambusia affinis</i> | 14 | 27 | chordates | animals |
| <i>Xiphophorus maculatus</i> | 14 | 32 | chordates | animals |
| <i>Poecilia reticulata</i> | 13 | 23 | chordates | animals |
| <i>Fundulus heteroclitus</i> | 14 | 38 | chordates | animals |
| <i>Gadus morhua</i> | 13 | 14 | chordates | animals |
| <i>Hucho hucho</i> | 21 | 73 | chordates | animals |
| <i>Salmo salar</i> | 20 | 126 | chordates | animals |
| <i>Oncorhynchus kisutch</i> | 21 | 117 | chordates | animals |
| <i>Esox lucius</i> | 13 | 48 | chordates | animals |
| <i>Electrophorus electricus</i> | 12 | 52 | chordates | animals |
| <i>Ictalurus punctatus</i> | 11 | 22 | chordates | animals |
| <i>Pygocentrus nattereri</i> | 13 | 24 | chordates | animals |
| <i>Astyanax mexicanus</i> | 12 | 19 | chordates | animals |
| <i>Sinocyclocheilus grahami</i> | 21 | 62 | chordates | animals |
| <i>Cyprinus carpio</i> | 22 | 105 | chordates | animals |
| <i>Carassius auratus</i> | 24 | 132 | chordates | animals |
| <i>Danio rerio</i> | 13 | 25 | chordates | animals |
| <i>Denticeps clupeoides</i> | 12 | 82 | chordates | animals |
| <i>Clupea harengus</i> | 9 | 43 | chordates | animals |
| <i>Lepisosteus oculatus</i> | 11 | 14 | chordates | animals |
| <i>Latimeria chalumnae</i> | 10 | 13 | chordates | animals |
| <i>Callorhynchus milii</i> | 9 | 62 | chordates | animals |
| <i>Eptatretus burgeri</i> | 9 | 30 | chordates | animals |
| <i>Petromyzon marinus</i> | 8 | 8 | chordates | animals |
| <i>Ciona intestinalis</i> | 5 | 6 | chordates | animals |

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|-----------------------------------|---|----|---------|---------|
| <i>Ephemera danica</i> | 7 | 7 | insects | animals |
| <i>Cloeon dipterum</i> | 5 | 11 | insects | animals |
| <i>Chrysoperla carnea</i> | 5 | 15 | insects | animals |
| <i>Megalurothrips usitatus</i> | 6 | 6 | insects | animals |
| <i>Thrips palmi</i> | 7 | 20 | insects | animals |
| <i>Frankliniella occidentalis</i> | 7 | 26 | insects | animals |
| <i>Ischnura elegans</i> | 6 | 12 | insects | animals |
| <i>Ladona fulva</i> | 6 | 6 | insects | animals |
| <i>Pediculus humanus</i> | 5 | 5 | insects | animals |
| <i>Timema podura</i> | 7 | 7 | insects | animals |
| <i>Zootermopsis nevadensis</i> | 7 | 14 | insects | animals |
| <i>Cryptotermes secundus</i> | 6 | 18 | insects | animals |
| <i>Coptotermes formosanus</i> | 6 | 6 | insects | animals |
| <i>Ctenocephalides felis</i> | 6 | 8 | insects | animals |
| <i>Colletes gigas</i> | 4 | 18 | insects | animals |
| <i>Neodiprion lecontei</i> | 4 | 23 | insects | animals |
| <i>Orussus abietinus</i> | 4 | 16 | insects | animals |
| <i>Cephus cinctus</i> | 4 | 21 | insects | animals |
| <i>Osmia lignaria</i> | 4 | 24 | insects | animals |
| <i>Megachile rotundata</i> | 4 | 10 | insects | animals |
| <i>Ceratosolen solmsi</i> | 4 | 5 | insects | animals |
| <i>Nomia melanderi</i> | 4 | 22 | insects | animals |
| <i>Dufourea novaeangliae</i> | 4 | 4 | insects | animals |
| <i>Megalopta genalis</i> | 4 | 27 | insects | animals |
| <i>Leptopilina heterotoma</i> | 5 | 21 | insects | animals |
| <i>Athalia rosae</i> | 4 | 22 | insects | animals |
| <i>Aphidius gifuensis</i> | 4 | 16 | insects | animals |
| <i>Chelonus insularis</i> | 4 | 20 | insects | animals |
| <i>Diachasma alloeum</i> | 4 | 4 | insects | animals |
| <i>Fopius arisanus</i> | 4 | 15 | insects | animals |
| <i>Cotesia congregata</i> | 2 | 2 | insects | animals |
| <i>Venturia canescens</i> | 4 | 21 | insects | animals |
| <i>Copidosoma floridanum</i> | 4 | 14 | insects | animals |
| <i>Ooceraea biroi</i> | 5 | 18 | insects | animals |
| <i>Cataglyphis hispanica</i> | 5 | 17 | insects | animals |
| <i>Pseudoatta argentina</i> | 5 | 5 | insects | animals |
| <i>Nylanderia fulva</i> | 4 | 5 | insects | animals |
| <i>Harpegnathos saltator</i> | 4 | 14 | insects | animals |
| <i>Dinoponera quadriceps</i> | 5 | 17 | insects | animals |
| <i>Odontomachus brunneus</i> | 4 | 24 | insects | animals |
| <i>Cyphomyrmex costatus</i> | 5 | 5 | insects | animals |
| <i>Vollenhovia emeryi</i> | 5 | 17 | insects | animals |
| <i>Monomorium pharaonis</i> | 5 | 13 | insects | animals |
| <i>Temnothorax longispinosus</i> | 5 | 5 | insects | animals |
| <i>Pseudomyrmex gracilis</i> | 4 | 16 | insects | animals |
| <i>Pogonomyrmex barbatus</i> | 5 | 6 | insects | animals |

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|--------------------------------------|----|----|---------|---------|
| <i>Camponotus floridanus</i> | 5 | 7 | insects | animals |
| <i>Acromyrmex echinatio</i> | 5 | 16 | insects | animals |
| <i>Linepithema humile</i> | 5 | 23 | insects | animals |
| <i>Formica exsecta</i> | 5 | 19 | insects | animals |
| <i>Lasius niger</i> | 5 | 5 | insects | animals |
| <i>Wasmannia auropunctata</i> | 5 | 21 | insects | animals |
| <i>Trachymyrmex septentrionalis</i> | 5 | 16 | insects | animals |
| <i>Solenopsis invicta</i> | 5 | 15 | insects | animals |
| <i>Atta cephalotes</i> | 5 | 5 | insects | animals |
| <i>Trichogramma pretiosum</i> | 4 | 16 | insects | animals |
| <i>Habropoda laboriosa</i> | 3 | 3 | insects | animals |
| <i>Frieseomelitta varia</i> | 4 | 24 | insects | animals |
| <i>Eufriesea mexicana</i> | 4 | 18 | insects | animals |
| <i>Melipona quadrifasciata</i> | 3 | 3 | insects | animals |
| <i>Ceratina calcarata</i> | 4 | 17 | insects | animals |
| <i>Bombus terrestris</i> | 4 | 17 | insects | animals |
| <i>Apis mellifera</i> | 4 | 19 | insects | animals |
| <i>Polistes dominula</i> | 4 | 9 | insects | animals |
| <i>Polistes fuscatus</i> | 4 | 9 | insects | animals |
| <i>Vespula vulgaris</i> | 4 | 19 | insects | animals |
| <i>Vespa mandarinia</i> | 4 | 17 | insects | animals |
| <i>Nasonia vitripennis</i> | 4 | 34 | insects | animals |
| <i>Hermetia illucens</i> | 6 | 15 | insects | animals |
| <i>Clunio marinus</i> | 5 | 7 | insects | animals |
| <i>Polypedilum vanderplanki</i> | 5 | 7 | insects | animals |
| <i>Chironomus riparius</i> | 6 | 8 | insects | animals |
| <i>Contarinia nasturtii</i> | 5 | 12 | insects | animals |
| <i>Teleopsis dalmanni</i> | 10 | 12 | insects | animals |
| <i>Bradysia coprophila</i> | 7 | 21 | insects | animals |
| <i>Glossina fuscipes</i> | 6 | 19 | insects | animals |
| <i>Lucilia cuprina</i> | 6 | 10 | insects | animals |
| <i>Stomoxys calcitrans</i> | 6 | 19 | insects | animals |
| <i>Musca domestica</i> | 6 | 12 | insects | animals |
| <i>Scaptodrosophila lebanonensis</i> | 5 | 10 | insects | animals |
| <i>Drosophila suzukii</i> | 5 | 11 | insects | animals |
| <i>Drosophila melanogaster</i> | 5 | 19 | insects | animals |
| <i>Rhagoletis zephyria</i> | 9 | 22 | insects | animals |
| <i>Rhagoletis pomonella</i> | 7 | 14 | insects | animals |
| <i>Zeugodacus cucurbitae</i> | 6 | 25 | insects | animals |
| <i>Bactrocera oleae</i> | 6 | 25 | insects | animals |
| <i>Bactrocera tryoni</i> | 6 | 16 | insects | animals |
| <i>Bactrocera dorsalis</i> | 6 | 28 | insects | animals |
| <i>Ceratitis capitata</i> | 6 | 20 | insects | animals |
| <i>Culex pipiens</i> | 6 | 14 | insects | animals |
| <i>Anopheles sinensis</i> | 5 | 5 | insects | animals |
| <i>Anopheles gambiae</i> | 5 | 6 | insects | animals |

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|-----------------------------------|---|----|---------|---------|
| <i>Aedes aegypti</i> | 6 | 17 | insects | animals |
| <i>Hypomocoma kahamanoa</i> | 6 | 12 | insects | animals |
| <i>Arctia plantaginis</i> | 6 | 8 | insects | animals |
| <i>Eumeta japonica</i> | 8 | 8 | insects | animals |
| <i>Aricia agestis</i> | 6 | 15 | insects | animals |
| <i>Parnassius apollo</i> | 6 | 10 | insects | animals |
| <i>Papilio xuthus</i> | 5 | 9 | insects | animals |
| <i>Plutella xylostella</i> | 6 | 16 | insects | animals |
| <i>Chilo suppressalis</i> | 6 | 6 | insects | animals |
| <i>Diatraea saccharalis</i> | 6 | 10 | insects | animals |
| <i>Maniola jurtina</i> | 6 | 19 | insects | animals |
| <i>Nymphalis io</i> | 6 | 21 | insects | animals |
| <i>Pararge aegeria</i> | 6 | 8 | insects | animals |
| <i>Melitaea cinxia</i> | 6 | 6 | insects | animals |
| <i>Bicyclus anynana</i> | 5 | 22 | insects | animals |
| <i>Vanessa atalanta</i> | 6 | 14 | insects | animals |
| <i>Danaus plexippus</i> | 6 | 14 | insects | animals |
| <i>Amyelois transitella</i> | 6 | 12 | insects | animals |
| <i>Plodia interpunctella</i> | 6 | 21 | insects | animals |
| <i>Galleria mellonella</i> | 6 | 8 | insects | animals |
| <i>Manduca sexta</i> | 7 | 17 | insects | animals |
| <i>Leptidea sinapis</i> | 7 | 13 | insects | animals |
| <i>Colias croceus</i> | 6 | 14 | insects | animals |
| <i>Zerene cesonia</i> | 6 | 13 | insects | animals |
| <i>Pieris brassicae</i> | 6 | 17 | insects | animals |
| <i>Helicoverpa armigera</i> | 6 | 23 | insects | animals |
| <i>Helicoverpa zea</i> | 6 | 22 | insects | animals |
| <i>Trichoplusia ni</i> | 6 | 8 | insects | animals |
| <i>Spodoptera litura</i> | 6 | 9 | insects | animals |
| <i>Spodoptera frugiperda</i> | 6 | 22 | insects | animals |
| <i>Bombyx mori</i> | 6 | 20 | insects | animals |
| <i>Ignelater luminosus</i> | 5 | 5 | insects | animals |
| <i>Agrilus planipennis</i> | 6 | 9 | insects | animals |
| <i>Anoplophora glabripennis</i> | 6 | 11 | insects | animals |
| <i>Onthophagus taurus</i> | 6 | 7 | insects | animals |
| <i>Aethina tumida</i> | 6 | 9 | insects | animals |
| <i>Nicrophorus vespilloides</i> | 6 | 10 | insects | animals |
| <i>Harmonia axyridis</i> | 5 | 11 | insects | animals |
| <i>Coccinella septempunctata</i> | 5 | 11 | insects | animals |
| <i>Acanthoscelides obtectus</i> | 5 | 23 | insects | animals |
| <i>Callosobruchus maculatus</i> | 6 | 11 | insects | animals |
| <i>Gonioctena quinquepunctata</i> | 6 | 6 | insects | animals |
| <i>Diabrotica virgifera</i> | 5 | 7 | insects | animals |
| <i>Leptinotarsa decemlineata</i> | 5 | 7 | insects | animals |
| <i>Asbolus verrucosus</i> | 7 | 7 | insects | animals |
| <i>Tribolium castaneum</i> | 6 | 7 | insects | animals |

