

A promotional image for the video game Assassin's Creed Brotherhood. It features four hooded assassins in 15th-century Italian attire. The central figure is in a blue hooded robe with a red sash. Behind them is a large banner with the word 'CONTRITE' written in red, blood-like paint. The background shows a hazy, historical cityscape.

SPECIES OF FUNGI

Urmas Kõljalg
Universities of Tartu



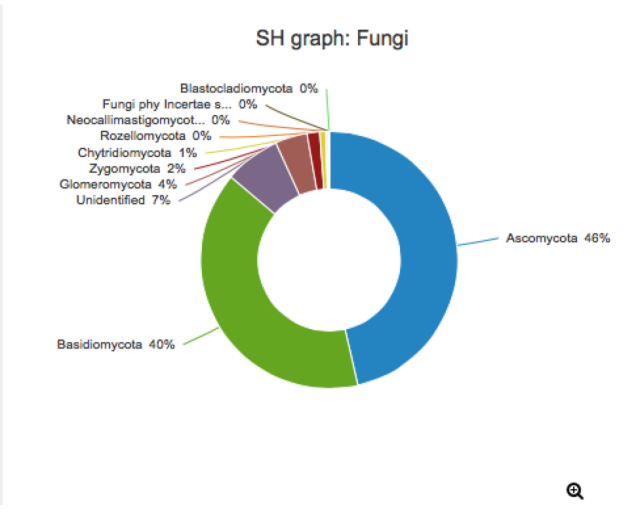
Unified system for the DNA based fungal species linked to the classification Ver. 7.0



Current version: **7.0**; Release date: 2015-08-01 ([read more](#)); Number of UNITE fungal Species Hypotheses: **53 891**

Threshold: 1.5 %
 Include: All SH-s
 Start typing taxon name here ...

- ▶ [Ascomycota](#) (24,553)
- ▶ [Basidiomycota](#) (21,036)
- ▶ [Unidentified](#) (3,716)
- ▶ [Glomeromycota](#) (2,138)
- ▶ [Zygomycota](#) (840)
- ▶ [Chytridiomycota](#) (402)
- ▶ [Rozellomycota](#) (114)
- ▶ [Neocallimastigomycota](#) (83)
- ▶ [Fungi phy Incertae sedis](#) (23)
- ▶ [Blastocladiomycota](#) (3)



[What is Species Hypothesis?](#)

[What are Reference and Representative sequences?](#)

Species Hypothesis – any species level group of individuals that share a

Reference sequence (Refs) – serves as a name anchor for the Species

UNITE

Curated rDNA ITS datasets from any biological sample
(specimen, living specimen, soil, water, air, medical,
etc.)

ITS sequences connected to the (type) specimen data,
locality, multimedia, etc.

UNITE Milestones

2001 – formation of UNITE (ITS and voucher specimens)

2003 – first online rDNA ITS based key for few hundred species

UNITE Milestones

2007 – online biocuration and third-party annotations of INSD (GenBank, ENA, DDBJ) sequences

