



## Updated information on species, host range, and geographical distribution of powdery mildew fungi in Iran

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**Abstract:** This paper presents an updated revision on Iran's species, host ranges, and geographical distribution of powdery mildew fungi. According to our findings, 154 powdery mildew fungal species belonging to nine genera—*viz.*, *Arthrocladiella* (one species), *Blumeria* (two species), *Erysiphe* sect. *Erysiphe* (25 species), *E.* section *Microsphaera* (21 species), *E.* section *Uncinula* (11 species), *Golovinomyces* (20 species), *Leveillula* (31 species), *Neoerysiphe* (three species), *Phyllactinia* (18 species), *Podosphaera* sect. *Podosphaera* (five species), *P.* section *Sphaerotheca* (14 species), and *Sawadaea* (three species)—occur in Iran. Moreover, several records on 88 miscellaneous host plants belong to unidentified anamorphic states considered as *Oidium s.l.* spp., which are kept in a separate section. In this updated version, 673 host plant species are reported, representing 339 genera.

**Keywords:** *Ascomycota*, Biodiversity, Biotrophic fungi, Checklist, *Erysiphaceae*.

### INTRODUCTION

Fungi belonging to the *Erysiphaceae* (*Ascomycota*, *Helotiales*) are widely distributed worldwide and cause powdery mildew diseases in numerous wild and cultivated plants. The knowledge of the species of powdery mildews in a particular area is important concerning the biology and taxonomy of these fungi and for phytopathological purposes. Over the past 150 years, many fungal specimens have been collected in Iran, some of which belong to the *Erysiphaceae* family. To our knowledge, the first report of the *Erysiphaceae* from Iran was made by Rabenhorst (1871), who reported *Erysiphe lamprocarpa* Duby on *Taraxacum denudatum* Boiss. and *Gundelia*

*tournefortii* L. in Lorestan, *T. glaucum* Boiss. et Haussk. in Hamedan, *Scutellaria multicaulis* Boiss. in Kermanshah, and *Sphaerotheca castagnei* Lév. on *Euphorbia* sp. from Kellal mountains, in southern Iran. There are many records of powdery mildew fungi from Iran but information on the species and their host plants is scattered in various old plant pathological reports and some general fungal lists (Eskandari 1964a,b; Esfandiari 1946, 1947, 1948, 1951; Petrak 1941, 1949, 1953; Petrak & Esfandiari 1941; Sharif & Ershad 1966; Altman et al. 1972; Ershad 1971, 1995, 2022; Tajik-Ghanbary et al. 2005; Khodaparast et al. 2000b, 2001, 2012, 2016; Tavanai et al. 2005 and other publications presented in the list of taxa section). There have been considerable publications since the first version of this checklist was published 15 years ago (Khodaparast & Abbasi 2009). In addition, significant advancements have been made in the classification and evolutionary understanding of powdery mildew fungi, particularly due to the application of molecular techniques. For this reason, we decided to release a newly updated checklist for species and distribution of powdery mildew fungi in Iran.

### MATERIALS AND METHODS

Between 2002 and 2024 numerous new collections and herbarium specimens of *Erysiphaceae* from Iran were examined using light microscopy. In addition, a list of the species, including their host plant species and geographical distributions, was compiled using data from the literature. The generic taxonomy was based on the new genus concept introduced by Braun (1999), Braun & Takamatsu (2000), Braun et al. (2002), and Braun & Cook (2012). The species identification was based on Braun's monographs (Braun 1987, 1995), Braun & Cook (2012), and some recently published papers (Khodaparast et al. 2000a, 2002, 2016; Shin 2000, Braun et al. 2001, 2006; Takamatsu et al. 2007; Braun & Minnis 2008, Braun et al. 2018, 2019, Qiu et al. 2020, Liu et al. 2021, 2022, Bradshaw et al. 2020, 2021a,b; 2022, 2023, 2024a,b,c, Maeda et al. 2021). The host plant nomenclature follows "The International Plant Names Index" and "Euro+Med PlantBase" formerly known as "Flora Europaea" (IPNI 2024, Euro+Med 2006+). In recent years, many Iranian powdery mildew species have been sequenced (mostly in the first

author's laboratory, at least in the ITS region). Therefore, if a sequence from that species in Iran is available, its accession number is provided as molecular data following the species name.

## RESULTS

At present, nine genera and 154 species of the *Erysiphaceae* have been identified in Iran. In addition, one anamorphic genus *viz.*, *Oidium*, has been included in the checklist and is reported to occur on 88 miscellaneous plant species. Our results showed that these fungi parasitized approximately 673 host plant species representing 339 genera. Compared to the previous version of the checklist (Khodaparast & Abbasi 2009), 64 fungal species and 145 host species have been newly added. However, more collections and further taxonomic studies are expected to increase substantially our knowledge of these fungi in Iran.

### List of Taxa

Powdery mildew taxa are listed alphabetically, with the molecular data, host plant species names, locations, and related references following the taxon names. A list of *Oidium* species was added after the teleomorphic taxa. Additionally, species names used in the original publications are shown after the relevant references when they differed from those determined during our identification studies. Because some species names in the original references are unclear, some records are regarded as uncertain and placed at the end of the checklist.

#### *Arthrocladiella* Vassilkov 1960

##### *Arthrocladiella mougeotii* (Lév.) Vassilkov

Molecular data: ITS-rDNA = OM658371 (Khodaparast et al. 2021).

*Lycium* sp.; Tehran, National Botanical Garden (Abbasi et al. 2013 as *Erysiphe deutziae* (Bunkina) U. Braun & S. Takam., Khodaparast et al. 2021).

#### *Blumeria* Golovin ex Speer

##### *B. bulbiger* (Bonord.) M. Liu & U. Braun

Molecular data: ITS+28S rDNA = AB273553; chitin synthase 1 = AB273587; b-tubulin = AB273616 (Inuma et al. 2007, Liu et al. 2021).

*Bromus japonicus* Murray; Guilan Province: Amarlu (Khodaparast et al. 2001, Abbasi 2006, Inuma et al. 2007, Liu et al. 2021).

*B. japonicus* var. *japonicus* Thunb.; Karaj (Hedjaroude & Abbasi 2000).

##### *B. graminis* (DC.) Speer *sensu stricto*

Molecular data: ITS+28S rDNA = AB273550 (Inuma et al. 2007, Liu et al. 2021).

*Aegilops tauschii* Coss.; Ardebil, Karaj, Golestan, Maraveh-tappeh (Hedjaroude & Abbasi 2000, Abbasi 2006, Inuma et al. 2007, Liu et al. 2021).

##### *B. graminis* (DC.) Speer *sensu lato*

Molecular data: ITS+28S rDNA = AB273550, AB273551, AB273553, AB273554, AB273555, AB273556, AB273557, AB273558, AB273552, AB103065; chitin synthase 1 = AB273585, AB273586, AB273587, AB273588, AB273589; b-tubulin = AB273614, AB273616, AB273618, AB273617, AB273615 (Inuma et al. 2007, Liu et al. 2021).

*Aegilops crassa* Boiss var. *crassa*; Darehghaz, Kalat (Abbasi et al. 2004, Abbasi 2006).

*A. caudate* L.; Malavi (Sepahvand & Mohammadian 2012).

*A. cylindrica* Host; Kuhdasht (Sepahvand & Mohammadian 2012).

*A. triaristata* Willd.; Tehran (Ershad 1971, Amano 1986, Ershad 1995, all records as *E. graminis* DC., Abbasi 2006).

*A. triuncialis* L.; Karaj, Khoramabad (Hedjaroude & Abbasi 2000, Abbasi 2006, Sepahvand & Mohammadian 2012).

*A. umbellulata* Zhuk.; Darab, Laayzangan, Tehran, Dorood, Kuhdasht (Abbasi et al. 2004, Abbasi 2006, Sepahvand & Mohammadian 2012).

*Agropyron elongatiform* Drobov; Khoramabad (Sepahvand & Mohammadian 2012).

*A. podperae* Nab.; Khoramabad (Sepahvand & Mohammadian 2012).

*A. pertenu* (C.A. Mey.) Nevski; Lorestan: Alashtar (Sepahvand & Mohammadian 2012).

*A. repens* (L.) P. Beauv.; Ardebil (Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 all records as *E. graminis*).

*A. trichophorum* (Link) Richter; Alashtar (Sepahvand and Mohammadian 2012).

*Alopecurus* sp.; Dezful (Amano 1986, Ershad 1995 all records as *E. graminis*, Davari et al. 2015).

*Agropyron* sp.; Ardebil (Davari et al. 2015).

*Avena barbata* Pott ex link; Khoramabad (Sepahvand & Mohammadian 2012).

*A. fatua* L.; Isfahan, Karaj, Tabriz-Marand road (Khabiri 1956, Mohammadi-Doustdar 1967, Daftari & Behdad 1968, Ershad 1971, Amano 1986, Ershad 1995; all records as *E. graminis*).

*A. ludoviciana* Durieu; Gorgan, Langrood, Jajroud protected region (Ershad 1995 as *E. graminis*, Khodaparast et al. 2001, Kachooeian Javadi et al. 2006, Abbasi 2006).

*A. sativa* L.; Ahvaz, Azarbaijan, Caspian Sea area, Yazd (Scharif & Ershad 1966, Mohammadi-Doustdar 1967, Ebrahimi & Minassian 1973, Amano 1986, Ershad 1995; all records as *E. graminis*, Abbasi 2006, Samadi et al. 2010).

- Avena* sp.; Borujerd, Maraveh tappeh, Loshan-Qazvin road, Mashhad (Ershad 1971, Amano 1986, Ershad 1995 all records as *E. graminis*, Aeenfar 2006).
- Brumus danthoniae* Trin. ex C.A. Mey.; Fasham, Alashtra, Doprood, Karaj (Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995; all records as *E. graminis*, Sepahvand & Mohammadian 2012, Abbasi 2006).
- B. gedrosianus* Penzes; Golestan national park (Abbasi et al. 2004).
- B. hordeaceus* L.; Kohgiluyeh and Boyer-Ahmad, Khanahmad (Mousavinezhad et al. 2023)
- B. lanceolatus* Roth; Polezanguleh (PetraK 1941, Amano 1986, Ershad 1995; all records as *E. graminis*).
- B. madritensis* L.; Golestan national park, Sharlogh (Abbasi et al. 2004).
- B. rechingeri* Melderis; Alashtar (Sepahvand & Mohammadian 2012).
- B. rubens* L. var. *rubens*; Khozestan, Behbahan towards Aghajari (Abbasi et al. 2004).
- B. scoparius* L.; Alashtar (Sepahvand & Mohammadian 2012).
- B. sterilis* L.; Jajroud protected region, Mashhad (Kachooeian Javadi et al. 2006, Aeenfar 2006).
- B. tectorum* L.; Khoramabad, Kohgiluyeh and Boyer-Ahmad, Khanahmad (Sepahvand & Mohammadian 2012, Mousavinezhad et al. 2023).
- B. tomentellus* Boiss.; Kuhdasht (Sepahvand & Mohammadian 2012).
- Catapodium rigidum* (L.) C.E. Hubb. ex Dony; Khozestan, Sardasht, Tot-e Olia, Mazandaran, Miankaleh protection region, Ghal-e palangan (Abbasi et al. 2004).
- Bromus* sp.; unknown Location (Ershad 1971, Amano 1986, Ershad 1995; all records as *E. graminis*).
- Cynodon dactylon* (L.) Pers.; unknown Location (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995; all records as *E. graminis*).
- Dactylis glomerata* L. subsp. *glomerata*; Golestan national park (Tajik-Ghanbary 1995).
- Elymus elongatiformis* (Drobov) Assadi; Lorestan: Malavi (Sepahvand & Mohammadian 2012).
- E. hispidus* (Opiz) Melderis subsp. *hispidus*; Karaj (Hedjaroude & Abbasi 2000).
- E. hispidus* (Opiz) Melderis var. *villosus* (Hack.) Assadi; Tehran (Abbasi et al. 2004).
- E. libanoticus* (Hack.) Melderis; Karaj (Hedjaroude & Abbasi 2000).
- E. repens* (L.) Gould.; unknown Location (Abbasi et al. 2004).
- Eremopoa persica* (Trin.) Roshev.; Alashtar (Sepahvand & Mohammadian 2012).
- Festuca* sp.; Mashhad (Aeenfar 2006).
- Heteranthelium piliferum* (Banks & Soland.) Hochst.; Alashtar (Sepahvand & Mohammadian 2012).
- Hordeum brevisubulatum* Link. subsp. *violaceum* (Boiss. & Huet.) Tzvelev.; Seesakht road, Amirabad (Abbasi et al. 2004).
- H. bulbosum* L.; Karaj, Orumieh, Amarlu, Alashtar, Dorood, Khoramabad, Kuhdasht, Poldokhtar, Hamedan, Kohgiluyeh and Boyer-Ahmad, Baba Hassan Pass (Esfandiari 1946a, Mohammadi-Doustdar 1967, Ershad 1971, Amano 1986, Ershad 1995; all records as *E. graminis*; Khodaparast et al. 2001, Sepahvand & Mohammadian 2012, Abbasi 2006).
- H. distichon* L.; Amarlu (Khodaparast et al. 2001).
- H. geniculatum* All.; Hamadan, Nahavand, Alashtar (Abbasi et al. 2004, Sepahvand & Mohammadian 2012).
- H. glaucum* Steud.; Karaj, Ardebil-Khalkhal road, Jajroud protected region, Poldokhtar, Kohgiluyeh and Buyer-Ahmad, Dehdasht (Hedjaroude & Abbasi 2000, Kachooeian Javadi et al. 2006, Sepahvand & Mohammadian 2012).
- H. hexasticon* L.; Shariyar, Maragheh (Mohammadi-Doustdar 1967 as *E. graminis*).
- H. murinum* L.; Konartakhte, Bandar Gaz, Khom, Ardebil: Fandoghlu Alashtar, Karaj (PetraK 1941, Khabiri 1956, Mohammadi-Doustdar 1967, Ershad 1971, Amano 1986, Ershad 1995; all records as *E. graminis*, Sepahvand & Mohammadian 2012, Davari et al. 2015, Abbasi 2006).
- H. leporinum* Link; Ghom, Karaj, Konartakhte, Maragheh (PetraK 1941, Khabiri 1956, Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995; all records as *E. graminis*).
- H. spontaneum* K. Koch.; Kermanshah, Gilan-e Gharb, Jajroud protected region (Abbasi et al. 2004, Kachooeian Javadi et al. 2006).
- H. violaceum* Boiss. et Huet; Alashtar (Sepahvand & Mohammadian 2012).
- H. vulgare* L.; all over the country (Esfandiari 1947, Scharif & Ershad 1966, Mohammadi-Doustdar 1967, Viennot-Bourgin et al. 1969, Ershad 1971, Ebrahimi & Minassian 1973, Amano 1986; all records as *E. graminis*, Samadi et al. 2010, Davari et al. 2015, Sepahvand & Mohammadian 2012, Salahi Ardekani et al. 2016).
- Hordeum* sp.; Abe ali, Karaj, Mashhad, Guilan: Amarlou, Dorood (Esfandiari 1946a, Ershad 1971, Amano 1986, Ershad 1995; all records as *E. graminis*; Aeenfar 2006, Khodaparast et al. 2005, Sepahvand & Mohammadian 2012).
- Koeleria phleoides* (Vill.) Pers. (Linn.) Tzvelev; Behbahan (Ebrahimi & Minasian 1973 as *E. graminis*).
- Lolium multiflorum* Lam.; Alashtar, Kuhdasht (Sepahvand & Mohammadian 2012).
- L. persicum* Boiss & Hohen.: Boiss.; Tehran (Abbasi et al. 2004).

- L. rigidum* Gaudin; Khoramabad (Sepahvand & Mohammadian 2012).
- Lolium* sp.; Mashhad (Aeenfar 2006, Samadi et al. 2010).
- Lophochloa pumila* (Desf.) Bor.; Bushehr, Tangestan (Abbasi et al. 2004).
- Parapholis incurva* (L.) C. E. Hubb.; Rasht, Gorgan (Esfandiari 1948, Ershad 1971, Ershad 1995; all records as *E. graminis*)
- Phalaris minor* Retz.; Ahvaz, Karaj, Susangerd, Lorestan: Kuhdasht, Khoramabad, Mazandaran, Sari (Khabiri 1956, Ershad 1971, Ebrahimi & Minassian 1973, Amano 1986, Ershad 1995; all records as *E. graminis*, Sepahvand & Mohammadian 2012, Abbasi 2006).
- P. paradoxa* L.; Korasan Razavi: Mashhad (Abkhoo 2015).
- Phalaris* sp.; Safi abad (Ershad 1971, Ebrahimi & Minasian 1973, Amano 1986, Ershad 1995; all records as *E. graminis*).
- Phleum paniculatum* Huds.; Amarlu, Mazandaran, Qaem Shahr (Khodaparast et al. 2001, Abbasi 2006).
- Poa annua* L.; Karaj (Esfandiari 1946a, Amano 1986, Ershad 1995; all records as *E. graminis*).
- P. araratica* Trautv.; Khorasan, Shirvan (Abbasi et al. 2004).
- P. bulbosa* L.; Gachsar, Garmsar, Karaj, Tabriz, Jajroud protected region, Khoramabad-Alashtar road, Hamedan, Kohgiluyeh and Buyer-Ahmad, Yasouj (Khabiri 1956, Mohammadi-Doustdar 1967, Ershad 1971, Amano 1986, Ershad 1995; all records as *E. graminis*; Kachooeian Javadi et al. 2006, Sepahvand & Mohammadian 2012).
- P. nemoralis* L.; Lahijan (Khodaparast et al. 2001).
- P. sinaica* Steud.; Kerman, Yazd, Taft (Magnus 1899, Amano 1986, Ershad 1995; all records as *E. graminis*, Abbasi 2006, Samadi et al. 2010).
- P. trivialis* L.; Lahijan, Karaj (Khodaparast et al. 2001, Abbasi 2006).
- Secale cereale* L.; unknown location (Amano 1986, Ershad 1995; both records as *E. graminis*)
- S. montanum* Guss.; Hamedan (Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995; all records as *E. graminis*).
- Taeniatherum caput-medusae* (L.) Nevski; Tehran, Jajroud protected region (Abbasi et al. 2004, Kachooeian Javadi et al. 2006).
- Triticum aestivum* L.; Isfahan, Gorgan, Karaj, Shiraz, Tarom, Yazd (Manuchehri 1964, Mohammadi-Doustdar 1967, Daftari & Behdad 1968, Amano 1986, Ershad 1995; all records as *E. graminis*, Abbasi 2006, Samadi et al. 2010).
- Triticum boeoticum* Boiss., Qazvin, Qazvin, Rasht road, 4 km W of Kuhin, around the road (Abbasi 2006).
- T. thaouudar* Reut. ex Hausskn.; Qazvin (Abbasi et al. 2004, Host's name as *T. boeoticum* Boiss. subsp. *thaouudar* (Reut.) Schiemann).
- Triticum* sp.; Azarbaijan, Caspian Sea area, Central Province, Fars, Khorasan, Khuzestan, Tehran vicinity (Esfandiari 1946a, Scharif & Ershad 1966, Amano 1986, Ershad 1995; all records as *E. graminis*).

### ***Erysiphe* R. Hedw. ex DC.**

#### ***Erysiphe* section *Erysiphe***

##### ***Erysiphe alliariicola* M. Bradshaw & U. Braun**

Molecular data: not available

*Alliaria petiolata* (M. B.) Cavara et Grande; Karaj (Mohamadi-Doustdar 1967, Amano 1986, Ershad 1995 all records as *E. communis*).

##### ***E. aquilegiae* DC. s.l.**

Molecular data: ITS-rDNA = AB104523, OP806831; 28S-rDNA = OP806872 (Khodaparast et al. 2003, Darsaraei et al. 2024).

*Delphinium* sp.; Hezar masjid, Khorassan (Petra 1949 as *E. nitida* (Wallr.) Rabh., Esfandiari 1951 as *E. nitida*, Amano 1986 as *E. ranunculi* Greville, Scharif & Ershad 1966 as *E. nitida*, Ershad 1995 as *E. ranunculi*).

*D. saniculifolium* Boiss.; Sabz pushan (Jørstad 1960 as *E. nitida*, Amano 1986 as *E. ranunculi*, Ershad 1995 as *E. ranunculi*).

*Ranunculus* sp.; Ardebil (Davari et al. 2015).

*Thalictrum minus* L.; Golestan national park (Tajik-Ghanbary 2005).

##### ***E. aquilegiae* DC., var. *aquilegiae***

Molecular data: ITS-rDNA = OP806832; 28S-rDNA = OP806873 (Darsaraei et al. 2024).

*Aquilegia vulgaris* L.; Karaj, Hamedan (Amano 1986, Ershad 1971, Ershad 1995, Darsaraei et al. 2023c).

*Ranunculus* sp.; Chahrmaal and Bakhteyari, Kouhrang (Darsaraei et al. 2023).

##### ***E. aquilegiae* var. *ranunculi* (Grev.) R.Y. Zheng & G.Q. Chen**

Molecular data: not available

*Aquilegia vulgaris*; Hamedan (Khodaparast & Abbasi 2009).

*Ranunculus constantinopolitanus* (DC.) d'Urv.; Marand, Masuleh (Khodaparast et al. 2000, 2003).

*Ranunculus* sp.; Guilan Province, Masuleh, Zanjan Province, Taham (Darsaraei et al. 2023c).

##### ***E. betae* (Vaňha) Weltzien**

Molecular data: ITS-rDNA = AB104516, OM856016, OM856015, OM856014; 28S-rDNA = OM978354, OM978353 (Khodaparast et al. 2003, Darsaraei et al. 2024).

*Beta vulgaris* L.; all over the country (Petra & Esfandiari 1941 as *E. communis* (Wallr.) Link, Esfandiari 1946a as *E. communis*, Khabiri 1956 as *E. communis*, Viennot-Bourgin 1958 as *E. communis*,

- Eskandari 1964 as *E. polygoni*, Amano 1986, Scharif & Ershad 1966 as *E. polygoni*, Mohammadi-Doustdar 1967 as *E. communis*, Daftari & Behdad 1968 as *E. communis*, Eskandari et al. 1969 as *E. polygoni*, Altman et al. 1972 as *Erysiphe* sp., Ahmadi-Nejad 1973, Ebrahimi & Minassian 1973, as *E. polygoni*, Ershad 1971, 1995 as *E. polygoni*, Samadi et al. 2010, Khodaparast et al. 2001, Davari et al. 2015, Darsaraei et al. 2023c).
- B. vulgaris* var. *cicla* Moq.; unknown location (Amano 1986 as *E. communis*).
- Dysphania ambrosioides* (L.) Mosyakin & Clemants; Guilan: Talesh (Sharifi et al. 2013).
- E. buhrii* U. Braun**  
Molecular data: ITS-rDNA = AB128924, OM856005; 28S-rDNA = OM978346 (Khodaparast et al. 2003, Darsaraei et al. 2024).
- Acanthophyllum microcephalum* Boiss.; Karaj (Abbasi & Khodaparast 2003).
- Acanthophyllum* cf. *mucronatum* C.A. Mey.; Alborz, Karaj (Darsaraei et al. 2023).
- Acanthophyllum* sp.; Karaj (Khodaparast et al. 2003)
- Dianthus barbatus* L.; Karaj, Tabriz, Tehran (Petra & Esfandiari 1941, Esfandiari 1946a, Scharif & Ershad 1966, Amano 1986, Ershad 1995 as *Oidium dianthi* Jacz.).
- Mesostemma kotschyana* (Fenzl ex Boiss.) Vved.; Lorestan, Oshtrankouh (Sepahvand et al. 2021b, Darsaraei et al. 2024).
- Minuartia lineata* (Boiss.) Bornm.; Eastern Alborz, Nizva (Abbasi & Khodaparast 2003).
- Silene latifolia* Poir.; Meshkinshahr-Ahar road (Darsaraei et al. 2023d).
- E. caulicola* (Petr.) U. Braun**  
Molecular data: ITS-rDNA = OP806838; 28S-rDNA = OP806880 (Darsaraei et al. 2024).
- Astragalus* sp.; Bastam (Petra 1949, Esfandiari 1951, Ershad 1995 all records as *M. caulicola*).
- A. glycyphyllos* L.; Golestan national park (Tajik-Ghanbary 1995, Darsaraei et al. 2023b, 2024).
- E. circaeae* L. Junell**  
Molecular data: ITS-rDNA = AB104517, OM856013 (Khodaparast et al. 2005, Darsaraei et al. 2024).
- Circaea lutetiana* L.; Talesh (Khodaparast et al. 2000, Khodaparast et al. 2003, Darsaraei et al. 2024).
- E. convolvuli* DC. s.l.**  
Molecular data: ITS-rDNA = AB104518; 28S-rDNA = AB102943.
- Convolvulus dorycnium* L. subsp. *subbirsutus* (Regl. et Schalh.) Saad; Golestan national park (Tajik-Ghanbary 2005).
- C. pilosellifolius* Desr. In Lam.; Mashad (Amano 1986, Ershad 1971, 1995).
- E. convolvuli* DC. var. *convolvuli***  
Molecular data: ITS-rDNA = OM855994.
- C. arvensis* L.; Widespread (Esfandiari 1946a, Khabiri 1956 as *E. communis* Wall.: Fr., Mohammadi-Doustdar 1967, Amano 1986, Ebrahimi & Minassian 1973, Ershad 1971, 1995, Tajik-Ghanbary 1995, Niknam & Guya 1996, Khodaparast et al. 2001, 2003; Kachooeian Javadi et al. 2006, Sepahvand 2010, Samadi et al. 2010, Davari et al. 2015, Darsaraei et al. 2024).
- Convolvulus* sp.; Rasht, Zanjan (Rostrup 1908, Amano 1986, Ershad 1995, Darsaraei et al. 2024).
- E. convolvuli* var. *calystegiae* U. Braun**  
Molecular data: ITS-rDNA = OM855993.
- Calystegia sepium* (L.) R. Br.; Hamedan, Lahijan, Neyshaboor (Khabiri 1956 as *E. communis*, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995).
- Calystegia* cf. *sepium* (L.) R. Br.; Kerman Province, Jiroft (Darsaraei et al. 2024).
- Convolvulus* sp.; Razavi Khorasan, Neyshabour, East Azarbaijan, Maragheh, Tera, Varamin (Darsaraei et al. 2024).
- E. cruchetiana* S. Blumer**  
Molecular data: ITS-rDNA = OP806845; 28S-rDNA = OP806885.
- O. spinosa* L.; Hamedan (Amano 1986, Ershad 1971, 1995, Darsaraei et al. 2023b, 2024).
- Ononis* sp.; Hamedan (Mohammadi-Doustdar 1967, Ershad 1995, Darsaraei et al. 2023b, 2024).
- E. cruciferarum* Opiz ex L. Junell *sensu stricto*.**  
Molecular data: not available.
- Alyssum dasycarpum* Steph. ex Willd.; unknown location (Ershad 1971, 1995 as *E. communis*).
- A. hirsutum* M.Bieb.; unknown location (Amano 1986, Ershad 1971, 1995 as *E. communis*).
- A. strigosum* Banks & Sol.; Amarlou (Khodaparast et al. 2000).
- A. repens* Baumg.; unknown location (Amano 1986).
- Alyssum* sp.; Lighvan (Viennot-Bogin 1958, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 all records as *E. communis*).
- E. heraclei* DC.**  
Molecular data: ITS-rDNA = AB104513, OM856023, OM856022, OM856021, OM856020, OM856019; 28S-rDNA = AB103066, OM978333; 28S-rDNA = AB103066, AB103067, AB103068, AB103069, AB103366, AB103071 (Khodaparast et al. 2003, 2005, Darsaraei et al. 2024).
- Ammi majus* L.; Rostam abad, Gachsaran (Khodaparast et al. 2000, Mousavinezhad et al. 2023).
- Anethum graveolens* L.; Ahvaz, Isfahan, Yazd (Ebrahimi & Minasian 1973, Amano 1986, Sharifnabi & Nakuei 1996, Samadi et al. 2010).
- Bifora testiculata* (L.) Spreng.; Amarlou (Khodaparast et al. 2001, 2003, 2005).
- Bunium* sp.; South Khorasan, Birjand (Darsaraei et al. 2024).

