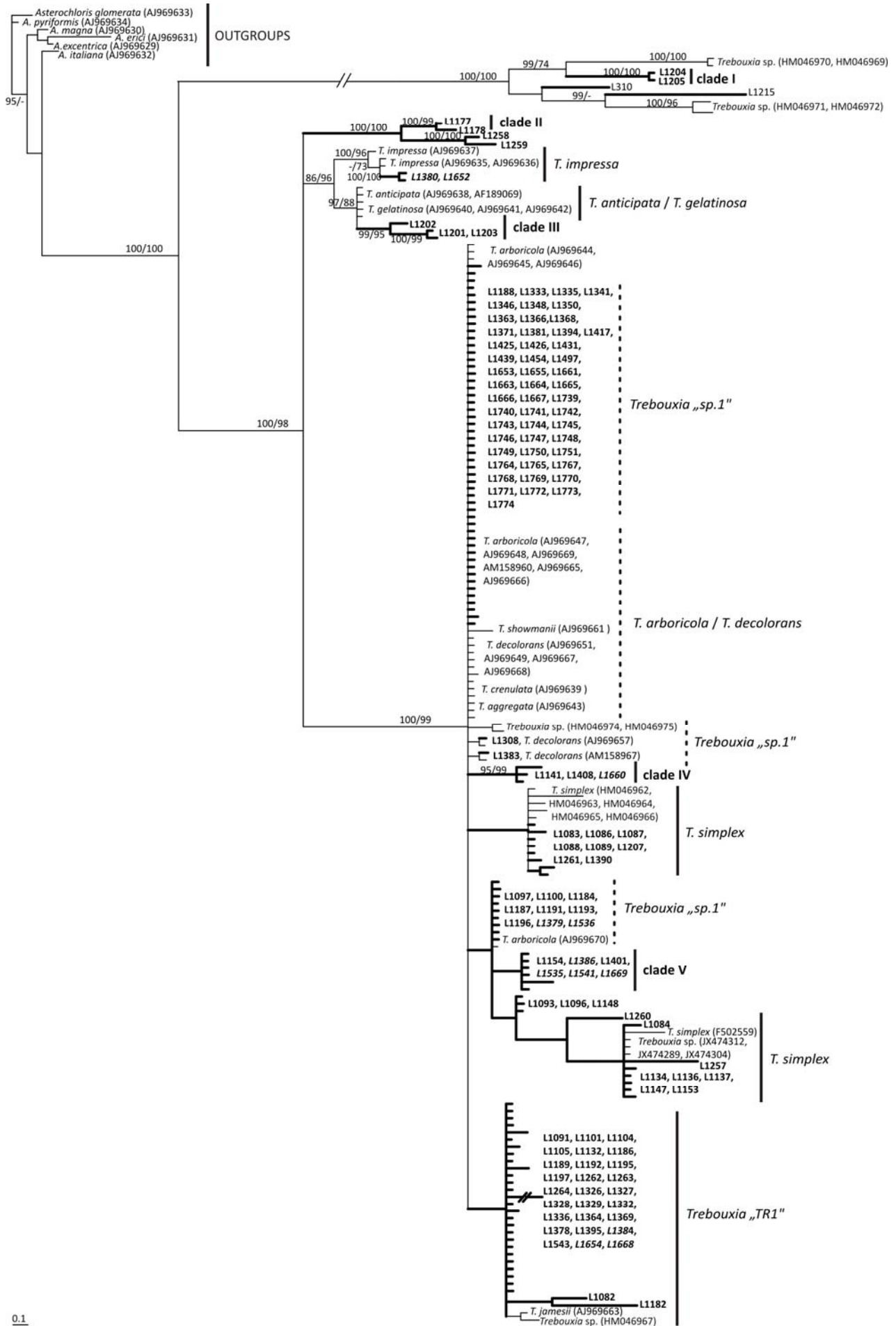


SUPPLEMENTARY DATA

Figure S1. Phylogenetic hypothesis of the *rbcL* locus of *Trebouxia* species: 50% majority rule consensus tree of the Bayesian analysis; branch supports (Bayesian PP>95% / ML bootstrap values >70%) are reported over or beside the branches; branches and DNA extraction numbers of our new *Trebouxia* sequences (see Table S1) are highlighted in bold; sequences retrieved from GenBank are reported with their accession numbers.



Supplementary information: Table S1

Table S1. Information about all the *Tephromela* spp. samples for which *Trebouxia* photobionts have been studied. Assignment to the phylogenetic clades as in Figure 1, DNA extraction numbers, geographic origin, lichen species, voucher information and growth substrate are reported. All NCBI accessions for the ITS and *rbcL* algal loci are here newly published. Sequence data corresponding to cultured photobiont are in italics. Dashes indicate lack data.

Table S1. Information about all the *Tephromela* spp. samples for which *Trebouxia* photobionts have been studied. Assignment to the phylogenetic clades as in Figure 1, DNA extraction numbers, geographic origin, lichen species, voucher information and growth substrate are reported. All NCBI accessions for the ITS and rbcL algal loci are here newly published. Sequence data corresponding to cultured photobiont are in italics. Dashes indicate lack data.

Phylogenetic clade (ITSp)	DNA extr. N.	Origin of specimens, year of collection	<i>Tephromela</i> species	collector and number (herbarium)	substrate	ITSp	rbcL
	Africa						
clade I	L1764	Kenya, Taita Taveta District, Mbololo Forest Peak, 3°19' S/ 38°27' E, ca. 2000 m a.s.l., 2012.	<i>T. atra</i> s.lat.	Krika P. 2234 (NMK)	bark	KJ754201	KM091781
-	L1765	Kenya, Kirinyaga District, Mt. Kenya, Bantu Lodge, 0°07' S/ 37°03' E, 1960 m a.s.l., 2012.	"	Krika P. 1140	bark	-	KM091782
-	L1767	Kenya, Taita Taveta District, Mbololo Hill, 3°19' S/ 38°27' E, 1766-2091 m a.s.l., 2012.	"	Krika P. 2234	bark	-	KM091783
clade I		<i>L1767 culture: L1831</i>				KJ754202	-
	Asia						
-	L1745	Japan, Sichuan Prov., Dege Co., Queershan Mt., 31°55'110" N/ 98°56'62" E, 4510 m a.s.l., 2007.	<i>T. atra</i> s.lat.	Wang Li-song 07-28239	rock	-	KM091774
-	L1746	Japan, Yunnan Prov., Lijiang Co., Laojunshan Mt., 26°37.878' N/ 99°	"	Wang Li-song 07-27718	rock	-	KM091775

		43,491'E, 4050 m a.s.l., 2007.					
-	L1748	Japan, Yunnan Prov., Dongchuan Co., Luoxue Village, 26°09'469" N/ 102°55'662"E, 4020 m a.s.l., 2009.	"	Wang Li-song 09-30572	rock	-	KM091777
-	L1749	Japan, Sichuan Prov., Kangding Co., Yajiagen 29°47'940" N/ 102°03'704" E, 3962 m a.s.l., 2010.	"	Wang Li-song 10-31875	rock	-	KM091778
-	L1747	Tibet, Basu Co. Ranwn village, 29°29'826"N / 96°42'040" E, 3920 m a.s.l., 2007.	"	Wang Li-song 07-28107	bark	-	KM091776
-	L1257	Russia, Primorskiy Kray, Sikhote-Alin' Mountains, 44°01.340'N/ 134°13.024'E, 2007.	"	Spribille 23341 (GZU)	bark (<i>Abies nephrolepis</i>)	-	KJ754363
-	L1258	Russia, Primorskiy Kray, Sikhote-Alin' Mountains, Sikhote-Alin'skiy Zapovednik, 45°07.743'N/ 135°52.309'E, 2007.	"	Spribille 23903 (GZU)	bark (<i>Abies nephrolepis</i>)	-	KJ754339
clade IV	L1141 (TS850)	Russia, Tsarskaya Dorogo, above Staraya Medvezhka, 52° 09.604' N/ 134°19.697'E, 910 m a.s.l., 2009.	"	Spribille 31797	rock	KJ754245	KJ754346
clade IV	L1739	Russia, 2011.	"	Yakovchenko T127	rocks	KJ754246	KM091768
clade I	L1740	Russia, 2011.	"	Yakovchenko T118	rocks	KJ754200	KM091769
-	L1741	Russia, 2011.	"	Yakovchenko	rocks	-	KM091770

