Fl. Medit. 28: 259-278
doi: 10.7320/FlMedit28.259
Version of Record published online on 20 December 2018

João Domingues de Almeida

New additions to the exotic vascular flora of continental Portugal

AbstractNew additions to the exotic vascular flora of continental Portugal

Domingues de Almeida, J.: New additions to the exotic vascular flora of continental Portugal. — Fl. Medit. 28: 259-278. 2018. — ISSN: 1120-4052 printed, 2240-4538 online.

In this paper, based on mainly recent bibliography and some own field observations, 105 more taxa (neophytes) are added to the catalogue of the exotic (or xenophytic) naturalized or subspontaneous vascular flora of continental Portugal, which includes now 772 taxa (species, subspecies, varieties and hybrids), a growth corresponding to more than 15 % of the previous total number of 667 taxa, since our last reassessment, published in 2012 (Almeida & Freitas 2012), and our earlier surveys (Almeida & Freitas 2006; Almeida 1999).

Key words: Continental Portugal; exotic species; naturalized flora; neophytes; subspontaneous flora; vascular plants; xenophytes.

Introduction

After studying this subject for more than twenty years (since 1996), and given the importance of this kind of checklist, I thought it would be a good idea to update the list of the xenophytic flora of continental Portugal.

At the present time (2018), I conclude that the exotic naturalized or subspontaneous flora of continental Portugal includes now at least 772 neophytic taxa (species, subspecies, varieties and hybrids), 272 more than the number of 500 taxa attained at our original work on this theme (Almeida 1999).

As we have written before (Almeida & Freitas 2000; Almeida & Freitas 2001; Almeida & Freitas 2012), the expansion of exotic invasive plants is threatening the Portuguese native flora, representing a severe environmental problem, as it happens in many other parts of the World.

More than 100 years ago, Professor Robert Chodat already noticed: «C'est une des caractéristiques du Portugal que la grande abondance de mauvaises herbes d'origine étrangère» (Chodat 1913).

And, more recently, as Professor Werner Greuter so eloquently said: «Portugal has the reputation of being particularly "rich" in aggressive alien plants and that reputation is fully confirmed (...). From *Eucalyptus* to *Carpobrotus*, many naturalized exotics work together in putting the country's rich native flora at risk» (Greuter 2002).

Materials and methods

The species are arranged in alphabetic order. Classification used in this paper follows modern concepts: APG III (2009) and APG IV (2016) for the delimitation of families, Flora Iberica (Castroviejo & al., 1986–2019) for the majority of taxa, Greuter & von Raab-Straube (2006+, 2008), for the family *Compositae* (*Asteraceae*), and Tutin & al. (1980) for the family *Gramineae* (*Poaceae*). Ecological classification of the referred taxa follows Kornas (1990). Phytotypes or plant life-forms are given according to Raunkiaer classification (1934).

These 105 new taxa are mainly from recent (or ancient, in some cases) bibliographic references, but also from observations in the field and personal communications, and represent an increment of more than 15 % to the exotic flora of continental Portugal, since our last survey (667 taxa), published in 2012 (Almeida & Freitas 2012).

These 772 exotic taxa represent more than 20 % (more than one fifth) of the total number of taxa of the continental Portuguese vascular flora, which includes about 3800 taxa (species, subspecies, varieties and hybrids), according to our recent estimations (Almeida 2009; Almeida & Freitas 2012).

Results

1. ***Acer campestre*** L. (*Sapindaceae*)
Phanerophyte, from Eurasia, subspontaneous in Portugal: Beira Litoral, probably introduced in an accidental way, as an ornamental or for soil protection (Sánchez Gómez & Güemes 2015).

2. ***Adiantum raddianum*** C. Presl (*Pteridaceae*)
Hemicryptophyte, from Tropical America (Franco & Rocha Afonso 1971); epoecophyte, recently (2015) found naturalized in walls in Sintra, in the Portuguese province of Estremadura (Sánchez Gullón & al. 2017); already cited for continental Portugal by A. Lawalrée, revised by J. R. Akeroyd & A. M. Paul (1993) and by Christenhusz & von Raab-Straub (2013).

