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## EXOTIC SPECIES OF THE MARCHES REGION (CENTRAL ITALY) AND THEIR DISTRIBUTION IN DIFFERENT NATURAL VEGETATION TYPES

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**Abstract:** The present work lists the exotic species of the Marche Region (central Italy) and examines their distribution in the context of the main types of natural vegetation. The Marche Region extends from sea level (Adriatic Sea) to the peak of Monte Vettore, 2.476 m. To date, 349 exotic taxa have been reported in this region. The flora of the Marche Region comprises about 2.750 species, 12.7% of which are exotic. The majority are distributed in anthropogenic environments, but in certain cases they are found in some types of natural vegetation, thus lowering the degree of naturalness of these environments.

**Keywords:** exotic species, Marche Region, naturalness of vegetation

### Introduction

The Marche Region (central Italy) extends from sea level (Adriatic Sea) to the peak of Monte Vettore, 2.476 m (in the Sibylline Mountains); the principal types of rocks throughout hilly sector are marly, arenaceous and argillaceous, while those of the mountain chains in the interior are calcareous.

The altitudinal belts in the Marche Region comprise Mediterranean (with vegetation of evergreen sclerophylls, predominantly *Quercus ilex* subsp. *ilex*), hilly (with thermophile deciduous vegetation predominantly of *Quercus pubescens* s.l. and *Ostrya carpinifolia*, according to substrate), montane (with mesophile deciduous vegetation, predominantly of *Fagus sylvatica* subsp. *sylvatica*), subalpine (with vegetation of subalpine scrub of *Rhamnus alpina* subsp. *alpina*, *Juniperus communis* subsp. *alpina*, etc.) and high Apennine (with vegetation of meadows of *Sesleria juncifolia* subsp. *juncifolia*, syn. *S. apennina*).

The aim of this study was to present the list of the exotic species of the Marche Region, and to examine the variations that have occurred since the first reports [15] and consequent impact on the spontaneous vegetation. Throughout Italy and across Europe there has been a progressive increase of these species [19], with a reduction in the degree of naturalness of the vegetation; particularly important in this regard are invasive species [20], which have often wrought changes to the landscape as well.

### Materials and Methods

The list of the exotic taxa of the Marche Region (see Appendix) was compiled on the basis of information in the literature [1-7, 9, 11, 13, 15, 17, 21-25], completed with personal observations. For each taxon the complete Latin name is recorded according to [8] and [12] and often the synonyms.

### Results and Discussion

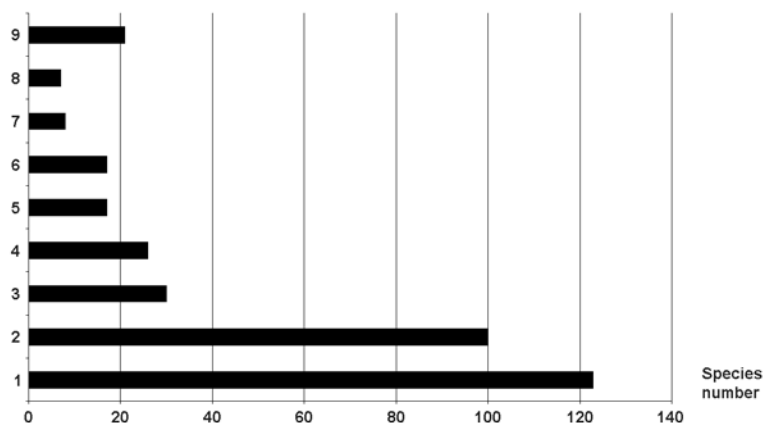
To date, 349 exotic plant entities have been found in the Marche Region, 77 more than the number reported previously [25]. These entities belong to 82 families and 234 genera. The

families *Asteraceae* (45), *Fabaceae* (26), *Poaceae* (26), *Rosaceae* (22), *Solanaceae* (19), *Brassicaceae* (17) and *Amaranthaceae* (12) are among the best represented.

Considering that the entities known to date for the Marche Region are about 2.750, it follows that 12.7% are exotic. In comparison, the regions close to the Marche have the following values: Lazio has 301 exotic entities, equivalent to 9.9% of the overall flora, Abruzzo has 218, equivalent to 6.8%, and Umbria has 142, equivalent to 5.7 %.

Regarding the **biological forms**, the following results were obtained: therophytes 136 entities equivalent to 38.97%, phanerophytes 81 equivalent to 23.20%, hemicryptophytes 59 equivalent to 16.91%, geophytes 42 equivalent to 12.03%, chamaephytes 21 equivalent to 6.2%, nanophanerophytes 9 equivalent to 2.58%, helophytes 1 equivalent to 0.29%. The prevalence of the therophytes is evident, given that these species adapt well to environments subjected to disturbance, such as urban areas, uncultivated and cultivated lands, and ruderal zones. The phanerophytes, on the other hand, including *Robinia pseudoacacia*, *Ailanthus glandulosa*, *Acer negundo* and others, are widespread on the edges of wooded areas and at times inside the woods. The elimination of forest vegetation and the transformation of areas thus obtained into agricultural areas, the opening of clearings and the uprooting of forests promote the diffusion of neophytes, particularly among them the therophytes.

Figure 1 shows the **chorological spectrum** of the 349 exotic species, based on the area of origin of the various species, which have the following provenance: 26 from the Mediterranean region, equivalent to 7.45%, 17 from Europe, equivalent to 4.87%, 100 from Asia, equivalent to 28.65%, 30 from Europe-Asia equivalent to 8.6%, 17 from Africa, equivalent to 4.87%, 7 from Africa-Asia equivalent to 2.29%, 123 from America equivalent to 35.24%, 8 from other geographic areas, equivalent to 2.01% and 21 with uncertain, unknown or hybrid origin, equivalent to 6.07%.