	Nord America						
<i>T. simplex/jamesii</i>	L1134	U.S.A., Oregon, Linn County, Horse Rock Ridge research Natural Area, 44.29° N/ 122.87° W, 766 m a.s.l., 2009.	<i>Tephromela</i> sp.	McCune 30446	bark (<i>Arctostaphylos columbiana</i>)	KJ754219	KJ754357
<i>T. simplex/jamesii</i>	L1136	U.S.A., Oregon, Linn County, Horse Rock Ridge Research Area, 44.2980° N/ 122.8743° W, 766 m a.s.l., 2009.	"	McCune 30446 (duplicate)	bark (<i>Arctostaphylos columbiana</i>)	KJ754220	KJ754358
-	L1137	Canada, British Columbia, 2009.	"	Björk 18421	bark	-	KJ754359
<i>T. simplex/jamesii</i>	L1138	Canada, British Columbia, Fraser Canyon, Sailor bar Tunnel, 49°38.5' N/ 121°24.6' W, 2009.	"	Björk 18507	bark	KJ754221	-
<i>Trebouxia</i> "sp.1"	L1394	U.S.A., Mexico, Baja California, Guadalupe Island, 29°00'30" N/ 118°15'20" W, 750 m a.s.l., 1996.	<i>T. nashii</i>	Nash 38500 (MSC0074768)	basaltic rock	KJ754311	KM091752
clade IV	L1389	U.S.A., Alaska, Kruzof Island-Liesnoi Island, 57°00.731' N/ 135°41.515' W, 1 m a.s.l., 2010.	<i>T. atra</i> s.lat.	Spribille WP825	basaltic rock	KJ754242	-
clade V		<i>L1389 culture: L1541 (and L1656)</i>				KJ754248	KJ754352
clade IV	L1408	U.S.A., Alaska, Central Interior, White Mountains, Twelvemile Summit, 65.399694° N/ 145.983796° W, 995 m a.s.l., 2011.	<i>T. atra</i> s.lat.	Spribille & Fernández- Mendoza (GZU)	siliceous rock	KJ754241	KJ754347
<i>Trebouxia</i> "TR1"		<i>L1408 culture: L1660</i>				KJ754297	KJ754348

clade IV	L1871	U.S.A., Alaska, Glacier Bay National Park and Preserve, Excursion Ridge, 58.46168° N/ 135.55652° W, 895 m a.s.l., 2012.	<i>T. atra</i> s.lat.	Spribille 38350 (B)	soft argillite	KJ754244	-
	South America						
-	L1147	Argentina, Prov. De Rio Negro, S.C. de Bariloche, 41°07'04" S/ 71°27'29" O, 817 m a.s.l., 2010.	<i>Tephromela</i> sp.	Messuti M.I. (BCRU 05151)	bark (<i>Lomatia hirsuta</i>)	-	KJ754360
<i>Trebouxia</i> "sp.1"	L1148	Chile, Tierra del Fuego, XII Region, Peninsula Brunswick, 53°50'46" S/ 71°7'4" W, 0-3 m a.s.l., 2009.	<i>T. atrocaesia</i>	Perez-Ortega 1194 (GZU)	basaltic rocks	KJ754303	KJ754361
clade II	L1177	Peru, Region de Cusco, Prov. De Anta, Distr. De Zurite, 13°26.133' S/ 72°15.196' W, 3794 m a.s.l., 2010.	<i>Tephromela</i> sp.	Perez-Ortega 1470	basaltic rock (granit like)	KJ754203	KJ754337
clade II	L1178	Peru, Region de Cusco, Prov. De Anta, Distr. De Zurite, 13°26.133' S/ 72°15.196' W, 3794 m a.s.l., 2010.	"	Perez-Ortega 1469	basaltic rock (granit like)	KJ754204	KJ754338
<i>Trebouxia</i> "TR1"	L1182	Peru, Region de Cusco, Prov. De Anta, Distr. De Zurite, 13°26.133' S/ 72°15.196' W, 3794 m a.s.l., 2010.	"	Perez-Ortega 1467	basaltic rock (granit like)	KJ754260	KM091800
clade III	L1199	Peru, Region de Cusco, Prov. De Canchis, Distr. De San Pedro, 14°10'57" S/71°21'59" W, 3484 m a.s.l., 2010.	"	Perez-Ortega 1455	volcanic rock	KJ754205	-
clade III	L1201	Peru, Region de Cusco, Departamento	"	Perez-Ortega	volcanic rock	KJ754206	KJ754343

		de Puno, Sillustani, 15°42.829' S/70°8.972' W, 3792 m a.s.l., 2010.		1457			
-	L1202	Peru, Region de Cusco, Departamento de Puno, Sillustani, 15°42.829' S/70°8.972' W, 3792 m a.s.l., 2010.	"	Perez-Ortega 1458	volcanic rock	-	KJ754344
clade III	L1203	Peru, Region de Cusco, Departamento de Puno, Sillustani, 15°42.829' S/70°8.972' W, 3792 m a.s.l., 2010.	"	S. Perez-Ortega 1459	volcanic rock	KJ754207	KJ754345
clade I	L1204	Peru, Region de Cusco, Prov. Urubamba, Distr. De Aguas Calientes, 13°8'59" S/ 72°32'17" W, 1 m a.s.l., 2010.	"	Perez-Ortega 1453	granitic rock	KJ754198	KJ754335
clade I	L1205	Peru, Region de Cusco, Prov. Urubamba, Distr. De Aguas Calientes, 13°8'59" S/ 72°32'17" W, 1 m a.s.l., 2010.	"	Perez-Ortega 1454	granitic rock	KJ754199	KJ754336
	Europe						
-	L1743	Albania, Diber distr., Kurore e Lures mountains, Fushe-Lure village, 41°48'40" N/ 20°12'30" E, ca. 1110 m a.s.l., 2007.	<i>T. atra</i> s.lat.		ophiolitic rock	-	KM091772
<i>Trebouxia</i> "TR1"	L1083	Austria, Carintia, Saualpe, Wirtsofen, 46°50'52" N/ 14°40'57" E, 1730 m a.s.l., 2010.	<i>T. atra</i> "Alps"	Muggia & Hafellner (TSB)	amphibolite rock	KJ754254	KJ754365
<i>T. simplex/jamesii</i>	L1084	Austria, Carintia, Saualpe, Gertrusk	"	Muggia &	eclogite rock	KJ754214	KJ754366

		Mt., 46°51'47" N/ 14°38'47" E, 1910 m a.s.l., 2010.		Hafellner (TSB)			
<i>T. simplex/jamesii</i>	L1086	Austria, Carintia, Saualpe, Gertrusk Mt., 46°51'47" N/ 14°38'47" E, 1910 m a.s.l., 2010.	"	Muggia & Hafellner (TSB)	eclogite rock	KJ754215X	KJ754367
<i>T. simplex/jamesii</i>	L1087	Austria, Carintia, Saualpe, Gertrusk Mt., 46°51'47" N/ 14°38'47" E, 1910 m a.s.l., 2010.	"	Muggia & Hafellner (TSB)	eclogite rock	KJ754216	KJ754368
<i>T. simplex/jamesii</i>	L1088	Austria, Carintia, Saualpe, Gertrusk Mt., 46°51'47" N/ 14°38'47" E, 1910 m a.s.l., 2010.	"	Muggia & Hafellner (TSB)	eclogite rock	KJ754217	KJ754369
<i>T. simplex/jamesii</i>	L1089	Austria, Carintia, Saualpe, Gertrusk Mt., 46°51'47" N/ 14°38'47" E, 1910 m a.s.l., 2010.	"	Muggia & Hafellner (TSB)	eclogite rock	KJ754218	KJ754370
<i>T. simplex/jamesii</i>	L1390	Austria, Styria, Steirisches Randgebirge, Handalm, 46°50'44" N/ 15°01'22" E, 1800 m a.s.l., 2011.	"	Muggia (GZU)	siliceous rock	KJ754224	KJ754373
-	L1742	Austria, Styria, Judenburg, Seetaler Alpe, Wildsee, 1981 m a.s.l., 47°02'30" N/ 14°35'07" E, 2007.	"	Muggia & Hafellner (TSB)	siliceous rock	-	KM091771
-	L1744	Austria, Styria, St. Oswald in Freiland, Koralpe Massiv, Swartzkogel, 1550 m a.s.l., 2008.	"	Muggia & Hafellner (TSB)	amphibolitic rock	-	KM091773
<i>T. simplex/jamesii</i>	L1750	Austria, Styria, Deutschlandsberg, Koralpe, NW side of Seespitz, ca.	"	Muggia & Hafellner	siliceous rock	KJ754225	KM091779

		1980 m a.s.l., 2008.		(TSB)			
-	L1751	Austria, Carintia, Kleinalp, St. Andrä, Berensteinerhofen, 1447 m a.s.l., 46°43'19" N/ 14°58'05" E, 2007.	"	Muggia & Hafellner (TSB)	siliceous rock	-	KM091780
<i>T. arboricola/decolorans</i>	L1308	Bulgaria (not available)	<i>T. atra</i> s.lat.	Atanassanova (GZU)	siliceous rock	KJ754238	KM091792
<i>T. simplex/jamesii</i>	L1259	Finland, Uusimaa, Kirkkonummi: Pokkala, (WGS 84) 59.9735° N, 24.4033° E, ca. 1-2 m a.s.l., 2010.	<i>T. atra</i> s.lat.	Högnabba F. 2080	siliceous rock (sea shore)	KJ754211	KJ754340
<i>Trebouxia</i> "sp.1"		<i>L1259 culture: L1653</i>	"			KJ754324	KM091754
<i>Trebouxia</i> "TR1"	L1260	Finland, Uusimaa, Kirkkonummi: Pokkala, (WGS 84) 59.9735° N, 24.4033° E, ca. 1-2 m a.s.l., 2010.	"	Högnabba 2079	siliceous rock (sea shore)	KJ754266	KJ754364
<i>T. simplex/jamesii</i>	L1261	Finland, Uusimaa, Kirkkonummi: Pokkala, (WGS 84) 59.9735° N, 24.4033° E, ca. 1-2 m a.s.l., 2010.	"	Högnabba 2077	siliceous rock (sea shore)	KJ754212	KJ754372
<i>Trebouxia</i> "TR1"	L1262	Finland, Uusimaa, Kirkkonummi: Pokkala, (WGS 84) 59.9735° N, 24.4033° E, ca. 1-2 m a.s.l., 2010.	"	Högnabba 2076	siliceous rock (sea shore)	KJ754267	KM091806
<i>Trebouxia</i> "TR1"	L1263	Finland, Uusimaa, Kirkkonummi: Pokkala, (WGS 84) 59.9735° N, 24.4033° E, ca. 1-2 m a.s.l., 2010.	"	Högnabba 2078	siliceous rock (sea shore)	KJ754268	KM091807
<i>Trebouxia</i> "TR1"		<i>L1263 culture: L1654</i>	"			KJ754296	KM091821
<i>Trebouxia</i> "TR1"	L1264	Finland, Uusimaa, Kirkkonummi: Pokkala, (WGS 84) 59.9735° N,	"	Veli Haikonen 26805	siliceous rock (sea shore)	KJ754269	KM091808

