

NEW CONTRIBUTIONS TO THE CHOROLOGY OF SOME ALIEN PLANT SPECIES IN ROMANIA'S FLORA

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Abstract: New data on the distribution of some species of alien vascular plants, some of which being considered so far very rare in the Romania's flora, are presented in this paper, e.g., *Amaranthus palmeri*, *Artemisia umbrosa*, *Erigeron sumatrensis*, *Euphorbia glyptosperma*, *E. prostrata*, *E. serpens*, *Grindelia squarrosa*, and so on. All these alien plant species have been shown to be fully naturalized in anthropically and disturbed habitats, some of them being distributed along water courses, affecting the biodiversity of wetland natural habitats of Romania.

Key words: Romania's flora, alien plants, new data, distribution

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Introduction

It is known that invasive alien species significantly threaten natural biodiversity worldwide (Genovesi & Shine 2004, Wittenberg & Cock 2001), often causes significant economic damage (Pimentel et al. 2000, McNeely 2001, Reinhardt & Streit 2003, Olsson 2006, Hulme 2007, Lovell & Stone 2005), and in some cases they can even seriously affect the human health (Kopelson 2014, Kumar & Singh 2020).

The number of alien species in Europe's flora is constantly growing (Lambdon et al. 2008), this trend being also registered into the Romania's flora. A decade ago, the vascular alien flora of Romania was evaluated by Sîrbu & Oprea (2011a) to a number of 671 species, but meanwhile many other species have been recorded through the contributions of various authors (e.g., Nagodă 2015, Camen-Comănescu et al. 2016, Oprea & Sîrbu 2016, Negrean et al. 2017, Sîrbu & Oprea 2017, Sîrbu & Șușnia 2018 and so on).

The early detection of invasive species is a very important step in a rapid response in order to minimizing the impact of biological invasion worldwide (Wittenberg & Cock 2001, Reaser et al. 2019).

The aim of this paper is to bring new contributions to the signaling of some alien plant species previously unknown in Romania or in different regions of the country or which, being previously reported, currently manifest an obvious tendency to spread across the whole country.

Material and methods

The field work was carried out in the last years. For the identification and nomenclature of plant species the *Flora Europaea* (Tutin et al. 1968-1980, Tutin et al. 1993, including the on-line version available at: <http://ww2.bgbm.org/europlusmed>) were followed, as well as the *Flora of the Northern United States and Canada* (Britton

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& Brown 1970), *Flora of Canada* (Scoggan 1978-1979), on-line floras of the *United States of America* (efloras.org/*Flora of North America*), or Republic of China (efloras.org/*Flora of China*).

The author's name of each plant species is abbreviated according to Brummitt & Powell (1992).

The distribution of the taxa within Europe follows the same on-line *Flora Europaea* (<http://ww2.bgbm.org/europlusmed>).

All the plant species recorded were deposited in official herbaria IASI ("Ion Ionescu de la Brad" University of Agricultural Sciences and Veterinary Medicine of Iași) and IAGB (Botanical Garden "Anastasiu Fătu", "Alexandru Ioan Cuza" University of Iași). The acronyms follow Thiers (2020).

The invasive status of the plant species in Romania (i.e., casual, naturalised or invasive) was established according to Richardson et al. (2000).

Results and discussion

New data on distribution of vascular plant species in Romania's flora are presented in this paper. Three vascular plant species as new entries in the spontaneous/subspontaneous flora of Romania were recorded. Other 19 taxa are still pretty rare in Romania's flora, being recorded scarcely in the 2nd, the 3rd or the 4th locality.

I. New taxa in the alien flora of Romania

Heliopsis helianthoides (L.) Sweet subsp. *scabra* (Dunal) T. R. Fisher

Origins and ecology in original areas: North America - eastern half of the United States of America and Canada (Britton & Brown 1970, Scoggan 1978-1979), in rare forests, old meadows, pastures, or along roads or ditches, between 0 and 2,300 m alt. [[https://www.semanticscholar.org/paper/Taxonomy-of-the-Genus-Heliopsis-\(Compositae\)](https://www.semanticscholar.org/paper/Taxonomy-of-the-Genus-Heliopsis-(Compositae))].