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|---|----|----|---------------|---------------|
| <i>Tenebrio molitor</i> | 6 | 6 | insects | animals |
| <i>Abscondita terminalis</i> | 7 | 7 | insects | animals |
| <i>Lamprigera yunnana</i> | 7 | 7 | insects | animals |
| <i>Photinus pyralis</i> | 8 | 12 | insects | animals |
| <i>Dendroctonus ponderosae</i> | 6 | 24 | insects | animals |
| <i>Sitophilus oryzae</i> | 6 | 15 | insects | animals |
| <i>Halyomorpha halys</i> | 7 | 24 | insects | animals |
| <i>Nesidiocoris tenuis</i> | 7 | 7 | insects | animals |
| <i>Apolygus lucorum</i> | 7 | 7 | insects | animals |
| <i>Homalodisca vitripennis</i> | 8 | 26 | insects | animals |
| <i>Diaphorina citri</i> | 11 | 11 | insects | animals |
| <i>Nilaparvata lugens</i> | 7 | 11 | insects | animals |
| <i>Cimex lectularius</i> | 7 | 26 | insects | animals |
| <i>Daktulosphaira vitifoliae</i> | 6 | 18 | insects | animals |
| <i>Bemisia tabaci</i> | 8 | 10 | insects | animals |
| <i>Melanaphis sacchari</i> | 7 | 19 | insects | animals |
| <i>Cinara cedri</i> | 7 | 8 | insects | animals |
| <i>Sipha flava</i> | 7 | 13 | insects | animals |
| <i>Diuraphis noxia</i> | 6 | 13 | insects | animals |
| <i>Aphis gossypii</i> | 7 | 31 | insects | animals |
| <i>Rhopalosiphum maidis</i> | 16 | 63 | insects | animals |
| <i>Myzus persicae</i> | 7 | 25 | insects | animals |
| <i>Acyrtosiphon pisum</i> | 11 | 29 | insects | animals |
| <i>Gryllus bimaculatus</i> | 7 | 14 | insects | animals |
| <i>Ditylenchus destructor</i> | 8 | 8 | nematodes | animals |
| <i>Bursaphelenchus xylophilus</i> | 6 | 6 | nematodes | animals |
| <i>Caenorhabditis elegans</i> | 9 | 17 | nematodes | animals |
| <i>Stentor coeruleus</i> | 7 | 7 | ciliates | ciliates |
| <i>Stylonychia lemnae</i> | 9 | 9 | ciliates | ciliates |
| <i>Pseudocohnilembus persalinus</i> | 9 | 9 | ciliates | ciliates |
| <i>Tetrahymena thermophila SB210</i> | 7 | 7 | ciliates | ciliates |
| <i>Ichthyophthirius multifiliis</i> | 5 | 5 | ciliates | ciliates |
| <i>Paramecium tetraurelia</i> | 13 | 13 | ciliates | ciliates |
| <i>Theileria orientalis</i> | 3 | 3 | apicomplexans | apicomplexans |
| <i>Theileria parva</i> | 3 | 3 | apicomplexans | apicomplexans |
| <i>Babesia bigemina</i> | 3 | 3 | apicomplexans | apicomplexans |
| <i>Babesia bovis</i> | 2 | 2 | apicomplexans | apicomplexans |
| <i>Plasmodium falciparum</i> CAMP/Malaysia | 3 | 3 | apicomplexans | apicomplexans |
| <i>Gregarina niphandrodes</i> | 2 | 2 | apicomplexans | apicomplexans |
| <i>Cystoisospora suis</i> | 5 | 5 | apicomplexans | apicomplexans |
| <i>Toxoplasma gondii VEG</i> | 5 | 5 | apicomplexans | apicomplexans |
| <i>Hammondia hammondi</i> | 5 | 5 | apicomplexans | apicomplexans |
| <i>Besnoitia besnoiti</i> | 5 | 5 | apicomplexans | apicomplexans |
| <i>Cyclospora cayetanensis</i> | 4 | 4 | apicomplexans | apicomplexans |
| <i>Eimeria acervulina</i> | 3 | 3 | apicomplexans | apicomplexans |

| | | | | |
|---|----|----|---------------------|------------------|
| <i>Naegleria gruberi</i> | 5 | 5 | other eukaryotes | other eukaryotes |
| <i>Planoprotostelium fungivorum</i> | 11 | 11 | other eukaryotes | other eukaryotes |
| <i>Cavenderia fasciculata</i> | 3 | 3 | other eukaryotes | other eukaryotes |
| <i>Tieghemostelium lacteum</i> | 5 | 5 | other eukaryotes | other eukaryotes |
| <i>Dictyostelium purpureum</i> | 4 | 4 | other eukaryotes | other eukaryotes |
| <i>Entamoeba histolytica</i> | 1 | 1 | other eukaryotes | other eukaryotes |
| <i>Spironucleus salmonicida</i> | 1 | 1 | diplomonads | diplomonads |
| <i>Giardia intestinalis</i> | 1 | 1 | diplomonads | diplomonads |
| <i>Perkinsella</i> sp. CCAP 1560/4 | 3 | 3 | kinetoplastids | kinetoplastids |
| <i>Phytomonas</i> sp. EM1 | 4 | 4 | kinetoplastids | kinetoplastids |
| <i>Angomonas deanei</i> | 11 | 11 | kinetoplastids | kinetoplastids |
| <i>Strigomonas culicis</i> | 5 | 5 | kinetoplastids | kinetoplastids |
| <i>Trypanosoma equiperdum</i> | 4 | 4 | kinetoplastids | kinetoplastids |
| <i>Leptomonas seymouri</i> | 4 | 4 | kinetoplastids | kinetoplastids |
| <i>Leishmania donovani</i> | 4 | 4 | kinetoplastids | kinetoplastids |
| <i>Paramicrosporidium saccamoebae</i> | 3 | 3 | other fungi | fungi |
| <i>Rozella allomyces CSF55</i> | 4 | 4 | other fungi | fungi |
| <i>Paraphysoderma sedebokerense</i> | 6 | 6 | other fungi | fungi |
| <i>Catenaria anguillulae</i> PL171 | 4 | 4 | blastocladiomycetes | fungi |
| <i>Allomyces macrogynus</i> ATCC 38327 | 9 | 11 | blastocladiomycetes | fungi |
| <i>Amphiambls</i> sp. WSBS2006 | 3 | 3 | microsporidians | fungi |
| <i>Mitosporidium daphniae</i> | 3 | 3 | microsporidians | fungi |
| <i>Spraguea lophii</i> 42_110 | 2 | 2 | microsporidians | fungi |
| <i>Edhazardia aedis</i> USNM 41457 | 2 | 2 | microsporidians | fungi |
| <i>Nematocida parisii</i> ERTm1 | 2 | 2 | microsporidians | fungi |
| <i>Enterospora canceri</i> | 2 | 2 | microsporidians | fungi |
| <i>Hepatospora eriocheir</i> | 2 | 2 | microsporidians | fungi |
| <i>Enterocytozoon bienersi</i> H348 | 2 | 2 | microsporidians | fungi |
| <i>Anncaliia algerae</i> PRA109 | 3 | 3 | microsporidians | fungi |
| <i>Tubulinozema ratisbonensis</i> | 2 | 2 | microsporidians | fungi |
| <i>Encephalitozoon hellem</i> ATCC 50504 | 2 | 2 | microsporidians | fungi |
| <i>Ordospora colligata</i> | 2 | 2 | microsporidians | fungi |
| <i>Hamiltosporidium magnivora</i> | 2 | 2 | microsporidians | fungi |
| <i>Pseudoloma neurophilia</i> | 3 | 3 | microsporidians | fungi |
| <i>Vavraia culicis</i> subsp. floridensis | 2 | 2 | microsporidians | fungi |
| <i>Trachipleistophora hominis</i> | 2 | 2 | microsporidians | fungi |
| <i>Nosema apis</i> BRL 01 | 3 | 3 | microsporidians | fungi |
| <i>Vittaforma corneae</i> ATCC 50505 | 2 | 2 | microsporidians | fungi |
| <i>Nosema ceranae</i> | 2 | 2 | microsporidians | fungi |
| <i>Moniliella</i> sp. MCA 3643 | 8 | 8 | basidiomycete fungi | fungi |
| <i>Mixia osmundae</i> IAM 14324 | 6 | 6 | basidiomycete fungi | fungi |
| <i>Dacrymyces fennicus</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Dacryopinax primogenitus</i> | 5 | 5 | basidiomycete fungi | fungi |
| <i>Calocera viscosa</i> TUF12733 | 6 | 6 | basidiomycete fungi | fungi |
| <i>Unilacryma unispora</i> | 8 | 8 | basidiomycete fungi | fungi |

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|---|----|----|---------------------|-------|
| <i>Cerinomyces crustulinus</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Wallemia ichthyophaga</i> | 5 | 5 | basidiomycete fungi | fungi |
| <i>Malassezia restricta</i> | 5 | 5 | basidiomycete fungi | fungi |
| <i>Chionosphaera apobasidialis</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Violaceomyces palustris</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Urocystis occulta</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Melanotaenium endogenum</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Testicularia cyperi</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Ustanciosporium gigantosporum</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Kalmanozyma brasiliensis GHG001</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Ustilago trichophora</i> | 10 | 10 | basidiomycete fungi | fungi |
| <i>Moesziomyces aphidis</i> | 5 | 5 | basidiomycete fungi | fungi |
| <i>Pseudozyma flocculosa</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Sporisorium scitamineum</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Septobasidium sp. PNB30-8B</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Melampsora allii-populina</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Puccinia sorghi</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Pseudomicrostroma glucosiphilum</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Jaminaea rosea</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Tilletiaria anomala UBC 951</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Ceraceosorus bombacis</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Exobasidium maculosum</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Meira miltontushii</i> | 5 | 5 | basidiomycete fungi | fungi |
| <i>Acaromyces ingoldii</i> | 5 | 5 | basidiomycete fungi | fungi |
| <i>Heterodoassansia hygrophilae</i> | 5 | 5 | basidiomycete fungi | fungi |
| <i>Rhamphospora nymphaeae</i> | 5 | 5 | basidiomycete fungi | fungi |
| <i>Tilletiopsis washingtonensis</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Robbauera albescens</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Tilletia indica</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Tilletia controversa</i> | 2 | 2 | basidiomycete fungi | fungi |
| <i>Naohidea sebacea CBS 8477</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Erythrobasidium hasegawianum ATCC 9536</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Symmetrospora gracilis</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Intextomyces contiguus</i> | 9 | 9 | basidiomycete fungi | fungi |
| <i>Sclerogaster hysterangioides</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Hysterangium stoloniferum HS.BST</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Exidia glandulosa HHB12029</i> | 11 | 11 | basidiomycete fungi | fungi |
| <i>Elmerina caryae</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Oliveonia pauxilla</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Serendipita vermifera MAFF 305830</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Jaapia argillacea MUCL 33604</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Thelephora ganbajun</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Xenasmatella vaga</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Mutinus elegans</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Plicaturopsis crispa FD-325 SS-3</i> | 1 | 1 | basidiomycete fungi | fungi |

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|--|---|---|---------------------|-------|
| <i>Anomoloma albolutescens</i> | 5 | 5 | basidiomycete fungi | fungi |
| <i>Serpulomyces borealis</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Anomoporia bombycina</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Amylocorticium subincarnatum</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Sistotremastrum suecicum</i> HHB10207 ss-3 | 7 | 7 | basidiomycete fungi | fungi |
| <i>Porpomyces mucidus</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Digitatispora marina</i> | 9 | 9 | basidiomycete fungi | fungi |
| <i>Fibularhizoctonia</i> sp. CBS 109695 | 2 | 2 | basidiomycete fungi | fungi |
| <i>Piloderma byssinum</i> | 9 | 9 | basidiomycete fungi | fungi |
| <i>Phlebiella tulasnelloidea</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Kurtia argillacea</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Crustoderma dryinum</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Mycobernardia incrustans</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Sistotrema brinkmannii</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Gautieria morchelliformis</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Cantharellales</i> sp. MUCL 035158 | 6 | 6 | basidiomycete fungi | fungi |
| <i>Hydnum rufescens</i> UP504 | 6 | 6 | basidiomycete fungi | fungi |
| <i>Tulasnella calospora</i> MUT 4182 | 8 | 9 | basidiomycete fungi | fungi |
| <i>Botryobasidium botryosum</i> FD-172 SS1 | 6 | 6 | basidiomycete fungi | fungi |
| <i>Ceratobasidium theobromae</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Rhizoctonia solani</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Thanatephorus cucumeris</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Sphaerobolus stellatus</i> SS14 | 7 | 7 | basidiomycete fungi | fungi |
| <i>Geastrum triplex</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Scytinostroma</i> sp. | 7 | 7 | basidiomycete fungi | fungi |
| <i>Vararia minispora</i> EC-137 | 7 | 7 | basidiomycete fungi | fungi |
| <i>Peniophora</i> sp. CONT | 7 | 7 | basidiomycete fungi | fungi |
| <i>Bondarzewia mesenterica</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Heterobasidion irregulare</i> TC 32-1 | 7 | 7 | basidiomycete fungi | fungi |
| <i>Gloeopeniophorella convolvens</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Dentipellis fragilis</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Hericium coralloides</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Laxitextum bicolor</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Stereum hirsutum</i> FP-91666 SS1 | 1 | 1 | basidiomycete fungi | fungi |
| <i>Boreostereum radiatum</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Amylostereum chailletii</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Lactifluus</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Multifurca ochricompacta</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Lactarius deliciosus</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Russula compacta</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Echinodontium tinctorium</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Lentinellus vulpinus</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Auriscalpium vulgare</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Melanogaster broomeanus</i> MBLB.BST | 8 | 8 | basidiomycete fungi | fungi |

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|---|----|----|---------------------|-------|
| <i>Pisolithus microcarpus</i> 441 | 7 | 7 | basidiomycete fungi | fungi |
| <i>Hydnomerulius pinastri</i> MD-312 | 4 | 4 | basidiomycete fungi | fungi |
| <i>Paxillus ammoniavirescens</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Paxillus involutus</i> ATCC 200175 | 5 | 5 | basidiomycete fungi | fungi |
| <i>Serpula lacrymans</i> var. <i>lacrymans</i> S7.9 | 8 | 8 | basidiomycete fungi | fungi |
| <i>Coniophora olivacea</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Hygrophoropsis aurantiaca</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Scleroderma citrinum</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Suillus subaureus</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Rhizopogon vulgaris</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Chalciporus piperatus</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Imleria badia</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Boletus edulis</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Resinicium bicolor</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Sidera vulgaris</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Rickenella mellea</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Pyrrhoderma noxium</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Porodaedalea niemelaei</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Phellinidium ferrugineofuscum</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Fuscoporia viticola</i> | 5 | 5 | basidiomycete fungi | fungi |
| <i>Phellopilus nigrolimitatus</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Phellinus igniarius</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Schizopora paradoxa</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Skeletocutis biguttulata</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Laetiporus sulphureus</i> 93-53 | 6 | 6 | basidiomycete fungi | fungi |
| <i>Obba rivulosa</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Gelatoporia subvermispora</i> B | 7 | 7 | basidiomycete fungi | fungi |
| <i>Wolfiporia cocos</i> MD-104 SS10 | 6 | 6 | basidiomycete fungi | fungi |
| <i>Fibroporia radiculosa</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Epithele typhae</i> | 10 | 10 | basidiomycete fungi | fungi |
| <i>Climacocystis borealis</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Meripilus sumstinei</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Rigidoporus microporus</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Pycnoporellus fulgens</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Postia stiptica</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Amylocystis lapponica</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Sparassis crispa</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Abortiporus biennis</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Phlebiopsis gigantea</i> 11061_1 CR5-6 | 9 | 9 | basidiomycete fungi | fungi |
| <i>Phanerochaete chrysosporium</i> RP-78 | 9 | 9 | basidiomycete fungi | fungi |
| <i>Porostereum spadiceum</i> | 10 | 10 | basidiomycete fungi | fungi |
| <i>Hermanssonia centrifuga</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Cabalodontia subcretacea</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Antrodiella citrinella</i> | 5 | 5 | basidiomycete fungi | fungi |