		24.4033° E, ca. 1-2 m a.s.l., 2010.					
8							
<i>Trebouxia</i> "TR1"	L1504	France, Bretagne, Le Conquet, Kermarvan Lighthouse, 48°21'44" N/ 4°47'18" E, 2 m a.s.l.	<i>T. atra</i> s.lat.	Grube (GZU)	granite	KJ754294	-
<i>Trebouxia</i> "sp.1"		<i>L1504 culture: L1667</i>				KJ754331	KM091761
-	L1509	France, Bretagne, Le Conquet, Kermarvan Lighthouse, 48°21'44" N/ 4°47'18" E, 2 m a.s.l.	<i>T. atra</i> s.lat.	Grube (GZU)	granite	-	-
<i>Trebouxia</i> "TR1"		<i>L1509 culture: L1668</i>				KJ754298	KM091822
<i>Trebouxia</i> "sp.1"	L1874	Ireland, Coubty Claire, White Strand northwest of Doonberg, c. 3 m a.s.l., 52°44'59" N/ 9°32'55" W, 2012.	<i>T. atra</i> s.lat.	Mayrhofer 19215	siliceous coastal cliff	KJ754321	-
-	L1414	Italy, Sicily, Palermo, Prov. Madonie Massif, Gibilmanna Sanctuary, 37.975° N/ 14.028° E, ca. 600 m a.s.l., 2011.	<i>T. atra</i> s.lat.	Muggia (GZU)	siliceous rock	-	-
clade IV		<i>L1414 culture: L1661</i>				KJ754243	KM091756
<i>Trebouxia</i> "sp.1"	L1417	Italy, Sicily, Palermo, Prov. Madonie Massif, Gibilmanna Sanctuary, 37.975° N/ 14.028° E, ca. 600 m a.s.l., 2011.	<i>T. atra</i> s.lat.	Muggia (GZU)	siliceous rock	KJ754312	KM091753
-	L1420	Italy, Sicily, Palermo Prov., Madonie Massif, near Piano Battaglia, 37.873° N/ 14.013° E, ca. 1450 m a.s.l., 2011.	"	Muggia (GZU)	calcareous-siliceous mixed rock	-	-

<i>Trebouxia</i> "sp.1"		<i>L1420 culture: L1662</i>				KJ754326	-
<i>Trebouxia</i> "sp.1"	L1425	Italy, Sicily, Palermo Prov., Madonie Massif, near Piano Battaglia, 37.873° N/ 14.013° E, ca. 1450 m a.s.l., 2011.	<i>T. atra</i> s.lat.	Muggia (GZU)	calcareous-siliceous mixed rock	KJ754313	KM091762
<i>Trebouxia</i> "sp.1"	L1426	Italy, Sicily, Palermo Prov., Madonie Massif, near Piano Battaglia, 37.873° N/ 14.013° E, ca. 1450 m a.s.l., 2011.	"	Muggia (GZU)	calcareous-siliceous mixed rock	KJ754314	KM091763
<i>T. flava/potteri/impressa</i>	L1428	Italy, Sicily, Palermo Prov., Madonie Massif, near Piano Battaglia, 37.873° N/ 14.013° E, ca. 1450 m a.s.l., 2011.	"	Muggia (GZU)	calcareous-siliceous mixed rock	KJ754210	-
<i>T. incrustata</i>		<i>L1428 culture: L1828</i>				KJ754253	-
<i>Trebouxia</i> "sp.1"	L1431	Italy, Sicily, Palermo Prov., Madonie Massif, near Piano Battaglia, 37.873° N/ 14.013° E, ca. 1450 m a.s.l., 2011.	<i>T. atra</i> s.lat.	Muggia (GZU)	calcareous-siliceous mixed rock	KJ754315	KM091764
<i>Trebouxia</i> "sp.1"	L1439	Italy, Sicily, Palermo Prov., Madonie Massif, near Piano Battaglia, 37.873° N/ 14.013° E, ca. 1450 m a.s.l., 2011.	"	Muggia (GZU)	calcareous-siliceous mixed rock	KJ754316	KM091765
<i>Trebouxia</i> "sp.1"	L1454	Italy, Sicily, Palermo Prov., Madonie Massif, near Piano Battaglia, 37.873° N/ 14.013° E, ca. 1450 m a.s.l., 2011.	"	Muggia (GZU)	calcareous-siliceous mixed rock	KJ754317	KM091766
<i>Trebouxia</i> "sp.1"	L1461	Italy, Sicily, Trapani Prov., Rocca d'Erice, 38.043° N/ 12.586° E, ca. 680 m a.s.l., 2011.	<i>T. atra</i> s.lat.	Muggia (GZU)	calcareous rock	KJ754318	-
<i>Trebouxia</i> "sp.1"		<i>L1461 culture: L1663</i>				KJ754327	KM091757
<i>Trebouxia</i> "TR1"	L1475	Italy, Sicily, Trapani Prov., Rocca	<i>T. atra</i> s.lat.	Muggia (GZU)	calcareous rock	KJ754293	-

		d'Erice, 38.043° N/ 12.586° E, ca. 680 m a.s.l., 2011.					
<i>Trebouxia</i> "sp.1"		<i>L1475 culture: L1664</i>				KJ754328	KM091758
-	L1491	Italy, Sicily, Trapani Prov., Egadi Islands, Marettimo Island, top of Pizzo Falcone, 37.981° N/ 12.052° E, 686 m a.s.l., 2011.	<i>T. atra</i> s.lat.	Muggia (GZU)	calcareous rock	-	-
<i>Trebouxia</i> "sp.1"		<i>L1491 culture: L1665</i>				KJ754329	KM091759
<i>Trebouxia</i> "sp.1"	L1497	Italy, Sicily, Trapani Prov., Egadi Islands, Marettimo Island, top of Pizzo Falcone, 37.981° N/ 12.052° E, 686 m a.s.l., 2011.	<i>T. atra</i> s.lat.	Muggia (GZU)	calcareous rock	KJ754319	KM091767
-	L1501	Italy, Sicily, Trapani Prov., Egadi Islands, Marettimo Island, top of Pizzo Falcone, 37.981° N/ 12.052° E, 686 m a.s.l., 2011.	"	Muggia (GZU)	calcareous rock	-	-
<i>Trebouxia</i> "sp.1"		<i>L1501 culture: L1666</i>				KJ754330	KM091760
<i>T. simplex/jamesii</i>	L1872	Kosovo, Bjeshket e Nemuna e Kosoves, northern slopes of Maja e Ropes, 42°34'42" N/ 20°5'49" E, 2244 m a.s.l., 2012.	<i>T. atra</i> s.lat.	Mayrhofer 19308	siliceous rock	KJ754226	-
<i>T. simplex/jamesii</i>	L1207	Norway, Spitzbergen, Svalbard, Longyearbyen, Bolterdalen, 78°10'77" N/ 15°50'30" E, 103 m a.s.l., 2010.	<i>T. atra</i> s.lat.	S. Perez-Ortega 1442	siliceous rock	KJ754222	KJ754371

<i>T. flava/potteri/impressa</i>		<i>L1211 culture: L1652</i>				KJ754209	KJ754342
<i>T. simplex/jamesii</i>	L1213	Norway, Spitzbergen, Svalbard, Longyearbyen, Bolterdalen, 78°10'77" N/ 15°50'30" E, 103 m a.s.l., 2010.	<i>T. atra</i> s.lat.	Perez-Ortega 1448	siliceous rock	KJ754223	-
-	L1215	Norway, Spitzbergen, Svalbard, Longyearbyen, Bolterdalen, 78°10'77" N/ 15°50'30" E, 103 m a.s.l., 2010.	<i>T. atra</i> s.lat.	Perez-Ortega 1445	siliceous rock	-	KM091791
-	L1129	Scotland, Skye Island, Dunvengan Peninsula, Coral Beach, 57°29'41" N/ 6°38'6" W, 5 m a.s.l., 2010.	<i>T. atra</i> s.lat.	Perez-Ortega 1329	granite	-	-
<i>Trebouxia</i> "TR1"		<i>L1129 culture: L1384</i>				KJ754291	KM091819
<i>Trebouxia</i> "TR1"	L1132	Scotland, Skye Island, Dunvengan Peninsula, Coral Beach, 57°29'41" N/ 6°38'6" W, 5 m a.s.l., 2010.	<i>T. atra</i> s.lat.	Perez-Ortega 1332	granite	KJ754259	KM091799
<i>Trebouxia</i> "TR1"	L1326	Scotland, East Invernesshire, Ardclach Churchyard, British Grid Coord. NH 9545 4505, 2010.	<i>T. grumosa</i>	Yahr 5243	siliceous rock	KJ754270	KM091809
<i>Trebouxia</i> "TR1"	L1327	Scotland, Mid Perthshire, Enochdhu, Kindrogan House Grounds, British Grid Coord. NO 05460 62978, 2010.	<i>T. atra</i> s.lat.	Yahr 5341	brick	KJ754271	KM091810
<i>Trebouxia</i> "TR1"	L1328	Scotland, Berwickshire, Northfield Farm, St Abbs Head, British Grid	"	Yahr 5164	coping stone	KJ754272	KM091811

