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New Records and Endemic Taxa Revealed in The Novel Checklist of Alexandria Flora: Implications for Conservation Prioritization

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LITTLE is still known about the composition and distribution of vegetation in the Mediterranean region, especially urban flora, and vegetation. Until recently, regional -scale ecological and evolutionary patterns of urban areas have tended to be ignored, as conservation efforts have been concerned mostly with species and their habitats. A combination of social, ecological experiences and direct field observations were carried out to record the plant taxa that are found in the urban areas of Alexandria city. The present study represents the first work to explore a recently neglected urban flora. In this study, we identified plant taxa and life forms from a typical natural site with different anthropogenic activities to assess the status of the vegetation type. 338 plant species (including the inferaspecific taxa) were recorded in the study area, most of them were therophytes (50%), and about 19 % are cultivated for ornamentals purposes or as crops. Only three endemic taxa were recorded in the studied urban habitat: *Anthemis microsperma* Boiss. & Kotschy, *Sonchus macrocarpus* Boulos & C. Jeffrey, *Thesium humile* var. *maritima* Simps. (N.D. Simpson) F.M. Saad, while 91 (26.9%) alien taxa were recorded, out of which six were invasive, and seven were recorded for the first time in the present study, three of them are considered new record species: *Nicotiana glutinosa* L., Sesuvium *portulacastrum* (L.) L. and *Commelina erecta* L.

Keywords: Alexandria, Alien species, Endemic species, Life-form, Urban flora.

Introduction

The Egyptian flora is well documented in many references such as Täckholm (1956, 1974), El-Hadidi & Fayed (1995) and Boulos (1999, 2000, 2002, 2005, 2009). It comprises 2145 species and 220 infra-specific taxa of native and naturalized vascular plants; in addition to 175 species and subspecies of mosses and 13 species of hepatics (El-Saadawi et al., 2003; El-Saadawi & Shabbara, 2007). In recent times, there is an upsurge of interest in urban flora conservation. In Egypt, the third most populous nation in Africa, a gross dearth of such conservation studies still abounds. At present, there is a lack of accurate database on the floristic diversity in urban areas. Thus, species being perceived as abundant might be getting closer to endangerment, while those previously perceived as being endangered might be extinct in the wild (Heneidy et al., 2021; 2022).

In terms of cultural background, Alexandria is regarded as one of Egypt's most multiethnic and culturally varied cities. This is frequently linked to the Mediterranean as well as the globalization, exposure, and integration that made Alexandria

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a reachable and livable city for people of many nations and ethnicities. The best quality of the urban environment in Alexandria was emphasized by creating gardens and public spaces for the community since the Ptolemaic era (300 BC) (Saad El-Din et al., 1993). Archeological sites and historical relic landscapes affect the distribution and diversity of plant species within these sites. The ecological conditions of archeological sites also permit the establishment of unique species, which excludes many species in those sites (Motti & Bonanomi, 2018; Heneidy et al., 2022).

Urban ecology has a strong history, the field has developed considerably, and the human settlements' flora has drawn a lot of interest (Sukopp, 2002). Due to the diversity of their habitats (Gilbert, 1989) and the invasion of alien species (Pysˇek, 1998), urban ecosystems have a remarkable abundance of species, which, in turn, emerged the field of urban habitat research. Meanwhile, studies on the factors contributing to urban biodiversity in certain cities are becoming more prevalent (Boone et al., 2010; Lowry et al., 2011; Wang et al., 2016). According to these studies, socioeconomic factors including affluence, property values, education, and active management practices influence plant diversity across various urban habitat types (Kinzig et al., 2005; Escobedo et al., 2006; Luck et al., 2009; Wang et al., 2016).

Since cities are points of immigration from which alien species can spread farther into the environment, understanding how alien species behave is essential (Sukopp & Werner, 1983; Pysˇek, 1998). Species with invasiveness potential tend to have more phenotypic plasticity and share characteristics that help in their successful establishment in new habitats. Some of these characteristics are support the ability of alien species to be more invasive (Heneidy et al., 2019). Plants with phenotypic plasticity are capable of adapting morphologically and/ or physiologically to changes in environmental conditions particularly temperature and light availability (Schlichting, 1986). Urban plant taxa can be divided into two main categories, "native" and "exotic," each has two subcategories, spontaneous or cultivated species (Zhu et al., 2019). While socioeconomic considerations are likely to have an impact on the variety of cultivated plants in a city, climate and soil conditions may limit the species that can be grown there (Hope et al., 2003). The majority of cultivated plant diversity is determined by human decisions, which in turn are influenced by socioeconomic indices, historical variables, and regional customs and preferences (Luck et al., 2009; Boone et al., 2010; Lowry et al., 2011; Wang et al., 2016, Heneidy et al., 2021). Cities typically support more species of vascular plants than rural areas of comparable size, and as a result, urbanization increases the variety of plant species (Wittig & Becker, 2010). Using the density of the local human population as an indicator, the number of species of vascular plants is significantly related to the degree of urbanization, (Brandes & Zacharias, 1990). But this growth is accompanied by homogeneity of the flora (McKinney, 2006).

According to CAPMAS (2023), Alexandria has the most important harbor in Egypt and it is the second largest urban governorate in the country with population more than five and half million (Alexandria's 2023 population is estimated at **5, 588, 477**). In Egypt and especially in Alexandria, human activities, change the landscape which becomes more ruderal and new types of artificial habitats have also been created. The main aim of the current study is to document and analyzes the floristic composition of Alexandria governorate (urban area), detect, and investigate diversity of the flora along Alexandria city, Egypt. It also aims to highlight the role of basic structure of urban area for preserving biological resources, collect all available published and unpublished survey data in the region to build a floristic list, produce of the most up-to-date and comprehensive floristic checklist, describe, and analyzes the floristic inventories to provide an overview of the plant composition of this important region with its potentiality of the biotic component of biological heterogeneity ecosystem.

Study area

The current study focus on Alexandria City, located to the west of Rosetta branch of the Nile River (Fig. 1). The largest city on the Mediterranean which is also known as the 'Bride of the Mediterranean', and the second largest city in Egypt. Alexandria governorate lies along the Mediterranean coast and stretches for about 70 km northwest of the Nile Delta. The governorate is bounded by the Mediterranean Sea in the north, El Behera governorate in the south and the east and Matrouh governorate in the west. The total area size of Alexandria governorate is almost

2818km^2. In ancient times during the Roman era, the city was a flourishing commercial center with a population of a few hundred thousand (Empereur, 1998; Yoyotte et al., 1998; Véron et al., 2006). Currently, the city is the main harbour in Egypt, and by holding near 37% of Egypt's industries (large oil refineries; chemical, cement, metal plants; textile mills; food processing operations) it is deemed as the second most important industrial centre in Egypt (UNDP, 2003). Throughout Alexandria, there is art that resembles some of the oldest architectural styles of the Hellenic city, and its ancient architects (Véron et al., 2006). However, Alexandria is also characterized by the presence of many historic buildings and monuments that can be dated back to 331 BC the time of the establishment of the city. The study area includes, also the archeological sites and historical relic landscapes affect the distribution and diversity of plant species within these sites.

The city has a population of more than five million (CAPMAS, 2023) and considered as the most popular summer resort for Egyptians. Alexandria governorates distinctly characterized by a unique variation geomorphology, topography, land cover and shoreline stability. The coastal plain is characterized by the existence of a lowland relic depression surrounded partly by high-elevated limestone ridges aligned parallel to the coastline (Mohamed, 2020).

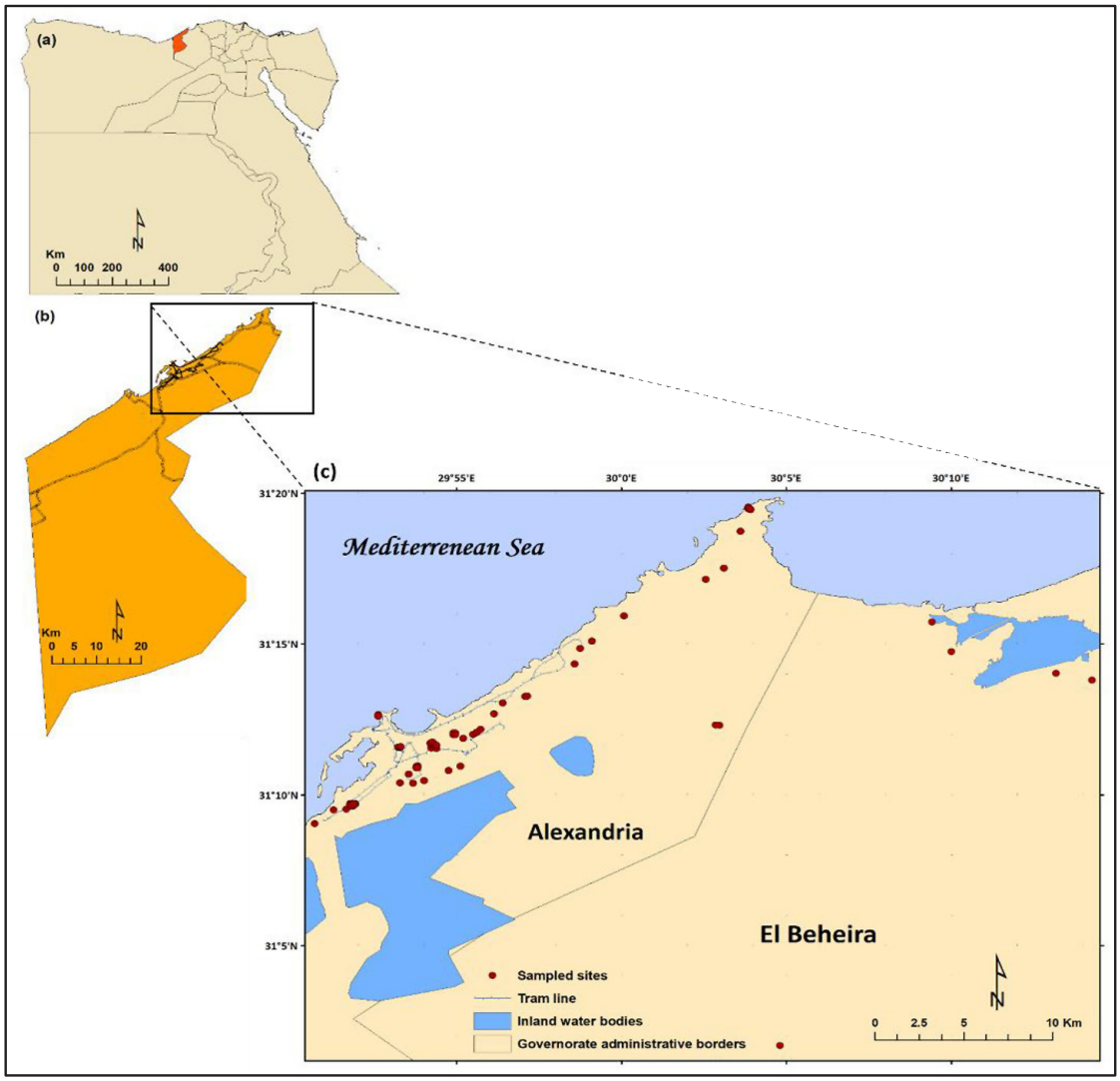

Fig. 1. Location of the study area (a) Egypt's administrative boundaries; (b) Alexandria Governorate; and (c) study area in Alexandria Governorate

Materials and Methods

Twenty field visits were conducted during spring 2020 -Autumn 2022 to many locations all over Alexandria City for collecting plant taxa as fresh materials. Available information and data were also collected: main habitats, coordinates, and threats for taxa were recorded during our visits. In each location, specimens of all taxa were collected, (include archeological sites representing different landscapes, where the heritage sites as a shelter for biodiversity is overlooked (Heneidy et al. 2022). Other notifications were taken into account, as possible, such as: status; life form; IUCN status; chorotype; local geographical distribution; habitat; synonymous. Other information from the available literature (papers, books, Theses, and scientific reports) was also taken into consideration. The checklist is arranged alphabetically, based on several literature and database reviews. These resources include previous floras and available literature: Täckholm & Täckholm (1941), Täckholm & Drar (1950), Zohary (1966, 1972), Täckholm (1974), Feinbrun-Dothan (1978, 1986), Boulos (1999, 2000, 2002, 2005 and 2009), El-Hadidi & Hosni (2000), Shaltout et al. (2010).

Identification of plant specimens was carried out depending on: Täckholm & Täckholm (1941), Täckholm & Drar (1950), Täckholm (1974), El-Hadidi & Hosni (2000) and Boulos (1999, 2000, 2002, 2005 and 2009). Ornamental taxa were identified according to R.H.S. (1992), and Heneidy (2010). The collected specimens were deposited and kept in the Herbarium of Alexandria University (ALEX), Faculty of Science, other specimens are processed to make herbarium specimens at the Herbarium of the Botanic Garden (BGH) (Heneidy et al., Collection), at Alexandria and Kafrelsheikh Universities' (KFSUH) Herbaria.

Life forms of the species were identified following the Raunkiaer scheme (Raunkiaer, 1937). The global geographical distribution of the recorded species was determined from Zohary (1966, 1972), Feinbrun-Dothan (1978,1986)); and the national geographical distribution was according to Täckholm (1974) and Boulos (1999-2005 & 2009). The plant species recorded in this study were checked with the IUCN list (2021) (International Union for Conservation of Nature and Natural Resources) to identify their threatened status on the global scale.