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|---|----|----|---------------------|-------|
| <i>Steccherinum ochraceum</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Xanthoporus peckianus</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Cytidiella melzeri</i> | 12 | 12 | basidiomycete fungi | fungi |
| <i>Flavodon flavus</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Irpex rosettiformis</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Leptoporus mollis</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Ceriporia viridans</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Daedalea quercina</i> L-15889 | 6 | 6 | basidiomycete fungi | fungi |
| <i>Fomitopsis schrenkii</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Neoantrodia serialis</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Rhodofomes roseus</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Poriella subacida</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Cerioporus squamosus</i> | 9 | 9 | basidiomycete fungi | fungi |
| <i>Lentinus tigrinus</i> ALCF2SS1-7 | 9 | 9 | basidiomycete fungi | fungi |
| <i>Ganoderma sinense</i> ZZ0214-1 | 12 | 12 | basidiomycete fungi | fungi |
| <i>Polyporus brumalis</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Dichomitus squalens</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Trametes cinnabarina</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Grifola frondosa</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Neolentinus lepideus</i> HHB14362 ss-1 | 7 | 7 | basidiomycete fungi | fungi |
| <i>Veluticeps abietina</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Gloeophyllum trabeum</i> ATCC 11539 | 8 | 8 | basidiomycete fungi | fungi |
| <i>Heliocybe sulcata</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Clitocybe</i> sp. CONT 1119283 | 6 | 6 | basidiomycete fungi | fungi |
| <i>Cristinia sonorae</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Typhula</i> sp. TRa3160C | 7 | 7 | basidiomycete fungi | fungi |
| <i>Pterula gracilis</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Pleurotus ostreatus</i> PC15 | 6 | 6 | basidiomycete fungi | fungi |
| <i>Fistulina hepatica</i> ATCC 64428 | 9 | 9 | basidiomycete fungi | fungi |
| <i>Dendrothele microspora</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Laccaria bicolor</i> S238N-H82 | 6 | 6 | basidiomycete fungi | fungi |
| <i>Cystostereum murrayi</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Hygrocybe coccinea</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Cortinarius saniosus</i> | 10 | 10 | basidiomycete fungi | fungi |
| <i>Phaeosolenia platensis</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Aphanobasidium pseudotsugae</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Radulomyces confluens</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Hebeloma cylindrosporum</i> h7 | 7 | 7 | basidiomycete fungi | fungi |
| <i>Gymnopilus dilepis</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Moniliophthora roreri</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Panaeolus cyanescens</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Pluteus cervinus</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Nia vibrissa</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Flagelloscypha</i> sp. PMI_526 | 6 | 6 | basidiomycete fungi | fungi |
| <i>Tricholoma populinum</i> | 5 | 5 | basidiomycete fungi | fungi |

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|---|----|----|---------------------|-------|
| <i>Crepidotus cesatii</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Schizophyllum commune</i> H4-8 | 7 | 7 | basidiomycete fungi | fungi |
| <i>Auriculariopsis ampla</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Lycoperdon perlatum</i> | 10 | 10 | basidiomycete fungi | fungi |
| <i>Amanita rubescens</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Candolleomyces aberdarensis</i> | 4 | 4 | basidiomycete fungi | fungi |
| <i>Coprinopsis marcescibilis</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Coprinellus micaceus</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Pholiota</i> sp. | 8 | 8 | basidiomycete fungi | fungi |
| <i>Hypholoma sublateritium</i> FD-334 SS-4 | 8 | 8 | basidiomycete fungi | fungi |
| <i>Galerina marginata</i> CBS 339.88 | 7 | 7 | basidiomycete fungi | fungi |
| <i>Psilocybe cyanescens</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Agrocybe praecox</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Mycocalia denudata</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Cyathus stercoreus</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Crucibulum laeve</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Guyanagaster necrorhizus</i> MCA 3950 | 10 | 10 | basidiomycete fungi | fungi |
| <i>Cylindrobasidium torrendii</i> FP15055 ss-10 | 9 | 9 | basidiomycete fungi | fungi |
| <i>Desarmillaria ectypa</i> | 9 | 9 | basidiomycete fungi | fungi |
| <i>Armillaria borealis</i> | 11 | 11 | basidiomycete fungi | fungi |
| <i>Termitomyces</i> sp. J132 | 6 | 6 | basidiomycete fungi | fungi |
| <i>Hypsizygus marmoreus</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Favolaschia claudopus</i> | 18 | 18 | basidiomycete fungi | fungi |
| <i>Roridomyces roridus</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Mycena galericulata</i> | 11 | 11 | basidiomycete fungi | fungi |
| <i>Panellus stipticus</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Conocybe apala</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Bolbitius vitellinus</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Cyclocybe aegerita</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Gymnopus androsaceus</i> JB14 | 7 | 7 | basidiomycete fungi | fungi |
| <i>Collybiopsis luxurians</i> FD-317 M1 | 2 | 2 | basidiomycete fungi | fungi |
| <i>Rhodocollybia butyracea</i> | 5 | 5 | basidiomycete fungi | fungi |
| <i>Lentinula edodes</i> | 5 | 5 | basidiomycete fungi | fungi |
| <i>Agaricus bisporus</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Phleogenia faginea</i> | 9 | 9 | basidiomycete fungi | fungi |
| <i>Meredithblackwellia eburnea</i> MCA 4105 | 8 | 8 | basidiomycete fungi | fungi |
| <i>Microbotryum intermedium</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Hyalopycnis blepharistoma</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Slooffia pilatii</i> | 9 | 9 | basidiomycete fungi | fungi |
| <i>Leucosporidium creatinivorum</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Rhodotorula toruloides</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Sporobolomyces pararoseus</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Mrakia frigida</i> | 8 | 8 | basidiomycete fungi | fungi |
| <i>Phaffia rhodozyma</i> | 6 | 6 | basidiomycete fungi | fungi |

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|--|----|----|---------------------|-------|
| <i>Pascua guehoae</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Trichosporon asahii</i> var. <i>asahii</i> CBS 2479 | 5 | 5 | basidiomycete fungi | fungi |
| <i>Cutaneotrichosporon oleaginosum</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Haglerozyma chiarellii</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Apiotrichum porosum</i> | 5 | 5 | basidiomycete fungi | fungi |
| <i>Vanrija humicola</i> | 4 | 4 | basidiomycete fungi | fungi |
| <i>Solicoccozyma terrea</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Filobasidium floriforme</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Saitozyma podzolica</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Kwoniella pini</i> CBS 10737 | 6 | 6 | basidiomycete fungi | fungi |
| <i>Cryptococcus neoformans</i> var. <i>grubii</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Naematelia encephala</i> | 5 | 5 | basidiomycete fungi | fungi |
| <i>Sirobasidium intermedium</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Fibulobasidium inconspicuum</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Papiliotrema laurentii</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Tremella mesenterica</i> | 5 | 5 | basidiomycete fungi | fungi |
| <i>Sterigmatosporidium polymorphum</i> | 7 | 7 | basidiomycete fungi | fungi |
| <i>Fellomyces penicillatus</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Kockovaella imperatae</i> | 6 | 6 | basidiomycete fungi | fungi |
| <i>Sclerophora sanguinea</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Neolecta irregularis</i> DAH-3 | 6 | 6 | ascomycete fungi | fungi |
| <i>Xylona heveae</i> TC161 | 4 | 4 | ascomycete fungi | fungi |
| <i>Trinosporium guianense</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Pneumocystis murina</i> B123 | 6 | 6 | ascomycete fungi | fungi |
| <i>Saitoella complicata</i> NRRL Y-17804 | 6 | 6 | ascomycete fungi | fungi |
| <i>Schizosaccharomyces pombe</i> 972h- | 3 | 3 | ascomycete fungi | fungi |
| <i>Lasallia pustulata</i> | 3 | 3 | ascomycete fungi | fungi |
| <i>Usnea florida</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Dactylellina haptotyla</i> CBS 200.50 | 4 | 4 | ascomycete fungi | fungi |
| <i>Orbilia oligospora</i> | 4 | 5 | ascomycete fungi | fungi |
| <i>Arthrobotrys flagrans</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Protomyces lactuca-debilis</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Plectania melastoma</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Ascodesmis nigricans</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Tirmania nivea</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Terfezia claveryi</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Kalaharituber pfeilii</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Mattirolomyces terfezioides</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Sarcoscypha coccinea</i> | 6 | 6 | ascomycete fungi | fungi |
| <i>Sphaerosporella brunnea</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Trichophaea hybrida</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Caloscypha fulgens</i> | 3 | 3 | ascomycete fungi | fungi |
| <i>Rhizina undulata</i> | 12 | 12 | ascomycete fungi | fungi |
| <i>Leucangium carthusianum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Choiromyces venosus</i> 120613-1 | 4 | 4 | ascomycete fungi | fungi |

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| <i>Tuber magnatum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Kalapuya brunnea</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Verpa conica</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Disciotis venosa</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Morchella esculenta</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Gyromitra esculenta</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Xylogone</i> sp. PMI_703 | 5 | 5 | ascomycete fungi | fungi |
| <i>Leotiomyces</i> sp. MPI-SDFR-AT-0126 | 4 | 4 | ascomycete fungi | fungi |
| <i>Oidiodendron maius</i> Zn | 5 | 5 | ascomycete fungi | fungi |
| <i>Pseudogymnoascus verrucosus</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Antarctomyces</i> sp. | 4 | 4 | ascomycete fungi | fungi |
| <i>Thelebolus microsporus</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Coccomyces strobi</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Lophodermium piceae</i> | 6 | 6 | ascomycete fungi | fungi |
| <i>Bulgaria inquinans</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Golovinomyces cichoracearum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Blumeria hordei</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Erysiphe necator</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Scytalidium lignicola</i> | 8 | 8 | ascomycete fungi | fungi |
| <i>Helotiales</i> sp. DMI_Dod_QoI | 4 | 4 | ascomycete fungi | fungi |
| <i>Venustampulla echinocandica</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Polyphilus sieberi</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Rhexocercosporidium</i> sp. MPI-PUGE-AT-0058 | 4 | 4 | ascomycete fungi | fungi |
| <i>Calycina marina</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Helotiales</i> sp. | 6 | 6 | ascomycete fungi | fungi |
| <i>Rutstroemia firma</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Cadophora</i> sp. | 4 | 4 | ascomycete fungi | fungi |
| <i>Leptodontidium</i> sp. 2 PMI_412 | 4 | 4 | ascomycete fungi | fungi |
| <i>Bispora</i> sp. | 5 | 5 | ascomycete fungi | fungi |
| <i>Hymenoscyphus varicosporioides</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Glarea lozoyensis</i> ATCC 20868 | 4 | 4 | ascomycete fungi | fungi |
| <i>Hyaloscypha bicolor</i> E | 5 | 5 | ascomycete fungi | fungi |
| <i>Diplocarpon rosae</i> | 6 | 6 | ascomycete fungi | fungi |
| <i>Drepanopeziza brunnea</i> f. sp. 'multigermtubi' MB_mI | 4 | 4 | ascomycete fungi | fungi |
| <i>Amorphotheca resinae</i> ATCC 22711 | 5 | 5 | ascomycete fungi | fungi |
| <i>Coleophoma crateriformis</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Marssonina coronariae</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Halenospora varia</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Lachnellula willkommii</i> | 3 | 3 | ascomycete fungi | fungi |
| <i>Acephala macrosclerotiorum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Phialocephala subalpina</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Mollisia scopiformis</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Loramyces juncicola</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Chalara hyalina</i> | 4 | 4 | ascomycete fungi | fungi |

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| <i>Amylocarpus encephaloides</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Rhynchosporium secalis</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Botrytis cinerea</i> B05.10 | 4 | 4 | ascomycete fungi | fungi |
| <i>Monilinia fruticola</i> | 3 | 4 | ascomycete fungi | fungi |
| <i>Sclerotinia sclerotiorum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Melanospora tiffanyae</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Boliniaceae</i> sp. AZ0804 | 4 | 4 | ascomycete fungi | fungi |
| <i>Chaetosphaeriaceae</i> sp. | 4 | 4 | ascomycete fungi | fungi |
| <i>Thozetella</i> sp. PMI_491 | 5 | 5 | ascomycete fungi | fungi |
| <i>Acidothrix acidophila</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Phaeoacremonium minimum</i> UCRPA7 | 4 | 4 | ascomycete fungi | fungi |
| <i>Thyridium curvatum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Ophiostoma piceae</i> UAMH 11346 | 4 | 4 | ascomycete fungi | fungi |
| <i>Sporothrix insectorum</i> RCEF 264 | 4 | 4 | ascomycete fungi | fungi |
| <i>Grosmannia clavigera</i> kw1407 | 5 | 5 | ascomycete fungi | fungi |
| <i>Torpedospora radiata</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Magnaporthiopsis poae</i> ATCC 64411 | 4 | 4 | ascomycete fungi | fungi |
| <i>Gaeumannomyces tritici</i> R3-111a-1 | 4 | 4 | ascomycete fungi | fungi |
| <i>Pyricularia oryzae</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Coniochaeta pulveracea</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Coniella lustricola</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Gnomoniopsis castaneae</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Cryptodiaporthe</i> sp. AZ0812 | 4 | 4 | ascomycete fungi | fungi |
| <i>Diaporthaceae</i> sp. PMI_573 | 4 | 4 | ascomycete fungi | fungi |
| <i>Diaporthe helianthi</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Cytospora leucostoma</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Lolliopopaia minuta</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Valsa mali</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Lindra thalassiae</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Bretziella fagacearum</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Ceratocystis platani</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Thielaviopsis punctulata</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Corollospora maritima</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Microascus trigonosporus</i> CBS 218.31 | 5 | 5 | ascomycete fungi | fungi |
| <i>Scedosporium apiospermum</i> | 3 | 3 | ascomycete fungi | fungi |
| <i>Lomentospora prolificans</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Xylariales</i> sp. AK1849 | 4 | 4 | ascomycete fungi | fungi |
| <i>Pseudomassariella vexata</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Apiospora esporlensis</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Nigrospora oryzae</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Daldinia</i> sp. EC12 | 4 | 4 | ascomycete fungi | fungi |
| <i>Hypoxylon vinosopulvinatum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Microdochium bolleyi</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Monosporascus cannonballus</i> | 4 | 4 | ascomycete fungi | fungi |