		Coord. NT 914 674, 2010.					
<i>Trebouxia</i> "TR1"	L1329	Scotland, Berwickshire, Northfield Farm, St Abbs Head, British Grid Coord. NT 914 674, 2010.	"	Yahr 5166	coping stone	KJ754273	KM091812
-	L1395	Scotland, Mid-Lothian, Haddington, Garleton Hills, 55°58.6'N/ 2°47.1' W, ca. 125 m a.s.l., 2010.	<i>T. grumosa</i>	Fryday 9429 (MSC0050468)	basalt outcrop	-	KM091818
<i>Trebouxia</i> "TR1"	L1396	Scotland, Mid-Lothian, Haddington, Garleton Hills, 55°58.6'N/ 2°47.1' W, ca. 125 m a.s.l., 2010.	<i>T. grumosa</i>	Fryday 9433 (MSC0050469)	basalt outcrop	KJ754292	-
<i>Trebouxia</i> "sp.1"	L1091	Spain, Aragon, Teruel province, Albarracin, in <i>Pinus</i> forest, 30TXK370706, 1350 m a.s.l., 2010.	<i>T. atra</i> s.lat.	Perez-Ortega 1358	sandstone boulders	KJ754255	KM091795
-	L1093	Spain, Aragon, Teruel province, Albarracin, in <i>Pinus</i> forest, 30TXK370706, 1350 m a.s.l., 2010.	"	Perez-Ortega 1367	sandstone boulders	-	KJ754355
<i>Trebouxia</i> "sp.1"	L1096	Spain, Aragon, Teruel province, Albarracin, in <i>Pinus</i> forest, 30TXK370706, 1350 m a.s.l., 2010.	"	Perez-Ortega 1360	sandstone boulders	KJ754299	KJ754356
<i>Trebouxia</i> "sp.1"	L1097	Spain, Aragon, Teruel province, Albarracin, in <i>Pinus</i> forest, 30TXK370706, 1350 m a.s.l., 2010.	"	Perez-Ortega 1364	sandstone boulders	KJ754300	KM091731
<i>Trebouxia</i> "sp.1"	L1098	Spain, Aragon, Teruel province, Albarracin, in <i>Pinus</i> forest, 30TXK370706, 1350 m a.s.l., 2010.	"	Perez-Ortega 1366	sandstone boulders	KJ754301	-

<i>Trebouxia</i> "sp.1"	L1100	Spain, Aragon, Teruel province, Albarracin, in <i>Pinus</i> forest, 30TXK370706, 1350 m a.s.l., 2010.	"	Perez-Ortega 1355	sandstone boulders	KJ754302	KM091732
<i>Trebouxia</i> "sp.1"	L1101	Spain, Aragon, Teruel province, Albarracin, in <i>Pinus</i> forest, 30TXK370706, 1350 m a.s.l., 2010.	"	Perez-Ortega 1357	sandstone boulders	KJ754256	KM091796
<i>Trebouxia</i> "sp.1"		<i>L1101 culture: L1379</i>				KJ754310	KM091738
<i>T. flava/potteri/impressa</i>		<i>L1103 culture: L1380</i>				KJ754208	KJ754341
<i>Trebouxia</i> "TR1"	L1104	Spain, Aragon, Teruel province, Albarracin, in <i>Pinus</i> forest, 30TXK370706, 1350 m a.s.l., 2010.	<i>T. atra</i> s.lat.	Perez-Ortega 1363	sandstone boulders	KJ754257	KM091797
<i>Trebouxia</i> "TR1"	L1105	Spain, Aragon, Teruel province, Albarracin, in <i>Pinus</i> forest, 30TXK370706, 1350 m a.s.l., 2010.		Perez-Ortega 1365	sandstone boulders	KJ754258	KM091798
<i>T. arboricola/decolorans</i>	L1107	Spain, Aragon, Teruel province, Bronchales, 30TXK244879, 1375 m a.s.l., 2010.		Perez-Ortega 1340	bark (<i>Quercus faginea</i>)	KJ754236	-
<i>T. arboricola/decolorans</i>		<i>L1107 culture: L1381</i>				KJ754237	KM091741
-	L1109	Spain, Aragon, Teruel province, Bronchales, 30TXK244879, 1375 m a.s.l., 2010.	<i>T. atra</i> s.lat.	Perez-Ortega 1338	bark (<i>Quercus faginea</i>)	-	-
<i>T. arboricola/decolorans</i>		<i>L1109 culture: L1382</i>				KJ754239	-
-	L1113	Spain, Aragon, Teruel province, Bronchales, 30TXK244879, 1375 m	<i>T. atra</i> s.lat.	Perez-Ortega 1339	bark (<i>Quercus faginea</i>)	-	-

		a.s.l., 2010.					
<i>T. arboricola/decolorans</i>		<i>L1113 culture: L1383</i>				KJ754240X	KM091793
<i>Trebouxia</i> "sp.1"	L1184	Spain, Castilla y Leon, Prov. De Soria, Almarza, 41°57'54" N/ 2°28'43" W, 950 m a.s.l., 2010.	<i>T. atra</i> s.lat.	Perez-Ortega 1489	siliceous rock	KJ754304	KM091733
clade V		<i>L1184 culture: L1535 (and L1650)</i>				KJ754247	KJ754351
<i>Trebouxia</i> "TR1"	L1186	Spain, Castilla y Leon, Prov. De Soria, Almarza, 41°57'54" N/ 2°28'43" W, 950 m a.s.l., 2010.	<i>T. atra</i> s.lat.	Perez-Ortega 1476	siliceous rock	KJ754261	KM091801
<i>Trebouxia</i> "sp.1"	L1187	Spain, Castilla y Leon, Prov. De Soria, Almarza, 41°57'54" N/ 2°28'43" W, 950 m a.s.l., 2010.	"	Perez-Ortega 1477	siliceous rock	KJ754305	KM091734
<i>Trebouxia</i> "sp.1"	L1188	Spain, Castilla y Leon, Prov. De Soria, Almarza, 41°57'54" N/ 2°28'43" W, 950 m a.s.l., 2010.	"	Perez-Ortega 1482	siliceous rock	KJ754306	KM091740
<i>Trebouxia</i> "TR1"	L1189	Spain, Castilla y Leon, Prov. De Soria, Almarza, 41°57'54" N/ 2°28'43" W, 950 m a.s.l., 2010.	"	Perez-Ortega 1479	siliceous rock	KJ754262	KM091800
<i>2Trebouxia</i> "sp.1"	L1191	Spain, Castilla y Leon, Prov. De Soria, Almarza, 41°57'54" N/ 2°28'43" W, 950 m a.s.l., 2010.	"	Perez-Ortega 1483	siliceous rock	KJ754307	KM091735
<i>Trebouxia</i> "TR1"	L1192	Spain, Castilla y Leon, Prov. De Soria, Almarza, 41°57'54" N/ 2°28'43" W, 950 m a.s.l., 2010.	"	Perez-Ortega 1478	siliceous rock	KJ754263	KM091803
<i>Trebouxia</i> "sp.1"	L1193	Spain, Castilla y Leon, Prov. De Soria,	"	Perez-Ortega	siliceous rock	KJ754308	KM091736

		Almarza, 41°57'54" N/ 2°28'43" W, 950 m a.s.l., 2010.		1481			
-	L1194	Spain, Castilla y Leon, Prov. De Soria, Almarza, 41°57'54" N/ 2°28'43" W, 950 m a.s.l., 2010.	"	Perez-Ortega 1486	siliceous rock	-	-
<i>Trebouxia</i> "sp.1"		<i>L1194 culture: L1536, L1651</i>				KJ754322; KJ754323	KM091739
<i>Trebouxia</i> "TR1"	L1195	Spain, Castilla y Leon, Prov. De Soria, Almarza, 41°57'54" N/ 2°28'43" W, 950 m a.s.l., 2010.	<i>T. atra</i> s.lat.	Perez-Ortega 1480	siliceous rock	KJ754264	KM091804
<i>Trebouxia</i> "sp.1"	L1196	Spain, Castilla y Leon, Prov. De Soria, Almarza, 41°57'54" N/ 2°28'43" W, 950 m a.s.l., 2010.	"	Perez-Ortega 1488	siliceous rock	KJ754309	KM091737
<i>Trebouxia</i> "TR1"	L1197	Spain, Castilla y Leon, Prov. De Soria, Almarza, 41°57'54" N/ 2°28'43" W, 950 m a.s.l., 2010.	"	Perez-Ortega 1484	siliceous rock	KJ754265	KM091805
<i>Trebouxia</i> "TR1"	L1332	Spain, Galicia, Pontevedra, Peninsula del Morrazo, Cabo ome, 42°15'5" N/ 8°52'5" W, 4 m a.s.l., 2010.	"	Perez-Ortega 1668	siliceous rock (coast)	KJ754274	KM091813
<i>Trebouxia</i> "TR1"	L1333	Spain, Galicia, Pontevedra, Peninsula del Morrazo, Cabo ome, 42°15'5" N/ 8°52'5" W, 4 m a.s.l., 2010.	"	Perez-Ortega 1671	siliceous rock (coast)	KJ754275	KM091742
<i>Trebouxia</i> "TR1"	L1335	Spain, Galicia, Pontevedra, Peninsula del Morrazo, Cabo ome, 42°15'5" N/ 8°52'5" W, 4 m a.s.l., 2010.	"	Perez-Ortega 1669	siliceous rock (coast)	KJ754276	KM091743

