

**Supplementary material**

## Appendix 1.

Table A1. Voucher information and GenBank accession numbers for the plant material used.

Taxa	DNA source (location, Voucher)	GenBank accession no.
nrDNA ITS/ <i>rpl32-trnL</i> <sub>(UAG)</sub> / <i>trnH-psbA</i>		
<i>O. visianii</i> Clem. <i>O. visianii</i>	Cecchi and Selvi 2009 Suteu 2016	EU919603*/-- JX267996*/--
<i>O. fastigiata</i> Braun-Blanq.	Kolarcik et al. 2013/Kolarcik et al. 2013	KC707654*/KC707754*/--
<i>O. fastigiata</i> <i>O. pseudoarenaria</i> Schur	Kolarcik et al. 2013 Kolarcik et al. 2013/Kolarcik et al. 2013/Suteu 2016	KC707684*/-- KC707698*/KC707750*/JX267991*
<i>O. pseudoarenaria</i> <i>O. arenaria</i> Waldst. et Kit	Kolarcik et al. 2013 Kolarcik et al. 2013/Kolarcik et al. 2013/Suteu 2016	KC707697*/-- KC707687*/KC707739*/JX267979*
<i>O. arenaria</i> <i>O. helvetica</i> Boiss. <i>O. helvetica</i> <i>O. echioides</i> L.	Kolarcik et al. 2013 Kolarcik et al. 2013/Kolarcik et al. 2013 Kolarcik et al. 2013 Wagstaff and Breitwieser 2010/Kolarcik et al. 2013	KC707677*/-- KC707682*/KC707739*/-- KC707676*/-- EU919601*/KC707726*/--
<i>O. echioides</i> <i>O. erecta</i> Sm.	Kolarcik et al. 2013 Cecchi et al. 2011	KC707694*/-- FR718846*/--
<i>O. stellulata</i> Waldst. & Kit. <i>O. taurica</i> Pall. ex Willd. <i>O. rigida</i> Ledeb. <i>O. rigida</i> <i>O. thracica</i> Velen. <i>O. malkarmayorum</i> Teppner <i>O. heterophylla</i> Griseb. <i>O. euboica</i> Rech.f.	Cohen 2014/Cohen and Davis 2016 Kolarcik et al. 2010/Kolarcik et al. 2013 Kolarcik et al. 2010/Kolarcik et al. 2013 Kolarcik et al. 2010 Kolarcik et al. 2010/Kolarcik et al. 2013 Kolarcik et al. 2010/Kolarcik et al. 2013 Cecchi and Selvi 2009/Kolarcik et al. 2013 Cecchi et al. 2011 Suteu 2012/Kolarcik et al. 2013/Suteu 2016	KF288006*/FJ827305*/-- GU827151*/KC707714*/-- GU827188*/KC707713*/-- GU827188*/-- GU827182*/KC707712*/-- GU827149*/KC707711*/-- EU919602*/KC707710*/-- FR718847*/-- JX267842*/KC707708*/JX267995*
<i>O. viridis</i> Javorka <i>O. viridis</i> <i>O. tornensis</i> Javorka <i>O. tornensis</i> <i>O. fruticosae</i> Sibth.	Suteu 2012 Kolarcik et al. 2010/Kolarcik et al. 2013 Kolarcik et al. 2010 Weigend et al. 2009	JX267843*/-- GU827136*/KC707704*/-- GU827135*/-- FJ763196*/--
<i>O. aleppica</i> Boiss. <i>O. rhodopea</i> Velen. <i>O. tricosperma</i> Lag. <i>O. bracteosa</i> Hausskn. & Bornm. <i>O. stridii</i> Teppner <i>O. tenuiflora</i> Willd. <i>O. spruneri</i> Boiss. <i>O. pygmaea</i> Riedl. <i>O. graeca</i> Boiss. <i>O. barszewskii</i> Lipsky <i>O. juliae</i> L.Cecchi & Selvi <i>O. elegantissima</i> Rech.f. & Goulimy <i>O. frutescens</i> Lam. <i>O. caespitosa</i> Kotschy <i>O. kittanae</i> Strid <i>O. strigosissima</i> Boiss. <i>O. mattirolii</i> Bald. <i>O. waltonii</i> Duthie <i>O. waltonii</i> <i>O. sp.</i> <i>O. hookeri</i> C.B.Clarke <i>O. hookeri</i> <i>O. paniculata</i> Bureau & Franch. <i>O. araratica</i> Riedl	Cecchi and Selvi 2009 Weigend et al. 2009 Cecchi et al. 2016 Cecchi et al. 2011 Cecchi et al. 2011 Cecchi et al. 2011 Cecchi et al. 2011 Cecchi et al. 2011 Cecchi et al. 2011 Chacon et al. 2016 Cecchi et al. 2017 Cecchi et al. 2011 Cecchi et al. 2011 Cecchi et al. 2011 Cecchi et al. 2011 Cecchi et al. 2011 Cecchi et al. 2011 Hu and Zhao 2007 Hu and Zhao 2007 Hu and Zhao 2007 Hu and Zhao 2007 Hu and Zhao 2007 Hu and Zhao 2007 Iran: Azerbaijan, Oroumieh, Alizadeh and Khodakarimi 2536 (WANRCH)	EU919600*/-- FJ763195*/-- KU927763*/-- FR718841*/-- FR718862*/-- FR718864*/-- FR718858*/-- FR718856*/-- FR718850*/-- KU927762*/-- LT629265*/-- FR718845*/-- FR718848*/-- FR718843*/-- FR718851*/-- FR718863*/-- FR718853*/-- EF199864*/-- EF199856*/-- EF199857*/-- EF199866*/-- EF199847*/-- EF199859*/-- LC426090*/--