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| <i>Neopestalotiopsis</i> sp. | 4 | 4 | ascomycete fungi | fungi |
| <i>Pestalotiopsis fici</i> W106-1 | 4 | 4 | ascomycete fungi | fungi |
| <i>Truncatella angustata</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Eutypa lata</i> UCREL1 | 3 | 3 | ascomycete fungi | fungi |
| <i>Diatrype disciformis</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Kretzschmaria zonata</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Rosellinia necatrix</i> | 3 | 3 | ascomycete fungi | fungi |
| <i>Xylaria hypoxylon</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Sodiomyces alkalinus</i> F11 | 4 | 4 | ascomycete fungi | fungi |
| <i>Plectosphaerella cucumerina</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Verticillium dahliae</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Colletotrichum trifolii</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Schizothecium vesticola</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Podospora appendiculata</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Madurella mycetomatis</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Lasiosphaeriaceae</i> sp. AZ0830 | 4 | 4 | ascomycete fungi | fungi |
| <i>Apodospora peruviana</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Apiosordaria backusii</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Lasiosphaeria hirsuta</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Bombardia bombarda</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Lasiosphaeria ovina</i> | 3 | 3 | ascomycete fungi | fungi |
| <i>Cercophora newfieldiana</i> | 3 | 3 | ascomycete fungi | fungi |
| <i>Dichotomopilus funicola</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Thermothelomyces thermophilus</i> ATCC 42464 | 4 | 4 | ascomycete fungi | fungi |
| <i>Chaetomium globosum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Sordaria macrospora</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Neurospora crassa</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Emericellopsis atlantica</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Acremonium chrysogenum</i> ATCC 11550 | 4 | 4 | ascomycete fungi | fungi |
| <i>Niesslia exilis</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Valettoniellopsis laxa</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Myrothecium inundatum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Stachybotrys elegans</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Stanjemonium grisellum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Akanthomyces lecanii</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Beauveria brongniartii</i> RCEF 3172 | 4 | 4 | ascomycete fungi | fungi |
| <i>Beauveria bassiana</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Cordyceps javanica</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Hirsutella minnesotensis</i> 3608 | 2 | 2 | ascomycete fungi | fungi |
| <i>Ophiocordyceps unilateralis</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Drechmeria coniospora</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Tolypocladium capitatum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Purpureocillium lilacinum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Nectriopsis sporangiicola</i> NRRL 22127 | 4 | 4 | ascomycete fungi | fungi |

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| <i>Clonostachys rosea</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Escovopsis weberi</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Trichoderma harzianum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>[Torribiella] hemipterigena</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Ustilaginoidea virens</i> | 3 | 3 | ascomycete fungi | fungi |
| <i>Claviceps purpurea</i> 20.1 | 4 | 4 | ascomycete fungi | fungi |
| <i>Moelleriella libera</i> RCEF 2490 | 4 | 4 | ascomycete fungi | fungi |
| <i>Pochonia chlamydosporia</i> 123 | 4 | 4 | ascomycete fungi | fungi |
| <i>Metarhizium anisopliae</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Mariannaea</i> sp. | 4 | 4 | ascomycete fungi | fungi |
| <i>Thelonectria olida</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Ilyonectria robusta</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Dactylonectria macrodidyma</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Neonectria ditissima</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Fusarium oxysporum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Fusarium fujikuroi</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Endocarpon pusillum</i> Z07020 | 4 | 4 | ascomycete fungi | fungi |
| <i>Phaeomoniella chlamydospora</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Chaetothyriales</i> sp. CBS 134920 | 5 | 5 | ascomycete fungi | fungi |
| <i>Coccodinium bartschii</i> CBS 121709 | 5 | 5 | ascomycete fungi | fungi |
| <i>Cyphellophora europaea</i> CBS 101466 | 5 | 5 | ascomycete fungi | fungi |
| <i>Rhinocladiella mackenziei</i> CBS 650.93 | 5 | 5 | ascomycete fungi | fungi |
| <i>Fonsecaea monophora</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Exophiala spinifera</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Capronia fungicola</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Phialophora americana</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Polytolypa hystrix</i> UAMH7299 | 4 | 4 | ascomycete fungi | fungi |
| <i>Ascosphaera apis</i> ARSEF 7405 | 4 | 4 | ascomycete fungi | fungi |
| <i>Paracoccidioides brasiliensis</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Helicocarpus griseus</i> UAMH5409 | 4 | 4 | ascomycete fungi | fungi |
| <i>Emergomyces pasteurianus</i> Ep9510 | 4 | 4 | ascomycete fungi | fungi |
| <i>Blastomyces dermatitidis</i> ATCC 26199 | 4 | 4 | ascomycete fungi | fungi |
| <i>Histoplasma mississippiense</i> (nom. inval.) | 4 | 4 | ascomycete fungi | fungi |
| <i>Emmonsia crescens</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Microsporum canis</i> CBS 113480 | 4 | 4 | ascomycete fungi | fungi |
| <i>Nannizzia gypsea</i> CBS 118893 | 4 | 4 | ascomycete fungi | fungi |
| <i>Trichophyton rubrum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Uncinocarpus reesii</i> 1704 | 4 | 4 | ascomycete fungi | fungi |
| <i>Coccidioides immitis</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Elaphomyces granulatus</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Paecilomyces variotii</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Rasamsonia emersonii</i> CBS 393.64 | 4 | 4 | ascomycete fungi | fungi |
| <i>Trichocoma paradoxa</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Talaromyces islandicus</i> | 4 | 4 | ascomycete fungi | fungi |

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| <i>Penicillium zonata</i> CBS 506.65 | 4 | 4 | ascomycete fungi | fungi |
| <i>Monascus purpureus</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Penicillium brevicompactum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Aspergillus flavus</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Gloniopsis</i> sp. FL0384 | 4 | 4 | ascomycete fungi | fungi |
| <i>Valsariales</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Rachicladosporium antarcticum</i> | 10 | 10 | ascomycete fungi | fungi |
| <i>Lizonia empirigonia</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Eremomyces bilateralis</i> CBS 781.70 | 5 | 5 | ascomycete fungi | fungi |
| <i>Rhizodiscina lignyota</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Aulographum hederæ</i> CBS 113979 | 4 | 4 | ascomycete fungi | fungi |
| <i>Coniosporium apollinis</i> CBS 100218 | 5 | 5 | ascomycete fungi | fungi |
| <i>Viridothelium virens</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Stomiopeltis betulæ</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Trichodelitschia bisporula</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Microthyrium microscopicum</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Lineolata rhizophoræ</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Cenococcum geophilum</i> 1.58 | 1 | 1 | ascomycete fungi | fungi |
| <i>Glonium stellatum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Pseudovirgaria hyperparasitica</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Lepidopterella palustris</i> CBS 459.81 | 4 | 4 | ascomycete fungi | fungi |
| <i>Mytiliniaceae</i> sp. NC0267 | 4 | 4 | ascomycete fungi | fungi |
| <i>Mytilinidion resinicola</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Lophium mytilinum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Zopfia rhizophila</i> CBS 207.26 | 4 | 4 | ascomycete fungi | fungi |
| <i>Didymocrea sadasivani</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Cryomyces minteri</i> | 7 | 7 | ascomycete fungi | fungi |
| <i>Peltaster fruticola</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Halojulella avicenniae</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Jahnula aquatica</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Aliquandostipite khaoyaiensis</i> | 3 | 3 | ascomycete fungi | fungi |
| <i>Zasmidium cellare</i> ATCC 36951 | 4 | 4 | ascomycete fungi | fungi |
| <i>Sphaerulina musiva</i> SO2202 | 4 | 4 | ascomycete fungi | fungi |
| <i>Zymoseptoria tritici</i> IPO323 | 4 | 4 | ascomycete fungi | fungi |
| <i>Cercospora beticola</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Pseudocercospora ulei</i> | 3 | 3 | ascomycete fungi | fungi |
| <i>Pseudocercospora musae</i> | 3 | 3 | ascomycete fungi | fungi |
| <i>Ramularia collo-cygni</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Teratosphaeriaceae</i> sp. | 4 | 4 | ascomycete fungi | fungi |
| <i>Baudoinia panamericana</i> UAMH 10762 | 4 | 4 | ascomycete fungi | fungi |
| <i>Salinomyces thailandica</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Friedmanniomyces simplex</i> | 6 | 6 | ascomycete fungi | fungi |
| <i>Neohortaea acidophila</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Acidomyces</i> sp. 'richmondensis' | 4 | 4 | ascomycete fungi | fungi |
| <i>Teratosphaeria nubilosa</i> | 4 | 4 | ascomycete fungi | fungi |

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| <i>Hortaea werneckii</i> | 8 | 8 | ascomycete fungi | fungi |
| <i>Myriangiaceae</i> sp. NC1570 | 5 | 5 | ascomycete fungi | fungi |
| <i>Sphaceloma murrayae</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Elsinoe australis</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Aplosporella prunicola</i> CBS 121167 | 5 | 5 | ascomycete fungi | fungi |
| <i>Melanops tulasnei</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Phyllosticta citricarpa</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Pseudofusicoccum</i> sp. LGMF1611 | 5 | 5 | ascomycete fungi | fungi |
| <i>Microdiplodia</i> sp. AK1800 | 4 | 4 | ascomycete fungi | fungi |
| <i>Neofusicoccum parvum</i> UCRNP2 | 5 | 5 | ascomycete fungi | fungi |
| <i>Diplodia seriata</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Lasiodiplodia theobromae</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Macrophomina phaseolina</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Delphinella strobiligena</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Aureobasidium pullulans</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Teichospora</i> sp. FL1471 | 4 | 4 | ascomycete fungi | fungi |
| <i>Flavomyces fulophazii</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Acrocalymma vagum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Aquilomyces patris</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Aaosphaeria arxii</i> CBS 175.79 | 4 | 4 | ascomycete fungi | fungi |
| <i>Corynespora cassiicola</i> Philippines | 4 | 4 | ascomycete fungi | fungi |
| <i>Paraphaeosphaeria sporulosa</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Bimuria novae-zelandiae</i> CBS 107.79 | 4 | 4 | ascomycete fungi | fungi |
| <i>Amniculicola lignicola</i> CBS 123094 | 4 | 4 | ascomycete fungi | fungi |
| <i>Dothidotthia symphoricarpi</i> CBS 119687 | 4 | 4 | ascomycete fungi | fungi |
| <i>Herpotrichia</i> sp. AK1299 | 4 | 4 | ascomycete fungi | fungi |
| <i>Melanomma pulvis-pyrius</i> CBS 109.77 | 4 | 4 | ascomycete fungi | fungi |
| <i>Pleomassaria siparia</i> CBS 279.74 | 4 | 4 | ascomycete fungi | fungi |
| <i>Lophiostoma macrostomum</i> CBS 122681 | 4 | 4 | ascomycete fungi | fungi |
| <i>Darksidea alpha</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Lentithecium fluviatile</i> CBS 122367 | 4 | 4 | ascomycete fungi | fungi |
| <i>Fenestella fenestrata</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Pyrenochaeta</i> sp. DS3sAY3a | 4 | 4 | ascomycete fungi | fungi |
| <i>Clathrospora elyanae</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Lophiotrema nucula</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Polyplosphaeria fusca</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Clohesyomyces aquaticus</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Lindgomyces ingoldianus</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Neopyrenochaeta inflorescentiae</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Trematosphaeria pertusa</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Sporormia fimetaria</i> CBS 119925 | 4 | 4 | ascomycete fungi | fungi |
| <i>Westerdykella ornata</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Pseudopyrenochaeta lycopersici</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Dendryphion nanum</i> | 4 | 4 | ascomycete fungi | fungi |

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|--|---|----|------------------|-------|
| <i>Phaeosphaeriaceae</i> sp. | 4 | 4 | ascomycete fungi | fungi |
| <i>Phaeosphaeria poagens</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Ophiobolus disseminans</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Paraphoma chrysanthemicola</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Parastagonospora nodorum</i> SN15 | 4 | 4 | ascomycete fungi | fungi |
| <i>Setomelanomma holmii</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Massarina eburnea</i> CBS 473.64 | 4 | 4 | ascomycete fungi | fungi |
| <i>Stagonospora</i> sp. SRC1lsM3a | 4 | 4 | ascomycete fungi | fungi |
| <i>Byssothecium circinans</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Massariosphaeria phaeospora</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Periconia macrospinosa</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Plenodomus lingam</i> JN3 | 4 | 4 | ascomycete fungi | fungi |
| <i>Ampelomyces quisqualis</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Leptosphaeria microscopica</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Pleosporaceae</i> sp. PMI_138 | 4 | 4 | ascomycete fungi | fungi |
| <i>Exserohilum turcica</i> Et28A | 4 | 4 | ascomycete fungi | fungi |
| <i>Bipolaris maydis</i> ATCC 48331 | 4 | 4 | ascomycete fungi | fungi |
| <i>Decorospora gaudefreyi</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Stemphylium lycopersici</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Pyrenophora tritici-repentis</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Alternaria alternata</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Didymella exigua</i> CBS 183.55 | 4 | 4 | ascomycete fungi | fungi |
| <i>Boeremia exigua</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Epicoccum nigrum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Ectophoma multirostrata</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Ascochyta rabiei</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Tothia fuscella</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Verruconis gallopava</i> | 5 | 13 | ascomycete fungi | fungi |
| <i>Venturia inaequalis</i> | 3 | 3 | ascomycete fungi | fungi |
| <i>Kuraishia capsulata</i> CBS 1993 | 5 | 5 | ascomycete fungi | fungi |
| <i>Ascoidea rubescens</i> DSM 1968 | 5 | 5 | ascomycete fungi | fungi |
| <i>Babjeviella inositovora</i> NRRL Y-12698 | 4 | 4 | ascomycete fungi | fungi |
| <i>Nadsonia fulvescens</i> var. <i>elongata</i> DSM 6958 | 5 | 5 | ascomycete fungi | fungi |
| <i>Lipomyces starkeyi</i> NRRL Y-11557 | 5 | 5 | ascomycete fungi | fungi |
| <i>Tortispora caseinolytica</i> NRRL Y-17796 | 4 | 4 | ascomycete fungi | fungi |
| <i>Botryozyma mucatilis</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Myxozyma melibiosi</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Hanseniaspora uvarum</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>[Candida] intermedia</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Metschnikowia bicuspidata</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Cephaloascus fragrans</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Sugiyamaella americana</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Blastobotrys attinorum</i> | 6 | 6 | ascomycete fungi | fungi |
| <i>Trichomonascus petasosporus</i> | 5 | 5 | ascomycete fungi | fungi |