2011 – online curation of Species Hypotheses



broad

narrow

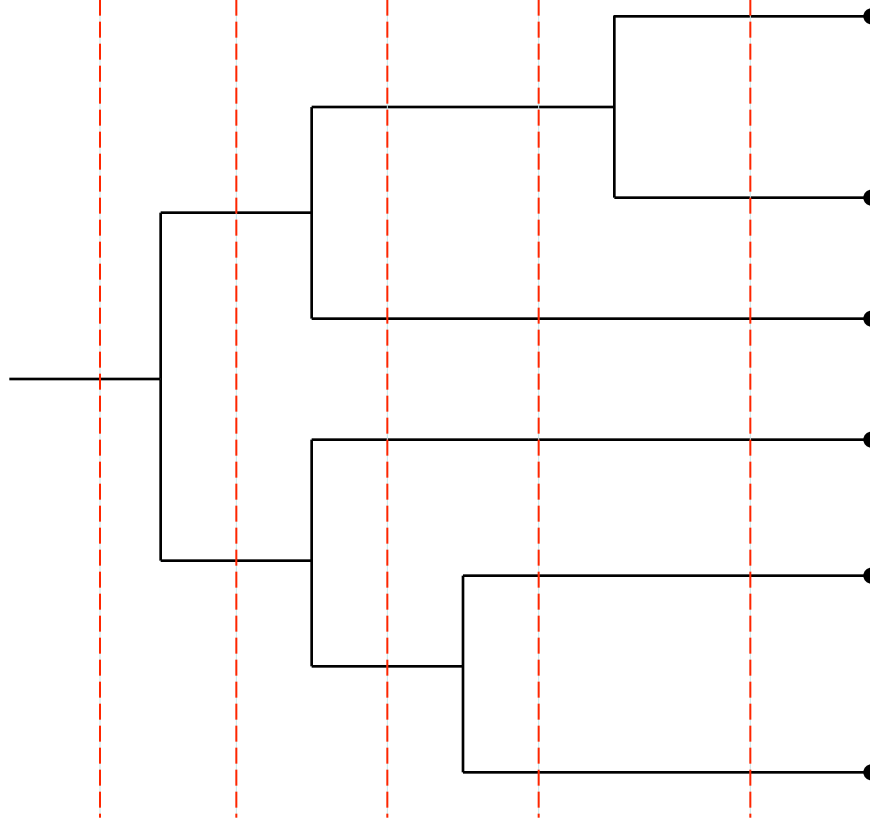
4%

3%

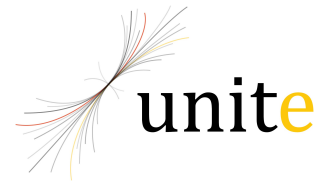
2%

1%

0.5%



PlutoF





Log in to PlutoF

3% cut off value

UNITE Species Hypotheses ver. 7 taxonomy browser

Select distance and dataset to browse:

3.0%

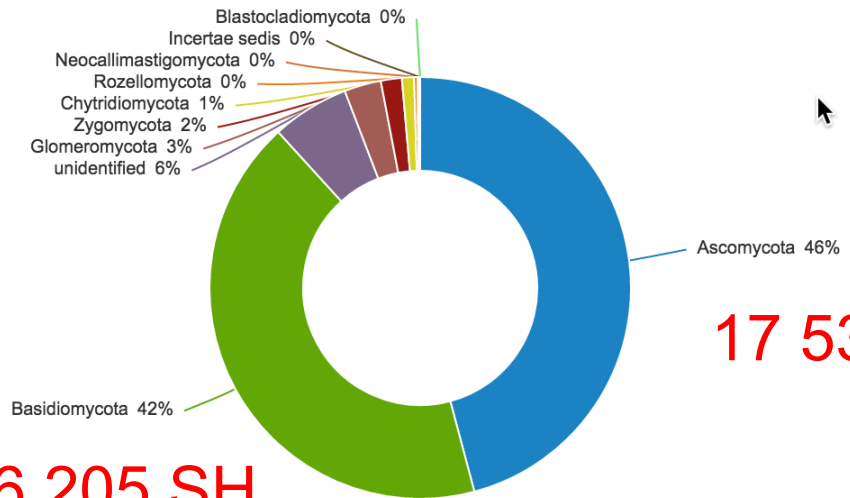
All SH-s

Go

Fungi

- Ascomycota** (17536)
- Basidiomycota** (16205)
- Blastocladiomycota** (3)
- Chytridiomycota** (356)
- Glomeromycota** (1080)
- Incertae sedis** (14)
- Neocallimastigomycota** (62)
- Rozellomycota** (98)
- unidentified** (2270)
- Zygomycota** (614)

SH graph: kgd Fungi



Open in a new window



Log in to PlutoF

1.5% cut off value

UNITE Species Hypotheses ver. 7 taxonomy browser

Select distance and dataset to browse:

1.5% (default)