3. ***Aeonium arboreum*** (L.) Webb & Berthel. subsp. ***holochrysum*** (H.-Y. Liu) Bañares (= *Aeonium arboreum* (L.) Webb & Berthel. var. *holochrysum* H.-Y. Liu) (*Crassulaceae*)
Chamephyte or phanerophyte, from Macaronesia: Canary Islands; epoecophyte or diaphyte, introduced as an ornamental species, found subspontaneous at Estremadura: Setúbal, Portinho da Arrábida, for the first time in 1971 by A.R. Pinto da Silva, A.N. Teles and M.H. Ramos Lopes (Silva & al. 2015a; Silva & al. 2015b).

4. ***Agapanthus praecox*** Willd. sensu lato (*Amaryllidaceae*)
Geophyte, from South Africa; diaphyte, subspontaneous as a garden escape: Beira Litoral (Coimbra, 10.VII.1998, J.D. de Almeida 6, COI; own observ. & photos).

5. ***Agave americana*** L. var. ***marginata*** Trel. (*Amaryllidaceae*)
Hemicryptophyte, from North America; epoecophyte, escaped from ornamental culture,

naturalized in central and Southern Portugal: Algarve (Smith & Figueiredo 2007; Silva & al. 2015b).

6. ***Agave americana*** L. subsp. ***americana*** × ***Agave salmiana*** Otto ex Salm-Dyck var. ***salmiana*** (*Amaryllidaceae*)
Hemicryptophyte, of hybrid origin; epoecophyte, escaped from ornamental culture, naturalized in Southern Portugal: Algarve (Smith & Figueiredo 2007).

7. ***Ageratina ligustrina*** (DC.) R. M. King & H. Robinson (= *Eupatorium ligustrinum* DC.) (*Asteraceae*)
Phanerophyte; diaphyte, probably, from North America, recently (2015) found naturalized in Portugal: Sintra (province of Estremadura) (Sánchez Gullón & al. 2017).

8. ***Ageratina riparia*** (Regel) R. M. King & H. Robinson (= *Eupatorium riparium* Regel) (*Asteraceae*)
Hemicryptophyte; diaphyte, probably, from North America, recently (2017) found naturalized in Portugal: Sintra (province of Estremadura) (Sánchez Gullón & al. 2017).

9. ***Alisma gramineum*** Lejeune (*Alismataceae*)
Helophyte or Hydrophyte, from the Holoarctic Region; ephemerophyte or arvense epoecophyte, collected by F.C. Fontes, ca. 1955, in the ricefields of Coruche, province of Ribatejo (Talavera & Balao 2010).

10. ***Alocasia macrorrhizos*** (L.) G. Don (= *Arum macrorrhizon* L.) (*Araceae*)
Cryptophyte (geophyte); maybe an agriophyte, probably introduced as an ornamental plant, recently (2015) found in three localities of the littoral provinces of Beira Litoral and Douro Litoral (Verloove & Alves 2016).

11. ***Araucaria columnaris*** (G. Forst.) Hook. (= *Cupressus columnaris* G. Forster) (*Araucariaceae*)
Phanerophyte, from New Caledonia; epoecophyte, commonly cultivated in Portugal with natural regeneration (Franco 1943).

12. ***Artemisia arborescens*** L. (*Asteraceae*)
Phanerophyte, from the Mediterranean Region; agriophyte, already cited for several provinces of continental Portugal by Brotero (1804) and Mariz (1894), recently considered as an exotic species in the Iberian Peninsula by Benedí (2019).

13. ***Azolla cristata*** Kaulf. (*Azollaceae*)
Hydrophyte, from North America; agriophyte, naturalized in Portugal at least since 1920 (Pinto da Silva 1940; Vasconcellos 1940; Pinto da Silva & Rainha 1948; Reed 1962; Almeida 1986; Lawalrée & Jermy 1993; Christenhusz & von Raab-Straub 2013).

14. ***Baccharis spicata*** (Lam.) Baillon (= *Eupatorium spicatum* Lam.) (*Asteraceae*)
Phanerophyte, from South America; agriophyte, recently (2015) found naturalized in

Portugal, in the province of Douro Litoral (Plantas invasoras em Portugal 2017a; Verloove & al. 2017).

15. ***Campsis grandiflora*** (Thunb.) Schumann (= *Bignonia grandiflora* Thunb. = Tecoma *grandiflora* (Thunb.) Loisel.) (*Bignoniaceae*)
Phanerophyte, from Eurasia: China; diaphyte, subspontaneous in Beira Litoral: Coimbra (IX.2015, own observ. and photos) and Douro Litoral: Maia (2012, 2014, C.M. Silva, pers. comm.).