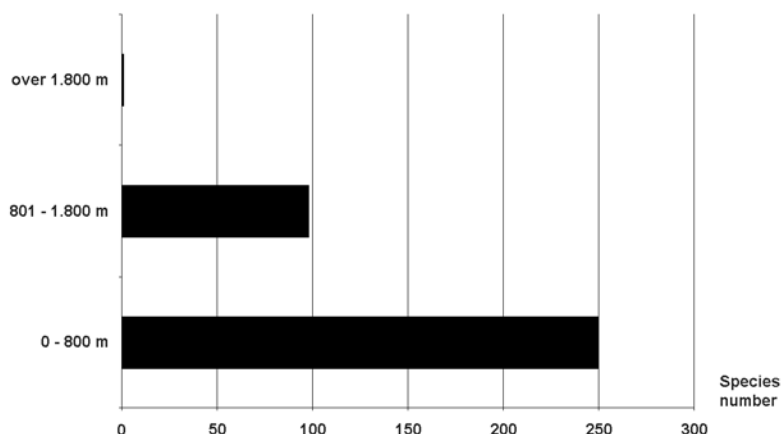


**Fig. 1: Chorological spectrum of the original distribution area of exotic species of Marche**  
**Region:** 1 - America; 2 - Asia; 3 - Europe-Asia; 4 - Mediterranean region; 5 - Europe; 6 - Africa; 7 - different geographical areas; 8 - Africa-Asia; 9 - unknown.

**The distribution** of exotic species can be examined from different points of view. In function of their capacity of dispersal [20], they can be divided as follows: 26 are considered invasive (*Robinia pseudoacacia*, *Ailanthus altissima*, *Amaranthus cruentus*, etc.), 141 have a considerable distribution and 182 are sporadic or rare.

In terms of altitude, from the diagram in Fig. 2 one can note that the majority of these exotic taxa (250) grow between 0 and 800 m, in other words in the hilly belt, where great deforestation has taken place and the land has since been used almost exclusively for farming, with ever-new forms of intervention carried out on the environment with consequent anthropization. There are almost a third fewer neophytes (98) at higher altitudes (800–1800 m),

that is, in the montane belt, where these transformations have been less dramatic than in the hilly zone. Above 1800 m, the only exotic species present is *Onobrychis viciifolia*.



**Fig. 2: Altitudinal distribution of exotic species in the Marche Region.**

These entities develop in various types of vegetation; the majority of them (144) are present in hilly and montane anthropogenic environments, 101 are found as urban ruderal vegetation, 25 in the vegetation of the coastal belt (beaches and dunes) and high coasts (the cliffs of Colle S. Bartolo and Monte Conero), 36 in woods, hedges and scrub (*Quercetalia pubescentis* and *Fagetalia*), 11 in secondary meadows (*Brometalia*), and one in primary meadows (*Seslerietalia apenninae*).

In terms of their diffusion in the various environments and types of vegetation, for the moment there are data about a few large categories; those habitats with the greatest number of neophytes are the anthropogenic environments (uncultivated and ruderal areas, roads, walls, etc.) and urban areas (towns, parks and public gardens, fields, vegetable gardens, and fields of lucerne). Fewer species are able to establish themselves in woods, scrub and hedges in the coastal zone and in wet environments. The montane meadows and grazing lands are the least affected, being less susceptible to invasion because of the dense and compact herb layer.

### Concluding considerations

The current number of exotic species found in the Marche (349 taxa) is destined to increase continually as the years go on. The majority of these species is distributed above all in anthropogenic environments, but in many cases they are also found in some types of natural vegetation, where they necessarily reduce the degree of naturalness. In this context, one can observe that the evaluation of the presence of adventive species in certain types of vegetation can serve to establish a degree of naturalness of the vegetation of a given zone (see [10] for an example in Poland). For the Trentino-Alto Adige Region (northern Italy), it was possible to establish 6 degrees of naturalness corresponding to major complexes of vegetation (high altitude, forest, meadow, forests mixed with meadows, nitrophilous vegetation infesting crops, ruderal vegetation); one notes that the number of neophytes grows progressively from the complexes of high altitude vegetation through the complexes characterized by mowable meadows, to the complexes characterized by agricultural zones and urban centres; these complexes have been mapped on a scale of 1:250.000 obtaining a "Naturalness Vegetation Map" [14, 16]. With further research, it will be possible to produce an analogous cartographic synthesis for the Marche Region as well.

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## SPECII EXOTICE DIN REGIUNEA MARCHE (ITALIA CENTRALĂ) ȘI DISTRIBUȚIA LOR ÎN TIPURILE DE VEGETAȚIE NATURALĂ

## (Rezumat)

Lucrarea de față prezintă lista speciilor de plante vasculare exotice care se regăsesc spontan în Regiunea Marche (Italia) și examinează distribuția acestora pe mari tipuri de vegetație naturală. Regiunea Marche se extinde altitudinal, de la nivelul Mării Adriatice până la vârful Muntelui Vettore (2476 m). Până în prezent au fost semnalati 349 de taxoni exotici, adică 12,7 % din flora Regiunii Marche ce cuprinde 2750 de taxoni. Majoritatea plantelor exotice se întâlnesc în habitate de origine antropică, dar apar uneori și în unele formațiuni de vegetație naturală, micșorându-le astfel gradul de naturalitate.