Distribution and habitats in Romania: Ludași village (Bacău County), along the Tazlău riverbanks, close to the bridge over the Tazlău river.

This taxon is largely spread in Europe's flora as an alien plant species, having an unknown or casual status (<http://ww2.bgbm.org/EuroPlusMed/>).

Introduced in Romania's flora: deliberately.

Current status in Romania's flora: a casual alien plant species.

It seems that it is also a naturalized plant species within the Botanical Garden "D. Brândză" of Bucharest (pers. comm., Paulina Anastasiu 2020).

This species has also been naturally distributed in the Botanical Garden "A. Fătu" in Iași in the past (from where it seems to have disappeared, in the meantime).

Albizia julibrissin Durazz.

Origins and ecology in original areas: subtropical Asia, from Iran to Japan, incl. Southern parts of Caspian Sea, India, and China, in dry places, sandy valleys or higher hilly areas, open sunny ravines, at mean annual temperatures of 20-25 °C, on sandy loam-medium loam soils, being able to withstand at high pH and soil salinities (http://apps.worldagroforestry.org/treedb/AFTPDFS/Albizia_julibrissin.PDF).

Distribution and habitats in Romania: Orșova (Mehedinți County); Roșița (Gorj County); Murighiol, Sarichioi, Jurilovca, and Tulcea (Tulcea County), on the wastelands (at Roșița), along the Danube riverbanks (at Murighiol and Orșova), on the sidewalks along the roads (at Sarichioi and Jurilovca), or pavements inside the courtyard of the

Lipovan church (having as Patron the "Saint of the Holy Trinity") close to the "Monument" in Tulcea town.

Distribution in Europe: South and East Europe (<http://ww2.bgbm.org/EuroPlusMed/>).

Introduced in Romania's flora: deliberately, being also cultivated in many places in Romania, as: Forestry Research Institute of Simeria (Hunedoara County), Forestry Research Institute of Snagov (Ilfov County), Periam, Periam-Port and Lovrin Experimental Station (all three in Timiș County) (Fizitea & Csűrös 1984), Botanical Garden "Pavel Covaci" of Macea (Arad County), Botanical Garden "Dimitrie Brandza" of Bucharest, Botanical Garden "Anastasiu Fătu" of Iași, along the Black Sea shores, etc.

Current status in Romania's flora: it is a casual alien plant species.

***Cercis chinensis* Bunge**

Origins and ecology in original areas: Central China, in dense forests or limestone areas, bushes, or along the sea coasts, from the sea level to ca 1400 m alt. about sea level, from Center to Southern China (<http://www.efloras.org/Flora of China, vol. 10, pp. 5-6>).

Distribution and habitats in Romania: Orșova town (Mehedinți County), on the waste lands associated with the railway embankments and on railway platforms.

Introduced in Romania's flora: deliberately.

Distribution in Europe: Georgia and Ukraine (<http://ww2.bgbm.org/EuroPlusMed/>).

Current status in Romania's flora: it is a casual alien plant species.

II. New or rare taxa in the alien flora of some regions of Romania

***Amaranthus palmeri* S. Watson**

Origin and general distribution: native to the United States of America, from New Mexico to California and Chihuahua (Britton & Brown 1970). It is also distributed in many countries of Europe and some of the North Africa countries (<http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: Bacău (Bacău County), Focșani (Vrancea County) and Dorohoi (Botoșani County) as the first records in Moldavia; Timișoara (Timiș County) as the first record in Banat; Oradea (Bihor County) as the first record in Crișana. This species has been identified on the waste lands associated with the railway embankments, in all these localities.

The species was recorded, for the first time in Romania's flora, in the railway station of București (leg. Negrean 1981) (according to Costea 1998) and in the harbour of Constanța (Constanța county) (Costea 1996, 1998, Anastasiu et al. 2011, Memedemin et al. 2016).

