

ALIEN FLORA FROM BRĂILA COUNTY – ROMANIA

CAMEN-COMĂNESCU Petronela^{1*}, MIHAI Daniela Clara²

Abstract: This paper presents the list of alien plant species from Brăila County (Romania). The inventory is based on personal observations in the field in the last two years. The study has recorded 81 alien taxa who belong to 30 families, 36 of them being invasive. The Americas, Asia and the Mediterranean area are the main places of origin of the taxa of the inventory.

Keywords: alien plant species, alloigenous, Romania, invasive species

Received: 19 April 2022 / Revised: 14 September 2022 / Accepted: 17 September 2022

Introduction

Following the increase in the global mobility of people and goods, more and more species reach new geographical areas where they are favoured by changes in ecosystems such as land use change, eutrophication of water and soil or anthropogenic disturbance (Schoenenberger 2014).

These plants are capable of rapidly spreading and because of them, especially, agriculture pays a huge annual tribute (Sămărghitan & Oroian 2012).

The floristic analyses of alien plants are very important and form an essential database for invasive species research, control and management. Regional investigations have been given high priority in the research field of ecological invasion and are of essential importance for further studies (Wu et al. 2008).

In this study, our goals were to provide an inventory and background information on alien plants from Brăila County, an area less studied from this point of view. Data on the alien plants from this area are sporadically reported in few papers (Mititelu et al. 1987, Ciocărlan 2000, Monah 2001, Oprea 2005, Sîrbu 2006, Sîrbu & Oprea 2011). Our inventory represents a reference list of alien species already present in the county area and can become the tool to assess which species should be better monitored because they are potentially harmful. It must be emphasized the importance of knowing the distribution of all alien plants identified in Brăila County, in accordance with Regulation (EU) no. 1143/2014 of the European Parliament and of the Council on the prevention and management of the introduction and spread of invasive alien species.

Material and methods

Investigated area. Brăila is a county in the South-East of Romania, located in an area where the Romanian Plain (Câmpia Română) takes place, being crossed from south to north by the Danube River. The total area of the county is 4,765.8 km² (according to Strategia de dezvoltare durabilă a județului Brăila 2014-2020). Brăila County has a relief made up of smooth spaces that are furrowed by wide confluences of rivers. The main relief elements of Brăila County are: Câmpia Râmnicului, Câmpia Brăilei and

¹ University of Bucharest, Botanic Garden “D. Brandza”, Șos. Cotroceni 32, 060114-București, România.

² University of Bucharest, Faculty of Biology, 1-3 Aleea Portocalelor, Bucharest – 060110, Romania.

*Correspondence: petronela.camen-comanescu@unibuc.ro

Câmpia Călmățuiului, Balta Brăilei, Lunca Buzăului, Lunca Călmățuiului and Lunca Siretului. The specific vegetation to Brăila County is mainly represented by steppic grasslands, in plain areas, and meadows in the Danube basin and all the rivers in the county (Stoiu 1980). A large area of the steppe has been transformed into agricultural land, currently occupying 81.3% of the territory (according to Strategia de dezvoltare durabilă a județului Brăila 2014-2020).

Materials. This study is based on literature data and the authors' field investigations from the autumn 2019 to the end of 2021. A database with alien plants from Brăila County has been done. Archaeophytes (aliens introduced before 1500 AD), neophytes and cryptogenic taxa (taxa for which the period of introduction is not known or not very well documented) were considered in the analyses.

The nomenclature of species is according to World Checklist of Vascular Plants database (WCVP 2022) and Sârbu et al. (2013). In the list of alien flora (Appendix 1), taxa were listed in alphabetic order. For each taxon we registered and analyzed: family, life span, life form (according to Sârbu et al. 2013), origin (according to Erhardt et al. 2008, to Sârbu et al. 2013), way of introduction, residence time, invasive status (according to Ministerul Mediului, Apelor și Pădurilor & Universitatea din București, 2020) and relative abundance (Aymerich & Sáez 2019). The terminology used to establish the status of alien plants in our country, has been adapted from Richardson et al. (2000) and Pyšek et al. (2004).

Abbreviations: **Life form:** Ch – Chamaephytae; G – Geophyte; H – Hemicryptophyte; HH – Helohydrophyte; PhLi – Liana; PhM – Macrophanerophyte; PhN – Nanophanerophyte; T – Therophyte; Ht – Hemitherophyte. **Origin:** Af – Africa; Am – America; As – Asia; Eu – Europe; Trop – Tropical; Med – Mediterranean; N – North; E – East; S – South; W – West; C – Centre (central). **Way of introduction:** a – accidental; d – deliberate. **Residence time:** arh – archaeophyte; neo – neophyte; cry – cryptogenic taxa. **Invasive status:** c = casual; n = naturalized; i = invasive. **Relative abundance:** Rare (R): <5 points where the inventory was made; Scattered (S): few points (typically <20) and locally scarce; Locally abundant (L): few points but locally abundant; Common (C): widespread and often locally abundant.

Results

***Abutilon theophrasti* Medik.:** Brăila, seafront, ferry station; Chișcani (45.16898°N, 27.924246°E); Insula Mare a Brăilei (45.007626°N, 28.031784°E); Însurăței (44.911572°N, 27.600583°E); Mihai Bravu (44.812012°N, 27.762392°E); Vișani (45.156742°N, 27.283345°E).

***Acer negundo* L.:** Berteștii de Jos; Brăila, Old Rite Russian Cemetery, Sf. Constantin Cemetery, seafront towards Vadul Spitalului Street, Grădina Mare Park, Răzoarelor Street, Odessa Street; the ring road of Brăila; Cazasu; Chișcani; Dropia; Făurei, railway station; Gropeni; Ianca; Insula Mare a Brăilei; between Iazu and Slobozia Nouă; between Viziru and Însurăței; Lacu Sărat Village; Stăncuța.

***Ailanthus altissima* (Mill.) Swingle:** Bărăganul; Brăila, Catholic Cemetery, Sf. Maria Cemetery, Old Rite Russian Cemetery, Sf. Constantin Cemetery, seafront towards Vadul Spitalului Street, Grădina Mare Park, Rink, Dr. Victor Dimitriu Street, Tazlăului Street; Cazasu; the ring road of Brăila; Constantinești; Corbeni; Cuza Vodă; Gemeenele; Gropeni, the road to the ferry; Insula Mare a Brăilei; between Brăila and

Muchea; Însurăței; Jugureanu; Lacu Sărat, lakeshore; Lanurile; Maxineni; between Măru Roșu and Lacu Rezii; Mihai Bravu; Movila Miresii; Opișenești; Plăsoiu; Racovița; Romanu; Sătuc; Silistraru; Stanca; Stăncuța; Surdila Greci; Șuțești; Tudor Vladimirescu, the entrance of locality; Tufești; Ulmu; Viziru.

***Alcea rosea* L.:** Brăila, railway station; between Brăila and Muchea (45.312107°N, 27.867502°E); between Cazasu and Mărtăcești (45.277802°N, 27.854071°E).

***Amaranthus albus* L.:** Brăila, railway station (45.279255°N, 27.954582°E).

***Amaranthus caudatus* L.:** Însurăței (44.915799°N, 27.608214°E).

***Amaranthus crispus* (Lesp. et Thénau) N. Terracc.:** Făurei, railway station, between the rails (45.082348°N, 27.275444°E).

***Amaranthus cruentus* L.:** Ianca (45.136109°N, 27.496907°E).

***Amaranthus deflexus* L.:** Brăila, seafront, Libertății Street, Sf. Maria Cemetery; Movila Miresii (45.216021°N, 27.630787°E).

***Amaranthus hybridus* L.:** Brăila, Odessa Street; between Frecăței and Titcov (44.953979°N, 28.123606°E); Stoenesti (44.794563°N, 28.035799°E); Tichilești (45.116548°N, 27.900028°E).