<i>Trebouxia</i> "TR1"	L1336	Spain, Galicia, Pontevedra, Peninsula del Morrazo, Cabo ome, 42°15'5" N/ 8°52'5" W, 4 m a.s.l., 2010.	"	Perez-Ortega 1670	siliceous rock (coast)	KJ754277	KM091814
<i>Trebouxia</i> "TR1"	L1340	Spain, Galicia, A. Coruna, O Barreiro, Playa O Baleo, 43°38'43"N/ 8°6'6" W, 4 m a.s.l., 2010.	"	Perez-Ortega 1650	siliceous rock (coast)	KJ754278	-
<i>Trebouxia</i> "TR1"	L1341	Spain, Galicia, A. Coruna, O Barreiro, Playa O Baleo, 43°38'43"N/ 8°6'6" W, 4 m a.s.l., 2010.	"	Perez-Ortega 1659	siliceous rock (coast)	KJ754279	KM091744
<i>Trebouxia</i> "TR1"	L1346	Spain, Galicia, A. Coruna, O Barreiro, Playa O Baleo, 43°38'43"N/ 8°6'6" W, 4 m a.s.l., 2010.	"	Perez-Ortega 1643	siliceous rock (coast)	KJ754280	KM091745
<i>Trebouxia</i> "TR1"	L1348	Spain, Galicia, A. Coruna, O Barreiro, Playa O Baleo, 43°38'43"N/ 8°6'6" W, 4 m a.s.l., 2010.	"	Perez-Ortega 1676	siliceous rock (coast)	KJ754281	KM091746
<i>6Trebouxia</i> "TR1"	L1350	Spain, Galicia, A. Coruna, O Barreiro, Playa O Baleo, 43°38'43"N/ 8°6'6" W, 4 m a.s.l., 2010.	"	Perez-Ortega 1658	siliceous rock (coast)	KJ754282	KM091747
<i>Trebouxia</i> "TR1"	L1360	Spain, Galicia, A. Coruna, O Barreiro, Playa O Baleo, 43°38'43"N/ 8°6'6" W, 4 m a.s.l., 2010.	"	Perez-Ortega 1660	siliceous rock (coast)	KJ754283	-
<i>Trebouxia</i> "TR1"	L1363	Spain, Galicia, A. Coruna, O Barreiro, Playa O Baleo, 43°38'43"N/ 8°6'6" W, 4 m a.s.l., 2010.	"	Perez-Ortega 1662	siliceous rock (coast)	KJ754284	KM091748
-	L1768	Spain, Canary Islands, La Gomera,	<i>T.</i>	Tafner R.	basaltic rock	-	KM091784

		“Laderas sobre Erquito”, UTM 277609/3111281, 1125 m a.s.l., 2012.	<i>follmannii</i> (<i>T. atra!</i>)	(GZU)			
-	L1769	Spain, Canary Islands, La Gomera, “Laderas sobre Erquito”, UTM 277609/3111281, 1125 m a.s.l., 2012.	"	Tafner R. (GZU)	basaltic rock	-	KM091785
-	L1770	Spain, Canary Islands, La Gomera, “Laderas sobre Erquito”, UTM 277609/3111281, 1125 m a.s.l., 2012.	"	Tafner R. (GZU)	basaltic rock	-	KM091786
-	L1771	Spain, Canary Islands, La Gomera, “Laderas sobre Erquito”, UTM 277609/3111281, 1125 m a.s.l., 2012.	"	Tafner R. (GZU)	basaltic rock	-	KM091787
<i>Trebouxia</i> "sp.1"		<i>L1771 culture: L1832</i>				KJ754332	-
-	L1772	Spain, Canary Islands, La Gomera, “Laderas sobre Erquito”, UTM 277609/3111281, 1125 m a.s.l., 2012.	<i>T.</i> <i>follmannii</i> (<i>T. atra!</i>)	Tafner R. (GZU)	basaltic rock	-	KM091788
-	L1773	Spain, Canary Islands, La Gomera, “Laderas sobre Erquito”, UTM 277609/3111281, 1125 m a.s.l., 2012.	"	Tafner R. (GZU)	basaltic rock	-	KM091789
<i>Trebouxia</i> "sp.1"		<i>L1773 culture: L1833</i>				KJ754333	-
-	L1774	Spain, Canary Islands, La Gomera, “Laderas sobre Erquito”, UTM 277609/3111281, 1125 m a.s.l., 2012.	<i>T.</i> <i>follmannii</i> (<i>T. atra!</i>)	Tafner R. (GZU)	basaltic rock	-	KM091790
<i>Trebouxia</i> "sp.1"		<i>L1774 culture: L1834</i>				KJ754334	-
<i>T. simplex/jamesii</i>	L1082	Sweden, Uppland Estuna parish, Lake Erken, 59°51'53" N/ 18°34'91" E, 150	<i>T. atra</i> s.lat.	Spribile (GZU)	siliceous rock	KJ754213	KM091794

		m a.s.l., 2010.					
<i>Trebouxia</i> "TR1"	L1364	Wales, Pembrokeshire, St. Brides, 51°45.50' N/ 5°11.30' W, 5 m a.s.l., 2010.	<i>T. atra</i> s.lat.	Perez-Ortega 1627	siliceous rock (sea shore)	KJ754285	KM091815
<i>Trebouxia</i> "TR1"	L1366	Wales, Pembrokeshire, St. Brides, 51°45.50' N/ 5°11.30' W, 5 m a.s.l., 2010.	"	Perez-Ortega 1636	siliceous rock (sea shore)	KJ754286	KM091749
<i>Trebouxia</i> "TR1"	L1368	Wales, Pembrokeshire, St. Brides, 51°45.50' N/ 5°11.30' W, 5 m a.s.l., 2010.	"	Perez-Ortega 1633	siliceous rock (sea shore)	KJ754287	KM091750
<i>Trebouxia</i> "TR1"	L1369	Wales, Pembrokeshire, St. Brides, 51°45.50' N/ 5°11.30' W, 5 m a.s.l., 2010.	"	Perez-Ortega 1631	siliceous rock (sea shore)	KJ754288	KM091816
		<i>L1369 culture: L1543</i>				KJ754295	KM091820
<i>Trebouxia</i> "TR1"	L1371	Wales, Pembrokeshire, St. Brides, 51°45.50' N/ 5°11.30' W, 5 m a.s.l., 2010.	"	Perez-Ortega 1630	siliceous rock (sea shore)	KJ754289	KM091751
<i>Trebouxia</i> "TR1"	L1378	Wales, Pembrokeshire, St. Brides, 51°45.50' N/ 5°11.30' W, 5 m a.s.l., 2010.	"	Perez-Ortega 1642	siliceous rock (sea shore)	KJ754290	KM091817
	Oceania						
-	L1153	Australia, Australian Capital Territory, Canberra, Aranda Bushland, 35°16'08" S/ 149°04'51" E, 650 m a.s.l., 2009.	<i>T.</i> <i>alectoronica</i>	Elix 43472	bark (<i>Eucalyptus</i> sp.)	-	KJ754362

clade V	L1154	Australia, Australian Capital Territory, Molonglo Gorge Forest Park, 35°19'46" S/ 149°14'59" E, 650 m a.s.l., 2009.	<i>T. atra</i> s.lat.	Elix 43476	metamorphic rock	KJ754250	KJ754349
clade V		<i>L1154</i> culture: <i>L1386</i> , <i>L1669</i> , <i>L1670</i>				KJ754249; KJ754251	KJ754350; KJ754353
clade V	L1401	Australia, Victoria, Kooyoora State Park, 1996.	<i>T. atra</i> s.lat.	Streimann H. 59158 MSC0143905	siliceous rock	KJ754252	KJ754354
<i>Trebouxia</i> "sp.1"	L1521	New Zealand, Southland, c. 4 km SSE of Riverton, Howell's Point, 46°23'03" S/ 168°01'46" E, 0-5 m a.s.l., 2010.	<i>T. atra</i> s.lat.	Wedin M. 9018 (S)	seashore rock	KJ754320	-
<i>Trebouxia</i> "sp.1"		<i>L1521</i> culture: <i>L1655</i>				KJ754325	KM091755
<i>T. simplex/jamesii</i>	L1889	New Zealand, Southland, Fiorland NP, Te Anau Lake by Henry Creek campsite, -45.235° N/ 167.807° E, ca. 300 m a.s.l., 2013.	<i>T. atra</i> s.lat.	Muggia	bark (<i>Nothofagus solandri</i>)	KJ754227	-
<i>T. simplex/jamesii</i>	L1893	New Zealand, South Island, Southland, Fiorland NP, Key Summit, -44.838° N/ 168.126° E, ca. 1050 m a.s.l., 2013.	"	Muggia	green schist rock	KJ754228	-
<i>T. simplex/jamesii</i>	L1900	New Zealand, South Island, Southland, Fiorland NP, Key Summit, -44.838° N/ 168.126° E, ca.	"	Muggia	green schist rock	KJ754229	-

		1050 m a.s.l., 2013.					
<i>T. simplex/jamesii</i>	L1902	New Zealand, South Island, Southland, Fiorland NP, Key Summit, -44.838° N/ 168.126° E, ca. 1050 m a.s.l., 2013.	"	Muggia	green schist rock	KJ754230	-
<i>T. simplex/jamesii</i>	L1903	New Zealand, South Island, Lake Nelson NP, Lake Rotoiti, on top of Rainbowd Range, -41.831° N/ 172.882° E, ca. 1800 m a.s.l., 2013.	"	Muggia	siliceous rock	KJ754231	-
<i>T. simplex/jamesii</i>	L1906	New Zealand, South Island, Lake Nelson NP, Lake Rotoiti, on top of Rainbowd Range, -41.831° N/ 172.882° E, ca. 1800 m a.s.l., 2013.	"	Muggia	siliceous rock	KJ754232	-
<i>T. simplex/jamesii</i>	L1911	New Zealand, South Island, Lake Nelson NP, Lake Rotoiti, at Parachute Rock, -41.824° N/ 172.881° E, ca. 1400 m a.s.l., 2013.	"	Muggia	siliceous rock	KJ754233	-
clade "URa3"	L1912	New Zealand, South Island, Lake Nelson NP, Lake Rotoiti, at Parachute Rock, -41.824° N/ 172.881° E, ca. 1400 m a.s.l., 2013.	"	Muggia	siliceous rock	KJ754235	-
<i>T. simplex/jamesii</i>	L1929	New Zealand, South Island, Southland, Fiorland NP, Lake Monowai, Eldrig Peak track, -45.748° N/ 167.471° E, ca. 1000 m a.s.l., 2013.	"	Muggia	bark (<i>Nothofagus solandri</i>)	KJ754234	-

Table S2. Sequence data retrieved from GenBank. *Trebouxia* species names are reported as in GenBank. Specimen ID, NCBI accession numbers and original lichen species are reported; the growth substrate (g.s.) of the lichen is color-coded: green = bark, orange = soil, grey = rock.