Introduced in Romania's flora: accidentally.

Current status in Romania's flora: it is an invasive alien plant species.

Artemisia umbrosa (Turcz. ex Besser) Turcz. ex Verlot (syn. *A. lavandulaefolia* DC.)

Origin and general distribution: native to East Asia, from the Russian Far East (South) and Siberia (South-East), China (mostly northern regions), and Mongolia (Sîrbu & Oprea 2011b; see also other references therein). It is known as an alien plant species in Eastern Europe (<http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: on the waste land associated with the railway embankments, in the Botoșani railway station (Botoșani County), as the second

record in Romania [the first record was in the railway station of Socola - Iași, Iași County (Sirbu & Oprea 2011b)].

Introduced in Romania's flora: accidentally.

Current status in Romania's flora: it is a naturalised alien plant species.

Bidens connatus Muhl. ex Willd.

Origin and general distribution: native in North America, Rhode Island to Ontario, Minnesota, Delaware, Georgia, Kentucky, Missouri, and Nebraska, in swamps or moist soil (Britton & Brown 1970). It is currently largely spread as an alien plant species in Europe, except North and Balkan Peninsula (<http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: this species was recorded at Vișeu de Sus, Petrova, and Ruscova (as the first records in Maramureș region), along the banks of rivers Vaser, Vișeu, and Ruscova. Previously, it was recorded in Danube Delta (Ciocârlan 1993, 1994) and Banat (Negrean 2011).

Introduced in Romania's flora: accidentally.

Current status in Romania's flora: it is an invasive alien plant species.

Buddleja davidii Franch.

Origin: Asia (<http://www.efloras.org/Flora of China, vol. 15, pp. 334>).

Distribution in Europe: Western and Central Europe. In the vicinity of Romania only in Bulgaria (<http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: Băile Herculane, along the banks, even on small sand islets of Cerna river (Caraș-Severin County), as the first record in Oltenia and Banat regions. Previously, this species was recorded in Transilvania (Țucra 1996/1997, Filipaș 2007); Muntenia (Anastasiu & Negrean 2009, Dihoru 2015, Nagodă 2015) and Dobrogea (Sirbu & Oprea 2011a).

Introduced in Romania's flora: deliberately.

Current status in Romania's flora: it is a naturalised alien plant species.

Catalpa bignonioides Walter

Origin and general distribution: native in the Gulf States of the United States of America (Britton & Brown 1970), and as an alien plant species in West and South Europe (<http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: on the waste lands associated with the railway embankments at “Băile Felix” - Oradea, Inand and Oșorhei (Bihar County) - as the first record in Crișana region; Timișoara (Timiș County), Băile Herculane, Moldova Veche, Pojejena, and Socol (Caraș-Severin County), Orșova (Mehedinți County) - as the first records in Banat region; Buzău (Buzău County) and Țândărei (Ialomița County) - as the first records in Muntenia region. Previously it was recorded in Transilvania (Prodan 1948), Muntenia (Tarnavschi & Diaconescu 1961), Moldova (Sirbu 2005), Oltenia (Răduțoiu & Stan 2013), and Dobrogea (Memedemin et al. 2016).

Introduced in Romania's flora: deliberately.

Current status in Romania's flora: it is a casual alien plant species.

Erigeron sumatrensis Retz. (syn. *Conyza sumatrensis* (Retz.) E. Walker)

Origin and general distribution: South America, from where it has spread to all warm regions of the globe (Pignatti 1982, Huang 1994-2003, Milović 2004, Vladimirov 2009). In Europe it is an alien plant species distributed mainly in the southern and western regions (<http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: Târgu Jiu (Gorj County); Drobeta Turnu-Severin and Orșova (Mehedinți County) - as the first records in Oltenia region; Băile Herculane (Caraș-Severin County) and Timișoara (Timiș County) - as the first records in Banat region; Focșani (Vrancea County) and Onești (Bacău County) - as the first records in Moldavia region; between Corbu-Midia and Năvodari (Constanța County) - as the second and third records in Dobrogea. It has been identified most often on the waste lands associated with the railway embankments, but also on ruderal habitats inside the localities (Focșani) or on the sandy banks of Troțuș river (Onești).