## Appendix (list of exotic vascular plant species occurring in the Marche Region, Italy)

- Acanthus mollis* L. (Acanthaceae)  
*Acer negundo* L. (Aceraceae)  
*Achillea filipendulina* Lam. (*A. eupatorium* Bieb.) (Asteraceae)  
*Aesculus hippocastanum* L. (Hippocastanaceae)  
*Agave americana* L. (Agavaceae)  
*Ailanthus altissima* (Mill.) Swingle (*A. glandulosa* Desf.) (Simaroubaceae)  
*Albizia julibrissin* (Willd.) Durazzo (Fabaceae)  
*Alcea biennis* Winterl. (*A. pallida* (Willd.) Waldst et Kit subsp. *pallida*) (Malvaceae)  
*Alcea rosea* L. (*Althaea r.* (L.) Cav.) (Malvaceae)  
*A. setosa* (Boiss.) Alef. (Malvaceae)  
*Allium cepa* L. (Alliaceae)  
*A. sativum* L. (Alliaceae)  
*Amaranthus albus* L. (Amaranthaceae)  
*A. blitoides* S. Watson (Amaranthaceae)  
*A. caudatus* L. (Amaranthaceae)  
*A. cruentus* L. (*A. hybridus* L. subsp. *cruentus* (L.) Thell.; *A. hybridus* L. p.p.; *A. paniculatus* L.; *A. chlorostachys* Willd. s. s.; *A. patulus* Bertol.) (Amaranthaceae)  
*A. deflexus* L. (*Albersia deflexa* (L.) Fourr.; *Euxolus deflexus* (L.) Rafin.) (Amaranthaceae)  
*A. graecizans* L. (Amaranthaceae)  
*A. hypocondriacus* L. (*A. chlorostachys* Willd. var. *erythrostachys* (Moq.) Aellen) (Amaranthaceae)  
*A. polygonoides* L. (Amaranthaceae)  
*A. retroflexus* L. (*A. delilei* Loret; *A. strictus* Ten.) (Amaranthaceae)  
*A. tricolor* L. (Amaranthaceae)  
*A. tuberculatus* (Moq.) J.D. Sauer (Amaranthaceae)  
*Ambrosia artemisiifolia* L. (*Ambrosia elatior* L.) (Asteraceae)  
*A. coronopifolia* Torrey et Gray (Asteraceae) (*A. psilostachya* A. Gray, non DC.)  
*A. trifida* L. (Asteraceae)  
*Amorpha fruticosa* L. (Fabaceae)  
*Anemone pavonina* Lam. (Ranunculaceae)  
*Anethum graveolens* L. (Apiaceae)  
*Anredera cordifolia* Ten. (Basellaceae)  
*Anthriscus cerefolium* Hoffm. (*Chaerophyllum c.* Schinz. et Thell.) (Apiaceae)  
*Antirrhinum majus* L. subsp. *majus* (Scrophulariaceae)  
*A. majus* L. subsp. *tortuosum* (Bosc. ex Lam.) Rouy (*A. australe* Rothm.) (Scrophulariaceae)  
*Apios americana* Medik. (*A. tuberosa* Moench) (Fabaceae)  
*Aptenia cordifolia* (L. f.) Schwantes (*Mesembryanthemum c.* L. f.; *Litocarpus c.* (L. f.) L. Bolus; *Tetracoilanthus c.* (L. f.) Rappa et Camarrone) (Aizoaceae)  
*Araujia sericifera* Brot. (*A. albens* G. Don; *Physianthus albens* Martius) (Asclepiadaceae)  
*Armoracia rusticana* P. Gaertn., B. Mey. et Scherb. (Brassicaceae)  
*Artemisia absinthium* L. (Asteraceae)  
*A. verlotiorum* Lam. (Asteraceae)  
*Arundo donax* L. (Poaceae)  
*Aster x versicolor* Willd. (*Aster laevis* L. x *A. novi-belgii* L.) (Asteraceae)