16. ***Cardamine oculta*** Hornem. (*Brassicaceae*)
Hemicryptophyte, from Asia, naturalized in many countries of Western Europe and the Western Mediterranean Region (Marhold 2009), recently found in Portugal (2011) in three littoral provinces: Beira Litoral, Douro Litoral and Minho (Verloove & Alves 2016).

17. ***Carthamus creticus*** L. (*Asteraceae*)
Therophyte, from the Mediterranean Region, endemic Mediterranean species, rarelly introduced in continental Portugal (López González 2014).

18. ***Carthamus lanatus*** L. (*Asteraceae*)
Therophyte, from the Mediterranean Region, endemic Mediterranean species, introduced in continental Portugal (López González 2014).

19. ***Casuarina cunninghamiana*** Miq. (*Casuarinaceae*)
Phanerophyte, from Australia; cultivated in Portuguese gardens and streets and rarely naturalized some provinces of continental Portugal: Alto Alentejo, Beira Litoral, Estremadura (Rocha Afonso 1990).

20. ***Casuarina stricta*** Aiton (*Casuarinaceae*)
Phanerophyte, from Australia; cultivated in Portuguese gardens and streets and rarely naturalized some provinces of continental Portugal: Algarve, Beira Litoral, Estremadura (Rocha Afonso 1990).

21. ***Cenchrus clandestinus*** (Chiov.) Morrone (= *Pennisetum clandestinum* Chiov.) (*Poaceae*)
Rhizomatous hemicryptophyte; diaphyte, recently (2015) found as a casual plant in a lawn at the province of Beira Litoral (Verloove & Alves 2016)

22. ***Centaurea solstitialis*** L. s. l. (*Asteraceae*)
Diaphyte; Therophye or Hemicriptophyte, from the Mediterranean Region; diaphyte, escaped from cultivation at the Botanical Garden of the University of Coimbra (Beira Litoral) (VII.2012, own observ. and photos).

23. ***Chaenomeles japonica*** (Thunb.) Lindley (*Rosaceae*)
Phanerophyte, from Eurasia; epoecophyte, introduced as an ornamental species, abundantly found in fruit, naturalized at Beira Litoral: Cantanhede (IX.2015, own observ. & photos).

24. ***Chlorophytum comosum*** (Thunb.) Jacques (*Asparagaceae*)
Geophyte, from Tropical and Southern Africa; epoecophyte, introduced as an ornamental species, was found forming a well-established population at Beira Litoral: Figueira da Foz, Quiaios, flowering near the margin of Lagoa das Braças (XI.2015, own observ. & photos).

25. ***Cichorium endivia*** L. (*Asteraceae*)
Therophyte, possibly from Asia; diaphyte, largely cultivated in continental Portugal (Mariz 1894; Greuter 2006+), and sometime escaped from cultivation in three Portuguese provinces: Baixo Alentejo, Beira Litoral and Estremadura (Talavera & Talavera 2017).

26. ***Cirsium scabrum*** (Poir.) Bonnet & Barratte (*Asteraceae*)
Hemicryptophyte, from the Mediterranean Region; epoecophyte, casually introduced, found naturalized at Beira Litoral: Coimbra, since 2011 (Carapeto 2016).

27. ***Citrullus lanatus*** (Thunb.) Matsum. & Nakai (*Cucurbitaceae*)
Therophyte, from Africa (Mabberley 2008); diaphyte, introduced as an edible plant for its succulent fruits (watermelons), recently (2015) found escaped from cultivation in the province of Beira Litoral (Verloove & Alves 2016).

28. ***Cotyledon orbiculata*** L. (*Crassulaceae*)
Chamephyte, from South Africa; diaphyte or epoecophyte, introduced as an ornamental species, found at Estremadura: Cascais, Malveira da Serra, by V. Silva, VIII.2014 (Silva & al. 2015a).

29. ***Crassula campestris*** (Eckl. & Zeyh.) Endl. (*Crassulaceae*)
Therophyte, from South Africa; epoecophyte, casually introduced, found at Algarve: Vilamoura, 14.I.2007, by D.J. Nicolle (E.J. Clement in Verloove & Sánchez Gullón, 2008).

30. ***Crassula ovata*** (Miller) Druce (*Crassulaceae*)
Chamaephyte; diaphyte, introduced as an ornamental plant, found escaped from cultivation at Estremadura: Oeiras, 1999, with other *Crassulaceae* (VI.1999, own observ. & photos).