<i>O. araratica</i>	Iran: Azerbaijan, Oroumieh, Takab; Alizadeh and Mottaghi 2032 (WANRCH)	LC426089/LC426157/LC426227
<i>O. araratica</i>	Iran: Azerbaijan, Khoy; Kazempour-Osaloo and Nafisi 1 Mar 2015 (Tarbiat Modares Univ. Herbarium)	-/LC426158/LC426226
<i>O. araratica</i>	Iran: Azerbaijan, Oroumieh, Ghasempour 7185 (WANRCH)	-/LC426284/-
<i>O. araratica</i>	Turkey: Ankara, Boraman village; Davis 43793 (TARI)	-/LC426159/LC426225
<i>O. armena</i> DC.	Iran: Zanjan, Maassoumi 64841 (TARI)	-/LC426228
<i>O. armena</i>	Iran: Azerbaijan, Oroumieh, Silvaneh; Foroghi and Ronemark 19595 (TARI)	LC426091/LC426160/-
<i>O. armena</i>	Iran: Azerbaijan, Piranshahr; Kazempour-Osaloo et al. 2 Mar 2015 (Tarbiat Modares Univ. Herbarium)	LC426092/LC426161/LC426228
<i>O. armena</i>	Iran: Azerbaijan, Oroumieh, Takap; Alizadeh and Safavi 7323 (WANRCH)	LC426093/-/-
<i>O. ambigens</i> Lacaita	Iran: Azerbaijan, Oroumieh, Lighvan; Assadi and Mozaffarian 30603 (TARI)	LC426088/-/-
<i>O. ambigens</i>	Iran: Azerbaijan, Oroumieh; Khatamsaz 315 (TARI)	-/LC426156/-
<i>O. alborosea</i> Fisch. & C.A.Mey.	Iran: Fars, Noorabad; Mozaffarian 45859 (TARI)	LC426086/LC426154/LC426223
<i>O. alborosea</i>	Iran: Lorestan, Andimeshk; Assadi and Wendelbu 16596 (TARI)	LC426087/LC426155/LC426224
<i>O. bulbotricha</i> DC.	Iran: Tehran, Jajrood; Kazempour-Osaloo 1 Mar 2013 (Tarbiat Modares Univ. Herbarium)	LC426096/LC426166/LC426234
<i>O. bulbotricha</i>	Iran: Tehran, Firozkoh; Kazempour-Osaloo and Nasrollahi 3 Mar 2015 (Tarbiat Modares Univ. Herbarium)	LC426097/-/-
<i>O. bulbotricha</i>	Iran: Markazi, Komijan; Kazempour-Osaloo and Nasrollahi 4 Mar 2015 (Tarbiat Modares Univ. Herbarium)	LC426098/-/LC426235
<i>O. bulbotricha</i>	Iran: Markazi, Tafresh; Kazempour-Osaloo and Nasrollahi 5 Mar 2015 (Tarbiat Modares Univ. Herbarium)	-/LC426167/-
<i>O. bodeana</i> Boiss.	Iran: Azerbaijan, Marand; Kazempour-Osaloo 6 Mar 2015 (Tarbiat Modares Univ. Herbarium)	-/LC426164/LC426232