- Atriplex hortensis* L. (*Chenopodiaceae*)  
*Aurinia saxatilis* (L.) Desv. subsp. *saxatilis* (*Brassicaceae*)  
*Avena sativa* L. (s.l.) (*Poaceae*)  
*Balsamita major* Desf. (*Chrysanthemum balsamita* L.; *Tanacetum b.* L.) (*Asteraceae*)  
*Bassia scoparia* (L.) A.J. Scott (*Kochia scoparia* (L.) Schrad.; incl. var. *trichophylla* (Hort.) ex Voss.) (*Chenopodiaceae*)  
*Bergenia crassifolia* (L.) Fritsch (*B. bifolia* Moench; *Saxifraga c.* L.) (*Saxifragaceae*)  
*Beta vulgaris* L. subsp. *vulgaris* (*Chenopodiaceae*)  
*Bidens aurea* (Aiton) Sherff (*Asteraceae*)  
*B. connata* Muhl. ex Willd. (*Asteraceae*)  
*B. frondosa* L. (*B. melanocarpa* K.M.Wiegand) (*Asteraceae*)  
*B. subalternans* DC. (*Asteraceae*)  
*Brassica napus* L. subsp. *napus* (*Brassicaceae*)  
*B. nigra* (L.) W.D.J. Koch (*Sinapis n.* L.) (*Brassicaceae*)  
*B. oleracea* L. (*Brassicaceae*)  
*B. rapa* L. (incl. *B. campestris* L.) (*Brassicaceae*)  
*Broussonetia papyrifera* (L.) Vent. (*Moraceae*)  
*Buddleja davidii* Franchet (*Buddlejaceae*)  
*Calendula officinalis* L. (*Asteraceae*)  
*Campis radicans* (L.) Seem. (*Tecoma r.* (L.) Juss.) (*Bignoniaceae*)  
*Cannabis sativa* L. (*Cannabaceae*)  
*Carpobrotus acinaciformis* (L.) L. Bolus (*Mesembryanthemum acinaciforme* L.) (*Aizoaceae*)  
*C. edulis* (L.) N.E. Br (*Mesembryanthemum e.* L.; *M. acinaciformis* L. var. *edule* L.) (*Aizoaceae*)  
*Carthamus tinctorius* L. (*Asteraceae*)  
*Catalpa bignonioides* Walt. (*Bignoniaceae*)  
*Celosia argentea* L. (incl. var. *cristata* (L.) O. Kuntze) (*C. cristata* L.) (*Amaranthaceae*)  
*Cenchrus incertus* Curtis (*C. pauciflorus* Benth) (*Poaceae*)  
*Cerastium biebersteinii* DC. (*Caryophyllaceae*)  
*Ceratochloa cathartica* (Vahl) Herter (*Bromus catharticus* Vahl; *B. willdenowii* Kunth; *B. uniolooides* (Willd.) Humb. et Kunth; *Ceratochloa u.* (Willd.) Beauv.) (*Poaceae*)  
*Cerastostigma plumbaginoides* Bunge (*Plumbaginaceae*)  
*Chaenomeles japonica* (Thunb.) Spach (*Rosaceae*)  
*Chamaesyce humifusa* Willd. (*Euphorbia h.* Willd.; *E. polygonisperma* Gren. et Godr.) (*Euphorbiaceae*)  
*C. maculata* (L.) Small. (*Euphorbia m.* L.; *E. thymifolia* auct.) (*Euphorbiaceae*)  
*C. nutans* Lag. (*Euphorbia n.* Lag.; *E. preslii* Guss.) (*Euphorbiaceae*)  
*C. prostrata* (Aiton) Small (*Euphorbia p.* Aiton) (*Euphorbiaceae*)  
*Chenopodium ambrosioides* L. (*C. anthelminticum* L.) (*Chenopodiaceae*)  
*C. multifidum* L. (*Roubiaeva multifida* (L.) Moq.) (*Chenopodiaceae*)  
*Chloris pichnothrix* Trin. (*Poaceae*)  
*Cicer arietinum* L. (*Fabaceae*)  
*Cichorium endivia* L. subsp. *endivia* (*Asteraceae*)  
*Citrullus lanatus* (Thunb.) Mansfeld (*Cucumis citrullus* Ser.; *C. vulgaris* Schrad.) (*Cucurbitaceae*)  
*Cleome spinosa* Jacq. (*Capparidaceae*)  
*Cochlearia officinalis* L. (*Brassicaceae*)  
*Conyza bonariensis* (L.) Cronq. (*C. ambigua* DC.; *Erigeron linifolius* Willd.; *E. crispus* Pourr.) (*Asteraceae*)  
*C. canadensis* (L.) Cronq. (*Erigeron c.* L.) (*Asteraceae*)  
*C. sumatrensis* (Retz.) E. Walker (*C. albida* Willd. ex Spreng.; *C. naudinii* Bonnet; *C. floribunda* Kunth; *Erigeron n.* (Bonnet) Bonnier) (*Asteraceae*)  
*Coriandrum sativum* L. (*Apiaceae*)  
*Coronopus didymus* (L.) Sm. (*Senebiera coronopifolia*; *S. pinnatifida* DC.) (*Brassicaceae*)  
*Cortaderia selloana* (Schult.) Asch. et Graebn. (*Poaceae*)  
*Corylus maxima* Mill. (*Corylaceae*)  
*Cosmos bipinnatus* Cav. (*Asteraceae*)  
*Crataegus azarolus* L. (*Rosaceae*)  
*C. crus-galli* L. (*Rosaceae*)  
*Crepis sancta* (L.) Babc. subsp. *nemausensis* (P. Fourn.) Babc. (*Asteraceae*)  
*Crocus sativus* L. (*Iridaceae*)  
*Cucumis melo* L. (*Cucurbitaceae*)  
*Cucumis sativus* L. (*Cucurbitaceae*)  
*Cucurbita maxima* Duchesne (*Cucurbitaceae*)