***Amaranthus retroflexus* L.:** Bărăganul; Bordei Verde; Brăila, Catholic Cemetery, Old Rite Russian Cemetery, Sf. Constantin Cemetery, seafront towards Vadul Spitalului Street, Grădina Mare Park, Odessa Street, Răzoarelor Street, Rink, storage area; Cazasu; Căineni-Băi; Constantinești; Corbeni; Dudescu; Frecăței; Gropeni, the road to the ferry; Ianca; Insula Mare a Brăilei; Însurăței; between Brăila and Muchea, water channel shore; between Cuza Vodă and Stăncuța; Mihail Kogălniceanu; between Muchea and Latinu; between Tufești and Cuza Vodă, water channel shore; between Viziru and Lișcoteanca, soya field; between Silistraru and Lacu Sărat; Lacul Sărat; Lanurile; Latinu, fallow; between Măru Roșu and Lacu Rezii; Mirecea Vodă; Opișenești; Plopi; Plopu, lakeshore, greenfield; Polizești; Racovița; Romanu; Stoenesti; Surdila Găiseanca, railroad crossing; Tichilești; Titcov; Tufești, water channel shore; Ulmu, cemetery; Urleasca; Victoria, greenfield for garbage.

***Ambrosia artemisiifolia* L.:** Bărăganul; Brăila, Catholic Cemetery, Sf. Constantin Cemetery, Sf. Maria Cemetery, Sf. Mina Cemetery, seafront towards Vadul Spitalului Street, seafront, railway station, Odessa Street, Răzoarelor Street, Rink, storage area; Berteștii de Jos; Cazasu; the ring road of Brăila; Chișcani; Dropia; Făurei, railway station, between the rails; Filipești; Frecăței; Găvani; Gropeni, the road to the ferry; Ianca; between Brăila and Muchea, water channel shore; Însurăței; between Cuza Vodă and Stăncuța; between Lacul Sărat and Silistraru, corn field; between Vărsătură and Chișcani; Jirlău; Lacu Sărat Village; Latinu, fallow; Măxineni; Măgureni; Mărașu; Măru Roșu; between Măru Roșu and Lacu Rezii; Mihai Bravu, landfill; Movila Miresii; Olăneasca; Plopi; Polizești; Romanu; Stoenesti; Surdila Greci; Tichilești; Insula Mare a Brăilei, ferry station; Tudor Vladimirescu; Tufești, water channel shore.

***Amorpha fruticosa* L.:** Brăila, seafront, Grădina Mare Park; Berteștii de Jos; Chișcani, water channel shore; Grădiștea; Gropeni, the road to the ferry; Insula Mare a Brăilei; between Berteștii de Jos and Mihai Bravu; Lacu Sărat, lakeshore; Stăncuța, the road of Danube river, Danube shore; Surdila Găiseanca, railroad crossing; Insula Mare a Brăilei, ferry station; Ulmu, cemetery; Urleasca.

***Armoracia rusticana* P.Gaertn., B.Mey. & Scherb.:** Brăila, seafront, Dr. Victor Dimitriu Street; Ianca; Însurăței, corn field; Lacu Sărat, roadside; Măxineni.

***Artemisia annua* L.:** Bărăganul; Berteștii de Jos; Brăila, seafront towards Vadul Spitalului Street, greenfield on seafront, Dr. Victor Dimitriu Street; Căineni-Băi; Frecăței; Însurăței; Jirlău, railway edge; Măgureni; Mărașu; Măxineni; Mihai Bravu, landfill; Mircea Vodă; Plășoiu; Plopi; Polizești; Stăcuța, the road of Danube river, Danube shore; Tichilești; Titcov; Țăcău; Ulmu, cemetery; Victoria; Vultureni.

***Azolla filiculoides* Lam.:** Berteștii de Jos (44.836700°N, 27.760654°E); Caragele (44.986603°N, 27.03809°E); between Scorțaru Vechi and Comăneasca (45.224331°N, 27.716473°E).

***Bassia scoparia* (L.) A.J.Scott:** Bărăganul; Brăila, Catholic Cemetery, Sf. Constantin Cemetery, Sf. Mina Cemetery, Dr. Victor Dimitriu Street, railway station, storage area; Căineni-Băi; the ring road of Brăila; Chișcani; Făurei, railway station, between the rails; Insula Mare a Brăilei; Însurăței; Jirlău; Jugureanu; Lacul Sărat, the entrance of locality, in locality; Mărașu; Between Măru Roșu and Lacu Rezii; Măxineni; Mihai Bravu, landfill; Mihail Kogălniceanu; Movila Miresii; Muchea; Polizești; Surdila Găiseanca, railroad crossing; Surdila Greci; Tichilești; Titcov; Ulmu, cemetery; Vărsătura; Victoria, greenfield for garbage, corn field; Vișani.

***Bassia sieversiana* (Pall.) W.A.Weber:** Brăila, Dr. Victor Dimitriu Street; Insula Marea Brăilei.

***Bidens frondosa* L.:** Lacu Rezii (44.897713°N, 27.674719°E).

***Calendula officinalis* L.:** Stăncuța, cemetery (44.897652°N, 27.8246°E).

***Cannabis sativa* L.:** Batogu; Brăila; Bărăganul; Chișcani; Cireșu; Cuza Vodă; Dudescu; between Frecăței and Titcov; Insula Mare a Brăilei; Însurăței; Jirlău; Lanurile; Mihai Bravu; Polizești; Tichilești; Șuțești, greenfield for garbage; Ulmu; Urleasca; Zăvoiaia; Victoria; Viziru.

***Catalpa bignonioides* Walter:** Brăila, seafront; Făurei, railway station.

***Celtis occidentalis* L.:** Brăila, Old Rite Russian Cemetery.

***Cercis siliquastrum* L.:** Brăila, seafront.

***Citrullus lanatus* (Thunb.) Mansf.:** Brăila, seafront; Lacu Rezii (44.897713°N, 27.674719°E).

***Commelina communis* L.:** Brăila, Dr. Victor Dimitriu Street.

***Coreopsis tinctoria* Nutt.:** Frecăței (44.952454°N, 28.129384°E); Racovița (45.295373°N, 27.457345°E).

***Cucurbita pepo* L.:** Brăila, seafront.

***Cuscuta campestris* Yunck.:** Brăila, Sf. Constantin Cemetery, seafront, railway station, Odessa Street, Rink; the ring road of Brăila; Dropia; Frecăței; Insula Mare a Brăilei; between Frecăței and Titcov; between Victoria and Bărăganu; Lacu Sărat Village; Stoenеști; Tichilești.

***Cyclachaena xanthiifolia* (Nutt.) Fresen. (*Iva xanthiifolia* (Nutt.)):** Bărăganul; Brăila, railway station, Dr. Victor Dimitriu Street, Odessa Street; Cazasu; Grădiștea, shore of Buzău river; between Frecăței and Titcov; Lacu Rezii; Lacul Sărat, the entrance of locality, in locality; Lacu Rezii; Măxineni; Mihai Bravu, landfill; Plopi; Tichilești; Titcov; Tudor Vladimirescu; Victoria, greenfield for garbage, corn field.

***Datura stramonium* L.:** Berteștii de Jos; Bordei Verde; Brăila, seafront, Odessa Street; Chișcani; Constantinești; Mihail Kogălniceanu; Ianca; Însurăței; between Albina

and Valea Cânepii; between Brăila and Muchea; between Bordei Verde and Viziru; between Cuza Vodă and Tufești; between Surdila Greci and Rușetu; between Vicotria and Bărăganu; Jirlău; Lacu Sărat Village; Lanurile; Măgureni; Lacu Rezii; Mihai Bravu, landfill; Mihail Kogălniceanu; Mircea Vodă; Plopi; Plopu, lakeshore, greenfield; Polizești; Racovița; Râmnicele; Romanu; Silistraru; Stăncuța; Stoenesti; Tichilești; Tudor Vladimirescu; Ulmu, cemetery; Victoria, greenfield for garbage, corn field; Vișani; Viziru.