- Carum persicum* Boiss.; Kuhe Jupar (Magnus 1899, Amano 1986, Ershad 1995).
- Coriandrum* sp.; Ahar, Mashhad, Orumieh (Petrak 1953, Amano 1986, Ershad 1971, Ershad 1995).
- C. sativum* L.; Mashhad (Amano 1986, Ershad 1971, 1995).
- Chaerophyllum aureum* L.; Amarlu (Khodaparast et al. 2000, 2005).
- Conium maculatum* L.; Deileman (Khodaparast et al. 2001, 2003, 2005).
- Daucus carota* L.; Caspian Sea area, Central Province, Dezful, Isfahan, Karaj, Mashhad, Tabriz, Varamin, Tehran vicinity, Meshkinshahr-Ahar road, Orumieh, Orumieh-Mahabad road, Yazd (Esfandiari 1946a as *E. umbelliferarum*, Scharif & Ershad 1966 as *E. umbelliferarum* de Bary, Mohammadi-Doustdar 1967 as *E. umbelliferarum*, Daftari & Behdad 1968, Ebrahimi & Minassian 1973 as *Erysiphe* sp., Amano 1986, Ershad 1971, 1995, Khodaparast et al. 2003, 2005, Samadi et al. 2010).
- D. carota* L. subsp. *maximus* (Desf.) Ball; Aghghalleh, Gorgan, Tehran, (Amano 1986, Mohammadi-Doustdar 1967, Ershad 1971, 1995, host name as *Daucus maximus* Desf.).
- Eryngium* sp.; Ardebil-Meshkinshahr road, Zanjan, Takhte Soleiman.
- E. caucasicum* Trautv.; Deileman-Asiabar road (Khodaparast et al. 2000, 2003).
- Falcaria* sp.; unknown location (Amano 1986).
- F. vulgaris* Bernh.; Hamedan, Kordestan, Marivan, Karaj, Kermanshah, Tehran, Toyserkan, Golestan national park, Zanjan-Miyaneh road, Orumieh-Mahabad road, Shahindej-Takab road, Khalkhal-Ardebil road, Sofian-Shabastar road, Meshkinshahr-Ahar road, Orumieh-Sero road (Wettstein 1885, Khabiri 1956, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1971, Ershad 1995, Tajik-Ghanbary 1995, Hedjaroude & Abbasi 2000, Samadi et al. 2010).
- Ferula* sp.; unknown location (Amano 1986, Ershad 1995).
- Heracleum persicum* Desf.; Fasham (Amano 1986, Ershad 1971, 1995).
- H. sphondylium* L.; unknown location (Amano 1986).
- Pastinaca sativa* L.; unknown location (Amano 1986, Ershad 1995).
- Petroselinum crispum* (Mill.) Fuss; Sumaehsara (Sharifi et al. 2013, host name as *P. hortense*).
- P. sativum* Hoffm.; Kashan (Mohammadi-Doustdar 1967 as *E. umbelliferarum*, Amano 1986, Ershad 1995).
- Pimpinella affinis* Ledeb.; Amarlu, Sofian-Shabastar road (Khodaparast et al. 2001, 2003, 2005).
- P. tragium* Vill.; Ghamsar, Kandeivan (Mohammadi-Doustdar 1967, as *E. umbelliferarum*, Amano 1986, Ershad 1995).
- Scandix pecten-veneris* L.; Jupar (Magnus 1899, Amano 1986, Ershad 1995).
- Scandix* sp.; Amarlu (Khodaparast et al. 2001).
- Torilis leptophylla* (L.) Rchb.f.; Masuleh (Amano 1986, Ershad 1971, 1995, Khodaparast et al. 2000, 2003, 2005).
- T. nodosa* (L.) Gaertn.; Rostam abad (Khodaparast et al. 2001).
- Torilis* sp.; Kohgiluyeh and Boyer-Ahmad, Khanahmad (Mousavinezhad et al. 2023).
- Turgenia latifolia* (L.) Hoffm.; Bastam, Marand, Hamedan, Iasuj, Tabriz (Bornmuller 1908, Mohammadi-Doustdar 1967 as *E. umbelliferarum*, Amano 1986, Ershad 1971, Ershad 1995, Niknam & Guya 1996, Darsaraei et al. 2024).
- E. howeana* U. Braun**  
Molecular data: ITS-rDNA = OM856007; 28S-rDNA = OM978348 (Darsaraei et al. 2024).
- Oenothera* sp.; Ardebil (Davari et al. 2015, Sharifi et al. 2020a, Darsaraei et al. 2024).
- E. limonii* L. Junell**  
Molecular data: not available.
- Limonium meyeri* (Boiss.) Kuntze; Tabriz (Tavanai & Khodaparast 2007).
- E. lycopsidis* R.Y. Zheng & G.Q. Chen**  
Molecular data: ITS-rDNA = OM856006; 28S-rDNA = AB103072, OM978347 (Khodaparast et al. 2003, Darsaraei et al. 2024).
- Anchusa arvensis* subsp. *orientalis* (L.) Nordh. (Syn. *A. ovata* Lehm.); Amarlu, Ardebil, Khalkhal-Ardebil road, Ardebil-Meshkinshahr road; Sistan and Baluchistan: Zahak (Khodaparast et al. 2000, 2005, Abkhoo 2015, Darsaraei et al. 2024).
- A. italica* Retz.; Tabriz (Khabiri 1958 as *E. horridula* (Wallr.) Lév., Amano 1986 as *E. horridula* and host name as *A. azurea* Mill., Ershad 1995 as *E. asperifoliorum* Grev., Niknam & Guya 1996).
- Alkanna orientalis* (L.) Boiss.; Tabriz (Niknam & Guya 1996).
- E. malvae* V.P. Heluta**  
Molecular data: ITS-rDNA = OM856003, OM856002; 28S-rDNA = OM978345, OM978339 (Darsaraei et al. 2024).
- Malva sylvestris* L.; Guilan Province, Manjil, Roudbar, Yazd Province, Yazd (Khodaparast et al. 2010, Samadi et al. 2010, Darsaraei et al. 2024).
- Malva* sp.; Tehran (Darsaraei et al. 2024).
- Erysiphe mayorii* S. Blumer**  
Molecular data: not available.
- Lactuca macrophylla* (Willd.) A.Gray (Syn: *Mulgedium cacaliifolium* (M. Bieb.) DC.; Guilan Province, Asalem (Darsaraei et al. 2024 as *Erysiphe mayorii* var. *japonica* U. Braun & Y. Nomura).
- E. medicaginis* L. Kiss, L. Kelly & Vaghefi**

Molecular data: ITS-rDNA = AB104519; 28S-rDNA = AB102942 (Khodaparast et al. 2003, 2005, Darsaraei et al. 2022, 2023b).

*Medicago coronata* (L.) Bartal.; Fasham (Khabiri 1956 as *E. Polygoni* DC., Amano 1986, Ershad 1995 as *E. pisi* DC.).

*M. sativa* L.; Damavand, Fasham, Isfahan, Lushan, Saghez, Khoramabad, Deileman –Kalishom road (Khabiri 1956 as *E. polygoni*, Viennot-Bourgin 1958, Scharif & Ershad 1966, Mohammadi-Doustdar 1967, Amano 1986 as *E. communis*, Ershad 1971, Ershad 1995, Sepahvand et al. 2002, Khodaparast et al. 2000, 2003, 2005, Sepahvand 2010, Darvishnia & Vafaei 2018, as *E. pisi* DC., Darsaraei et al. 2023b, 2024).

***Erysiphe neolycopersici* (L. Kiss) H.Y. Hsiao & Y.M. Shen**

Molecular data: ITS-rDNA = PP177477 (Davari et al. 2015).

*Lycopersicon esculentum* L.; Ardebil province., Ardebil (Davari et al. 2015 as *Pseudoidium neolycopersici* (L. Kiss) L. Kiss, Darsaraei et al. 2024).

***E. paeoniae* R.Y. Zheng & G.Q. Chen**

Molecular data: not available.

*Paeonia* sp.; Ardebil province, Khalkhal (Ershad 1971, Amano 1986 as *E. communis*, Ershad 1995 as *E. Ranunculi*, Darsaraei et al. 2024).

***E. pisi* DC.**

Molecular data: ITS-rDNA = OP806846; 28S-rDNA = OP806886 (Darsaraei et al. 2023b, 2024).

*Pisum* sp.; Abe Ali, Karaj (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995).

*P. sativum* L.; Ramin, Tehran vicinity, Guilan province: Roudbar (Scharif & Ershad 1966 as *Erysiphe* sp., Ebrahimi & Minassian 1973 as *E. polygoni*, Amano 1986, Ershad 1995).

***E. pisi* DC. sensu lato**

*Astragalus alpinus* L.; Lorestan province: Biranshahr (Darvishnia & Vafaei 2018 as *Erysiphe pisi* var. *pisi*).

*Lathyrus annuus* L.; Lorestan province: Khorranabad (Darvishnia & Vafaei 2018 as *Erysiphe pisi* var. *pisi*).

*Medicago hispida* L.; Lorestan province: Alashtar (Darvishnia & Vafaei 2018 as *Erysiphe pisi* var. *pisi*).

*Melilotus indicus* (L.) All.; Golestan national park (Tajik-Ghanbary 2005).

*M. officinalis* (L.) Pall.; East Azarbaijan province: Tabriz, Moghan; Yazd Province: Mehris, Banadak Sadat (Niknam & Guya 1996, Samadi et al. 2010, Davari et al. 2015).

*Trigonella foenum-graecum* L.; Ramin (Amano 1986 as *E. communis*, Ebrahimi & Minassian 1973, Ershad 1971, 1995).

*Vicia* sp.; Karaj (Ershad 1971, 1995).

*V. faba* L.; Abadan (Mohammadi-Doustdar 1967, Ershad 1995).

*V. peregrina* L.; Alborz Province: Karaj (Ershad 1971, 1995).

*V. persica* Boiss.; Damavand, Fasham (Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Ershad 1995).

*Vigna unguiculata* (L.) Walp.; Mazandran (Kaiser et al. 1968, Ershad 1995; host name as *V. sinensis* (L.) Endl.).

**Note:** Darsaraei et al. (2023b) concluded that *E. pisi* is probably restricted to the genus *Pisum*. The records assigned to *E. pisi* on some of the hosts mentioned above from Iran, cannot be verified without exact molecular studies. Therefore, we temporarily assign these reports to *E. pisi sensu lato*.

***E. polygoni* DC.**

Molecular data: ITS-rDNA = AB104522 (Khodaparast et al. 2003, Darsaraei et al. 2023c).

*Persicaria maculosa* Gray L.; Karaj, Tehran, Manjil, Jajroud protected region, Isfahan (Khabiri 1956, Amano 1986, Ershad 1971, 1995, Khodaparast et al. 2000, Kachooeian Javadi et al. 2006, Darsaraei et al. 2023c, 2024).

*Polygonum alpestre* C. A. Mey; unknown location (Amano 1986, Ershad 1995).

*P. aviculare* L.; Isfahan, Fasham, Ghamsar, Karaj, Mashhad, Deileman, Golestan national park, Ardebil-Khalkhal road, Khoramabad, Sistan and Baluchistan: Zahak, East Azarbaijan, Tabriz, Taft (Esfandiari 1946a, Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1971, 1995, Tajik-Ghanbary 1995, Khodaparast et al. 2000, Sepahvand et al. 2002, Sepahvand 2010, Samadi et al. 2010, Abkhoo 2015, Darsaraei et al. 2023c, 2024).

*P. bellardii* All.; Isfahan (Amano 1986; Ershad 1971, 1995).

*P. erioptera* L.; South Khorasan, Birjand (Abkhoo 2015).

*P. lapathifolium* L.; Jajroud protected region (Kachooeian Javadi et al. 2006).

*P. mite* Schrank; Karaj (Esfandiari 1946a, Amano 1986, Ershad 1995).

*P. patulum* M.Bieb.; Isfahan, Tabriz, Khoramabad, Zanjan (Amano 1986, Ershad 1995, Niknam & Guya 1996, Sepahvand 2010, Darsaraei et al. 2023c, 2024).

*P. polycnemoides* Jaub & Spach; Mahi dasht (Ershad 1995).

*P. rottboellioides* Jaub. & Spatch; Tehran (Khabiri 1956, Amano 1986, Ershad 1995).

*Polygonum* sp.; Borujerd, Sufian-Shabastar road, Ardebil-Meshkinshahr road, Zanjan, Guilan, Yazd Province: Mehris, Banadak Sadat (Ershad 1971, Amano 1986, Ershad 1995, Khodaparast et al.

- 2003, Samadi et al. 2010, Darsaraei et al. 2023c, 2024).
- E. punicae* T.M. Achundov**  
Molecular data: not available.  
*Punica granatum* L.; Roodbar, Tales (Khodaparast et al. 2000).
- Erysiphe radulescui* Docea**  
Molecular data: ITS-rDNA = OM856026, OM856025, OM856024; 28S-rDNA = AB102944, AB079684, OM978337, OM978336 (Khodaparast et al. 2005, Darsaraei et al. 2024).  
*Barbarea* sp.; Fars Province, Sepidan, Cheleh-Gaah (Abbasi et al. 2019).  
*Brassica oleracea* L.; Abadan (Mohammadi-Doustdar 1967 as *E. communis*).  
*B. napus* L.; Dezful, Yazd, Ardebil: Bilesovar-Parsabad road, Sistan and Baluchistan: Zahak (Amano 1986, Ershad 1995 as *E. Polygoni*, Samadi et al. 2007, Samadi et al. 2010, Davari et al. 2015, Abkhoo 2015).  
*B. cf. nigra* (L.) K. Koch; Guilan province, Amarlou, Bararoud, Damash (Darsaraei et al. 2024).  
*B. rapa* L.; Dezful (Amano 1986, Ershad 1995 as *E. polygoni*).  
*Brassica* sp.; Karaj, Markazi Province, Arak (Amano 1986, Mohammadi-Doustdar 1967 as *E. communis*, Ershad 1995 as *E. Communis*, Darsaraei et al. 2024).  
*Conringia planisiligua* Fish. & C.A. Mey; Masuleh (Khodaparast et al. 2000, host name as *Conringia planisiligua* Fish. & C.A. Mey).  
*Crambe orientalis* L.; Fasham, Golestan national park (Ershad 1971 as *E. communis*, Amano 1986, Ershad 1995 as *E. communis*, Tajik-Ghanbary 1995).  
*Crambe* sp., Jajroud protected region (Kachooeian Javadi et al. 2006).  
*Descurainia sophia* (L.) Webb et Prantl; Lahijan, Tabriz, Ardebil-Meshkinshar road, Ardebil Khalkhal road (Viennot-Bourgin 1958 as *E. communis*, Mohammadi-Doustdar 1967 as *E. communis*, Amano 1986, Ershad 1971, 1995 as *E. communis*, Samadi et al. 2010).  
*Fumaria* sp.; unknown location (Mohammadi-Doustdar 1967 as *E. communis*, Ershad 1995 as *E. communis*).  
*Iberis* sp. Dezful; (Amano 1986, Ershad 1995 as *E. polygoni*).  
*Lepidium campestre* L.; unknown location (Amano 1986, Ershad 1995 as *E. communis*).  
*L. draba* L.; Mashhad, Margoan, Zanjan Province, Miyaneh (Khodaparast et al. 2000, 2005 Aeenfar 2006, Samadi et al. 2010, Salahi Ardekani et al. 2016).  
*L. draba* subsp. *chalepense* (L.) P.Fourn.; Golestan national park (Tajik-Ghanbary 1995).  
*L. latifolium* L.; Karaj, Rude hen, Golestan national park, Jajroud protected region, South Khorasan, Sar-Bisheh (Viennot-Bourgin 1958 as *E. communis*, Mohammadi-Doustdar 1967 as *E. communis*, Amano 1986, Ershad 1995 as *E. communis*, Tajik-Ghanbary 1995, Kachooeian Javadi et al. 2006).  
*L. sativum* L.; unknown location (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 both records as *E. communis*).  
*Raphanus sativus* L.; Ardebil, Sarab, Tabriz (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1971, 1995 all records as *E. communis*, Davari et al. 2015).  
*Rapistrum rugosum* (L.) All.; Ardebil, Gorgan, Golestan national park, Ardebil-Khalkhal road, Orumieh-Sero road (Mohammadi-Doustdar 1967 as *E. communis* (Wallr.) Fr., Amano 1986, Ershad 1995 as *E. communis*, Khodaparast et al. 2000, Tajik-Ghanbary 1995, Darsaraei et al. 2024).  
*Sinapis arvensis* L.; Gorgan, Khalkhal-Ardebil road, Gachsaran (Amano 1986, Ershad 1971, 1995 as *E. communis*, Mousavinezhad et al. 2023).  
*Sisymbrium irio* L.; Tabriz (Niknam & Guya 1996).  
*S. cf. orientale* L.; Amarlu (Khodaparast et al. 2000).  
***E. rumicicola* Darsaraei, Khodap., Afshan & U. Braun**  
Molecular data: ITS-rDNA = OP326702; 28S-rDNA = OP326704 (Darsaraei et al. 2023c).  
*Rumex* sp.; Torghabeh, Ardebil, Yazd Province: Deh Bala (Amano 1986, Ershad 1971, 1995, Samadi et al. 2010, Davari et al. 2015, all records as *E. polygoni*).  
*R. acetosa* L.; Fasham, Tehran (Mohammadi-Doustdar 1967, Amano 1986 as *E. communis*, Ershad 1971, 1995, all records as *E. polygoni*).  
*R. alveolatus* Los.-Losinsk.; Mashhad (Aeenfar 2006, as *E. polygoni*).  
*R. chalepensis* Mill.; Isfahan Province, Isfahan (Darsaraei et al. 2023c, 2024).  
*R. conglomeratus* Murry; Sistan and Baluchistan: Zahak (Amano 1986, Ershad 1995, Abkhoo 2015, all records as *E. polygoni*).  
*R. crispus* L.; Damavand, Khorram Abad, Tabriz-Marand road, Orumieh-Sero road, Ardebil-Khalkhal road, Dena protected area, Kohgiluyeh and Boyer-Ahmad Province, Kakan Rural (Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1971, 1995, Tajik-Ghanbary 1995, Salahi Ardekani et al. 2016 all records as *E. polygoni*, Darsaraei et al. 2023c, 2024).  
*R. crispus* L. var. *strictissimus* Rech. F.; Golestan national park (Tajik-Ghanbary 1995).  
*R. dentatus* L.; unknown location (Amano 1986, Ershad 1971, 1995 as *E. polygoni*).  
*R. patientia* L.; Tabriz (Ershad 1995, Niknam & Guya 1996 as *E. polygoni*).



*R. scutatus* L.; Fasham (Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1971, 1995, all records as *E. polygoni*).

***E. sedi* U. Braun**

Molecular data: ITS-rDNA = OM856009; 28S-rDNA = OM978350 (Darsaraei et al. 2024).

*Bryophyllum* sp.; Guilan, Rasht (Darsaraei et al. 2024).

*Kalanchoe* sp.; Guilan, Rasht (Darsaraei et al. 2024).

***E. urticae* (Wallr.) S. Blumer**

Molecular data: ITS-rDNA = AB104524, OM856018 (Khodaparast et al. 2003, Darsaraei et al. 2024).

*Urtica dioica* L.; Amarlu, Sumaehsara, Talesh (Khodaparast et al. 2000, 2003).

***Erysiphe* section *Microsphaera***

***E. alphitoides* (Griffon & Maubl.) U. Braun & S. Takam.**

Molecular data: ITS-rDNA = OM855991, OM855990, OM855989, OM855988, OM855987, OM855985, OM855982; 28S-rDNA = OM978331 (Darsaraei et al. 2023a).

*Castanea sativa* Mill.; Shaft, Lahijan (Sharifi et al. 2013 as *E. alphitoides* (Griffon & Maubl.) U. Braun & S. Takam.).

*Quercus castaneifolia* C. A. Mey.; Astara, Gorgan, Lorestan, Mazandran, Pole zanguleh, Ramsar, Shirgah (Esfandiari 1946a as *Microsphaera alphitoides*, Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Scharif and Ershad 1966 as *M. alni* var. *quercina* Neg., Ershad 1971, 1995 as *M. alphitoides*, Amano 1986 as *M. alphitoides*).

*Q. infectoria* Oliv.; West Azarbaijan Province, Piranshar-Sardasht road, Sardasht- Baneh road; Kermanshah Province, Gahvareh-Kouzara road; Lorestan Province, Alashtar (Sepahvand 2000).

*Quercus infectoria* Oliv. Subsp. Boisieri; Lorestan province: Khoramabad (Sepahvand et al. 2015).

*Q. macranthera* Fisch. & Mey. ex Hohen.; Arasbaran forest, Arasbaran: Andab (Tavanaei et al. 2002b; Abbasi et al. 2013 as *Erysiphe castaneigena* U. Braun & Cunningt., Darsaraei et al. 2023a).

*Q. petraea* (Matt.) Liebl.; Arasbaran forest (Tavanaei et al. 2001).

*Quercus* sp.; Bisheh, Caspian sea area, Ziyarat (Esfandiari 1946a as *M. alni* (DC.) Wint. var. *extensa*, Mohammadi-Doustdar 1967, Ershad 1971, Amano 1986 as *M. alni*, Ershad 1995 as *M. alphitoides*).

***E. astragali* DC. emend. Darsaraei et al. 2024**

(including *E. coluteae* (Kom.) U. Braun & S. Takam. and *E. crispula* (U. Braun) U. Braun & S. Takam.).

Molecular data: ITS-rDNA = OP806834, OP806835, OP806841, OP806842, OP806843, OP806844, OP806839, OP806840; 28S-rDNA = OP806876,

OP806877, OP806883, OP806884, OP806881, OP806882 (Darsaraei 2023a, 2023b).

*Astragalus basineri* Trautv.; Golestan national park (Tajik-Ghanbary 2005 as *M. astragali*).

*A. glycyphyllos* L.; Golestan Province, Golestan national park (Tajik-Ghanbary 2005, Darsaraei 2023a, 2023b).

*A. iranicus* Bunge; Lorestan Province, Oshtorankuh (Sepahvand et al. 2021b, as *E. polygoni*, Darsaraei et al. 2023a, 2023b).