- C. pepo* L. (*Cucurbitaceae*)  
*Cupressus sempervirens* L. (incl. f. *sempervirens* et f. *horizontalis*) (*Cupressaceae*)  
*Cuscuta campestris* Yuncher (*Convolvulaceae*)  
*C. epilinum* Weihe (*Convolvulaceae*)  
*C. suaveolens* Ser. (*Convolvulaceae*)  
*Cycloloma atriplicifolia* (L.) Schrader (*Chenopodiaceae*)  
*Cydonia oblonga* Mill. (*Pyrus* c. L.; *C. vulgaris* Pers.) (*Rosaceae*)  
*Cynara cardunculus* L. subsp. *scolymus* (L.) Hayek (*Asteraceae*)  
*Cyperus difformis* L. (*Cyperaceae*)  
*C. eragrostis* Lam. (*C. vegetus* Willd.) (*Cyperaceae*)  
*C. glomeratus* L. (*Cyperaceae*)  
*C. involucratus* Rothb. (*Cyperaceae*)  
*Cyrtomium falcatum* (L. f.) C. Presl (*Dryopteridaceae*)  
*Datura ferox* L. (*Solanaceae*)  
*D. innoxia* Mill. (*D. metel* auct. fl. ital., non L.) (*Solanaceae*)  
*D. stramonium* L. (incl. var. *tatula* (L.) Fiori) (*Solanaceae*)  
*Dicentra spectabilis* (L.) Lemaire (*Papaveraceae*)  
*Dichondra micrantha* Urban (*Convolvulaceae*)  
*Dinebra retroflexa* (Vahl) Panzer (*D. arabica* P. Beauv.; *Cynosurus retroflexus* Vahl) (*Poaceae*)  
*Diospyros lotus* L. (*Ebenaceae*)  
*Elaeagnus angustifolia* L. (*Elaeagnaceae*)  
*Eleusine indica* (L.) Gaertn. (*E. tristachya* Schrank) (*Poaceae*)  
*Erigeron annuus* (L.) Pers. subsp. *septentrionalis* (Fernald et Wiegand) Wagenitz (*Asteraceae*)  
*E. karwinskyanus* DC. (*Asteraceae*)  
*Eriobotrya japonica* (Thumb.) Lindl. (*Pyrus* j. Thunb.) (*Rosaceae*)  
*Eruca vesicaria* (L.) Cav. *sativa* (Mill.) Thell. (*E. sativa* Mill. subsp. *sativa*) (*Brassicaceae*)  
*Eryngium creticum* Boiss. (*Apiaceae*)  
*Erysimum cheiri* (L.) Crantz (*Cheiranthus* c. L.; *E. suffruticosum* Spreng.) (*Brassicaceae*)  
*Eschscholzia californica* Cham. (*Papaveraceae*)  
*Euonymus japonicus* L. f. (*Celastraceae*)  
*Euphorbia lathyris* L. (*Euphorbiaceae*)  
*E. marginata* Pursh (*E. variegata* Sims.) (*Euphorbiaceae*)  
*Fallopia baldschuanica* (Regel) Holub (*F. aubertii* (L. Henry) Holub; *Bilderdykia a.* (L. Henry) Moldenke; *Polygonum a.* L. Henry) (*Polygonaceae*)  
*Foeniculum vulgare* Mill. subsp. *vulgare* var. *vulgare* (*Apiaceae*)  
*Fragaria x ananassa* Duchesne (*Rosaceae*)  
*F. virginiana* Duchesne (*Rosaceae*)  
*Galinsoga ciliata* (Rafin.) S.F. Blake (*G. quadriradiata* Ruiz et Pavon subsp. *hispida* (DC.) Thell.) (*Asteraceae*)  
*G. parviflora* Cav. (*Asteraceae*)  
*Glandularia x hybrida* (Grönland et Rümpler) Nesom et Pruski (*Verbena x h.* Grönland et Rümpler) (*Verbenaceae*)  
*Glebionis coronaria* (L.) Spach (*Chrysanthemum* c. L.) (*Asteraceae*)  
*Gleditsia triacanthos* L. (*Fabaceae*)  
*Glycine max* (L.) Merr. (*G. soja* Hort., non Sieb. et Zucc.; *Soja hispida* Moench) (*Fabaceae*)  
*Guizotia abyssinica* (L. f.) Cass. (*Asteraceae*)  
*Gypsophila paniculata* L. (*Caryophyllaceae*)  
*Helianthus annuus* L. (incl. ibridi e sp. pl.) (*Asteraceae*)  
*H. pauciflorus* Nutt. subsp. *pauciflorus* (*H. rigidus*) (*Asteraceae*)  
*H. tuberosus* L. (*Asteraceae*)  
*Hemerocallis fulva* L. (*Liliaceae*)  
*Hibiscus syriacus* L. (*Malvaceae*)  
*H. trionum* L. (*H. ternatum* Cav.) (*Malvaceae*)  
*Hordeum distichon* L. (*Poaceae*)  
*Hordeum vulgare* L. (*Poaceae*)  
*Hyacinthoides hispanica* (Mill.) Rothm. (*Scilla* h. Mill.; *Endymion hispanicum* (Mill.) P. Fourn.) (*Hyacinthaceae*)  
*H. non-scripta* (L.) Chourard ex Rothm. (*Hyacinthaceae*)  
*Hyacinthus orientalis* L. (*Hyacinthaceae*)  
*Hyosциamus niger* L. (*Solanaceae*)  
*Hypericum calycinum* L. (*Hypericaceae*)  
*Impatiens balfourii* Hook. f. (*Balsaminaceae*)  
*I. balsamina* L. (*Balsaminaceae*)

