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Biology and ecology of *Juniperus phoenicea* – *J. turbinata* – *J. canariensis* complex. III. Reproduction, herbivory, utilization, conservation

Supplementary Material

Table S1. Vertebrata connected with *Juniperus phoenicea*, *J. turbinata* and *J. canariensis*

Juniper species	Geographic region	Taxonomic position	species	consumed part	Animal character	Source of data
Reptilia						
<i>turbinata</i>	Spain, Almeria	Lacertidae	<i>Timon lepidus</i> (Peters, 1962)	Cone	Disperser	Valido & Olesen, 2019
<i>turbinata</i>	Spain, Balearic Islands, Cabrera	Lacertidae	<i>Podacris lilfordi</i> (Günther, 1874)	Cone	Disperser	Traveset & Sans, 1994
<i>canariensis</i>	Spain, Canary Islands	Lacertidae	<i>Gallotia sp.</i>	Cone	Disperser	Fernández-Palacios et al., 2008
<i>canariensis</i>	Spain, Canary Islands	Lacertidae	<i>Gallotia galloti</i> Oudart	Cone	Disperser	Otto et al., 2010
Aves						
<i>phoenicea</i>	Spain, Mountains of S Spain	Passeriformes: Turdidae	<i>Turdus merula</i> (Linnaeus, 1758)	Cone	Disperser	Jordano, 1993
<i>phoenicea</i>	Spain, Mountains of S Spain	Passeriformes: Turdidae	<i>Turdus iliacus</i> Linnaeus, 1758	Cone	Disperser	Jordano, 1993
<i>phoenicea</i>	Spain, Mountains of S Spain	Passeriformes: Turdidae	<i>Turdus torquatus</i> Linnaeus, 1758	Cone	Disperser	Jordano, 1993
<i>phoenicea</i>	Spain, Mountains of S Spain	Passeriformes: Turdidae	<i>Turdus viscivorus</i> Linnaeus, 1758	Cone	Disperser	Jordano, 1993
<i>turbinata</i>	S Iberian Peninsula	Passeriformes: Fringillidae	<i>Chloris chloris</i> (Linnaeus, 1758)	Seeds	Predator and disperser	Isla et al., 2022
<i>turbinata</i>	Algeria, Saharan Atlas	Passeriformes: Fringillidae	<i>Chloris chloris</i> Linnaeus, 1758.	Seed	Predator and disperser	Benabderrahmane et al., 2022
<i>turbinata</i>	S Iberian Peninsula	Passeriformes: Turdidae	<i>Turdus philomelos</i> C.L.Brehm, 1831	Cone	Disperser	Isla et al., 2023
<i>turbinata</i>	S Iberian Peninsula	Passeriformes: Turdidae	<i>Turdus merula</i> (Linnaeus, 1758)	Cone	Disperser	Isla et al., 2023
<i>turbinata</i>	Spain, Balearic Islands	Passeriformes: Turdidae	<i>Turdus merula</i> (Linnaeus, 1758)	Cone	Disperser	Rodríguez-Pérez et al., 2005
<i>turbinata</i>	S Iberian Peninsula	Passeriformes: Turdidae	<i>Turdus iliacus</i> Linnaeus, 1766	Cone	Disperser	Isla et al., 2023
<i>turbinata</i>	S Iberian Peninsula	Passeriformes: Turdidae	<i>Turdus torquatus</i> Linnaeus, 1758	Cone	Disperser	Isla et al., 2023
<i>turbinata</i>	Algeria, Saharan Atlas	Passeriformes: Turdidae	<i>Turdus torquatus</i> Linnaeus, 1758	Seed	Predator and disperser	Benabderrahmane et al., 2022
<i>turbinata</i>	S Iberian Peninsula	Passeriformes: Muscipidae	<i>Erithacus rubecula</i> (Linnaeus, 1758)	Cone	Disperser	Isla et al., 2023
<i>turbinata</i>	S Iberian Peninsula	Passeriformes: Sylviidae	<i>Curruca melanocephala</i> (J.F.Gmelin, 1789)	Cone	Disperser	Isla et al., 2023
<i>turbinata</i>	S Iberian Peninsula	Passeriformes: Corvidae	<i>Cyanopica cooki</i> Bonaparte, 1850	Cone	Disperser	Isla et al., 2023
<i>turbinata</i>	S Iberian Peninsula	Passeriformes: Sylviidae	<i>Sylvia atricapilla</i> (Linnaeus, 1758)	Cone	Disperser	Isla et al., 2023
<i>turbinata</i>	Algeria, Saharan Atlas	Passeriformes: Emberizidae	<i>Emberiza cia</i> Linnaeus, 1766	Seed	Predator and disperser	Benabderrahmane et al., 2022
<i>turbinata</i>	Algeria, Saharan Atlas	Passeriformes: Fringillidae	<i>Fringilla coelebs</i> Linnaeus, 1758	Seed	Predator and disperser	Benabderrahmane et al., 2022
<i>turbinata</i>	Algeria, Saharan Atlas	Passeriformes: Fringillidae	<i>Linaria cannabina</i> Linnaeus, 1758	Seed	Predator and disperser	Benabderrahmane et al., 2022
<i>canariensis</i>	Spain, Canary Islands	Passeriformes: Corvidae	<i>Corvus corax</i> Linnaeus, 1758	Cone	Disperser	Nogales et al., 1999
<i>canariensis</i>	Spain, Canary Islands	Passeriformes: Corvidae	<i>Corvus corax</i> subsp. <i>canariensis</i> Hartert & Kleinschmidt, 1901	Cone	Disperser	Fernández-Palacios et al., 2008