***Datura wrightii* Regel:** Berteștii de Jos (44.784333°N, 27.705026°E); Brăila, Catholic Cemetery, Odessa Street; Chișcani; between Iazu and Slobozia Nouă; Mihai Bravu; Movila Miresii; Surdila Greci (45.06196°N, 27.256523°E); Tichilești.

***Dysphania ambrosioides* (L.) Mosyakin & Clements:** Brăila, seafront.

***Dysphania botrys* (L.) Mosyakin & Clements:** Brăila, seafront.

***Eclipta prostrata* (L.) L.:** Brăila, seafront, seafront towards Vadul Spitalului Street; Stăncuța, Danube shore.

***Elaeagnus angustifolia* L.:** Albina; Balta Albă; Brăila, Grădina Mare Park; Cazasu; Comăneasca; Constantinești; Frecăței; Grădiștea, Buzău river; between Căineni-Băi and Plășoiu; between Lacu Sărat and Silistraru; between Silistraru and Urleasca; between Tufești and Gropeni; Jirlău, railway edge; Lacu Sărat, lakeshore; Lacu Sărat Village; Latinu; Maxineni; Movila Miresii, the entrance of locality; Muchea; Plopu, lakeshore, greenfield; Stoenesti; Surdila Greci; Urleasca.

***Erigeron annuus* (L.) Pers.:** Brăila, Catholic Cemetery, Sf. Constantin Cemetery, Old Rite Russian Cemetery.

***Erigeron canadensis* L.:** Bărăganul; Brăila, seafront, Odessa Street, Răzoarelor Street, Catholic Cemetery, Sf. Maria Cemetery, Old Rite Russian Cemetery, Sf. Constantin Cemetery, Sf. Mina Cemetery, railway station; Chișcani, water channel shore; Constantinești; Cuza Vodă; Făurei, railway station, between the rails; Frecăței; Gemenele; Gropeni, ferry station; Insula Mare a Brăilei, in the middle of the island; Însurăței; between Cuza Vodă and Spiru Haret; between Frecăței and Titcov; between Lacu Sărat and Silistraru; between Surdila Greci and Rușetu; between Viziru and Însurăței; Măgureni; Măru Roșu; Mircea Vodă; Muchea; Racovița; Râmnicele; Romanu; Stăncuța, Danube shore; Tichilești; Insula Mare a Brăilei, ferry station; Tufești; Țăcău; Ulmu, cemetery; Urleasca; Victoria; Vultureni.

***Euphorbia maculata* L.:** Brăila, seafront; Făurei, railway station, between the rails.

***Fallopia aubertii* (L. Henry) Holub:** Brăila, Sf. Constantin Cemetery, ferry station; Făurei, railway station; Insula Mare a Brăilei.

***Fraxinus pennsylvanica* Marshall:** Balta Albă; Brăila, Ortodox Cemetery, Grădina Mare Park, Rink; between Iazu and Slobozia (44.699455°N, 27.418823°E); Mihail Kogălniceanu.

***Gaillardia pulchella* Foug.:** Mircea Vodă, cemetery (45.104177°N, 27.373634°E).

***Galinsoga quadriradiata* Ruiz & Pav.:** Făurei, railway station.

***Gleditsia triacanthos* L.:** Albina; Brăila, Odessa Street; Cazasu; Căineni-Băi; the ring road of Brăila; Comăneasca; Corbeni; Cuza Vodă; Dropia; Însurăței; between Brăila and Muchea, water channel shore; between Opresenești and Ianca; Lacu Rezii; Lacu Sărat Village; Lacu Sărat, lakeshore; Mărașu; Muchea; Olăneasca; Opresenești; Polizești; Racovița; Romanu; Silistraru; Urleasca.

***Glinus lotoides* L.:** Brăila, seafront (45.271562°N, 27.982295°E).

***Helianthus tuberosus* L.:** Bărăganul; Brăila, Old Rite Russian Cemetery, Fluierului Street; Cazasu; Însurăței; Lanurile; Oprișenești; Valea Cănepii; Viziru.

***Hordeum marinum* Huds.:** Lacu Sărat.

***Ipomoea purpurea* (L.) Roth.:** Brăila, Sf. Constantin Cemetery, Odessa Street, Celulozei Street; Gropeni; the road to the ferry; Însurăței, vineyard; Latinu, fallow; between Măru Roșu and Lacu Rezii; Stanca; Tudor Vladimirescu; Vișani.

***Juglans regia* L.:** Chișcani.

***Koeleria paniculata* Laxm.:** Brăila, seafront.

***Lemna minuta* Kunth.:** Chișcani, water channel (45.168980°N, 27.924246°E); Însurăței, waterhole (44.911572°N, 27.600583°E); Lacu Rezii (44.897713°N, 27.674719°E).

***Lycium barbarum* L.:** Bărăganul; Brăila, Catholic Cemetery, Sf. Maria Cemetery, Sf. Constantin Cemetery, Sf. Mina Cemetery, seafront, Grădina Mare Park, Dr. Victor Dimitriu Street; Cazasu; Căineni-Băi; Constantinești; Corbeni; Filipești; Grădiștea, Buzău river; Însurăței; Lacu Sărat Village; Lacu Rezii; Mircea Vodă; Muchea; Oprișenești; Plășoiu; Plopu, lakeshore, greenfield; Racovița; Spiru Haret; Surdila Găiseanca railway station crossing; Șutești; Tudor Vladimirescu; Tufești; Ulmu, cemetery; Vișani; Viziru; Vultureni.

***Matricaria discoidea* DC.:** Jirlău (45.164345°N, 27.202377°E).

***Medicago sativa* L.:** Insula Mare a Brăilei; Măxineni.

***Morus alba* L.:** Bărăganul; Brăila, Grădina Mare Park; Chișcani; Însurăței; between Lacu Sărat and Silistraru; between Silistraru and Urleasca; Latinu, uncultivated field; Lacu Rezii; Stoenesti.

***Morus nigra* L.:** Brăila, Sf. Mina Cemetery, middle of the seafront, seafront towards Vadul Spitalului Street, Dr. Victor Dimitriu Street, Libertății Street; Constantinești; Movila Miresii, the entrance of locality; Plopu, lakeshore, greenfield; Racovița.

***Nicotiana glauca* Link et Otto:** Brăila, seafront.

***Oenothera biennis* L.:** Cazasu (45.269445°N, 27.901437°E); Râmnicelu (45.276573°N, 27.550253°E).

***Oenothera glazioviana* Micheli:** Brăila, Sf. Constantin Cemetery (45.264069°N, 27.952305°E); Tichilești (45.128724°N, 27.914283°E).

***Oxalis corniculata* L.:** Brăila, Catholic Cemetery, Odessa Street.

***Oxalis dillenii* Jacq.:** Brăila, Catholic Cemetery.

***Panicum capillare* L.:** Brăila, seafront, seafront towards Vadul Spitalului Street.

***Panicum dichotomiflorum* Michx.:** Brăila, seafront (45.265281°N, 27.974334°E).

***Parthenocissus quinquefolia* (L.) Planchon:** Brăila, Sf. Constantin Cemetery, Grădina Mare Park, Libertății Street; Filipești.

***Parthenocissus inserta* (A. Kerner) Fritsch:** Brăila, Sf. Maria Cemetery, Old Rite Russian Cemetery, Sf. Constantin Cemetery, Grădina Mare Park, Odessa Street; Făurei, railway station, roadside; Filipești; Gropeni; Lacu Sărat Village; Plășoiu; Racovița; Șutești; Tichilești.