- Ipheion uniflorum* (R.C. Graham) Raf. (*Triteleia u.* Lindl.) (*Alliaceae*)  
*Ipomoea purpurea* Roth (*Convolvulaceae*)  
*Iris germanica* L. (*Iridaceae*)  
*I. pallida* Lam. s. s. (*Iridaceae*)  
*Isatis tinctoria* L. (*Brassicaceae*)  
*Jasminum nudiflorum* Lindley (*Oleaceae*)  
*J. officinale* L. (*Oleaceae*)  
*Juglans nigra* L. (*Juglandaceae*)  
*Juglans regia* L. (*Juglandaceae*)  
*Juncus tenuis* Willd. (*Juncaceae*)  
*Kerria japonica* (L.) DC. (*Rosaceae*)  
*Lactuca sativa* L. (*Asteraceae*)  
*Lagenaria siceraria* (Molina) Standley (*L. vulgaris* Ser.) (*Cucurbitaceae*)  
*Lathyrus sativus* L. (*L. cicera* L. var. *sativus* L.) (*Fabaceae*)  
*Lens culinaris* Medik. (*L. esculenta* Moench; *Vicia l.* (L.) Coss. et Germ.; *Ervum l.* L.) (*Fabaceae*)  
*Lepidium sativum* L. (*Brassicaceae*)  
*Lepidium virginicum* L. (*Brassicaceae*)  
*Leucanthemum maximum* (Ramond) DC. (*Chrysanthemum m.* Ramond s.s.) (*Asteraceae*)  
*Ligustrum lucidum* Ait. (*Oleaceae*)  
*Lilium candidum* L. (*Liliaceae*)  
*Linum usitatissimum* L. (*Linaceae*)  
*Lonicera japonica* Thunb. (*Caprifoliaceae*)  
*Lunaria annua* L. subsp. *annua* (*Brassicaceae*)  
*Lupinus albus* L. (*L. termis* Forsskål) (*Fabaceae*)  
*Lychnis chalcedonica* L. (*Caryophyllaceae*)  
*Lycium chinense* Mill. (*Solanaceae*)  
*L. europaeum* L. (*Solanaceae*)  
*Lycopersicon esculentum* Mill. (*Solanum lycopersicum* L.) (*Solanaceae*)  
*Maclura pomifera* (Rafin.) C.K. Schneid. (*Toxylon p.* Raf.; *M. aurantiaca* Nutt.) (*Moraceae*)  
*Mahonia aquifolium* (Pursh) Nutt. (*Berberidaceae*)  
*Malus domestica* (Borkh.) Borkh. (*Rosaceae*)  
*Mantisalca salmantica* (L.) Briq. et Cavill. (*Centaurea s.* L.) (*Asteraceae*)  
*Matricaria chamomilla* L. (*Asteraceae*)  
*M. discoidea* DC. (*M. suaveolens* auct., non L.; *M. matricarioides* (Less.) Porter; *Chamomilla suaveolens* (Pursh) Rydb.) (*Asteraceae*)  
*Melia azedarach* L. (*Meliaceae*)  
*Melissa officinalis* L. subsp. *officinalis* (*Lamiaceae*)  
*Mentha x piperita* L. (*M. aquatica* L. x *M. spicata* L.) (*Lamiaceae*)  
*M. spicata* L. *M. sylvestris*; *M. longifolia* var. *mollissima* Borkh. ex G. Gaertn.; B. Mey. et Scherb.; *M. longifolia* var. *molligiona* Borck; *M. sylvatica* var. *nemorosa* Willd.) (*Lamiaceae*)  
*Mespilus germanica* L. (incl. *M. germanica* L. var. *sylvestris* Goir) (*Rosaceae*)  
*Mirabilis jalapa* L. (*Nyctaginaceae*)  
*Morus alba* L. (*Moraceae*)  
*Myogalum nutans* (L.) Link (*Ornithogalum n.* L.) (*Hyacinthaceae*)  
*Narcissus pseudonarcissus* L. ( *Aiex p.-n.* Hawort) (*Amaryllidaceae*)  
*N. x incomparabilis* Mill. (*N. pseudonarcissus* L. x *N. poeticus* L.) (*Amaryllidaceae*)  
*N. x medioluteus* Mill.) (*N. poeticus* L. x *N. tazetta* L.) (*N. biflorus* Curtis) (*Amaryllidaceae*)  
*Nicandra physalodes* (L.) Gaertn. (*Solanaceae*)  
*Nicotiana glauca* R. Graham (*Solanaceae*)  
*N. rustica* L. (*Solanaceae*)  
*Oenothera adriatica* Soldano (*Onagraceae*)  
*O. biennis* L. (*Onagraceae*)  
*O. glazoviana* Micheli (*Oe. erythrosepala* Borbás; *Oe. lamarckiana* auct., non Ser.) (*Onagraceae*)  
*O. oakesiana* (A. Gray) Robbins ex S. Wats. et Coult. (*O. syrticola* Bartlett) (*Onagraceae*)  
*O. stucchii* Soldano (*Onagraceae*)  
*O. suaveolens* Desf. ex Pers. (*Onagraceae*)  
*Omphalodes linifolia* (L.) Moench (*Boraginaceae*)  
*Onobrychis viciifolia* Scop. (*Fabaceae*)  
*Opuntia ficus-indica* (L.) Mill. (*O. ficus-barbarica* A. Berger) (*Cactaceae*)