<i>Trebouxia</i> species name	Specimen ID	NCBI accessions (ITS)	Lichen species name	Phylogenetic clade (as in Fig. 1)	g.s.
<i>T. arboricola</i>		AF389917	<i>Anaptychia ciliaris</i>	<i>T. arboricola</i> / <i>T. decolorans</i>	Green
<i>T. arboricola</i>		AF389916	<i>Anaptychia ciliaris</i>	" "	Green
<i>T. arboricola</i>	AB99.082B1	AF453259	<i>Chaenotheca phaeocephala</i>	" "	Green
<i>T. arboricola</i>	86045E1	AJ249482	<i>Pleurosticta acetabulum</i>	" "	Green
<i>T. arboricola</i>	strain M-92.025C1	AJ007387	<i>Xanthoria parietina</i>	" "	Green
<i>T. arboricola</i>	P-319-Ig	AJ970889	<i>Xanthoria parietina</i>	" "	Green
<i>T. asymmetrica</i>	B207	AF344177	<i>Toninia sedifolia</i>	<i>T. asymmetrica</i>	Orange
<i>T. asymmetrica</i>	99.024B3	AF344176	<i>Fulgensia fulgida</i>	" "	Orange
<i>T. asymmetrica</i>	99.023C2	AF344175	<i>Fulgensia fulgida</i>	" "	Orange
<i>T. asymmetrica</i>	UTEX 2507	AF345889	<i>Diploschistes albescens</i>	" "	Orange
<i>T. asymmetrica</i>	SAG 48.88	AJ249565	<i>Diploschistes diacapsis</i>	" "	Orange
<i>T. corticola</i>	Ohmura 5410	AB177835	<i>Parmotrema tinctorum</i>	" "	Green
<i>T. corticola</i>	Ohmura 5404	AB177833	<i>Parmotrema tinctorum</i>	<i>T. corticola</i>	Green
<i>T. corticola</i>	Ohmura 5372	AB177828	<i>Parmotrema tinctorum</i>	" "	Green
<i>T. corticola</i>	Ohmura 5361A	AB177825	<i>Parmotrema tinctorum</i>	" "	Green
<i>T. corticola</i>	Ohmura 5344	AB177819	<i>Parmotrema tinctorum</i>	" "	Green
<i>T. decolorans</i>	P-121-Ib	AJ969549	<i>Xanthoria parietina</i>	<i>T. arboricola</i> / <i>T. decolorans</i>	Green
<i>T. decolorans</i>	P-319-IIc2	AJ969597	<i>Xanthoria parietina</i>	" "	Green
<i>T. decolorans</i>	P-319-If2	AJ969594	<i>Xanthoria parietina</i>	" "	Green
<i>T. decolorans</i>	P-144-IIIhd	AJ969556	<i>Xanthoria parietina</i>	" "	Green
<i>T. decolorans</i>	P-319-IVc2	AJ969598	<i>Xanthoria parietina</i>	" "	Green
<i>T. decolorans</i>	P-120a-IIIb	AJ969545	<i>Xanthoria parietina</i>	" "	Green
<i>T. decolorans</i>	P-164-IXa-1	AJ969562	<i>Xanthoria parietina</i>	" "	Green
<i>T. galapagensis</i>	strain UTEX 2230	AJ249567	-	OUTGROUP	-
<i>T. gelatinosa</i>		AJ249575	<i>Flavoparmelia subrudecta</i>	<i>T. gelatinosa</i>	Green
<i>T. gelatinosa</i>		AJ249568	<i>Flavoparmelia caperata</i>	" "	Green

<i>T. gelatinosa</i>	UTEX 905	Z68698	-	" "	-
<i>T. gelatinosa</i>	UBT-86.108B2	Z68697	-	" "	-
<i>T. gigantea</i>		AF242468	<i>Letharia vulpina</i>	<i>T. gigantea</i>	
<i>T. gigantea</i>		AJ249577	<i>Caloplaca cerina</i>	" "	
<i>T. higginsiae</i>	strain UTEX 2232	AJ249574	-	OUTGROUP	-
<i>T. impressa</i>	Moerberg 12019	AF389918	<i>Physcia caesia</i>	<i>T. impressa</i>	
<i>T. impressa</i>	Theler 7901	AF389931	<i>Phaeophyscia orbicularis</i>	" "	
<i>T. impressa</i>	Theler 7893	AF389930	<i>Phaeophyscia orbicularis</i>	" "	
<i>T. impressa</i>		AF389927	<i>Physconia distorta</i>	" "	
<i>T. impressa</i>		AF389926	<i>Physconia distorta</i>	" "	
<i>T. impressa</i>	Tuerk 36121	JN204759	<i>Lecidea atrobrunnea</i>	" "	
<i>T. impressa</i>	Tuerk 38621	JN204761	<i>Lecidella carpathica</i>	" "	
<i>T. impressa</i>	Tuerk 43008	JN204778	<i>Lecidea andersonii</i>	" "	
<i>T. impressa</i>	Tuerk 44632	JN204800	<i>Lecanora fuscobrunnea</i>	" "	
<i>T. incrustata</i>		AM920667	<i>Xanthoparmelia conspersa</i>	<i>T. incrustata</i>	
<i>T. incrustata</i>	UTEX 784	AJ293795	<i>Lecanora dispersa</i>	" "	
<i>T. incrustata</i>		FJ792801	<i>Xanthoparmelia tinctina</i>	" "	
<i>T. incrustata</i>		AM920666	<i>Lecidea fuscoatra</i>	" "	
<i>T. jamesii</i>	Tuerk 42158	JN204767	<i>Carbonea vorticosa</i>	<i>T. simplex/ T. jamesii</i>	
<i>T. jamesii</i>	Tuerk 42730	JN204768	<i>Lecidea obluridata</i>	" "	
<i>T. jamesii</i>	Tuerk 43426	JN204793	<i>Lecidea auriculata</i>	" "	
<i>T. jamesii</i>	Tuerk 44692	JN204809	<i>Lecidea cancriformis</i>	" "	
<i>T. jamesii</i>	458_Sv4_2	GQ375319	<i>Cetraria aculeata</i>	" "	
<i>T. jamesii</i>	1087_A1_3	GQ375320	<i>Cetraria aculeata</i>	" "	
<i>T. jamesii</i>	1436_Is1_49	GQ375323	<i>Cetraria aculeata</i>	" "	
<i>T. jamesii</i>	1135_Fa2_40	GQ375355	<i>Cetraria aculeata</i>	" "	
<i>T. jamesii</i>	1159_Sp1_15	GQ375338	<i>Cetraria aculeata</i>	" "	
<i>T. jamesii</i>	1384_Ch1_32	GQ375363	<i>Cetraria aculeata</i>	" "	
<i>T. jamesii</i> "letharii" (1)		AF242460	<i>Letharia vulpina</i>	<i>T. jamesii</i> "letharii"	
<i>T. jamesii</i> "letharii" (4)		AF242463	<i>Letharia vulpina</i>	" "	
<i>T. jamesii</i> "letharii" (5)		AF242464	<i>Letharia vulpina</i>	" "	
<i>T. showmanii</i>		AF242470	<i>Letharia vulpina</i>	<i>T. showmanii</i>	