***Paspalum distichum* L.:** Gropeni, Danube shore (45.067497°N, 27.900906°E).

***Petrosedum ochroleucum* (Chaix) Niederle (*Sedum ochroleucum* Chaix):** Brăila, Catholic Cemetery, seafront.

***Petunia integrifolia* (Hooker) Schinz & Thell.:** Brăila, seafront, Celulozei Street; Mircea Vodă, cemetery (45.104177°N, 27.373634°E).

***Phytolacca americana* L.:** Brăila, Old Rite Russian Cemetery (45.288641°N, 27.969978°E).

***Portulaca oleracea* L.:** Brăila; Berteștii de Jos; Cuza Vodă; Dropia; Făurei; Gemecele; Grădiștea; Gropeni; Insula Mare a Brăilei; Însurăței; Jirlău; Jugureanu; Lacu Rezii; Lanurile; Latinu; Lișcoteanca; Mărașu; Mihai Bravu; Movila Miresii; Polizești; Racovița; Râmnicelu; Silistraru; Stanca; Șuțești, greenfield for garbage; Tufești; Ulmu; Victoria.

***Prunus cerasifera* Ehrh.:** Brăila, Sf. Maria Cemetery; Grădiștea; Plăsoiu; Racovița.

***Reynoutria japonica* Houtt.:** Ianca (45.133616°N, 27.474561°E).

***Robinia pseudoacacia* L.:** Albina; Bărăganul; Brăila, middle of the seafront, seafront towards Vadul Spitalului Street, Catholic Cemetery, Old Rite Russian Cemetery, Sf. Maria Cemetery, Grădina Mare Park, Libertății Street, Tazlăului Street; Căineni-Băi; Constantinești; Corbeni; Cuza Vodă; Dropia; Făurei, railway station, roadside; Filipești; Gropeni, the road to the ferry; Ianca; Însurăței; between Viziru and Lișcoteanca; Jirlău; Jugureanu; Lacu Rezii; Lacu Sărat, lakeshore; Lacu Sărat Village; Lanurile; Latinu, fallow; Maxineni; Mărașu; between Măru Roșu and Lacu Rezii; Mihail Kogălniceanu; Mircea Vodă; Movila Miresii, the entrance of locality; Olaneasca; Oprișenești; Plăsoiu; Polizești; Racovița; Râmnicelu; Romanu; Silistraru; Stoenesti; Surdila Găiseanca, railway crossing; Surdila Greci; Tichilești; Tufești; Ulmu, cemetery; Ulmu; Urleasca; Viziru.

***Setaria faberi* R.A.W.Herrm.:** Jirlău (45.164345°N, 27.202377°E).

***Setaria verticilliformis* Dumort.:** Brăila, Sf. Maria Cemetery.

***Solanum lycopersicum* L.:** Brăila, seafront; Lacu Rezii.

***Solidago canadensis* L.:** Brăila, Old Rite Russian Cemetery (45.288641°N, 27.969978°E), seafront (45.265282°N, 27.974277°E).

***Sorghum halepense* (L.) Pers.:** Albina; Balta Albă; Bărăganul; Brăila, Catholic Cemetery, Old Rite Russian Cemetery, Sf. Constantin Cemetery, Sf. Maria Cemetery, Sf. Mina Cemetery, Odessa Street, seafront, railway station; Cazasu; Căineni-Băi; the ring road of Brăila; Comăneasca; Constantinești; Corbeni; Făurei, railway station, between the rails; Frecăței; Gropeni; Ianca; Insula Mare a Brăilei; Mihail Kogălniceanu; Însurăței; between Albina and Valea Cănepii; between Berteștii de Jos and Berteștii de Sus; between Berteștii de Sus and Mihai Bravu; between Bordei Verde and Viziru, corn field; between Brăila and Muchea, roadside, water channel shore; between Cazasu and Mărtăcești; between Cuza Vodă and Spiru Haret, corn field; between Cuza Vodă and Stăncuța; between Iazu and Slobozia Nouă; between Lacu Sarat and Silistraru, corn field; between Muchea and Latinu; between Silistraru and Urleasca; between Victoria and Mihai Bravu; between Viziru and Însurăței; between Viziru and Lișcoteanca, soya field; Lacu Sărat Village; Lanurile; Latinu, fallow; Măxineni; Măgureni; Măru Roșu; Mircea Vodă; Muchea; Oprișenești; Plopu, lakeshore, greenfield; Polizești; Racovița, greenfield; Râmnicelu; Romanu; Silistraru; Slobozia; Stoenesti; Surdila Găiseanca, railroad crossing; Tichilești; Tudor Vladimirescu; Tufești; Ulmu, cemetery; Ulmu; Urleasca, sunflower field; Victoria; Viziru.

***Symphytotrichum ciliatum* (Ledeb.) G.L.Nesom:** Lacu Rezii (44.89762°N, 27.67491°E).

***Xanthium orientale* subsp. *italicum* (Moretti) Greuter:** Albina; Berteștii de Jos; Bordei Verde, roadside, corn field; Brăila, middle of the seafront, seafront towards Vadul Spitalului Street, railway station, Odessa Street, storage area; Cazasu; Chișcani, water channel shore; Constantinești; Dropia; Făurei, railway station, between the rails; Filipești; Gropeni, the road to the ferry; Ianca; Insula Mare a Brăilei, roadside in the middle of island; Însurăței; between Albina and Valea Cânepii; between Bărağanul and Iazu; between Brăila and Muchea, water channel shore; between Cuza Vodă and Spiru Haret, corn field; between Cuza Vodă and Stăncuța; between Lacu Sărat and Silistraru; between Muchea and Latinu; between Opreșenești and Ianca; between Silistraru and Urleasca; between Surdila Greci and Rușetu; between Tufești and Cuza Vodă, water channel shore; between Victoria and Mihai Bravu; between Viziru and Lișcoteanca, soya field; Jugureanu, grazing; Lacu Sărat Village; Lanurile; Latinu, fallow; Maxineni; between Măru Roșu and Lacu Rezii; Mihai Bravu, landfill; Mihail Kogălniceanu; Mircea Vodă; Olăneasca; Opreșenești; Plăsoiu; Plopi; Plopu, lakeshore, greenfield; Polizești; Racovița, greenfield; Romanu; Silistraru; Stăncuța, Danube shore; Surdila Găiseanca, railroad crossing; Surdila Greci; Tichilești; Insula Mare a Brăilei, ferry station; Tudor Vladimirescu; Tufești; Țăcău; Ulmu, cemetery; Ulmu; Urleasca; Victoria, greenfield for garbage; Vișani; Vultureni.

***Xanthium spinosum* L.:** Berteștii de Jos; Bordei Verde, corn field; Constantinești; Dudescu; Frecăței; Grădiștea, Buzău river; Gropeni; between Bordei Verde and Viziru, corn field; between Cuza Vodă and Spiru Haret, corn field; between Viziru and Lișcoteanca, soya field; Jirlău; Lacu Rezii; Mihai Bravu, landfill; Movila Miresii; Plopu, lakeshore, greenfield; Stoenesti; Tichilești; Titcov; Tudor Vladimirescu; Țăcău; Victoria, greenfield for garbage.

Discussion

In Brăila County we identified 81 alien plants taxa belonging to 30 families (Appendix 1). The families with most representatives are: Asteraceae (17 taxa – 20.98%), Amaranthaceae (11 taxa - 13.58%), Poaceae (7 taxa), Solanaceae (6 taxa) and Fabaceae (5 taxa). The rest of the families are represented by only two or one taxa. The presence of the Amaranthaceae family on the second position is due to the fact that Brăila County includes many agricultural lands and this family includes genera that are agricultural weeds like *Amaranthus* genus (Pyšek et al. 2009).