Results

The total number of recorded species (including the inferaspecific taxa) was 338 belonging to 227 genera and 65 families. About 49.4% of the recorded species (167 species) were perennials, while 50% (169 species) were therophytes and 2 species are biennials (0.6%). One hundred and twenty-five species (37%) were the natural (native) flora, while 122 species (36%) were recorded as weeds (all of them were native species) associated with them in the sampled stands and 91 species (26.9%) were assessed as alien ones (55 casual, 30 naturalized and 6 invasive species). These invasive species are: *Bassia indica* (Wight) A.J. Scott., *Ipomoea carnea* Jacq., *Acacia saligna* (Labill.) H.L.Wendl., *Dalbergia sissoo* Roxb. ex DC., ***Neltuma juliflora* (Sw.) Raf. (***_Prosopis juliflora_ (Sw.) DC.) and ***Pontederia crassipes* Mart.** (*Eichhornia crassipes* (Mart.) Solms). Seven species were recorded for the first time in Alexandia city: *Sesuvium portulacastrum* (L.) L., *Hydrocotyle umbellata* L., *Nicotiana glutinosa* L., *Salvinia auriculata* Aubl., *Samolus valerandi* L., *Cenchrus purpureus* (Schumach.) Morrone., and *Commelina erecta* L.. The first eight families contribute 50.9% (172 species) of the total number of species are in the following sequence: Asteraceae > Poaceae > Brassicaceae > Fabaceae = Chenopodiaceae > Solanaceae = Euphorbiaceae > Caryophyllaceae (Fig. 2).

The train railway habitat had the highest number of species (194 species = 57.7% of the total recorded species), followed by rocky ridge slope habitat in some of the archeological sites (172 species = 51.2%); tram ways (139 species= 41.4%) rocky ridge top habitat (127 species= 37.8%) and flat plains (84 species = 25.0%), while coastal dunes and water bodies swamps had the lowest number of species (20 species = 6.0% and 26 species = 7.7%) (Fig. 3).

Regarding the life form spectra of the recorded species, therophytes had the highest contribution (169 species = 50% of the total species), followed by phanerophytes (53 species = 15.7%), hemicryptophytes (44 species = 13.0% of the total species), chamaephytes (43 species = 12.7% each), and geophytes (19 species = 5.6%) (Fig. 4). According to the local geographical distribution suggested by Täckholm (1974), the distribution of recorded taxa in our study, indicates that 217 sp. = 64.2% of the recorded species

belong to Mediterranean coastal region, followed by Egyptian deserts (178 sp. =52.7%), Nile region (169 sp. = 50%), Sinai (148 sp. = 43.8%), and Oasis (125 sp.= 37%) (Fig. 5).

Chronological analysis of the floristic data revealed the predominance of mono-regional taxa (146 species = 43.2%) over the other phytogeographical elements followed by the bi-regionals (106 species = 31.4%), and the pluri-regional (83 species = 24.6%), of which 19 species = 5.6% are cosmopolitans (Fig. 6a). Only three endemic taxa were recorded in the studied urban habitats namely *Anthemis microsperma, Thesium humile* var. *maritima*, and *Sonchus macrocarpus*. On the other hand, 181 species belong to Mediterranean elements, of which 49 species are mono-regionals; 109 species were Irano-Turanian, of which only one species is mono-regional; 93 species are Saharo-Arabian, of which 22 species are mono-regionals and 54 species are European elements (Fig 6b).

The recorded species in Alexandria are listed alphabetically and written in the following order: **Species; Status; Life form; IUCN status; Chorotype; Local geographical distribution; Habitat; Synonymous.** Abbreviations of the life forms: PH: Phanerophytes, CH: Chamaephytes, GH: Geophytes–Helophytes, HC: Hemicryptophytes, PA: Parasites, TH: Therophytes. The IUCN status: CR: critical endangered, NT: near threatened, LC: least concern, DD: data deficit and NE: not evaluated. Abbreviations of the chorotypes: COSM: Cosmopolitan, Pluri: Pluri-regionals, SA: Saharo-Arabian, ME: Mediterranean, SU: Sudano-Zambezian, IT: Irano-Turanian, TR: Tropical, EU: Europian, PAN: Panotropic, PAL: Paleotropical. The local geographical regions: M: Mediterranean coast, N: Nile region, O: Oases, D: Desert, R: Red Sea coast, S: Sinai Peninsula and G: Gebel Elba. Abbreviations of the urban habitats in Alexandria: TN: train railways, TM: tram ways, RT: rocky ridge top, RS: rocky ridge slopes, GO: gorges, FP: flat plains, RP: rocky plateau, WB: water bodies and CD: coastal dunes.

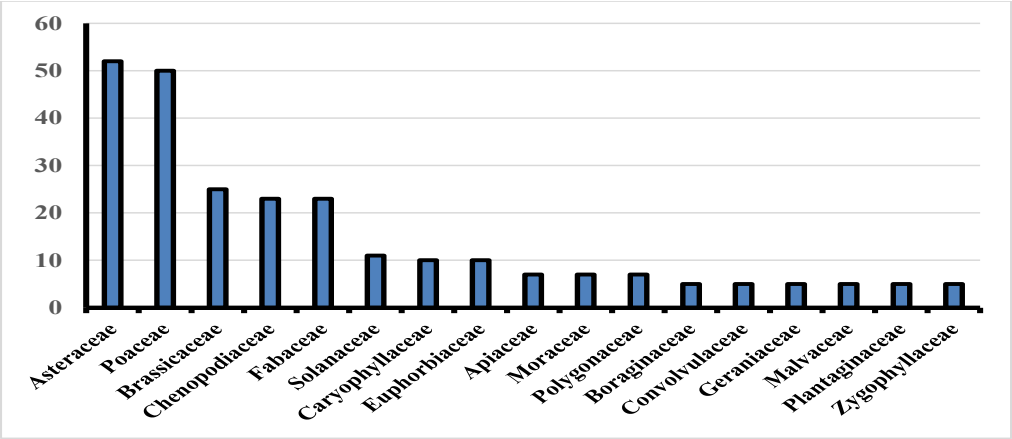

Fig. 2. The sequence of contributed families recorded in the study area

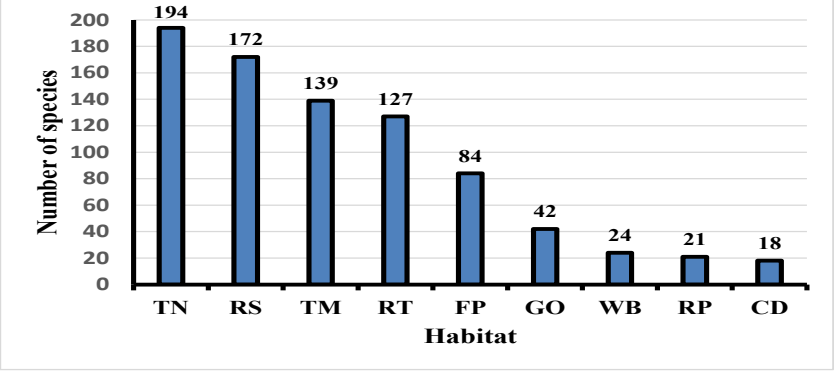

Fig. 3. Distribution of the recorded species in different habitats. The habitats: TN: train railways, TM: tram ways, RT: rocky ridge top, RS: rocky ridge slopes, GO: gorges, FP: flat plains, RP: rocky plateau, WB: water bodies and CD: coastal dunes

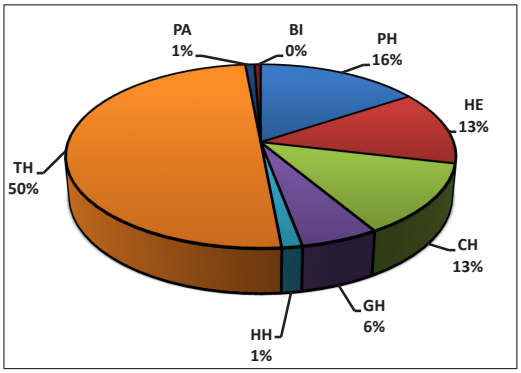

Fig. 4. Life form spectra of the recorded species. The life forms: PH: Phanerophytes, HE: Hemicryptophytes, CH: Chamaephytes, GH: Geophytes–Helophytes, HH: hydrophytes, PA: Parasites, TH: Therophytes, BI: Biennials

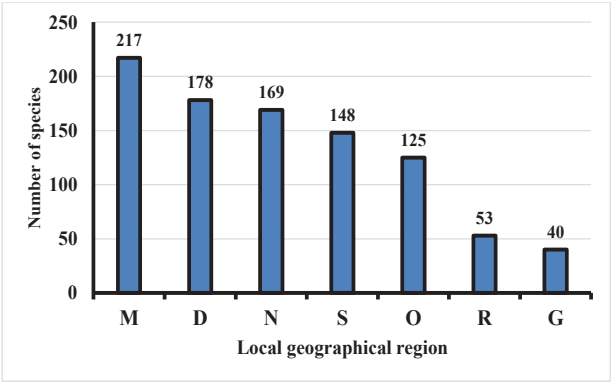

Fig. 5. Local geographical distribution of the recorded species. The local geographical regions are M: Mediterranean coast, N: Nile region, O: Oases, D: Desert, R: Red Sea coast, S: Sinai Peninsula and G: Gebel Elba

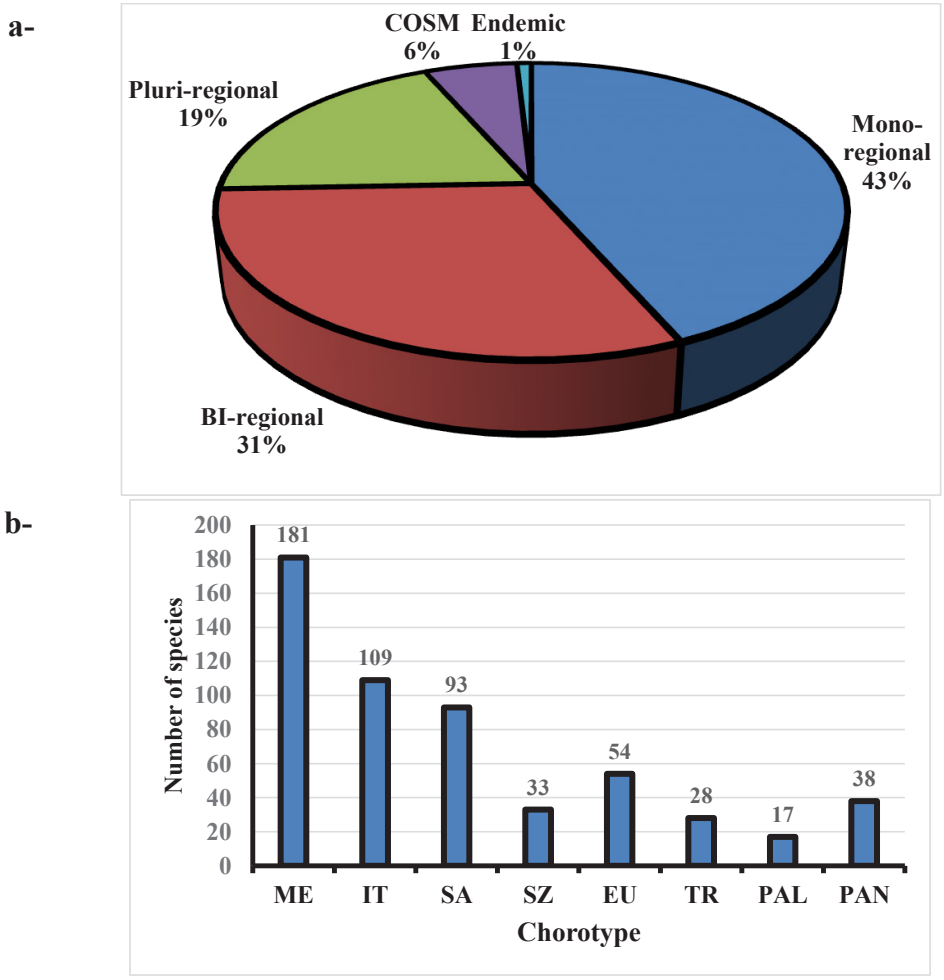

Fig. 6 a, b. The global phytogeographical distribution of the recorded species (a), chorotype spectrum of the recorded species in the study area (b). COSM: Cosmopolitan, Pluri: Pluri-regionals, SA: Saharo-Arabian, ME: Mediterranean, SZ: Sudano-Zambezian, IT: Irano-Turanian, TR: Tropical, EU: Europian, PAN: Panotropical, PAL: Paleotropical