Juniper species	Geographic region	Taxonomic position	species	consumed part	Animal character	Source of data
<i>canariensis</i>	Spain, Canary Islands	Passeriformes: Turdidae	<i>Turdus merula</i> (Linnaeus, 1758)	Cone	Disperser	Fernández-Palacios et al., 2008
<i>canariensis</i>	Spain, Canary Islands	Columbiformes: Columbidae	<i>Streptopelia turtur</i> (Linnaeus, 1758)	Cone	Disperser	Otto et al., 2010
Mammalia						
<i>phoenicea</i>	Spain, Font Roja	Carnivora: Canidae	<i>Vulpes vulpes</i> (Linnaeus, 1758)	Cone	Disperser	Rico-Guzmán et al., 2012
<i>phoenicea</i>	Spain, Font Roja	Carnivora: Mustelidae	<i>Martes foina</i> (Erxleben, 1777)	Cone	Disperser	Rico-Guzmán et al., 2012
<i>phoenicea</i>	France, Ardeche	Carnivora: Mustelidae	<i>Martes foina</i> (Erxleben, 1777)	Cone	Disperser	Mathaux, 2017
<i>turbinata</i>	S Iberian Peninsula	Rodentia	<i>Apodemus sylvaticus</i> (Linnaeus, 1758)	Cone pulp and seeds	Predator and disperser	Isla et al., 2022
<i>turbinata</i>	S Iberian Peninsula	Rodentia	<i>Mus spretus</i> Lataste, 1883	Cone pulp and seeds	Predator and disperser	Isla et al., 2022
<i>turbinata</i>	S Iberian Peninsula	Carnivora: Canidae	<i>Vulpes vulpes</i> (Linnaeus, 1758)	Cone	Disperser	Isla et al., 2023
<i>turbinata</i>	Italy, Sardinia	Carnivora: Canidae	<i>Vulpes vulpes</i> subsp. <i>ichnusae</i> Miller, 1907	Cone	Disperser	Farris et al., 2017
<i>turbinata</i>	S Iberian Peninsula	Carnivora: Mustelidae	<i>Meles meles</i> (Linnaeus, 1758)	Cone	Disperser	Isla et al., 2023
<i>turbinata</i>	S Iberian Peninsula	Carnivora: Viverridae	<i>Genetta genetta</i> (Linnaeus, 1758)	Cone	Disperser	Isla et al., 2023
<i>turbinata</i>	Algeria, Saharan Atlas	Carnivora: Viverridae	<i>Genetta genetta</i> Linnaeus, 1758	Cone	Disperser	Benabderrahmane et al., 2022
<i>turbinata</i>	Spain, Balearic Islands	Carnivora: Viverridae	<i>Genetta genetta</i> Linnaeus, 1758	Cone	Disperser	Traveset & Sans, 1994
<i>turbinata</i>	S Iberian Peninsula	Lagomorpha: Leporidae	<i>Oryctolagus cuniculus</i> (Linnaeus, 1758)	Cone	Disperser	Isla et al., 2023
<i>turbinata</i>	Algeria, Saharan Atlas	Artiodactyla, Suidae	<i>Sus scrofa</i> Linnaeus, 1758	Cone	Disperser	Benabderrahmane et al., 2022
<i>turbinata</i>	Algeria, Saharan Atlas	Carnivora: Canidae	<i>Canis lupaster</i> Hemprich & Ehrenberg, 1833	Cone	Disperser	Benabderrahmane et al., 2022
<i>turbinata</i>	Algeria, Saharan Atlas	Rodentia	<i>Meriones shawi</i> (Duvvernoy, 1842)	Cone	Disperser and Predator	Benabderrahmane et al., 2022
<i>canariensis</i>	Spain, Canary Islands	Rodentia	<i>Rattus rattus</i> (Linnaeus, 1758)	Cone	Predator and disperser	Fernández-Palacios et al., 2008; Otto et al., 2010
<i>canariensis</i>	Spain, Canary Islands	Lagomorpha: Leporidae	<i>Oryctolagus cuniculus</i> (Linnaeus, 1758)	Cone	Disperser	Otto et al., 2010