*A. kahiricus* DC.; South Khorasan, Tabas, Yazd Province, Tabas-Robot road (Darsaraei et al. 2023a, 2023b).

*A. ovinus* Boiss.; Lorestan Province, Azna, Kamandan (Sepahvand et al. 2021b, Darsaraei et al. 2023a, 2023b).

*Astragalus* sp.; Ardabil Deileman, Zanjan (Amano 1986, Ershad 1995, Khodaparast et al. 2000, 2003; all records as *M. astragali*).

*Colutea arborescens* L.; Fasham (Viennot-Bourgin 1958., Mohammadi-Doustdar 1967, Amano 1986, Ershad 1971, 1995; all records as *M. coluteae*).

*C. buhsei* (Boiss.) Shapar.; Alborz Province, Golestan national park (Tajik-Ghanbary 2005, (Darsaraei et al. 2023a, 2023b).

*C. cilicica* Boiss. & Ball.; Arasbaran forests (Tavanaei et al. 2009).

*Colutea* sp.; Tehran (Darsaraei et al. 2023a, 2023b).

***E. begoniicola* U. Braun & S. Takam.**

Molecular data: not available.

*Begonia* sp.; Tehran (Scharif & Ershad 1966, Amano 1986, Ershad 1995).

*Begonia fuchsoides* Hook.; Rasht (Sharifi et al. 2013).

***E. berberidis* DC. emend. Liu et al. 2022** (including *Erysiphe dimorpha* (Y.N. Yu & Z.Y. Zhao) U. Braun & S. Takam., *Erysiphe multappendicis* (Z.Y. Zhao & Y.N. Yu) U. Braun & S. Takam.).

Molecular data: ITS-rDNA = OL690577, OL690576, OL690575, OL690574, OL690573, OL690572, OL690571; 28S-rDNA = OL690554, OL690553, OL690552, OL690551, OL690550, OL690549, OL690548, OM978335; 28S-rDNA = AB103076 (Khodaparast et al. 2005, Darsaraei 2023a, Liu et al. 2022).

*Berberis vulgaris* L.; Damavand, Fasham, Karaj, Ghachsar, Mazandran, Arasbaran forest (Esfandiari 1948, Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1971, 1995; all records as *M. berberidis* (DC.) Lév.).

***E. berberidis* DC. var. *berberidis***

*Berberis vulgaris* L.; East Azarbaijan Province, Arasbaran, North Khorasan, Shirvan (Tavanaei et al. 2009, Darsaraei et al. 2023a).

*Berberis* sp. (Darsaraei et al. 2023a).

- E. berberidis* var. *asiatica*** (U. Braun) U. Braun & S. Takam.  
*Berberis integerrima* Bunge, Yazd Province, Yazd, (Samadi et al. 2010, Darsaraei et al. 2022).
- B. vulgaris* L. East Azarbaijan: Arasbaran forests (Tavanaei et al. 2009).
- Berberis* sp., Tehran Province, Tehran, East Azerbaijan Province, Gilan Province, Damash, on *Berberis* sp. (Tavanaei et al. 2009, Darsaraei et al. 2023a).
- E. berberidis* var. *dimorpha* (Y.N. Yu & Z.Y. Zhao) L. Liu & U. Braun**  
*Berberis vulgaris* L.; Deileman-Kalishom road (Khodaparast et al. 2000, 2003, 2005 as *M. multappendicis* (Z.Y. Zhao & Y.N. Yu) U. Braun & S. Takam.).
- B. thunbergii* DC.; Astrara, Rasht, Isfahan, Ardebil (Khodaparast & Abbasi 2009, Davari et al. 2015, Sharifi et al. 2020a as *M. multappendicis*).
- B. aquifolium* Pursh; Alborz (Darsaraei et al. 2023a).
- Berberis* sp. Qazvin Province, Qazvin, North Khorasan Province, Shirvan, Namanlu, Gololsarani, Zoghapan mount (Abbasi et al. 2019, Darsaraei et al. 2023a).
- E. bremeri* U. Braun emmend. Darsaraei et al. 2024**  
(including *Erysiphe sophorae* (Gándara) U. Braun).  
Molecular data: ITS-rDNA = OP806836, OP806837; 28S-rDNA = AB103077, OP806878, OP806879 (Khodaparast et al. 2005, Darsaraei 2023a, 2023b).
- Alhagi maurorum* Medic.; Kordestan, Yazd (Rabenhorst 1871 as *E. martii* Lév., Amano 1986 as *E. alhagi*, Ershad 1995 as *E. martii*, Samadi et al. 2010).
- Alhagi* sp.; Roodbar, Orumieh-Mahabad road (Khodaparast et al. 2000, 2003, 2005 as *M. alhagi*).
- Sophora pachycarpa* C.A. May.; Yazd (Samadi et al. 2010, Darsaraei et al. 2023a, 2023b).
- Sophora* sp.; Neyshabur (Darsaraei et al. 2023b).
- E. corylacearum* U. Braun & S. Takam.**  
Molecular data: ITS-rDNA = MF668615, OM856017, MF668615; 28S-rDNA = OM978355, OM978338 (Khodaparast et al. 2019, Darsaraei et al. 2023a).
- Corylus avellana* L.; East Azerbaijan: Ahar, Gilan: Rasht, Lahijan (Arzanlou et al. 2018, Khodaparast et al. 2019, Darsaraei et al. 2023a).
- E. ehrenbergii* (Lév.) U. Braun, M. Bradshaw & S. Takam.**  
Molecular data: ITS-rDNA = OM856000, OM855999, OM855998, OM855997, OM855996, OM855995; 28S-rDNA = OM978344, OM978343, OM978342, OM978341, OM978334 (Darsaraei et al. 2023a).
- Lonicera caucasica* pall. (Tavanaei et al. 2002a, 2009 as *E. lonicera* DC. var. *lonicera* Darsaraei et al. 2023a).
- L. floribunda*; Mazandaran: Kiasar National Park (Abbasi and Mohseni-Chamazkoti 2014 as *Erysiphe lonicerae* var. *ehrenbergii* (Lév.) U. Braun & S. Takam.).
- L. iberica* M. Bieb.; Arasbaran (Tavanaei et al. 2002 as *Erysiphe lonicerae* var. *ehrenbergii*, Darsaraei et al. 2023a).
- L. numulariifolia* Joub & Spach.; Deileman-Amarlu road (Khodaparast et al. 2000 as *M. erlangshanensis*).
- Lonicera* sp.; Ardebil, Heruabad (Khodaparast & Abbasi 2009, Darsaraei et al. 2023a).
- E. euonymicola* U. Braun**  
Molecular data: ITS-rDNA = OM856012; 28S-rDNA = OM978352 (Darsaraei et al. 2023a).
- Euonymus japonicus* L.; All over the country (Esfandiari 1948 as *Oidium evonymi-japonici* (Arcang.) Sacc., Khabiri 1956, Eskandari 1964 as *O. evonymi-japonici*, Scharif & Ershad 1966 as *O. evonymi-japonici*, Mohammadi-dousdar 1967 as *O. evonymi-japonici*, Daftari & Behdad 1968 as *O. evonymi-japonici*, Viennot-Bourgin et al. 1969 as *O. evonymi-japonici*, Amano 1986 as *M. evonymi-japonici*, Ershad 1971, 1995 as *M. evonymi-japonici*, Samadi et al. 2010, Sharifi et al. 2013, Davari et al. 2015, Abbasi & Braun 2020, Sharifi et al. 2020a, Darsaraei et al. 2023a).
- E. hyperici* (Wallr.) S. Blumer**  
Molecular data: not available.
- Hypericum perforatum* L.; unknown location (Amano 1986, Braun 1987 as *M. hypericacearum*, Ershad 1995).
- Hypericum* sp.; (Amano 1986).
- E. iranica* Darsaraei, Khodap. & Pirnia**  
Molecular data: ITS-rDNA = OL709413; 28S-rDNA = OL709411 (Darsaraei et al. 2023a).
- Onobrychis caput-galli* (L.) Lam.; Kohkiluyeh & Boyerahmad Province, Gachsaran, Khan Ahmad (Darsaraei et al. 2022).
- E. magnifica* (U. Braun) U. Braun & S. Takam.**  
Molecular data: ITS-rDNA = MF668614; 28S-rDNA = OP806875 (Khodaparast et al. 2019, Darsaraei et al. 2023a).
- Magnolia* sp.; Mazandaran: Ramsar, Gilan Rasht (Khodaparast et al. 2019, Darsaraei et al. 2023a).
- E. penicillata* (Wallr.: Fr.) Link**  
Molecular data: ITS-rDNA = OM856001 (Darsaraei et al. 2023a).
- Alnus cordifolia* Ten.; unknown location (Amano 1986 as *M. alni*, Ershad 1995 as *M. penicillata*).
- A. glutinosa* (L.) Gaertn.; Caspian sea area, Gorgan, Mazandaran, Ziyarat (Esfandiari 1946a as *M. alni* (DC.) G. Wint., Mohammadi-Doustdar 1967 as *M.*

- alni*, Scharif & Ershad 1966 as *M. alni*, Amano 1986 as *M. alni*, Ershad 1995 as *M. penicillata*.
- Alnus subcordata* C.A. Mey; unknown location (Darsaraei et al. 2023a).
- E. platani* (Howe) U. Braun & S. Takam.**  
Molecular data: ITS-rDNA = MF663775, OM856011, OM856010; 28S-rDNA = OM978351 (Khodaparast 2016, Darsaraei et al. 2023a).
- Platanus orientalis* L.; Guilan, Gorgan, Isfahan, Yazd, Meshkinshar (Ershad 1995, Samadi et al. 2010, Davari et al. 2015, Khodaparast 2016, Sharifi et al. 2020a, Darsaraei et al. 2023a).
- E. quercicola* S. Takam. & U. Braun**  
Molecular data: ITS-rDNA = AB292693, OM855986, OM855984, OM855983; 28S-rDNA = OM978330 (Takamatsu et al. 2007, Darsaraei et al. 2023a).
- Quercus infectoria*; Kermanshah Province, Javanrood, Kurdistan Province, Baneh, West Azarbaijan Province, Piranshar (Darsaraei et al. 2023a).
- Q. macranthera* Fisch. & C.A. Mey. ex Hohen.; Ardebil Province: Khalkhal, Andebil forest (Davari et al. 2015).
- Q. petraea* (Mattuschka) Liebl; Ardebil Province: Khalkhal, Andebil forest (Davari et al. 2015).
- Quercus* sp.; Guilan: Rasht (Khodaparast et al. 2010).
- E. rayssiae* (Mayor) U. Braun & S. Takam.**  
Molecular data: not available.
- Spartium junceum* L.; Ardebil Province: Ardebil, Lorestan: Khoramabad (Sharifi et al. 2014, Darvishnia & Vafaei 2018, Sharifi et al. 2020a, Darsaraei et al. 2023a,b).
- E. robiniae* var. *robiniae* Grev.**  
Molecular data: ITS-rDNA = OP806850; 28S-rDNA = OP806890 (Darsaraei et al. 2023a,b).
- Robinia pseudoacacia* L.; Ardebil, Isfahan (Sharifi et al. 2014, Davari et al. 2015, Sharifi et al. 2020a, Darsaraei et al. 2023a,b).
- E. sesbaniae* Wolcan & U. Braun**  
Molecular data: ITS-rDNA = OP806847; 28S-rDNA = OP806887 (Darsaraei et al. 2023a,b).
- Sesbania punicea* Benth.; Guilan: Rezvanshahr, Rasht; Mazandaran Province, Mahmud-Abad (Abbasi et al. 2013, Sharifi et al. 2013, Khodaparast 2016, Abbasi et al. 2019, Darsaraei et al. 2023a,b).
- E. syringae-japonicae* (U. Braun) U. Braun and S. Takam.**  
Molecular data: ITS-rDNA = OM856004 (Darsaraei et al. 2023a).
- Jasminum* sp.; Ardabil, Tehran (Pirnia 2014, Sharifi et al. 2014).
- Ligustrum* sp.; Yazd Province, Yazd, Azad University Campus (Abbasi et al. 2019).
- Syringa persica* L.; East Azarbaijan: Arasbaran forest, Glibar (Tavanaei & Khodaparast 2004).
- Syringa vulgaris*; Isfahan (Sharifi et al. 2020a, Darsaraei et al. 2023a).
- E. tortilis* (Wallr. : Fr.) Link**  
Molecular data: not available.
- Cornus sanguinea* L.; Lahijan, (Viennot-Bourgin 1958, Scharif & Ershad 1966, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995).
- Cornus* sp.; Urmia, Ramsar (Darsaraei et al. 2023a)
- E. triflorum* (Wallr.) U. Braun species complex**  
Molecular data: ITS-rDNA = AB104521, OP806848, OP806849; 28S-rDNA = AB103078, OP806888, OP806889, MF663774; 28S-rDNA = AB103078 (Khodaparast et al. 2003, 2005, Khodaparast 2016, Darsaraei et al. 2023a,b).
- Melilotus indicus* (L.) All.; Golestan national park (Tajik-Ghanbary 2005 as *M. trifolii*).
- M. officinalis* (L.) Pall.; Golestan national park, Chaharmahal and Bakhtiari Province, Kuhrang county, Tehran (Tajik-Ghanbary 1995 as *M. trifolii*, Darsaraei et al. 2023a,b).
- Onobrychis caput-galli* (L.) Lam.; Khoramabad (Azadbakht et al. 2013).
- Sophora alopecuroides* L.; Isfahan (Darsaraei et al. 2023a,b).
- Trifolium pratense* L.; Deileman-Kalishom road, Marand, Kordestan Province, Baneh (Khodaparast et al. 2000, 2003, 2005 as *M. trifolii*, Darsaraei et al. 2023a).
- Trifolium resupinatum* L.; Khoramabad (Azadbakht et al. 2013).
- Trifolium* sp.; Ardebil (Davari et al. 2015).
- Trigonella foenum-graecum* L.; Hamedan, Kerman Province, Jiroft (Abkhoo 2015, Darsaraei et al. 2023a).
- Trifolium spadiceum* L.; Tehran (Darsaraei et al. 2023a).
- Vicia faba* L.; Orumieh, Varamin, Rasht (Eskandari 1964, Scharif & Ershad 1966, Ershad 1995, Khodaparast 2016).
- E. viburni* Duby**  
Molecular data: ITS-rDNA = OM856008; 28S-rDNA = OM978349 (Darsaraei et al. 2023a).
- Viburnum lantana* L.; Arasbaran forests (Tavanaei et al. 2009, Darsaraei et al. 2023a).
- Erysiphe* section *Uncinula***
- E. adunca* (Wallr.) Fr.**  
Molecular data: ITS-rDNA = MW077663 (Darsaraei et al. 2021a).
- Populus nigra* L.; Damavand, Fasham, Karaj, Tabriz (Scharif & Ershad 1966, as *U. salicis* (DC.) Wint.; Viennot-Bourgin 1958, as *U. salicis*; Mohammadi-Doustdar 1967, as *U. salicis*; Amano 1986, as *U. salicis*; Ershad 1995, as *U. adunca*, Niknam & Guya 1999, as *U. adunca* var. *adunca*).
- Populus* sp.; Hamedan (Darsaraei et al. 2021a).

***Erysiphe ampelopsidis* (Peck) M. Bradshaw, U. Braun & Pfister**

Molecular data: not available.

*Parthenocissus quinquefolia* (L.) Planch.; Tehran (Scharif & Ershad 1966 host name as *Ampelopsis quinquefolia*, Ershad 1995 as *Uncinula necator*).

***E. arcuata* U. Braun**

Molecular data: ITS-rDNA = OM530243; 28S-rDNA = OM574833 (Darsaraei et al. 2021b).

*Carpinus betulus* L.; Guilan Province: Asalem, Rezvanshahr, Doran village; East Azarbaijan: Arabaran forests, Golestan Province (Schmidt & Scholler 2006 a *Oidium carpini* Foitzik, Tavanaei et al. 2009, Braun & Cook 2012, Darsaraei et al. 2021b).

***E. australiana* (McAlpine) U. Braun & S. Takam**

Molecular data: ITS-rDNA = MF663773, OM574844; 28S-rDNA = OM574835 (Khodaparast 2016, Darsaraei et al. 2021a).

*Lagerstroemia indica* L.; Rasht, Isfahan, Gorgan, Mazandran, Tehran, Mashhad, Sistan and Baluchistan Province: Zabol (Ershad 1995, Sharifi et al. 2013, Khodaparast 2016, Aeenfar 2006, Abbasi et al. 2013 as *Pseudoidium yenii* (U. Braun) Braun & Cook 2012, Abkhoo 2015, Sharifi et al. 2020a, Darsaraei et al. 2021b).

***E. capreae* DC. ex Duby**

Molecular data: ITS-rDNA = MW077657, MW077658, MW077661, MW077662, MW077659, MW077656; 28S-rDNA = MW077669, MW077670, MW077672, MW077673, MW077671, MW077668 (Darsaraei et al. 2021a).

*Salix aegyptiaca* L.; Abbasabad, Karaj, Nur, Masuleh, Damavand, Kashan, Mazandran, Golestan National Park, Arasbaran forests (Petraik & Esfandiari 1941 as *Uncinula salicis*; Esfandiari 1946a as *U. salicis*; Amano 1986, Scharif & Ershad 1966 as *U. salicis*; Mohammadi-Doustdar 1967 as *U. salicis*; Ershad 1995, Tajik-Ghanbary 1995, Khodaparast et al. 2000 as *U. adunca*, Tavanaei et al. 2009, Darsaraei et al. 2021a).

*Salix* sp.; East Azarbaijan Province, Kaleybar (Darsaraei et al. 2021a).

***E. celtidis* (Shvartsman & Kusnezowa) U. Braun & S. Takam.**

Molecular data: ITS-rDNA = OM574855; 28S-rDNA = OM574834 (Darsaraei et al. 2021a).

*Celtis caucasica* Willd. subsp. *caucasica*; Arasbaran forest (Tavanaei et al. 2001, Darsaraei et al. 2021b).

***E. necator* Schwein.**

Molecular data: ITS-rDNA = OM574832 (Darsaraei et al. 2021b).

*Vitis vinifera* L.; All over the country (Khabiri 1958, Viennot-Bourgin 1958, Manuchehri 1964 as *Oidium tuckeri* Berk., Boubals & Nazemille 1966, Scharif & Ershad 1966, Mohammadi-Doustdar

1967, Ershad 1971, Altman et al. 1972, Ebrahimi & Minassian 1973, Amano 1986, Ershad 1995, Karimi & Hajian 1998, Hajian et al. 2005, Tavanaei et al. 2009, Samadi et al. 2010, Davari et al. 2015, Abkhoo 2015, Darsaraei et al. 2021b).

*V. vinifera* L. subsp. *sylvestris* (C.C. Gmel.) Hegi; Golestan national park (Tajik-Ghanbary 1995 host name as *Vitis sylvistris* C.C. Gmel).

*Vitis* sp.; Karaj, Qazvin, Shareiar (Esfandiari 1946a as *U. necator*).

***E. paradoxa* (Simonyan) U. Braun & S. Takam.**

Molecular data: ITS-rDNA = OM574845, OM574846 (Darsaraei et al. 2021b).

*Acer hyrcanum* Fisch. & C.A. Mey.; Arasbaran forest (Tavanaei et al. 2000, 2009, Darsaraei et al. 2021b).

*A. monspessulanum* L.; Golestan national park, Arasbaran forest (Tavanaei et al. 2000, Tajik-Ghanbary 1995 both record as *U. paradoxa*, Darsaraei et al. 2021b).

*A. monspessulanum* L. subsp. *turcomanicum*; Golestan national park (Tajik-Ghanbary 2005 as *U. paradoxa*, Darsaraei et al. 2021b).

***E. prunastri* DC. s.l.**

Molecular data = not available.

*Prunus ceracifera* Ehrh., East Azarbaijan Province, Arasbaran, Golestan Province, Golestan National Park, Guilan Province, Amarlu, Mazandaran Province, (Darsaraei et al. 2021b).

*P. cerasus* L.; Khorasan (Karimi & Hajian 1998 as *U. prunastri*, Darsaraei et al. 2021).

*P. divaricata* Ledeb.; Amarlu, Masuleh, Rasht, Golestan national park, Arasbaran forest, Mazandran: Kiasar National Park (Tajik-Ghanbary 2005, Khodaparast et al., 2000, Tavanaei et al. 2009, Abbasi and Mohseni-Chamazkoti 2014, Darsaraei et al. 2021).

*P. domestica* L.; Khorasan (Karimi & Hajian 1998 as *U. prunastri*).

*P. mahaleb* L.; Khorasan (Karimi & Hajian 1998 as *U. prunastri*).

*P. spinosa* L.; Mazandaran Province (Darsaraei et al. 2021).

***E. prunastri* var. *prunastri* DC.**

Molecular data: ITS-rDNA = OM530246, OM530248, OM530247; 28S-rDNA = OM574837, OM574836 (Darsaraei et al. 2021b).

*Prunus divaricata* Ledeb.; (Tavanaei et al. 2009, Abbasi & Mohseni-Chamazkoti 2014).

*Prunus divaricata* sup sp. *capsica*; Mazandran: Khoramabad-Dohezar road (Darsaraei et al. 2021b).

*Prunus* sp.; East Azarbaijan Province, Arasbaran, Guilan Province, Masuleh (Darsaraei et al. 2021b).

***E. salicis* DC., var. *salicis***

Molecular data: ITS-rDNA = MW077655, MW077654; 28S-rDNA = MW077667, MW077666 (Darsaraei et al. 2021a, b).

*Salix* sp.; Chaharmahal and Bakhtiari Province, Babaheidar, Hamedan, Isfahan Province, Kashan, (Darsaraei et al. 2021a,b).

***E. ulmi* Castagne var. *ulmi***

Molecular data: ITS-rDNA = OM574849, OM574852, OM574851, OM574850, OM574854, OM574848, OM574853, OM574847; 28S-rDNA = OM574839, OM574838, OM574841, OM574840; 28S-rDNA=AB103070 (Khodaparast et al. 2005, Darsaraei et al. 2021b).

*Ulmus glabra* Huds.; Arasbaran forest, Ziarat (Esfandiari 1946a, Amano 1986 Tavanaei et al. 2009, all records as *U. Clandestina*, Darsaraei et al. 2021b).

*U. minor* Mill.; Damavand, Gorgan, Karaj, Shemiran, Sumaehsara (Petra & Esfandiari 1941, Khabiri 1952, 1958, Viennot-Bourgin 1958, Scharif & Ershad 1966, Amano 1986, Ershad 1995, Khodaparast et al. 2000; all records as *U. Clandestina*, Darsaraei et al. 2021b).

*Ulmus carpinifolia* Geld; Tabriz (Arzanlou and Torbati 2016 as *Erysiphe ulmi* var. *ulmi-foliaceae* (Dzhaf.) U. Braun).

*Ulmus* sp.; Guilan Province, Manjil, Rasht; Hamedan Province (Khodaparast et al. 2005, Darsaraei et al. 2021b).

***Erysiphe* sp.**

*Cleome* sp. (Sharifi et al. 2020a).

*Glycine max* (L.) Merr.; Southern part (Majidieh-Ghassemi 1986, Ershad 1995).

*Vicia narbonensis* L.; Kohgiluyeh and Boyer-Ahmad Province Kakan (Mousavinezhad et al. 2023).

*Vicia peregrina* L.; Gachsaran (Mousavinezhad et al. 2023).

***Golovinomyces* (U. Braun) Heluta**

***G. ambrosiae* (Schwein.) U. Braun & R.T.A. Cook**

Molecular data: ITS-rDNA = MN684152 (Sharifi et al. 2020b).

*Dahlia* sp.; Ramin, Rasht (Ebrahimi & Minassian 1973, Amano 1986, Ershad 1995 all records as *E. cichoracearum*, Khodaparast 2016 as *G. spadiceus*).

*Rudbeckia hirta* L.; Isfahan Province, Isfahan (Sharifi et al. 2020b).

***G. artemisiae* (Grev.) Heluta**

Molecular data = not available.

*Artemisia annua* L.; Guilan Province: Sumaehsara (Thia study).

*Artemisia dracunculus* L.; Tabriz, Orumieh-Sero road (Behroozin et al. 1991 as *E. artemisiae* Grev., Ershad 1995 as *E. artemisiae*).

*Artemisia* sp.; Yazd (Samadi et al. 2010).

***G. asperifolii* (Erikss.) U. Braun & H.D. Shin**

Molecular data: ITS-rDNA = MT621669 (Sharifi et al. 2020a).

*Nonea* sp.; Isfahan (Sharifi et al. 2020a).

***G. asterum* U. Braun**

Molecular data: ITS-rDNA = MN684151 (Sharifi et al. 2020b).

*Ageratum houstonianum* Mill.; Ardebil, Isfahan (Sharifi et al. 2014 as *Euoidium* cf. *agerati* (J. M. Yen) U. Braun and R. T. A. Cook), Sharifi et al. 2020b).

***G. asterum* var. *moroczkovskii* (Heluta) U. Braun**

Molecular data: ITS-rDNA = KM434159 (Mirhosseini et al. 2015).

*Symphotrichum squamatum* (Spreng.) G.L.; Fars Province, Bamu National Park, Sadi station (Abbasi et al. 2019).