Checklist of the vascular urban flora of the city area of Alexandria

Acanthaceae;
***Justicia adhatoda* L.**: Alien (Causal); PH; LC; PAL; RT.
Syn. *Justicia vasica* Nees
Aizoaceae;
***Mesembryanthemum crystallinum* L**.: Natural; TH; NE; ME+EU; M+N+D; TR+RT+RS+GO+RP+CD.
Syn. Cryophytum crystallinum (L.) N.E.Br.
***Mesembryanthemum nodiflorum* L**.: Natural; TH; NE; ME+EU+SA; M+N; TM+RT+RS+GO+FB+RP.
Syn. Cryophytum nodiflorum (L.) L. Bolus
***Opophytum forsskalii* (Hochst. ex Boiss.) N.E. Br.**: Natural; TH; NE; SZ; N, O, M, D; CD.
Syn. *Mesembryanthemum forsskalii* Hochst. ex Boiss.
***Sesuvium portulacastrum* (L.) L.:** Alien (Naturalized); CH; LC; SA+SZ+PAN; CD
Syn. *Trianthema portulacastrum* L
Alliaceae;
***Allium* erdelii Zucc.:** Natural; GH; NE; ME+IT; M+S; RS.
Syns. *Allium erdelii Zucc. var. roseum* Boiss
Allium erdelii var. *hirtellum* Oppenh.
Allium philistaeum Boiss.
Aloaceae;
***Aloe vera* (L.) Burm.f.:** Alien (Causal); H; NE; ME+SA; WB.
Syns. Aloe vera Mill.
Aloe barbadensis Mill.
Amaranthaceae;
***Amaranthus blitum* subsp. *oleraceus* (L.) Costea:** Alien (Naturalized); TH; NE; TR; N+M+S; TN+TM.
Syns. Amaranthus lividus L.
Amaranthus oleraceus L.
***Amaranthus hybridus* L.:** Alien (Naturalized); TH; NE; RT; N+O+M+S; TN+TM.
Syn. Amaranthus hybridus subsp. *hybridus* L.
***Amaranthus retroflexus* L.:** Alien (Naturalized); TH; NE; COSM; N+M+S; TN.
Syn. Amaranthus delilei Richt. & Loret
***Amaranthus viridis* L.:** Weed; TH; NE; COSM; N+O+M+D+S; TN+TM+RS.
Syns. Amaranthus gracilis (Desf.) Webb & Berthel.
Albersia caudata (Jacq.) Bioss.
Amaryllidaceae;
Nothoscordum gracile (Aiten) Stearn.: Alien; GH; NE; COSM;
Syns. Allium gracile Aiton
Maligia gracilis (Aiton) Raf.
***Pancratium maritimum* L.:** Natural; GH; LC; ME; M+S; RS. \
Syn. Hymenocallis maritima (L.) M.Roem.
Anacardiaceae;
***Schinus molle* L.:** Alien (Naturalized); PH; NE; PAN; TN+TM+RS.
***Schinus terebinthifolius* Raddi:** Natural; PH; NE; PAN; FB.
Apiaceae;
***Ammi majus* L.:** Weed; TH; LC; ME; N+O+M+S; TN.
Syn. Apium ammi Crantz
***Conium maculatum* L.:** Alien (Causal); CH; NE; ME.
Syns. Conium cicuta (Crantz) Neck.
Coriandrum maculatum (L.) Roth
***Coriandrum sativum* L.:** Alien (Causal); TH; NE; IT+ME; N+O+M; TV+TM.
Syn. Selinum coriandrum E.H.L.Krause
***Deverra tortuosa* (Desf.) DC.:** Natural; CH; NE; PAL+PAN; N+O+M+D+R+S; RT+RS.
Syns. Bubon tortuosum Desf.
Pituranthos tortuosus (Desf.) Benth. ex Asch. & Schweinf.

***Duacus syrticus* Murb.:** Natural; TH; NE; ME; M; TN+TM+RT+RS+GO+FB.
***Daucus pumilus* (L.) Hoffmanns. & Link:** Natural; TH; LC; ME+SA; N+M+D; RT+RS.
Syns.Pseudorlaya pumila (L.) Grande
Caucalis pumila L.
Caucalis maritima Gouan
Orlaya maritima (Gouan) Koch
Orlaya pumila (L.) Halácsy
***Visnaga daucoides* Gaertn.:** Weed; TH; LC; ME+IT; N+M; RP+SW.
Syns. Ammi visnaga (L.) Lam.
Daucus visnaga L.
Apocynaceae;
Nerium oleander* L.*: Alien (Causal); CH; LC; ME; TN; TM; RT; RS; FB.
Syns. Nerium carneum Dum.Cours.
Nerium flavescens Spin
Nerium floridum Salisb.
Nerium grandiflorum Desf.
Nerium indicum Mill.
***Plumeria rubra* L.:** Alien (Causal); PH; LC; PAN; RT.
Syns. Plumeria acuminata W.T. Aiton
Plumeria acutifolia Poir.
Plumeria acutifolia var. *gasparrinii* A. DC.
Plumeria angustifolia A. DC.
Plumeria arborea Noronha
Plumeria arborescens G. Don
Plumeria aurantia Bosse
***Vinca difformis* Pourr.:** Alien (Causal); CH; NE; ME; RS.
Syn. Vinca difformis subsp. *difformis*
Araliaceae;
Hydrocotyle umbellata L.: Alien (Causal); HH; LC; PAN.
Syns. Hydrocotyle caffra Meisn.
Hydrocotyle fluitans DC.
Arecaceae;
***Hyphaene thebaica* (L.) Mart.:** Natural; PH; LC; SU+SA; N+O+D+R+S; TM.
Syns. Corypha thebaica L.
Cucifera thebaica (L.) Delile
Hyphaene sinaitica Furtado
Phoenix dactylifera* L.*: Natural; PH; LC; SA; N+O+M+D+R+G+S; TN+TM+RT+RS+GO+FB+WB.
Syns. Palma dactylifera (L.) Mill.
Phoenix excelsior Cav.
***Washingtonia filifera* var. *robusta* (H.Wendl.) Parish:** Alien (Causal); PH; NE; ME+PAN; TN+TM+RT+RS+FB.
Syn. Washingtonia robusta H. Wendl.
Asclepiadaceae (Apocynaceae);
Cynanchum acutum* L.*: Weed; PH; LC; ME+IT; N+O+M; TN+TM+RS+GO+FB.
Syns. Solenostemma acutum (L.) Wehmer
Vincetoxicum acutum (L.) Kuntze
Asparagaceae;
***Agave americana subsp. americana*:** Alien (Causal); PH; LC; PAN; RT+RS+FB.
Syn. Agave americana L. *var. marginata* Trel.
***Yucca gigantea* Lem.:** Alien (Causal); PH; DD; PAN; RS.
Syn.Yucca elephantipes Regel ex Trel.
Asteraceae;
***Anacyclus alexandrinus* Willd.:** Natural; TH; NE; ME; M; RT+RS.
Syns. Anthemis arabica Viv.

Cyrtolepis alexandrina DC.
Hiorthia alexandrina Less.
Santolina terrestris Forssk.

***Anthemis melampodina* Delile:** Natural; TH; NE; SA; O+M+D+R+S; RT.
Syn. Anthemis melampodia Spreng.

Anthemis microsperma* Boiss &Kotschy*: Natural; TH; NE; Endemic; M+S; RT+RS+GO.

***Artemisia monosperma* Delile:** Natural; CH; NE; SA+ME; N+O+M+D+S; FB.
Syn. Oligosporus monospermus (Delile) Poljakov

Atractylis carduus* (Forssk.) C. Chr.*: Natural; CH; SA; M+D+G+S; TN.
Syn.Centaurea carduus Forssk.

***Bidens pilosa* L.;** Natural; TH; NE; PAN; N+M+D; RS.
Syns. Bidens sudanica Blume
Bidens pilosa var. *minor* (Blume) Sherff

***Calendula arvensis* L.:** Weed; TH; NE; ME+IT+SA; N+O+M+D+S; RS+GO.
Syns.Calendula aegyptiaca Pers.
Calendula bicolor Raf.
Calendula crista-galli Viv.
Calendula gracilis DC.
Calendula malacitana Boiss & Reut.
Calendula persica C.A. Mey.

***Carduus getulus* Pomel:** Natural; TH; NE; SA; N+M+D; RT+RS.

***Carthamus glaucus* M. Bieb.:** Natural; TH; NE; ME; M; RS.
Syns. Onobroma glaucum (M.Bieb.) Spreng.
Kentrophyllum glaucum (M.Bieb.) M.A.Maxim.

***Centaurea alexandrina* Delile:** Natural; TH; NE; ME+SA; M; RS+FB.
Syns. Calcitrapa alexandrina (Delile) Soják
Centaurea pallescens Bové ex DC.

***Centaurea ammocyanus* Boiss.:** Natural; TH; NE; ME+SA+IT+SU; D; TN.
Syn. Ammocyanus arabicus Dostál

Centaurea calcitrapa* L.*: Alien (Causal); TH; NE; SA; N+O+M; TN+TM+RT+RS+GO+FB.
Syns. Calcitrapa calcitrapa (L.) Hill
Calcitrapa vulgaris Bernh.
Rhaponticum calcitrapa (L.) Scop.

***Centaurea dimorpha* Viv.:** Natural; H; NE; ME; M; TN+RS.
Syn. Centaurea kralikii Boiss.

***Centaurea glomerata* Vahl.:** Natural; TH; NE; ME; M+O+D; TN+RT+RS+GO+FB+CD.
Syn. Centaurea acaulis Forssk.

***Centaurea solstitialis* L.:** Natural; TH; NE; IT+SA; M+S; TN+RT.
Syns. Calcitrapa solstitialis (L.) Lam.
Cyanus solstitialis (L.) J.Presl & C.Presl
Setachna solstitialis (L.) Dulac

***Cichorium pumilum* Jacq.:** Weed; TH; LC; ME+IT; N+O+M; TN+TM.
Syns. Cichorium ambiguum Schult.
Cichorium divaricatum Schousb.
Cichorium endivia L. subsp. *pumilum* (Jacq.) Cout.
Cichorium endivia subsp. *divaricatum* (Schoush.) P.D. Sell.
Cichorium intybus L. subsp. *divaricatum* (Schousb.) Bonnier & Layens
Cichorium intybus L. *subsp. pumilum* (Jacq.) Ball
Cichorium minimum Port.
Cichorium noeanum Boiss.

Cichorium polystachyum Pomel

***Crocodilium creticum* (Boiss. & Heldr.) N. Garcia & Susanna**: Natural; H; NE; ME; M; TN+RS.
Syns. Aegialophila cretica Boiss. & Heldr.
Centaurea aegialophila Wagenitz
Centaurea cretica (Boiss. & Heldr.) Nyman.

Echinops spinosissimus* Turra.*: Natural; H; NE; ME; M+D+R+S; TN+RT+RS.
Syn. Echinops viscosus DC.

Erigeron bonariensis* L.*: Alien (Naturalized); TH; NE; PAN; N+O+M+D+S; TN+TM+RS.
Syns. Conyza bonariensis (L.) Cronquist
Erigeron linifolius Willd.
Conyza linifolia (Willd.) Täckh.

***Ethulia conyzoides* L.f. subsp. *Conyzoides*:** Natural; TH; LC; SA+IT+SZ; N+M; TN.
Syns. Ethulia angustifolia Bojer ex DC.
Ethulia megapolitana Sch.Bip. ex de Vriese
Pirarda megacephala Kuntze

Filago desertorum* Pomel*: Natural; TH; NE; SA+IT; M+D+R+S; RT+RS.
Syns. Evax mauritanica Pomel var. *cyrenaica* Pamp.
Filago spathulata C. Presl forma *desertorum* (Pomel) Pamp.Atti

***Filago mareotica* Delile:** Natural; TH; NE; ME; M; RS.
Syn. Gifolaria mareotica (Delile) Chrtek & Holub

***Glebionis coronaria* (L.) Cass. ex Spach:** Natural; TH; NE; ME; N+M+S; TN+TM+RT; +RS+GO+FB+WB.
Syn. Chrysanthemum coronarium L.

***Hedypnois rhagadioloides* (L.) F.W.Schmidt:** Alien (Causal); TH; NE; ME+SA; WB.
Syns. Hedypnois cretica subsp. rhagadioloides (L.) Täckh. & Boulos
Leontodon rhagadioloides (L.) Enke & Zidorn

***Ifloga spicata* (Forssk.) Sch.Bip.:** Natural; TH; NE; SA+ME; N+M+D+R+G+S; RT+RS.
Syns. Chrysocoma spicata Forssk.
Trichogyne spicata (Forssk.) Sch.Bip.

Lactuca serriola* L.*: Weed; TH; LC; ME+IT+EU; N+O+S; TN+TM+RS+FB.
Syn. Lactuca scariola L.

Launaea capitata* (Spreng.) Dandy:* Natural; HE; NE; SA+SZ; N+O+M+D+R+G+S; RS.
Syns. Launaea glomerata (Cass.) Hook.f.
Lomatolepis glomerata Cass.
Microrhynchus glomeratus Jaub. & Spach
Sonchus capitatus Spreng.
Zollikoferia glomerata (Cass.) Boiss.

***Launaea fragilis* (Asso) Pau:** Natural; H; NE; ME+SA; N+M+D; TN.
Syn. Lactuca fragilis Asso

Launaea nudicaulis* (L.) Hook. f.*: Weed; H; NE; SA; N+O+M+D+R+G+S; TN+RT+RS.
Syns. Chondrilla nudicaulis L.
Lomatolepis nudicaulis (L.) Cass.
Microrhynchus nudicaulis (L.) Less.
Sonchus nudicaulis (L.) Sch.Bip.
Zollikoferia nudicaulis (L.) Boiss.

***Launaea fragilis* (Asso) Pau *subsp. fragilis*:** Natural; H; NE; ME; M; TN+RT+RS.
Syn. Launaea resedifolia (L.) Kuntze

***Limbarda crithmoides* (L.) Dumort:** Natural; CH; NE; ME; N+M+O; RT.
Syn. Inula crithmoides L.

***Nidorella aegyptiaca* (L.) J.C. Manning & Goldblatt:** Weed; TH; LC; SU; N+O+G; TN+TM+RT+RS+FB.
Syns. Conyza aegyptiaca (L.) Aiton
Conyza lineariloba DC.
Erigeron aegyptiacus L.
Erigeron serratus Forssk.