Additional literature

Rico-Guzmán E, Terrones B, Cantó JL & Bonet A (2012) Frugivore carnivores: preferences and contribution to seed dispersal of red fox *Vulpes vulpes* (Linnaeus, 1758)

and stone marten *Martes foina* (Erxleben, 1777) in Carrascal de la Font Roja Natural Park (Alicante, Spain). *Galemys* 24: 25–33. doi:10.7325/Galemys.2012.A03.

Table S2. Insects and mites associated with *Juniperus phoenicea* s.l.

Juniper species	Insect family	Insect species	Type of feeding	Data source
Acari				
Prostigmata				
<i>canariensis, phoenicea</i>	Phytoptidae	<i>Trisetacus quadrisetus</i> (Thomas, 1889)	gall	Guido & Roques, 1996; Ribes Escolà & Askew, 2009
Insecta				
Coleoptera				
<i>phoenicea, turbinata</i>	Buprestidae	<i>Anthaxia confusa</i> Gory, 1841	phloeophagous	Cleu, 1957
<i>phoenicea, turbinata</i>	Buprestidae	<i>Lamprodila festiva</i> (Linnaeus, 1767) ⁽¹⁾	phloeophagous	Cleu, 1957; Hellrigl, 1972
<i>phoenicea, turbinata</i>	Buprestidae	<i>Melanophila cuspidata</i> (Klug, 1829)	phloeophagous (stem)	Mifsud & Bílý, 2002
<i>canariensis</i>	Cerambycidae	<i>Delagrangeus schurmanni</i> Sama, 1985	phloeophagous/xylphagous (branches)	Vives & Trócoli, 2021
<i>turbinata</i>	Cerambycidae	<i>Icosium tomentosum atticum</i> Ganglbauer, 1881	phloeophagous/xylphagous (branches)	Mikšić & Georgijević, 1973; Sturani, 1981
<i>phoenicea, turbinata</i>	Cerambycidae	<i>Phymatodes glabratus</i> (Charpentier, 1825) syn. <i>Poecilium glabratum</i> (Charpentier, 1825)	phloeophagous/ xylophagous	Sama, 2002
<i>phoenicea, turbinata</i>	Cerambycidae	<i>Semanotus laurasi</i> (Lucas, 1852)	phloeophagous/xylphagous	Cleu, 1957
<i>canariensis</i>	Curculionidae	<i>Laparocerus auctus</i> (Wollaston, 1864)	foliophagous	Carrillo, 2015
<i>phoenicea, canariensis</i>	Curculionidae	<i>Nanodiscus transversus</i> (Aubé, 1850)	frugivorous/conophagous	Guido & Roques, 1996; Ribes Escolà & Askew, 2009
<i>phoenicea, turbinata</i>	Curculionidae	<i>Pachyrhinus lethierryi</i> (Desbrochers des Loges, 1875) syn. <i>Scythropus lethierryi</i> Desbr.	rhizophagous	Cleu, 1957
<i>phoenicea, turbinata</i>	Curculionidae	<i>Phloeosinus aubei</i> (Perris, 1855) syn. <i>Ph. bicolor</i> (Brullé, 1832)	phloeophagous	Cleu, 1957; Pfeffer, 1995; Bright & Skidmore, 1997; Lieutier et al., 2016
<i>phoenicea, turbinata</i>	Curculionidae	<i>Phloeosinus henschi</i> Reitt. 1901	phloeophagous	Pfeffer, 1995
<i>phoenicea, turbinata</i>	Curculionidae	<i>Phloeosinus thujae</i> (Pieris, 1855)	phloeophagous	Cleu, 1957
<i>phoenicea</i>	Curculionidae	<i>Pseudomeira foveithorax</i> (Desbrochers, 1875)	foliophagous	Pierotti & Bellò, 2001
<i>phoenicea</i>	Dasytidae	<i>Dasytidae</i> sp.	frugivorous/conophagous (decaying)	Ribes Escolà & Askew, 2009
<i>phoenicea, turbinata</i>	Ptinidae	<i>Ernobius juniperi</i> Chobaut, 1899	frugivorous/conophagous	Cleu, 1957
<i>phoenicea</i>	Ptinidae	<i>Ptinidae</i> sp.	frugivorous/conophagous (decaying)	Ribes Escolà & Askew, 2009
<i>phoenicea, turbinata</i>	Rhynchitidae	<i>Auletes tubicen</i> Boheman, 1829	foliophagous	Cleu, 1957
Diptera				
<i>phoenicea</i>	Cecidomyiidae	<i>Cecidomyiidae</i> spp.	frugivorous/conophagous (decaying)	Ribes Escolà & Askew, 2009
Hemiptera				
<i>phoenicea, turbinata</i>	Aphididae	<i>Cinara cupressi</i> (Buckton, 1881)	sap-sucking	Holman, 2009
<i>turbinata</i>	Aphididae	<i>Cinara fresai</i> Blanchard, 1939	sap-sucking	Barbagallo & Cocuzza, 2014
<i>phoenicea, turbinata</i>	Aphididae	<i>Cinara juniperi</i> (De Geer, 1773)	sap-sucking	Holman, 2009
<i>phoenicea</i>	Aphididae	<i>Cinara tujafilina</i> (Del Guercio, 1909)	sap-sucking	Holman, 2009
<i>phoenicea</i>	Aphididae	<i>Stomaphis cupressi</i> Pintera, 1965	sap-sucking	Holman, 2009
<i>phoenicea, turbinata</i>	Acanthosomatidae	<i>Cyphostethus tristriatus</i> (Fabricius, 1787)	sap-sucking/ frugivorous/conophagous	Cleu, 1957; Ward, 1977
<i>phoenicea, turbinata</i>	Cicadellidae	<i>Liguropia juniperi</i> (Lethierry, 1876)	sap-sucking	Nickel, 2008