<i>O. bodeana</i>	Iran: Kurdistan, Naran village; Runemark and Mozaffarian 29267 (TARI)	-/LC426165/-
<i>O. bodeana</i>	Iran: Kurdistan, Kamyaran; Fattahi 60621 (TARI)	LC426095/-/LC426233
<i>O. iranshahrii</i> Ghahr. & Attar	Iran: Kurdistan, Marivan; Ghahreman and Mozaffarian 75701 (TARI)	LC426118/LC426185/LC426253
<i>O. iranshahrii</i>	Iran: Kurdistan, Nosood; Mozaffarian 74813(TARI).	LC426119/LC426180/LC426254
<i>O. bilabiata</i> Boiss.	Iran: Lorestan, Sefid mountain; Wendelbo and Assadi 16636 (TARI)	LC426094/LC426162/LC426230
<i>O. bilabiata</i>	Iran: Azerbayejan, Sahand mountain; Assadi and Mozaffarian 30764 (TARI)	-/LC426163/LC426231
<i>O. chrysochaeta</i> Bornm.	Iran: Mazandaran, Ramsar; Assadi and Maassoumi 51310 (TARI)	LC426104/LC426172/LC426240
<i>O. cornuta</i> Riedl	Iran: Azerbaijan, Oromieh, Pasan; Sabeti and Siami 3121 (TARI)	LC426105/LC426173/LC426241
<i>O. chlorotricha</i> Boiss.	Iran: Fars, Estahbanat; Mozaffarian 46999 (TARI)	LC426102/LC426170/LC426238
<i>O. chlorotricha</i>	Iran: Azerbayejan, Arasbaran; Khatamsaz 73075 (TARI)	LC426103/LC426171/LC426239
<i>O. cardiostegia</i> Bornm	Iran: Kermanshah, Kolangah; Fattahi and Hamzei 738 (TARI)	LC426101/LC426169/LC426237
<i>O. caerulescens</i> Boiss.	Iran: Khuzestan, Izeh; Pabote 703 (TARI)	LC426099/LC426168/LC426236
<i>O. caerulescens</i>	Iran: Kordestan, Sanandaj; 1289 (TARI)	LC426100/-/-
<i>O. dichroantha</i> Boiss.	Iran: Shahrood, Shahvar mountain; Kazempour-Osaloo 2 Mar 2013 (Tarbiat Modares Univ. Herbarium)	LC426111/LC426176/LC426244
<i>O. dichroantha</i>	Iran: Tehran, Firozkoh; Kazempour-Osaloo and Nasrollahi 7 Mar 2015 (Tarbiat Modares Univ. Herbarium)	-/LC426177/LC426245
<i>O. demavendica</i> Riedl	Iran: Tehran, Arak; Mozaffarian 64003 (TARI)	LC426108/-/-
<i>O. demavendica</i>	Iran: Tehran, Damawand mountain; Mozaffarian 32448 (TARI)	LC426109/-/LC426247