*Symphotrichum subulatum* var. *squamatum* (Spreng.) S.D. Sundb.; (Mirhosseini et al. 2015 as *G. cichoracearum*).

***G. asterum* var. *solidaginis* U. Braun**

Molecular data = not available.

*Solidago canadensis* L.; unknown location (Amano 1986, Ershad 1995 both records as *E. cichoracearum*, Braun and Cook 2012).

***G. aff. asterum* (Schwein.) U. Braun**

Molecular data = not available.

*Symphotrichum subula* Michx.; Kohgiluyeh and Boyer-Ahmad, Khanahmad (Mousavinezhad et al. 2023).

***G. biocellatus* (Ehrenb.) Heluta s. l.**

Molecular data = not available.

*Lamiaceae* (Unknown); Kamarbon (Ershad 1971, 1995).

*Mentha piperita* L.; Karaj (Yazdani & Abbasi 1998, Sharifi et al. 2020a).

*M. longifolia* (L.) Huds.; Fasham; Kowkhdan, Sisakht, Kohgiluyeh and Boyer-Ahmad (Viennot-Borgin 1958 as *E. labiatarum* (Wallr.) Chev., Mohammadi-Doustdar 1967 as *E. biocellata*, Amano 1986, Ershad 1995 as *E. biocellata*, host name as *Mentha sylvestris* L., Mousavinezhad et al. 2023).

*Nepeta sintenisii* Bornm.; Amarlu (Khodaparast et al. 2000 as *E. biocellata*).

*Salvia nemorosa* L.; Meshkinshahr-Ahar (Khodaparast & Abbasi 2009).

*S. pseudo-silvestris* Stapf; Tehran, Golestan national park (Khabiri 1956 as *E. lamprocarpa*, Ershad 1995 as *E. biocellata*, Tajik-Ghanbary 2005)

*Ziziphora tenuior* L.; Ahar-Tabriz road (Khodaparast & Abbasi 2009).

***G. bolayi* S. Takam., Lebeda & M. Götz**

Molecular data: ITS-rDNA = MK601682, MT250933, AB077695 (Takamatsu et al. 2013, Golmohammadi et al. 2019, Tahery Ardestani et al. 2020a).

- Abelmoschus esculentus* Moench; Yazd, Karaj (Samadi et al. 2010, Tahery Ardestani et al. 2020a).
- Cichorium endivia* L.; unknown location (Amano 1986, Ershad 1971, Ershad 1995, all records as *E. cichoracearum*).
- C. intybus* L.; Karaj, Deileman, Tabriz-Marand road, Ardebil-Khalkhal road (Viennot-Borgin et al. 1970, Amano 1986 as *E. cichoracearum*, Ershad 1995, Khodaparast et al. 2000, 2003).
- Lactuca sativa* L.; Karaj, Tehran (Scharif & Ershad 1966, Mohammadi-Doustdar 1967, Ershad 1971, 1995, all records as *E. cichoracearum*).
- Lactuca tuberosa* Jacq., Fars Province, Noorabad (Pirmia & Taheri 2020).
- Lactuca* sp., Orumieh-Sero road, Tabriz (Niknam & Guya 1996).
- Taraxacum glaucum* Boiss. & Haussk. ex Rabenh.; (Rabenhorst 1871, Amano 1986 as *E. cichoracearum*, Ershad 1995 as *E. sordida*).
- T. montanum* DC.; Lorestan Province (Rabenhorst 1871 as *E. lambrocarpa*, host name as *T. denudatum* Boiss., Amano 1986 as *E. cichoracearum*, Ershad 1995 as *E. sordida*).
- T. syriacum* Boiss.; Borujerd, Karaj, Hamedan, Lorestan (Esfandiari 1946a, 1948, Khabiri 1956 as *E. communis*, Amano 1986 as *E. cichoracearum*, Ershad 1995 as *E. cichoracearum*).
- Veronica persica* Poir.; East Azarbaijan: Tabriz University campus (Golmohammadi et al. 2019).
- G. aff. bolayi S. Takam., Lebeda & M. Götz.**  
Molecular data = not available.
- Cichorium intybus* L.; Khanahmad, Kohgiluyeh and Boyer-Ahmad (Mousavinezhad et al. 2023)
- Taraxacum sonchoides* (D. Don) Sch. Bip.; Sisakht, Kohgiluyeh and Boyer-Ahmad (Mousavinezhad et al. 2023)
- G. cichoracearum (DC.) Heluta**  
Molecular data: ITS-rDNA = AB077694, 28S-rDNA = AB103074 (Khodaparast et al. 2005, Takamatsu et al. 2013).
- Chondrilla juncea* L., Ardebil-Khalkhal road, Tabriz (Niknam & Guya 1996).
- Scorzonera* sp.; Isfahan-Samirom road (Khodaparast et al. 2010).
- Tragopogon graminifolius*; Birjand-Kerman road (Mohammadi) (Khodaparast et al. 2010).
- Tragopogon bupthalmoides* (DC.) Boiss. Isfahan (Khodaparast et al. 2003, Matsuda & Takamatsu 2003).
- Tragopogon* sp., Zanjan-Miyaneh road, Km 11, Isfahan, Yazdm Guilan, Manjil (Khodaparast et al. 2003, 2010, Samadi et al. 2010).
- G. cynoglossi (Wallr.) Heluta s. l.**  
(including: *G. asperifoliorum* Grev.) U. Braun & H.D. Shin and *G. asperifolii* (Erikss.) U. Braun & H.D. Shin)  
Molecular data = not available.
- Anchusa azurea* P. Mill.; Ardebil (Davari et al. 2015).
- Asperugo procumbens* L.; Ardebil, Kamarbon, Jajroud protected region (Amano 1986 as *E. horridula* Lév., Ershad 1971, 1995 as *E. asperifoliorum* Grev., Kachooeian Javadi et al. 2006, Davari et al. 2015).
- Cynoglossum creticum* Mill.; Amarlu (Khodaparast et al. 2001).
- Echium italicum* L.; Hamedan (Wettstein 1885 as *E. cichoracearum*, Amano 1986 as *E. horridula*, Ershad 1995 as *E. cichoracearum*).
- Lithospermum arvense* L.; Alborz Province, Kalvan road (Abbasi et al. 2019).
- L. incrassatum* Guss.; Amarlu (Khodaparast et al. 2001).
- L. officinale* L.; Amarlu (Khodaparast et al. 2001).
- Myosotis palustris* (L.) Nathh.; Lorestan (Sepahvand et al. 2018).
- Nonea flavescens* (C. A. Mey) Fisch & C. A. Mey; Amarlu (Khodaparast et al. 2001).
- Nonea pulla* (L.) DC.; Azadbar (Bornmuller 1908 as *E. horridula*, Amano 1986 as *E. horridula*, Ershad 1995 as *E. asperifoliorum*).
- Nonea* sp.; Yazd Province: Banadak Sadat (Samadi et al. 2010).
- Onosma stenosphon* Boiss.; Harat, Yazd Province (Samadi et al. 2010).
- Paracaryum rugulosum* Boiss.; Fars Province, Shiraz towards Dasht-e Arzhan, Hossein Abad protected region (Abbasi et al. 2019).
- Solenanthus cerinthoides* Boiss.; Fasham (Viennot-Bourgin 1958 as *E. horridula*, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 as *E. asperifoliorum*).
- Symphytum asperum* Lepech.; Guilan Province: Sumaehsara (Khodaparast et al. 2010).
- G. depressus (Wallr.) Heluta**  
*Arctium lappa* L.; Karaj, Khorasan, Shahriar (Petraik & Esfandiari 1941, Esfandiari 1946a, Khabiri 1956, Amano 1986 as *E. depressa*, Mohammadi-Doustdar 1967 as *E. Communis*, Braun & Cook 2012).
- Centaurea depressa* M. Bieb.; Fars Province, Malussjaan (Abbasi et al. 2019).
- Onopordum acanthium* L.; Ardebil (Davari et al. 2015).
- G. fischeri (S. Blumer) U. Braun & R.T.A. Cook**  
*Senecio glaucus* L.; Karaj (Khodaparast et al. 2010).
- G. inulae U. Braun and H.D. Shin**  
Molecular data = not available.
- Inula oculus-christi* L.; Azarbaijan (Ershad 1995, Braun & Cook 2012).
- I. salicina* L. subsp. *aspera* (Poir.) Hayek; Ahar-Tabriz road; Yazd Province: Banadak Sadat, (Khodaparast & Abbasi 2009, Samadi et al. 2010).
- G. latisporus (U. Braun) P.-L. Qiu & S. Y. Liu**  
Molecular data: ITS-rDNA = MF663777, MH699992 (Khodaparast 2016, Arzanlou et al. 2018).

*Helianthus annuus* L.; Ardekan, Isfahan, Karaj; Sistan and Balochistan: Zabol (Samadi et al. 2007, 2010 as *G. orontii*, Khodaparast et al. 2010, Davari et al. 2015, Abkhoo 2015).

*H. tuberosus* L.; Rasht (Khodaparast et al. 2009, Davari et al. 2015).

*Zinnia elegans*; Isfahan; Ardebil, Khoy (Sharifnabi & Nakoei 1995 as *E. cichoracearum*, Sharifi et al. 2014, Davari et al. 2015, Darvishnia & Vafaei 2018, Arzanlou et al. 2018 as *Golovinomyces* sp., Sharifi et al. 2020a).

***G. macrocarpus* (Speer) U. Braun**

Molecular data = not available.

*Achillea wilhelmsii* K. Koch.; Jajroud protected region (Kachooeian Javadi et al. 2006 as *G. cichoracearum*, Braun & Cook 2012).

*Tanacetum balsamita* L.; Ardebil (Davari et al. 2015).

*T. parthenium* (L.) Sch. Bip.; Golestan national park (Tajik-Ghanbary 2005).

***G. magnicellulatus* var. *magnicellulatus* (U. Braun)**

**V.P. Heluta**

Molecular data = not available.

*Phlox drummondii* Hook.; unknown location (Amano 1986, Ershad 1995 both records as *E. cichoracearum*; Braun & Cook 2012).

***G. montagnei* U. Braun**

*Carduus pycnocephalus* L.; Khanahmad, Kohgiluyeh and Boyer-Ahmad (Mousavinezhad et al. 2023).

*Centaurea aucheri* (DC.) Wagenitz; Jajroud protected region (Kachooeian Javadi et al. 2006).

*Cirsium arvense* (L.) Scop.; Ardebil (Sharifi et al. 2014).

*C. syriacus* Gaertn.; Khanahmad, Kohgiluyeh and Boyer-Ahmad (Mousavinezhad et al. 2023).

*Cousinia pterocaulos* (C.A. Mey.) K.H. Rechinger; Khalkhal-Asalem road (Khodaparast & Abbasi 2009).

*C. multiloba* DC.; Varamin (Khodaparast & Abbasi 2009).

*Cynara scolymus* L.; unknown location (Amano 1986 as *E. cichoracearum*).

*Jurinea carduiiformis* (Jaub. & Spach) Boiss.; Dashtroom, Kohgiluyeh and Boyer-Ahmad (Mousavinezhad et al. 2023).

*Notobasis syriaca* (L.) Cass.; Ilam Province (Abbasi et al. 2019).

*Silybum marianum* (L.) Gaertn.; Karaj, Rasht (Yazdani & Abbasi 1998, Sharifi et al. 2013).

***G. orontii* (Castagne) Heluta sensu lato**

Molecular data: ITS-rDNA = AB077693, MT621670; 28S-rDNA = AB077692 (Khodaparast et al. 2005, Takamatsu et al. 2013, Sharifi et al. 2020a).

*Antirrhinum majus* L.; Ardebil (Sharifi et al. 2014, Sharifi et al. 2020a).

*Fraxinus* sp.; Guilan: Rasht (Sharifi et al. 2013 as *Golovinomyces* cf. *orontii* (Castagne) V.P.) Heluta

*Hibiscus brasiliensis* L.; unknown location (Amano 1986).

*H. cannabinus* L.; Dezful (Ershad 1995).

*Papaver somniferum* L.; Tehran Province, Evin, from greenhouse (Abbasi et al. 2019).

*Valerianella* cf. *uncinata* (M.Bieb.) Dufur.; Masuleh, Amarlu (Khodaparast et al. 2001, 2003, 2005 as *G. orontii*).

*Veronica* sp.; Yazd Province: Banadak Sadat (Samadi et al. 2010).

*Vinca herbacea* Waldst. & Kit.; Golestan national park (Tajik-Ghanbary 2005).

*Viola odorata* L.; unknown location (Amano 1986, Ershad 1995, both records as *E. cichoracearum*).

*V. tricolor* L.; Tehran, Tabriz, Ardebil (Petrak & Esfandiari 1941, Esfandiari 1946a, Amano 1986, Ershad 1971, 1995, Davari et al. 2015).

***G. redlianus* (Speer) Heluta**

Molecular data = not available.

*Galium humifusum* M. Bieb.; Ardebil-Khalkhal road (Khodaparast & Abbasi 2009).

*G. aparine* L.; Jajroud protected region (Kachooeian Javadi et al. 2006).

*Sherardia arvensis* L.; Khoramabad (Sepahvand et al. 2002, Sepahvand 2010 as *E. galii* var. *redliana*).

***G. senecionis* U. Braun**

Molecular data: ITS+LSU = OR424996 (Bradshaw et al. 2024).

*Ligularia persica* Boiss. (= *Dolichorrhiza persica* (Boiss.) B.Nord.); Tehran Province, Palang Chal Mt (Esfandiari 1948, Ershad 1971, 1995 all records as *E. cichoracearum*, Bradshaw et al. 2024).

***G. sonchicola* U. Braun & R.T.A. Cook**

*Sonchus asper* (L.) Hill; unknown location (Amano 1986, Ershad 1995 both records as *E. cichoracearum*).

*Sonchus oleraceus* L.; Zanjan-Miyaneh road, Orumieh: Gharalou village, Karaj, Tabriz, Sistan and Baluchistan: Zahak (Hedjaroude & Abbasi 2000, Niknam & Guya 1996, Khodaparast et al. 2010, Abkhoo 2015).

*Sonchus* sp.; Manjil (Khodaparast et al. 2010).

***G. sordidus* (L. Junell) Heluta**

Molecular data = not available.

*Plantago* sp.; Deileman-Kalishom road (Amano 1986, Khodaparast et al. 2000).

*P. lanceolata* L.; Damavand (Viennot-Bourgin 1958 as *E. plantaginis* (Link) Sawada, Mohammadi-Doustdar 1967 as *E. plantaginis*, Amano 1986 as *E. sordida*, Ershad 1971, 1995 as *E. sordida*).

*P. major* L.; Karaj, Tonekabon, Tabriz, Amarlu (Amano 1986 as *E. sordida*, Ershad 1971, 1995 as *E. sordida*, Niknam & Guya 1996 as *E. sordida*, Khodaparast et al. 2000).

*P. media* L.; Fasham, Marand (Viennot-Bourgin 1958 as *E. plantaginis*, Mohammadi-Doustdar 1967 as *E. plantaginis*, Amano 1986 as *E. sordida*).

*P. psyllium* L.; Masjed Solaiman (Viennot-Bourgin 1958 *E. plantaginis*, Amano 1986 as *E. sordida*,

- Ebrahimi and Minasian 1975 as *E. sordida*, Ershad 1971, 1995 as *E. sordida*).
- G. tabaci (Sawada) H.D. Shin, S. Takam. & L. Kiss**  
Molecular data: ITS-rDNA = AB103073, AB077697 (Khodaparast et al. 2005, Takamatsu et al. 2013).  
*Cucurbita maxima* Duchesne; Talesh (Khodaparast et al. 2001).
- C. pepo* L.; Boroojerd, Tabriz (Scharif & Ershad 1966 as *E. cichoracearum*).
- Cucurbita* sp.; Dezful, Guilan (Eskandari 1964, Amano 1986, Ershad 1995, all records as *E. cichoracearum*; Khodaparast et al. 2000, 2003, 2005, Braun et al. 2019).
- Cucumis melo* L.; Karaj, Tehran (Khabiri 1956 as *E. communis*, Scharif & Ershad 1966 as *E. communis*, Mohammadi-Doutdar 1967 as *E. communis*, Ershad 1995 as *E. communis*).
- Cucumis sativus* L.; Borujerd, Dezful, Maygun, Tabriz, Isfahan, Sistan and Baluchistan: Zabol (Scharif & Ershad 1966, Daftari & Behdad 1968, Ershad 1971, Altman et al. 1972, Ebrahimi & Minasian 1973, Amano 1986, Ershad 1995 all records as *E. cichoracearum*, Abkhoo 2015 as *G. orontii*).
- Hyoscyamus niger* L.; Hamedan, Golestan national park (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 all records as *E. cichoracearum*, Tajik-Ghanbary 1995 as *E. hyoscyami*).
- Nicotiana* sp. L.; Fars (Ershad 1971 as *E. polyphaga* Hamm., Amano 1986, Ershad 1995 as *E. polyphaga*).
- N. tabacum* L.; Azarbaijan, Caspian sea area, Orumieh, Ardebil in greenhouse (Esfandiari 1947 as *E. cichoracearum*, Khabiri 1956 as *Oidium tabaci* Thüm, Scharif & Ershad 1966 as *E. cichoracearum*, Amano 1986 as *Oidium* sp., Ershad 1971, 1995 as *E. polyphaga*, Davari et al. 2015 as *G. orontii*).
- Golovinomyces sp.**  
*Carthamus tinctorius* L.; Dezful, (Altman et al. 1972 as *Erysiphe* sp., Amano 1986 as *E. cichoracearum*, Ershad 1995 as *Erysiphe* sp.).  
*Crupina crupinastrum* (Moris) Vis.; Lorestan, Oshtrankouh (Sepahvand et al. 2021b as *G. orontii* (Castagne) V.P. Heluta).  
*Gaillardia rossica* L.; Sistan and Baluchistan: Zahak (Abkhoo 2015).  
*Gundelia tournefortii* L.; Kordestan, Lorestan (Rabenhorst 1871 as *E. lamprocarpa*, Amano 1986 as *E. cichoracearum*, Ershad 1995 as *E. sordida* Junell).  
*Helichrysum oligocephalum* DC.; Kohgiluyeh and Boyer-Ahmad Province: Khanahmad, (Mousavinezhad et al. 2023).  
*Urospermum picroides* (L.) Desf.; Roodbar (This study).
- Verbascum thapsus* L.; Lorestan: Khorramabad (Darvishnia & Vafaei 2018 as *Golovinomyces ambrosiae* (Schwein.) U. Braun & R.T.A. Cook).  
*Zinnia elegans* L.; Lorestan: Khorramabad, Yazd (Darvishnia & Vafaei 2018 as *Golovinomyces ambrosiae* (Schwein.) U. Braun & R.T.A. Cook, Samadi et al. 2010 as *G. cichoracearum*).
- Leveillula Arnaud**  
**L. alhagi (Sorokin) U. Braun**  
Molecular data: ITS-rDNA = AB044999 (Khodaparast et al. 2001).  
*Alhagi* sp., Zanjan, Isfahan, Aligoodars (Khodaparast et al. 2001, Sepahvand 2010).  
*A. camelorum* Fisch.; Tabriz (Niknam & Guya 1999).  
*A. maurorum* Medik.; Menshad, Yazd Province (Amano 1986, Aeenfar 2006 host as *A. persuarum*, Samadi et al. 2010).  
*A. pseudalhagi* (M. Bieb) Desv.; Sistan and Baluchistan: Zabol (Abkhoo 2015).
- L. allii Z.Y. Zhao & J.S. Jia**  
Molecular data: ITS-rDNA = AM498635 (Khodaparast et al. 2007).  
*Allium cepa* L.; Birjand Region (Giuq Sofla), South Khorasan (Mirzaee & Mohammadi 2010).  
*Allium* sp.; Hamedan (Khodaparast et al. 2003, 2007).
- L. braunii Simonyan & V.P. Heluta**  
Molecular data: ITS-rDNA = AB045001, AB667872 (Khodaparast et al. 2001, 2012).  
*Eryngium billardierei* F. Delaroché; Lorestan: Azna (Sepahvand et al. 2018, host name as *Eryngium noeanum* Boiss.  
*E. biehersteinianum* Nevski; unknown location (Ershad 1995 as *L. umbeliferarum*).  
*E. bungei* Boiss.; unknown location, Mashhad (Amano 1986, Ershad 1995 as *L. umbeliferarum*, Aeenfar 2006).  
*E. caeruleum* M. B.; Astara, Hamedan, (Amano 1986, Ershad 1971, 1995 as *L. umbeliferarum*).  
*E. campestre* L.; unknown location (Amano 1986).  
*E. noeanum* Boiss.; Shah Kuh (Magnus 1899 as *E. taurica*, Amano 1986, Ershad 1995 as *L. umbeliferarum*).  
*E. thyrsoides* Boiss.; Takab-Dendi road (Khodaparast & Abbasi 2009).  
*Eryngium* sp.; Ghazvin, Tehran, Isfahan, Golpayegan-Khansar road, Taft (Amano 1986, Ershad 1971, 1995 as *L. umbeliferarum*, Samadi et al. 2010, Khodaparast et al. 2001, 2012).
- L. bornmuelleriana (Magnus) U. Braun**  
Molecular data: not available.  
*Acanthophyllum* sp.; Maygun (Esfandiari 1946a, Amano 1986, Ershad 1995 as *L. caryophyllacearum* Golovin).  
*A. crassifolium* Boiss.; Egil (Bornmüller 1908 as *E. taurica*, Amano 1986, Ershad 1995 as *L. caryophyllacearum*).  
*A. glandulosum* Bunge ex Boiss.; unknown location (Amano 1986, Ershad 1995 as *M. bornmuelleriana* Magnus).



- A. microcephalum* Boiss.; Karaj (Hedjaroude & Abbasi 2000).
- L. catalpae* U. Braun**  
Molecular data: not available.
- Catalpa speciosa* Warder ex Engelm.; Karaj (Petraik & Esfandiari 1941, Esfandiari 1946a, Golato 1960, Scharif & Ershad 1966, Amano 1986, Ershad 1971, 1995 as *L. bignoniacearum* Golovin f. *catalpae* Teich., Braun & Cook 2012).
- L. chrozophorae* U. Braun**  
Molecular data: ITS-rDNA = AB045147 (Khodaparast et al. 2001).
- Chrozophora gracilis* Fisch. & Mey. ex Kar.; unknown location (Amano 1986).
- C. hierosolymitana* Spreng.; Jajroud protected region, Mashhad, Khoramabad (Amano 1986, Ershad 1971, 1995 as *L. lanata* (Magnus) Golovin f. *chrozophorae* Jacz., Kachooeian Javadi et al. 2006, Aeenfar 2006, Sepahvand 2010).
- C. obliqua* A. Juss.; Dezful, Khorramabad (Ershad 1995 as *L. lanata* f. *chrozophorae*).
- C. tinctoria* (L.) A. Juss.; Evin, Ghorgan, Kamal abad, Kan, Lorestan, Amarlu, Karaj, Tehran, Guilan: Amarlou (Amano 1986, Ershad 1971, 1995, as *L. lanata* f. *chrozophorae*, Khodaparast et al. 2001, Sepahvand et al. 2002).
- L. cleomes* Simonyan and Heluta**  
Molecular data: ITS-rDNA = MT621677 (Sharifi et al. 2020a).
- Cleome* sp.; Isfahan (Sharifi et al. 2020a).
- Cleome glaucescens* DC.; unknown location (Amano 1986).
- L. contractirostris* Heluta & Simonyan**  
Molecular data: ITS-rDNA = AB045006, AB045105; 28S-rDNA = AB080467 (Khodaparast et al. 2001, Takamatsu et al. 2008).
- Alcea aucheri* Alef.; Yazd Province: Menshad (Samadi et al. 2010).
- Alcea glabrata* Alef.; Mahalat, Kuhe sefid (Khodaparast and Abbasi 2009).
- A. haussknechtii* Boiss.; unknown location (Amano 1986 as *L. taurica* (Lév.) Arn.).
- A. hohenackeri* (Boiss. & Huet) Boiss.; Jajroud protected region (Kachooeian Javadi et al. 2006).
- Alcea* cf. *popovii*; Tehran, (Khodaparast et al. 2001).
- Alcea koelzii* Riedl; Lorestan, Oshtrankouh (Sepahvand et al. 2021b).
- Alcea* sp.; Khorasan, Fars, Jajroud protected region (Kachooeian Javadi et al. 2006, Aeenfar 2006, Khodaparast et al. 2001).
- Althaea ficifolia* L.; Karaj, Shariyar, Shiraz (Mohammadi-Doustdar as *L. taurica*, Amano 1986 as *L. taurica*, Ershad 1995 as *L. malvacearum* f. *althaeae*).
- A. kurdica* Schltdl.; Karaj, Kermanshah, Tabriz (Amano 1986 as *L. taurica*, Mohammadi-Doustdar 1967 as *L. taurica* and host name as *Althaea kurdica* Boiss., Ershad 1995 as *L. malvacearum* f. *althaeae*).
- A. rosea* L.; Ahvaz, Evin, Shemiran (Ebrahimi & Minassian 1973 as *L. malvacearum* f. *althaeae*, Amano 1986, Ershad 1971, 1995 as *L. malvacearum* f. *althaeae*).
- Althaea* sp.; Bisheh, Khoys, Lorestan, Ardebil, Khoramabad-Broujerd road (Petraik 1949 as *L. taurica*, Esfandiari 1951 as *L. taurica*, Scharif & Ershad 1966 as *L. taurica*, Amano 1986, Ershad 1971, 1995 as *L. malvacearum* Golovin f. *althaeae* Jacz., Sepahvand 2010, Davari et al. 2015).
- Malva neglecta* Wallr.; unknown location, Tabriz (Ershad 1971, 1995 as *L. malvacearum*, Niknam & Guya 1999).
- M. sylvestris* L.; Karaj, Shahriar (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 as *L. malvacearum*).
- Malva* sp.; Hamedan (Amano 1986, Ershad 1971, 1995 as *L. malvacearum*).
- Ficus carica* L.; Sistan and Bluchistan (Salari et al. 2010 as *L. taurica*, Khodaparast et al. 2016).
- L. cylindrospora* U. Braun**  
Molecular data: ITS-rDNA = AB044350, AB044352, AB044372; 28S-rDNA = AB080468 (Takamatsu et al. 2008, Khodaparast et al. 2001).
- Anthochlamys polygaloides* (Fisch. & C.A. Mey.) Moq.; Tehran (Khodaparast et al. 2001).
- Bassia scoparia* (L.) A.J. Scott (= *Kochia scoparia* (L.) Schrad.); Mashhad, Yazd Province, on the way from Yazd to Herat and Marvast (Aeenfar 2006, Abbasi et al. 2019).
- Chenopodium album* L.; Tabriz (Niknam & Guya 1999).
- Chenopodium* sp.; Mashhad (Aeenfar 2006).
- Noaea mucronata* (Forssk.) Asch. & Schweinf.; Ghazvin, Guilan Province: Jirandeh, Zanjan (Ershad 1971, 1995 as *L. chenopodiacearum* Golov., Khodaparast et al. 2001).
- N. spinosissima* Moq.; Ghorgan (Ershad 1971, 1995 as *L. chenopodiacearum*).
- Salsola canescens* Boiss.; Kerman province: Kuhe jupar (Magnus 1899 as *E. taurica* Lév., Amano 1986 as *L. taurica*, Ershad 1995, as *L. chenopodiacearum*).
- S. kali* L.; Roodbar, Mashhad (Khodaparast et al. 2001, Aeenfar 2006).
- Spinacia oleracea* L.; Lorestan Province: Khoramabad (Darvishnia & Vafaei 2018).
- L. duriaei* (Lév.) U. Braun**  
Molecular data: ITS-rDNA = AB667859, AB044373, AB044374; 28S-rDNA = AB080475 (Khodaparast et al. 2001, Takamatsu et al. 2008).
- Epilobium hirsutum* L.; Karaj (Amano 1986, Ershad 1971, 1995, Hedjaroude & Abbasi 2000).
- Marrubium parviflorum* Fisch. & C.A. Mey.; Zanjan-Taham road (Khodaparast et al. 2012).