***Onopordum alexandrinum* Boiss.:** Natural; H; NE; ME; M+S; TN+RT+RS.
***Phagnalon rupestre* (L.) DC.:** Natural; CH; NE; ME+IT; RS.
Syn. Conyza rupestris L.
***Picris asplenioides* L.:** Weed; TH; NE; SA; N+M+D+S; TN+RS.
Syns. Crepis raicata Forssk.
Leontodon coronopifolim Desf.
Picris lyrata Delile
Picris pilosa Delile
Picris radiata (Forssk.) Less.
Picris coronopilifolia (Desf.) DC.
Pluchea dioscoridis* (L.) DC.*: Weed; PH; LC; SA+SU; N+O+M+D+S; TN+TM+RS+FB.
Syns. Baccharis aegyptiaca Forssk. Ex DC.
Baccharis dioscoridis L.
Conyza dioscoridis (L.) Desf.
Conyza odora Forssk.
***Pseudognaphalium luteoalbum* (L.) Hilliard & B.L. Burtt:** Weed; HE; LC; COSM; RS.
Syn. Gnaphalium luteo-album L.
Reichardia tingitana* (L.) Roth*; Weed; TH; NE; ME+IT; N+M+D+R+G+S; TN+TM+RT+RS+GO+FB+RP+CD.
Syns. Picridium tingitanum (L.) Desf.
Scorzonera tingitana L.
***Senecio aegyptius* L.:** Weed; TH; DD; ME+EU; N+O+D; TN+RT+RS+FB.
Syn. Senecio triflorus L.
***Senecio flavus* (Decne) Sch. Bip.:** Weed; TH; NE; ME+SA+SU; D+R+G+S; TM+RT+RS.
Syns. Crassocephalum flavum Decne.
Senecio decaisnei DC.
***Senecio glaucus* L.:** Weed; TH; NE; SA+IT; N+O+M+D+R+S; TN+TM+RS.
Syns. Senecio joppensis Dinsm.
Senecio vernalis Waldst. & Kit.
***Senecio glaucus* L. subsp. *coronopifolius* (Maire) C. Alexander:** Weed; TH; NE; SA+ME; N+O+M+D+R+S; TN+TM+RT+RS+GO+FB+RP+CD.
Syn. Senecio desfontainei Druce
***Senecio vulgaris* L.:** Weed; TH; NE; EU+IT+ME; N+O+M+D; TN+TM.
Syns. Jacobaea vulgaris (L.) Claus
Senecio vulgaris var. villosus Iverus
***Silybum marianum* (L.) Gaertn.:** Weed; H; LC; IT+EU+ME; N+O+M+D; TN+RS.
Syns. Carduus lactifolius Stokes
Carduus marianus L.
Carduus mariae Crantz
Sonchus asper* (L.) Hill.*: Weed; TH; NE; ME; N+O+M+S; TN+TM+RS+FB.
Syns. Sonchus oleraceus var. asper L.
Sonchus oleraceus subsp. asper (L.) Ehrh.
***Sonchus macrocarpus* Boulos & C. Jeffrey:** Weed; CH; DD; Endemic; N+M; TN+RT+RS+GO+FB.
Syn. Sonchus gigas Boulos
Sonchus oleraceus* L.*: Weed; TH; NE; ME+IT+EU; N+O+M+D+R+S; TN+TM+RT+RS+GO+FB.
Syns. Sonchus ciliatus Lam.
Sonchus glaber Gilib.
Sonchus lacerus Willd.
Symphyotrichum squamatum (*Spreng.) G.L. Nesom*: Alien (Naturalized); BI; NE; PAN; N+O+M+D+S; TN+TM.
Syns. Aster squamatus (Spreng.) Hieron.
Aster subulatus var. sandwicensis (A. Gray ex H. Mann) A.G. Jones
Conyza squamata Spreng.
Conyzanthus squamatus (Spreng.) Tamamsch.

***Urospermum picroides* (L.) Scop. ex F.W. Schmidt:** Weed; TH; NE; ME+IT; N+O+M+D+G+S; TN+TM+RT+RS+GO+FB+CD.
Syn. Tragopogon picroides L.
Verbesina encelioides (Cav.) Benth. & Hook.f. ex A.Gray: Alien (Naturalized); TH; NE; PAN**.**
Syns. Ximenesia encelioides Cav.
Encelia albescens A.Gray
Verbesina australis Baker
***Xanthium spinosum* L.;** Natural; TH; NE; TR; N+M; WB.
Syn. Xanthium spinosum f. *typicum* Widder
Bignoniaceae;
***Tecoma stans* (L.) Juss. ex Kunth var *stans*;** Alien (Causal); PH; NE; PAN; TN.
Syns. Bignonia frutescens Mill.
Bignonia incisa DC.
Bignonia sorbifolia Salisb.
Bignonia stans L.
Bignonia tecoma Wehmer
Bignonia tecomoides DC.
Tecoma tronadora (Loes.) I.M. Johnst.
Tecoma velutina Lindl.
Bombacaceae;
***Bombax ceiba* L.;** Alien (Causal); PH; LC; TR; TM.
Syns. Bombax aculeatum L.
Bombax ceiba Burm.f.
Bombax ceiba var. *leiocarpum* A.Robyns
Bombax heptaphyllum Cav.
Bombax malabaricum DC.
Bombax thorelii Gagnep.
Gossampinus malabarica Merr.
Gossampinus rubra Buch.Ham.
Gossampinus thorelii (Gagnep.) Bakh.
Melaleuca grandiflora Blanco
Salmalia malabarica (DC.) Schott & Endl
Boraginaceae;
***Anchusa milleri* Willd**.; Natural; TH; NE; SA+IT; M+D+S; TN+RT+RS.
Syn. Buglossum milleri Taush
***Echium angustifolium* Mill. subsp. *sericeum* (Vahl) Klotz;** Natural; CH; NE; ME; M+D+S; TN+TM+RT+RS.
Syns. Echium distachum Viv.
Echium sericeum Vahl
***Gastrocotyle hispida* (Forssk.) Bunge;** Natural; TH; NE; IT+SA; N+M+D+S; RT+RS.
Syn. Anchusa hispida Forssk.
***Trichodesma africanum* (L.) R. Br.;** Natural; TH; NE; SA; N+O+M+D+R+G+S; TN.
Syns. Borago Africana L.
Borago verrcosa Forssk.
Boraginella Africana (L.) Kuntze
Wigandia urens (Ruiz & Pav.) Kunth; Alien (Causal); PH; LC; PAL; WB.
Syn. Wigandia caracasana Kunth.
Brassicaceae;
***Anastatica hierochuntica* L.;** Natural; TH; NE; SA; O, D, R, S; TN.
Syns. Anastatica littoralis Salisb.
Myagrum hierochunticum (L.) Crantz
***Brassica rapa* L.;** Weed; TH; DD; EU+ME; N, O, M; RS.
Syn. Brassica campestris L.
***Cakile maritima* Scop.;** Natural; TH; NE; ME+EU; N, M, D; RS; RP; CD.
Syns. Rapistrum cakile (L.) Crantz

Rapistrum maritimum (Scop.) Bergeret
Cakile cakile (L.) H.Karst.

***Carrichtera annua* (L.) DC.;** Natural; TH; NE; ME; N, M, D, S; TM; RT; RS; GO.
Syn. Vella annua L.

***Coincya tournefortii* (Gouan) Alcaraz, T.E.Díaz, Rivas Mart. & Sánchez-Gómez;** Weed; TH; LC; ME+SA; N, O, M, D, S; RT; RS; FB.
Syn. Brassica tournefortii Gouna

***Descurainia sophia* (L.) Webb ex Prantl;** Natural; TH; NE; IT + SA; M; TN.
Syns. Sisymbrium sophia L.

***Diplotaxis harra* (Forssk.) Boiss.;** Weed; CH; LC; SA; O, D, S; TN; TM.
Syn. Sinapis harra Forssk.

***Enarthrocarpus strangulatus* Boiss.;** Natural; TH; NE; SA; M, D, S; TN; TM; RT; RS.
Syns. Enarthrocarpus anceps Godr.
Enarthrocarpus strangulatus var. *anceps* (Godr.) Thell.

***Eruca sativa* Mill.;** Alien; Naturalized; TH; LC; ME+IT; N, O, M, D, S; TN; TM; RT; RS.
Syn. Eruca lativalvis Boiss.

***Erucaria crassifolia* (Forssk.) Delile;** Natural; TH; NE; SA; TM; RT; RS; GO.
Syn. Brassica crassifolia Forssk.

***Erucaria pinnata* (Viv.) Täckh. & Boulos;** Weed; TH; NE; SA+ME; O, M, D; WB.
Syns. Erucaria aegiceras Coss.
Erucaria pinnata var. *major* (Post) Täckh. & Boulos
Erucaria uncata (Boiss.) Asch &Schweinf.
Hussonia pinnata (Viv.) Jafri
Hussonia uncata Boiss.
Raphanus pinnatus Viv.

***Lepidium coronopus* (L.) Al-Shehbaz;** Weed; TH; LC; ME+EU+IT; N, O, M; TN; TM.
Syns. Coronopus squamatus (Forssk.) Asch.
Lepidium squamatum Forssk.

***Lepidium didymum* L.;** Alien; Naturalized; TH; NE; PAN; Nd; TN; TM; RS.
Syns. Coronopus didymus (L.) Sm
Senebiera didyma (L.) Pers.

***Lobularia arabica* (Boiss.) Muschl.;** Weed; TH; NE; SA; M, D; TN.
Syn. Koniga arabica Boiss.

***Lobularia libyca* (Viv.) Meisn.;** Weed; TH; NE; ME; M, D; TN.
Syns. Koniga libyca (Viv.) R. Br. In Denham et al.
Lunaria libyca Viv.

***Matthiola incana* (L.) W.T. Aiton;** Alien (Causal); CH; NE; ME; RS.
Syns. Cheiranthus incanus L.
Hesperis incana (L.) Kuntze
Matthiolaria incana (L.) Chevall.

***Matthiola longipetala* (Vent.) DC.;** Natural; TH; NE; ME+IT; N, M, D; RT; RS.
Syn. Cheiranthus longipetalus Vent.

***Raphanus raphanistrum* L.;** Weed; TH; LC; ME+EU; N, M; TM; RS.
Syns. Raphanistrum raphanistrum (L.) H.Karst.
Raphanistrum vulgare Gray

***Rhamphospermum nigrum* (L.) Al-Shehbaz;** Weed; TH; NE; EU+ME; N, O, D; TN; TM.
Syns. Brassica nigra (L.) W.D.J. Koch
Sinapis Nigra L.
Brassica bracteolata Fisch. & C. A. Mey

***Rorippa palustris* (L.) Besser;** Natural; TH; LC; COSM; N, M; WB.
Syns. Cardamine palustris subvar. erecta Kuntze
Brachiolobos palustris (L.) Clairv.
Cardamine palustris (L.) Kuntze
Myagrum palustre (L.) Lam.

***Sinapis alba* L.;** Weed; TH; LC; ME+IT+ EU; Nd, M; TN; RT.
Syns. Brassica alba (L.) Rabenh.
Eruca alba (L.) Noulet
Leucosinapis alba (L.) Spach
Raphanus albus (L.) Crantz
***Sinapis allionii* Jacq.;** Weed; TH; NE; ME+ES; N, M; TN; RS.
Syns. Sinapis arvensis subsp. *allionii* (Jacq.) Baillarg.
Sinapis turgida (Pers.) Delile
Rhamphospermum arvense (L.) Andrz. ex Besser
Sinapis arvensis* L. var. *orientalis; Weed; TH; LC; ME; N, O, M, D, S; TN; TM.
Syns. Brassica sinapistrum Boiss.
Sinapis orientalis L.
***Sisymbrium erysimoides* Desf.;** Weed; TH; NE; SA+ME+TR; D, R, GE, S; TN; TM.
Syns. Hesperis erysimodes (Desf.) Kuntze
Velarum erysimoides (Desf.) V.I.Dorof.
***Sisymbrium irio* L.;** Weed; TH; NE; ME+IT; N, M, De, GE, S; TN; TM; RT; RS; FB; RP.
Syns. Crucifera irio (L.) E.H.L.Krause
Hesperis iriodes Kuntze
Sisymbrium irioides Boiss.
Cactaceae;
***Opuntia ficus-indica* (L.) Mill.;** Alien; Naturalized; PH; DD; PAN; RT; RS; FB.
Syns. Cactus ficus-indica L.
Cactus opuntia L.
Opuntia arcei Cárdenas
Opuntia castillae Griffiths
Opuntia chinensis (Roxb.) K. Koch
Opuntia cordobensis Speg.
Caprifoliaceae:
***Scabiosa columbaria* L.;** Alien; CH; NE; ES+IT; FP; CD.
Syn. Asterocephalus columbaria (L.) Wallr.
Caryophyllaceae;
***Herniaria hemistemon* J. Gay;** Natural; H; NE; ME + SA; M, Di, S; TM; RT; RS.
Syns. Herniaria fruticosa var. hemistemon (J.Gay)
Herniaria fruticosa Delile
Heterochiton hemistemon Graebn. & Mattf.
***Sabulina mediterranea* (Ledeb. ex Link) Rchb;** Natural; TH; NE; ME; RT; RS; RP; WB.
Syns. Alsine mediterranea (Ledeb. ex Link) Gren.
Arinaria mediterranea Ledeb.
Minuartia mediterranea (Ledeb. ex Link) K. Malý
***Paronychia arabica* (L.) DC.;** Natural; TH; NE; SA+ ME+SU; O, M; TN; RS; FB.
Syn. Illecebrum arabicum L.
***Polycarpaea repens* (Forssk.) Asch. & Schweinf.;** Natural; HE; NE; SZ; RT; RS; FB; RP; WB.
Syns. Corrigiola repens Forssk.
Polycarpaea fragilis Delile
***Polycarpon tetraphyllum* (L.) L.;** Natural; TH; NE; ME+EU; RT; RS; RP.
Syns. Holosteum tetraphyllum (L.) Thunb.
Polycarpaea tetraphylla (L.) E.H.L.Krause
***Silene villosa* var. *villosa* Forssk.;** Weed; TH; NE; SA+IT; N, M, S; TN; RS.
***Spergula fallax* (Lowe) E. H. L. Krause;** Natural; TH; NE; SA+SZ+ME; RS; FB; RP.
Syns. Spergularia fallax Lowe
Spergularia flaccida Asch.
***Spergularia diandra* (Guss.) Heldr.;** Weed; TH; NE; ME+SA+IT; N, O, M, D, R, GE, S; TN; TM; RS.
Syns. Arenaria diandra Guss.
Spergula diandra (Guss.) Murb.