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|---|----|----|------------------|-------|
| <i>Wickerhamiella sorbophila</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Zygoascus hellenicus</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Diutina rugosa</i> | 6 | 6 | ascomycete fungi | fungi |
| <i>Suhyomyces tanzawaensis</i> NRRL Y-17324 | 6 | 6 | ascomycete fungi | fungi |
| <i>Hyphopichia burtonii</i> NRRL Y-1933 | 5 | 5 | ascomycete fungi | fungi |
| <i>Spathaspora passalidarum</i> NRRL Y-27907 | 6 | 6 | ascomycete fungi | fungi |
| <i>Yamadazyma tenuis</i> ATCC 10573 | 4 | 6 | ascomycete fungi | fungi |
| <i>Milleromyces farinosa</i> CBS 7064 | 8 | 8 | ascomycete fungi | fungi |
| <i>Lodderomyces elongisporus</i> NRRL YB-4239 | 6 | 6 | ascomycete fungi | fungi |
| <i>Scheffersomyces stipitis</i> CBS 6054 | 6 | 6 | ascomycete fungi | fungi |
| <i>Meyerozyma guilliermondii</i> ATCC 6260 | 5 | 5 | ascomycete fungi | fungi |
| <i>Debaryomyces fabryi</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Candida parapsilosis</i> | 6 | 6 | ascomycete fungi | fungi |
| <i>Geotrichum candidum</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Sporopachydermia lactativora</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Yarrowia lipolytica</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Kazachstania africana</i> CBS 2517 | 5 | 5 | ascomycete fungi | fungi |
| <i>Tetrapisispora blattae</i> CBS 6284 | 5 | 5 | ascomycete fungi | fungi |
| <i>Naumovozyma castellii</i> CBS 4309 | 5 | 5 | ascomycete fungi | fungi |
| <i>Vanderwaltozyma polyspora</i> DSM 70294 | 6 | 7 | ascomycete fungi | fungi |
| <i>Eremothecium cymbalariae</i> DBVPG#7215 | 5 | 5 | ascomycete fungi | fungi |
| <i>[Ashbya] acris (nom. inval.)</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Eremothecium gossypii</i> ATCC 10895 | 5 | 5 | ascomycete fungi | fungi |
| <i>Zygorhizula sporobolii</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Nakaseomyces glabratus</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Lachancea fermentati</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Zygosaccharomyces bailii</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Torulaspora globosa</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Torulaspora delbrueckii</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Saccharomyces cerevisiae</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>Kluyveromyces marxianus</i> | 5 | 5 | ascomycete fungi | fungi |
| <i>[Candida] arabinoferruginea</i> NRRL YB-2248 | 4 | 4 | ascomycete fungi | fungi |
| <i>Ogataea polymorpha</i> | 4 | 4 | ascomycete fungi | fungi |
| <i>Brettanomyces bruxellensis</i> | 2 | 2 | ascomycete fungi | fungi |
| <i>[Candida] inconspicua</i> | 3 | 3 | ascomycete fungi | fungi |
| <i>Pichia kudriavzevii</i> | 3 | 3 | ascomycete fungi | fungi |
| <i>Wickerhamomyces anomalus</i> NRRL Y-366-8 | 4 | 4 | ascomycete fungi | fungi |
| <i>Komagataella pastoris</i> | 3 | 3 | ascomycete fungi | fungi |
| <i>Cyberlindnera jadinii</i> | 1 | 1 | ascomycete fungi | fungi |
| <i>Basidiobolus meristosporus</i> CBS 931.73 | 10 | 10 | zoopagomycota | fungi |
| <i>Ramicandelaber brevisporus</i> | 3 | 3 | zoopagomycota | fungi |

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|--|----|----|----------------|-------|
| <i>Dimargaris cristalligena</i> | 5 | 5 | zoopagomycota | fungi |
| <i>Syncephalis pseudoplumigaleata</i> | 3 | 3 | zoopagomycota | fungi |
| <i>Piptocephalis tieghemiana</i> | 3 | 3 | zoopagomycota | fungi |
| <i>Thamnocephalis sphaerospora</i> | 3 | 3 | zoopagomycota | fungi |
| <i>Neoconidiobolus thromboides</i> FSU 785 | 6 | 6 | zoopagomycota | fungi |
| <i>Conidiobolus coronatus</i> NRRL 28638 | 4 | 4 | zoopagomycota | fungi |
| <i>Entomophaga maimaiga</i> | 7 | 7 | zoopagomycota | fungi |
| <i>Zoophthora radicans</i> | 8 | 8 | zoopagomycota | fungi |
| <i>Martensiomycetes pterosporus</i> | 5 | 5 | zoopagomycota | fungi |
| <i>Kickxella alabastrina</i> | 6 | 6 | zoopagomycota | fungi |
| <i>Linderina pennispora</i> | 6 | 6 | zoopagomycota | fungi |
| <i>Coemansia mojavenensis</i> | 6 | 6 | zoopagomycota | fungi |
| <i>Umbelopsis isabellina</i> | 6 | 6 | mucoromycota | fungi |
| <i>Lunasporangiospora selenospora</i> | 6 | 6 | mucoromycota | fungi |
| <i>Linnemannia elongata</i> | 10 | 10 | mucoromycota | fungi |
| <i>Dissophora decumbens</i> | 8 | 8 | mucoromycota | fungi |
| <i>Gamsiella multivaricata</i> | 8 | 8 | mucoromycota | fungi |
| <i>Actinomortierella wolfii</i> | 7 | 7 | mucoromycota | fungi |
| <i>Lobosporangium transversale</i> | 8 | 8 | mucoromycota | fungi |
| <i>Glomus cerebriforme</i> | 7 | 7 | glomeromycetes | fungi |
| <i>Rhizophagus clarus</i> | 6 | 6 | glomeromycetes | fungi |
| <i>Gigaspora margarita</i> | 7 | 10 | glomeromycetes | fungi |
| <i>Bifiguratus adelaidae</i> | 6 | 6 | other fungi | fungi |
| <i>Jimgerdemannia flammicorona</i> | 6 | 7 | other fungi | fungi |
| <i>Endogone</i> sp. FLAS-F59071 | 4 | 4 | other fungi | fungi |
| <i>Pilobolus umbonatus</i> | 5 | 5 | other fungi | fungi |
| <i>Chaetocladium brefeldii</i> | 6 | 6 | other fungi | fungi |
| <i>Mycotypha africana</i> | 6 | 6 | other fungi | fungi |
| <i>Radiomyces spectabilis</i> | 5 | 5 | other fungi | fungi |
| <i>Lichtheimia ramosa</i> | 8 | 8 | other fungi | fungi |
| <i>Fennellomyces linderi</i> | 9 | 9 | other fungi | fungi |
| <i>Circinella umbellata</i> | 9 | 9 | other fungi | fungi |
| <i>Zychaea mexicana</i> | 8 | 8 | other fungi | fungi |
| <i>Dichotomocladium robustum</i> | 8 | 8 | other fungi | fungi |
| <i>Phascolomyces articulatus</i> | 9 | 9 | other fungi | fungi |
| <i>Lentamyces zychae</i> | 6 | 6 | other fungi | fungi |
| <i>Helicostylum pulchrum</i> | 6 | 6 | other fungi | fungi |
| <i>Thamnidium elegans</i> | 6 | 6 | other fungi | fungi |
| <i>Kirkomyces cordense</i> | 6 | 6 | other fungi | fungi |
| <i>Ellisomyces anomalus</i> | 7 | 7 | other fungi | fungi |
| <i>Cokeromyces recurvatus</i> | 6 | 6 | other fungi | fungi |
| <i>Pilaira anomala</i> | 6 | 6 | other fungi | fungi |
| <i>Benjaminiella poitrasii</i> | 6 | 6 | other fungi | fungi |
| <i>Parasitella parasitica</i> | 6 | 6 | other fungi | fungi |
| <i>Amylomyces rouxii</i> | 7 | 7 | other fungi | fungi |

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|---|---|----|-------------|-----------|
| <i>Mucor mucedo</i> | 5 | 5 | other fungi | fungi |
| <i>Syncephalastrum racemosum</i> | 6 | 6 | other fungi | fungi |
| <i>Gilbertella persicaria</i> var. <i>persicaria</i> | 6 | 6 | other fungi | fungi |
| <i>Choanephora cucurbitarum</i> | 6 | 6 | other fungi | fungi |
| <i>Blakeslea trispora</i> | 6 | 6 | other fungi | fungi |
| <i>Sporodiniella umbellata</i> | 6 | 6 | other fungi | fungi |
| <i>Rhizopus stolonifer</i> | 8 | 8 | other fungi | fungi |
| <i>Spinellus fusiger</i> | 7 | 7 | other fungi | fungi |
| <i>Phycomyces blakesleeanus</i> | 7 | 7 | other fungi | fungi |
| <i>Hesseltinella vesiculosa</i> | 4 | 4 | other fungi | fungi |
| <i>Halteromyces radiatus</i> | 5 | 5 | other fungi | fungi |
| <i>Gongronella butleri</i> | 5 | 5 | other fungi | fungi |
| <i>Chlamydoabsidia padenii</i> | 6 | 6 | other fungi | fungi |
| <i>Cunninghamella echinulata</i> | 5 | 5 | other fungi | fungi |
| <i>Absidia caerulea</i> | 6 | 6 | other fungi | fungi |
| <i>Gonapodya prolifera</i> JEL478 | 8 | 8 | chytrids | fungi |
| <i>Hyaloraphidium curvatum</i> | 8 | 8 | chytrids | fungi |
| <i>Anaeromyces robustus</i> | 5 | 5 | chytrids | fungi |
| <i>Neocallimastix californiae</i> | 7 | 7 | chytrids | fungi |
| <i>Piromyces finnis</i> | 6 | 6 | chytrids | fungi |
| <i>Caulochytrium protostelioides</i> | 4 | 4 | chytrids | fungi |
| <i>Blyttomyces helicus</i> | 5 | 5 | chytrids | fungi |
| <i>Batrachochytrium</i> <i>salamandrivorans</i> | 5 | 10 | chytrids | fungi |
| <i>Globomyces pollinis-pini</i> | 5 | 5 | chytrids | fungi |
| <i>Gorgonomycetes haynaldii</i> | 4 | 4 | chytrids | fungi |
| <i>Synchytrium endobioticum</i> | 5 | 5 | chytrids | fungi |
| <i>Polychytrium aggregatum</i> | 4 | 4 | chytrids | fungi |
| <i>Cladochytrium replicatum</i> | 7 | 7 | chytrids | fungi |
| <i>Spizellomyces</i> sp. 'palustris' | 7 | 7 | chytrids | fungi |
| <i>Gaertneriomyces semiglobifer</i> | 5 | 5 | chytrids | fungi |
| <i>Fimicolochytrium jonesii</i> | 6 | 6 | chytrids | fungi |
| <i>Powellomyces hirtus</i> | 7 | 7 | chytrids | fungi |
| <i>Geranomyces variabilis</i> | 7 | 7 | chytrids | fungi |
| <i>Zopfochytrium polystomum</i> | 9 | 9 | chytrids | fungi |
| <i>Phlyctochytrium arcticum</i> | 5 | 5 | chytrids | fungi |
| <i>Chytridium lagenaria</i> | 9 | 9 | chytrids | fungi |
| <i>Rhizoclosmatium globosum</i> | 7 | 7 | chytrids | fungi |
| <i>Obelidium mucronatum</i> | 5 | 5 | chytrids | fungi |
| <i>Entophlyctis luteolus</i> | 5 | 5 | chytrids | fungi |
| <i>Chytriomyces</i> sp. | 3 | 3 | chytrids | fungi |
| <i>Chytriomyces hyalinus</i> | 7 | 7 | chytrids | fungi |
| <i>Albugo laibachii</i> Nc14 | 4 | 4 | oomycetes | oomycetes |
| <i>Phytophthora vexans</i> DAOM BR484 | 7 | 7 | oomycetes | oomycetes |
| <i>Pythium arrhenomanes</i> ATCC 12531 | 9 | 9 | oomycetes | oomycetes |

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|--|----|----|------------------|------------------|
| <i>Pythium aphanidermatum</i> DAOM BR444 | 9 | 9 | oomycetes | oomycetes |
| <i>Globisporangium ultimum</i> DAOM BR144 | 9 | 9 | oomycetes | oomycetes |
| <i>Achlya hypogyna</i> | 10 | 10 | oomycetes | oomycetes |
| <i>Saprolegnia parasitica</i> CBS 223.65 | 15 | 15 | oomycetes | oomycetes |
| <i>Aphanomyces astaci</i> | 9 | 18 | oomycetes | oomycetes |
| <i>Thraustotheca clavata</i> | 14 | 14 | oomycetes | oomycetes |
| <i>Nothophytophthora</i> sp. Chile5 | 18 | 18 | oomycetes | oomycetes |
| <i>Hyaloperonospora arabidopsidis</i> Emoy2 | 5 | 5 | oomycetes | oomycetes |
| <i>Peronospora effusa</i> | 6 | 6 | oomycetes | oomycetes |
| <i>Phytophthora lateralis</i> MPF4 | 8 | 8 | oomycetes | oomycetes |
| <i>Phytophthora capsici</i> LT1534 | 8 | 8 | oomycetes | oomycetes |
| <i>Phytophthora palmivora</i> var. palmivora | 9 | 9 | oomycetes | oomycetes |
| <i>Phytophthora kernoviae</i> | 8 | 8 | oomycetes | oomycetes |
| <i>Phytophthora ramorum</i> | 11 | 11 | oomycetes | oomycetes |
| <i>Phytophthora sojae</i> | 7 | 7 | oomycetes | oomycetes |
| <i>Phytophthora cactorum</i> | 9 | 9 | oomycetes | oomycetes |
| <i>Phytophthora megakarya</i> | 3 | 3 | oomycetes | oomycetes |
| <i>Phytophthora parasitica</i> | 9 | 14 | oomycetes | oomycetes |
| <i>Phytophthora nicotianae</i> | 8 | 8 | oomycetes | oomycetes |
| <i>Phytophthora infestans</i> | 8 | 8 | oomycetes | oomycetes |
| <i>Plasmopara halstedii</i> | 4 | 4 | oomycetes | oomycetes |
| <i>Amoebophrya</i> | 5 | 5 | dinoflagellates | dinoflagellates |
| <i>Fugacium kawagutii</i> | 6 | 6 | dinoflagellates | dinoflagellates |
| <i>Cladocopium goreauii</i> | 12 | 12 | dinoflagellates | dinoflagellates |
| <i>Breviolum minutum</i> | 10 | 10 | dinoflagellates | dinoflagellates |
| <i>Symbiodinium microadriaticum</i> | 7 | 7 | dinoflagellates | dinoflagellates |
| <i>Chroomonas mesostigmatica</i> CCMP1168 | 1 | 1 | cryptomonads | cryptomonads |
| <i>Guillardia theta</i> CCMP2712 | 13 | 13 | cryptomonads | cryptomonads |
| <i>Cryptophyta</i> sp. CCMP2293 | 8 | 8 | cryptomonads | cryptomonads |
| <i>Cryptomonas paramecium</i> | 1 | 1 | cryptomonads | cryptomonads |
| <i>Saccharina japonica</i> | 13 | 13 | brown algae | brown algae |
| <i>Undaria pinnatifida</i> | 11 | 11 | brown algae | brown algae |
| <i>Nemacystus decipiens</i> | 16 | 16 | brown algae | brown algae |
| <i>Cladosiphon okamuranus</i> | 15 | 15 | brown algae | brown algae |
| <i>Ectocarpus siliculosus</i> | 11 | 11 | brown algae | brown algae |
| <i>Galdieria sulphuraria</i> | 3 | 3 | red algae | red algae |
| <i>Cyanidioschyzon merolae</i> | 4 | 4 | red algae | red algae |
| <i>Porphyridium purpureum</i> | 5 | 5 | red algae | red algae |
| <i>Neopyropia yezoensis</i> | 4 | 4 | red algae | red algae |
| <i>Porphyra umbilicalis</i> | 2 | 2 | red algae | red algae |
| <i>Gracilariopsis chorda</i> | 6 | 6 | red algae | red algae |
| <i>Chondrus crispus</i> | 4 | 4 | red algae | red algae |
| <i>Cyanophora paradoxa</i> | 10 | 10 | other eukaryotes | other eukaryotes |