The pattern of the families is similar to national pattern (Anastasiu & Negrean 2009) and of other countries such as Bosnia and Herzegovina (Maslo 2014), Greece (Arianoutsou et al. 2010), Italy and Spain (Podda et al. 2011) and partially reflect the global pattern (Pyšek et al. 2009).

The genus with the highest number of alien taxa is *Amaranthus* (7 species). The rest of the genera are represented by two species (10 genera) or by a single species (54 genera).

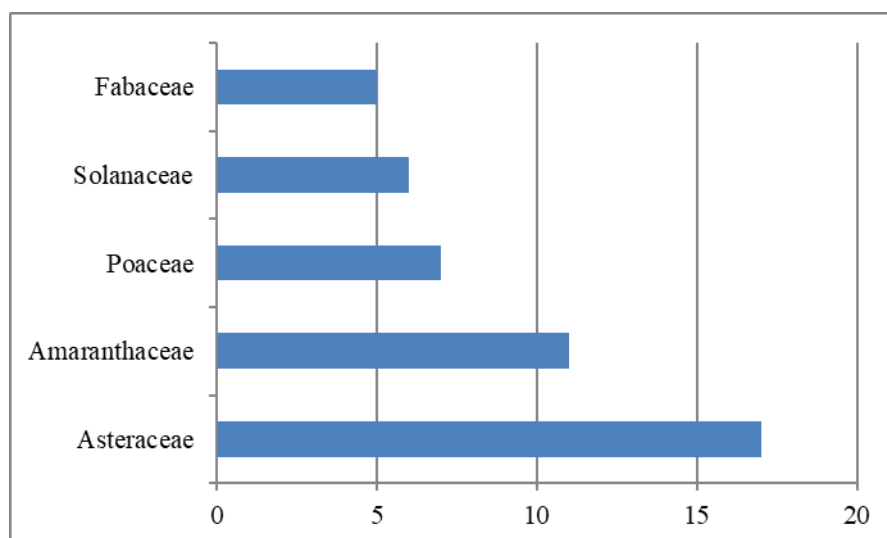


Fig. 1. Spectrum of the families of alien plant species from Brăila County with more than one or two taxa

The analysis of life span shows a sharp prevalence of annuals – 47 species (56.79%), while perennials are represented by 32 species (39.50%) and biennials by 2 species (2.46%). The dominance of the annuals is maintained also in other areas of Romania (Burduşel et al. 2020; Răduţoiu & Stan 2013) and is a trend observed in other regional alien floras as well (Lambdon et al. 2008).

Among the annuals there are many species that appear to be in the initial stages of expansion (*Azolla filiculoides*, *Lemna minuta*, *Panicum capillare*, *Paspalum distichum*, *Symphyotrichum ciliatum*). Most of these type of alien plants live in habitats closely associated with man: along roadsides (*Ambrosia artemisiifolia*, *Conyza canadensis*, *Portulaca oleracea*), in front of the courtyards (*Datura wrightii*, *Nicotiana glauca*), in places where garbage is dumped (*Artemisia annua*), on cultivated fields (*Datura stramonium*, *Amaranthus retroflexus*, *Ambrosia artemisiifolia*, *Xanthium orientale* subsp. *italicum*), on the Danube seafront (*Panicum capillare*, *Panicum dichotomiflorum*, *Euphorbia maculata*, *Eclipta prostrata*).

Annual hydrophytes reported in this county are two species, *Azolla filiculoides* and *Lemna minuta* present in water holes or on water channels on the edge of agricultural land.

Azolla filiculoides was cited for the first time in Brăila County in 2009, in the Romanian Red Book of Vascular Plants (Dihoru & Negrean) where the authors include it in the list of vulnerable species. Also, *Glinus lotoides* has been included in national Red Lists like rare species (Oltean et al. 1994).

The biennials and many perennials (19 species) are very common in cemeteries in this county.

Among the perennials, the first place belongs to phanerophytes with 19 species, followed by hemicryptophytes with 11 species. The geophytes and chamaephytes have just one representative.

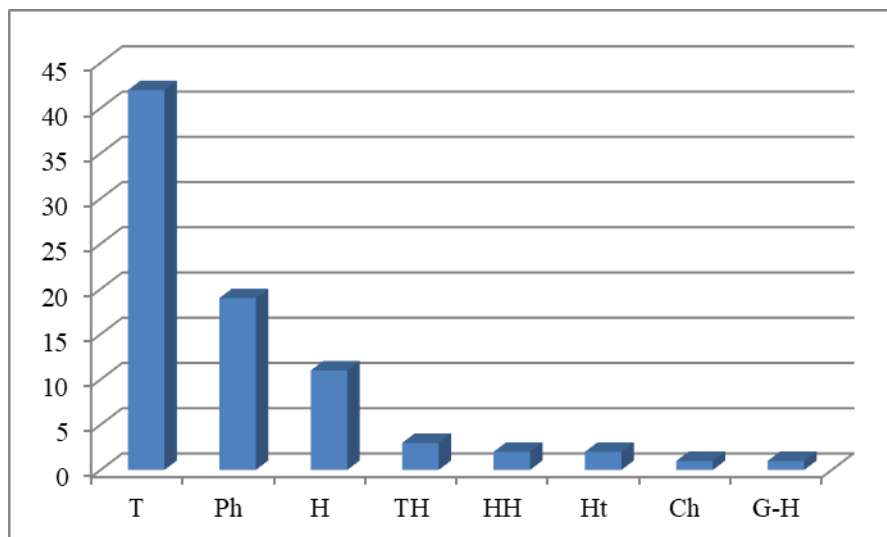


Fig. 2. Biological form spectrum of alien plant species from Brăila County

Analysis of the geographical origin of the alien flora of Brăila County showed that the most plants originated from the Americas (45 taxa, 55.55%), among which most originate from North America (34 taxa). The next most frequent areas of origin are: Asia (19 taxa) and the Mediterranean basin (6 taxa). Five species are widely distributed across tropical regions: one from tropical Africa and America and four from tropical America. Three taxa are from South-East Europe and West Asia. African and European taxa have just two representatives.

Considering the way of introductions, 47 taxa (58.02%) have arrived deliberately and 34 (41.97%) accidentally. Regarding the introduction pathways of invasive flora, ornamental use results to be the main cause of introduction. The updated list of non-native ornamental plants from Romania includes 264 taxa with 34.84% phanerophytes (Urziceanu et al. 2020). This is the result of widespread use of trees and shrubs as ornamentals. Thus, of those deliberately introduced in Brăila County, 32 taxa (39.50%) are ornamental plants and half of which are phanerophytes.

A large part of the decorative plants have been identified with a high frequency in cemeteries and on the Danube seafront in Brăila. For example, the species *Phytolacca americana* was found only in the Old Russian Rite Cemetery in Brăila and *Petrosedum ochroleucum* only in cemeteries and on the Danube seafront.

Of the total 81 alien taxa, neophytes are in a very high percentage (73 taxa, 90.12%). A percentage of 7.4% (6 taxa) are archaeophytes and only two taxa belong of the cryptogenic category (*Abutilon theophrasti* and *Armoracia rusticana*).

