

**Table S1.** Strains used in this study. Accession numbers new in this study are marked in bold.

Strain No.	Taxonomy after revision	Original designation	Origin	Accession no.	Number of introns (position)
<b>ULVALES</b>					
CCMP 2158	<i>Ctenocladus circinnatus</i>	<i>Ctenocladus circinnatus</i>	Italy, Pompei, from ruins	<b>MF034603</b>	-
ULVO-16	<i>Ctenocladus circinnatus</i>	<i>Dilabifilum sp.</i>	Ukraine, Kherson Oblast, Azov-Syvash National Park, solonchak (hyperhaline soil)	<b>MF034604</b>	-
ULVO-17	<i>Ctenocladus circinnatus</i>	<i>Dilabifilum sp.</i>	Ukraine, Kherson Oblast, Azov-Syvash National Park, solonchak (hyperhaline soil)	<b>MF034605</b>	-
ULVO-18	<i>Ctenocladus circinnatus</i>	<i>Dilabifilum sp.</i>	Luxembourg, Casemate „Petruș“, Fort Bourbon	<b>MF034606</b>	-
ULVO-24	<i>Ctenocladus circinnatus</i>	<i>Dilabifilum sp.</i>	Ukraine, Odesa Oblast, Snake Island, quartz, epilithic	<b>MF034607</b>	-
ULVO-25	<i>Ctenocladus circinnatus</i>	<i>Dilabifilum sp.</i>	Ukraine, Odesa Oblast, Kuyalnyk, solod (hyperhaline soil)	<b>MF034608</b>	-
SAG 467-1	<i>Ctenocladus printzii</i>	<i>Dilabifilum printzii</i>	Switzerland, Rosenau/Basel, bog water	<b>MF034613</b>	-
SAG 2.95	<i>Halofilum helgolandicum</i>	<i>Pirula salina</i>	Germany, Schleswig-Holstein, Helgoland, from an enrichment culture of Rhizoclonium riparium	<b>MF034635</b>	-
SAG 2050	<i>Halofilum ramosum</i>	<i>Dilabifilum sp.</i>	United Kingdom, Wales, Anglesey, Porth Treacastel, in stonecracks of coastal rocks, isolated from lichen <i>Wahlenbergiella striatula</i>	<b>MF034615</b>	-
SAG 2235	<i>Halofilum ramosum</i>	<i>Dilabifilum sp.</i>	France, North Atlantic, Roscoff, Brittany, photobiont of <i>Verrucaria maura</i>	<b>MF034617</b>	-
ULVO-19	<i>Halofilum ramosum</i>	<i>Dilabifilum sp.</i>	Tunesia, Carthage, archeological remains, green biofilm on the wall	<b>MF034621</b>	-
ULVO-28	<i>Halofilum ramosum</i>	<i>Dilabifilum sp.</i>	France, North Atlantic, Roscoff, Brittany, photobiont of <i>Verrucaria maura</i>	<b>MF034624</b>	-
SAG 1.95	<i>Halofilum salinum</i>	<i>Pirula salina</i>	France, Schorre de estuary of the river Orne at Sallenelles, from a piece of wood	<b>MF034634</b>	-