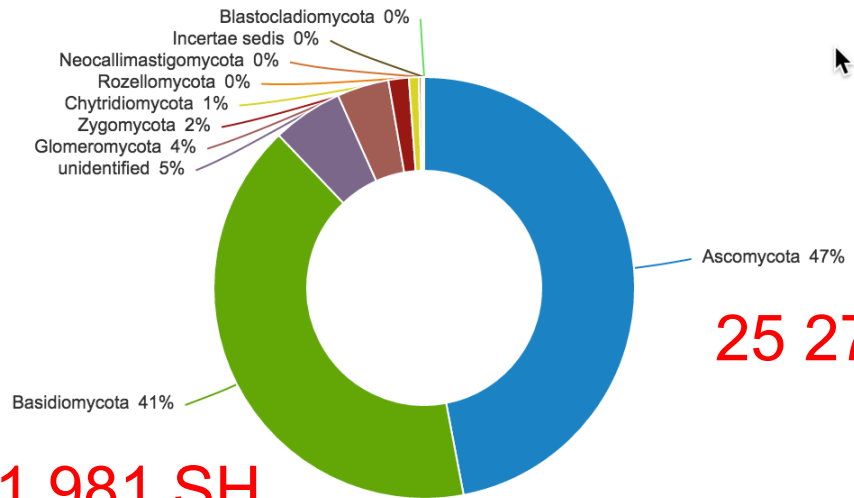
All SH-s

Go

Fungi

- Ascomycota** (25273)
- Basidiomycota** (21981)
- Blastocladiomycota** (3)
- Chytridiomycota** (402)
- Glomeromycota** (2139)
- Incertae sedis** (23)
- Neocallimastigomycota** (83)
- Rozellomycota** (114)
- unidentified** (2911)
- Zygomycota** (841)

SH graph: kgd Fungi



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Log in to PlutoF

0.5% cut off value

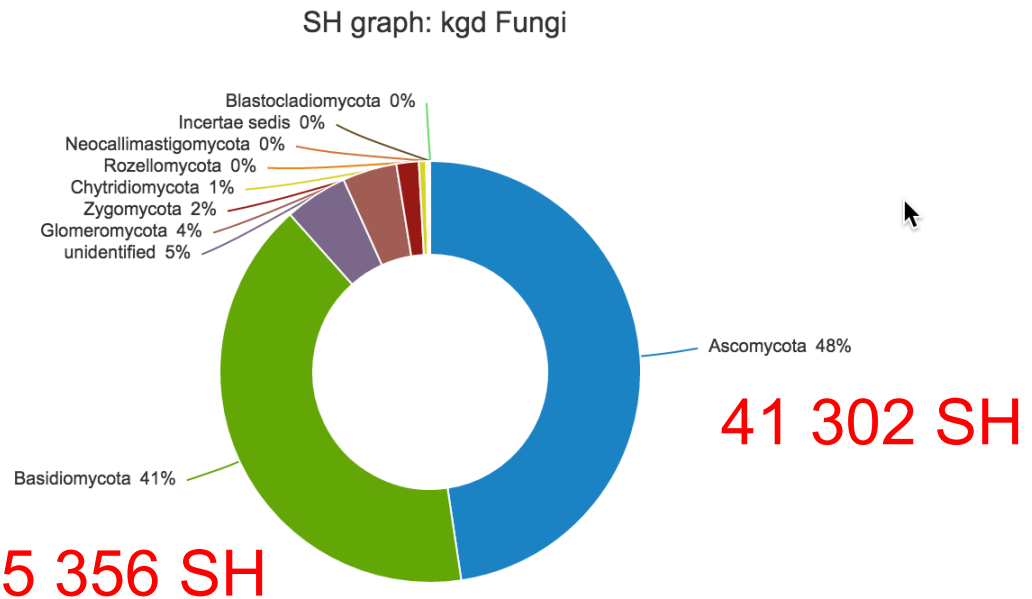
UNITE Species Hypotheses ver. 7 taxonomy browser

Select distance and dataset to browse:

0.5% All SH-s Go

Fungi

- Ascomycota** (41302)
- Basidiomycota** (35356)
- Blastocladiomycota** (3)
- Chytridiomycota** (479)
- Glomeromycota** (3614)
- Incertae sedis** (30)
- Neocallimastigomycota** (110)
- Rozellomycota** (127)
- unidentified** (4195)
- Zygomycota** (1485)