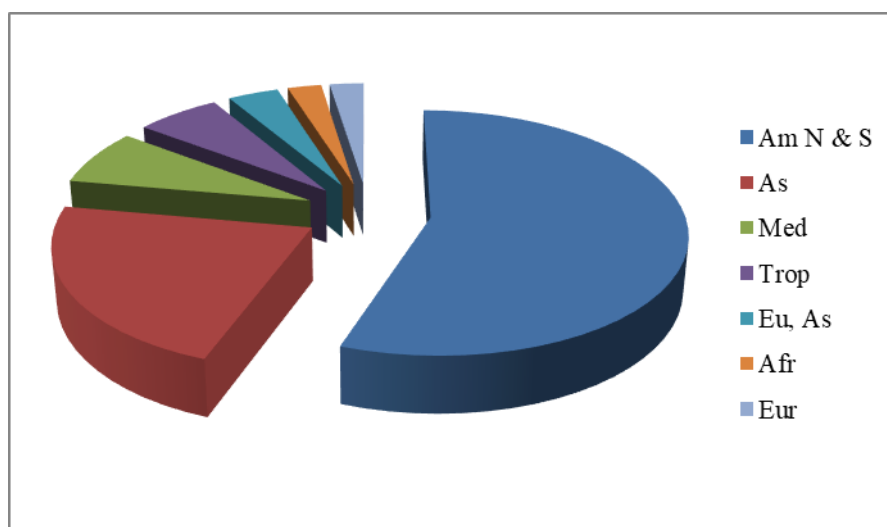


Fig. 3. Origin spectrum of alien plant species from Brăila County

The presence of a large proportion of neophytes indicates an active invasion of alien plants into the flora of Brăila County. Confirming this, Sîrbu & Oprea (2011) reported just 54 alien species from this area. Of these, 19 taxa were not found by us in our study. Among these taxa are: *Chenopodium multifidum*, *Colutea arborescens*, *Erechtites hieraciifolius*, *Helianthus decapetalus*, *Maclura pomifera*, *Salvia reflexa* and *Solanum triflorum*. As for *Vallisneria spiralis*, it was identified on the outskirts of Iazu, in an irrigation channel, 9 kilometers from the border of Brăila County.

53 taxa have the first report for this county. The rather large number of these species can be explained by the lack of studies on the flora of the studied area after 2011. Among the new reported taxa are species with a small number of individuals which shows that their presence on the territory of Braila County is recent: *Artemisia annua*, *Comelina communis*, *Datura wrightii*, *Lemna minuta*, *Oenothera glazioviana*, *Panicum dichotomiflorum*, *Reynoutria japonica*.

A large number of them certainly existed before 2011, some being weeds, others being cultivated for decorative purposes, in gardens and cemeteries: *Ailanthus altissima*, *Amaranthus retroflexus*, *Armoracia rusticana*, *Datura stramonium*, *Iva xanthifolia*, *Oenothera biennis*, *Solidago canadensis*, *Helianthus tuberosus*, *Xanthium spinosum*.

Regarding the degree of naturalization, almost half taxa are invasive (43), 20 are casual aliens and 18 are considered naturalised. The established aliens (naturalised + invasive) are 61 (75.30%) of the recorded taxa. Of this, just *Ailanthus altissima* are included in the updated list of invasive alien species of EU concern (The European Commission 2019). No eradication actions were observed on the surface of Brăila County.

The neophytes comprise 42 invasive taxa (51.85%), 19 casual taxa (23.45%) and 12 naturalised taxa (14.81%). From the invasive taxa, 24 are included in the list of the 150 most widespread alien plant species in Europe (Lambdon et al. 2008).

Analysis of relative abundance of alien plant species from Brăila County show that a high percentage have the status of rare (48), meaning they were identified in less

than 5 points where the inventory was made. The common species (because they have a wide regional distribution and a large number of individuals), are 21, 3 are considered locally abundant (restricted to few place), and 9 are scattered (because were identified in less than 20 points and are locally scarce). Overall, taxa that have achieved a major implantation in the territory (common + locally abundant) are 28.39% and those that show little colonization success (rare + scarce) 70.37 %.

The point where most of non-native species were registered is in the locality of Lacu Rezii, where 16 taxa have been identified. Also, a large number of taxa were recorded in cemeteries in Brăila (Sf. Constantin Cemetery -15 taxa, Catholic Cemetery – 13 taxa) as spontaneous plants.

The richest locality in non-native species in Brăila County is the city of Brăila, with 48 taxa. This is due to the fact that it is the largest of the only four cities in this county, and the most anthropized, with numerous parks, cemeteries, a cliff on the Danube bank, ferry and port. It is followed by the locality Lacu Sărat with 21 taxa (locality through which DN2B passes, which connects the city of Buzău and Brăila) and the village of Stăncuța, located on the Danube bank with 15 taxa.

The most common species are *Sorghum halepense* (93 points), *Xanthium orientale* subsp. *italicum* (90 points), *Robinia pseudoacacia* (73 points), *Ambrosia artemisiifolia* (66 points), *Amaranthus retroflexus* (52 records) and *Datura stramonium* (51 points). *Robinia pseudoacacia* was planted a lot on the roads in this county, forming dense populations that shade the land. It also appears in gardens, in roadsides as an ornamental plant, in vacant places and is present in all studied cemeteries. The others are species that are agricultural weeds, in Brăila County the agricultural area occupying 81.3% of the territory.

Conclusion

This inventory describes the richness and diversity of the alien flora of Brăila County and it can therefore serve as a reference for future comparisons. The inventory from this area is of interest because the available data about alien flora for this area are really rare. The data set comprises 81 taxa. Most of them are Asteraceae (17 taxa), therophytes (42 taxa), of American origin (45 taxa), neophytes (73 taxa), invasive (36 taxa). Among the species of European Union concern, only *Ailanthus altissima* is present in our study area.

Acknowledgements. This work was supported by the projects POIM120008 “Adequate management of invasive species in Romania in accordance with EU regulation 1143/2014 regarding the prevention and management of the introduction and spread of invasive alien species” implemented by the Ministry of Waters, Forests and Environment as beneficiary, and the University of Bucharest as partner.

References

- Anastasiiu, P. & Negrean, G. (2009). Neophytes in Romania. In L. Rákossy & L. Momeu (coord.). *Neobiota din România* (pp. 66-97). Cluj-Napoca: Edit. Presa Univ. Clujeană.
- Arianoutsou, M., Bazos, I., Delipetrou, P. & Kokkoris, Y. (2010). The alien flora of Greece: taxonomy, life traits and habitat preferences. *Biological Invasions*, 12(10), 3525-3549.