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SAG 2038	<i>Lithotrichon pulchrum</i>	<i>Dilabifilum sp.</i>	Germany, Gladenbacher Bergland, near Dillenburg and Wetzlar, submers from lichen <i>Verrucaria rheitrophila</i>	<b>MF034614</b>	1 (943)
SAG 2240	<i>Paulbroadya petersii</i>	<i>Dilabifilum sp.</i>	France, North Atlantic, Roscoff, Brittany, photobiont of <i>Verrucaria mucosa</i>	<b>MF034620</b>	-
ULVO-34	<i>Paulbroadya petersii</i>	<i>Dilabifilum sp.</i>	Scotland, North Atlantic, Oban, photobiont of <i>Verrucaria mucosa</i>	<b>MF034625</b>	-
CCAP 415/4	<i>Paulbroadya prostrata</i>	<i>Dilabifilum prostratum</i>	Antarctica, Ross Island, Cape Royds, green epilithic crusts on rocks	<b>MF034612</b>	3 (943, 1046, 1512)
SAG 23.92	<i>Paulbroadya prostrata</i>	<i>Dilabifilum prostratum</i>	Antarctica, Ross Island, Cape Royds, green epilithic crusts on rocks	<b>MF034611</b>	3 (943, 1046, 1512)
SAG 467-2	<i>Pseudendoclonium arthopyreniae</i>	<i>Dilabifilum arthopyreniae</i>	Germany, Wangerooge, photobiont of lichen <i>Arthopyrenia kelpii</i> on snail shell of <i>Littorina littorea</i>	<b>MF034609</b>	3 (943, 1046, 1512)
ULVO-21	<i>Pseudendoclonium commune</i>	<i>Dilabifilum sp.</i>	Ukraine, Odesa Oblast, Snake Island, quartz, epilithic	<b>MF034622</b>	1 (1512)
SAG 2236	<i>Pseudendoclonium commune</i>	<i>Dilabifilum sp.</i>	France, North Atlantic, Öland, photobiont of <i>Verrucaria maura</i>	<b>MF034618</b>	1 (1512)
SAG 2051	<i>Pseudendoclonium commune</i>	<i>Dilabifilum sp.</i>	United Kingdom, Wales, Anglesey, Aberfraw, on coastal rocks (Pelvetia-zone)	<b>MF034616</b>	1 (1512)
ULVO-62	<i>Pseudendoclonium commune</i>	<i>Dilabifilum sp.</i>	USA, RI, Oakland Beach, from rock of the tidal zone	<b>MF034626</b>	2 (1046, 1512)
CCAP 415/1	<i>Pseudendoclonium incrustans</i>	<i>Dilabifilum incrustans</i>	Austria, photobiont of lichen <i>Verrucaria aquatilis</i>	<b>MF034610</b>	-
SAG 2237	<i>Pseudendoclonium submarinum</i>	<i>Dilabifilum sp.</i>	Scotland, North Atlantic, Oban, photobiont of <i>Verrucaria mucosa</i>	<b>MF034619</b>	-
ULVO-26	<i>Pseudendoclonium submarinum</i>	<i>Dilabifilum sp.</i>	France, North Atlantic, Roscoff, Brittany, photobiont of <i>Verrucaria maura</i>	<b>MF034623</b>	-

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Strain No.	Taxonomy after revision	Original designation	Origin	Accession no.	Number of introns (position)
<b>ULOTRICHALES</b>					
SAG 466-1	<i>Chamaetrichon basiliensis</i>	<i>Hazenia basiliense</i>	Switzerland, Basel, garden pool	<b>MF034629</b>	-
SAG 1.87	<i>Chamaetrichon basiliensis</i>	<i>Hazenia mirabilis</i>	USA, TE, Nashville, pool at Couchville Pike	<b>MF034630</b>	-
SAG 18.88	<i>Chamaetrichon basiliensis</i>	<i>Chamaetrichon capsulatum</i>	Portugal, Arganil, queda de água (waterfall)	<b>MF034602</b>	2 (943, 1512)
SAG 23.88	<i>Chamaetrichon basiliensis</i>	<i>Gloeotilopsis sarcinoidea</i>	Portugal, Amieiro, pond near Arazede	<b>MF034627</b>	1 (1512)
SAG 2396	<i>Chamaetrichon basiliensis</i>	<i>Hazenia mirabilis</i>	Germany, Franconian Alb, from tufa-forming karstwater stream „Deinschwanger Bach“	<b>MF034631</b>	-
CCALA 986	<i>Chamaetrichon basiliensis</i>	<i>Hazenia broadyi</i>	Antarctica, Ross Island, Andreassen Point, shallow lake	HF570951/ HF570954	-
UTEX 1918	<i>Chamaetrichon basiliensis</i>	<i>Chamaetrichon capsulatum</i>	USA, Texas, Sam Houston National Forest, Pallavincinia Iyellii, Double Lake	<b>MF034600</b>	-
ULVO-15	<i>Chamaetrichon basiliensis</i>	<i>Helicodictyon sp.</i>	UK, Northamptonshire, Pitsford Water, in shallow water	<b>MF034633</b>	1 (1512)
ULVO-1	<i>Planophila bipyrenoidosa</i>	<i>Planophila bipyrenoidosa</i>	unknown	<b>MF034636</b>	-
ULVO-55	<i>Planophila bipyrenoidosa</i>	<i>Pseudendocloniopsis sp.</i>	Ukraine, Cherkassy Oblast, Regional Landscape Park „Trakhtemyriv“, sandstone, chasmoendolithic	<b>MF034637</b>	-
SAG 2008	<i>Planophila laetevirens</i>	<i>Planophila laetevirens</i>	Italy, South Tyrol, Italy, Dolomites	<b>MF034638</b>	-
SAG 465-1	<i>Planophila laetevirens</i>	<i>Pseudendocloniopsis botryoides</i>	Switzerland, Basel, pond	<b>MF034642</b>	-
SAG 32.98	<i>Planophila laetevirens</i>	<i>Planophila laetevirens</i>	Costa Rica, Ojo de Agua, Cultivo trucha, soil	<b>MF034639</b>	-