Open in a new window



1.5% cut off value

Select distance and dataset to browse:

1.5% (default) ▾

All SH-s ▾

Go

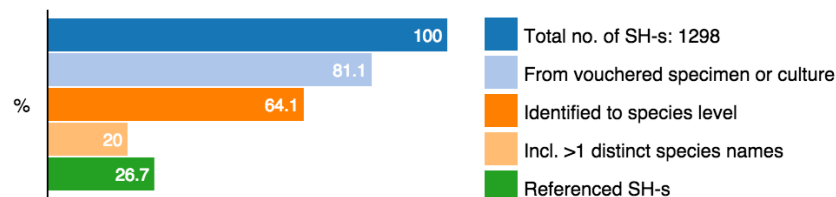
Fungi; Basidiomycota; Agaricomycetes;
Agaricales; Cortinariaceae; Cortinarius

UNITE Species Hypotheses ver. 7 taxonomy browser

Illustrative photos: gen Cortinarius



Taxon statistics: gen Cortinarius



1 298 SH

There are 1298 SH-s falling into "Cortinarius":

1. **SH223009.07FU** (1) *Cortinarius xenosma*
2. **SH222627.07FU** (3) *Cortinarius xenosma*
3. **SH184362.07FU** (5) **RefS:** *Cortinarius xanthodryophilus*
4. **SH222378.07FU** (14) **RefS:** *Cortinarius xanthocephalus*
5. **SH222693.07FU** (2) **RefS:** *Cortinarius wiebeae*
6. **SH222367.07FU** (16) *Cortinarius walpolensis*
7. **SH222558.07FU** (4) *Cortinarius vulpinus* subsp. *pseudovulpinus* (as *Cortinarius pseudovulpinus*)



0.5% cut off value

Select distance and dataset to browse:

0.5%

All SH-s

Go

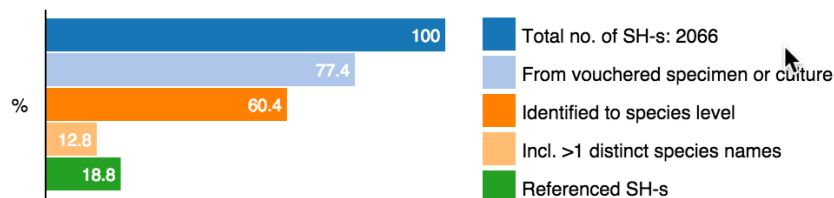
Fungi; Basidiomycota; Agaricomycetes;
Agaricales; Cortinariaceae; Cortinarius

UNITE Species Hypotheses ver. 7 taxonomy browser

Illustrative photos: gen Cortinarius



Taxon statistics: gen Cortinarius



2 066 SH

There are 2066 SH-s falling into "Cortinarius":

1. **SH304855.07FU** (1) *Cortinarius xenosma*
2. **SH304246.07FU** (3) *Cortinarius xenosma*
3. **SH240916.07FU** (8) *Cortinarius xanthophyllus*
4. **SH240928.07FU** (4) **RefS:** *Cortinarius xanthodryophilus*
5. **SH240949.07FU** (1) *Cortinarius xanthodryophilus*
6. **SH240911.07FU** (10) *Cortinarius xanthochlorus*
7. **SH303960.07FU** (13) **RefS:** *Cortinarius xanthocephalus*



Unified system for the DNA based fungal species linked to the classification
 Ver. 7.0

Home Run Analysis Search Pages Workbench Resources Notes and news UNITE Board Acknowledgements

Username: Log in

1.5% cut off value - Cortinarius xanthodryophilus

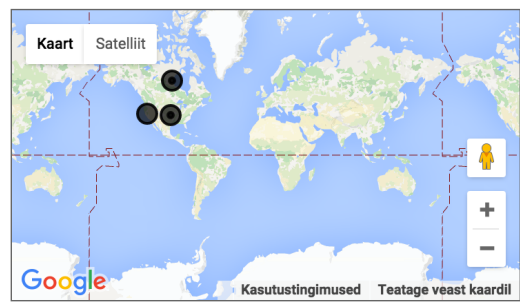
Cortinarius xanthodryophilus | SH184362.07FU