Juniper species	Insect family	Insect species	Type of feeding	Data source
<i>phoenicea</i>	Coreidae	<i>Gonocerus juniperi</i> (Her- rich-Schäffer, 1839)	sap-sucking	Linnavuori, 1965; Gessé Solé, 2005
<i>phoenicea</i>	Diaspididae	<i>Aspidiotus nerii</i> Bouche, 1833	sap-sucking	Ben-Dov & Sánchez-García, 2015
<i>phoenicea</i>	Diaspididae	<i>Carulaspis juniperi</i> (Bouché, 1851)	sap-sucking	Foldi, 2000; Yaşar, 2020
<i>turbinata</i>	Diaspididae	<i>Carulaspis visci</i> (Schrank, 1781)	sap-sucking	Biche et al., 2022
<i>phoenicea</i>	Diaspididae	<i>Cupressaspis mediterranea</i> (Lindinger, 1910)	sap-sucking	Gómez-Menor Ortega, 1960; Martín Mateo, 1983
<i>phoenicea</i>	Diaspididae	<i>Lineaspis striata</i> (Newstead, 1897)	sap-sucking highly-polyphagous	Pellizzari & Fontana, 1996; Ben- Dov & Sánchez-García, 2015
<i>phoenicea</i>	Eriococcidae	<i>Gossypariella juniperi</i> (Goux, 1936)	sap-sucking	Goux, 1936; Foldi, 2002
<i>phoenicea, turbinata</i>	Lygaeidae	<i>Orsillus depressus</i> (Mulsant & Rey, 1852)	frugivorous/conopha- gous	Cleu, 1957; Linnavuori, 1965; Roques, 1983; Roques et al., 1984
<i>phoenicea, turbinata</i>	Lygaeidae	<i>Orsillus maculatus</i> (Fieber, 1861)	frugivorous/conopha- gous	Rouault et al., 2005
<i>turbinata</i>	Margarodidae	<i>Icerya purchasi</i> Maskell, 1879	sap-sucking	Souttou et al., 2015
<i>turbinata</i>	Miridae	<i>Acrorrhinium conspersum</i> Noualhier, 1895	sap-sucking	Linnavuori, 2007
<i>phoenicea, turbinata</i>	Miridae	<i>Deraeocoris schach</i> (Fabricius, 1781)	sap-sucking	Novak & Wagner, 1951
<i>turbinata</i>	Miridae	<i>Dichroscytus cyprius</i> Lindberg, 1948	sap-sucking	Linnavuori, 1965
<i>turbinata</i>	Miridae	<i>Dichroscytus dalmatinus</i> Wag- ner 1951	sap-sucking	Novak & Wagner, 1951
<i>turbinata</i>	Miridae	<i>Megaloceroea recticornis</i> (Geof- froy, 1785)	sap-sucking	Novak & Wagner, 1951
<i>phoenicea</i>	Miridae	<i>Orthotylus gemmae</i> Gessé & Goula, 2003	sap-sucking	Gessé & Goula, 2003; Pago- la-Cardé & Zabalegui, 2010
<i>turbinata</i>	Miridae	<i>Orthotylus hodiernus</i> Lin- navuori, 1961	sap-sucking	Ribes, 1991
<i>phoenicea, turbinata</i>	Miridae	<i>Orthotylus junipericola</i> Lin- navuori, 1965	sap-sucking	Ribes, 1978
<i>phoenicea</i>	Miridae	<i>Phytocoris fieberi</i> Bolívar, 1881	sap-sucking	Pagola-Cardé, 2010
<i>canariensis phoenicea, turbinata</i>	Pentatomidae	<i>Acrosternum heegeri</i> Fieber, 1861	sap-sucking	Ribes, 1984
<i>phoenicea, turbinata</i>	Pentatomidae	<i>Gonocerus juniperi</i> Her- rich-Schäffer, 1839	sap-sucking/ frugivo- rous/conophagous	Cleu, 1957
<i>canariensis phoenicea, turbinata</i>	Pentatomidae	<i>Holcogaster fibulata</i> (Germar, 1831)	sap-sucking	Cleu, 1957; Linnavuori, 1965; Ribes & Gapon, 2006
<i>phoenicea, turbinata</i>	Pentatomidae	<i>Piezodorus lituratus</i> (Fabricius, 1794)	sap-sucking	Cleu, 1957
<i>phoenicea, turbinata</i>	Pseudococcidae	<i>Planococcus vovae</i> (Nasonov, 1909)	sap-sucking	Francardi & Covassi, 1992; Ben- Dov, 1994
<i>turbinata</i>	Tettigometri- dae	<i>Tettigometra virescens</i> Panzer, 1799	sap-sucking	Linnavuori, 1965
Hymenoptera				
<i>phoenicea, turbinata, canariensis</i>	Torymidae	<i>Megastigmus amicornum</i> Bouček, 1969	frugivorous/conopha- gous	Roques & Skrzypczyńska, 2003
Lepidoptera				
<i>Phoenicea</i>	Argyresthiidae	<i>Argyresthia chrysidella</i> de Peyer- imhoff, 1877	foliophagous	Lieutier & Ghaïoule, 2005; Requena & Pérez De-Gregoria, 2021
<i>phoenicea, turbinata</i>	Argyresthiidae	<i>Argyresthia trifasciata</i> Stauding- er, 1871	foliophagous	Emmet, 1982; Agassiz, 1987; Ribes Escolà & Askew, 2009
<i>phoenicea, turbinata</i>	Gelechiidae	<i>Gelechia sabinellus</i> (Zeller, 1839)	foliophagous	Requena, 2009