- O. humifusa* (Raf.) Raf. (*O. vulgaris* Mill.; *O. compressa* (Salisb.) Mcbride; *O. italica* Ten.; *O. nana* Vis.) (Cactaceae)  
*Origanum majorana* L. (*Majorana hortensis* Moench; *O. paniculatum* Kock) (Lamiaceae)  
*Oxalis articulata* Savigny (Oxalidaceae)  
*O. debilis* Kunth (*O. corymbosa* DC.; *O. bowiei* Lind.) (Oxalidaceae)  
*O. stricta* L. (*O. dillenii* Jacq.; *O. europaea* Jord; *O. fontana* Bunge) (Oxalidaceae)  
*O. latifolia* Kunth (Oxalidaceae)  
*O. pes-caprae* L. (*O. cernua* Thunb.) (Oxalidaceae)  
*Paeonia suffruticosa* André (*P. arborea* Don.) (Paeoniaceae)  
*Panicum capillare* L. (Poaceae)  
*P. dichotomiflorum* Michx. (Poaceae)  
*P. miliaceum* L. (Poaceae)  
*Papaver somniferum* L. (Papaveraceae)  
*Parthenocissus inserta* (A. Kerner) Fritsch (Vitaceae)  
*P. quinquefolia* (L.) Planchon (Vitaceae)  
*P. tricuspidata* (Sieb. et Zucc.) Planchon (Vitaceae)  
*Paspalum dilatatum* Poir. (Poaceae)  
*P. paspaloides* (Michx.) Scribn. (*P. distichum* auct. fl. ital., non L.; *P. digitaria* Poir.; *P. distichum* L. subsp. *paspalodes* (Michx.) Thell.) (Poaceae)  
*Passiflora coerulea* L. (Passifloraceae)  
*P. incarnata* L. (Passifloraceae)  
*Paulownia tomentosa* (Spreng.) Steudel (Bignoniaceae)  
*Pennisetum villosum* R. Br. (*P. longistylum* auct.) (Poaceae)  
*Persicaria orientalis* (L.) Spach (*Polygonum orientale* L.) (Polygonaceae)  
*Petroselinum crispum* (Mill.) Fuss. (*P. hortense* auct.; *P. crispum* A. W. Hill; *P. sativum* Hoffm.) (Apiaceae)  
*Petunia nyctaginiflora* Juss. (Solanaceae)  
*P. violacea* Lindley (*P. integrifolia* (Hooker) Schinz et Thell.) (Solanaceae)  
*P. x hybrida* Hort. (*P. nyctaginiflora* Juss. x *P. violacea* Lindley) (Solanaceae)  
*Phacelia tanacetifolia* Benthham (Hydrophyllaceae)  
*Phalaris canariensis* L. (Poaceae)  
*Phaseolus vulgaris* L. (Fabaceae)  
*Phyla canescens* (Kunth) Greene (*Lippia c.* Kunth) (Verbenaceae)  
*Phyllostachys bambusoides* Sieb. et Zucc. (Poaceae)  
*P. mitis* A. et C. Rivi re (*Bambusa m.* Poir.) (Poaceae)  
*P. nigra* (Lodd.) Munro (Poaceae)  
*Physalis franchetii* Mast. (Solanaceae)  
*P. peruviana* L. (Solanaceae)  
*Phytolacca americana* L. (*P. decandra* L.) (Phytolaccaceae)  
*Pimpinella anisum* L. (Apiaceae)  
*Pistacia vera* L. (Anacardiaceae)  
*Pisum sativum* L. subsp. *sativum* (Fabaceae)  
*Pittosporum tobira* (Thunb.) Aiton f. (Pittosporaceae)  
*Platanus acerifolia* (Aiton) Willd. (*P. occidentalis* L. x *P. orientalis* L.) (*P. hybrida* Brot.) (Platanaceae)  
*Plumbago auriculata* Lam. (*P. capensis* Thunb.) (Plumbaginaceae)  
*Populus x canadensis* Moench (*P. nigra* L. x *P. deltoides* Marshall) (Salicaceae)  
*P. deltoides* Marshall (Salicaceae)  
*Portulaca grandiflora* Hooker (Portulacaceae)  
*P. oleracea* L. subsp. *sativa* (Haw.) Celak. (Portulacaceae)  
*Potentilla indica* (Jacks.) Th. Wolf (*Fragaria i.* Andrews; *Duchesnea i.* (Andrews) Focke) (Rosaceae)  
*Prunus armeniaca* L. (Rosaceae)  
*P. cerasifera* Ehrh. (incl. var. *pissardii* (Carri re) L.H. Bailey) (Rosaceae)  
*P. cerasus* L. (*C. vulgaris* Mill.) (Rosaceae)  
*P. domestica* L. subsp. *domestica* (Rosaceae)  
*P. domestica* L. subsp. *insitia* (L.) Bonnier et Layens (Rosaceae)  
*P. dulcis* (Mill.) D.A. Webb (*P. communis* Arcang., non Huds.; *Amygdalus c.* L.) (Rosaceae)  
*P. laurocerasus* L. (Rosaceae)  
*P. persica* (L.) Batsch (*Amygdalus p.* L.; *Persica vulgaris* Mill.) (Rosaceae)  
*Punica granatum* L. (Punicaceae)  
*Pyracantha angustifolia* (Franch.) C.K. Schneid. (Rosaceae)  
*P. crenulata* (G. D. Don) M. Roem. (Rosaceae)