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|---------------------------------------|----|----|------------------------------|--------------|
| <i>Prasinoderma coloniale</i> | 10 | 10 | other green plants | green plants |
| <i>Picocystis</i> sp. ML | 1 | 1 | green algae | green plants |
| <i>Chloropicon primus</i> | 7 | 7 | green algae | green plants |
| <i>Ulva mutabilis</i> | 9 | 9 | green algae | green plants |
| <i>Caulerpa lentillifera</i> | 9 | 9 | green algae | green plants |
| <i>Micromonas commoda</i> | 7 | 7 | green algae | green plants |
| <i>Bathycoccus prasinos</i> RCC1105 | 6 | 6 | green algae | green plants |
| <i>Ostreococcus tauri</i> | 10 | 10 | green algae | green plants |
| <i>Tetraselmis striata</i> | 17 | 17 | green algae | green plants |
| <i>Pedinomonas minor</i> | 8 | 8 | green algae | green plants |
| <i>Picochlorum</i> sp. 'soloecismus' | 8 | 8 | green algae | green plants |
| <i>Coccomyxa subellipsoidea</i> C-169 | 12 | 12 | green algae | green plants |
| <i>Trebouxia</i> sp. A1-2 | 9 | 9 | green algae | green plants |
| <i>Asterochloris glomerata</i> | 9 | 9 | green algae | green plants |
| <i>Symbiochloris reticulata</i> | 9 | 9 | green algae | green plants |
| <i>Botryococcus braunii</i> | 11 | 16 | green algae | green plants |
| <i>Micractinium conductrix</i> | 12 | 12 | green algae | green plants |
| <i>Chlorella sorokiniana</i> | 13 | 13 | green algae | green plants |
| <i>Auxenochlorella protothecoides</i> | 6 | 6 | green algae | green plants |
| <i>Raphidocelis subcapitata</i> | 14 | 14 | green algae | green plants |
| <i>Monoraphidium minutum</i> | 13 | 13 | green algae | green plants |
| <i>Chromochloris zofingiensis</i> | 14 | 14 | green algae | green plants |
| <i>Scenedesmus</i> sp. NREL 46B-D3 | 15 | 15 | green algae | green plants |
| <i>Desmodesmus armatus</i> | 14 | 14 | green algae | green plants |
| <i>Flechtneria rotunda</i> | 14 | 14 | green algae | green plants |
| <i>Enallax costatus</i> | 17 | 17 | green algae | green plants |
| <i>Tetradesmus obliquus</i> | 13 | 13 | green algae | green plants |
| <i>Tetrabaena socialis</i> | 11 | 11 | green algae | green plants |
| <i>Edaphochlamys debaryana</i> | 16 | 16 | green algae | green plants |
| <i>Gonium pectorale</i> | 13 | 13 | green algae | green plants |
| <i>Volvox carteri</i> | 14 | 15 | green algae | green plants |
| <i>Microglens</i> sp. YARC | 11 | 11 | green algae | green plants |
| <i>Chlamydomonas</i> | 14 | 14 | green algae | green plants |
| <i>Dunaliella salina</i> | 12 | 13 | green algae | green plants |
| <i>Klebsormidium nitens</i> | 11 | 11 | uniseriate?filamentous algae | green plants |
| <i>Chara braunii</i> | 5 | 5 | charophyte algae | green plants |
| <i>Sphagnum fallax</i> | 11 | 20 | moss | green plants |
| <i>Ceratopteris richardii</i> | 11 | 44 | ferns | green plants |
| <i>Mesostigma viride</i> | 5 | 5 | charophyte algae | green plants |
| <i>Spirogloea muscicola</i> | 24 | 24 | green algae | green plants |
| <i>Mesotaenium endlicherianum</i> | 7 | 7 | green algae | green plants |
| <i>Zygnema circumcarinatum</i> | 9 | 9 | green algae | green plants |
| <i>Selaginella moellendorffii</i> | 11 | 11 | moss | green plants |
| <i>Diphasiastrum complanatum</i> | 24 | 75 | moss | green plants |
| <i>Thuja plicata</i> | 10 | 30 | moss | green plants |

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|--|----|-----|--------------------|--------------|
| <i>Ceratodon purpureus</i> | 9 | 33 | moss | green plants |
| <i>Physcomitrium patens</i> | 11 | 49 | moss | green plants |
| <i>Marchantia polymorpha</i> | 8 | 11 | moss | green plants |
| <i>Chlorokybus atmophyticus</i> | 10 | 10 | streptophyte algae | green plants |
| <i>Cinnamomum micranthum</i> f. <i>kanehirae</i> | 9 | 9 | flowering plants | green plants |
| <i>Acorus americanus</i> | 11 | 21 | flowering plants | green plants |
| <i>Actinidia chinensis</i> var. <i>chinensis</i> | 11 | 11 | flowering plants | green plants |
| <i>Vaccinium darrowii</i> | 9 | 9 | flowering plants | green plants |
| <i>Nymphaea colorata</i> | 13 | 37 | flowering plants | green plants |
| <i>Kalanchoe fedtschenkoi</i> | 14 | 27 | flowering plants | green plants |
| <i>Macadamia integrifolia</i> | 10 | 23 | flowering plants | green plants |
| <i>Hydrangea quercifolia</i> | 8 | 15 | flowering plants | green plants |
| <i>Dioscorea alata</i> | 12 | 19 | flowering plants | green plants |
| <i>Coffea canephora</i> | 8 | 8 | flowering plants | green plants |
| <i>Eucalyptus grandis</i> | 12 | 28 | flowering plants | green plants |
| <i>Corymbia citriodora</i> | 12 | 18 | flowering plants | green plants |
| <i>Vitis vinifera</i> | 11 | 34 | flowering plants | green plants |
| <i>Spirodela polyrhiza</i> | 8 | 8 | flowering plants | green plants |
| <i>Zostera marina</i> | 10 | 10 | flowering plants | green plants |
| <i>Amborella trichopoda</i> | 9 | 9 | flowering plants | green plants |
| <i>Asparagus officinalis</i> | 8 | 8 | flowering plants | green plants |
| <i>Zingiber officinale</i> | 25 | 62 | flowering plants | green plants |
| <i>Musa acuminata</i> | 14 | 14 | flowering plants | green plants |
| <i>Joinvillea ascendens</i> | 11 | 14 | flowering plants | green plants |
| <i>Ananas comosus</i> | 11 | 11 | flowering plants | green plants |
| <i>Oropetium thomaeum</i> | 12 | 12 | flowering plants | green plants |
| <i>Digitaria exilis</i> | 27 | 27 | flowering plants | green plants |
| <i>Urochloa fusca</i> | 13 | 36 | flowering plants | green plants |
| <i>Aegilops tauschii</i> subsp. <i>strangulata</i> | 11 | 164 | flowering plants | green plants |
| <i>Paspalum vaginatum</i> | 12 | 24 | flowering plants | green plants |
| <i>Echinochloa crus-galli</i> | 39 | 39 | flowering plants | green plants |
| <i>Thinopyrum intermedium</i> | 42 | 75 | flowering plants | green plants |
| <i>Leersia perrieri</i> | 13 | 14 | flowering plants | green plants |
| <i>Miscanthus sinensis</i> | 23 | 38 | flowering plants | green plants |
| <i>Saccharum spontaneum</i> | 30 | 30 | flowering plants | green plants |
| <i>Chasmanthium laxum</i> | 12 | 14 | flowering plants | green plants |
| <i>Panicum virgatum</i> | 27 | 55 | flowering plants | green plants |
| <i>Pharus latifolius</i> | 11 | 21 | flowering plants | green plants |
| <i>Eragrostis tef</i> | 31 | 31 | flowering plants | green plants |
| <i>Eragrostis curvula</i> | 25 | 25 | flowering plants | green plants |
| <i>Brachypodium distachyon</i> | 11 | 45 | flowering plants | green plants |
| <i>Zea mays</i> | 15 | 34 | flowering plants | green plants |
| <i>Triticum aestivum</i> | 36 | 215 | flowering plants | green plants |
| <i>Sorghum bicolor</i> | 12 | 14 | flowering plants | green plants |
| <i>Setaria viridis</i> | 13 | 34 | flowering plants | green plants |

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|--|----|-----|------------------|--------------|
| <i>Secale cereale</i> | 12 | 12 | flowering plants | green plants |
| <i>Oryza barthii</i> | 14 | 19 | flowering plants | green plants |
| <i>Oryza sativa</i> | 15 | 23 | flowering plants | green plants |
| <i>Oryza longistaminata</i> | 14 | 14 | flowering plants | green plants |
| <i>Lolium perenne</i> | 12 | 12 | flowering plants | green plants |
| <i>Hordeum vulgare</i> | 15 | 170 | flowering plants | green plants |
| <i>Eleusine coracana</i> | 23 | 23 | flowering plants | green plants |
| <i>Mikania micrantha</i> | 11 | 11 | flowering plants | green plants |
| <i>Cynara cardunculus</i> var. <i>scolymus</i> | 8 | 8 | flowering plants | green plants |
| <i>Cichorium endivia</i> | 14 | 14 | flowering plants | green plants |
| <i>Cichorium intybus</i> | 9 | 9 | flowering plants | green plants |
| <i>Lactuca sativa</i> | 15 | 25 | flowering plants | green plants |
| <i>Helianthus annuus</i> | 14 | 14 | flowering plants | green plants |
| <i>Ambrosia artemisiifolia</i> | 13 | 13 | flowering plants | green plants |
| <i>Lindenbergia philippensis</i> | 11 | 26 | flowering plants | green plants |
| <i>Sesamum indicum</i> | 8 | 8 | flowering plants | green plants |
| <i>Erythranthe guttata</i> | 19 | 24 | flowering plants | green plants |
| <i>Fraxinus excelsior</i> | 15 | 25 | flowering plants | green plants |
| <i>Olea europaea</i> | 10 | 10 | flowering plants | green plants |
| <i>Ipomoea triloba</i> | 12 | 21 | flowering plants | green plants |
| <i>Nicotiana tabacum</i> | 21 | 33 | flowering plants | green plants |
| <i>Solanum tuberosum</i> | 7 | 15 | flowering plants | green plants |
| <i>Solanum lycopersicum</i> | 9 | 9 | flowering plants | green plants |
| <i>Capsicum annum</i> | 10 | 10 | flowering plants | green plants |
| <i>Daucus carota</i> | 13 | 13 | flowering plants | green plants |
| <i>Trifolium pratense</i> | 11 | 11 | flowering plants | green plants |
| <i>Vigna unguiculata</i> | 11 | 29 | flowering plants | green plants |
| <i>Pisum sativum</i> | 10 | 19 | flowering plants | green plants |
| <i>Phaseolus vulgaris</i> | 11 | 25 | flowering plants | green plants |
| <i>Medicago truncatula</i> | 10 | 19 | flowering plants | green plants |
| <i>Lupinus angustifolius</i> | 13 | 13 | flowering plants | green plants |
| <i>Lupinus albus</i> | 14 | 14 | flowering plants | green plants |
| <i>Lens ervoides</i> | 9 | 9 | flowering plants | green plants |
| <i>Lens culinaris</i> | 9 | 9 | flowering plants | green plants |
| <i>Glycine max</i> | 19 | 34 | flowering plants | green plants |
| <i>Cicer arietinum</i> | 8 | 8 | flowering plants | green plants |
| <i>Cajanus cajan</i> | 10 | 10 | flowering plants | green plants |
| <i>Arachis hypogaea</i> | 18 | 25 | flowering plants | green plants |
| <i>Linum usitatissimum</i> | 15 | 15 | flowering plants | green plants |
| <i>Ricinus communis</i> | 8 | 8 | flowering plants | green plants |
| <i>Manihot esculenta</i> | 8 | 34 | flowering plants | green plants |
| <i>Hevea brasiliensis</i> | 13 | 34 | flowering plants | green plants |
| <i>Salix purpurea</i> | 11 | 34 | flowering plants | green plants |
| <i>Populus trichocarpa</i> | 10 | 24 | flowering plants | green plants |
| <i>Cucurbita maxima</i> | 11 | 27 | flowering plants | green plants |
| <i>Cucumis sativus</i> | 9 | 14 | flowering plants | green plants |