Previously, this species was recorded in Constanța harbour (leg. Anastasiu 2009) (in: Anastasiu & Memedemin 2012, Memedemin et al. 2016).

Introduced in Romania's flora: accidentally.

Current status in Romania's flora: it is an invasive alien plant species.

***Eclipta prostrata* (L.) L.**

Origin and general distribution: it is a native species in tropical and subtropical America [according to some authors (Tutin, in Tutin et al. 1976, Strother 2006, Ciocârlan 2009)], or in Asia (Iran, South Asia?) according to others (Vassilczenko 1999/1959, Tzonev 2007, Prostko 2004); now, it is widespread and naturalized in all warm regions of the globe (Vassilczenko 1999/1959, Hansen del Orbe 1977, Huang 1994-2003, Tzonev 2007). As an alien plant species in Europe, it has been recorded mainly in the South-Western, Southern, and Eastern regions (<http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: Iași (Iași County), in the yard of the "Pallas Public Garden" - as the second record in Moldavia (previously, it was recorded in Galați town, along the Danube riverbanks); Orșova (Mehedinți County) - as the first record in Oltenia region. Previously it was recorded along the Danube riverbanks in Muntenia (Dihoru & Sârbu 1998), Dobrogea in Danube Delta (Anastasiu 2010), and Moldova - at Galați (Oprea 2005, Goia et al. 2008). It seems that it is a naturally distributed plant species along the whole area of the Danube riverbanks in Romania (pers. comm., Paulina Anastasiu, 2020).

Introduced in Romania's flora: accidentally.

Current status in Romania's flora: it is an invasive alien plant species.

***Euphorbia glyptosperma* Engelm. (syn. *Chamaesyce glyptosperma* (Engelm.) Small)**

Origin and general distribution: it is native in North America (Berry et al. 2016), and introduced in Europe (Roux 1992, Hügin & Starlinger 1997, Somlyay 2009, Celesti-Grapow et al. 2009, Aymerich 2016, Geltman & Medvedeva 2017) and Asia (Geltman & Medvedeva 2017).

Distribution and habitats in Romania: railway platforms and waste lands associated to the railways of Zorleni train station (Vaslui County) - as the first record in Vaslui County. Previously it was recorded in Ciurea (Iași County) and Galați, Movilenii de Jos and Șerbeștii Vechi (Galați County) (Sirbu & Șușnia 2018).

Introduced in Romania's flora: accidentally.

Current status in Romania's flora: it is an invasive alien plant species.

***Euphorbia prostrata* Aiton (syn. *Chamaesyce prostrata* (Aiton) Small)**

Origin and ecology: North America, Central America, South America and West Indies, on disturbed areas, fields, gardens, sidewalks, sandy places or ballast piles, between 0 and 1400 m alt. a.s.l. (<http://www.efloras.org/florataxon.aspx?flora>).

Distribution in Europe: Spain, Portugal, France, and Greece (<http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: Iași, in the yard of the “Pallas Public Garden” and surroundings - as the first record in Moldavia region; Baziaș (Caraș-Severin County) - as the first record in Banat region. Previously it was recorded in București (leg. Negrean 2008) (Anastasiu & Negrean 2008) and Craiova (Răduțoiu & Stan 2013).

Introduced in Romania's flora: accidentally.

Current status in Romania's flora: it is a naturalised alien plant species.

Euphorbia serpens Kunth (syn. *Chamaesyce serpens* (Kunth) Small)

Origin and general distribution: native in Tropical America, Illinois to Yowa, Western Ontario, South Dakota and Kansas, in South to Mexico, and West Indies, on balast of seaports (Britton & Brown 1970).