Distance to the closest SH (read more): 1.5%
 No of sequences in SH: 5

Placement in the fungal classification (read more):
 Fungi; Basidiomycota; Agaricomycotina; Agaricomycetes; Agaricomycetidae;
 Agaricales; Cortinariaceae; Cortinarius
 Links to taxon name in: [Index Fungorum](#); [NCBI](#)

Reference sequence: **HQ441244**
 Chosen by: Tuula Niskanen
 Date: 2014-11-09 21:04:52

[Large map](#) (incl. map info)



Older version(s) of this SH is/are available:
 SH code (Count*/Total count**)
SH207574.06FU (5/5);
 There are no totally new sequences in this SH compared to version 6.0
 *Number of sequences carried over from version 6.0
 **Total number of sequences composing this SH in version 6.0



Sequence ID	UNITE taxon name	INSD taxon name	Country	DNA source	Interacting taxa	Clustering based on: Full ITS
more DQ974721	Cortinarius xanthodryophilus	Cortinariaceae (uncultured Cortinar...	United States	Ectomycorrhiza	Quercus	-----AGGATCATTATTGAA-AT-AAATCTGATAAGTT
more JF273637	Cortinarius xanthodryophilus	Cortinarius (Cortinarius xanthodryo...	United States	Fruitbody		-----AAGGATCATTATTGAA-AT-AAATCTGATAAGTT
more JF273636	Cortinarius xanthodryophilus	Cortinarius (Cortinarius xanthodryo...	United States	Fruitbody		-----AAGGATCATTATTGAA-AT-AAATCTGATAAGTT
more HQ441244	Cortinarius xanthodryophilus	Cortinarius (Cortinarius xanthodryo...	United States	Fruitbody (Holotype)	Quercus agrifolia	-----AAGGATCATTATTGAA-AT-AAATCTGATAAGTT
more GQ159771	Cortinarius xanthodryophilus	Cortinarius (Cortinarius xanthodryo...	Canada	Fruitbody		-----CATTATTGAA-AT-AAATCTGATAAGTT

- chimeric
- low quality
- UNITE core sequence
- automatically chosen SH representative sequence
- Ex = sequence to be excluded from the next version of global key



Sequence ID	UNITE taxon name	INSD taxon name	Country	DNA source	Interacting taxa	Clustering based on: Full ITS
more FJ158047	Cortinarius	Cortinariaceae (uncultured Cortinar...	Poland	Ectomycorrhiza	Pinus sylvestris	
more UDB011349	Cortinarius alboviolaceus		Estonia	Fruitbody		
more HQ285366	Cortinarius	Cortinariaceae (uncultured Cortinar...	United States	Ectomycorrhiza		
more HQ022045	Cortinarius	Cortinariaceae (uncultured Cortinar...	United States	Soil fungal DNA		
more KJ705149		Cortinarius (Cortinarius alboviolac...				
more FJ266726	Cortinarius	Cortinariaceae (uncultured Cortinar...	United States	Ectomycorrhiza	Picea	
more JX316781		Cortinariaceae (uncultured Cortinar...	United States			
more KJ705148		Cortinarius (Cortinarius alboviolac...				
more UDB001122	Cortinarius alboviolaceus		Sweden	Fruitbody		
more AJ549965	Cortinarius	Cortinariaceae (uncultured Cortinar...	Germany	Ectomycorrhiza	Betula pendula	
more AY669657		Cortinarius (Cortinarius alboviolac...	Germany	Fruitbody		
more JF907875		Cortinarius (Cortinarius alboviolac...	Italy			
more UDB011739	Cortinarius alboviolaceus		Estonia	Fruitbody		
more UDB011755	Cortinarius alboviolaceus		Estonia	Fruitbody		
more			Canada	Fruitbody	Tsuga heterophylla	
more			Norway	Fruitbody		
more			Estonia	Fruitbody		
more			Estonia	Fruitbody		
more			Estonia	Fruitbody		
more			United States	Fruitbody		
more			Sweden	Fruitbody		
more			Austria	Fruitbody		
more			Canada	Fruitbody		
more			Sweden	Fruitbody		
more			Canada	Fruitbody		
more			Canada	Fruitbody		
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more			Canada	Fruitbody		
more			Canada	Fruitbody		
more			Norway	Fruitbody		
more			Finland	Fruitbody		
more						
more			Estonia	Fruitbody		
more			Estonia	Fruitbody		
more			Estonia	Fruitbody		
more			Estonia	Fruitbody		
more			Estonia	Fruitbody		