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|-----------------------------------|----|----|------------------|--------------|
| <i>Citrullus lanatus</i> | 9 | 9 | flowering plants | green plants |
| <i>Cleome violacea</i> | 8 | 15 | flowering plants | green plants |
| <i>Descurainia sophioides</i> | 10 | 11 | flowering plants | green plants |
| <i>Meniocus linifolius</i> | 16 | 19 | flowering plants | green plants |
| <i>Myagrurn perfoliatum</i> | 8 | 8 | flowering plants | green plants |
| <i>Diptychocarpus strictus</i> | 10 | 11 | flowering plants | green plants |
| <i>Euclidium syriacum</i> | 8 | 8 | flowering plants | green plants |
| <i>Malcolmia maritima</i> | 12 | 12 | flowering plants | green plants |
| <i>Cakile maritima</i> | 14 | 15 | flowering plants | green plants |
| <i>Iberis amara</i> | 13 | 13 | flowering plants | green plants |
| <i>Eruca vesicaria</i> | 25 | 26 | flowering plants | green plants |
| <i>Isatis tinctoria</i> | 28 | 30 | flowering plants | green plants |
| <i>Rorippa islandica</i> | 11 | 12 | flowering plants | green plants |
| <i>Caulanthus amplexicaulis</i> | 17 | 20 | flowering plants | green plants |
| <i>Lunaria annua</i> | 11 | 12 | flowering plants | green plants |
| <i>Schrenkiella parvula</i> | 9 | 9 | flowering plants | green plants |
| <i>Camelina sativa</i> | 36 | 39 | flowering plants | green plants |
| <i>Capsella grandiflora</i> | 10 | 10 | flowering plants | green plants |
| <i>Capsella rubella</i> | 12 | 12 | flowering plants | green plants |
| <i>Eutrema salsugineum</i> | 8 | 10 | flowering plants | green plants |
| <i>Stanleya pinnata</i> | 8 | 8 | flowering plants | green plants |
| <i>Boechera stricta</i> | 9 | 10 | flowering plants | green plants |
| <i>Crambe hispanica</i> | 12 | 14 | flowering plants | green plants |
| <i>Arabis alpina</i> | 5 | 6 | flowering plants | green plants |
| <i>Lepidium sativum</i> | 14 | 15 | flowering plants | green plants |
| <i>Thlaspi arvense</i> | 9 | 10 | flowering plants | green plants |
| <i>Sinapis alba</i> | 14 | 14 | flowering plants | green plants |
| <i>Raphanus sativus</i> | 17 | 18 | flowering plants | green plants |
| <i>Brassica oleracea</i> | 9 | 9 | flowering plants | green plants |
| <i>Brassica rapa</i> | 16 | 16 | flowering plants | green plants |
| <i>Brassica napus</i> | 30 | 30 | flowering plants | green plants |
| <i>Arabidopsis halleri</i> | 10 | 11 | flowering plants | green plants |
| <i>Arabidopsis thaliana</i> | 10 | 14 | flowering plants | green plants |
| <i>Carica papaya</i> | 15 | 15 | flowering plants | green plants |
| <i>Corchorus capsularis</i> | 8 | 8 | flowering plants | green plants |
| <i>Theobroma cacao</i> | 8 | 15 | flowering plants | green plants |
| <i>Gossypium hirsutum</i> | 19 | 40 | flowering plants | green plants |
| <i>Portulaca amilis</i> | 9 | 14 | flowering plants | green plants |
| <i>Amaranthus hypochondriacus</i> | 8 | 8 | flowering plants | green plants |
| <i>Chenopodium quinoa</i> | 19 | 19 | flowering plants | green plants |
| <i>Spinacia oleracea</i> | 8 | 14 | flowering plants | green plants |
| <i>Beta vulgaris</i> | 8 | 8 | flowering plants | green plants |
| <i>Juglans regia</i> | 26 | 26 | flowering plants | green plants |
| <i>Carya illinoensis</i> | 10 | 30 | flowering plants | green plants |
| <i>Betula platyphylla</i> | 14 | 14 | flowering plants | green plants |
| <i>Corylus avellana</i> | 10 | 10 | flowering plants | green plants |

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|-------------------------------|----|----|------------------|----------------|
| <i>Castanea dentata</i> | 9 | 26 | flowering plants | green plants |
| <i>Quercus rubra</i> | 11 | 22 | flowering plants | green plants |
| <i>Ziziphus jujuba</i> | 8 | 23 | flowering plants | green plants |
| <i>Rosa chinensis</i> | 12 | 12 | flowering plants | green plants |
| <i>Fragaria vesca</i> | 9 | 18 | flowering plants | green plants |
| <i>Prunus avium</i> | 11 | 11 | flowering plants | green plants |
| <i>Prunus armeniaca</i> | 9 | 9 | flowering plants | green plants |
| <i>Prunus persica</i> | 9 | 23 | flowering plants | green plants |
| <i>Prunus dulcis</i> | 9 | 11 | flowering plants | green plants |
| <i>Malus domestica</i> | 16 | 16 | flowering plants | green plants |
| <i>Ficus carica</i> | 7 | 7 | flowering plants | green plants |
| <i>Aquilegia coerulea</i> | 10 | 19 | flowering plants | green plants |
| <i>Papaver somniferum</i> | 21 | 21 | flowering plants | green plants |
| <i>Anacardium occidentale</i> | 13 | 47 | flowering plants | green plants |
| <i>Pistacia vera</i> | 11 | 11 | flowering plants | green plants |
| <i>Mangifera indica</i> | 14 | 26 | flowering plants | green plants |
| <i>Citrus clementina</i> | 9 | 17 | flowering plants | green plants |
| <i>Citrus sinensis</i> | 8 | 30 | flowering plants | green plants |
| <i>Acidovorax citrulli</i> | 2 | 2 | proteobacteria | proteobacteria |
| <i>Xanthomonas oryzae</i> | 1 | 1 | proteobacteria | proteobacteria |
| <i>Pseudomonas syringae</i> | 1 | 1 | proteobacteria | proteobacteria |

Table S3. The classification of *HDAC* genes from the 142 selected species.

| Tax name | HDAC1 | HDAC3 | HDAC8 | Class I | HDAC4 | HDAC6 | HDAC12 | Class II | HDAC11 | Class IV | Total | Subphyla | Species |
|-----------------------------------|-------|-------|-------|---------|-------|-------|--------|----------|--------|----------|-------|-----------|---------|
| <i>Rattus norvegicus</i> | 3 | 1 | 1 | 5 | 4 | 3 | 0 | 7 | 1 | 1 | 13 | chordates | animals |
| <i>Oryctolagus cuniculus</i> | 2 | 1 | 1 | 4 | 3 | 2 | 0 | 5 | 1 | 1 | 10 | chordates | animals |
| <i>Equus caballus</i> | 2 | 1 | 1 | 4 | 4 | 2 | 0 | 6 | 1 | 1 | 11 | chordates | animals |
| <i>Bos taurus</i> | 2 | 1 | 1 | 4 | 4 | 2 | 0 | 6 | 1 | 1 | 11 | chordates | animals |
| <i>Felis catus</i> | 2 | 1 | 1 | 4 | 4 | 2 | 0 | 6 | 1 | 1 | 11 | chordates | animals |
| <i>Homo sapiens</i> | 2 | 1 | 2 | 5 | 4 | 2 | 0 | 6 | 1 | 1 | 12 | chordates | animals |
| <i>Erinaceus europaeus</i> | 3 | 1 | 1 | 5 | 2 | 2 | 0 | 4 | 1 | 1 | 10 | chordates | animals |
| <i>Phascolarctos cinereus</i> | 2 | 1 | 1 | 4 | 4 | 2 | 0 | 6 | 1 | 1 | 11 | chordates | animals |
| <i>Ornithorhynchus anatinus</i> | 3 | 0 | 1 | 4 | 2 | 2 | 0 | 4 | 2 | 2 | 10 | chordates | animals |
| <i>Gallus gallus</i> | 2 | 1 | 1 | 4 | 4 | 1 | 0 | 5 | 1 | 1 | 10 | chordates | animals |
| <i>Anas platyrhynchos</i> | 2 | 1 | 1 | 4 | 3 | 1 | 0 | 4 | 1 | 1 | 9 | chordates | animals |
| <i>Naja naja</i> | 2 | 1 | 1 | 4 | 4 | 2 | 0 | 6 | 1 | 1 | 11 | chordates | animals |
| <i>Pelodiscus sinensis</i> | 2 | 1 | 1 | 4 | 4 | 1 | 0 | 5 | 1 | 1 | 10 | chordates | animals |
| <i>Chelydra serpentina</i> | 2 | 1 | 1 | 4 | 4 | 2 | 0 | 6 | 2 | 2 | 12 | chordates | animals |
| <i>Lithobates catesbeianus</i> | 2 | 1 | 0 | 3 | 2 | 0 | 0 | 2 | 1 | 1 | 6 | chordates | animals |
| <i>Danio rerio</i> | 1 | 2 | 1 | 4 | 5 | 2 | 0 | 7 | 2 | 2 | 13 | chordates | animals |
| <i>Ephemera danica</i> | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 4 | 1 | 1 | 7 | insects | animals |
| <i>Chrysoperla carnea</i> | 1 | 1 | 0 | 2 | 1 | 1 | 0 | 2 | 1 | 1 | 5 | insects | animals |
| <i>Frankliniella occidentalis</i> | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 2 | 2 | 2 | 7 | insects | animals |
| <i>Pediculus humanus</i> | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 2 | 0 | 0 | 5 | insects | animals |
| <i>Zootermopsis nevadensis</i> | 1 | 2 | 1 | 4 | 1 | 1 | 0 | 2 | 1 | 1 | 7 | insects | animals |
| <i>Leptopilina heterotoma</i> | 2 | 1 | 0 | 3 | 1 | 1 | 0 | 2 | 0 | 0 | 5 | insects | animals |
| <i>Solenopsis invicta</i> | 2 | 1 | 0 | 3 | 1 | 1 | 0 | 2 | 0 | 0 | 5 | insects | animals |
| <i>Apis mellifera</i> | 1 | 1 | 0 | 2 | 1 | 1 | 0 | 2 | 0 | 0 | 4 | insects | animals |
| <i>Hermetia illucens</i> | 1 | 1 | 0 | 2 | 1 | 1 | 0 | 2 | 2 | 2 | 6 | insects | animals |
| <i>Clunio marinus</i> | 2 | 1 | 0 | 3 | 1 | 1 | 0 | 2 | 0 | 0 | 5 | insects | animals |
| <i>Drosophila melanogaster</i> | 1 | 1 | 0 | 2 | 1 | 1 | 0 | 2 | 1 | 1 | 5 | insects | animals |

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|---|---|---|---|---|---|---|---|---|---|---|----|---------------------|---------|
| <i>Zeugodacus cucurbitae</i> | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 2 | 1 | 1 | 6 | insects | animals |
| <i>Plutella xylostella</i> | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 2 | 1 | 1 | 6 | insects | animals |
| <i>Chilo suppressalis</i> | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 2 | 1 | 1 | 6 | insects | animals |
| <i>Spodoptera frugiperda</i> | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 2 | 1 | 1 | 6 | insects | animals |
| <i>Bombyx mori</i> | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 2 | 1 | 1 | 6 | insects | animals |
| <i>Agrius planipennis</i> | 1 | 1 | 1 | 3 | 1 | 1 | 0 | 2 | 1 | 1 | 6 | insects | animals |
| <i>Leptinotarsa decemlineata</i> | 1 | 1 | 0 | 2 | 1 | 1 | 0 | 2 | 1 | 1 | 5 | insects | animals |
| <i>Nilaparvata lugens</i> | 1 | 2 | 0 | 3 | 1 | 1 | 0 | 2 | 2 | 2 | 7 | insects | animals |
| <i>Bemisia tabaci</i> | 2 | 1 | 2 | 5 | 1 | 1 | 0 | 2 | 1 | 1 | 8 | insects | animals |
| <i>Ditylenchus destructor</i> | 1 | 2 | 1 | 4 | 1 | 2 | 0 | 3 | 1 | 1 | 8 | nematodes | animals |
| <i>Bursaphelenchus xylophilus</i> | 2 | 1 | 0 | 3 | 1 | 1 | 0 | 2 | 1 | 1 | 6 | nematodes | animals |
| <i>Encephalitozoon hellem ATCC 50504</i> | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | microsporidians | fungi |
| <i>Ustilago trichophora</i> | 4 | 2 | 2 | 8 | 0 | 2 | 0 | 2 | 0 | 0 | 10 | basidiomycete fungi | fungi |
| <i>Moesziomyces aphidis</i> | 1 | 1 | 1 | 3 | 0 | 1 | 1 | 2 | 0 | 0 | 5 | basidiomycete fungi | fungi |
| <i>Sporisorium scitamineum</i> | 2 | 1 | 1 | 4 | 0 | 1 | 1 | 2 | 0 | 0 | 6 | basidiomycete fungi | fungi |
| <i>Puccinia sorghi</i> | 2 | 1 | 1 | 4 | 0 | 1 | 1 | 2 | 0 | 0 | 6 | basidiomycete fungi | fungi |
| <i>Rhizoctonia solani</i> | 2 | 1 | 1 | 4 | 0 | 1 | 1 | 2 | 1 | 1 | 7 | basidiomycete fungi | fungi |
| <i>Hericium coralloides</i> | 2 | 1 | 1 | 4 | 0 | 1 | 2 | 3 | 0 | 0 | 7 | basidiomycete fungi | fungi |
| <i>Ganoderma sinense ZZ0214-1</i> | 7 | 1 | 1 | 9 | 0 | 1 | 2 | 3 | 0 | 0 | 12 | basidiomycete fungi | fungi |
| <i>Moniliophthora roreri</i> | 2 | 1 | 1 | 4 | 0 | 1 | 1 | 2 | 0 | 0 | 6 | basidiomycete fungi | fungi |
| <i>Agaricus bisporus</i> | 2 | 1 | 1 | 4 | 0 | 1 | 1 | 2 | 0 | 0 | 6 | basidiomycete fungi | fungi |
| <i>Microbotryum intermedium</i> | 2 | 1 | 1 | 4 | 0 | 1 | 1 | 2 | 0 | 0 | 6 | basidiomycete fungi | fungi |
| <i>Cryptococcus neoformans</i> var. <i>grubii</i> | 3 | 1 | 1 | 5 | 0 | 1 | 1 | 2 | 0 | 0 | 7 | basidiomycete fungi | fungi |
| <i>Tuber magnatum</i> | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 0 | 4 | ascomycete fungi | fungi |
| <i>Lachnellula willkommii</i> | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 0 | 0 | 3 | ascomycete fungi | fungi |
| <i>Rhynchosporium secalis</i> | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 0 | 4 | ascomycete fungi | fungi |
| <i>Botrytis cinerea</i> B05.10 | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 0 | 4 | ascomycete fungi | fungi |
| <i>Monilinia fructicola</i> | 1 | 1 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 3 | ascomycete fungi | fungi |
| <i>Sclerotinia sclerotiorum</i> | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 0 | 4 | ascomycete fungi | fungi |