- Nepeta asterotricha* Rech. f.; Yazd Province: Deh Bala, (Samadi et al. 2010).
- Phlomis* cf. *anisodonta* Boiss.; Hamedan, Chashme malek-Alvand (Khodaparast and Abbasi 2009).
- P. herba-venti* L.; unknown location (Amano 1986 as *L. taurica*, Ershad 1995 as *L. labiatarum* Golovin, Braun 1987).
- P. persica* Boiss.; Faridan, Thakhte Solieman, Khomein, Fars, Sivand, Isfahan, 20 km NW of Daran, Zanjan (Sarifnabi & Banihashemi 1990, Ershad 1995 as *L. labiatarum*, Khodaparast et al. 2012).
- Salvia hypoleuca* Benth.; Jajroud protected region (Kachooeian Javadi et al. 2006).
- S. limbata* C. A. Mey.; Karaj (Ershad 1971, 1995 as *L. labiatarum*).
- S. multicaulis* Vahl.; Lorestan: Azna (Sepahvand et al. 2018).
- S. nemorosa* L.; Ebrahim abad, Amarlu, Ardebil-Khalkhal road, Meshkinshahr-Ahar road, Zanjan-Miyaneh road, Orumieh, Ballanj village, Orumieh-Sero road (Amano 1986, Ershad 1995 as *L. taurica* f. *salviae* (Jacz.) Golovin, Khodaparast et al. 2001).
- S. pseudo-silvestris* Stapf; Karaj (Petrak & Esfandiari 1941, Esfandiari 1946b, Golato 1960, Amano 1986, Ershad 1995 as *L. labiatarum*).
- S. virgata* Jacq.; unknown location (Amano 1986).
- Salvia* sp.; Fasham, Ghorogh, Hamedan, Chashme malek-Alvand, (Amano 1986, Ershad 1971, 1995, *L. labiatarum*).
- Scutellaria multicaulis* Boiss.; unknown location (Amano 1986).
- Stachys palaestina* L.; unknown location (Ershad 1995 as *L. labiatarum*).
- Teucrium orientale* L.; Lorestan: Azna (Sepahvand et al. 2018).
- Thymus kotschyanus* Boiss. & Mohen.; Hamedan: Alvand (Khodaparast & Abbasi 2009).
- L. elaeagnai* (Jacz.) Simonyan and Heluta**  
Molecular data: ITS-rDNA = AB048350; 28S-rDNA = AB042642 (Takamatsu et al. 2008, Khodaparast et al. 2001).
- Elaeagnus angustifolia* L.; Borujerd, Darzin, Sabzevaran, Karaj, Lorestan, Kerman, Rafsanjan, Shiraz, Tabriz, Tehran, Loshan, Zanjan (Petrak & Esfandiari 1941, Esfandiari 1946a, Khabiri 1956, Viennot-Bourgin 1958, Scharif & Ershad 1966, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1971, 1995 as *L. eleagnacearum* Golovin, Khodaparast et al. 2001).
- E. latifolia* L.; unknown location (Amano 1986, Ershad 1995 as *L. eleagnacearum*).
- L. golovinii* Simonyan & V.P. Heluta**  
Molecular data: not available.
- Nepeta crispa* Willd.; Yazd (host name as: *Nepeta asterotricha*).
- Plumbago europaea* L.; Ghorogh, Salmas (Esfandiari 1948, Amano 1986, Ershad 1971, 1995 as *L. plumbaginacearum* Golovin, Khodaparast et al. 2012).
- L. guilanensis* Khodap. & Hedjar.**  
Molecular data: ITS-rDNA = AB045156, AB045109; 28S-rDNA = AB080478 (Takamatsu et al. 2008, Khodaparast et al. 2001).
- Chondrilla juncea* L.; Damavand, Karaj, Tabriz, Roodbar, Zanjan, Mashhad (Amano 1986 as *L. taurica*, Ershad 1995, as *L. compositarum* Golovin, Khodaparast et al. 2001, 2002, Aeenfar 2006, Khodaparast et al. 2010).
- L. jaczewskii* U. Braun**  
Molecular data: ITS-rDNA = KU721074 (Khodaparast et al. 2016).
- Dodartia orientalis* L., North Khorasan Province, Bojnord (Khodaparast et al. 2016).
- L. lactucae-serriolae* Khodap. & Hedjar.**  
Molecular data: ITS-rDNA = AB044375, AB044375; 28S-rDNA = AB080476 (Takamatsu et al. 2008, Khodaparast et al. 2001).
- Lactuca scarioloides* Boiss.; Shahrood (Ershad 1995 as *L. compositarum*).
- L. serriola* L.; Mahidasht, Karaj, Jajroud protected region, Isfahan-Mobarakeh road, Mashhad, Kermanshah, Dena protected area, Yazd Province: Sanij (Ershad 1995 as *L. compositarum*, Khodaparast et al. 2002, Kachooeian Javadi et al. 2006, Aeenfar 2006 as *L. lactucarum*, Khodaparast et al. 2010, Samadi et al. 2010, Salahi Ardekani et al. 2016).
- L. azerbaijanica* Rech. f.; Tabriz (Niknam & Guya 1999).
- Lactuca* sp.; Darzin, Sabzevaran, Yazd Province: Sanij (Amano 1986, Ershad 1995 as *L. compositarum*, Samadi et al. 2010).
- L. lactucarum* Durrieu & Rostam**  
Molecular data: ITS-rDNA = AB66786, AB667861, KT221632 (Khodaparast et al. 2001, 2012).
- Lactuca orientalis* (Boiss.) Boiss.; Ghazvin, Golestan national park, Khodabandeh-Ahar road, Chaharmahal and Bakhteyari: Babaheydar, Lorestan: Oshtrankouh, Banadak Yazd Province: Sadat, (Viennot-Bourgin et al. 1970, Ershad 1995, host name as *Scariola orientalis* (Boiss.) Sojak, both records as *L. compositarum*, Tajik-Ghanbary 1995, Samadi et al. 2010, Khodaparast et al. 2010, 2012; Sepahvand et al. 2018 as *L. taurica*).
- Lactuca* sp.; Chaharmahal and Bakhtiari, Sharekord (Khodaparast et al. 2012).
- L. lanata* (Magnus) Golovin**  
Molecular data: ITS-rDNA = AB045004 (Khodaparast et al. 2001).
- Euphorbia hebecarpa* Boiss.; Shirkooh, Yazd Province Chaharmahal and Bakhtiari Province,

- Kuhrang, Bazoft District (Samadi et al. 2010, Abbasi et al. 2019).
- E. macroclada* Boiss.; unknown location (Amano 1986, Ershad 1995 as *L. lanata*).
- E. petiolata* Banks & Soland.; Evin, Fars, Karaj, Tehran, Khozestan, Izeh (Magnus 1899 as *E. lanatae* P. Magn., Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 as *L. lanata*, Khodaparast et al. 2001).
- E. virgata* Waldst & Kit.; Lorestan: Oshtrankouh (Sepahvand et al. 2018).
- Euphorbia* sp.; Gorgan, Tole Khosrow, Dena protected area (Esfandari 1948, Amano 1986, Ershad 1971, 1995 as *L. lanata*, Salahi Ardekani et al. 2016).
- L. lanuginosa* (Fuckel) Golovin**  
Molecular data: ITS-rDNA = AB042641, AB044376, AB045153; 28S-rDNA = AB042641 (Takamatsu et al. 2008, Khodaparast et al. 2001).
- Daucus carota* L.; Manjil, Tabriz-Marand road (Khodaparast et al. 2001).
- D. carota* L. subsp. *maximus* (Desf.) Ball; Karaj, Tehran (Amano 1986, Mohammadi-Doustdar 1967, Ershad 1995 host name as *Daucus maximus* Desf.).
- Echinophora sibthorpiana* Guss.; Jirandeh (Amano 1986, Ershad 1971, 1995 as *L. umbeliferarum* Khodaparast et al. 2001).
- Foeniculum piperitum* Sweet.; Ray (Khabiri 1956 as *L. taurica*, Amano 1986 as *L. taurica*, Ershad 1995).
- F. vulgare* Mill.; Ahvaz, Marand, Shiraz (Viennot-Bourgin 1958 as *L. taurica*, Amano 1986 as *L. taurica*, Mohammadi-Doustdar 1967 as *L. taurica*, Ershad 1995).
- Heracleum persicum* Desf. ex Fisch., C.A. Mey. & Avé-Lall.; Mashhad (Khodaparast et al. 2001).
- L. lappae* (Castagne) U. Braun**  
Molecular data: ITS-rDNA = AB667870, AB667871 (Khodaparast et al. 2012).
- Arctium lappa* L.; unknown location (Amano 1986 as *L. compositarum*).
- Carthamus oxyacantha* M. B.; Evin, Golpaygan, Isfahan, Jajroud protected region (Amano 1986, Ershad 1971, 1995 as *L. compositarum* f. *carthami* Jacz., Sharifnabi & Banihashemi 1990, Kachooeian Javadi et al. 2006, Khodaparast et al. 2010).
- C. tinctorius* L.; Damavand, Evin, Ghazvin, Karaj, Varamin, Mashhad, Yazd (Anonymous 1970, Viennot-Bourgin et al. 1970 as *L. compositarum*, Amano 1986, Ershad 1971, 1995 as *L. compositarum* f. *carthami*, Aeenfar 2006, Khodaparast et al. 2010, Samadi et al. 2010).
- Carthamus* sp.; Zanjan (Khodaparast et al. 2012).
- Cirsium aduncum* Fisch. & C.A. Mey; Borujerd (Sepahvand 2008).
- C. arvense* (L.) Scop.; Isfahan, Tabriz, Tehran, Jajroud protected region (Sharifnabi & Banihashemi 1990, Niknam & Guya 1999, Ershad 1995 as *L. compositarum*, Kachooeian Javadi et al. 2006, Khodaparast et al. 2001, 2010).
- C. lanceolatum* Hill; Karaj (Mohammadi-Doustdar 1967, Ershad 1995, *L. compositarum*).
- Cirsium* sp.; Mahabad, Yasuj (Amano 1986, Ershad 1971, 1995 as *L. compositarum*).
- Cousinia bachtiarica* Boiss et. Hausskn.; Faridan (Sharifnabi & Banihashemi 1990, Ershad 1995 as *L. compositarum*).
- Cousinia eriobasis* Bunge; Yazd Province: Banadak Sadat (Samadi et al. 2010).
- C. eryngioides* Boiss., Jajroud protected region, (Kachooeian Javadi et al. 2006).
- C. hermonis* Boiss.; unknown location (Amano 1986).
- C. keredjensis* Bornm. & Gauba; Karaj (Hedjaroude & Abbasi 2000).
- C. khorramabadensis* Bornm.; Lorestan: Azna (Sepahvand 2010).
- C. orthoclada* Hausskn. & Bornm.; Chaharmahal and Bakhtiari, Gandoman, La deraz, Sabz Kuh).
- Cousinia* sp.; Ardekan (Amano 1986, Ershad 1971, 1995 as *L. compositarum*, Khodaparast et al. 2010).
- Cynara cardunculus* L.; Isfahan (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 as *L. compositarum*).
- C. scolymus* L.; unknown location (Amano 1986).
- Echinops ceratophorus* Boiss.; Karaj (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 as *L. compositarum*).
- E. chorassanicus* Bunge; Zanjan: Khodabandeh-Ahar road (Khodaparast et al. 2010).
- E. mosulensis* Rech.f.; Aligoodarz (Sepahvand 2010).
- E. pungens* Trautv.; Shahindej-Takab (Khodaparast et al. 2010).
- E. ritro* L.; Damavand (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 as *L. compositarum*).
- Gundelia tournefortii* L.; Karaj, Kuhe bozghush, Zanjan-Miyaneh road, Jajroud protected region (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1971, 1995 as *L. compositarum*, Kachooeian Javadi et al. 2006, Khodaparast et al. 2010).
- Iranecio paucilobus* (DC.) B. Nord.; Yazd Province, Shir-kuh mount (Abbasi et al. 2019).
- L. linariae* (Jacz.) U. Braun**  
Molecular data: not available.
- Linaria melanogramma* Rech.f., Aellen & Esfand; Khorassan Razavi Province: Torbate Heidarieh towards Mashhad, Kadkan, Sefid-darreh (Abbasi et al. 2019).
- L. loranthi* Hajian, Moharrery & Hedjar.**  
Molecular data: ITS-rDNA = AB044377 (Khodaparast et al. 2001).
- Loranthus europaeus* Jacq.; Ilam (Hajian et al. 1999).

***L. mindii* Khodap. & Hedjar.**

Molecular data: ITS-rDNA = AB045106; 28S-rDNA = AB080466 (Takamatsu et al. 2008, Khodaparast et al. 2001).

*Mindium laevigatum* (Vent.) Rech f. & Schiman-Czeika; Karaj (Hedjaroude & Abbasi 2000 as *L. taurica*, Khodaparast et al. 2001, 2002).

***L. papilionacearum* (Kom.) U. Braun**

Molecular data: ITS-rDNA = AB044992 (Khodaparast et al. 2001).

*Ammothamnus lehmannii* Bunge; (Amano 1986).

*Astragalus brachicalix* Fischer; Lorestan, Azna, Kamandan (Sepahvand et al. 2021b).

*A. florulentus* Boiss. & Haussk.; Hamedan (Amano 1986, Mohammad-Doustdar 1967, Ershad 1995).

*A. kirrindicus* Boiss.; Borujerd (Sepahvand 2008).

*A. multijugus* DC.; Astara, Damavand, Isfahan, Karaj (Amano 1986, Mohammadi-Doustdar 1967, Ershad 1995).

*Astragalus* sp.; Tehran (Amano 1986, Ershad 1995, Khodaparast et al. 2001).

*Sophora alopecuroides* L.; Karaj, Tabriz (Mohammadi-Doustdar 1967, Ershad 1995, Niknam & Guya 1999).

***L. picridis* (Castagne) Durrieu and Rostam**

Molecular data: ITS-rDNA = AB044380, AB045003; 28S-rDNA = AB080473 (Takamatsu et al. 2008, Khodaparast et al. 2001).

*Achillea santolina* L.; Damavand, Karaj (Viennot-Bourgin 1958, Mohammad-Doustdar 1967, Amano 1986, Ershad 1995 as *L. compositarum*).

*A. tenuifolia* Lam.; Lorestan: Oshtrankouh (Sepahvand et al. 2018).

*Anthemis tinctoria* L.; Karaj (Yazdani and Abbasi 1998).

*Artemisia annua* L.; Guilan: Roudbar (Khodaparast et al. 2001, Khodaparast et al. 2010).

*Artemisia aucheri* Boiss.; Ghorogh (Amano 1986, Ershad 1971, 1995 as *L. compositarum*, Khodaparast et al. 2010).

*Centaurea behen* L.; Darakeh, Isfahan, Kuhe dena, (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1971, 1995 as *L. compositarum* f. *centaureae*).

*C. depressa* M. B.; Tabriz (Amano 1986, Ershad 1995, as *L. compositarum* f. *centaureae*, Niknam & Guya 1999).

*C. iberica* Trevir. ex Spreng.; Mashhad (Aeenfar 2006).

*C. picris* Pall.; (Khodaparast et al. 2010).

*C. solstitialis* L.; Borujerd, Chaharmahal and Bakhtiari, Sharekord (Sepahvand 2008, Khodaparast et al. 2010, 2012).

*C. solstitialis* subsp. *solstitialis*; Sharekord-Flard road (Khodaparast and Abbasi 2001).

*C. virgata* Lam.; Isfahan, Ardebil-Meshkinshahr road, Mashhad, Borujerd, Lorestan: Hirab (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 as *L. compositarum* f. *centaureae*, Aeenfar 2006,

Sepahvand 2008, Khodaparast et al. 2010, Sepahvand 2010).

*C. virgata* subsp. *squarrosa* (Wild.) Gugler; Golestan national park (Tajik-Ghanbary 1995).

*C. xanthocephalus* Benth. & Hook.; Isfahan (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 as *L. compositarum* f. *centaureae*).

*Centaurea* sp.; Isfahan (Sharifnabi & Banihashemi 1990, Ershad 1995 as *L. compositarum* f. *centaureae* Jacz.).

*Impatiens balsamina* L.; Gorgan (Amano 1986, Ershad 1995 as *L. balsaminacearum* Golovin).

*Impatiens* sp.; Karaj (Khodaparast et al. 2001).

*Launaea acanthodes* (Boiss) O. Kuntze; Isfahan, Yazd Province: Nodooshan (Amano 1986, Ershad 1995 as *L. compositarum*, Samadi et al. 2010, Khodaparast et al. 2010, 2012, Abbasi et al. 2019).

*Launaea acanthodes* f. *pulverulenta* (Rech.f.) Parsa; Yazd (Samadi et al. 2010).

*Picris strigosa* M.B. subsp. *goniocala* (Boiss.) Lack; Golestan national park, Roodbar (Tajik-Ghanbary 2005 as *L. taurica*).

***L. ricini* (Speshnew) U. Braun**

Molecular data: not available.

*Ricinus communis* L.; South Khorasan Province: Mohammadiyan region (Mirzaee et al. 2011).

***L. rubiae* Khodap., U. Braun & Hamz. Zarghan.**

Molecular data: ITS-rDNA = AB044381; 28S-rDNA = AB080465 (Khodaparast et al. 2002, Takamatsu et al. 2008).

*Rubia tinctorum* L.; Yazd Province: Yazd, Sadooghm (Khodaparast et al. 2000, 2001, Samadi et al. 2010).

***L. rutae* (Jacz.) U. Braun**

Molecular data: ITS-rDNA = AB045151 (Khodaparast et al. 2001).

*Haplophyllum acutifolium* G. Don; Ardebil province: Givi to Khalkhal road (Abbasi et al. 2013).

*H. buxbaumi* (Por.) G. Don.; Karaj (Mohammadi-Doustdar 1967, Amano 1986 Ershad 1995 as *L. rutacearum*).

*H. perforatum* (M. B.) Kar. et Kir.; Alangeh, Ghazvin, Hamedan, Mashhad, Mianeh, Khalkhal, Golestan national park, Jajroud protected region, Karaj (Esfandiari 1946b, Ershad 1971, 1995 as *L. rutacearum*, Tajik-Ghanbary 1995, Khodaparast et al. 2001, Kachooeian Javadi et al. 2006).

*Haplophyllum* sp.; Ghorgan, Karaj (Mohammadi-Doustdar 1967, Ershad 1971, 1995 as *L. rutacearum*).

*Ruta acutifolia* DC.; Maygoon (Esfandiari 1946a, host name as *Haplophyllum acutifolium* (DC.). G. Don, Amano 1986 host name as *Ruta sieversiana* B. Fedtsch.).

*Ruta* sp.; Khorasan (Amano 1986, Khodaparast et al. 2012).

***L. saxaouli* (Sorokin) Golovin**

- Molecular data: ITS-rDNA = AB044382; 28S-rDNA = AB080469 (Khodaparast et al. 2001, Takamatsu et al. 2008).
- Haloxylon ammodendron* (C.A. Mey.) Bunge ex E. Fenzl; Rafsanjan, Sabzevar, Shahrud, Varamin (Amano 1986 as *L. taurica*, Ershad 1995).
- Haloxylon aphyllum* (Minkw.) Iljin; Yazd (Samadi et al. 2010).
- H. persicum* Bunge ex Boiss. & Buhse; Chah Afzal Road, Yazd Province, Sistan and Balochistan: Zahak, (Samadi et al. 2010, Abkhoo 2015).
- Haloxylon* sp.; Mashhad (Khodaparast et al. 2001).
- Salsola crassa* M. Bieb.; South Khorasan: Bandan (Abkhoo 2015).
- Salsola arbuscula* Pall.; Yazd Province: Maroost (Samadi et al. 2010).
- L. taurica* (Lév.) Arnaud**
- Molecular data: ITS-rDNA = AB667863, AB045002, AB667864, AB045150, AB667869, AB045107, AB000940, AB667876, AB045149, AM498634, AB667881, AB667882, AB045148, AB045000; 28S-rDNA = AB080474 (Khodaparast et al. 2001, 2007, 2012, Takamatsu et al. 2008).
- Alkanna* cf. *orientalis* (L.) Boiss.; Hamedan (Alvand) (Khodaparast et al. 2012).
- Amaranthus caudatus* L.; unknown location (Amano 1986, Ershad 1995).
- Anethum graveolens* L.; unknown location (Ershad 1971, 1995 as *L. umbeliferarum* Golovin f. *anethi* Golov.).
- Apiaceae* (unknown); Mashhad (Ershad 1995 as *L. umbeliferarum*).
- Apophyllum buhsei* Boiss.; Karaj (Viennot-Bourgin 1958, Mohammad-Doustdar 1967, Amano 1986, Ershad 1995 as *L. rutacearum* Golovin, host name as *H. buhsei* Boiss.).
- Capparis spinosa* L.; Ajichy, Gorgan, Karaj, Khuzestan, Roodbar, Mashhad (Esfandiari 1946a, Amano 1986, Ershad 1971, Ebrahimi & Minassian 1973 as *L. capparidacearum* Golovin., Khodaparast et al. 2001, Aeenfar 2006).
- C. spinosa* var. *spinosa*; Golestan national park (Tajik-Ghanbary 1995).
- Capsicum annuum* L.; Shiraz, Isfahan, Rasht (Banihashemi & Zakeri 1989, This study).
- Caryophyllaceae* (unknown); Hamedan, Cheshmeh malek.
- Catharanthus roseus* (L.) G. Don (Sharifi et al. 2020).
- Celosia* sp.; Karaj (Khodaparast et al. 2001).
- C. argentea* L.; Ardebil (Davari et al. 2015).
- C. cristata* L.; Gorgan, Shemiran (Ershad 1971, Ershad 1995 as *L. chenopodiacearum*, Amano 1986).
- Cerintho minor* L.; Zanjan, Khalkhal: Shal (Khodaparast et al. 2012, Abbasi et al. 2013).
- Chaerophyllum macropodium* Boiss; Damavand (Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 as *L. umbeliferarum*).
- Cicer arietinum* L.; Ghazvin, Karaj, Kermanshah, Shahriar, Varamin (Amano 1986, Mohammadi-Doustdar 1967, Scharif & Ershad 1966 as *Oidopsis* sp., Kaiser et al. 1968, as *Erysiphe* sp., Ershad 1971, 1995 as *L. leguminosarum* Golovin f. *ciceris* Jacz.).
- C. cf. spiroceras* Jaub. & Spach; Hamedan (Khodaparast et al. 2012).
- Cichorium intybus* L.; Damavand, Karaj (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1971, Ershad 1995 as *L. compositarum*).
- Clematis orientalis* L.; Shahrestanak (Amano 1986, Ershad 1995 as *L. ranunculacearum* Golovin).
- Coriandrum sativum* L.; Mashhad (Amano 1986, Ershad 1971, 1995 as *L. umbeliferarum*).
- Coronilla* sp.; Karaj (Viennot-Bourgin 1958, Ershad 1995 as *L. leguminosarum*).
- C. varia* L.; Karaj, Zanjan, Dena protected area (Mohammadi-Doustdar 1967, Amano 1986, Khodaparast et al. 2012, Salahi Ardekani et al. 2016).
- Crepis asadbarensis* Bornm ex. Rech. f.; Karaj (Khodaparast et al. 2010, 2012).
- Cucumis sativus* L.; Guilan: Rasht after inoculation in a greenhouse with conidium source from *Lycopersicon esculentum* (Hoseinkhaniha et al. 2012).
- Cucurbita maxima* Duchesne; Mashhad (Aeenfar 2006).
- Cytisus laburnum* L.; Karaj (Petraik & Esfandiari 1941, Esfandiari 1946a, Ershad 1995 as *L. leguminosarum*).
- Daphne mucronata* Royle; Kuhrang, Aligoodarz (Khodaparast et al. 2010, 2012, Sepahvand et al. 2015).
- Datisca cannabina* L. Khalkhal: Kandragh (Abbasi et al. 2013).
- Daucus maximus* Desf.; unknown location (Amano 1986).
- Dendrostellera lessertii* Tiegh.; Kuhe alvand (Ershad 1995 as *L. thymelaeacearum* Golovin).
- Dianthus* sp.; Shiraz (Viennot-Boutgin 1958, Scharif & Ershad 1966, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 as *L. caryophyllacearum*).
- D. barbatus* L.; Tehran (Ershad 1971, Amano 1986, Ershad 1995 as *L. caryophyllacearum*).
- D. macranthoides* Hausskn. ex Bornm.; Lorestan: Oshtrankouh (Sepahvand et al. 2018).
- Diarthron vesiculosum* (Fisch. & C.A. Mey. ex Kar. & Kir.) C.A. Mey.; Kerman Province: Darzin, Sabzevaran, Hamedan Province: Toyserkan, (Ershad 1995 as *L. thymelaeacearum*, Abbasi et al. 2019).
- Exochorda alberti* Rgel; unknown location (Amano 1986).