<i>T. showmanii</i>	SAG 2009	FJ626734	-	" "	-
<i>T. simplex</i>		DQ166600	<i>Lecanora rupicola</i>	<i>T. simplex/ T. jamesii</i>	
<i>T. simplex</i>		DQ166620	<i>Lecanora swartzii</i>	" "	
<i>T. simplex</i>		EU551513	<i>Tephromela atra</i>	" "	
<i>T. simplex</i>		EU551512	<i>Tephromela atra</i>	" "	
<i>T. simplex</i>		EU551541	<i>Tephromela atra</i>	" "	
<i>T. simplex</i>		EU551542	<i>Tephromela atra</i>	" "	
<i>T. simplex</i>		EU551543	<i>Tephromela atra</i>	" "	
<i>T. suecica</i>	strain SAG 2207	FJ626736	-	" "	-
<i>T. usneae</i>		AJ249573	<i>Usnea filipendula</i>	OUTGROUP	-
<i>T. usneae</i>	UBT-87.019A1	Z68702	-	OUTGROUP	-
<hr/>					
<i>Trebouxia "URa1"</i>	Tuerk 35604	JN204749	<i>Lecidea cancriformis</i>	<i>Trebouxia "URa1"</i>	
<i>Trebouxia "URa1"</i>	Tuerk 42992	JN204771	<i>Lecidea cancriformis</i>	" "	
<i>Trebouxia "URa1"</i>	Tuerk 44712	JN204811	<i>Lecidea cancriformis</i>	" "	
<i>Trebouxia "URa1"</i>	Tuerk 44727	JN204812	<i>Lecidea cancriformis</i>	" "	
<i>Trebouxia "URa2"</i>	Tuerk 33620	JN204735	<i>Lecidea greenii</i>	<i>Trebouxia "URa2"</i> (Antarctic)	
<i>Trebouxia "URa2"</i>	Tuerk 35770	JN204756	<i>Lecanora physciella</i>	" "	
<i>Trebouxia "URa2"</i>	Tuerk 42995	JN204772	<i>Lecidea andersonii</i>	" "	
<i>Trebouxia "URa2"</i>	Tuerk 43004	JN204776	<i>Lecidea spilei</i>	" "	
<i>Trebouxia "URa2"</i>	Tuerk 43006	JN204777	<i>Lecidea andersonii</i>	" "	
<i>Trebouxia "URa2"</i>	Tuerk 43011	JN204779	<i>Lecidea andersonii</i>	" "	
<i>Trebouxia "URa2"</i>	Tuerk 43015	JN204782	<i>Lecidea greenii</i>	" "	
<i>Trebouxia "URa2"</i>	Tuerk 43032	JN204790	<i>Rhizoplaca macleanii</i>	" "	
<i>Trebouxia "URa3"</i>	Tuerk 40136	JN204765	<i>Lecidea fuscoatra</i>	<i>Trebouxia "URa3"</i>	
<i>Trebouxia "URa3"</i>	Tuerk 35502	JN204747	<i>Carbonea vorticosa</i>	" "	
<i>Trebouxia "URa3"</i>	ADT 18027	JN204826	<i>Lecidea andersonii</i>	" "	
<i>Trebouxia "URa3"</i>	RS19162	JN204841	<i>Lecidea cancriformis</i>	" "	
<i>Trebouxia</i> sp.		DQ166595	<i>Lecanora rupicola</i>	" "	
<i>Trebouxia</i> sp.		DQ166611	<i>Lecanora rupicola</i>	" "	
<i>Trebouxia</i> sp.	PS2008	FM945345	<i>Cetraria islandica</i>	<i>T. simplex/ T. jamesii</i>	

<i>Trebouxia</i> sp.		JX474334	<i>Lasallia pustulata</i>	"	"	
<i>Trebouxia</i> sp.		JX474349	<i>Lasallia pustulata</i>	"	"	
<i>Trebouxia</i> sp.		JX474357	<i>Lasallia pustulata</i>	"	"	
<i>Trebouxia</i> sp.		JX036166	<i>Lecidea cancriformis</i>	"	"	
<i>Trebouxia</i> sp.		JX036180	<i>Austrolecia</i> sp.	"	"	
<i>Trebouxia</i> sp.		JX036194	<i>Austrolecia</i> sp.	"	"	
<i>Trebouxia</i> sp.		JX036210	<i>Austrolecia</i> sp.	"	"	
<i>Trebouxia</i> sp.		JX036208	<i>Austrolecia</i> sp.	"	"	
<i>Trebouxia</i> sp.		JX036273	<i>Austrolecia</i> sp.	"	"	
<i>Trebouxia</i> sp.		JX036217	<i>Lecanora</i> sp.	"	"	
<i>Trebouxia</i> sp.		JX036168	<i>Lecidea greenii</i>	"	"	
<i>Trebouxia</i> sp.		JX036240	<i>Rhizoplaca</i> sp.	"	"	
<i>Trebouxia</i> sp.		JX036211	<i>Sarcogyne privigna</i>	"	"	
<i>Trebouxia</i> sp.		JX036160	lichen sp.	"	"	
<i>Trebouxia</i> sp.		JX036213	<i>Buellia frigida</i>	"	"	
<i>Trebouxia</i> sp.		JX036272	<i>Buellia frigida</i>	"	"	
<i>Trebouxia</i> sp.		JX036231	<i>Rhizoplaca macleanii</i>	"	"	
<i>Trebouxia</i> sp.		JX036259	<i>Rhizoplaca macleanii</i>	"	"	
<i>Trebouxia</i> "TR1"		GU252178	<i>Ramalina farinacea</i>		<i>Trebouxia "TR1"</i>	
<i>Trebouxia</i> "TR1"		GU252173	<i>Ramalina farinacea</i>	"	"	
<i>Trebouxia</i> "TR1"		GU252195	<i>Ramalina farinacea</i>	"	"	
<i>Trebouxia</i> "TR1"		GU252202	<i>Ramalina farinacea</i>	"	"	
<i>Trebouxia</i> sp.	TRS1	FJ792799	<i>Ramalina siliquosa</i>	"	"	
<i>Trebouxia</i> sp.		DQ166608	<i>Lecanora rupicola</i>	"	"	
<i>Trebouxia</i> sp.		EU551525	<i>Lecanora cenisia</i>	"	"	
<i>Trebouxia</i> sp.		EU551527	<i>Tephromela atra</i>	"	"	
<i>Trebouxia</i> sp.		EU551546	<i>Tephromela atra</i>	"	"	
<i>Trebouxia</i> sp.		EU551547	<i>Tephromela atra</i>	"	"	
<i>Trebouxia</i> sp.		EU551536	<i>Tephromela grumosa</i>	"	"	
<i>Trebouxia</i> "TR9"		GU252182	<i>Ramalina farinacea</i>		<i>Trebouxia "TR9"</i>	
<i>Trebouxia</i> "TR9"		GU252197	<i>Ramalina farinacea</i>	"	"	
<i>Trebouxia</i> "TR9"		GU252200	<i>Ramalina farinacea</i>	"	"	

<i>Trebouxia</i> sp.		EU551508	<i>Tephromela atra</i>	<i>Trebouxia "sp.1"</i>	
<i>Trebouxia</i> sp.		EU551523	<i>Tephromela atra</i>	" "	
<i>Trebouxia</i> sp.		AF534386	<i>Rimularia insularis</i>	" "	
<i>Trebouxia</i> sp.		DQ166610	<i>Lecanora rupicola</i>	" "	
<i>Trebouxia</i> sp.		DQ166587	<i>Lecanora rupicola</i>	" "	
<i>Trebouxia</i> sp.		DQ166584	<i>Lecanora lojkaeana</i>	" "	
<i>Trebouxia</i> sp.		AM159216	<i>Xanthoria karrooensis</i>	" "	
<i>Trebouxia</i> sp.	A4cIII	HQ026180	<i>Boreoplaca ultrafrigida</i>	clade IV	
<i>Trebouxia</i> sp.	A4cI	HQ026178	<i>Boreoplaca ultrafrigida</i>	" "	
<i>Trebouxia</i> sp.	AdIII	HQ026182	<i>Boreoplaca ultrafrigida</i>	" "	
<i>Trebouxia</i> sp.	A3cI	HQ026167	<i>Boreoplaca ultrafrigida</i>	" "	
<i>Trebouxia</i> sp.	A3dII	HQ026171	<i>Boreoplaca ultrafrigida</i>	" "	
<i>Trebouxia</i> sp.		DQ166603	<i>Lecanora rupicola*</i>	clade V	
<i>Trebouxia</i> sp.		DQ133476	<i>Protoparmeliopsis muralis</i>	<i>Trebouxia "muralis I"</i>	
<i>Trebouxia</i> sp.		DQ133500	<i>Protoparmeliopsis muralis</i>	" "	
<i>Trebouxia</i> sp.		DQ133481	<i>Protoparmeliopsis muralis</i>	" "	
<i>Trebouxia</i> sp. "URa6"	Tuerk 38608	JN204760	<i>Lecidella stigmatea</i>	" "	
<i>Trebouxia</i> sp.	Trinkaus 439	AJ293782	<i>Buellia elegans</i>	" "	
<i>Trebouxia</i> sp.		FJ792797	<i>Seirophora villosa</i>	<i>T. arboricola/ T. decolorans</i>	
<i>Trebouxia</i> sp.	P400	AM159210	<i>Xanthomendoza hasseana</i>	<i>T. arboricola/ T. decolorans</i>	
<i>Trebouxia</i> sp.	Trinkaus 450	AJ293784	<i>Buellia zoharyi</i>	<i>T. asymmetrica</i>	
<i>Trebouxia</i> "URa4"	Tuerk 39665	JN204764	<i>Lecidella stigmatea</i>	<i>T. asymmetrica</i>	
<i>Trebouxia</i> sp.	P350aIII	AM159213	<i>Xanthomendoza</i> sp.	<i>T. gelatinosa</i>	
<i>Trebouxia</i> sp.	Dornes 11-1996	AJ293787	<i>Physcia semipinnata</i>	" "	
<i>Trebouxia</i> sp.	TTC1	FJ792802	<i>Teloschistes chrysophthalmus</i>	" "	
<i>Trebouxia</i> sp.	Mayrhofer 13747	AJ293790	<i>Rinodinella controversa</i>	<i>T. gigantea</i>	
<i>Trebouxia</i> sp.	Kauff 4-1998	AJ293773	<i>Physcia adscendens</i>	<i>T. impressa</i>	
<i>Trebouxia</i> sp.	Helms 4-1999	AJ293771	<i>Physcia adscendens</i>	" "	
<i>Trebouxia</i> sp.	Mayrhofer 13723	AJ293793	<i>Rinodina capensis</i>	" "	
<i>Trebouxia</i> sp.	Pa2	AJ293775	<i>Physcia aipolia</i>	" "	
<i>Trebouxia</i> sp.	B10	AJ431579	<i>Umbilicaria antarctica</i>	<i>T. incrustata</i>	
<i>Trebouxia</i> sp.	B7	AJ431577	<i>Umbilicaria antarctica</i>	" "	