<i>O. demavendica</i>	Iran: Tehran, Firozkuh; Kazempour-Osaloo and Nasrollahi 8 Mar 2015 (Tarbiat Modares Univ. Herbarium)	LC426110/-/-
<i>O. demavendica</i>	Iran: Bakhtiari, Lordegan; Fattahi and Tavakoli 54968 (TARI)	-/LC426175/LC426243
<i>O. dasytricha</i> Boiss.	Iran: Kordestan, Oramanat; Assadi and Abohamze 88584 (TARI)	LC426106/-/-
<i>O. dasytricha</i>	Iran: Fars, Noorabad; Asadi and Abohamze 38361 (TARI)	LC426107/LC426174/LC426242
<i>O. elivendica</i> Wettst.	Iran: Tehran, Jajrood; Foroughi et al. 12412 (TARI)	LC426112/LC426178/LC426246
<i>O. elivendica</i>	Iran: Azerbaijan, Marand; Rechinger 40667 (TARI)	LC426113/LC426179/-
<i>O. hebebulba</i> DC.	Iran: Ilam, Mehran; Dini and Arazm 1490 (TARI)	-/LC426251
<i>O. hebebulba</i>	Iran: Tehran, Mahdasht; Babakhanloo and Amin 1446 (TARI)	LC426116/-/LC426252
<i>O. intertexta</i> Hub.-Mor.	Iran: Kermanshah, Dalahoo mountain; Assadi 60835 (TARI)	LC426117/LC426184/-
<i>O. kotschy</i> Boiss.	Iran: Esfahan, Samirom; Norouzi 2727 (TARI)	LC426125/-/-
<i>O. kotschy</i>	Iran: Lorestan, Oshtorankoh; Assadi and Mozaffarian 37156(TARI)	LC426124/LC426190/LC426259
<i>O. kotschy</i>	Iran: Markazi, Komijan; Kazempour-Osaloo and Nasrollahi 9 Mar 2015 (Tarbiat Modares Univ. Herbarium)	-/LC426191/LC426260
<i>O. kilouyensis</i> Boiss. & Hausskn. ex Boiss.	Iran: Kohkiluyeh, Yasooj; Khatamsaz and Jafari 72985 (TARI)	LC426122/LC426188/LC426257
<i>O. kilouyensis</i>	Iran: Esfahan, Samirom; Khatamsaz 72978 (TARI)	LC426123/LC426189/LC426258
<i>O. khorassanica</i> Attar & Joharchi	Iran: Khorasan, Dargez; Joharchy and Zangoei 16398 (FUMH)	LC426120/LC426186/LC426255
<i>O. khorassanica</i>	Iran: Khorasan, Shirvan; Rashed 12 Apr 2013	LC426121/LC426187/LC426256
<i>O. longiloba</i> Bge.	Iran: Shahrood, Tash; Kazempour-Osaloo 4 Mar 2013 (Tarbiat Modares Univ. Herbarium)	LC426126/LC426192/LC426261
<i>O. longiloba</i>	Iran: Khorasan, Bojnord; Memariani et al. 3625 (FUMH)	LC426127/LC426193/LC426262
<i>O. microcarpa</i> Stev. ex DC.	Iran: Ghazvin, Alamot; Alimohamadi and Mozaffarian 619 (TARI)	LC426129/-/LC426264
<i>O. microcarpa</i>	Iran: Bakhtiary, Shahrekord; Mozaffarian 17749 (TARI)	LC426130/LC426195/LC426264
<i>O. microcarpa</i>	Iran: Markazi, Komijan; Kazempour-Osaloo and Nasrollahi 10 Mar 2015 (Tarbiat Modares Univ. Herbarium)	-/LC426196/-
<i>O. nervosa</i> Riedl	Iran: Kermanshah, Kamyaran; Asri and Hamzei 87747 (TARI)	LC426131/LC426197/-
<i>O. macrophylla</i> Bornm.	Iran: Kermanshah, Bojan; Hamze and Hatami 1381 (TARI)	LC426128/LC426194/LC426263
<i>O. olivieri</i> Boiss.	Iran: Kurdistan, Baneh; Assadi 60497 (TARI)	LC426132/LC426198/LC426267
<i>O. platyphylla</i> Riedl	Iran: Lorestan, Bisheh; Assadi and Mozaffarian 37007 (TARI)	-/LC426204/LC426271
<i>O. pachypoda</i> Boiss.	Iran: Tehran, Shemiran; Mozaffarian et al. 45309 (TARI)	LC426135/LC426202/LC426270
<i>O. pachypoda</i>	Iran: Azerbaijan, Tabriz, Mianeh; Assadi and Shahsavari 65389 (TARI)	-/LC426203/-
<i>O. rostellata</i> Lehm.	Iran: Ilam, Kerand; Rashidi 10 Mar 2013 (Tarbiat Modares Univ. Herbarium)	LC426138/LC426207/LC426274
<i>O. rostellata</i>	Iran: Hormozgan, Bandarabas; Foroghi 15774 (TARI)	LC426139/LC426208/LC426275
<i>O. rechingeri</i> Riedl	Iran: Kordestan, Marivan; Tavakoli, 2633 (TARI)	LC426137/-/-
<i>O. rascheyana</i> Boiss.	Iran: Azerbaijan, Khalkhal; Forghandost 36280 (TARI)	LC426136/LC426205/LC426272
<i>O. rascheyana</i>	Iran: Azerbaijan, Kohseir; Heydarloo 189 (TARI)	-/LC426206/LC426273
<i>O. sabalanica</i> Ponert	Iran: Azerbaijan, Meshkinshahr, Sabalan mountain; Foroghi and Asadi 13835 (TARI)	LC426140/LC426209/LC426276
<i>O. stenosphon</i> Boiss.	Iran: Khorasan, Sabzevar; Joharchy 30823 (FUMH)	LC426145/LC426213/LC426279