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ULVO-56	<i>Planophila laetevirens</i>	<i>Planophila laetevirens</i>	Ukraine, Cherkassy Oblast, Regional Landscape Park „Trakhtemyriv“, sandstone, chasmoendolithic	<b>MF034640</b>	1 (1512)
GSM-5A-LK1	<i>Planophila laetevirens</i>	<i>Planophila</i> sp.	USA, North Carolina, Great Smoky Mountains National Park, soil sample	<b>MF034641</b>	-
ULVO-10	<i>Rhexinema edaphica</i>	<i>Rhexinema</i> sp.	unknown	<b>MF034647</b>	1 (1046)
SAG 463-1	<i>Rhexinema paucicellularis</i>	<i>Gloeotilopsis paucicellulare</i>	Switzerland, Basel, botanical garden, Victoria green house, small basin, stagnant water	Z47997	3 (943, 1046, 1512)
SAG 29.93	<i>Rhexinema paucicellularis</i>	<i>Gloeotilopsis planctonica</i>	Czech Republic, Trebon, soil from the shore at a lake near Suchdol	Z28970	1 (943)
SAG 8.90	<i>Rhexinema paucicellularis</i>	<i>Chamaetrichon capsulatum</i>	Czech Republic, near Trebon, sandy soil at an anthropogenic lake near Suchdol	<b>MF034601</b>	1 (943)
SAG 466-2	<i>Rhexinema paucicellularis</i>	<i>Pseudendoclonium basiliense</i> var. <i>brandii</i>	Switzerland, Basel, botanical garden, bog water	<b>MF034645</b>	3 (943, 1046, 1512)
UTEX 1570	<i>Rhexinema planctonica</i>	<i>Helicodictyon planctonicum</i>	USA, Pennsylvania, Mount Holy Springs, flooded ore pit	<b>MF034632</b>	3 (943, 1046, 1512)
ACOI 592	<i>Rhexinema sancta-tomea</i>	<i>Gloeotilopsis sarcinoidea</i>	São Tomé and Príncipe	<b>MF034628</b>	2 (1199, 1512)
UTEX 1710	<i>Rhexinema sarcinoidea</i>	<i>Protoderma sarcinoidea</i>	USA, Texas, Bastrop, Bastrop National Park, soil	Z47998	2 (943, 1512)
SAG 4.90	<i>Sarcinofilum mucosum</i>	<i>Trichosarcina mucosa</i>	Antarctica, Prinzess Elizabeth Land, Vestfold Hills, freshwater	<b>MF034648</b>	-
SAG 24.93	<i>Sarcinofilum mucosum</i>	<i>Trichosarcina polymorpha</i>	USA, Texas, Llano Co., shallow temporary pool in granite rock	<b>MF034649</b>	2 (943, 1046)
SAG 26.88	<i>Sarcinofilum mucosum</i>	<i>Trichosarcina polymorpha</i>	Portugal, Porto	<b>MF034650</b>	-
SAG 26.94	<i>Sarcinofilum mucosum</i>	<i>Trichosarcina polymorpha</i>	Germany, Hessen, Biebergemünd/Spessart, garden pool, from roots of <i>Lemna minor</i>	<b>MF034651</b>	-

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SAG 29.94	<i>Sarcinofilum mucosum</i>	<i>Trichosarcina polymorpha</i>	USA, IA, Dickinson Co., Spring Run Preserve	<b>MF034652</b>	-
CCALA 423	<i>Tupiella speciosa</i>	<i>Pseudendozonium basiliense</i>	Czech Republic, Lednice n.M	<b>MF034643</b>	1 (1512)
ULVO-11	<i>Tupiella speciosa</i>	<i>Rhexinema sp.</i>	unknown	<b>MF034644</b>	-
SAG 38.86	<i>Ulothrix zonata</i>	<i>Ulothrix zonata</i>	Czech Republic, South Bohemia, brook in Jeseníky Mts.	<b>MF034653</b>	-
UTEX 1913	<i>Vischeriocladium submersum</i>	<i>Pseudendozonium basiliense</i> var. <i>brandii</i>	USA, Texas, Fort Davis, submerged grass, Limpia Creek	<b>MF034646</b>	-