Author: Vello Liiv

iris.ut.ee/plutof/thumbs_medium/thumb_medium_SP001152.JPG

Communication of the species

Accession code of the *Cortinarius xanthodryophilus* SH:

SH184362.07FU

is resolved with unique DOI (digital object identifier):

dx.doi.org/10.15156/BIO/SH184362.07FU

Version 7 includes 487 435 SHs and each of them have unique DOI

Cortinarius xanthodryophilus | SH184362.07FU

Species Hypothesis pages version 7 

Reference sequence

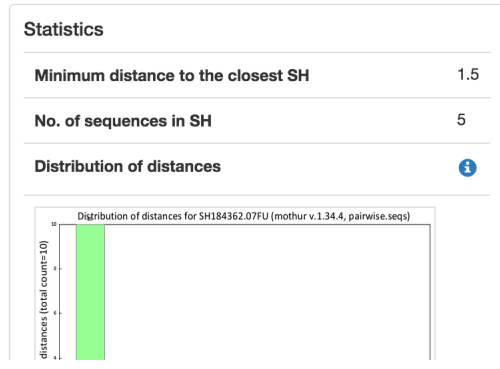
Accession numbers	HQ441244
Chosen by	Tuula Niskanen
Date	2014-11-09 23:04:52

Taxonomy

Placement in classification
Fungi; Basidiomycota; Agaricomycetes; Agaricales; Cortinariaceae; Cortinarius

[See Cortinarius xanthodryophilus in Index Fungorum](#)

Identifications
Cortinarius xanthodryophilus (5);



Ecology

Interacting taxa
Quercus (1); Quercus douglasii (1);

Metadata

Location
[10.15156/BIO/SH184362.07FU](#)

Dataset
Köljalg, Urmas; Abarenkov, Kessy; Nilsson, Henrik; Larsson, Karl-Henrik; Aas, Anders Bjørnsgard; Adams, Rachel; Alves, Artur; Ammirati, Joseph F.; Arnold, A. Elizabeth; Bahram, Mohammad et al. (2015); SH184362.07FU. UNITE Community. 10.15156/BIO/SH184362.07FU

Publisher
UNITE Community

Published In
2015

Creators
Urmas Köljalg, Kessy Abarenkov, Henrik Nilsson, Karl-Henrik Larsson, Anders Bjørnsgard Aas, Rachel Adams, Artur Alves, Joseph F. Ammirati, A. Elizabeth Arnold, Mohammad Bahram. [Show more](#)

Document(s)
SH184362.07FU_graph.png; SH184362.07FU.json;

Uncultured ectomycorrhiza (Boletus) isolate 26 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence

GenBank: EF644121.1

[FASTA](#) [Graphics](#) [PopSet](#)

Go to:

LOCUS EF644121 582 bp DNA linear ENV 01-OCT-2008

DEFINITION Uncultured ectomycorrhiza (Boletus) isolate 26 18S ribosomal RNA gene, partial sequence; internal transcribed spacer 1, 5.8S ribosomal RNA gene, and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence.

ACCESSION EF644121

VERSION EF644121.1 GI:157284042

KEYWORDS ENV.

SOURCE uncultured Boletus

ORGANISM [uncultured Boletus](#)

Eukaryota; Fungi; Dikarya; Basidiomycota; Agaricomycotina; Agaricomycetes; Agaricomycetidae; Boletales; Boletineae; Boletaceae; environmental samples.