- Aymerich, P. & Sáez, L. (2019). Checklist of the vascular alien flora of Catalonia (northeastern Iberian Peninsula, Spain). *Mediterranean Botany*, 40(2), 215-242.
- Burduşel, M., Anastasiu, P. & Şesan, T.E. (2020). Preliminary study on the alien flora of the Olteţ River Basin (Romania). *Acta Horti Bot. Bucurest.*, 46, 107-132.
- Ciocârlan, V. (2009). *Flora ilustrată a României. Pteridophyta et Spermatophyta* (ed. III). Bucureşti: Edit. Ceres.
- Dihoru, G. & Negrean, G. (2009). *Cartea roşie a plantelor vasculare din România*. Bucureşti: Edit. Academiei Române.
- Erhardt, W., Götz, E., Bödeker, N. & Seybold, S. (2008). *Der grosse Zander Enzyklopädie der Pflanzennamen*. Band 2. Arten und Sorten Stuttgart (Hohenheim).
- Lambdon, P., Pyšek, P., Basnou, C., Hejda, M., Arianoutsou, M., Essl, F., ... & Vilà, M. (2008). Alien flora of Europe: species diversity, temporal trends, geographical patterns and research needs. *Preslia*, 80, 101-149.
- Maslo, S. (2014). Alien flora of Hutovo Blato Natural Park (South Bosnia and Herzegovina). *Herbologia*, 14(1). DOI 10.5644/Herb.14.1.01.
- Ministerul Mediului, Apelor şi Pădurilor & Universitatea din Bucureşti (2020). *Baza de date Microsoft Excel cu informaţii relevante din literatură privind caracteristicile speciilor de plante alogene invazive şi potenţial invazive*. Retrieved March, 2022, from: http://invazive.ccmesi.ro/wp-content/uploads/2020/02/POIM_120008_Subactv.-1.1.1_Baza-de-date-15082019.pdf.
- Mititelu, D., Barabaş, N. & Ştefan, N. (1987). Contribuţii la corologia unor plante rare în Moldova şi Muntenia. *Analele Şti. Univ. "Al. I. Cuza" Iaşi, secţ. II, a. Biol.*, 33, 20-24.
- Monah, F. (2001). *Flora şi vegetaţia cormofitelor din lunca Siretului*. Piatra Neamţ: Edit. Constantin Matasă.
- Oltean, M., Negrean, G., Popescu, A., Roman, N., Dihoru, G., Sanda, V. & Mihăilescu, S. (1994). Lista Roşie a plantelor superioare din România. *Inst. de biologie, studii, sinteze, documentaţii de ecologie, Bucureşti*, 1, 1-52.
- Oprea, A. (2005). *Lista critică a plantelor vasculare din România*. Iaşi: Edit. Univ. "Al. I. Cuza".
- Podda, L., Fraga i Arguimbau, P., Mascia, F., Mayoral García-Berlanga, O. & Bacchetta, G. (2011). Comparison of the invasive alien flora in continental islands: Sardinia (Italy) and Balearic Islands (Spain). *Rendiconti Lincei*, 22(1), 31-45.
- Pyšek, P., Lambdon, P.W., Arianoutsou, M., Kühn, I., Pino, J. & Winter, M. (2009). Alien vascular plants of Europe. In *Handbook of alien species in Europe* (pp. 43-61). Dordrecht: Springer.
- Pyšek, P., Richardson, D.M., Rejmánek, M., Webster, G.L., Williamson, M. & Kirschner, J. (2004). Alien plants in checklists and floras: towards better communication between taxonomists and ecologists. *Taxon*, 53(1), 131-143.
- Răduţoiu, D. & Stan, I. (2013). Preliminary Data on Alien Flora from Oltenia–Romania. *Acta Horti Botanici Bucurestiensis*, 40(1), 33-42.
- Richardson, D.M., Pyšek, P., Rejmánek, M., Barbour, M.G., Panetta, F.D. & West, C.J. (2000). Naturalization and invasion of alien plants: concepts and definitions. *Diversity and distributions*, 6(2), 93-107.

- Sămărghițan, M., & Oroian, S. (2012). Invasive Plants in the Flora of Mureș County. *Journal of Plant Development*, 19, 131-140.
- Sârbu, I., Ștefan, N. & Oprea, A. (2013). *Plante Vasculare din România. Determinator ilustrat de teren*. București: Edit. Victor B Victor.
- Schoenenberger, N., Röthlisberger, J. & Carraro, G. (2014). La flora esotica del Cantone Ticino (Svizzera). *Bollettino della Società ticinese di scienze naturali*, 102, 13-30.
- Sîrbu, C. & Oprea, A. (2011). *Plante adventive în flora României*. Iași: Edit. Ion Ionescu de la Brad.
- Sîrbu, C. (2006). Floristic and chorological contributions from Moldavia and Muntenia (Romania). *Analele Ști. Univ. "Al. I. Cuza" Iași, s. II, a. Biol. veget.*, 52, 92-98.
- Stoiu, V. (coord). (1980). *Brăila: monografie*. București: Edit. Sport-Turism.
- Strategia de dezvoltare durabilă a județului Brăila 2014-2020 <https://cjbraila.ro/dm/portal.nsf/AllByUNID/Strategia-de-dezvoltare-durabila-a-judetului-Braila-20142020-0000801E?OpenDocument>.
- The European Parliament and the Council of the European Union (2014). Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species. Official Journal of the European Union, L 317/35, 4 November 2014.
- The European Commission (2019). Commission Implementing Regulation (EU) 2019/1262 of 25 July 2019 amending Implementing Regulation (EU) 2016/1141 to update the list of invasive alien species of Union concern. Official Journal of the European Union, L 199/1, 25 July 2019.
- Urziceanu, M., Camen-Comănescu, P., Nagodă, E., Raicu, M., Sîrbu, I.M. & Anastasiu, P. (2020). Updated list of non-native ornamental plants in Romania. *Contribuții Botanice*, 55, 59-82.
- WCVP (2022). World Checklist of Vascular Plants, version 2.0. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet; <http://wcvp.science.kew.org/> Retrieved 16 March 2022.
- Wu, T., Li, J., Dai, J. & Wang, R. (2008). Floristic analysis and distribution pattern of alien plants in Shandong Province, eastern China. *Frontiers of Forestry in China*, 3(2), 219-225.

Appendix 1 List of alien plants recorded in Brăila County

No.	Taxa	Family	Life span	Life form	Origin	Way of introduction	Residence time	Invasivity	Relative abundance
1.	<i>Abutilon theophrasti</i> Medik.	Malvaceae	Annual	T	As	a	cry	i	S
2.	<i>Acer negundo</i> L.	Sapindaceae	Perennial	PhM	AmN	d	neo	i	C
3.	<i>Ailanthus altissima</i> (Mill.) Swingle	Simaroubaceae	Perennial	PhM	As E	d	neo	i	C
4.	<i>Alcea rosea</i> L.	Malvaceae	Perennial	H	As	d	neo	c	R
5.	<i>Amaranthus albus</i> L.	Amaranthaceae	Annual	T	AmN&C	a	neo	i	R
6.	<i>Amaranthus caudatus</i> L.	Amaranthaceae	Annual	T	AmS	d	neo	n	R
7.	<i>Amaranthus crispus</i> (Lesp. & Thévenau) A.Braun ex J.M.Coult. & S.Watson	Amaranthaceae	Annual	T	AmS (Argentina)	a	neo	i	R
8.	<i>Amaranthus cruentus</i> L.	Amaranthaceae	Annual	T	Am Trop	d	neo	n	R
9.	<i>Amaranthus deflexus</i> L.	Amaranthaceae	Annual	T	AmS	a	neo	i	R
10.	<i>Amaranthus hybridus</i> L. s.l.	Amaranthaceae	Annual	T	AmN	a	neo	i	R
11.	<i>Amaranthus retroflexus</i> L.	Amaranthaceae	Annual	T	AmN	a	neo	i	C
12.	<i>Ambrosia artemisiifolia</i> L.	Asteraceae	Annual	T	AmN	a	neo	i	C
13.	<i>Amorpha fruticosa</i> L.	Fabaceae	Perennial	PhN	AmN	d	neo	i	C
14.	<i>Armoracia rusticana</i> G.Gaertn., B.Mey. & Scherb.	Brassicaceae	Perennial	H	Eu SE, As W	d	cry	n	S
15.	<i>Artemisia annua</i> L.	Asteraceae	Annual	T	AsC&SW	a	neo	i	C
16.	<i>Azolla filiculoides</i> Lam.	Salvinaceae	Annual	HH	AmN	a	neo	i	L
17.	<i>Bassia scoparia</i> (L.) A.J.Scott	Amaranthaceae	Annual	T	AsTemp	d	neo	i	C
18.	<i>Bassia sieversiana</i> (Pall.) W.A.Weber	Amaranthaceae	Annual	T	As	a	neo	n	R
19.	<i>Bidens frondosa</i> L.	Asteraceae	Annual	T	AmN	a	neo	i	R
20.	<i>Calendula officinalis</i> L.	Asteraceae	Annual	T	Med	d	arh	c	R
21.	<i>Cannabis sativa</i> L.	Cannabaceae	Annual	T	AsSW	d	arh	n	C
22.	<i>Catalpa bignonioides</i> Walter	Bignoniaceae	Perennial	PhM	AmN	d	neo	n	R