Although in *Flora Europaea* (<http://ww2.bgbm.org/EuroPlusMed/>) it is indicated only from Greece (Continental and Islands), this plant species is much more widespread in Europe, especially in the Southern, Western and Central regions (see different authors cited by Sîrbu & Șușnia 2018).

Distribution and habitats in Romania: pots with ornamental trees at Năvodari (Constanța County) - as the first record in Dobrogea region. Previously it was recorded in Iași (at “Palas Public Garden”) and București - along the “Calea Plevnei” Avenue (Sîrbu & Șușnia 2018).

Introduced in Romania's flora: accidentally.

Current status in Romania's flora: it is a naturalised alien plant species.

Ficus carica L.

Origin and general distribution: native to the Mediterranean area and alien (casual to naturalized) in other regions (Central, Western, Eastern Europe etc.) (Tutin et al. 1968-1980, Tutin et al. 1993; <http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: railways and waste lands associated to the railways at Botoșani train station (Botoșani County), as the first record in Moldavia region. Previously it was recorded in Banat, Dobrogea, Muntenia, and Oltenia (various authors cited in: Sîrbu & Oprea 2011a).

Introduced in Romania's flora: deliberately.

Current status in Romania's flora: it is a casual alien plant species.

Grindelia squarrosa (Pursh) Dunal.

Origin and general distribution: native to North America, in Illinois and Minnesota to Manitoba, Missouri, Texas, Arizona and Mexico (Britton & Brown 1970) and introduced in Central and East Europe (<http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: Râșești and Bogdănești villages (Vaslui County), along the roadsides, as the first records in Vaslui County. Previously it was recorded in Iași, at Socola railway station (Sîrbu & Oprea 1998), Galați, Tirighina-Barboși and Movileni-Șendreni (Galați County) (Sîrbu & Oprea 2011a).

Introduced in Romania's flora: accidentally.

Current status in Romania's flora: it is an invasive alien plant species.

Oenothera depressa E. Greene

Origin and general distribution: native on North America (Dietrich et al. 1997), currently widespread as an alien plant species in a large part of Europe (except the Iberian and Balkan peninsulas) (<http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: Sulina (Tulcea County), on sea sands – as the first record in Danube Delta. Previously it was recorded in Galați County (river sands at Șerbeștii Vechi, Movilenii de Jos, and Bucești) and in Harghita County (waste lands associated to the railways) (Șirbu & Oprea 2017).

Introduced in Romania's flora: accidentally.

Current status in Romania's flora: it is an invasive alien plant species.

Reynoutria sacchalinensis (F. Schmidt) Nakai

Origin: East Asia (Sakhalin, Kurile, Hokkaido, Honshu, Ullung-do, Korea) (Mandák et al. 2004, Wittenberg 2005, Alberternst & Böhmer 2006).

Distribution in Europe: most of the continent, except the Iberian Peninsula (<http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: Siret town (along the banks of the Căcaina brook), and Stroiești (on waste lands along the road) (Suceava county) – as the first records in Moldavia region; Vama Marga (on waste lands along the road) (Caraș-Severin County) (leg. Oprea 2019). Previously it was recorded in Cluj-Napoca (cultivated and sub-spontaneous) (Țopa 1947), București – at Herăstrău (cultivated) (Grințescu 1952), and along Eșelnița and Crivița river valleys (Mehedinți County) (Matacă 2005).

Introduced in Romania's flora: deliberately and accidentally.

Current status in Romania's flora: it is a naturalised alien plant species.

Rudbeckia laciniata L.

Origin: North America, Quebec to Manitoba, Idaho, Colorado, Florida, and Arizona (Britton & Brown 1970).