<i>O. stenosphon</i>	Iran: Fars, Shiraz; Foroughi 17342 (TARI)	–/LC426214/LC426280
<i>O. sericea</i> Willd.	Iran: Qazvin, Alamoot; Charkhchian 1929 (TARI)	LC426141/LC426210/–
<i>O. sericea</i>	Iran: Ilam, Reno Mt; Rashidi 3 Mar 2013 (Tarbiat Modares Univ. Herbarium)	–/LC426211/LC426277
<i>O. sericea</i>	Iran: Tehran, Fasham; Kazempour Osaloo 10 Mar 2015 (Tarbiat Modares Univ. Herbarium)	LC426142/–/–
<i>O. sericea</i>	Iran: Azerbaijan, Oroumieh; Alizadeh and Ghasempour 2032 (TARI)	LC426143/LC426212/LC426278
<i>O. sericea</i>	Iran: Azerbaijan, Oroumieh, Arghand et al. 5925 (TARI)	LC426144/–/–
<i>O. tschichtatschevii</i> M. Pop.	Iran: Markazi, Komijan; Kazempour-Osaloo and Nasrollahi 11 Mar 2015 (Tarbiat Modares Univ. Herbarium)	LC426148/LC426217/–
<i>O. tschichtatschevii</i>	Iran: Kermanshah, Peroo mountain; Fattahi and Hamzei 672 (TARI)	LC426149/LC426218/LC426283
<i>O. straussii</i> (Riedl) Khatamsaz	Iran: Bakhtiari, Lordegan; Mozaffarian 54989 (TARI)	LC426147/LC426215/LC426281
<i>O. straussii</i>	Iran: Khozestan, Masjed Soleyman; Mozaffarian 53593 (TARI)	LC426146/LC426216/LC426282
<i>O. pabotii</i> Riedl	Iran: Kordestan, Sanandaj, Kamyaran; Foroughi and Assadi 5926 (TARI)	LC426134/LC426201/–
<i>O. gaobae</i> Bornm.	Iran: Tehran, Damawand; Mozaffarian 37319 (TARI)	–/LC426181/–
<i>O. ghahremanii</i> Attar & Naqinezhad	Iran: Tehran, Attar and Zamani 11 May 2015 (TUH)	LC426114/LC426182/LC426249
<i>O. ghahremanii</i>	Iran: Tehran, Alborz mountain; Attar and Zamani 11 Apr 2015 (TUH)	LC426115/LC426183/LC426250
<i>Podonosma orientalis</i> L.	Iran: Kohkiloye, Dogonbadan; Assadi and Abohamze 38708 (TARI)	–/LC426199/LC426268
<i>Podonosma orientalis</i>	Iran: Fars, Firozabad; Assadi and Sardabi 41533 (TARI)	LC426133/LC426200/LC426269
<i>Alkanna bracteosa</i> Boiss.	Iran: Tehran, Alborz mountain; Charkhchian 611 (Tarbiat Modares Univ. Herbarium)	LC426082/LC426150/LC426219
<i>A. frigida</i> (L.) Boiss.	Iran: Azerbaijan, Khoy; Assadi and Mozaffarian 59970 (TARI)	LC426083/LC426151/LC426220
<i>Echium amoenum</i> Fisch.	Iran: Gilan, Roodbar; Kazempour-Osaloo 12 Mar 2013 (Tarbiat Modares Univ. Herbarium)	LC426084/LC426152/LC426221
<i>E. italicum</i> L.	Iran: Khorasan, Neyshaboor; Joharchi 38140 (FUMH)	LC426085/LC426153/LC426222
<i>Maharanga emodi</i> DC.	Weigend et al. 2009	FJ763207*/–/–

Abbreviations used in plant accession information: FMUH = Ferdowsi Univ. of Mashhad Herbarium, Mashhad, Iran. TARI = Herbarium of the Research Inst. of Forests and Rangelands, Tehran, Iran. TUH = Tehran Univ. Herbarium, Tehran, Iran. WANRCH = West Azerbaijan Natural Resources Research Center Herbarium, Oroumieh, Iran.

\*: sequences retrieved from GenBank. – : sequences are unavailable for those species.