Juniper species	Insect family	Insect species	Type of feeding	Data source
<i>phoenicea, turbinata</i>	Gelechiidae	<i>Gelechia senticetella</i> (Staudinger, 1859)	foliophagous	Cleu, 1957; Traveset & Sans, 1994; Dionisio, 2007
<i>phoenicea, turbinata, canariensis</i>	Gelechiidae	<i>Mesophleps oxycedrella</i> (Millière, 1871)	frugivorous/conophagous	Cleu, 1957; Guido & Roques, 1996; Requena, 2009; Ribes Escolà & Askew, 2009
<i>phoenicea, turbinata</i>	Geometridae	<i>Ekboarmia atlanticaria</i> (Staudinger, 1859)	foliophagous	Zangheri, 1968; Corley 2004, Flamigni et al., 2016; Skou et al., 2017
<i>phoenicea, turbinata</i>	Geometridae	<i>Eupithecia phoeniceata</i> (Rambur, 1834)	foliophagous	Cleu, 1957; Riley & Prior, 2003; De Prins, 2007
<i>phoenicea, turbinata</i>	Geometridae	<i>Menophra nyctemeraria</i> (Geyer, 1831)	foliophagous	Cleu, 1957
<i>phoenicea, turbinata</i>	Geometridae	<i>Peribatodes ilicaria</i> (Geyer, 1833)	foliophagous	Cleu, 1957
<i>phoenicea, turbinata</i>	Geometridae	<i>Thera cupressata</i> (Geyer, 1831)	foliophagous	Wiltshire, 1985
<i>phoenicea, turbinata</i>	Lasiocampidae	<i>Gufria limosa</i> (de Villiers, 1827)	foliophagous	Cleu, 1957
<i>phoenicea</i>	Lasiocampidae	<i>Streblote panda</i> Hübner, 1820	foliophagous	Dionisio, 2007
<i>phoenicea, turbinata</i>	Noctuidae	<i>Lithophane lapidea</i> (Hübner, 1808)	foliophagous	Fritsch et al., 2014
<i>phoenicea, turbinata</i>	Noctuidae	<i>Lithophane leautieri</i> (Boisduval, 1829)	foliophagous	Cleu, 1957
<i>phoenicea</i>	Tortricidae	<i>Lozotaeniodes cupressana</i> (Duponchel, 1836)	foliophagous	Dionisio, 2007; Corley et al., 2012
<i>turbinata</i>	Tortricidae	<i>Pammene blockiana</i> (Herich-Schäffer, 1851)	frugivorous/conophagous	Klimesch, 1942
<i>phoenicea, canariensis</i>	Tortricidae	<i>Pammene oxycedrana</i> (Millière, 1876)	frugivorous/conophagous	Guido & Roques, 1996
Thysanoptera				
<i>phoenicea</i>	Thripidae	<i>Ankothrips niezabitoskii</i> (Schille, 1910)	palynivore/	Strassen zur et al., 1997
<i>phoenicea</i>	Thripidae	<i>Frankliniella intonsa</i> (Trybom, 1895)	palynivore	Strassen zur, et al., 1997
<i>phoenicea</i>	Thripidae	<i>Odontothrips ignobilis</i> Bagnall, 1919	palynivore	Strassen zur, et al., 1997
<i>phoenicea</i>	Thripidae	<i>Scirtothrips dignus</i> zur Strassen, 1986	palynivore	Strassen zur, 2003
<i>phoenicea</i>	Thripidae	<i>Tenothrips discolor</i> (Karny, 1907)	palynivore	Strassen zur, et al., 1997
<i>phoenicea</i>	Thripidae	<i>Tenothrips frici</i> (Uzel, 1895)	palynivore	Strassen zur, et al., 1997