Distribution in Europe: the whole continent, except the Iberian Peninsula and Greece (<http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: Vârful Câmpului (Botoșani County), on waste lands along the banks of the Siret river – as the first record in Botoșani County. Previously it was recorded in many localities in Transylvania, Crișana, Banat, and Muntenia; but, it is still a rare plant species in Moldavia, where it was previously recorded in Suceava County, at Jordănești (Hormuzaki 1911) and Șaru Dornei (Mititelu et al. 1988, 1989); Bacău County – with no location (Mititelu et al. 1994), but from Nemira Mts. (Mititelu & Barabaș 1994) and Ghimeș (Mititelu et al. 1994, cited by Epuran 2000); Neamț County at Bicaz-Chei and Pîntec; Iași - close to the “Alexandru cel Bun” bridge (Șirbu 2005) (disappeared meanwhile in the last locality!).

Introduced in Romania's flora: deliberately.

Current status in Romania's flora: it is an invasive alien plant species.

Solanum rostratum Dunal (Syn.) (syn. *S. cornutum* auct. eur. non Lam.)

Origin and general distribution: native to North and Central America (Britton & Brown 1970, Basset & Munro 1986); introduced to Australia, Europe, Asia and South Africa (Anghel et al. 1972, Hawkes & Edmonds 1972, Larina 2008). In the vicinity of Romania, it was reported from Hungary, the Republic of Moldova and Bulgaria (<http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: Ceamurlia de Sus (Tulcea County), on agricultural crops, along the roadsides and on the wastelands – as the fourth record in Romania. The previous three records were in: Constanța harbour (Costea 1996), the West of the village of Făclia – at the inn “Nașu” (Negrean 2011), and Credința – on the wasteland close to the railways (ined.).

Introduced in Romania's flora: accidentally.

Current status in Romania's flora: it is a naturalised alien plant species.

Symphotrichum laeve (L.) Á. Löve & D. Löve (syn. *Aster laevis* L.)

Origin and general distribution: North America, Maine to Ontario, Virginia, Alabama, Louisiana, Saskatchewan, Missouri and Colorado, on dry soils (Britton & Brown 1970). Introduced in Europe, being more widespread in the western half of the continent (<http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: Băiuț, Copalnic Mănăștur, and Ocna Șugatag (Maramureș County) – as the first record in Maramureș region. This plant species was identified on waste lands along the Lăpuș riverbanks at Băiuț, along the Bloaja brook banks at Copalnic Mănăștur, or on the waste lands close to the Southern cemetery at Ocna Șugatag. Previously, it was recorded only in Sibiu town (Sibiu County) and Năsăud town (Bistrița-Năsăud County) (Morariu & Nyárady 1964).

Introduced in Romania's flora: deliberately.

Current status in Romania's flora: it is a naturalised alien plant species.

Symphotrichum novae-angliae (L.) G. L. Nesom (syn. *Aster novae-angliae* L.)

Origin: North America, Quebec to Saskatchewan, South Carolina, Alabama, Kansas and Colorado, in fields and along swamps (Britton & Brown 1970).

Distribution in Europe: Western, Central, Northern countries. It is also distributed in all the countries around Romania, except Bulgaria, where it is met on a large-scale cultivated, only (<http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: waste lands, in Repedea, Remetea Chioarului, Tulghieș, and Băița de sub Codru villages (Maramureș County) - as the first records in Maramureș region. Previously it was recorded in Banat, Muntenia, Transilvania (Prodan 1939), and Moldavia (Sirbu & Oprea 2011a).

Introduced in Romania's flora: deliberately.

Current status in Romania's flora: it is a casual alien plant species.

Verbesina encelioides (Cav.) Benth. et Hook. fil. ex A. Gray

Origin: North America, Kansas to Texas, Arizona and Mexico, in moist soils, occasional on waste grounds (Britton & Brown 1970).

Distribution in Europe: Western and Northern countries of Europe and in Northern Africa. In the countries around Romania it is present only in Ukraine (<http://ww2.bgbm.org/EuroPlusMed/>).