***Spergularia marina* (L.) Besser;** Weed; H; LC; EU+ME+IT; N, M; TN; TM; RT; RS; FB; WB.
Syns. Arenaria marina (L.) Roth.
Arenaria rubra var. *marina* L.
Spergula salina J. &C. Presl
***Spergularia media* (L.) C. Presl.;** Natural; HE; LC; EU+ME+IT; N, O, M, S; RS.
Syns. Arenaria maritima All.
Arenaria media L.
Spergularia marginata (DC.) Kittel
Spergularia maritima (All.) Chiov
Casuarinaceae;
***Casuarina equisetifolia* L.;** Alien; Causal; PH; LC; PAL; TM; RT; RS; FB.
Syns. Casuarina equisetifolia var. *typica* Domin.
Ceratophyllaceae;
***Ceratophyllum demersum* L.;** Natural; HH; LC; COSM; N; WB.
Syns. Ceratophyllum demersum var. commune A.Gray
Dichotophyllum demersum (L.) Moench
Chenopodiaceae (Amaranthaceae);
***Anabasis articulata* (Forssk.) Moq.;** Natural; CH; NE; SA; O, M, D, S; RT.
Syn. Salsola articulata Frossk.
***Arthrocnemum macrostachyum* (Moric.) Piirainen & G. Kadereit;** Natural; CH; NE; ME + SA; N, O, M, D, R, S; TN.
Syns. Arthrocnemum glaucum (Delile) Ung.-Sternb.
Arthrocnemum macrostachyum (Moric.) Moris
Salicornia glauca Delile
Salicornia macrostachya Moric.
***Atriplex canescens* (Pursh) Nutt.;** Alien; Naturalized; CH; NE; PAN; M, D; TN.
Syn. Calligonum canescens Pursh
***Atriplex coriacea* Forssk.;** Natural; CH; NE; SA+ME+SU; M, D; TN.
Syns. Atriplex ocymifolium Viv.
Obione coriacea (Forssk.) Moq.
***Atriplex halimus* L.;** Natural; CH; LC; SA+IT; M, D, S; TN; RT; RS.
Syns. Chenopodium halimus (L.) Thunb.
Atriplex halimoides Tineo
***Atriplex leucoclada* var. *inamoena* (Allen) Zohary;** Weed; CH; NE; SA+IT; O, M, D, S; TN; RT; RS.
Syn. Atriplex inamoena Aellen
***Atriplex lindleyi* Moq. Subsp. *inflata* (F. Muell.) P.G. Wilson;** Alien; Naturalized; CH; NE; PAN; N, M, D, S; TN.
Syns. Atriplex Inflata F. Muell.
Blackiella Inflata (F. Muell.) Aellen
***Atriplex suberecta* I.Verd.;** Alien; Naturalized; TH; NE; PAN; N, M, D; TN.
Syn. Obione suberecta (I.Verd.) G.L.Chu
***Bassia eriophora* (Schrad.) Asch.;** Natural; TH; NE; SA+ IT; D, S; TN; TM; RP.
Syns. Bassia latifolia (Fresen.) Asch.
Kochia eriophora Schrad., Neues.
Kochia latifolia Fresen., Mus.
***Bassia indica* (Wight) A.J.Scott.;** Alien; Invasive; TH; NE; SU+ IT; N, O, M, D; TN; TM; RT; RS; GO; FB; RP.
Syns. Bassia joppensis Bornm. & Dinsm.
Kochia indica Wight
Kochia scoparia (L.) Schrad. subsp. *indica* (Wight) Aellen
***Bassia muricata* (L.) Asch.;** Weed; TH; NE; SA+IT; O, M, D, S; TN; TM.
Syns. Bassia aegyptiaca Turki, El Shayeb & Shehata
Kochia muricata (L.) Schrad.
Salsola muricata L.

***Beta vulgaris* L.;** Weed; TH; LC; ME+IT+EU; N, O, M, D, S; TN; RS; GO.
Syns. Beta maritima L.
Beta perennis, (L.) Halácsy
***Chenopodium album* L.;** Weed; TH; NE; COSM; N, O, M, D, S; TN; TM; RT; RS; FB.
Syns. Atriplex alba (L.) Crantz
Chenopodium viride var. album (L.) Hartm.
***Chenopodium ficifolium* Sm.;** Weed; TH; NE; ME+ EU+ IT+PAL; N; TN.
Syns. Chenopodium album var. ficifolium (Sm.) Fiori
Chenopodium album subsp. ficifolium (Sm.) Hook.f.
Chenopodium filifolium Krock.
***Chenopodiastrum murale* (L.) S. Fuentes, Uotila & Borsch;** Weed; TH; NE; COSM; N, O, M, D, R, GE, S; TN; TM; RT; RS; GO; FB; RP; WB.
Syn. Chenopodium murale L.
***Chenopodium opulifolium* Schrad. Ex Koch & Ziz.;** Weed; TH; NE; ME+IT+EU+PAL; N; TN; TM; RT; RS; GO.
Syns. Chenopodium opulifolium subsp. orientale Murr
Chenopodium erosum Bastard
***Dysphania ambrosioides* (L.) Mosyakin & Clemants;** Alien; Naturalized; TH; NE; COSM; N, O, M, S; TN; TM; RS.
Syn. Chenopodium ambrosioides L.
***Haloxylon scoparium* Pomel;** Natural; CH; NE; IT+SA; RT; RS.
Syn. Hammada scoparia (Pomel) Iljin
***Salicornia fruticosa* (L.) L.;** Natural; CH; NE; ME + EU; N, O, M, D; TN.
Syns. Salicornia europaea L. var. *fruticosa* L.
Arthrocnemum fruticosum (L.) Moq.
***Suaeda fruticosa* Forssk. ex J.F. Gmel.;** Natural; CH; NE; SZ; RT; RS; GO.
Syns. Dondia fruticosa (Forssk. ex J.F.Gmel.) Druce
Salsola frutescens Forsyth f.
Schoberia fruticosa (Forssk. ex J.F.Gmel.) C.A.Mey.
***Suaeda pruinosa* Lange;** Natural; CH; NE; ME; M, Di; TM; RT; RS; GO.
Syns. Suaeda pruinosa var. solmsiana Maire & Weiller
Suaeda vera subsp. pruinosa (Lange) O.Bolòs & Vigo
***Suaeda vera* Forssk. ex J.F. Gmel.;** Natural; CH; NE; SA+ME; N, M, D, R, GE, S; RT; RS.
Syns. Chenopodium fruticosum L.
Salsola fruticosa (L.) L.
Suaeda fruticosa (L.) Delile
Suaeda fruticosa subsp. *vera* (Forssk. ex J.F.Gmel.) Maire & Weiller
***Suaeda vermiculata* Forssk. ex J.F. Gmel.;** Natural; CH; NE; SA+SZ; N, M, O, D, R, S; WB.
Syns. Salsola forskahlii Forsyth f.
Suaeda volkensii C.B.Clarke
Suaeda mollis (Desf.) Delile
Commelinaceae;
***Commelina erecta* L**. ; Alien, Casual; GH; LC; PAN+TR;
Syn. Commelina erecta var. *typica* Fernald
Convolvulaceae;
***Convolvulus arvensis* L.;** Weed; GE; NE; COSM; N, O, M, De, S; TN; TM; FB.
Syns. Convolvulus hastatus Forssk.
Convolvulus longipedicellatus Sa'ad
***Cressa cretica* L.;** Natural; H; LC; ME + IT; N, O, M, D, R, GE, S; TN; TM.
Syns. Cressa monosperma Stokes
Cressa villosa Hoffmanns. & Link
Cressa cretica var. villosa (Hoffmanns. & Link) Choisy
***Cuscuta palaestina* Boiss.;** Weed; PA; NE; ME+SA; M, De, S; TN; TM.
Syn. Cuscuta globularis Bertol.

***Ipomoea cairica* (L.) Sweet;** Alien; Causal; H; LC; TR; N, M, D; TN.
Syns. Convolvulus cairicus L.
Convolvulus tuberculatus Desr.
Ipomoea palmata Forssk.
Ipomoea senegalensis Lam.
Ipomoea tuberculata (Desr.) Roem. & Schult.
Ipomoea vesiculosa P. Beauv.
***Ipomoea carnea* Jacq.;** Alien; Invasive; CH; NE; PAN; N, M; TN.
Syn. Convolvulus carneus (Jacq.) Spreng.
Cucurbitaceae;
***Citrullus colocynthis* (L.) Schrad.;** Weed; H; NE; SA; N, O, M, D, R, GE, S; TN.
Syns. Colocynthis vulgaris Schrad.
Cucumis colocynthis L.
Cupressaceae;
***Cupressus sempervirens* L.;** Alien; Causal; PH; LC; ME; RT; RS.
Syns. Cupressus elongata Salisb.
Cupressus sempervirens subvar. pyramidalis Hayek
Cupressus sempervirens var. pendula (Endl.) A.Camus
Cyperaceae;
***Cyperus conglomeratus* Rottb.;** Natural; GH; LC; SA+SZ+ME; N, O, M, D, GE, S; RS.
Syns. Cyperus complanatus Forssk
Cyperus jeminicus Rottb
***Cyperus rotundus* L.;** Weed; GE; LC; TR; N, O, M, D, R, GE, S; TN; TM; FB.
Syns. Cyperus hexastachyos Rottb.
Chlorocyperus rotundus (L.) Palla
Euphorbiaceae;
***Acalypha wilkesiana* Muell. Arg.;** Alien; Causal; CH; NE; TN; RT; FB.
Syns. Acalypha amentacea subsp. wilkesiana (Müll.Arg.) Fosberg
Acalypha amentacea f. circinata (Müll.Arg.) Fosberg
***Euphorbia arguta* Banks & Sol.;** Weed; TH; NE; EU+ME; N, O, Dl, M; TN.
Syns. Tithymalus argutus (Banks & Sol.) Soják
Euphorbia arguta var. dasycarpa Plitmann
***Euphorbia chamaepeplus* Boiss. & Gaill.;** Weed; TH; NE; IT+SA; RS.
Syn. Euphorbia chamaepeplus var. *sinaica* Boiss.
***Euphorbia heterophylla* L.;** Alien; Naturalized; TH; LC; PAN; N; TN.
Syns. Euphorbia geniculata Ortega
Euphorbia prunifolia Jacq.
***Euphorbia mauritanica* L.;** Alien; Causal; HE; NE; TR; WB.
Syns. Tithymalus mauritanicus (L.) Haw.
Euphorbia hydnorae E.Mey. ex Boiss.
***Euphorbia peplis* L.;** Weed; TH; NE; EU+ME+IT; RS.
Syn. Tithymalus peplis (L.) Scop.
***Euphorbia peplus* L.;** Weed; TH; NE; ME+IT+EU; N, O, M, D, S; TN; TM; RT; RS; FB.
Syns. Euphorbia peploides Gouan
Euphorbia peplus var. *peploides* Gouan
***Euphorbia prostrata* Aiton;** Alien; Naturalized; TH; CR; PAN; N, M, S; TN; RS.
Syns. Chamaesyce prostrata (Aiton) Small
Tithymalus prostrata (Aiton) Samp.
***Mercurialis annua* L**. Alien; TH; NE; ME+ES, WB
Syns. Mercurialis annua subvar. euannua Litard.
Mercurialis annua f. verticillata Bolzon
***Pergularia tomentosa* L;** Natural; CH; NE; SU; GE, S; TN.
Syns. Doemia tomentosa (L.) Pomel
Telosma tomentosa (L.) M.R.Almeida

Pergularia tomentosa var. virescens Maire

***Ricinus communis* L.;** Alien; Naturalized; PH; NE; TR; D, GE; TN; TM; RT; RS; GO; FB.
Syns. Ricinus communis var. genuinus Müll.Arg.
Ricinus communis var. aegyptiaceus (Popova) Moshkin
Ricinus communis var. americanus Müll.Arg.

Fabaceae;

***Acacia saligna* (Labill.) H.L. Wendl.;** Alien; Invasive; PH; LC; PAN; TN.
Syns. Mimosa saligna Labill.
Acacia bracteata Maiden & Blakely

***Albizia lebbeck* (L.) Benth.;** Alien; Causal; PH; LC; PAL; RS.
Syns. Acacia lebbeck (L.) Willd.
Mimosa lebbeck L.
Albizia lebbeck var. rostrata Haines

***Alhagi graecorum* Boiss.;** Weed; H; NE; ME+IT; N, O, M, D, R, S; TN; TM.
Syn. Alhagi mannifera Jaub. & Spach

***Astragalus hamosus* L.;** Natural; TH; NE; ME + IT; M, D; TN.
Syns. Astragalus brachyceras Ledeb.
Astragalus buceras Willd.

***Bauhinia variegata* L.;** Alien; Causal; PH; LC; TN; FB.
Syns. Bauhinia variegata var. purpurascens Voigt
Perlebia variegata (L.) A.Schmitz

***Dalbergia sissoo* Roxb. ex DC.;** Alien; Invasive; PH; LC; PAL; TM.
Syns. Amerimnon sissoo (Roxb. ex DC.) Kuntze
Dalbergia pendula Ten.

***Delonix regia* (Bojer ex Hook.) Raf.;** Alien; Causal; PH; LC; SZ+ME+PAN; TN; RS.
Syns. Caesalpinia regia (Bojer ex Hook.) D.Dietr.
Delonix regia var. flavida Stehlé

***Enterolobium cyclocarpum* (Jacq.) Griseb.;** Alien; Causal; PH; LC; TN; RT.
Syns. Feuilleea cyclocarpa (Jacq.) Kuntze
Albizia longipes Britton & Killip

***Erythrina corallodendron* L.;** Alien; Causal; PH; LC; PAN; TN; TM.
Syns. Erythrina corallifera Salisb.
Erythrina corallodendron var. connata Krukoff
Corallodendron aculeatum Medik.