REFERENCE 1 (bases 1 to 582)

AUTHORS Krpata,D., Peintner,U., Langer,I., Fitz,W.J. and Schweiger,P.
 TITLE Ectomycorrhizal communities associated with Populus tremula growing on a heavy metal contaminated site

JOURNAL Mycol. Res. 112 (PT 9), 1069-1079 (2008)
 PUBMED [18692376](#)

REFERENCE 2 (bases 1 to 582)

AUTHORS Krpata,D., Peintner,U., Langer,I., Fitz,W. and Schweiger,P.
 TITLE Direct Submission
 JOURNAL Submitted (01-JUN-2007) Institute of Microbiology, University Innsbruck, Technikerstrasse 25, Innsbruck 6020, Austria

FEATURES Location/Qualifiers

source 1..582
 /organism="uncultured Boletus"
 /mol_type="genomic DNA"
 /isolate="26"
 /isolation_source="ectomycorrhizal root tips of Populus tremula growing in heavy metal contaminated site near

Change region shown

Customize view

Analyze this sequence

Run BLAST

Pick Primers

Highlight Sequence Features

Find in this Sequence

LinkOut to external resources

SILVA LSU Database

[SILVA]

SH326509.06FU

[UNITE]

related identified ITS sequences

[emerencia]

Related information

Related Sequences

PopSet

PubMed

Taxonomy

Recent activity

Turn Off Clear

Uncultured ectomycorrhiza (Boletus) isolate 26 18S ribosomal RNA gene, partial Nucleotide



High-Throughput Sequencing projects

HTS sequences included in UNITE SH version 7

FJ152528		Leotiomyces (uncultured...	Canada	Ectomycorrhiza						
JX857198		Fungi (uncultured fungus)	United States							
JX857214		Fungi (uncultured fungus)	United States							
KC514890		Sordariomycetes (Sordario...								
HQ611285		Fungi (uncultured fungus)	Sweden							
KF274409		Fungi (uncultured fungus)	Finland							
AM260917	Helotiales	Fungi (uncultured fungus)	United Kingdom	Soil fungal DNA						
HF947879		Helotiales (uncultured He...	Ireland							
HF947876		Helotiales (uncultured He...	Ireland							
KC965984		Fungi (uncultured fungus)	United States							
KF617245		Fungi (uncultured fungus)	United States							RepSeq
AB476482	Helotiales	Fungi (uncultured fungus)	Sweden	Ericoid mycorrhiza						
UDB020841			Sweden	Soil fungal DNA						
KF879483		Pezizomycotina (unculture...	United States							
GU180254	Helotiales	Ascomycota (uncultured As...	United States	Ectomycorrhiza						
DQ273331	Helotiales	Pezizomycotina (unculture...	United States	Ectomycorrhiza						
FJ152527		Leotiomyces (uncultured...	Canada	Ectomycorrhiza						
HF947867		Helotiales (uncultured He...	Ireland							
FN565266	Helotiales	Helotiales (uncultured He...	United Kingdom	Ectomycorrhiza						
FN565265	Helotiales	Helotiales (uncultured He...	United Kingdom	Ectomycorrhiza						
EF445405	Helotiales	Fungi (uncultured fungus)	United Kingdom	Ericoid mycorrhiza						
AM260813		Fungi (uncultured fungus)	United Kingdom	Soil fungal DNA						
AM292203		Ascomycota (ascomycete sp...	United Kingdom	Soil fungal DNA						
AM260927		Fungi (uncultured fungus)	United Kingdom	Soil fungal DNA						

Identification of species

Open Data / Open Access

All SHs are freely downloaded at unite.ut.ee
For the inhouse analyses or for the building
identification pipelines

HTS pipelines: QIIME, mothur, SCATA, CREST,
UCHIME, UTAX.

Identification of species

All UNITE SH accession codes are connected to the Fungal classification.

It means OTUs will receive accession codes and will be connected to the classification even when species names are not available.



Thank you!