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|--|---|---|---|---|---|---|---|---|---|---|----|---------------------|--------------|
| <i>Pyricularia oryzae</i> | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 0 | 4 | ascomycete fungi | fungi |
| <i>Diaporthe helianthi</i> | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 0 | 4 | ascomycete fungi | fungi |
| <i>Valsa mali</i> | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 0 | 4 | ascomycete fungi | fungi |
| <i>Bretziella fagacearum</i> | 1 | 1 | 0 | 2 | 0 | 1 | 2 | 3 | 0 | 0 | 5 | ascomycete fungi | fungi |
| <i>Monosporascus cannonballus</i> | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 0 | 4 | ascomycete fungi | fungi |
| <i>Verticillium dahliae</i> | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 0 | 4 | ascomycete fungi | fungi |
| <i>Metarhizium anisopliae</i> | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 0 | 4 | ascomycete fungi | fungi |
| <i>Fusarium fujikuroi</i> | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 0 | 4 | ascomycete fungi | fungi |
| <i>Histoplasma mississippiense (nom. inval.)</i> | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 0 | 4 | ascomycete fungi | fungi |
| <i>Aspergillus flavus</i> | 2 | 1 | 0 | 3 | 0 | 1 | 1 | 2 | 0 | 0 | 5 | ascomycete fungi | fungi |
| <i>Pseudocercospora musae</i> | 1 | 1 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 3 | ascomycete fungi | fungi |
| <i>Boeremia exigua</i> | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 0 | 4 | ascomycete fungi | fungi |
| <i>Venturia inaequalis</i> | 1 | 1 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 3 | ascomycete fungi | fungi |
| <i>Saccharomyces cerevisiae</i> | 1 | 1 | 1 | 3 | 0 | 1 | 1 | 2 | 0 | 0 | 5 | ascomycete fungi | fungi |
| <i>Lobosporangium transversale</i> | 3 | 1 | 1 | 5 | 1 | 1 | 1 | 3 | 0 | 0 | 8 | mucoromycota | fungi |
| <i>Rhizophagus clarus</i> | 2 | 1 | 0 | 3 | 0 | 1 | 1 | 2 | 1 | 1 | 6 | glomeromycetes | fungi |
| <i>Piromyces finnis</i> | 2 | 1 | 2 | 5 | 0 | 1 | 0 | 1 | 0 | 0 | 6 | chytrids | fungi |
| <i>Synchytrium endobioticum</i> | 1 | 1 | 1 | 3 | 0 | 1 | 1 | 2 | 0 | 0 | 5 | chytrids | fungi |
| <i>Pythium arrhenomanes ATCC 12531</i> | 1 | 1 | 1 | 3 | 0 | 0 | 6 | 6 | 0 | 0 | 9 | oomycetes | oomycetes |
| <i>Pythium aphanidermatum DAOM BR444</i> | 1 | 1 | 1 | 3 | 0 | 0 | 6 | 6 | 0 | 0 | 9 | oomycetes | oomycetes |
| <i>Phytophthora sojae</i> | 1 | 1 | 0 | 2 | 0 | 0 | 5 | 5 | 0 | 0 | 7 | oomycetes | oomycetes |
| <i>Plasmopara halstedii</i> | 1 | 1 | 0 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 4 | oomycetes | oomycetes |
| <i>Dunaliella salina</i> | 2 | 1 | 0 | 3 | 3 | 0 | 2 | 5 | 4 | 4 | 12 | green algae | green plants |
| <i>Ceratopteris richardii</i> | 4 | 1 | 0 | 5 | 2 | 0 | 1 | 3 | 3 | 3 | 11 | ferns | green plants |
| <i>Selaginella moellendorffii</i> | 2 | 1 | 0 | 3 | 1 | 1 | 5 | 7 | 1 | 1 | 11 | moss | green plants |
| <i>Physcomitrium patens</i> | 2 | 1 | 0 | 3 | 2 | 1 | 2 | 5 | 3 | 3 | 11 | moss | green plants |
| <i>Eucalyptus grandis</i> | 2 | 1 | 0 | 3 | 1 | 5 | 2 | 8 | 1 | 1 | 12 | flowering plants | green plants |
| <i>Vitis vinifera</i> | 3 | 2 | 0 | 5 | 1 | 1 | 3 | 5 | 1 | 1 | 11 | flowering plants | green plants |

| | | | | | | | | | | | | | |
|--------------------------------|----|---|---|----|---|---|---|----|---|---|----|------------------|--------------|
| <i>Spirodela polyrhiza</i> | 2 | 1 | 0 | 3 | 1 | 1 | 2 | 4 | 1 | 1 | 8 | flowering plants | green plants |
| <i>Amborella trichopoda</i> | 3 | 1 | 0 | 4 | 1 | 1 | 2 | 4 | 1 | 1 | 9 | flowering plants | green plants |
| <i>Asparagus officinalis</i> | 3 | 1 | 0 | 4 | 1 | 1 | 1 | 3 | 1 | 1 | 8 | flowering plants | green plants |
| <i>Zingiber officinale</i> | 9 | 2 | 0 | 11 | 4 | 2 | 6 | 12 | 2 | 2 | 25 | flowering plants | green plants |
| <i>Musa acuminata</i> | 7 | 1 | 0 | 8 | 1 | 1 | 2 | 4 | 2 | 2 | 14 | flowering plants | green plants |
| <i>Ananas comosus</i> | 4 | 2 | 0 | 6 | 1 | 1 | 2 | 4 | 1 | 1 | 11 | flowering plants | green plants |
| <i>Digitaria exilis</i> | 11 | 2 | 0 | 13 | 2 | 3 | 5 | 10 | 4 | 4 | 27 | flowering plants | green plants |
| <i>Oryza sativa</i> | 8 | 1 | 0 | 9 | 1 | 1 | 3 | 5 | 1 | 1 | 15 | flowering plants | green plants |
| <i>Mikania micrantha</i> | 2 | 2 | 0 | 4 | 1 | 2 | 3 | 6 | 1 | 1 | 11 | flowering plants | green plants |
| <i>Lactuca sativa</i> | 2 | 1 | 0 | 3 | 4 | 5 | 2 | 11 | 1 | 1 | 15 | flowering plants | green plants |
| <i>Helianthus annuus</i> | 2 | 2 | 0 | 4 | 2 | 2 | 5 | 9 | 1 | 1 | 14 | flowering plants | green plants |
| <i>Ambrosia artemisiifolia</i> | 3 | 3 | 0 | 6 | 1 | 3 | 2 | 6 | 1 | 1 | 13 | flowering plants | green plants |
| <i>Sesamum indicum</i> | 2 | 1 | 0 | 3 | 1 | 1 | 2 | 4 | 1 | 1 | 8 | flowering plants | green plants |
| <i>Erythranthe guttata</i> | 7 | 1 | 0 | 8 | 2 | 6 | 2 | 10 | 1 | 1 | 19 | flowering plants | green plants |
| <i>Olea europaea</i> | 6 | 1 | 0 | 7 | 0 | 1 | 2 | 3 | 0 | 0 | 10 | flowering plants | green plants |
| <i>Solanum lycopersicum</i> | 3 | 1 | 0 | 4 | 1 | 1 | 2 | 4 | 1 | 1 | 9 | flowering plants | green plants |
| <i>Daucus carota</i> | 7 | 1 | 0 | 8 | 1 | 1 | 2 | 4 | 1 | 1 | 13 | flowering plants | green plants |
| <i>Glycine max</i> | 10 | 2 | 0 | 12 | 2 | 2 | 2 | 6 | 1 | 1 | 19 | flowering plants | green plants |
| <i>Arachis hypogaea</i> | 6 | 2 | 0 | 8 | 2 | 2 | 4 | 8 | 2 | 2 | 18 | flowering plants | green plants |
| <i>Linum usitatissimum</i> | 4 | 2 | 0 | 6 | 2 | 2 | 4 | 8 | 1 | 1 | 15 | flowering plants | green plants |
| <i>Manihot esculenta</i> | 2 | 1 | 0 | 3 | 1 | 1 | 2 | 4 | 1 | 1 | 8 | flowering plants | green plants |
| <i>Cucumis sativus</i> | 3 | 1 | 0 | 4 | 1 | 1 | 2 | 4 | 1 | 1 | 9 | flowering plants | green plants |
| <i>Brassica oleracea</i> | 1 | 1 | 0 | 2 | 2 | 2 | 2 | 6 | 1 | 1 | 9 | flowering plants | green plants |
| <i>Arabidopsis thaliana</i> | 3 | 1 | 0 | 4 | 1 | 2 | 2 | 5 | 1 | 1 | 10 | flowering plants | green plants |
| <i>Carica papaya</i> | 3 | 2 | 0 | 5 | 1 | 7 | 1 | 9 | 1 | 1 | 15 | flowering plants | green plants |
| <i>Theobroma cacao</i> | 2 | 1 | 0 | 3 | 1 | 1 | 2 | 4 | 1 | 1 | 8 | flowering plants | green plants |
| <i>Gossypium hirsutum</i> | 6 | 3 | 0 | 9 | 2 | 2 | 4 | 8 | 2 | 2 | 19 | flowering plants | green plants |
| <i>Ziziphus jujuba</i> | 2 | 1 | 0 | 3 | 1 | 1 | 2 | 4 | 1 | 1 | 8 | flowering plants | green plants |
| <i>Malus domestica</i> | 7 | 2 | 0 | 9 | 2 | 2 | 2 | 6 | 1 | 1 | 16 | flowering plants | green plants |
| <i>Pistacia vera</i> | 3 | 1 | 0 | 4 | 1 | 1 | 3 | 5 | 2 | 2 | 11 | flowering plants | green plants |
| <i>Mangifera indica</i> | 4 | 1 | 0 | 5 | 1 | 2 | 4 | 7 | 2 | 2 | 14 | flowering plants | green plants |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|----|---|---|----|------------------|------------------|
| <i>Citrus sinensis</i> | 3 | 1 | 0 | 4 | 0 | 1 | 2 | 3 | 1 | 1 | 8 | flowering plants | green plants |
| <i>Chromera velia</i> CCMP2878 | 1 | 4 | 0 | 5 | 0 | 0 | 3 | 3 | 1 | 1 | 9 | chromeraceae | other eukaryotes |
| <i>Capsaspora owczarzaki</i> ATCC 30864 | 1 | 1 | 1 | 3 | 1 | 0 | 1 | 2 | 1 | 1 | 6 | filasterea | other eukaryotes |
| <i>Aureococcus anophagefferens</i> | 1 | 1 | 0 | 2 | 0 | 1 | 3 | 4 | 1 | 1 | 7 | pelagophytes | other eukaryotes |
| <i>Tritrichomonas foetus</i> | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | parabasalia | other eukaryotes |
| <i>Saccharina japonica</i> | 1 | 2 | 2 | 5 | 0 | 0 | 6 | 6 | 2 | 2 | 13 | brown algae | brown algae |
| <i>Plasmodiophora brassicae</i> | 1 | 1 | 0 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 4 | endomyxa | other eukaryotes |
| <i>Labyrinthula sp.</i> | 3 | 1 | 1 | 5 | 0 | 0 | 1 | 1 | 0 | 0 | 6 | labyrinthulida | bigyra |
| <i>Cafeteria roenbergensis</i> | 1 | 1 | 0 | 2 | 1 | 0 | 2 | 3 | 1 | 1 | 6 | bicosoecida | bigyra |
| <i>Blastocystis hominis</i> | 2 | 1 | 0 | 3 | 0 | 0 | 1 | 1 | 0 | 0 | 4 | opalinata | bigyra |
| <i>Aurantiochytrium limacinum</i> ATCC MYA-1381 | 2 | 2 | 1 | 5 | 0 | 2 | 5 | 7 | 0 | 0 | 12 | thraustochytrida | bigyra |
| <i>Entamoeba histolytica</i> | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | other eukaryotes | other eukaryotes |
| <i>Symbiodinium microadriaticum</i> | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 6 | 1 | 1 | 7 | dinoflagellates | dinoflagellates |
| <i>Acanthamoeba castellanii</i> str. Neff | 2 | 0 | 1 | 3 | 0 | 0 | 3 | 3 | 1 | 1 | 7 | other eukaryotes | other eukaryotes |
| <i>Guillardia theta</i> CCMP2712 | 1 | 1 | 1 | 3 | 0 | 3 | 5 | 8 | 2 | 2 | 13 | cryptomonads | cryptomonads |
| <i>Nitzschia inconspicua</i> | 1 | 1 | 0 | 2 | 0 | 0 | 4 | 4 | 2 | 2 | 8 | diatoms | diatoms |
| <i>Fragilariopsis cylindrus</i> | 3 | 1 | 0 | 4 | 0 | 0 | 4 | 4 | 2 | 2 | 10 | diatoms | diatoms |
| <i>Pseudo-nitzschia multistriata</i> | 2 | 1 | 1 | 4 | 0 | 0 | 2 | 2 | 2 | 2 | 8 | diatoms | diatoms |
| <i>Thalassiosira oceanica</i> | 2 | 1 | 1 | 4 | 0 | 0 | 2 | 2 | 2 | 2 | 8 | diatoms | diatoms |
| <i>Galdieria sulphuraria</i> | 1 | 1 | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 3 | red algae | red algae |
| <i>Theileria orientalis</i> | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 2 | 0 | 0 | 3 | apicomplexans | apicomplexans |
| <i>Paramecium tetraurelia</i> | 4 | 5 | 0 | 9 | 0 | 0 | 2 | 2 | 2 | 2 | 13 | ciliates | ciliates |
| <i>Phaeocystis globosa</i> | 2 | 1 | 1 | 4 | 0 | 3 | 9 | 12 | 2 | 2 | 18 | haptophytes | haptophytes |
| <i>Trypanosoma equiperdum</i> | 0 | 0 | 2 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 4 | kinetoplastids | kinetoplastids |
| <i>Acidovorax citrulli</i> | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 2 | proteobacteria | proteobacteria |
| <i>Xanthomonas oryzae</i> | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | proteobacteria | proteobacteria |
| <i>Pseudomonas syringae</i> | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | proteobacteria | proteobacteria |

Table S4. Parameter estimates, Ln L values, and LRTs of codon substitution evolutionary analyses of selective patterns for the selected HDACs.

| Foreground Branch | Model | p ^a | Parameter estimates (Frequency, f and ω Values) | | | | Ln L | P | BEB ^b |
|------------------------|--|----------------|---|---------|---------|---------|------------|----------|-------------------------------------|
| Class II & Class IV | One-ratio model 0 ($\omega_0=\omega_1$) | 134 | $\omega_0=\omega_1=0.11001$ | | | | -142466.38 | 3.19E-05 | NA |
| | Two-ratio model 2 (ω_0, ω_1) | 135 | $\omega_0=0.0904145; \omega_1=0.116512$ | | | | -142463.24 | | NA |
| | Model 3 (discrete) | 138 | - | | | | -138539.86 | 1.70E-02 | NA |
| | Clade model D (K = 3) | 139 | site class | 0 | 1 | 2 | -138537.01 | | NA |
| | | | proportion | 0.27406 | 0.63601 | 0.08994 | | | |
| | | | branch type 0: | 0.10274 | 0.38531 | 0.02281 | | | |
| | | | branch type 1: | 0.10274 | 0.38531 | 0.02716 | | | |
| | Model A null ($\omega_2=1$) | 136 | 1 | | | | -139613.92 | 1 | NA |
| | Model A ($0<\omega_0<1$) | 137 | site class | 0 | 1 | 2a | -139613.92 | | 7*,9**,10**,28**,50**,56**,67*, |
| | | | proportion | 0.23276 | 0.23803 | 0.26164 | | | 82**,251**,327**,329**,331**, |
| | | | background w | 0.09658 | 1.00000 | 0.09658 | | | 333**,334*,335**,336**,337*, |
| | | | foreground w | 0.09658 | 1.00000 | 1.00000 | | | 339**,341*,342**,343**,344,345**, |
| | | | | | | | | | 346**,351**,352**,353*,355**,356**, |

^a Number of parameters in the ω distribution.

^b Amino acids from BEB analysis as fixed by PS with posterior probabilities >90% (>95% indicated with one asterisk, >99% indicated with two asterisks) are shown. The numbers corresponding to the positions in HDAC2 (ENSP00000430432.1) of *H. sapiens* were shown in **Figure S14**.