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Table S3. Fungi and lichenized fungi connected with *Juniperus phoenicea*, *J. turbinata* and *J. canariensis*

Juniper species	Geographic region	Taxonomy	Species	Infection	Data source
<i>turbinata</i>	Italy, Sardinia	Basidiomycota, Russulales	<i>Echinodontium rywardenii</i> Bernicchia & Piga	Wood decay	Saita et al., 2011
<i>turbinata</i>	Italy, Sardinia	Basidiomycota, Hymenochaetales	<i>Hyphoderma etruriae</i> Bernicchia	Wood decay	Saita et al., 2011
<i>turbinata</i>	Italy, Sardinia, Caprera; Libya	Ascomycota, Botryosphaeriales	<i>Diplodia africana</i> Damm & Crous	Branches dieback, tree mortality	Linaldeddu et al., 2011; Evidente et al., 2012
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Sordariales	<i>Sordaria fimicola</i> (Roberge ex Desm.) Ces. & De Not.	Tree mortality	Hasna et al., 2014
<i>turbinata</i>	Italy, Sardinia	Basidiomycota, Thelephorales	<i>Lenzitopsis oxycedri</i> Malençon & Bertault	Wood	Saita et al., 2011
<i>turbinata</i>	Italy	Basidiomycota, Polyporales	<i>Neolentiporus squamosellus</i> (Bernicchia & Rywarden) Bernicchia & Rywarden	Wood	Saita et al., 2011
<i>turbinata</i>	Italy	Basidiomycota, Polyporales	<i>Trametes junipericola</i> Manjón, G. Moreno & Rywarden	Wood	Saita et al., 2011
<i>Juniperus</i> sp.	Italy	Ascomycota, Pezizomycotina	<i>Coccomyces juniperi</i> P. Karst. = <i>Colpoma juniperi</i> (P. Karst. ex P. Karst.) Dennis	Wood	Saita et al., 2011
<i>turbinata</i>	Croatia	Ascomycota, Hypocreales	<i>Nectria gymnosporangii</i> (Jaap) Rossman	Branches	Species Fungorum, 2024
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Pleosporales	<i>Microsphaeropsis olivacea</i> (Bonord.) Höhn.	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Hypocreales	<i>Trichoderma viride</i> Pers.	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Mucorophycota, Mucorales	<i>Rhizopus azygosporus</i> G.F.Yuan & S.C.Jong = <i>Rhizopus microsporus</i> Tiegh	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Pleosporales	<i>Alternaria alternata</i> (Fr.) Keissl.	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Hypocreales	<i>Fusarium oxysporum</i> Schltdl. = <i>Plectosphaerella cucumerina</i> (Lindf.) W. Gams, in Domsch & Gams	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Hypocreales	<i>Fusarium poae</i> (Peck) Wollenw.	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Hypocreales	<i>Fusarium tabacinum</i> (J.F.H.Beyma) = <i>Plectosphaerella cucumerina</i> Gams, in Domsch & Gams (Lindf.) W.Gams, in Domsch & Gams	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Hypocreales	<i>Fusarium dimerum</i> Penz.	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Eurotiales	<i>Emericella nidulans</i> (Eidam) Vuill. = <i>Aspergillus nidulans</i> (Eidam) G. Winter	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Eurotiales	<i>Aspergillus niger</i> Tiegh.	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Eurotiales	<i>Aspergillus niveus</i> Blochwitz = <i>Aspergillus neoniveus</i> Samson, S.W. Peterson, Frisvad & Varga	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Eurotiales	<i>Aspergillus candidus</i> Link	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Eurotiales	<i>Aspergillus terreus</i> Thom	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Eurotiales	<i>Penicillium crustaceum</i> Link	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Eurotiales	<i>Penicillium simplicissimum</i> (Oudem.) Thom	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Eurotiales	<i>Penicillium steckii</i> K.W. Zaleski = <i>Penicillium citrinum</i> Thom	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Eurotiales	<i>Talaromyces wortmannii</i> (Klöcker) C.R.Benj.	Roots	Abubaker & Ali, 2021