<i>Trebouxia</i> sp.	B8	AJ431591	<i>Umbilicaria antarctica</i>	"	"
<i>Trebouxia</i> sp.	B9	AJ431578	<i>Umbilicaria antarctica</i>	"	"
<i>Trebouxia</i> sp.	Mayrhofer 13740	AJ293791	<i>Rinodina atrocineria</i>	"	"
<i>Trebouxia</i> sp.	Mayrhofer 13749	AJ293789	<i>Rinodina tunicata</i>	"	"
<i>Trebouxia</i> sp.	Trinkaus 356a	AJ293783	<i>Buellia georgei</i>	"	"
<i>Trebouxia</i> sp.	003 BRY-C55153	KF026223	<i>Xanthoparmelia</i> aff. <i>cumberlandia</i>	"	" (BMP2)
<i>Trebouxia</i> sp.	013 BRY-C55163	KF026233	<i>Xanthoparmelia</i> aff. <i>norchlorochroa</i>	<i>Trebouxia</i>	"BMP1"
<i>Trebouxia</i> sp.	024 BRY-C55173	KF026242	<i>Xanthoparmelia</i> aff. <i>cumberlandia</i>	<i>Trebouxia</i>	"BMP1"
<i>Trebouxia</i> sp.	034 BRY-C55182	KF026251	<i>Xanthoparmelia</i> aff. <i>coloradoënsis</i>	<i>Trebouxia</i>	"BMP1"
<i>Trebouxia</i> sp.	062 BRY-C55207	KF026276	<i>Xanthoparmelia</i> aff. <i>cumberlandia</i>	<i>T. incrustata</i>	(BMP2)
<i>Trebouxia</i> sp.	005 BRY-C55155	KF026225	<i>Xanthoparmelia</i> aff. <i>chlorochroa</i>	"	" (BMP3)
<i>Trebouxia</i> sp.	006 BRY-C55156	KF026226	<i>Xanthoparmelia</i> aff. <i>coloradoënsis</i>	"	" (BMP5)
<i>Trebouxia</i> sp.	011 BRY-C55161	KF026231	<i>Xanthoparmelia</i> aff. <i>chlorochroa</i>	"	" (BMP5)
<i>Trebouxia</i> sp.	016 BRY-C55166	KF026236	<i>Xanthoparmelia</i> aff. <i>chlorochroa</i>	"	" (BMP4)
<i>Trebouxia</i> sp.	017 BRY-C55167	KF026237	<i>Xanthoparmelia</i> aff. <i>coloradoënsis</i>	"	" (BMP5)
<i>Trebouxia</i> sp.	018 BRY-C55168	KF026238	<i>Xanthoparmelia</i> aff. <i>coloradoënsis</i>	"	" (BMP4)
<i>Trebouxia</i> sp.	023 BRY-C55172	KF026241	<i>Xanthoparmelia</i> aff. <i>coloradoënsis</i>	"	" (BMP5)
<i>Trebouxia</i> sp.	028 BRY-C55176	KF026245	<i>Xanthoparmelia</i> aff. <i>chlorochroa</i>	"	" (BMP5)
<i>Trebouxia</i> sp.	031 BRY-C55179	KF026248	<i>Xanthoparmelia</i> aff. <i>chlorochroa</i>	"	" (BMP3)
<i>Trebouxia</i> sp.	032 BRY-C55180	KF026249	<i>Xanthoparmelia</i> aff. <i>chlorochroa</i>	"	" (BMP4)
<i>Trebouxia</i> sp.	035 BRY-C55183	KF026252	<i>Xanthoparmelia</i> aff. <i>coloradoënsis</i>	"	" (BMP5)
<i>Trebouxia</i> sp.	038 BRY-C55186	KF026255	<i>Xanthoparmelia</i> aff. <i>cumberlandia</i>	"	" (BMP5)
<i>Trebouxia</i> sp.	060 BRY-C Leavitt 060	KF026274	<i>Xanthoparmelia</i> aff. <i>cumberlandia</i>	"	" (BMP5)
<i>Trebouxia</i> sp.	064 BRY-C55209	KF026278	<i>Xanthoparmelia</i> aff. <i>coloradoënsis</i>	"	" (BMP4)
<i>Trebouxia</i> sp.		EU717912	<i>Physcia tenella</i>	-	
<i>Trebouxia</i> sp.		EU717913	<i>Physcia tenella</i>	-	

Table S3. Information about axenically isolated *Trebouxia* photobionts: DNA extraction number of original lichen thallus, country of origin, substrate, DNA extraction number of the axenically isolated photobiont, notes on growth type and affiliation to phylogenetic clades in Fig. 1 are reported. Incongruences found between the photobionts directly amplified from the lichen thallus and those isolated in culture are labelled with numbers (1-8) and asterisks.

incongruences	DNA id. N° original thallus	Thallus sp. (according <i>Trebouxia</i> phylogeny)	Origin		DNA id. N° algal culture	Cultured sp. (according <i>Trebouxia</i> phylogeny)		Type of growth	
			Country	Substrate				colour	morphology
*1	L1101	<i>Trebouxia "TRI"</i>	Spain	sandstone	L1379	<i>Trebouxia "sp.1"</i>	TEM	dark green	fast growth, rather slimy, 3d growths
	L1103	-	Spain	sandstone	L1380	<i>T. impressa/flava/potteri</i>		light green	middle growth, rather slimy, 3D growth darker
	L1107	<i>T. arboricola</i>	Spain	bark	L1381	<i>T. arboricola</i>		dark green	fast-middle growth, brittle,
	L1109	-	Spain	bark	L1382	<i>T. arboricola</i>		dark green	fast growth, rather slimy
	L1113	-	Spain	bark	L1383	<i>T. arboricola</i>		dark green	fast growth, rather slimy, 3d growths
	L1129	-	Scotland		L1384	<i>Trebouxia "TRI"</i>	TEM	light green	fast growth, rather slimy
	L1154	<i>clade V</i>	Australia	metamorphic rock	L1386, L1669	<i>clade V</i>		dark and light green	fast-middle growth, brittle, 3D growth darker
*2	L1184	<i>Trebouxia "sp.1"</i>	Spain	siliceous rock	L1535, L1650	<i>clade V</i>	TEM	light green	fast growth, rather slimy
	L1194	-	Spain	siliceous rock	L1536, L1651	<i>Trebouxia "sp.1"</i>		light green	fast growth, rather slimy, 3d growths
	L1211	-	Norway	siliceous rock	L1652	<i>T. impressa</i>		dark green	fast growth, brittle, 3D growth darker
*3	L1259	<i>T. simplex/jamesii</i>	Finland	siliceous rock	L1653	<i>Trebouxia "sp.1"</i>		light green	fast growth, rather slimy

	L1263	<i>Trebouxia "TRI"</i>	Finland	siliceous rock	L1654	<i>Trebouxia "TRI"</i>	TEM	light green	fast-middle growth, brittle, 3D growth
	L1360	<i>Trebouxia "TRI"</i>	Spain	siliceous rock	L1542	-		dark green	fast growth, brittle, 3D growth
	L1369	<i>Trebouxia "TRI"</i>	Wales	siliceous rock	L1543, L1659	<i>Trebouxia "TRI"</i>	TEM	light green	fast growth, rather slimy
*4	L1389	<i>clade IV</i>	Alaska	basaltic rock	L1541, L1656	<i>clade V</i>		light green	fast-middle growth, rather slimy
*5	L1408	<i>clade IV</i>	Alaska	siliceous rock	L1660	<i>Trebouxia "TRI"</i>		dark green	fast growth, brittle, 3D growth
	L1414	-	Italy	siliceous rock	L1661	<i>clade IV</i>		light green	fast growth, brittle, 3D growth
	L1420	-	Italy	calcareous rock	L1662	<i>Trebouxia "sp.1"</i>		light green	fast-middle growth, brittle, 3D growth
*6	L1428	<i>T. impressa</i>	Italy	calcareous rock	L1828	<i>T. incrustata</i>		dark green	fast-middle growth, brittle, 3D growth
	L1461	<i>Trebouxia "sp.1"</i>	Italy	calcareous rock	L1663	<i>Trebouxia "sp.1"</i>		light green	fast-middle growth, brittle, 3D growth
*7	L1475	<i>Trebouxia "TRI"</i>	Italy	calcareous rock	L1664	<i>Trebouxia "sp.1"</i>		light green	fast growth, brittle, 3D growth
	L1491	-	Italy	calcareous rock	L1665	<i>Trebouxia "sp.1"</i>		dark green	fast-middle growth, brittle, 3D growth darker
	L1501	-	Italy	calcareous rock	L1666	<i>Trebouxia "sp.1"</i>		light green	fast-middle growth, brittle, 3D growth darker
*8	L1504	<i>Trebouxia "TRI"</i>	France	granite (seashore)	L1667	<i>Trebouxia "sp.1"</i>		dark green	fast growth, rather slimy
	L1509	-	France	granite (seashore)	L1668	<i>Trebouxia "TRI"</i>		light green	fast growth, rather slimy
	L1521	<i>Trebouxia "sp.1"</i>	New Zeland	siliceous rock (seashore)	L1655	<i>Trebouxia "sp.1"</i>		dark green	fast growth, rather slimy

L1767	-	Africa	bark	L1831	<i>clade I</i>	light green	fast growth, rather slimy
L1771	-	Spain (<i>T. follmannii</i>)	siliceous rock	L1832	<i>Trebouxia "sp.1"</i>	light green	fast growth, rather slimy
L1773	-	Spain (<i>T. follmannii</i>)	siliceous rock	L1833	<i>Trebouxia "sp.1"</i>	light green	fast-middle growth, brittle, 3D growth
L1774	-	Spain (<i>T. follmannii</i>)	siliceous rock	L1834	<i>Trebouxia "sp.1"</i>	light green	fast growth, rather slimy