***Lotus corniculatus* L.;** Weed; HE; LC; EU+ME+IT; RT.
Syns. Lotus corniculatus subsp. minor Ehrh.
Lotus corniculatus var. ericetorum H.Post

***Lotus polyphyllus* E.D. Clarke;** Natural; CH; NE; ME; RT; RS.

***Medicago laciniata* (L.) Mill.;** Weed; TH; LC; SA; M, Di, S; TN; RT.
Syn. Medicago polymorpha var. *laciniata* L.

***Medicago littoralis* Rhode ex Loisel.;** Natural; TH; LC; ME; RT; RS; FB.
Syns. Medicago arenaria Ten.
Medicago cylindracea DC.

***Medicago polymorpha* L.;** Weed; TH; LC; ME+IT+EU; M, O, Di; TN; RS.
Syns. Medicago denticulata Willd.
Medicago nigra Krock.

***Melilotus albus* Medic.;** Bi; Weed; LC; EU+IT+ ME; Nd, Mp; TN; RT; RS; FB; CD.
Syn.Melilotus argutus Rchb

***Melilotus indicus* (L.) All.;** Weed; TH; NE; ME; N, O, M, D, S; TN; TM; RS; FB.
Syns. Melilotus bonplandii Ten.
Melilotus parviflorus Desf.
Melilotus tommasinii Jord.
Trifolium indicum L.

***Melilotus sulcatus* Desf.;** Natural; TH; NE; ME; O, M, S; WB.

Syns. Medicago sulcata (Desf.) E.H.L.Krause
Melilotus sulcatus subsp. *brachystachys* Maire ex Quézel & Santa
Melilotus indicus var. *prostratus* P.Palau

***Mimosa pigra* L.;** Alien; Causal; PH; LC; SU; Nv, Da; TN.
Syn. Mimosa polyacantha Willd.

***Neltuma juliflora* (Sw.) Raf.;** Alien; Invasive; PH; NE; SA; TN; RS.
Syn. Prosopis juliflora (Sw.) DC.

***Onobrychis crista-galli* (L.) Lam.;** Natural; TH; NE; ME+SU; M, Di; TN.
Syns. Hedysarum crista-galli L.
Onobrychis ligulifera Pau

***Senna italica* Mill.;** Natural; CH; NE; SU; N, O, D, GE, S; TN; TM; RT; RS; FB.
Syns. Cassia aschrek Forssk.
Cassia italica (Mill.) F.W. Andrews
Cassia obovata Collad.

***Trigonella stellata* Forssk.;** Weed; TH; NE; SA+IT; N, M, D, R, S; RS.
Syns. Medicago stellata (Forssk.) Trautv.
Trigonella aegyptiaca Steud.
Trigonella egyptiaca Poir.

***Vicia sativa* L.;** Weed; TH; LC; ME+IT+ EU; N, O, M, Di, S; TN; RS.
Syns. Vicia cosentinii Guss.
Vicia globosa Retz.
Vicia notata Gilib.
Vicia torulosa Boreau

Fumariaceae (Papaveraceae);

***Fumaria densiflora* DC.;** Weed; TH; NE; ME+EU+IT; N, O, M, Di; TN; TM; RT; RS; FB.
Syns. Fumaria densiflora subsp. *micrantha* (Lag.) Maire & Weiller
Fumaria micrantha Lag.
Fumaria obtusisepala Pugsley,

***Fumaria judaica* Boiss.;** Weed; TH; NE; ME; Nd, M; RT.

Geraniaceae;

***Erodium crassifolium* L'Hér.;** Natural; H; NE; ME+IT; M, D, S; TN; TM; RS; GO.
Syns. Erodium hirtum Willd.
Geranium hirtum Forssk.

***Erodium glaucophyllum* (L.) L'Hér.;** Natural; H; NE; IT + SA; Nv, M, D, S; TN; TM; RT; RS; FB; RP.
Syn. Geranium glaucophyllum L.

***Erodium laciniatum* subsp. *pulverulentum* (Boiss.) Batt.;** Weed; TH; NE; ME; N, M, D, R, S; TN; TM; RT; RS; FB.
Syns. Erodium laciniatum var. *pulverulentum* (Cav.) Boiss.
Erodium pulverulentum (Cav.) Willd.
Geranium pulverulentum Cav

***Erodium malacoides (*L.) L'Hér.;** Natural; TH; NE; ME; RS.
Syns. Erodium althaeoides Jord
Erodium malacoides (L.) Willd
Erodium malvaceum Jord
Granium malacoides L.

***Erodium oxyrhinchum* M. Bieb.;** Natural; TH; NE; SA; N O, M, D, S; TN; TM.
Syn. Erodium bryoniifolium Boiss.

Iridaceae;

***Moraea sisyrinchium* (L.) Ker Gawl.;** Natural; GH; NE; ME+IT; FB.
Syn. Gynandriris sisyrinchium (L.) Parl.

Juncaceae;

***Juncus acutus* L.;** Weed; H; LC; ME+IT; N, O, M, De, S; TM.
Syn. Juncus spinosus Forssk.

***Juncus rigidus* Desf.;** Weed; H; LC; SA+IT; N, O, M, D, R, GE, S; TM.

Syns. Juncus arabicus (Asch. & Buchenau) Adamson
Juncus maritimus var. *arabicus* Asch. & Buchenau

Lamiaceae;

***Mentha longifolia* (L.) Huds.;** Weed; H; LC; ME+IT+EU; N, O, S; TM.
Syn. Mentha lavandulacea Willd.

***Ocimum basilicum* L.;** Alien; Causal; TH; NE; TR; TM; RT; FB.
Syn. Ocimum odorum Salisb.

Linaceae;

***Linum strictum* L.;** Weed; TH; NE; ME+EU+SU+IT; M; TM.
Syns. Linum gallicum subsp. *strictum* (L.) Bonnier
Linum strictum subsp. *cymosum* (Gren.) H.Lindb.
Linum strictum var. racemosum P.Palau

Malvaceae;

***Hibiscus rosa-sinensis* L.;** Alien; Causal; PH; NE; PAN; TN; TM; RT; FB.
Syns. Hibiscus rosa-sinensis var. *genuinus* Hochr.
Hibiscus sinensis grandiflorus Hovey

***Malva aegyptia* L.;** Weed; TH; NE; SA+ME; M, Mp, Di; TN; RS.
Syns. Dinacrusa aegyptia (L.) G.Krebs
Malva aegyptia var. *armeniaca* (Iljin) Pakravan

***Malva ludwigii* (L.) Soldano, Banfi & Galasso;** Natural; Causal; TH; NE; SA+IT+SU; N, O, M, Di, S; TN; TM; RT; RS; GO; FB.
Syn. Althaea ludwigii L.

***Malva parviflora* L.;** Weed; TH; NE; ME+IT; N, O, M, D, R, S; TN; TM; RT; RS; GO; FB; RP; CD.
Syns. Althaea parviflora (L.) Alef.
Malva rotundifolia subsp. *parviflora* (L.) Ball
Malva microcarpa var. *cristata* Sennen

***Malva sylvestris* L.;** Weed; H; LC; EU+ME+IT; Nd, M, Di; TN; TM; RT; RS.
Syn. Malva ambigua var. *microphylla* Rouy

Moraceae;

***Ficus benghalensis* L.;** Alien; Causal; PH; NE; PAL; RS; FB.
Syns. Perula benghalensis (L.) Raf.
Urostigma bengalense (L.) Gasp.
Ficus banyana Oken

***Ficus benjamina* L.;** Alien; Causal; PH; LC; PAN; TN; TM; RS; FB.
Syn. Ficus nitida Thunb.

***Ficus carica* L.;** Alien; Naturalized; PH; LC; ME+IT; S; TN; TM; RT; RS; FB; RP.

***Ficus laurifolia* Lam.;** Alien; Causal; PH; NE; PAL; FB.
Syns. Urostigma laurifolium (Lam.) Miq.
Ficus africana Miq.

***Ficus palmata* Forssk.;** Natural; PH; NE; SU; De, GE, S; TN; FB.
Syn. Ficus pseudo-sycomorus Decne

***Ficus sycomorus* L.;** Natural; PH; LC; ME; N, O, M, S; TN; TM.
Syns. Ficus sycomorus subsp. gnaphalocarpa (Miq.) C.C.Berg
Sycomorus antiquorum Gasp.

***Morus alba* L.;** Alien; Naturalized; PH; LC; PAL; RT.

Myrtaceae;

***Eucalyptus camaldulensis* Dehnh.;** Alien; Causal; PH; NT; PAN; TN; TM; RT; FB.

***Myrtus communis* L.;** Alien; Causal; PH; LC; IT; TN.

***Psidium guajava* L.;** Alien; Causal; PH; LC; TR; TM.
Syns. Guajava pyrifera Kuntze
Myrtus guajava (L.) Kuntze
Psidium pyriferum L.

Nyctaginaceae;

***Bougainvillea glabra* Choisy;** Alien; Causal; PH; LC; TR; TM.

Syns. Bougainvillea glabra var. *typica* Heimerl
Bougainvillea spectabilis var. *glabra* (Choisy) Hook.

Oleaceae;

***Olea europaea* L. var. *europaea*;** Natural; PH; DD; SA+ME; M, D; TN; TM.
Syns. Olea pallida Salisb.
Olea sativa Hoffmanns. & Link

Onagraceae;

Ludwigia adscendens (L.) H. Hara; Natural; HH; LC; SA-SZ;
Syn. Jussiaea adscendens L.

Orobanchaceae;

***Cistanche tubulosa* (Schenk) Wight ex Hook.f.;** Weed; PA; NE; SA+IT+SZ; N, M, D, GE, S; RS.
Syns. Cistanche lutea Wight,
Phelipaea tubulosa Schenk

***Orobanche cernua* Loefl.;** Natural; PA; NE; ME+SA+IT; N, M, D, R, S; TN.
Syns. Orobanche badchysensis Novopokr. & V.V.Nikitin
Phelipanche nikitae Teryokhin

Oxalidaceae;

***Oxalis anthelmintica* A. Rich**.; Natural; G; NE; SU; GE:
Syns. Oxalis abyssinica Turcz.
Oxalis adoensis Turcz.
Oxalis anthelmintica var. *glabrostyla* Roti Mich.
Oxalis homblei De Wild.

Oxalis corniculata L.; Natural; G; NE; Neotropical; N, O, M;
Syns. Acetosella corniculata (L.) Kuntze
Oxys corniculata (L.) Scop.
Xanthoxalis corniculata (L.) Small

***Oxalis pes-caprae* L.;** Natural; GH; NE; PAL; N, M; WB.

Plantaginaceae;

***Plantago crypsoides* Boiss.;** Natural; TH; NE; EU+ME+IT; M, D; RT; RS.
Syn. Plantago crassipes (Coss. & Daveau) Brullo

***Plantago lagopus* L.;** Weed; TH; NE; ME+IT; N, O, M; TM; RT.
Syn. Plantago lusitanica L.

***Plantago lanceolata* L.;** Natural; H; LC; COSM; Nd; TM; RT.
Syns. Arnoglossum lanceolatum (L.) Gray
Plantago lanceolata var. *mediterranea* (Strobl) Pilg.

***Plantago major* L.;** Weed; TH; LC; ME+IT+EU; N, O, M, S; TN.
Syn. Plantago major var. *megastachya* Wallr.

***Plantago notata* Lag.;** Natural; TH; NE; IT+SA; RS.
Syns. Plantago loeflingii subsp. *notata* (Lag.) O.Bolòs & Vigo
Plantago notata var. *alba* Pilg.

Poaceae;

***Aegilops bicornis* (Forssk.) Jaub. & Spach.;** Weed; TH; NT; ME, SA; N, M; TN.
Syn. Triticum bicorne Forssk.

***Aegilops kotschyi* Boiss.;** Weed; TH; LC; SA+IT; O, M, S; TN; TM.
Syn. Aegilops triuncialis L. var. *kotschyi* (Boiss.) Boiss.

***Aeluropus lagopoides* (L.) Thwaites;** Natural; GH; CC; LC; SS+ IT+ME+SZ; N, O, M, D, R, S; RS; FB.
Syns. Dactylis lagopoides L.
Poa lagopoides (L.) Kunth

***Arundo donax* L.;** Alien; Causal; PH; LC; ME+IT; N, O, M, D, S; TN; RS.
Syn. Donax arundinaceus P. Beauv.

***Avena barbata* Pott ex Link;** Weed; TH; LC; ME; N, O, M, D, S; TN; TM; RS.
Syns. Avena alba var. *barbata* (Pott ex Link) Maire & Weiller
Avena fatua subsp. *barbata* (Pott ex Link) Rouy

***Avena fatua* L.;** Weed; TH; LC; PAL; N, O, M, D, S; TN; TM; RT; RS; GO; FB.

Syns. Avena patens St.-Lag.
Avena sativa subsp. *fatua* (L.) Thell.
Avena sterilis subsp. *fatua* (L.) Bonnier & Layens

***Brachypodium distachyon* (L.) P. Beauv.;** Weed; TH; NE; ME+IT; N, O, M, De, GE, S; TN; TM; RT; RS; FB.
Syns. Bromus distachyos L.
Trachynia distachya (L.) Link

***Bromus catharticus* Vahl;** Alien; Naturalized; TH; NE; ME+IT+EU; N, O, M, De; TN; TM; RS.
Syns. Ceratochloa cathartica (Vahl) Herter
Bromus unioloides var. *glaucescens* Nees

***Bromus diandrus* Roth.;** Natural; TH; NE; ME+IT; N, O, M, D, S; RT; RS.
Syn. Bromus rigidus var. *gussonei* (Parl.) Coss. & Durieu

***Bromus fasciculatus* C. Presl.;** Natural; TH; LC; ME; M, Di, S; TN; RT; RS; GO; FB.
Syns. Bromus rubens var. *eufasciculatus* Maire & Weiller
Bromus fasciculatus var. *alexandrinus* Thell.