- Fagonia indica* Burm F.; South Khorasan: Bandan (Abkhoo 2015).
- Ferulago angulata* subsp. *carduchorum* (Boiss. & Hausskn.) D.F. Chamb; Dena protected area (Salahi Ardekani et al. 2016).
- Glaucium elegans* Fisch. & C. A. Mey.; Damavand (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 as *L. papaveracearum* Golovin).
- G. oxylobum* Boiss. & Buhse; Guilan Province: Amarlou (Khodaparast et al. 2001).
- Glycyrrhiza asperrima* L. f.; Jajrud, Kan, Karaj (Petrak & Esfandiari 1941, Eskandari 1946, Khabiri 1956, Ershad 1971, Amano 1986, Ershad 1995 as *L. leguminosarum* f. *glycyrriza* Jacz.).
- G. glabra* L.; Borujerd, Ghorogh, Mashhad, Shiraz, Sorkheh, Manjil, Taft (Esfandiari 1946a, Ershad 1971, Amano 1986, Ershad 1995 as *L. leguminosarum* f. *glycyrriza*, Khodaparast et al. 2001, Samadi et al. 2010).
- Gossypium* sp.; Isfahan (Ershad 1971, 1995 as *Oidiopsis gossypii* (Wakef.) Raych., Amano 1986).
- Gypsophila elegans* M. Bieb.; Hamedan (Viennot-Bourgin 1958, Amano 1986, Ershad 1995 as *L. caryophyllacearum*).
- Helianthus annuus* L.; Isfahan, Khenamon, Mashhad, Salmas (Amano 1986, Sharifnabi & Banihashemi 1990, Ershad 1995 as *L. compositarum*, Aeenfar 2006, Khodaparast et al. 2010).
- Heliotropium europeum* L.; Dezful (Amano 1986, Ershad 1995 as *L. boraginacearum* Golovin).
- Heracleum anisactis* Boiss. & Hohen.; Chalus (Viennot-Bourgin et al. 1970, Amano 1986, Ershad 1995 as *L. umbelliferarum*).
- H. persicum* Desf.; Karaj, Yasyj, Komehr (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1971, 1995 as *L. umbelliferarum*).
- Hibiscus cannabinus* L.; Dezful, Varamin (Scharif & Ershad 1966, Scharif & Akhavizadegan 1967, Ebrahimi & Minasian 1973 as *L. malvacearum*, Amano 1986, Ershad 1971, 1995 as *L. malvacearum* f. *hibisci* Zaprom.).
- H. sabdariffa* L.; Birjand (Mirzaee et al. 2007).
- Hyoscyamus leucanthera* Bornm. & Gauba.; Mashhad (Ershad 1971, 1995 as *L. solanacearum* Golovin).
- H. niger* L.; Karaj, Jajroud protected region (Kachooeian Javadi et al. 2006, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 as *L. solanacearum*, Kachooeian Javadi et al. 2006).
- H. pojarkovae* Schönbn.-Tem.; Tabriz (Niknam & Guya 1999).
- H. pusillus* L.; Khalkhal (Khodaparast and Abbasi 2009).
- Hyoscyamus* sp.; Zanjan: Khodabandeh (Khodaparast et al. 2012).
- Hypericum perforatum* L.; Fasham, Karaj (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 as *L. guttiferarum* Golovin).
- Klasea cerinthifolia* (Sm.) Greuter & Wagenitz.; Lorestan Province: Oshtrankouh (Sepahvand et al. 2018 host name as *Serratula cerinthifolia* (Sm.) Boiss).
- Laburnum anagyroides* Medik.; unknown location (Amano 1986).
- Lathyrus incurvus* (Roth) Willd.; Karaj (Esfandiari 1946a, Amano 1986, Ershad 1995 as *L. leguminosarum*).
- Leptorhabdos parviflora* Benth.; Karaj (Petrak & Esfandiari 1941, Esfandiari 1946b, Amano 1986, Ershad 1995 as *L. scrophulariacearum* Golovin).
- Levisticum officinale* W.D.J. Koch; Karaj (Petrak & Esfandiari 1941, Esfandiari 1946b, Ershad 1995 as *Oidiopsis sicula* Scalia).
- Lotus corniculatus* L.; Borujerd (Ershad 1971, Amano 1986, Ershad 1995 as *L. leguminacearum*, Khodaparast et al. 2001).
- Lycopersicon esculentum* Mill.; Shiraz, Karaj, Rasht, Qazvin, Sistan and Baluchistan: Zabol (in greenhouse), Mashhad (Banihashemi & Zakeri 1996, Aeenfar 2006, Hoseinkhaniha et al. 2012, Abkhoo 2015).
- Melandrium pratense* Roehl.; Tabriz (Ershad 1995 as *L. taurica* f. *caryophyllacearum*).
- Ononis leiosperma* Boiss.; Karaj (Esfandiari 1948, Amano 1986, Ershad 1971, 1995).
- O. spinosa* L.; Chaharmahal and Bakhtiari, Gandoman, Borujerd (Sepahvand 2008, Khodaparast et al. 2001, Khodaparast et al. 2012, Sepahvand & Moridi 2007).
- Opsicarpium insignis* Mozaff.; Lorestan Province, Oshtrankouh (Sepahvand et al. 2021a).
- Papaver macrostomum* Boiss. & A. Huet; Fars Province, Sepidan road, Dehpagah (Abbasi et al. 2019).
- Papaver* sp., Ramin (Ershad 1971, Ebrahimi & Minassian 1973, Amano 1986, Ershad 1995 as *L. papaveracearum*).
- Peganum harmala* L.; Widespread (Esfandiari 1946b, Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Daftari & Behdad 1968, Ershad 1971, Amano 1986, Ershad 1995, Tajik-Ghanbary 1995, Niknam & Guya 1999, Khodaparast et al. 2001, Kachooeian Javadi et al. 2006, Aeenfar 2006, Samadi et al. 2010, Abkhoo 2015).
- Phlox drummondii* Hook.; unknown location (Amano 1986, Ershad 1995 as *L. polemoniacearum* Golovin).
- P. pyramidalis* S. M.; Karaj (Amano 1986, Mohammadi-Doustdar 1967, Ershad 1995 as *L. polemoniacearum*).
- Polianthes tuberosa* L.; Markazi Province: Mahalat (Khodaparast et al. 2003, 2012).

- Prangos haussknechtii* Boiss.; unknown location (Amano 1986, Ershad 1995 as *L. umbelliferarum*).
- P. uloptera* DC.; Tehran Province: Pasghalleh (Ershad 1995 as *L. umbelliferarum*).
- Prosopis fracta* (Banks & Soland.) J.F. Macbr.; Sistan and Baluchistan: Zabol (Abkhoo 2015).
- Reseda lutea* L.; Karaj, Damavand (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995).
- Robinia pseudoacacia* L.; Karaj (Mohammadi-Doustdar 1967, Ershad 1995).
- Rosa persica* J.F. Gmel.; Razavi Khorasan: Mashhad, Abardeh (Aeenfar 2011).
- Sanguisorba minor* Scop.; Khoys (Ershad 1995 as *L. taurica* f. *scabiosae* (Jacq.) Golovin).
- Scabiosa olivieri* Coult.; unknown location (Amano 1986, Ershad 1971, 1995 as *L. dipsacearum* Golov.).
- S. ucranica* L.; unknown location (Amano 1986).
- Sanguisorba* sp., Hamedan (Khodaparast et al. 2012).
- Senecio persicus* Boiss.L.; unknown location (Amano 1986, Ershad 1995 as *L. compositarum*).
- Serratula latifolia* Boiss.; unknown location (Amano 1986, Ershad 1995 as *L. compositarum*).
- Sesamum indicum* L. Yazd Province, Banadak Sadat (Abassi et al. 2003, Samadi et al. 2010).
- Silybum marianum* (L.) Gaertn.; Karaj (Yazdani and Abbasi 1998, Sharifi et al. 2020a).
- Silene chlorifoila* Sm.; Lorestan Province: Oshtrankouh (Sepahvand et al. 2018).
- Silene* sp.; Hamedan (Khodaparast et al. 2012).
- Solanum melongera* L.; Ghasre shirin, Rasht (Amano 1986, Ershad 1971, 1995 as *L. Solanacearum*, Hoseinkhaniha et al. 2012, in Rasht after inoculation in greenhouse using inoculation source from *Lycopersicon esculentum*).
- Spartium junceum* L.; Karaj, (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 as *L. leguminosarum*).
- Taraxacum montanum* (C. A. Mey.) DC.; Damavand, Karaj, Pasghalleh (Mohammadi-Doustdar 1967, Ershad 1995, Khodaparast et al. 2010).
- T. syriacum* Boiss.; Chaharmahal and Bakhtiari, Brujen, Siah Sard spring (Amano 1986, as *L. compositarum* and host name as *T. denudatum* Boiss.).
- Tribulus longipetalus* Viv. Hebrew.; Sistan and Baluchistan: Zabol (Abkhoo 2015).
- Verbena officinalis* L.; unknown location (Amano 1986).
- Verbena* sp.; unknown location (Amano 1986, Ershad 1995).
- Vincetoxicum medium* Decne.; unknown location (Amano 1986, host name as *V. funebre* Boiss. & Kotschy).
- Zygophyllum attriplicoides* Fisch. & C.A. Mey.; Fars, Yazd Province: Nadooshan (Khodaparast et al. 2001, Samadi et al. 2010).
- Z. eichwaldi* C.A. Mey.; Yazd (Samadi et al. 2010).
- Z. eurypterum* Boiss. & Buhse; South Khorasan, Bandan (Abkhoo 2015).
- Z. fabago* L.; Rafsanjan, Roodbar, Golestan national park, Jajroud protected region (Ershad, 1971, Amano 1986, Ershad 1995, Tajik-Ghanbary 1995, Khodaparast et al. 2001, Kachooeian Javadi et al. 2006).
- L. thevenotiae*** (Jacq.) Golovin  
Molecular data: ITS-rDNA =AB044383; 28S-rDNA = AB080477 (Khodaparast et al. 2001, Takamatsu et al. 2008).
- Thevenotia persica* DC.; Ghorogh, Tehran, Isfahan (Magnus 1899 as *Er. taurica*, Amano 1986 as *L. taurica*, Ershad 1971, 1995 as *L. thevenotiae* (Jacq.) Golovin, Khodaparast et al. 2001, Khodaparast et al. 2010).
- T. scabra* Boiss.; Bisheh, Karaj, Soltan abad, Tehran, Lorestan (Magnus 1899 as *E. taurica*, Petrak 1949 as *L. taurica*, Esfandiari 1948 as *L. taurica*, Amano 1986 as *L. taurica*, Ershad 1995, Khodaparast et al. 2010).
- Cucurbita* sp.; North Khorasan Province, Bojnord (Khodaparast et al. 2016).
- L. verbasci*** (Jacq.) Golovin  
Molecular data: ITS-rDNA =AB045155 (Khodaparast et al.2001).
- Verbascum phlomoides* L.; Karaj, Shemiran (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 all records as *L. taurica*).
- V. sinuatum* L.; unknown location (Amano 1986, Ershad 1971, 1995 all records as *L. taurica*).
- V. sinuatum* var. *adenosepalum* Murb.; unknown location (Amano 1986 as *L. taurica*).
- Verbascum* sp.; Fasham, Hamedan, Khoramabad, Boroujerd (Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995 all records as *L. taurica*; Khodaparast et al. 2001, Sepahvand et al. 2002, Sepahvand 2010).
- Leveillula* sp.**  
*Acroptilon repens* (L.) DC.; Tabriz, Karaj, Mashhad, Tehran, Takab-Shahindej road, Mobarakeh, Isfahan, Golpayegan-Khansar road, Samirom-Isfahan road, Abar kooh, Yazd Province (Esfandiari 1946a, Petrak and Eskandari 1941, Mohammadi-Doustdar 1967 host name as *Acroptilon picris* DC., Amano 1986 host name as *Acroptilon picris*, Ershad 1971, 1995 as *L. compositarum* f. *centaureae* Jacq., Niknam & Guya 1999, Aeenfar 2006, Khodaparast et al. 2010, Samadi et al. 2010, Khodaparast et al. 2012).
- Medicago falcata* L.; Fasham (Amano 1986, Ershad 1971, Ershad 1995 as *L. leguminosarum*).
- M. lupulina* L.; Evin (Amano 1986, Ershad 1995 *L. taurica* f. *medicaginis* Jacq.).
- M. orbicularis* (L.) Bartalini.; Alashtar (Azadbakht et al. 2013).
- M. rigidula* (L.) All; Alashtar (Azadbakht et al. 2013).

- M. sativa* L.; widespread (Manuchehri 1964 as *Leveillula* sp., Viennot-Bourgin 1958, Scharif & Ershad 1966, Mohammadi-Doustdar 1967, Daftari and Behdad 1968, Ershad 1971, Amano 1986, Sharifnabi & Banihashemi 1990, Ershad 1995 as *L. leguminasearum*, Tajik-Ghanbary 1995, Niknam & Guya 1999, Hedjaroude & Abbasi 2000, Aeenfar 2006, Khodaparast et al. 2001, Davari et al. 2015, Abkhoo 2015).
- Medicago* sp.; Evin, Guilan: Amarlou, (Amano 1986, Ershad 1971, 1995 as *L. leguminasearum*, Khodaparast et al. 2001).
- Onobrychis galegifolia* Boiss.; Sanandaj, Paveh (Ershad 1995 as *L. leguminasearum*).
- O. gaubae* Bornm., Jajroud protected region (Kachooeian Javadi et al. 2006).
- O. chorassanica* Bunge ex Boiss.; Golestan national park (Tajik-Ghanbary 2005).
- O. montana* DC.; unknown location (Amano 1986).
- O. vicifolia* Scop.; widespread (Viennot-Bourgin 1958, Scharif & Ershad 1966, Mohammadi-Doustdar 1967, Daftari & Behdad 1968, Amano 1986, Sharifnabi & Banihashemi 1990, Ershad 1995 as *L. leguminasearum*, Sepahvand 2008, Khodaparast et al. 2001).
- Onobrychis* sp.; Khoram abad (Sepahvand et al. 2002).
- Tropaeolum majus* L.; Ahvaz, Dezful, Karaj, Hamadan, Shiraz, Tehran (Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Ershad 1971, Ebrahimi & Minassian 1973, Amano 1986, Ershad 1995).
- Vicia faba* L.; unknown location (Amano 1986).
- V. tenuifolia* Roth; unknown location (Amano 1986).
- Vicia variabilis* Freyn & Sint. ex Freyn; Karaj, Khalkhal-Ardebil road, Golestan (Tajik-Ghanbary 1995, Khodaparast et al. 2001, Hedjaroude & Abbasi 2000).
- Vicia* sp.; Zanjan-Taham road (Khodaparast et al. 2012).

#### ***Neoerysiphe* U. Braun**

- N. galeopsidis* (DC.) U. Braun**  
Molecular data: not available.
- Ballota nigra* L.; Ardebil (Davari et al. 2015).
- Lamium amplexicaule* L.; Karaj (Esfandiari 1946a, Khabiri 1956, Viennot-Bourgin 1958, Amano 1986, Ershad 1995 all records as *E. galeopsidis*).
- Leonurus cardiaca* L.; Deileman, Khalkhal-Ardebil road (Khodaparast et al. 2000 as *E. galeopsidis*).
- Mentha sylvestris* L.; unknown location (Ershad 1995 as *E. galeopsidis*).
- M. pulegium* L., Hamedan (Khodaparast and Abbasi 2009).

- Phlomis herba-venti* subsp. *Kopetdaghensis* (Knorring) Rech.f.; Golestan Province, Golestan national park, Almehr (Abbasi et al. 2019).
- P. orientalis* Mill.; Purkan (Amano 1986, Ershad 1971, Ershad 1995 all records as *E. galeopsidis*).
- P. pungens* Willd.; Azarbaijan (Amano 1986, Ershad 1995 both records as *E. galeopsidis*).
- Phlomis* sp.; unknown location (Pettrak 1953, Amano 1986, Ershad 1971, Ershad 1995 all recrd as *E. galeopsidis*).
- Prunella grandiflora* Jacq.; Damavand (Mohammadi-Doustdar 1967 as *E. labiatarum* (Wallr.) Chev., Ershad 1995 as *E. galeopsidis*).
- Rosmarinus officinalis* L.; Yazd (Samadi et al. 2010).
- Stachys arvensis* L.; unknown location (Khabiri 1958, Amano 1986, Ershad 1995 all records as *E. galeopsidis*).
- N. galii* (S. Blumer) U. Braun**  
Molecular data: ITS-rDNA = AB104525, rDNA-28S=AB103365 (Khodaparast et al. 2003).
- Galium aparine* L.; Fars Province, 30 km of Estahbanat, Morghak pass; Khanahmad, Kohgiluyeh and Boyer-Ahmad (Abbasi et al. 2019, Mousavinezhad et al. 2023).
- Galium* sp. unknown location, Amarlu (Amano 1986, Ershad 1971, Ershad 1995, Khodaparast et al. 2000).
- Phuopsis stylosa* Benth. & Hook.f.; Talesh, Amarlu (Khodaparast et al. 2000, 2003, 2005).
- N. nevoi* V.P. Heluta & S. Takam.**  
Molecular data: not available.
- Crepis kotschyana* (Boiss.) Boiss.; Fars Province, Bamu National Park, Zarghan gate (Abbasi et al. 2019).
- Hedypnois rhagadioloides* (L.) F.W. Schmidt; Fars Province: Kazerun, mountain besides Shahranjan village; Kohgiluyeh and Boyer-Ahmad: Khanahmad (Abbasi et al. 2019, Mousavinezhad et al. 2023).

#### ***Phyllactinia* Lév.**

- Phyllactinia acaciae* Syd.**  
Molecular data: not available.
- Acacia oerfota* (Forssk.) Schweinf.; Hormozgan: Bandarabbas to Minab road, Chahesmael village (Abbasi 2020).
- Phyllactinia antarctica* Speg.**  
Molecular data: ITS-rDNA = AB080554; 28S-rDNA = AB080452 (Takamatsu et al. 2008).
- Alnus glutinosa* Medik.; Mazanderan, Rostam abad, Masuleh, Shaft, Amlash, Ziyabar-Talesh road, Ramsar (Esfandiari 1946a as *Ph. corylea*, Khabiri 1958 as *Ph. suffulta*, Scharif & Ershad 1966, Ershad 1971, Amano 1986 as *Ph. suffulta*, Ershad 1995, Khodaparast et al. 2001, Pirnia et al. 2007, Takamatsu et al. 2008).



*Alnus* sp.; unknown location (Amano 1986 as *Ph. suffulta*).

***Ph. babayanii* Simonyan**

Molecular data: ITS-rDNA = KU721075 (Khodaparast et al. 2016).

*Amygdalus haussknechti* (C.K. Schneider) Bornm.; Lorestan Province, Oshtrankouh (Sepahvand 2021b).

*Prunus dulcis* (Mill.) D.A. Webb; Fars Province: Eghlid, Isfahan Province: Isfahan, Ghamsar, Kashan, Shahreza, Sharafkhaneh, East Azarbaijan Province: Shabastar-Tasuj road, Taft (Petrak 1953 as *P. suffulta*, Scharif & Ershad 1966, Viennot-Bourgin et al. 1970, Ershad 1971, 1995 as *Ph. guttata* (Wall. : Fr.) Lév., Pirnia et al. 2007, Samadi et al. 2007, 2010).

*P. horrida* (Spach) Schneider; Karaj (Mohammadi-Doustdar 1967 as *P. suffulta* (Rebent.) Sacc., host name as *Amygdalus reuteri* Boiss. & Buhse, Pirnia et al. 2007).

*P. lycioides* C.K. Schneid.; unknown location (Mohammadi-Doustdar 1967, Amano 1986 as *Ph. suffulta*, Ershad 1995, Pirnia et al. 2007).

***Ph. carpini* (Rabenh.) Fuss**

Molecular data: not available.

*Carpinus betulus* L.; Masuleh, Ardabil, Arasbaran forest (Pirnia et al. 2007, Tavanaei et al. 2009).

***Phyllactinia catalpae* U. Braun**

Molecular data: not available.

*Catalpa speciosa* Warder ex Engelm.; Karaj (Scharif & Ershad 1966).

***Ph. aff. corni* H.D. Shin & M.J. Park**

Molecular data: ITS-rDNA = AY870865 (Khodaparast et al. 2016).

*Cornus australis* C.A. Mey.; Mazandaran: Kiasar National Park (Abbasi & Mohseni-Chamazkoti 2014).

*C. mas* L.; Arasbaran forests (Tavanaei et al. 2009).

*C. sanguinea* L.; Arasbaran forest (Pirnia et al. 2007).

*C. sanguinea* L.; subsp. *australis* (C. A. Meyer) Jav., Karaj (Hedjaroude & Abbasi 2000).

*Cornus* sp.; Arasbaran forest (Pirnia et al. 2007).

***Ph. fraxini* (DC.) Fuss**

Molecular data: ITS-rDNA = AB080555; 28S-rDNA = AB080453 (Takamatsu et al. 2008, Khodaparast et al. 2016 as *Ph. fraxinicola*, Maeda et al. 2021).

*Chionanthus virginica* L.; unknown location (Amano 1986 as *Ph. suffulta*, Mohammadi-Doustdar 1967 as *Ph. suffulta*, Ershad 1995 as *Ph. guttata*).

*Fraxinus excelsior* L.; Ghazvin, Karaj, Tabriz, Golestan national park, Fuman, Arasbaran forest (Khabiri 1958 as *Ph. suffulta*, Scharif & Ershad 1966 as *Ph. guttata*, Viennot-Bourgin et al. 1970 as *Ph. suffulta*, Amano 1986 as *Ph. suffulta*, Ershad 1971, 1995 as *Ph. fraxini* (DC.) Homma, Tajik-Ghanbary 1995, Niknam & Guya 1999, Pirnia et al. 2007).

*F. excelsior* subsp. *Coriarifolia*; Arasbaran forests (Tavanaei et al. 2009).

*F. platycarpa* Michx.; Karaj (Esfandiari 1946a as *Ph. corylea* Pers., Amano 1986 as *Ph. suffulta*).

*Fraxinus* sp.; Asalem-Khalkhal road, Masuleh, Siakal-Deileman road (Khodaparast et al. 2001, Takamatsu et al. 2008).

***Ph. guttata* (Wall. : Fr.) Lév.**

Molecular data: ITS-rDNA = AB080558; 28S-rDNA = AB080456 (Takamatsu et al. 2008, Khodaparast et al. 2016).