Distribution and habitats in Romania: wastelands and roadside edges at Sulina and Sfiștofca villages and along the water channel edges at Letea village (Tulcea county), mainly on ruderal, sandy places – as the first records in Danube Delta. Previously it was recorded at Cheia, Grădina and Râmnicul de Jos (Constanța county) and Sarighiol de Deal (Tulcea County) (Anastasiu et al. 2009).

Introduced in Romania's flora: accidentally.

Current status in Romania's flora: it is an invasive alien plant species.

Conclusions

Three new plant species/subspecies of the alien vascular flora of Romania have been identified, as they are: *Albizia julibrissin*, *Cercis chinensis*, and *Heliopsis helianthoides* subsp. *scabra*.

Other nineteen alien species, being still rare in different regions or counties of the country, were registered (as the second, the third or the fourth locality) in Romania, namely: *Amaranthus palmeri*, *Artemisia umbrosa*, *Bidens connatus*, *Buddleja davidii*, *Catalpa bignonioides*, *Eclipta prostrata*, *Erigeron sumatrensis*, *Euphorbia glyptosperma*, *E. prostrata*, *E. serpens*, *Ficus carica*, *Grindelia squarrosa*, *Oenothera depressa*, *Reynoutria sacchalinensis*, *Rudbeckia laciniata*, *Solanum rostratum*, *Symphotrichum laeve*, *S. novae-angliae*, and *Verbesina encelioides*.

Regarding the origin of the species presented here, they are as follows: twelve species/subspecies are native to North America (*Amaranthus palmeri*, *Bidens connatus*, *Catalpa bignonioides*, *Euphorbia glyptosperma*, *Grindelia squarrosa*, *Heliopsis helianthoides* subsp. *scabra*, *Oenothera depressa*, *Rudbeckia laciniata*, *Solanum rostratum*, *Symphotrichum laeve*, *S. novae-angliae*, and *Verbesina encelioides*), five species come from Asia (*Albizia julibrissin*, *Artemisia umbrosa*, *Buddleja davidii*, *Cercis chinensis*, and *Reynoutria sacchalinensis*), two species are native to tropical America (*Eclipta prostrata* and *Euphorbia serpens*), a species is native to South America (*Erigeron sumatrensis*), a species is native to the Mediterranean area (*Ficus carica*), and a species is native to both North America and South America (*Euphorbia prostrata*).

In terms of live forms, nine species are annuals (*Amaranthus palmeri*, *Bidens connatus*, *Erigeron sumatrensis*, *Eclipta prostrata*, *Euphorbia glyptosperma*, *E. prostrata*, *E. serpens*, *Solanum rostratum*, *Verbesina encelioides*), six are perennials (*Artemisia umbrosa*, *Heliopsis helianthoides* subsp. *scabra*, *Reynoutria sacchalinensis*, *Rudbeckia laciniata*, *Symphotrichum laeve*, *S. novae-angliae*), five are trees and shrubs (*Albizia julibrissin*, *Buddleja davidii*, *Catalpa bignonioides*, *Cercis chinensis*, *Ficus carica*), one is biennial (*Oenothera depressa*), and one is biennial-perennial (*Grindelia squarrosa*).

Regarding the preferred habitats, nine species/subspecies grows along the river banks (*Albizia julibrissin*, *Buddleja davidii*, *Eclipta prostrata*, *Heliopsis helianthoides* subsp. *scabra*, *Oenothera depressa*, *Reynoutria sacchalinensis*, *Rudbeckia laciniata*, *Symphotrichum laeve*, *S. novae-angliae*), five species grows on dry lands/warmer areas (*Eclipta prostrata*, *Erigeron sumatrensis*, *Euphorbia serpens*, *Solanum rostratum*, *Verbesina encelioides*), four species grows on embankments railways and associated railway platforms (*Catalpa bignonioides*, *Cercis chinensis*, *Euphorbia glyptosperma*, *Grindelia squarrosa*), three species grows along the railway embankments (*Amaranthus palmeri*, *Artemisia umbrosa*, *Ficus carica*), and a species grow in swamps (*Bidens connatus*).

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