***Bromus inermis* Leyss.;** Alien; Naturalized; H; NE; ME+IT; N; TN; TM; RT.
Syn. Bromopsis inermis (Leyss.) Holub

***Bromus madritensis* L.;** Natural; H; NE; ME + IT; M, Di, S; TN; RT.
Syn. Bromus villosus Forssk.

***Bromus rubens* L.;** Natural; TH; NE; ME+IT+SA; M, O, Di, S.; TN; TM; RT; RS; GO; FB; CD.
Syns. Bromus madritensis var. *rubens* (L.) Husn.
Bromus rubens subsp. *eurubens* Maire

***Cenchrus americanus* (L.) Morrone;** Weed; TH; LC; TR; N, O, De, GE; TM.
Syns. Alopecurus typhoides Burm.f.
Panicum americanum L.
Panicum glaucum L.
Panicum lutescens Weigel
Pennisetum americaum (L) Leeke
Pennisetum glaucum (L.) R.Br.
Pennisetum spicatum (L.) Körn.
Setaria glauca (L.) P. Beauv.

***Cenchrus ciliaris* L.;** Alien; Causal; H; LC; ME+SA + SU; N, M, D, R, S; TN; TM.
Syn. Pennisetum ciliare (L.) Link

Cenchrus purpureus (Schumach.) Morrone.; Alien, Casual; GH; LC; TR+PAN;
S*yns. Pennisetum benthamii* Steud.
Pennisetum purpureum Schumach.

***Cutandia dichotoma* (Forssk.) Trab.;** Natural; TH; NE; SA+IT; N, M, D; RT; RS.
Syn. Festuca dichotoma Forssk.

***Cutandia memphitica* (Spreng.) K. Richt.;** Natural; TH; NE; ME+IT+SA; N, O, M, D, R, GE, S; RS; FB.
Syns. Dactylis memphitica Spreng.
Sclerpoa memphitica Parl.

***Cynodon dactylon* (L.) Pers.;** Weed; GE; NE; COSM; N, O, M, D, R, GE, S; TN; TM; RT; RS; GO; FB; CD.
Syns. Dactylon officinale Vill.
Panicum dactylon L.

***Dactyloctenium aegyptium* (L.) Willd.;** Weed; TH; NE; TR; N, D, R, GE; RS.
Syn. Cynosurus aegyptius L.

***Digitaria sanguinalis* (L.) Scop.;** Weed; TH; NE; COSM; N, O, M, De, S; TN; TM; RT; RS; FB.
Syn. Panicum sanguinale L.

***Echinochloa colonum* (L.) Link;** Weed; TH; LC; TR; N, O, M, D, R, GE, S; TN; RS.
Syn. Panicum colonum L.

***Echinochloa crus-galli* (L.) P. Beauv.;** Weed; TH; LC; EU+ME+IT; RS.
Syns. Panicum crusgalli L.
Panicum hispidum Forssk.

Echinochloa stagnina (Retz.) P. Beauv; Natural; G; LC; Paleotropical

Syns. Panicum scabrum subsp. *stagninum* (Retz.) A.Chev.
Panicum stagninum Retz.

***Hordeum marinum* Huds.;** Weed; TH; LC; IT+ME; RT; RS.
Syn. Hordeum maritimum With

***Hordeum murinum* L. subsp. *galucum* (Steud.) Tzvelev;** Weed; TH; LC; ME+IT; N, O, M, D, S; TN; TM; RT; RS; GO; CD.
Syn. Hordeum glaucum Steud

***Hordeum murinum* subsp. *leporinum* (Link) Arcang.;** Weed; TH; NE; IT+ ME; N, O, M, Di, S; TN; TM; RT; RS; GO; FB.
Syn. Hordeum leporinum Link

***Hordeum vulgare* L.;** Alien; Causal; TH; LC; ME; N, M, D, S; TN; TM; RS.
Syns. Hordeum hexastichon L.
Hordeum sativum Pers.

***Imperata cylindrica* (L.) Raeusch.;** Weed; H; LC; ME+SA+IT; N, O, M, D, R, S; TN; TM.
Syn. Lagurus cylindricus L.

***Lolium perenne* L.;** Weed; H; LC; EU+ME+ IT; N, O, M, Di, S; TN; TM; FB; WB.
Syn. Festuca perennis (L.) Columbus & J.P.Sm.

***Lolium temulentum* L.;** Weed; TH; LC; EU+ME+IT; Nd, O, M, Di, S; TN.
Syn. Lolium temulentum var. *macrochaeton* (A. Braun) Junge

***Lophochloa cristata* (L.) Hyl.;** Natural; TH; NE; ME+IT; RT; RS.
Syn. Rostraria cristata (L.) Tzvelev

***Oloptum miliaceum* (L.) Röser & Hamasha;** Weed; CH; NE; ME; N, M, De, S; TN; TM; RT; RS; GO; FB.
Syns. Oryzopsis miliacea (L.) Asch. & Schweinf.
Piptatherum miliaceum (L.) Coss

***Panicum repens* L.;** Weed; CH; LC; TR; N, O, M, De; TM.
Syn. panicum leiogonum Del.

***Parapholis marginata* Runemark;** Natural; TH; NE; ME+IT+EU; M, N, O, Di, S; TN; TM; RT; RS; CD.

***Phalaris minor* Retz.;** Weed; TH; NE; ME+IT; N, O, M, S, D; TN; TM; RT; RS; FB.
Syns. Phalaris aquatica var. *minor* (Retz.) Mutel
Phalaris minor var. *genuina* Maire & Weiller
Phalaris aquatica Thunb.

***Phalaris paradoxa* L.;** Weed; TH; LC; ME+IT; N, M, Di; TN; RT; RS.
Syns. Phalaris appendiculata Schult.
Phalaris paradoxa var. *praemorsa* (Lam.) Coss. & Durieu
Phalaris praemorsa Lam.

***Phragmites australis* (Cav.) Trin. ex Steud.;** Weed; H; LC; COSM; N, O, M, D, R, S; TN; TM; RT; RS; FB; WB.
Syn. Arundo australis Cav.

***Poa annua* L.;** Weed; TH; LC; ME+IT+EU; N, O, M, S; TN; TM.
Syn. Ochlopoa annua (L.) H.Scholz

***Poa infirma* Kunth;** Weed; TH; NE; ME; Nd, M, Da; TM.
Syns. Eragrostis infirma (Kunth) Steud.
Poa annua Schltdl. & Cham.

***Polypogon monspeliensis* (L.) Desf.;** Weed; TH; LC; ME+SA+IT; N, O, M, D, R, S; TN; TM; RT.
Syns. Alopecurus monospeliensis L.
Phalaris cristata Forssk.

***Rostraria cristata* (L.) Tzvelev;** Weed; TH; NE; ME + IT; N, O, M, D, S; TN; TM.
Syns. Festuca cristata L.
Festuca gerardii Vill.
Festuca phleoides Vill.
Koeleria gerardii (Vill.) Shinners.

***Schismus arabicus* Nees;** Natural; TH; NE; IT+SA; RT; RS.
Syn. Festuca calycina Forssk.

***Schismus barbatus* (L.) Thell;** Weed; TH; NE; ME + SA + IT; Nd, O, M, D, R, S; TN; TM; RT; RS; GO; FB; CD.

Syns. Festuca barbata L.
Festuca calycina Loefl.
*Schismus calycinus (*Loefl.) K. Koch
Schismus marginatus P. Beauv
Setaria viridis* (L.) P. Beauv.*; Natural; Naturalized; TH; NE; ME+IT+EU; N, O, De, S; TN; TM.
Syn. Panicum viride (L.) P. Beauv.
***Sporobolus spicatus* (Vahl) Kunth;** Weed; GE; NE; PAL; N, O, M, D, R, S; TN; TM.
Syns. Agrostis spicata Vahl.
Agrostis virginica Forssk.
***Thinopyrum junceum* (L.) Á. Löve;** Natural; HE; LC; ME; N, M; RT; CD.
Syns. Elymus farctus (Viv.) Runemark ex Melderis
Elytrigia juncea (L.) Nevski
Agropyron junceum (L.) P. Beauv.
***Triticum aestivum* L.;** Alien; Causal; TH; DD; EU+IT; N; TN; TM; RT; RS.
Syns. Triticum hybernum L.
Triticum sativum Lam.
Triticum vulgare Vill.
***Zea mays* L.;** Alien; Causal; TH; LC; PAL; N; TM.
Syns. Mays americana Baumg.
Mayzea cerealis Raf.
Polygonaceae;
***Persicaria decipiens* (R.Br.) K.L.Wilson;** Natural; GE; NE; PAL; N, M, R, S; TN; TM.
Syns. Persicaria decipiens R.Br.
Persicaria salicifolia (Brouss. ex Willd.) Assenov
Polygonum decipiens R.Br.
Polygonum salicifolium Brouss. ex.Willd
Polygonum serrulatum Lag.
Polygonum equisetiforme* Sm.*; Weed; H; NE; ME+IT; N, O, M, D, S; TN; TM; FB.
Syns. Dioctis equisetifolia Raf.
Polygonum equisetiforme var. *foliosum* Sennen
***Polygonum maritimum* L.;** Natural; HE; NE; ME+EU; N, M, S; RT.
Syns. Centinodia maritima (L.) Fourr.
Polygonum aviculare var. *littorale* Chapm.
Rumex dentatus* L.*; Weed; TH; LC; ME+IT+EU; N, M; TN; TM.
***Rumex pictus* Forssk.;** Weed; TH; NE; SA + ME; M, Di; TN; TM; RS.
Syn. Rumex lacerus Balb.
***Rumex spinosus* L.;** Weed; TH; NE; SA +ME; N, O, M, Di; TN; TM; RT; RS; GO; FB; WB.
Syn. Emex spinosa (L.) Campd.
Rumex vesicarius* L.*; Weed; TH; NE; SA; M, D, R, GE, S; TN; TM.
Pontederiaceae;
***Pontederia crassipes* Mart.;** Alien; Invasive; HH; NE; PAN; N.O.M; WB.
Syn. Eichhornia crassipes (Mart.) Solms
Portulacaceae;
Portulaca oleracea* L.*; Weed; TH; LC; COSM; N, O, M, S; TN.
Syns. Portulaca hortensis Rupr.
Portulaca oleracea var. *sylvestris* DC.
Primulaceae;
Lysimachia arvensis* (L.) U. Manns & Anderb.*; Weed; TH; NE; ME+IT+EU; N, O, M, D, R, GE, S; TN; RS; FB; RP.
Syn. Anagallis arvensis L.
Anagallis phoenicea Scop.
***Samolus valerandi* L.;** Natural; GH; LC; M, O; CD
Syn. Samolus valerandi var. *typicus* R.Knuth
Ranunculaceae;

***Ranunculus sceleratus* L.;** Natural; TH; LC; EU+ME+TR; N, M; WB.
Syns. Ranunculus sceleratus var. *typicus* L.D.Benson
Batrachium sceleratum (L.) Th.Fr. ex A.Pihl
Resedaceae;
***Oligomeris linifolia* (Vahl ex Hornem.) J.F.Macbr.;** Weed; TH; NE; SU; N, M, D, R, S; TN.
Syn. Reseda linifolia Vahl ex Hornem.
***Reseda alba* L.;** Natural; TH; NE; ME; Nv, M, Di, S; TN.
Syn. Eresda alba (L.) Spach
Rhamnaceae;
***Ziziphus lotus* (L.) Lam.;** Alien; Naturalized; NE; ME+SA, M. D; TN
Syn. Rhamnus lotus L
***Ziziphus spina-christi* (L.) Desf.;** Alien; Naturalized; PH; LC; SU; N, O, M, D, R, GE, S; TN; TM; RS; FB.
Syn. Rhamnus spina-christi L.
Rubiaceae;
***Galium tricornutum* Dandy;** Weed; TH; NE; ME; Nd, O, M, Di, S; TN; RS.
Syn. Galium tricorne Stocks
***Rubia tinctorum* L.**; Natural; GH; NE; ME; Di;
Syns. Galium rubia E.H.L.Krause
Rubia peregrina subsp. *tinctorum* (L.) Bonnier & Layens
Rutaceae;
***Citrus aurantium* L.;** Alien; Causal; PH; NE; PAN; TM; RS.
Syn. Aurantium × *coronatum* Poit. & Turpin
Salviniaceae;
Salvinia auriculata Aubl.; HH; Alien; Causal; TR; LC;
Syn. Marsilea auriculata Vitman
Santalaceae;
***Thesium humile* var. *maritima* Simps. (N.D. Simpson) F.M. Saad:** Natural; Endemic; TH; NE; N+O+D; TN.
Syn. Thesium humile Vahl var. *maritima* N.D. Simpson
Scrophulariaceae;
***Kickxia aegyptiaca* (L.) Nábělek;** Natural; CH; NE; ME+SA; RT.
Syns. Antirrhinum aegyptiacum L.
Elatinoides aegyptiaca (L.) Wettst.
Linaria aegyptiaca (L.) Dum.
***Verbascum letourneuxii* Asch.;** Natural; CH; NE; ME; M; FB.
***Veronica anagallis-aquatica* L.;** Weed; H; LC; COSM; N; TN; FB.
Syns. Beccabunga anagallis-aquatica (L.) Fourr.
Veronica aquatica f. *subeglandulosa* Holmb.
***Veronica polita* Fr.;** Weed; TH; NE; ME; N, M; WB
Syns. Pocilla polita (Fr.) Fourr.
Veronica agrestis subsp. *polita* (Fr.) Rouy
Solanaceae;
***Datura innoxia* Mill.;** Alien; Naturalized; TH; NE; COSM; N; TN; TM; RT.
Syn. Datura guayaquilensis Kunth
***Hyoscyamus albus* L.;** Natural; H; NE; ME+PAN; M, Da; TM; RP.
Syn. Hyoscyamus luridus Salisb.
***Hyoscyamus muticus* L.;** Natural; CH; NE; SA; N, O, M, D, R, GE, S; TN; RP.
Syn. Scopolia mutica (L.) Dunal
***Lycium europaeum* L.;** Natural; PH; NE; ME; N, M, D; RT.
Syn. Lycium mediterraneum Dunal
***Nicotiana glauca* Graham;** Alien; Naturalized; PH; NE; COSM; N, O, M, De, S; TN; TM; RT; RS; GO; FB; RP; CD.
Syn. Nicotiana glauca f. *genuina* Millán
Nicotiana glutinosa L.; Alien; CH; NE; Neotropical