- Pyrus communis* L. (*Rosaceae*)  
*Ranunculus asiaticus* L. (incl. var. *sanguineus* DC.) (*Ranunculaceae*)  
*Raphanus sativus* L. (*Brassicaceae*)  
*Reseda odorata* L. (*Resedaceae*)  
*Rhus coriaria* L. (*Anacardiaceae*)  
*R. typhina* L. (*Anacardiaceae*)  
*Ricinus communis* L. (*Euphorbiaceae*)  
*Robinia hispida* L. (*Fabaceae*)  
*R. pseudo-acacia* L. (*Fabaceae*)  
*Rubia tinctorum* L. (*Rubiaceae*)  
*Rumex cristatus* DC. (*R. graecus* Boiss. et Heldr.) (*Polygonaceae*)  
*Ruta graveolens* L. subsp. *graveolens* (*R.g.* subsp. *hortensis* (Mill.) Gams) (*Rutaceae*)  
*Salix babylonica* L. (*Salicaceae*)  
*S. viminalis* L. (*Salicaceae*)  
*Salpichroa organifolia* (Lam.) Baillon (*S. rhomboidea* (Gill. et Hook.) Miers.) (*Solanaceae*)  
*Salvia officinalis* L. (*Lamiaceae*)  
*S. splendens* Sellow. (*Lamiaceae*)  
*Satureja hortensis* L. (*Lamiaceae*)  
*Scilla hyacinthoides* L. (*Hyacinthaceae*)  
*Secale cereale* L. (*Poaceae*)  
*Sedum prealtum* DC. (*Crassulaceae*)  
*Senecio inaequidens* DC. (*Asteraceae*)  
*S. mikanioides* Otto ex Walp. (*Asteraceae*)  
*Setaria italica* (L.) Beauv. (*Poaceae*)  
*Sicyos angulatus* L. (*Cucurbitaceae*)  
*Sinapis alba* L. subsp. *alba* (*Brassicaceae*)  
*Sisymbrium orientale* L. (*Brassicaceae*)  
*Solanum aviculare* Forst. (*S. laciniatum* Forst. f.) (*Solanaceae*)  
*S. pseudocapsicum* L. (*Solanaceae*)  
*S. tuberosum* L. (*Solanaceae*)  
*Solidago canadensis* L. (*Asteraceae*)  
*S. gigantea* Aiton (*Asteraceae*)  
*Sophora japonica* L. (*Fabaceae*)  
*Sorghum bicolor* (L.) Moench (*S. vulgare* Pers.) (*Poaceae*)  
*S. halepense* (L.) Pers. (*Poaceae*)  
*Spinacia oleracea* L. (*Chenopodiaceae*)  
*Symphoricarpos albus* C. Koch (*S. albus* Blake; *S. racemosus* auct., non Michx) (*Caprifoliaceae*)  
*Symphotrichium lanceolatum* (Willd.) G.L. Nesom (*Aster lanceolatus* Willd.) (*Asteraceae*)  
*S. novi-belgii* (L.) G.L. Nesom (*Aster n.-b.* L.) (*Asteraceae*)  
*S. squamatum* (Spreng.) G.L. Nesom (*Aster s.* (Sprengel) Hieron.) (*Asteraceae*)  
*Symphytum asperum* Lepechin (*Boraginaceae*)  
*S. orientale* L. (*Boraginaceae*)  
*Syringa vulgaris* L. (*Oleaceae*)  
*Tamarix parviflora* DC. (*Tamaricaceae*)  
*Tanacetum parthenium* (L.) Sch. Bip. (*Asteraceae*)  
*Thuja orientalis* L. (*Cupressaceae*)  
*Tilia tomentosa* Moench (*Tiliaceae*)  
*Trifolium alexandrinum* L. (*Fabaceae*)  
*T. hybridum* L. subsp. *hybridum* (*Fabaceae*)  
*T. incarnatum* L. subsp. *incarnatum* (*Fabaceae*)  
*Trigonella foenum-graecum* L. (*Fabaceae*)  
*Tripleurospermum inodorum* Schultz Bip. (*T. perforatum* (Mèrat) Lainz; *Matricaria inodora* L., nom. illeg.; *M. perforata* Mèrat) (*Asteraceae*)  
*Triticum aestivum* L. (incl. cultivar sp. pl.) (*T. vulgare* Host) (*Poaceae*)  
*Tropaeolum majus* L. (*Tropaeolaceae*)  
*Tulipa agenensis* DC. (*T. oculus-solis* St. Amans.) (*Liliaceae*)  
*T. clusiana* DC. (*Liliaceae*)  
*T. gesneriana* L. (incl. *T. strangulata* Reb.) (*Liliaceae*)  
*T. praecox* Ten. (*T. oculus-solis* St. Amans. var. *praecox* Ten.) (*Liliaceae*)  
*Ulmus laevis* Pallas (*U. effusa* Willd.) (*Ulmaceae*)

*Veronica peregrina* L. (*Scrophulariaceae*)  
*V. persica* Poir. (*V. tournefortii* Gmelin; *V. buxbaumii* Ten.) (*Scrophulariaceae*)  
*Vicia ervilia* (L.) Willd. (*Ervum e.* L.) (*Fabaceae*)  
*V. faba* L. ( (*Faba vulgaris* Moench) (*Fabaceae*)  
*V. sativa* L. subsp. *sativa* (*Fabaceae*)  
*Vigna unguiculata* (L.) Walpers (*Fabaceae*)  
*Viola x wittrockiana* Gams (*V. hortensis* auct.; *V. tricolor* var. *h.* auct.) (*Violaceae*)  
*Vitis lambrusca* L. (*Vitaceae*)  
*V. vinifera* L. subsp. *vinifera* (*V. v.* subsp. *sativa* Hegi) (*Vitaceae*)  
*Wisteria floribunda* (Willd.) DC. (*W. multijuga* Van Houtte) (*Fabaceae*)  
*Wisteria sinensis* (Sims) Sweet (*Glycine s.* Sims) (*Fabaceae*)  
*Xanthium italicum* Moretti (*X. strumarium* L. subsp. *italicum* (Moretti) D. Löve) (*Asteraceae*)  
*Xanthium spinosum* L. (*Asteraceae*)  
*Yucca gloriosa* L. (*Agavaceae*)  
*Zea mays* L. (*Poaceae*)  
*Ziziphora capitata* L. (*Lamiaceae*)  
*Ziziphus ziziphus* (L.) Meikle (*Z. jujuba* Mill.; *Z. sativa* Gaertn.; *Z. vulgaris* Lam.) (*Rhamnaceae*)

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