Juniper species	Geographic region	Taxonomy	Species	Infection	Data source
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Glomerellales	<i>Plectosporium tabacinum</i> (J.F.H. Beyma) M.E. Palm, W. Gams & Nirenberg = <i>Plectosphaerella cucumerina</i> (Lindf.) W. Gams, in Domsch & Gams 1972	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Mucoromycota, Mucorales	<i>Cunninghamella bertholletiae</i> Stadel = <i>Cunninghamella elegans</i> Lendn.	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Onygenales	<i>Trichophyton verrucosum</i> E.Bodin	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Hypocreales	<i>Memmoniella echinata</i> (Rivolta) Galloway = <i>Stachybotrys echinatus</i> (Rivolta) G. Sm.	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Microascales	<i>Pseudallescheria boydii</i> (Shear) McGinnis, A.A.Padhye & Ajello	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Eurotiales	<i>Talaromyces assiutensis</i> Samson & Abdel-Fattah	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Libya, Cyrenaica	Ascomycota, Eurotiales	<i>Talaromyces trachyspermus</i> (Shear) Stolk & Samson	Roots	Abubaker & Ali, 2021
<i>turbinata</i>	Italy, Sardinia	Basidiomycota,	<i>Arrasia rostrata</i> Bernicchia, Gorjón & Nakasone	Bark of living tree	Bernicchia et al., 2011
<i>turbinata</i>	Morocco	Basidiomycota, Pucciniales	<i>Gymnosporangium atlanticum</i> Guyot & Malençon (1957).	Branches	Khouader et al., 2012
<i>turbinata</i>	Morocco; Spain, Mallorca	Basidiomycota, Pucciniales	<i>Gymnosporangium clavariiforme</i> (Wulfen) DC. (1805).	Branches	Khouader et al., 2012 ; Fernández et al., 2016
<i>turbinata</i>	Morocco	Basidiomycota, Pucciniales	<i>Gymnosporangium confusum</i> sensu Dietel = <i>Gymnosporangium asiaticum</i> Miyabe ex G. Yamada	Branches	Khouader et al., 2012
<i>turbinata</i>	Morocco	Basidiomycota, Pucciniales	<i>Gymnosporangium fuscum</i> DC. = <i>Gymnosporangium sabinae</i> (Dicks.) G. Winter	Branches	Khouader et al., 2012
<i>turbinata</i>	Italy, Sardinia	Ascomycota, Helotiales	<i>Phialocephala humicola</i> S.C. Jong & E.E. Davis = <i>Chloridium humicola</i> (S.C. Jong & E.E. Davis) T.P. Wei & Y.L. Jiang, in Wei, Wang, Zhang, Luo, Jia, Zeng & Jiang	Saprotroph, needle	Pasqualetti et al., 2005
<i>turbinata</i>	Italy, Sardinia	Ascomycota, Chaetosphaeriales	<i>Kylindria keitae</i> Rambelli & Onofri	Saprotroph, needle	Pasqualetti et al., 2005
<i>turbinata</i>	Italy, Sardinia	Ascomycota, Chaetosphaeriales	<i>Cylindrotrichum oligospermum</i> (Corda) Bonord.	Saprotroph, needle	Pasqualetti et al., 2005
<i>turbinata</i>	Italy, Sardinia	Ascomycota, Incertae sedis	<i>Gyrothrix podosperma</i> (Corda) Rabenh	Saprotroph, needle	Pasqualetti et al., 2005
<i>turbinata</i>	Italy, Sardinia	Ascomycota, Incertae sedis	<i>Gyrothrix grisea</i> Piroz.	Saprotroph, needle	Pasqualetti et al., 2005
<i>turbinata</i>	Italy, Sardinia	Ascomycota, Chaetosphaeriales	<i>Circinotrichum maculiforme</i> Nees.	Saprotroph, needle	Pasqualetti et al., 2005
<i>turbinata</i>	Italy, Sardinia	Ascomycota, Sordariales	<i>Beltrania rhombica</i> Penz., 1882	Saprotroph, needle	Pasqualetti et al., 2005
<i>turbinata</i>	Italy, Sardinia	Ascomycota, Chaetosphaeriales	<i>Trimmatostroma betulinum</i> (Corda) S. Hughes	Saprotroph, needle	Pasqualetti et al., 2005
<i>turbinata</i>	Italy, Sardinia	Ascomycota, Mycosphaerellales	<i>Phaeoramularia hachijoensis</i> Matsush., 1975	Saprotroph, needle	Pasqualetti et al., 2005
<i>turbinata</i>	Italy, Sardinia	Ascomycota, Cladosporiales	<i>Cladosporium cladosporioides</i> (Fresen.) G.A. de Vries	Saprotroph, needle	Pasqualetti et al., 2005
<i>turbinata</i>	Italy, Sardinia	Ascomycota, Cladosporiales	<i>Cladosporium herbarum</i> (Pers.: Fr.) Link	Saprotroph, needle	Pasqualetti et al., 2005
<i>turbinata</i>	Italy, Sardinia	Ascomycota, Pleosporales	<i>Torula herbarum</i> (Pers.) Link	Saprotroph, needle	Pasqualetti et al., 2005