No.	Taxa	Family	Life span	Life form	Origin	Way of introduction	Residence time	Invasivity	Relative abundance
23.	<i>Celtis occidentalis</i> L.	Cannabaceae	Perennial	PhM	AmN	d	neo	c	R
24.	<i>Cercis siliquastrum</i> L.	Fabaceae	Perennial	PhM	Med	d	neo	c	R
25.	<i>Cirullus lanatus</i> (Thunb.) Matsum. & Nakai	Cucurbitaceae	Annual	T	AfrSW	d	neo	c	R
26.	<i>Commelina communis</i> L.	Commelinaceae	Perennial	H	As	d	neo	n	R
27.	<i>Coreopsis tinctoria</i> Nutt.	Asteraceae	Annual	T	AmN	d	neo	c	R
28.	<i>Cucurbita pepo</i> L.	Cucurbitaceae	Annual	T	AmC	d	neo	c	R
29.	<i>Cuscuta campestris</i> Yunck.	Convolvulaceae	Annual	T	AmN	a	neo	i	C
30.	<i>Cyclachaena xanthifolia</i> (Nutt.) Fresen.	Asteraceae	Annual	T	AmN	a	neo	i	C
31.	<i>Datura stramonium</i> L.	Solanaceae	Annual	T	AmN	d	neo	i	C
32.	<i>Datura wrightii</i> Regel	Solanaceae	Annual	T	AmN	d	neo	c	S
33.	<i>Dysphania ambrosioides</i> (L.) Mosyakini & Clements	Amaranthaceae	Annual	T	AmTrop	d	neo	n	R
34.	<i>Dysphania botrys</i> (L.) Mosyakini & Clements	Amaranthaceae	Annual	T	Eu S, AsW	a	neo	c	R
35.	<i>Eclipta prostrata</i> (L.) L.	Asteraceae	Annual	T	AmTrop	a	neo	i	L
36.	<i>Elaeagnus angustifolia</i> L.	Elaeagnaceae	Perennial	PhN	AsTemp	d	neo	i	C
37.	<i>Erigeron annuus</i> (L.) Desf	Asteraceae	Annual	T	AmN	a	neo	i	R
38.	<i>Erigeron canadensis</i> L.	Asteraceae	Annual	T	AmN	a	neo	i	C
39.	<i>Euphorbia maculata</i> L.	Euphorbiaceae	Annual	T	AmN	a	neo	i	S
40.	<i>Fallopia aubertii</i> (L. Henry) Holub	Polygonaceae	Perennial	PhLi	As	d	neo	c	R
41.	<i>Fraxinus pennsylvanica</i> Marshall	Oleaceae	Perennial	PhN	Am	d	neo	c	S
42.	<i>Gaillardia pulchella</i> Foug.	Asteraceae	Perennial	H	AmN	d	neo	c	R
43.	<i>Galinsoga quadriradiata</i> Ruiz & Pav.	Asteraceae	Annual	T	AmN	a	neo	i	R

No.	Taxa	Family	Life span	Life form	Origin	Way of introduction	Residence time	Invasivity	Relative abundance
44.	<i>Gleditsia triacanthos</i> L.	Fabaceae	Perennial	PhM	AmN-C&E	d	neo	n	C
45.	<i>Gliricidia lotooides</i> L.	Molluginaceae	Annual	T	Med	a	neo	c	R
46.	<i>Helianthus tuberosus</i> L.	Asteraceae	Perennial	H	AmN	d	neo	i	S
47.	<i>Hordeum marinum</i> Huds.	Poaceae	Annual	T	EuW&S	a	neo	n	L
48.	<i>Ipomoea purpurea</i> (L.) Roth.	Convolvulaceae	Annual	T	AmTrop	d	neo	c	S
49.	<i>Juglans regia</i> L.	Juglandaceae	Perennial	PhM	Med	d	arth	n	R
50.	<i>Koeleria paniculata</i> Laxm.	Sapindaceae	Perennial	PhM	AsE	d	neo	c	R
51.	<i>Lemna minuta</i> Kunth.	Araceae	Annual	HH	Am	a	neo	n	R
52.	<i>Lycium barbarum</i> L.	Solanaceae	Perennial	PhN	As (China)	d	neo	i	C
53.	<i>Matricaria discoidea</i> DC.	Asteraceae	Annual	T	AmN,As NE	a	neo	i	R
54.	<i>Medicago sativa</i> L.	Fabaceae	Perennial	H	AsC,W	d	arth	n	R
55.	<i>Morus alba</i> L.	Moraceae	Perennial	PhM	As (China)	d	neo	i	S
56.	<i>Morus nigra</i> L.	Moraceae	Perennial	PhM	AsC	d	neo	n	S
57.	<i>Nicotiana glauca</i> Link et Otto	Solanaceae	Annual	T	AmS	d	neo	c	R
58.	<i>Oenothera biennis</i> L.	Onagraceae	Biennial	Ht	AmN	d	neo	i	R
59.	<i>Oenothera glazioviana</i> Micheli	Onagraceae	Biennial	Ht	AmN	d	neo	i	R
60.	<i>Oxalis corniculata</i> L.	Oxalidaceae	Perennial	H	EuS	a	neo	i	R
61.	<i>Oxalis dillenii</i> Jacq	Oxalidaceae	Annual/Perennial	T-H	AmN-C&E	a	neo	i	R
62.	<i>Panicum capillare</i> L.	Poaceae	Annual	T	AmN	a	neo	i	R

No.	Taxa	Family	Life span	Life form	Origin	Way of introduction	Residence time	Invasivity	Relative abundance
63.	<i>Panicum dichotomiflorum</i> Michx.	Poaceae	Annual	T	AmN	a	neo	n	R
64.	<i>Parthenocissus inserta</i> (A. Kerner) Fritsch	Vitaceae	Perennial	PhLi	AmN	d	neo	i	C
65.	<i>Parthenocissus quinquefolia</i> (L.) Planch.	Vitaceae	Perennial	PhLi	AmN	d	neo	i	R
66.	<i>Paspalum distichum</i> L.	Poaceae	Perennial	H	Trop (Afr, Am)	a	neo	i	R
67.	<i>Petrosedum ochroleucum</i> (Chaix) Niederle (<i>Sedum ochroleucum</i> Chaix)	Crassulaceae	Perennial	Ch	Med	d	neo	c	R
68.	<i>Petunia integrifolia</i> (Hooker) Schinz & Thell.	Solanaceae	Annual	T	AmS	d	neo	c	R
69.	<i>Phytolacca americana</i> L.	Phytolaccaceae	Perennial	H	AmN	d	neo	i	R
70.	<i>Portulaca oleracea</i> L.	Portulacaceae	Annual	T	As	d	arh	n	C
71.	<i>Prunus cerasifera</i> Ehrh.	Rosaceae	Perennial	PhN	AsW, EuSE	d	arh	n	R
72.	<i>Reynoutria japonica</i> Houtt.	Polygonaceae	Perennial	G-H	As (Japon)	d	neo	i	R
73.	<i>Robinia pseudoacacia</i> L.	Fabaceae	Perennial	PhM	AmN-E&C	d	neo	i	C
74.	<i>Setaria faberi</i> R.A.W.Herm.	Poaceae	Annual	T	AsE	a	neo	c	R
75.	<i>Setaria verticilliformis</i> Dumort.	Poaceae	Annual	T	Med	a	neo	n	R
76.	<i>Solanum lycopersicum</i> L.	Solanaceae	Annual	T	AmS	d	neo	c	R
77.	<i>Solidago canadensis</i> L.	Asteraceae	Perennial	H	AmN	d	neo	i	R
78.	<i>Sorghum halepense</i> (L.) Pers.	Poaceae	Perennial	H	AfrN, As SW	a	neo	i	C
79.	<i>Symphytotrichum ciliatum</i> (Ledeb.) G.L.Nesom	Asteraceae	Annual	T	AmN	a	neo	i	R
80.	<i>Xanthium orientale</i> subsp. <i>italicum</i> (Moretti) Greuter	Asteraceae	Annual	T	Am	a	neo	i	C
81.	<i>Xanthium spinosum</i> L.	Asteraceae	Annual	T	AmS	a	neo	i	C