*Corylus avellana* L.; Guilan Province: Amarlu, Amlash, Astara, Masuleh, Sumaehsara; Ghazvin; Karaj; Mazandaran Province: Kelar dasht, Tonekabon; Tehran, Shemiran, Damavand; East Azarbaijan: Sufiyan to Shabastar road, Arasbaran forest, Ardebil (Esfandiari 1946a as *Ph. corylea*, Khabiri 1952, Amano 1986, Scharif & Ershad 1966, Mohammadi-Doustdar 1967, Ershad 1971, Amano 1986 as *Ph. suffulta*, Ershad 1995, Tavanaei et al. 2009, Khodaparast et al. 2001, Pirnia et al. 2007, Takamatsu et al. 2008, Davari et al. 2015).

***Ph. mali* (Duby) U. Braun**

Molecular data: ITS-rDNA = AB080556, AB080559, KU712267; 28S-rDNA = AB080454, AB080457 (Takamatsu et al. 2008, Khodaparast et al. 2016).

*Crataegus azarolus* L.; Khoramabad (Sepahvand et al. 2015).

*C. meyeri* Pojark.; Arasbaran forest (Pirnia et al. 2007, Tavanaei et al. 2009).

*C. microphylla* K. Koch var. *dolichocarpa* (Simmoier & Levier) Hend.-Mazt.; Masuleh (Khodaparast et al. 2001 as *Ph. guttata*).

*C. monogyna* Jacq.; Karaj (Esfandiari 1946a as *Ph. mespili*, Amano 1986 as *Ph. oxyacanthae*, Scharif & Ershad 1966, Mohammadi-Doustdar 1967 as *Ph. mespili*, Ershad 1971, 1995 as *Ph. mespili*).

*C. pentagyna* Waldst. & Kit. ex Willd.; Ebrahim abad (Khabiri 1958 as *Ph. mespili*, Amano 1986 as *Ph. mespilii*, Ershad 1995 as *Ph. mespili*).

*Crataegus* sp.; Karaj, Golestan national park, Amlash, Masuleh, Shaft, Rasht, Talesh to Astara road, Kiasar National Park (Amano 1986 as *Ph. oxyacanthae*, Mohammadi-Doustdar 1967 as *Ph. mespili*, Ershad 1995 as *Ph. mespili*, Tajik-Ghanbary 1995, Hedjaroude & Abbasi 2000, Pirnia et al. 2007, Takamatsu et al. 2008, Abbasi & Mohseni-Chamazkoti 2014).

*Cydonia oblonga* Mill.; Gorgan (Amano 1986 as *Ph. oxyacanthae* (DC.) de Bary, Ershad 1995 as *Ph. mespili* (Castagne) S. Blumer).

*Cydonia* sp.; unknown location (Amano 1986 as *Ph. suffulta*).

*Mespilus germanica* L.; Karaj, Golestan national park, Talesh to Astara road, Rasht, Arasbaran forest, Amlash, Kiasar national park (Scharif & Ershad 1966 as *Ph. guttata*, Mohammadi-

- Doustdar 1967 as *Ph. mespili*, Amano 1986 as *Ph. suffulta*, Ershad 1995 as *Ph. mespili*, Tajik-Ghanbary 1995, Pirnia et al. 2007, Takamatsu et al. 2008, Tavanaei et al. 2009, (Abbasi & Mohseni-Chamazkoti 2014).
- Prunus armeniaca* L.; Mashhad (Pirnia et al. 2007).
- P. cerasus* L.; unknown location (Amano 1986 as *Ph. suffulta*, Ershad 1995).
- P. persica* L.; Karaj (Mohammadi-Doustdar 1967 as *Ph. suffulta*).
- P. divaricata* Ledeb.; Golestan national park (Tajik-Ghanbary 2005).
- Pyrus amygdaliformis* Vill.; Karaj, Tehran vicinity (Amano 1986 as *Ph. suffulta*, Mohammadi-Doustdar 1967 as *Ph. suffulta*, Ershad 1995).
- P. communis* L.; Azarbaijan, Caspian sea area, Isfahan, Karaj, Khorasan, Tehran vicinity, Orumieh (Scharif & Ershad 1966, Ershad 1971, Amano 1986 as *Ph. suffulta*, Ershad 1995, Pirnia et al. 2007).
- P. salicifolia* Pall.; Arasbaran forest (Amano 1986 as *Ph. suffulta*, Mohammad-Doustdar 1967 as *Ph. suffulta*, Ershad 1995, Pirnia et al. 2007).
- P. salicifolia* Pall. var. *salicifolia*; Arasbaran forests (Tavanaei et al. 2009).
- Sorbus aria* (L.) Crantz; unknown location (Scharif & Ershad 1966).
- S. graeca* (Spach) Kotschy; unknown location (Amano 1986 as *Ph. suffulta*, Ershad 1995).
- Ph. moricola* (Henn.) Homma**  
Molecular data: ITS-rDNA = AB080561; 28S-rDNA = AB080459 (Takamatsu et al. 2008, Khodaparast et al. 2016).
- Morus alba* L.; Mashhad (Scharif & Ershad 1966 as *Phyllactinia* sp., Aeenfar 2006 as *Ph. guttata*).
- M. nigra* L.; unknown location (Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995).
- Morus* sp.; Caspian sea area, Karaj, Khalkhal-Ardebil road; Sistan and Balochistan: Zahak (Scharif & Ershad 1966, Ershad 1971, 1995, Amano 1986, Khodaparast et al. 2001 as *Ph. guttata*, Pirnia et al. 2007, Takamatsu et al. 2008, Davari et al. 2015, Abkhoo 2015).
- Ph. nivea* (Castagne) U. Braun**  
Molecular data: not available.
- Ulmus glabra* Huds.; Karaj, Tehran vicinity (Mohammadi-Doustdar 1967 as *Ph. suffulta*, Amano 1986 *Ph. suffulta*, Ershad 1995, Tavanaei et al. 2009).
- Ulmus* sp.; Karaj (Scharif & Ershad 1966, Ershad 1971, Amano 1986 as *Ph. suffulta*, Ershad 1995)
- Ph. orbicularis* (Ehrenb.) U. Braun**  
Molecular data: ITS-rDNA = AB080557; 28S-rDNA = AB080455 (Takamatsu et al. 2008, Khodaparast et al. 2016).
- Fagus grandifolia* Ehrh.; unknown location (Amano 1986 as *Ph. suffulta*).
- F. orientalis* Lipsky; Mazandaran: Kiasar national park; Guilan Asalem-Khalkhal road (Takamatsu et al. 2008 as *Phyllactinia* sp., Khodaparast et al. 2001, Abbasi & Mohseni-Chamazkoti 2014).
- F. sylvatica* L.; Mazandaran (Esfandiari 1946a as *Ph. corylea*, Scharif & Ershad 1966, Amano 1986 as *Ph. suffulta*).
- Quercus macranthera* Fisch. & Mey. ex Hohen.; Arasbaran forest (Tavanaei et al. 2005, Pirnia et al. 2007).
- Q. petraea* (Matt.) Liebl.; Arasbaran forest (Tavanaei et al. 2001).
- Quercus* sp.; unknown location (Scharif & Ershad 1966, Amano 1986 as *Ph. suffulta*).
- Ph. paliuri* U. Braun**  
Molecular data: ITS-rDNA = AB080560; 28S-rDNA = AB080458 (Takamatsu et al. 2008, Khodaparast et al. 2016).
- Paliurus spina-christi* Mill.; Astara, Talesh to Astara road, Golestan national park, Arasbaran forest (Viennot-Bourgin 1958 host name as *Ph. aculeatus* Lam., Amano 1986 as *Ph. suffulta*, Ershad 1995, Tajik-Ghanbary 1995, Pirnia et al. 2007, Tavanaei et al. 2009).
- P. spina-christi* Mill. var. *spina-christi*; Jirandeh-Loshan road (Khodaparast et al. 2001, Takamatsu et al. 2008).
- Ph. parietariae* U. Braun & Khodap.**  
Molecular data: ITS-rDNA = AB080562; 28S-rDNA = AB080460 (Takamatsu et al. 2008, Braun & Cook 2012, Khodaparast et al. 2016).
- Parietaria officinalis* L.; Roodbar, Gorgan (Khodaparast et al. 2000, Pirnia et al. 2007, Takamatsu et al. 2008 as *Phyllactinia* sp. All records as *Ph. guttata*).
- Ph. pistaciae* H.D. Shin & Y.J. Choi**  
Molecular data: ITS-rDNA = PQ236699 (This study).
- Pistacia khinjuk* Stocks; Tabas (Pirnia et al. 2007).
- P. mutica* Fisch. and Mey.; Yazd Province: Jabal barez, Koyjan, (Amano 1986 as *Ph. suffulta*, Ershad 1995 as *Ph. imperialis* Miyabe, Samadi et al. 2010).
- P. vera* L.; Damavand, Ghazvin, Jabal barez, Kerman, Rafsanjan, Zarand (Esfandiari 1948 as *Ph. corylea*, Khabiri 1958 as *Ph. suffulta*, Scharif & Ershad 1966 as *Ph. guttata*, Amano 1986 as *Ph. suffulta*, Ershad 1971, 1995 as *P. imperialis*).
- Rhus cotinus* L.; Tehran (Amano 1986 as *Phyllactinia* sp., Scharif & Ershad 1966 as *Ph. guttata*, Ershad 1971, 1995 as *Ph. imperialis*).
- Ph. populi* (Jacz.) Y.N. Yu, in Yu & Lai**  
Molecular data: not available.
- Salix aegyptiaca* L.; Arasbaran forest (Pirnia et al. 2007).
- Salix alba* L.; Khoramabad (Sepahvand et al. 2015).
- Ph. pyri-serotinae* Sawada**  
Molecular data: not available.

*Pyrus boissieriana* Buhse; Mazandaran, Kiasar national park (Abbasi & Mohseni-Chamazkoti 2014).

***Ph. takamatsui* Khodap. & A. H. Mohammadi**

Molecular data: ITS-rDNA = KU695459 (Khodaparast et al. 2016).

*Cotoneaster nummularius* Fisch. & C.A. Mey.; Kerman Province, Shahr-e Babak, Riseh Village (Khodaparast et al. 2016).

***Phyllactinia* sp.**

*Lonicera floribunda* Boiss. & Buhse; Mazandaran: Kiasar national park (Abbasi & Mohseni-Chamazkoti 2014).

*L. iberica* M. Bieb.; Arasbaran forest (Tavanaei et al. 2002, 2009 as *Ph. guttata*).

*Vitis sylvestris* Gmelin; subsp. *trichophylla* Kolen.; Arasbaran forests (Tavanaei et al. 2009 as *Ph. guttata*).

***Podosphaera* Kunze**

***Podosphaera* section *Podosphaera***

***P. clandestina* (Wallr. : Fr.) Lév.**

Molecular data: not available.

*Crataegus monogyna* Jacq.; Damavand (Mohammadi-Doustdar 1967 as *P. oxyacanthae* (Wallr. : Fr.) Lév., Amano 1986 as *P. oxyacanthae*, Ershad 1995).

*C. oxyacantha* L.; Damavand (Viennot-Bourgin 1958 as *P. oxyacanthae*, Amano 1986, Ershad 1995).

*Crataegus* sp.; Zarringol, Golestan national park (Ershad 1995, Tajik-Ghanbary 1995).

*Prunus cerasus*; West Azarbaijan: Khoy (Arzanlou et al. 2017).

***P. clandestina* (Wallr. : Fr.) Lév. var. *cydonia* N. Ahmad, A.K. Sarbhoy & Kamal**

Molecular data: 28S-rDNA = AB103070 (Khodaparast et al. 2005).

*Cydonia oblonga* Mill.; Ajabshir, Borujerd, Karaj, Malayer, Mashhad, Nishabur, Roodbar, Khalkhal-Ardebil (Khabiri 1958 as *P. oxyacanthae*, Sharif and Ershad 1966 as *P. leucotricha* (Ell. and Ev.) Salm., Mohammadi-Doustdar 1967 as *P. oxyacanthae*, Ershad 1971 as *P. clandestina*, Ershad 1995 as *P. clandestina*, Khodaparast et al. 2000, 2005, Aeenfar 2006 as *P. clandestina*, Davari et al. 2015).

***P. leucotricha* (Ellis and Everh.) E.S. Salmon**

Molecular data: ITS-rDNA = MT621673 (Sharifi et al. 2020a).

*Malus domestica* Borkh.; all over the country (Esfandiari 1946a, 1947, Viennot-Bourgin 1958, Golato 1960, Eskandari 1964, Amano 1986, Scharif & Ershad 1966, Mohammadi-Doustdar 1967, Ershad 1995, Samadi et al. 2010, Davari et al. 2015, Abkhoo 2015).

*M. orientalis* Ugl.; Arasbaran forests (Tavanaei et al. 2009).

*Photinia serrutata* Lindl.; Karaj (Khodaparast et al. 2010, Sharifi et al. 2020a).

*Pyrus communis* L.; Tehran (Amano 1986, Viennot-Bourgin 1958, Golato 1960, Ershad 1995).

***P. lini* (Zvetkov) U. Braun & S. Takam.**

Molecular data: ITS-rDNA = MZ540779 (Taheri Ardestani et al. 2020b).

*Linum usitatissimum* L.; Alborz Province, Karaj (Taheri Ardestani et al. 2020b).

***P. minor* Howe**

Molecular data: ITS-rDNA = OQ254755 (Khodaparast et al. 2023).

*Spiraea* sp.; Guilan Province, Chaboksar, Rasht (Khodaparast et al. 2023).

***P. tridactyla* (Wallr.) de Bary**

Molecular data: not available.

*Prunus armeniaca* L. Lam.; Damavand, Karaj, Maku (Mohammadi-Doustdar 1967 as *P. oxyacanthae* var. *tridactyla* (Wallr.) S. Salmon, Ershad 1971, Amano 1986, Ershad 1995).

*P. divaricata* Ledeb. subsp. *divaricata*; Golestan national park (Tajik-Ghanbary 2005).

*P. domestica* L.; Karaj, Khorasan, Khalkhal (Mohammadi-Doustdar 1967 as *P. oxyacanthae* var. *tridactyla*, Karimi & Hajian 1998, Ershad 1995, Aeenfar 2006, Davari et al. 2015).

*P. domestica* subsp. *italica* var. *claudiana*; Meshkinshar, Khoy (Arzanlou & Torbati 2017).

*P. dulcis* (Mill.) D.A. Webb; unknown location (Amano 1986, Ershad 1995).

*P. persica* L.; unknown location (Amano 1986, Ershad 1995).

*Prunus* sp., Meshkinshahr-Ahar road (Khodaparast & Abbasi 2009).

***Podosphaera* section *Sphaerotheca***

***P. aphanis* (Wallr.) U. Braun & S. Takam. var. *aphanis***

Molecular data: not available.

*Agrimonia eupatoria* L.; Karaj, Meshkinshahr-Ahar road (Petraik & Esfandari 1941 as *S. macularis* (Wall. ex Fr.) Magnus, Esfandiari 1946a as *S. humuli* DC., Amano 1986 as *S. macularis*, Ershad 1995 as *S. macularis*).

*Alchemilla* sp.; Fasham (Ershad 1971, Amano 1986, Ershad 1995 all records as *S. macularis*, Ghasemzadeh et al 2008).

*A. persica* Rothm.; Karaj (Hedjaroude & Abbasi 2000 as *S. aphanis*, Ghasemzadeh et al. 2008).

***P. aphanis* (Wallr.) U. Braun & S. Takam. var. *hyalina* U. Braun**

Molecular data: not available.

*Fragaria vesca* L.; (Sharifi et al. 2020a).

*Potentilla hirta* L.; Karaj-Chalus road (Ghasemzadeh et al 2008).

- P. pedata* Willd. ex Hornem.; Golestan national park (Tajik-Ghanbary 2005 as *S. aphanis*, Ghasemzadeh et al 2008).
- P. balsaminae* (Kari ex U. Braun) U. Braun & S. Takam.**  
Molecular data: not available.  
*Impatiens noli-tangere* L.; Asalem (Amano 1986, Ershad 1971, 1995 as *S. fusca* (Fr.) Blumer, Ghasemzadeh et al 2008).
- P. dipsacacearum* (Tul. & C. Tul.) U. Braun & S. Takam.**  
Molecular data: not available.  
*Cephalaria syriaca* (L.) Schrad, Hamedan; Kohgiluyeh and Boyer-Ahmad Province; Bakhtaran, Dashtroum, (Ershad 1995, as *S. fuliginea* (Schltdl. : Fr.) Pollacci, Ghasemzadeh et al 2008, Mousavinezhad et al. 2023).
- Ptercephalus plumosus* (L.) Coul.; Lorestan Province: Azna (Sepahvand et al. 2018, 2021b).
- Scabiosa persica* Boiss.; Zanjan (Ghasemzadeh et al 2008).
- P. epilobii* (Wallr.) de Bary**  
Molecular data: ITS-rDNA = MF663779 (Khodaparast 2016).  
*Epilobium* sp.; Guilan: Rasht (Khodaparast 2016).
- P. erigerontis-canadensis* (Lev.) U. Braun & T. Z. Liu**  
Molecular data: not available.  
*Erigeron candensis* L.; Lahijan (Viennot-Bourgin 1958 as *S. fuliginea*, Amano 1986 as *S. fuliginea*, Ershad 1995 as *S. fuliginea*).
- Taraxacum bessarabicum* Hand.-Mazz.; Fars Province (Banihashemi & Zakeri 1989 as *S. fuliginea*).
- Taraxacum campylodes* G.E.Haglund; Kohgiluyeh and Boyer-Ahmad: Sisakht, Kowkhdan, (Mousavinezhad et al. 2023).
- T. montanum* (C.A. May) DC.; Damavand, Fasham (Mohammadi-Doustdar 1967 as *S. fuliginea*, host name as *T. montaniana*).
- T. officinale* Weber ex Wigg.; Tabriz (Viennot-Bourgin 1979 as *S. fuliginea*, Amano 1986 as *S. fuliginea*).
- T. syriacum* Boiss.; Borujerd (Khabiri 1958, Amano 1986, Ershad 1971, 1995 all records as *S. fuliginea*, Ghasemzadeh et al 2008).
- Taraxacum* sp.; Amarlou, Tabriz, Zanjan, Ardebil Province: Fandoghloou forest (Niknam & Guya 1999, Khodaparast et al. 2000 as *S. fusca*, Ghasemzadeh et al 2008, Sharifi et al. 2014, Davari et al. 2015).
- P. erodii* (Durrieu & Mont.) U. Braun & S. Takam.**  
Molecular data: rDNA-ITS=MF663779 (Khodaparast 2016).  
*Erodium cicutarium* (L.) L'Her. ex Aiton; Amarlou (Khodaparast et al. 2001, Ghasemzadeh et al 2008).
- Erodium glaucophyllum* (L.) L Her.; Kohgiluyeh and Boyer-Ahmad: Gachsaran (Mousavinezhad et al. 2023).
- Erodium moschatum* (L.) L'Hér.; Kohgiluyeh and Boyer-Ahmad: Khanahmad (Mousavinezhad et al. 2023).
- P. euphorbiae* (Castagne) U. Braun & S. Takam.**  
Molecular data: not available.  
*Chrozophora tinctoria* (L.) A. Juss.; unknown location (Amano 1986, Ershad 1995 as *S. euphorbiae*).
- Euphorbia esula* L.; Kashan (Mohammadi-Doustdar 1967 as *S. euphorbiae*).
- E. falcata* L.; Yazd Province: Banadak Sadat, (Samadi et al. 2010).
- E. helioscopia* L.; Yazd Province: Banadak Sadat (Samadi et al. 2010).
- E. macroclada* Boiss.; Hamedan, Damavand (Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Amano 1986, Ershad 1995; all records as *S. euphorbiae*).
- E. teheranica* Boiss., Jajroud protected region (Kachooeian Javadi et al. 2006, Ghasemzadeh et al 2008).
- E. tithymaloides* L.; Tehran Province, Iranian Research Institute of Plant Protection campus (Abbasi et al. 2019).
- Euphorbia* sp.; Fars, Tole Khosrow, Orumieh-Mahabad road (Amano 1986, Banihashemi & Zakeri 1989, Ershad 1971, 1995 as *S. Euphorbiae*, Ghasemzadeh et al 2008).
- P. euphorbiae-helioscopiae* (Tanda & Y. Nomura) U. Braun & S. Takam.**  
Molecular data: ITS-rDNA = MT621672, PQ236700 (Sharifi et al. 2020a, This study).
- Pedilanthus* sp.; Talash, Rasht, Markazi Province (Sharifi et al. 2013 as *Podosphaera euphorbiae-hirtae* (U. Braun & Somani) U. Braun & S. Takam.; Sharifi et al. 2020a).
- P. ferruginea* (Schltdl. : Fr.) U. Braun & S. Takam.**  
Molecular data: not available.  
*Sanguisorba minor* Scop.; Ardebil, Mashhad (Aeenfar 2006, Ghasemzadeh et al 2008).
- S. minor* Scop. subsp. *muricata* (Spach.) Briq.; Yazd Province: Deh Bala (Khabiri 1958 as *S. sanguisorbae* (DC.) S. Blumer, Amano 1986 *S. macularis*, Ershad 1995 as *S. ferruginea*, Samadi et al. 2010).
- Sanguisorba* sp.; Karaj, Isfahan-Samirom road (Hedjaroude & Abbasi 2000 as *S. ferruginea*, Ghasemzadeh et al 2008).
- P. fugax* (Penz. & Sacc.) U. Braun & S. Takam.**  
Molecular data: not available.  
*Geranium dissectum* L.; Lahijan; Kohgiluyeh and Boyer-Ahmad: Imamzadeh Jafar, (Amano 1986 as *S. fugax*, Ershad 1971, 1995 as *S. macularis*, Ghasemzadeh et al 2008; Mousavinezhad et al. 2023).

- G. pyrenaicum* Burm. f.; Kohgiluyeh and Boyer-Ahmad: Khanahmad (Mousavinezhad et al. 2023).
- Geranium* sp.; Kandevar, Karaj, Lahijan, Rasht, Tarom (Petrak & Esfandiari 1941, Esfandiari 1946a as *S. humuli* DC., Esfandiari 1946b as *S. fugax*, Amano 1986 as *S. fugax*, Ershad 1995 as *S. Fugax*, Ghasemzadeh et al 2008).
- P. macularis* (Wallr. : Fr.) U. Braun & S. Takam.**  
Molecular data: not available.  
*Humulus lupulus* L.; Karaj (Hedjaroude & Abbasi 2000).
- P. pannosa* (Wallr. : Fr.) de Bary**  
Molecular data: not available.  
*Eucalyptus* sp.; Yazd (Samadi et al. 2007).  
*Eucalyptus camaldulensis* Dehnh.; Yazd (Samadi et al. 2010).  
*Hulthemia persica* (Mich.) Stapf.; Ghazvin, Karaj (Bornmüller 1908, as *Sphaerotheca* sp., Petrak & Esfandiari 1941 as *S. pannosa*, Esfandiari 1946b, Amano 1986 as *S. pannosa*, Ershad 1995 as *S. pannosa*).
- Prunus dulcis* (Mill.) D.A. Webb; Karaj, Shariyar, Savojbolagh, Mashhad, Tehran, Taft (Sharif & Ershad 1966 as *O. leucoconium* Desm., Mohammadi-Doustdar 1967 as *S. pannosa* var. *persica*, Samadi et al. 2007, 2010).
- P. persica* Stokes; All over the country (Esfandiari 1946b, 1947, Khabiri 1958, Viennot-Bourgin 1958 as *S. pannosa*, Golata 1960, Eskandari 1964, Mohammadi-Doustdar 1967 as *S. pannosa* var. *persica* Woron., Amano 1986 as *S. pannosa*, Scharif & Ershad 1966 as *S. pannosa* var. *persica*, Daftari & Behdad 1968, Ashkan 1972, Ershad 1971, 1995, Ghasemzadeh et al 2008, Samadi et al. 2010, Davari et al. 2015).
- Rosa boissieri* Crepin.; Arasbaran forests (Tavanaei et al. 2009).
- R. canina* L.; Arasbaran forests, Lorestan Province (Tavanaei et al. 2009, Sepahvand 2009).
- R. centifoila* L.; unknown location (Amano 1986 as *S. pannosa*).
- R. elymatica* Boiss & Hausken, Lorestan Province (Sepahvand 2009).
- R. foetida* J. Herrmann.; Arasbaran forests (Tavanaei et al. 2009).
- R. moschata* J. Herrmann; Arasbaran forests (Tavanaei et al. 2009).
- R. multiflora* Murray.; Dezful (Altman et al. 1972, Amano 1986; both records as *S. pannosa*).
- R. persica* J. F. Gmel.; Jajroud protected region, Chahnimeh, Sistan and Baluchistan (Kachooeian Javadi et al. 2006, Abkhoo 2015).
- Rosa* sp.; all over the country (Esfandiari 1946b, Eskandari 1964, Viennot-Bourgin 1958 as *S. pannosa*, Manuchehri 1964, Mohammadi-Doustdar 1967 as *S. pannosa* var. *rosae* Woron., Scharif & Ershad 1966 as *S. pannosa* var. *rosae* Gor., Ershad 1971, Ebrahimi & Minassian 1973, Amano 1986 as *S. pannosa*, Ershad 1995, Ghasemzadeh et al 2008, Davari et al. 2015).
- P. plantaginis* (Castagne) U. Braun & S. Takam.**  
Molecular data: not available.  
*Plantago atrata* ssp. *spadicea* (Waller.) Pilger; Karaj (Hedjaroude & Abbasi 2000 as *S. plantaginis*, Ghasemzadeh et al 2008).
- P. lanceolata* L.; Kashan, Amarlu, Deileman-Asiabar road, Tabriz, Karaj, Zanjan (Mohammadi-Doustdar 1967 as *S. fuliginea*, Ershad 1995 as *S. fuliginea*, Yazdani & Abbasi 1998 as *S. plantaginis*, Niknam & Guya 1999 as *S. plantaginis*, Khodaparast et al. 2000 as *S. Plantaginis*, Ghasemzadeh et al 2008).
- P. major* L.; (Mohammadi-Doustdar 1967 as *S. fuliginea*).
- P. media* L.; Fars Province (Banihashem & Zakeri 1989, Ershad 1995 both records as *S. plantaginis*).
- Plantago* sp.; Isfahan-Samirom road (Ghasemzadeh et al 2008).
- P. xanthii* (Castagne) U. Braun & Shishkoff**  
Molecular data: ITS-rDNA = MT621674, MT621675, MF663780, MF663781; 28S-rDNA=AB103368, AB103369 (Sharifi et al. 2020a).
- Arctium majus* Bernh.; unknown location (Mohammadi-Doustdar 1967).
- Bidens tripartida* L.; Roodbar (Khodaparast et al. 2000 as *S. fusca*, Ghasemzadeh et al 2008).
- Citrullus vulgaris* Schrad.; Yazd Province: Harat (Amano 1986 as *S. fuliginea*, Samadi et al. 2010).
- Calendula officinalis* L.; Tabriz, Karaj, Rasht, Ardebil, Yazd (Yazdani & Abbasi 1998, Niknam & Guya 1999 both records as *S. fusca*, Ghasemzadeh et al 2008, Samadi et al. 2010, Davari et al. 2015, Sharifi et al. 2020a).
- Coreopsis grandiflora* Hogg ex Sweet; unknown location (Sharifi et al. 2020a).
- Cucumis melo* L.; Caspian sea area, Fars Province, Ghom, Hamedan, Karaj, Tabriz, Tehran vicinity (Viennot-Bourgin 1958 as *S. fuliginea*, Scharif & Ershad 1966 as *S. fuliginea*, Ershad 1971 as *S. fuliginea*, Banihashemi & Zakeri 1989 as *S. fuliginea*, Amano 1986 as *S. fuliginea*, Ershad 1995 as *S. Fuliginea*).
- C. sativus* L.; Caspian sea area, Isfahan, Evin, Fars Province, Ghom, Hamedan, Karaj, Khuzestan, Marand, Tabriz, Taft, Yazd (Viennot-Bourgin 1958, Amano 1986, Scharif & Ershad 1966, Mohammadi-Doustdar 1967, Ershad 1971, Banihashemi et al 1972, Ebrahimi & Minassian 1973, Amano 1986, Banihashemi & Zakeri 1989, Ershad 1995 all records as *S. Fuliginea*, Samadi et al. 2007, Ghasemzadeh et al 2008, Samadi et al. 2010).