Juniper species	Geographic region	Taxonomy	Species	Infection	Data source
<i>turbinata</i>	Italy, Sardinia	Ascomycota, Pleosporales	<i>Corynespora cassicola</i> (Berk. & M.A. Curtis) CT Wei	Saprotroph, needle	Pasqualetti et al., 2005
<i>turbinata</i>	Italy, Sardinia	Ascomycota, Incertaedis	<i>Sporidesmium dioscoreae</i> M.B. Ellis = <i>Ellisembia dioscoreae</i> (M.B. Ellis) Subram.	Saprotroph, needle	Pasqualetti et al., 2005
<i>turbinata</i>	Lybia, El-Jabal El-Akhdar	Ascomycota, Lecanorales	<i>Cladonia foliacea</i> subsp. <i>endiviifolia</i> (Dicks.) Boistel = <i>Cladonia foliacea</i> (Huds.) Willd.	Branches	Saaed et al., 2021
<i>turbinata</i>	Lybia, El-Jabal El-Akhdar	Ascomycota, Lecanorales	<i>Lecanora horiza</i> (Ach.) Nyl.		Saaed et al., 2021
<i>turbinata</i>	Lybia, El-Jabal El-Akhdar	Ascomycota, Lecanorales	<i>Lecanora</i> sp.		Saaed et al., 2021
<i>turbinata</i>	Lybia, El-Jabal El-Akhdar	Ascomycota, Lecanorales	<i>Pertusaria hymenea</i> (Ach.).		Saaed et al., 2021
<i>turbinata</i>	Lybia, El-Jabal El-Akhdar	Ascomycota, Lecanorales	<i>Pertusaria</i> sp.		Saaed et al., 2021
<i>turbinata</i>	Lybia, El-Jabal El-Akhdar	Ascomycota, Lecanorales	<i>Tornabea scutellifera</i> J.R. Laundon		Saaed et al., 2021
<i>turbinata</i>	Lybia, El-Jabal El-Akhdar	Ascomycota, Lecanorales	<i>Ramalina maciformis</i> (Delile) Bory		Saaed et al., 2021
<i>turbinata</i>	Lybia, El-Jabal El-Akhdar	Ascomycota, Lecanorales	<i>Polyscaulion polycarpa</i> (Hoffm.) Frödén, Arup & Søchting		Saaed et al., 2021
<i>turbinata</i>	Lybia, El-Jabal El-Akhdar	Ascomycota, Telo-schistales	<i>Seiophora lacunosa</i> (Rupr.) Frödén		Saaed et al., 2021
<i>turbinata</i>	Lybia, El-Jabal El-Akhdar	Ascomycota, Telo-schistales	<i>Seiophora villosa</i> (Ach.) Frödén		Saaed et al., 2021
<i>turbinata</i>	Lybia, El-Jabal El-Akhdar	Ascomycota, Telo-schistales	<i>Seiophora</i> sp.		Saaed et al., 2021
<i>turbinata</i>	Lybia, El-Jabal El-Akhdar	Ascomycota, Telo-schistales	<i>Xanthoria parietina</i> (L.) Th. Fr.		Saaed et al., 2021
<i>phoenicea</i>	Spain, Retuerta de Pina	Basidiomycota, Pucciniales	<i>Gymnosporangium atlanticum</i> Guyot & Malençon (1957).	Branches	Fernández et al., 2016
<i>canariensis</i>	Spain, Canary Islands	Ascomycota, Lecanorales	<i>Lecanora sabinae</i> Hern.-Padr. & Vänškä	Wood and leaves	Hernández Padrón et al., 1991

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