Syns. Tabacus viscidus Moench
Sairanthus glutinosus (L.) G. Don
***Physalis ixocarpa* Brot. ex Hornem.;** Alien; Naturalized; TH; LC; PAN; N; TN; TM.
Syn. Physalis aequata Jacq. ex Nees
***Solanum incanum* L.;** Natural; CH; LC; SZ; RS.
Syn. Solanum unguiculatum A. Rich.
***Solanum lycopersicum* L.;** *Alien; Causal; H; NE; COSM; TN; TM; RS; GO.*
Syn. Lycopersicon esculentum L.
***Solanum nigrum* L.;** Weed; H; NE; ME+IT+EU; N, O, M, D, R, GE, S; TN; TM.
***Withania somnifera* (L.) Dunal;** Alien; Naturalized; PH; NE; SU; GE, S; TN; TM; RT; RS; FB.
Syn. Withania obtusifolia Täckh.
Tamaricaceae;
***Tamarix nilotica* (Ehrenb.) Bunge;** Natural; PH; LC; SA+IT; N, O, M, D, R, GE, S; RT.
Syn. Tamarix arabica Bunge
Typhaceae;
***Typha domingensis* Pers.;** Weed; GE; LC; ME+SA+IT; N, O, M D, R, S; TN; RS.
Syns. Typha angustata Bory & Chaub
Typha australis Schumach
Urticaceae;
***Parietaria alsinifolia* Delile;** Natural; TH; NE; SA; De, S; TN; TM; RT; RS; GO.
***Urtica pilulifera* L.;** Weed; TH; NE; ME + IT + EU; M, Nd; TN; TM; RS; GO.
Syn. Urtica pilulifera f. *balearica* (L.) Webb ex Asch. & Graebn.
***Urtica urens* L.;** Weed; TH; LC; ME+EU; N, M, De; TN; TM; RT; RS; GO; FB; WB.
Syn. Urtica urens var. *lanceolata* E.Nilsson
Verbenaceae;
***Duranta erecta* L.;** Alien; Causal; PH; LC; PAN; FB.
***Lantana camara* L.;** Alien; Naturalized; PH; NE; TR; N; TN; RT; RS; GO; FB.
Syn. Camara vulgaris Benth.
***Phyla nodiflora* (L.) Greene;** Weed; H; LC; ME+EU+TR; N, O, M, D, S; TN.
Syns. Lippia nodiflora (L.) Michx
Verbena nodiflora L.
***Vitex angus-castus* L.;** Alien; Causal; PH; NE; ME; TN.
Vitaceae;
***Vitis vinifera* L.;** Alien; Causal; PH; NE; ME+EU; TN.
Zygophyllaceae;
***Tribulus terrestris* L.;** Weed; GE; LC; ME+IT+EU; N, M, D, R, S; TN; TM.
***Zygophyllum* aegyptium Hosny;** Natural; CH; NE; ME; N, M, D, S; RT; RS; CD.
Syn. Tetraena aegyptia (Hosny) Beier & Thulin
***Zygophyllum album* L.f.;** Natural; CH; NE; SA+ME; N, O, M, D, R, S; RT; RS.
Syns. Tetraena alba (L.f.) Beier & Thulin
Zygophyllum album var. *amblyocarpum* (Baker) Hadidi
Zygophyllum amblyocarpum Baker
***Zygophyllum creticum* (L.) Christenh. & Byng;** Natural; CH; NE; ME; M; TM; FB.
Syn. Fagonia cretica L.
***Zygophyllum indicum* (Burm.f.) Christenh. & Byng;** Natural; CH; NE; SA; O, Da, R, GE.
Syns. Fagonia indica Burm.f.
Fagonia mysorensis Roth.
Fagonis persica DC.
Fagonia parviflora Boiss.

Discussion

The present checklist of the vascular flora of the city area of Alexandria includes 338 species (including the inferaspecific taxa), with the native taxa representing about 12% of the total flora of Egypt and about 19 % of which are cultivated taxa, for ornamentals purposes or as crops. Although

the Alexandria's plant biodiversity is directly threatened by urbanization and other pressures, including agriculture, the plant biodiversity of urban flora of Alexandria has rarely been dealt with. Bidak et al. (2015, 2021) stated that *P. oceanica* is one of 11 plant species confined to the north western coastal region, many of these plants have become rare, threatened or endangered under the influence of environmental conditions or human activities. Flora of Egypt encompasses about 2145 species and 220 intraspecific taxa belonging to 755 genera and 129 families of native and naturalized vascular plants (Boulos, 2009). Alexandria is a city covering an area of 2679km^2 (Abdelaziz, 2023), which constitutes a small part of the total area of Egypt (about 0.2%). The city is characterized by high floristic diversity, as revealed by the present study. It is worthy mentioned that Alexandria city supports about 50% of plant families of the Egyptian flora. The flora of urban areas has been widely considered as relatively rich, and the cities themselves have been regarded as areas of high diversity (Haeupler, 1974; Kühn et al., 2004; Stešević 2014). Habitat heterogeneity or heterogeneous urban environment makes survival possible for species with differing survival strategies. Gilbert (1989) gave the most frequently cited opinion that due to habitat heterogeneity and the increased potential for the immigration of new species, urban floras are constantly enriched. The high diversity of habitats with different anthropogenic impact in the city of Alexandria creates unique assemblage of heterogeneous urban environments, that may increase immigration of plants from the surrounding ecosystems. Besides, the unique archeological sites and relict landscapes heritage of city assets that are spanning various eras, constitute (semi-) natural habitats, which may be considered as refuges for some plant species.

The coastal Mediterranean part of Alexandria was the richest, where therophytes dominate the vegetation. However, the higher precipitation of the coastal area, and the variation in elevation from the sea level leads to the dominance of Mediterranean chamaephyte and phanerophyte species. Native Mediterranean species also predominate in intra-city railway flora. It is worthy mentioned that Elements of the native flora are represented with 73.1% in the city of Alexandria. Dominant among them are plants of Mediterranean chorotype. The life form spectrum of Urban flora of Alexandria is dominated by therophytes, mainly due to the climatic conditions of the area and due to anthropogenic disturbance. The current list also indicated that plant species richness is strongly associated with archeological complexity at historical sites, which is confirmed by Heneidy et al. (2022) in western Alexandria.

Täckholm (1974), suggested that Egypt may be divided into 17 phytogeographical regions. According to this local phytogeographical distribution suggested by Täckholm, the distribution of the recorded taxa in our study, indicates that about 64.2% of the recorded taxa in the urban habitats of the city were belonging to the coastal Mediterranean phytogeographical region of Egypt, followed by the species belonging to the Egyptian deserts (52.7%), and Nile region (50%), while plant species belonging to Sinai region constitutes about 43.8%, and those belonging to Oasis region constitutes about 37%.

Considerable participation of alien taxa in the city of Alexandria is detected (26.9% of the total recorded taxa) probably due to the long history of the settlement and the well-developed transportation and trading networks. Dominant among aliens are members of Poaceae (11%) and Fabaceae (10%). The recent list of alien species in Egypt includes 250 taxa (11.7% of the Egyptian flora); including 5 subspecies and two varieties; related to 161 genera and 41 families (El-Beheiry et al., 2020). Alien species recorded in the present list could be recognized as: causal (55 taxa; about 60.4%), naturalized (30 taxa; about 33%) and, invasive (6 taxa; 6.6%). Invasive alien species were *Acacia saligna, Bassia indica, Dalbergia sissoo, Pontederia crassipes* (*Eichhornia crassipes*)*, Ipomoea carnea*, and *Neltuma juliflora* **(***Prosopis juliflora*). *Acacia saligna* was reported as an invader in North Sinai by El-Bana (2008). *Bassia indica* was introduced into the northwestern coastal strip of Egypt from India in 1930 as a promising fodder plant and is now recognized as an aggressive invader (Draz, 1954). *Ipomoea carnea* was introduced from South America for ornamental purposes in 1932 (Austin, 1977) and is currently recognized as a naturalized species along the water courses in the Nile Delta (Shaltout et al., 2010). The aggressive invader *Prosopis juliflora* was introduced to the southeastern part of Egypt in 1952, for timber and charcoal production (Draz, 1954). Moreover, *Dalbergia sissoo* was introduced as a source of timber and for ornamental purposes (Keshta,

2010). *Eichhornia crassipes* was introduced into Egypt in the 1890's as an ornamental plant in public gardens at that time (Täckholm & Drar, 1950). Now the plant grows everywhere in the Nile and its Delta. It is the most dangerous aquatic weed in the study area. It infests all water courses with large cover and causes major problems such as restricting water flow transpiring high amounts of water, hindering navigation, and fishing and providing many vectors of human diseases (Ilaco, 1985; Khattab, 1988).

Three endemic taxa were recorded in the present list, namely*: Anthemis microsperma, Sonchus macrocarpus* and *Thesium humile* var. *maritima*. Although *Thesium humile* is an annual species grows in the subtropical biome, and its native range is Canary islands, Mediterranean to west Iran and Arabian peninsula (POWO, 2023), many studies in Egypt confirmed that *Thesium humile* var. *maritima* is a variety endemic to Egypt (Boulos, 1999 , 2009; El-Hadidi & Hosni, 2000; El-Khalafy et al., 2021; Shaltout et al., 2023).

Included in the present list are seven species which were recorded for the first time in the area of Alexandia city: *Sesuvium portulacastrum*, *Hydrocotyle umbellata, Nicotiana glutinosa*, *Salvinia auriculata, Samolus valerandi, Cenchrus purpureus,* and *Commelina erecta.* Three of them "*Nicotiana glutinosa, Sesuvium portulacastrum,* and *Commelina erecta* are considered new record species. Further future studies should be carried out to monitor the new records in the study area. Also, we may conclude that if any species has not been recorded in the flora of an area for the last 50 years, and later detected, it will be considered as a new record species, while if the species is recorded again in a period less than 50 years, it will be considered as a revived species, but if the species completely disappeared, it will be considered as extinct in the wild (personal communication with Adel El-Gazzar, professor of plant taxonomy at Suez Canal University, Egypt).

The outcomes of the current study indicated that urban habitats under low urbanization intensity usually harbor a relatively higher richness of native species; therefore, they ought to be considered for the implementation of proper conservation measures. This is consistent with the results of Heneidy et al. (2021) which stated that the range of habitats suitable for native species conservation was probably wider and more continuous in the less urbanized sites than in the urbanized ones. Fragmentation of habitats or their complete loss may be considered key factors in endangering current flora in Alexandria city. Moreover, rapid urbanization in Alexandria over the last decade caused a detectible decrease in green areas. The current study's findings could be useful for the conservation of the urban flora of Alexandria city. Further future studies are also recommended to be conducted for monitoring the newly recorded species in the study area.

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قائمة حديثة لفلورة الموائل الحضرية لمدينة الاسكندرية تكشف عن أنواع جديدة وأنواع متوطنة: متضمنة أولويات الحفظ

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لا يزال حتى الآن لا يعرف الا القليل عن تركيب وتوزيع الغطاء النباتي في منطقة البحر الأبيض المتوسط، خاصة فلورة المناطق الحضرية. وحتى وقت قريب كانت الأنماط البيئية والتطورية على المستوى الاقليمي لا تحظى بالاهتمام، حيث كانت جهود الحفظ تهتم غالبا بالأنواع وموائلها الطبيعية. اهتمت الدراسة الحالية بتسجيل الأنواع النباتية الموجودة في المناطق الحضرية بالاضافة للملاحظات الميدانية في مدينة الاسكندرية. وتعتبر هذه هي الدراسة الأولى لتوثيق النباتات الحضرية بمدينة الاسكندرية. وقد تم تسجيل الأنواع النباتية وطرز الحياة المختلفة لها. حيث تم تسجيل 338 نوعا نباتيا في منطقة الدراسة، 50% منها نباتات حولية، وحوالي 19% أنواع يتم زراعتها لأغراض الزينة. كما تم تسجيل ثلاثة أنواع متوطنة في الموائل الحضرية بالمدينة وهي:
Anthemis microsperma Boiss. & Kotschy, *Sonchus macrocarpus* Boulos & C. Jeffrey, *Thesium humile* var. *maritima* Simps. (N.D. Simpson) F.M. Saad .

وتم تسجيل 91 نوعا نباتيا دخيلا بنسبة 26.9%، منها ستة أنواع غازية . و لأول مرة يتم تسجيل سبعة أنواع جديدة في منطقة الدراسة، ثلاثة منها تعتبر أنواع جديدة لم يتم تسجيلها في الفلورة المصرية من قبل و هي: *Commelina erecta* L. ، *Sesuvium portulacastrum* (L.) L. ، *Nicotiana glutinosa* L.