- Cucurbita pepo* L.; Isfahan, Fars Province, Ghom, Hamedan, Karaj, Marand, Tabriz, Yazd (Viennot-Bourgin 1958, Scharif & Ershad 1966, Mohammadi-Doustdar 1967, Ershad 1971, Amano 1986, Banihashemi & Zakeri 1989, Ershad 1995 all records as *S. fuliginea*, Samadi et al. 2010).
- C. maxima* Duchesne; Karaj, Marand, Tabriz (Mohammadi-Doustdar 1967, Amano 1986; both records as *S. fuliginea*, Ghasemzadeh et al 2008).
- Cucurbita* sp.; Ardebil: Meshkinshar-Khalkhal road (Davari et al. 2015).
- Dahlia pinnata* Cav.; Isfahan, Markazi (Sharifi et al. 2020a)
- Dichrocephala integrifolia* (L.f.) Kuntze; Fuman (Sharifi et al. 2013).
- Gerbera* sp.; unknown location (Sharifi et al. 2020a).
- Hieracium* sp.; Zanjan (Ghasemzadeh et al 2008 as *P. fusca*).
- Matricaria chamomilla* L.; Rasht in Greenhouse (Khodaparast 2016).
- Phaseolus aureus* Roxb.; Karaj (Hamdollah-Zadeh 1987, Ershad 1995; both records as *S. fuliginea*).
- Phlox paniculata* L.; Tehran Province, Darakeh (Abbasi et al. 2019).
- Phlox* sp.; Tehran Province, Tehran (Abbasi et al. 2019).
- Physalis alkekengi* L.; Fuman, Ghaleh roodkhan (Khodaparast & Abbasi 2009).
- Xanthium brasiliicum* Vell.; Jajroud protected region (Kachooeian Javadi et al. 2006, Ghasemzadeh et al 2008).
- X. spinosum* L.; Talesh, Deileman-Kalishomm, Ardebil-Meshkinshahr road (Khodaparast et al. 2000, Ghasemzadeh et al 2008).
- X. strumarium* L.; Guilan Province: Anzali, Rasht, Sumaehsara; Ardebil, Bostan, Gorgan, Golestan national park (Amano 1986 as *S. fuliginea*, Ershad 1971, 1995 as *S. fuliginea*, Tajik-Ghanbary 1995, Khodaparast et al. 2000, Ghasemzadeh et al 2008, Davari et al. 2015).
- Xanthium* sp.; Azarbijan, Guilan: Talesh (Pettrak 1953, Amano 1986 both records as *S. fuliginea*, Khodaparast et al. 2005).
- Vigna unguiculata* (L.) Walp.; Rasht, in Greenhouse (Khodaparast 2016).
- Verbena officinalis* L.; Yazd (Samadi et al. 2010).
- Podosphaera* sp.**
- Centaurea babylonica* L.; unknown location (Amano 1986 as *S. fuliginea*).
- Peganum harmala* L.; Tabriz (Niknam & Guya 1999 as *S. fusca*).
- Sonchus oleraceus* L.; unknown location (Samadi et al. 2010 as *P. fusca* (Fr.) U. Braun & Shishkoff).
- Molecular data: 28S-rDNA = AB103370 (Khodaparast et al. 2005).
- Acer campestre* L.; Sovaldi, Arasbaran (Pettrak 1941 as *U. aceris*, Ershad 1995 as *U. bicornis* (Wallr. :Fr.) Lév.).
- A. cappadocicum* Gled.; Ardebil, Tehran (Amano 1986, Mohammadi-Doustdar 1967 as *U. aceris*, Ershad 1995 as *U. bicornis*).
- A. hyrcanum* Fisch. & C. A. Mey; Roodbar (Khodaparast et al. 2001, 2005).
- A. monspessulanum* L.; Gorgan, Kordestan, Lorestan, Mazandaran (Rabenhorst 1871 as *U. bicornis*, Esfandiari 1946a as *U. aceris*, Scharif & Ershad 1966 as *U. aceris*, Amano 1986, Ershad 1995 as *U. bicornis*).
- A. negundo* L.; Ardebil (Amano 1986, Ershad 1995 as *U. Bicornis*, Davari et al. 2015)
- A. platanoides* L.; Gorgan, Lorestan Province, Mazandaran (Esfandiari 1946a as *U. aceris*, Scharif & Ershad 1966 as *U. aceris*, Amano 1986 as *Sawadaea* sp., Ershad 1995 as *U. bicornis*).
- A. pseudoplatanus* L.; Tehran (Mohammadi-Doustdar 1967 as *U. aceris*, Amano 1986, Ershad 1995 as *U. Bicornis*, Davari et al. 2015).
- A. velutinum* Boiss.; Gorgan, Lorestan Province, Mazandaran, Ziyarat (Esfandiari 1946a as *U. aceris*, host name as *A. insigne* Boiss. & Buhse, Scharif & Ershad 1966 as *U. aceris*, host name as *A. insigne*, Ershad 1995 as *U. bicornis*, host name as *A. insigne*).
- A. velutinum* Boiss. var. *velutinum* unknown location (Amano 1986).
- Acer* sp.; Rasht, Rasht-Anzali road (Eskandari 1964 as *U. aceris* (DC.) Sacc., Amano 1986).
- S. negundinis* Homma**
- Molecular data: ITS-rDNA = MT621671, MF179622, MF179623 (Arzanlou & Narmani 2017, Sharifi et al. 2020a).
- Acer negundo* L.; East Azarbaijan (Arzanlou & Narmani 2017, Sharifi et al. 2020a).
- S. tulasnei* (Fuckel) Homma**
- Acer compestre* L.; unknown location (Amano 1986, Ershad 1995 as *U. tulasnei* Fuck.).
- A. monspesulanum* L.; Aligoodar (Sepahvand et al. 2015).
- A. monspessulanum* L. subsp. *cineracens* (Boiss.) Yaltirik; Bisheh (Ershad 1971, 1995 as *U. tulasnei*).
- A. platanoides* L.; unknown location (Amano 1986 as *U. tulasnei*).

### ***Oidium***

The following powdery mildews, reported as '*Oidium*' species in the literature, have an unclear generic affinity. We have considered all of them in this section as *Oidium* species.

### ***Sawadaea* Miyabe**

#### ***S. bicornis* (Wallr. : Fr.) Homma**

**Oidium sp.**

- Abelmoschus esculentus* (L.) Moench; Ramin, Shemiran, Shiraz (Scharif & Ershad 1966, Manuchehri 1964, Ershad 1971, Ebrahimi & Minassian 1973, Ershad 1995, host name as: *Hibiscus esculentus* L.).
- Acer* sp.; Ardebil, Mashhad (Aeenfar 2006).
- Agrimonia eupatoria* L.; Eshkavarat, Manjil (Harzevil), Astara-Ardebil road (Khodaparast & Abbasi 2009).
- Alhagi* sp.; Sufian-Shabastar road (Khodaparast & Abbasi 2009).
- Alliaria petiolata* (M.Bieb.) Cavara & Grande; Langrood (Khodaparast & Abbasi 2009).
- Anethum graveolens* L.; Mashhad (Aeenfar 2006).
- Arctium lappa* L.; Sumaehsara (Khodaparast & Abbasi 2009).
- Artemisia annua* L.; Sumaehsara (Khodaparast & Abbasi 2009).
- Aster* sp.; Evin (Ershad 1971, 1995).
- Begonia rex* Putz.; unknown location (Mohammadi-Doustdar 1967).
- Berberis thunbergii* DC.; Isfahan, Tehran, Mashhad (Aeenfar 2006, Khodaparast & Abbasi 2009).
- Brassica* sp.; Ramin (Ebrahimi & Minassian 1973, Ershad 1995).
- Calendula officinalis* L.; unknown location (Amano 1986).
- C. persica* C. A. Mey.; Ramin, Tehran (Ebrahimi & Minassian 1973, Amano 1986, Ershad 1995).
- Calamintha officinalis* Moench; Golestan national park (Tajik-Ghanbary 2005).
- Campanula stevenii* M. Bieb.; Golestan national park (Tajik-Ghanbary 1995, host name as *C. simplex* Stev.).
- Carduus pycnocephalus* L.; Loshan (Khodaparast & Abbasi 2009).
- Cardaria draba* (L.) Desv.; Samirom, Isfahan (Khodaparast & Abbasi 2009).
- Centaurea iberica* Trev. ex. Spreng.; Shabastar-Tasuj road, Mashhad (Khodaparast & Abbasi 2009, Aeenfar 2006).
- C. hyrcanica* Bornm.; Masuleh (Khodaparast & Abbasi 2009).
- Circaea lutetiana* L.; Fuman (Khodaparast & Abbasi 2009).
- Cichorium intybus* L.; Isfahan (Khodaparast & Abbasi 2009).
- Citrullus vulgaris* Schrad.; Caspian Sea area (Esfandiari 1947, Scharif & Ershad 1966).
- Coronilla varia* L.; Tabriz-Marand road (Khodaparast & Abbasi 2009).
- Cucumis melo* L.; Caspian sea area (Esfandiari 1947).
- C. sativus* L.; Caspian sea area (Esfandiari 1947).
- Cucurbita maxima* Duchesne; Caspian sea area (Esfandiari 1947).
- Cucurbita* sp., Shabastar-Tasuj road, Khalkhal-Ardebil road, Isfahan -Ziyar road (Khodaparast & Abbasi 2009).
- Cydonia oblonga* Mill.; Shaft-Emamzadehebrahim road (Khodaparast & Abbasi 2009).
- Dahlia* sp.; Isfahan; Isfahan (Khodaparast & Abbasi 2009).
- Dianthus caryophyllus* L.; Tabriz (Eskandari 1964).
- Dichrocephala integrifolia* (L. f.) O. Kuntze; Guilan (Khodaparast & Abbasi 2009).
- Dipsacus strigosus* Willd.; Asalem-Khalkhal road (Khodaparast & Abbasi 2009).
- Echinops* sp.; Isfahan (Khodaparast and Abbasi 2009).
- Epilobium minutiflorum* Hausskn.; Mashhad (Aeenfar 2006).
- Erigeron canadensis* L.(= *Conyza canadensis* (L.) Cronquist); Golestan national park, Mashhad, Ramin, Lahijan, Sumaehsara (Ebrahimi & Minassian 1973, Ershad 1995, Tajik-Ghanbary 2005, Aeenfar 2006, this study).
- Eryngium* sp.; Meshkinshahr-Ahar road (Khodaparast & Abbasi 2009).
- Eupatorium cannabinum* L.; Asalem-Khalkhal road (Khodaparast & Abbasi 2009).
- Ficus carica* L.; Kashan (Esfandiari 1948, Scharif & Ershad 1966, Amano 1986, Ershad 1995 as *Oidium erisiphoides* Fr.).
- Fragaria ananassa* Duchesne.; Orumieh (Eskandari 1946a, Scharif & Ershad 1966, Amano 1986, Ershad 1995).
- Galium humifusum* M. Bieb.; Orumieh-Sero road (Khodaparast & Abbasi 2009).
- Geranium* sp.; Sumaehsara (Khodaparast & Abbasi 2009).
- Geum urbanum* L.; Rasht, Emamzadeh Hashem, Mashhad (Aeenfar 2006, Khodaparast & Abbasi 2009).
- Helianthus annuus* L.; Isfahan, Jiroft (Khodaparast & Abbasi 2009).
- H. tuberosus* L.; Mashhad (Aeenfar 2006).
- Hesperis hyrcana* Bornm. & Gauba; Golestan national park (Tajik-Ghanbary 2005).
- Heteropappus altaicus* Novopokrov.; Khorasan (Aeenfar 2006).
- Hydrangea hortensia* Siebold.; Karaj, Sumaehsara, Chamestan (Hedjaroude 1983, Ershad 1995, Khodaparast & Abbasi 2009).
- Hypericum perforatum* L.; Rasht, Sumaehsara (Khodaparast & Abbasi 2009).
- Lactuca orientalis* Boiss.; Zanjan (Khodaparast & Abbasi 2009).
- Lactuca* sp.; Ardebil-Meshkinshar road (Khodaparast & Abbasi 2009).
- Lamiaceae*; Meshkinshar-Ardebil road (Khodaparast & Abbasi 2009).
- Lamium album* L. subsp. *crinitum* (Montbr. & Auch. ex Benth. ) J. Mennema; Golestan national park

(Tajik-Ghanbary 2005, host name as *Laminaria album*).

*Malus floribunda* Siebold ex Van Houtte; Mashhad (Aeenfar 2006).

*M. orientalis* Uglitzk.; Mashhad (Aeenfar 2006).

*M. domestica* Borkh.; Sumaehsara (Khodaparast & Abbasi 2009).

*Malva neglecta* Wallr.; Mashhad (Aeenfar 2006).

*Melilotus officinalis* (L.) Pall.; Ardebil, Khalkhal-Ardebil road (Khodaparast & Abbasi 2009).

*Mentha longifolia* (L.) Huds.; Mashhad (Aeenfar 2006).

*Nicotiana tabacum* L.; Rasht (Khodaparast & Abbasi 2009).

*Onobrychis altissima* Grossh.; Ardebil (Khodaparast & Abbasi 2009).

*Papaver somniferum* L.; Tehran: Evin (Ershad 1971, 1995).

*Parietaria officinalis* L., Golestan national park, Guilan (Tajik-Ghanbary 2005).

*Petroselinum sativum* Hoffm.; Shasevar (Eskandari 1964).

*Phlox* sp.; Darankeh; (Amano 1986, Ershad 1971, 1995).

*Physalis alkekengi* L.; Fuman, Ghaleh roodkhan (Khodaparast & Abbasi 2009).

*Plantago major* L.; Ardebil (Khodaparast & Abbasi 2009).

*Prunus armeniaca* L.; Karaj (Scharif & Ershad 1966, Amano 1986, Ershad 1995).

*Robinia hispida* L.; Shemiran (Scharif & Ershad 1966, Ershad 1971, 1995 all records as *O. orbiculare* Nann.).

*Salvia verticillata* L.; Khalkhal-Ardebil road (Khodaparast & Abbasi 2009).

*Sesbania punicea* Benth.; Guilan (Khodaparast & Abbasi 2009).

*Solanum tuberosum* L.; Damavand, Kabutarahang (Amano 1986, Ershad 1995).

*Sonchus asper* (L.) Hill.; Kolpayegan- Khansar road, Mashhad (Khodaparast & Abbasi 2009, Aeenfar 2006).

*S. oleraceus* L.; Isfahan-Golpayegan road (Khodaparast & Abbasi 2009).

*Sophora pachycarpa* Schrenk ex C.A. Mey.; Golestan national park (Tajik-Ghanbary 2005).

*Symphotrichum squamatum* (Spreng.) G.L. Nesom (= *Coryzanthus squamatus* (Spreng.) Tamamsch.); Seyakal-Deileman road, Sumaehsara, Mashhad (Aeenfar 2006, Khodaparast & Abbasi 2009).

*Tanacetum parthenium* (L.) Sch.Bip.; Masuleh (Khodaparast & Abbasi 2009).

*Torilis arvensis* Link; Golestan national park (Tajik-Ghanbary 2005).

*Tragopogon gongylorrhizus* Rech.f.; Golestan national park (Tajik-Ghanbary 2005).

*T. graminifolius* DC.; Evin, Kelardasht, Ardebil, Ardebil-Meshkinshah road, Zanjan, Isfahan-Zeyar road (Ershad 1971, 1995).

*Tragopogon* sp.; Tarom, Isfahan-Mobarakeh road (Khodaparast & Abbasi 2009).

*Urtica dioica* L.; Rezvanshahr, Doran village (Khodaparast & Abbasi 2009).

*Verbascum cheiranthifolium* Boiss.; Golestan national park (Tajik-Ghanbary 2005).

*V. sinuatum* L.; Golestan national park (Tajik-Ghanbary 2005).

*Verbascum* sp.; Khalkhal-Asalem road (Khodaparast & Abbasi 2009).

*Verbena officinalis* L.; Karaj, Asbadan, Golestan national park, Sumaehsara, Amarlu (Mohammadi-Doustdar 1967 as *Oidium verbenae*, (Tajik-Ghanbary 2005).

*Veronica* sp.; Mashhad (Aeenfar 2006).

*Zinnia* sp.; unknown location (Amano 1986).

*Z. elegans* Jacq.; Mashhad (Aeenfar 2006).

### Doubtful and unresolved records

We were unable to verify certain records reported in some of the references cited in this work. Therefore, the records listed below are considered to be of questionable validity (doubtful records).

#### *Erysiphe capreae/E. salicis*

*Salix babylonica* L.; Karaj (Mohammadi-Doustdar 1967 as *Uncinula salicis*, Amano 1986 as *U. salicis*, Ershad 1995 as *U. adunca*).

*Salix triandra* L.; Astara (Mohammadi-Doustdar 1967 as *U. salicis*, Amano 1986 as *U. salicis*, Ershad 1995 as *U. adunca*).

#### *Erysiphe alphitoides/E. quercicola*

*Mangifera indica* L.; Tis (Zakii et al. 1993, Ershad 1995 as *Oidium mangiferae* Berthet).

#### *E. cichoracearum* DC.

*Glycyrrhiza* sp.; (Daftari & Behdad 1968).

#### *E. communis* (Wallr.) Link

*Acantholimon* sp.; Bostan abad (Amano 1986, Ershad 1971, Ershad 1995).

*A. kotschyi* Boiss.; (Mohammadi-Doustdar 1967).

*Gypsophila paniculata* L.; unknown location (Ershad 1971, Amano 1986, Ershad 1995).

*Laburnum anagyroides* Medik.; Karaj (Esfandiari 1946a, Amano 1986).

*Scabiosa ucranica* L.; Damavand (Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Amano 1986 as *E. knautiae*, Ershad 1995).

*Sophora alopecuroides* L.; Karaj (Khabiri 1956, Amano 1986, Mohammadi-Doustdar 1967, Ershad 1995).

*Trifolium fragiferum* L.; unknown location (Amano 1986, Ershad 1995).

#### *E. malvacearum* Fr.

*Alcea haussknechtii* Boiss.; Kordestan (Rabenhorst 1871, Amano 1986, Ershad 1995).

*Erysiphe ligustri* (Homma) U. Braun & S. Takam.



*Ligustrum* [as *Ligustrum*] *vulgare* L.; Lorestan Province: Khoramabad (Darvishnia & Vafaei 2018).

***E. martii* Lév.**

*Arenaria juniperina* L.; Kuhe alvand (Wettstein 1885 as *E. martii*, Amano 1986 as *E. communis*, Ershad 1995 as *E. martii*).

*Cytisus* sp.; Karaj (Mohammadi-Doustdar 1967).

*Lathyrus aphaca* L.; Damavand (Amano 1986 as *E. communis*, Mohammadi-Doustdar 1967).

*L. cicera* L.; Karaj (Amano 1986 as *E. communis*, Ershad 1971).

*Melilotus* sp., Karaj (Viennot-Bourgin 1958, Mohammadi-Doustdar 1967).

*M. officinalis* (L.) Pall.; Damavand, Evin, Gorgan, Karaj, Kashan (Khabiri 1956, Viennot-Bourgin 1958, Mohammadi-Doustdar 1967, Ershad 1971).

*Trigonella foenum-graecum* L.; Karaj, Tehran (Mohammadi-Doustdar 1967, Amano 1986 as *E. communis*).

*Vicia tenuifolia* Roth; Kordestan (Rabenhorst 1871).

***E. salviae* (Jacq.) S. Blumer**

*Salvia nemorosa* Crantz.; Karaj (Khabiri 1956 as *E. lamprosa* (Wallr.) Lév., Amano 1986, Ershad 1995).

*S. pseudo-silvestris* Stapf; Karaj (Esfandiari 1946a, Scharif & Ershad 1966 as *E. salviae* (Gaez) Bl., Amano 1986, Ershad 1995).

***Golovinomyces ambrosiae* (Schwein.) U. Braun & R.T.A. Cook**

*Verbascum thapsus* L.; Lorestan Province: Khoramabad (Darvishnia & Vafaei 2018). Probably this fungus belongs to *Golovinomyces verbasci* (Jacq.) V.P. Heluta.

***Podosphaera leucotricha* (Ellis & Everh.) E.S. Salmon**

*Bupleurum linearifolium* DC.; Kordestan (Rabenhorst 1871, Amano 1986 as *S. macularis*, Ershad 2022).

*Centaurea babylonica* (L.) L.; Kordestan (Rabenhorst 1871, *Sphaerotheca castagnei* Lev., Ershad 2022).

*Euphorbia* sp.; Southern part (Rabenhorst 1871 as *Sphaerotheca castagnei* Lev.).

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## اطلاعات به روز شده در مورد گونه‌ها، دامنه میزبانی و پراکنش جغرافیایی قارچ‌های عامل سفیدک پودری در ایران

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**چکیده:** این مقاله یک بازنگری به روز در مورد گونه، دامنه میزبانی و پراکنش جغرافیایی قارچ‌های عامل سفیدک‌های پودری در ایران ارائه می‌کند. بر اساس یافته‌های این مطالعه، ۱۵۴ گونه از قارچ‌های عامل سفیدک پودری متعلق به ۹ جنس، شامل *Arthrocladiella* (یک گونه)، *Blumeria* (دو گونه)، *Erysiphe sect. Erysiphe* (۲۵ گونه)، *E. sect. Microsphaera* (۲۱ گونه)، *sect. Uncinula* (۱۱ گونه)، *Golovinomyces* (۲۰ گونه)، *Leveillula* (۳۱ گونه)، *Neoerysiphe* (۳ گونه)، *Phyllactinia* (۱۸ گونه)، *Podosphaera sect. Podosphaera* (۵ گونه)، *P. sect. Sphaerotheca* (۱۴ گونه) و *Sawadaea* (۳ گونه) در ایران وجود دارد. علاوه بر این، گزارش‌های متعددی روی ۸۸ گیاه میزبان متعلق به مرحله غیرجنسی که به‌عنوان *Oidium s. l. spp* شناسایی شده‌اند در قسمتی جداگانه آورده شده‌اند. در این نسخه به روز شده، ۶۷۳ گونه در ۳۳۹ جنس از گیاهان میزبان گزارش شده است.

**کلمات کلیدی:** آسکومیکوتا، تنوع زیستی، قارچ‌های بیوتروف، فهرست گونه‌ها، *Erysiphaceae*