31. ***Crataegus azarolus*** L. (*Rosaceae*)
Phanerophyte, from the Eastern Mediterranean Region (Franco 1968: 77), found as a cultivated, naturalized or perhaps native species at several Spanish provinces (Muñoz Garmendia & al. 1998); shrubby ornamental plant, rarelly cultivated in Portugal, possibly subspontaneous – one only individual fructifying in an oakwood at Estremadura: Torres Novas (Jorge Capelo in Facebook 31.VIII.2014).

32. ***Cucurbita moschata*** Duchesne (*Cucurbitaceae*)
Therophyte, from America (Mabberley 2008); diaphyte, introduced as an alimentar and medicinal plant, recently (2015) found escaped from cultivation in the province of Beira Litoral (Verloove & Alves 2016).

33. ***Cyathea*** sp. (*Cyatheaceae*)
Phanerophyte, from the Tropics; diaphyte, subspontaneous or escaped from cultivation in Estremadura: Serra de Sintra: "Monserrate vs. Tapada das Roças, ad fossulis solo humoso humido sabuloso-granitico, 300 m s.m. (ASC 2315, 5 Set. 1985: LISU)" (Pinto da Silva & al. 1991, sub Alsophila sp.).

34. ***Cyclosorus dentatus*** (Forsskal) Ching (= *Christella dentata* (Forsskal) Brownsey & Jermy) (*Thelypteridaceae*)
Hemicryptophyte, from tropical and subtropical regions; ruderal diaphyte, found escaped from cultivation at Beira Litoral: Botanical Garden of the University of Coimbra, I.1999, XI.2010, V.2012, observations. This is a "vigorously growing species, readily propagated from spores, often establishing spontaneously in pots of other ferns" (Page & Bennel 1986).

35. ***Cyperus papyrus*** L. (*Cyperaceae*)
Geophyte, from Africa and the Mediterranean Region; epoecophyte, introduced as an ornamental species, was found forming a well-established population at Beira Litoral: Figueira da Foz, Quiaios, near the margin of Lagoa das Braças (XI.2015, A. C. Matos, pers. comm.); Sánchez Gullón & al. (2017) also indicate the very recent (2017) presence of this species in the Spanish province of Huelva.

36. ***Dahlia imperialis*** Ortgies (*Asteraceae*)
Tuberous geophyte, from Tropical America; diaphyte, with vegetative propagation, introduced as an ornamental plant in Beira Litoral: Coimbra, alt. ca. 80 m (IV.2015, XI.2015, own observ. & photos).

37. ***Digitaria ciliaris*** (Retz.) Koeler (= *Panicum ciliare* Retz.) (*Poaceae*)
Therophyte, from Temperate and Tropical Asia; epoecophyte, naturalized in Portugal in the province of Algarve at least since 1972 (Wilhalm 2009), also recently found in the province of Beira Litoral (Verloove & Alves 2016).

38. ***Digitaria violascens*** Link (*Poaceae*)
Hemicryptophyte, from Temperate and tropical Asia; epoecophyte, naturalized in Douro Litoral: Vila do Conde: Vairão; introduced at the Botanical Garden of Porto, now becoming an invasive species (P. Alves in Facebook 10.IX.2014); detected also in several other places in the provinces of Minho, Douro Litoral and Beira Litoral (Verloove & Alves 2016).

39. ***Egeria densa*** Planchon (*Hydrocharitaceae*)
Cryptophyte (Hydrophyte), from South America; agriophyte; This aquatic perennial herb was cited for continental Portugal: Minho by Marchante & al. (2014); found escaped from cultivation at Beira Litoral: Botanical Garden of the University of Coimbra, XI, 2010 (V.2012, own observ. & photos).

40. ***Elaeagnus angustifolia*** L. (*Elaeagnaceae*)
Phanerophyte, from Eurasia; agriophyte or epoecophyte, recently (2014) found naturalized in continental Portugal: Baixo Alentejo: Grândola, in secondary dunes (Carapeto 2016).

41. ***Eleocharis caduca*** (Delile) Schult. (*Cyperaceae*)
Hemicriptophyte, from Tropical Africa; agriophyte, naturalized in ricefields, dams, lakes and other wet places, at Beira Litoral, Estremadura (Verloove & Sánchez Gullón 2010).

42. ***Eragrostis barrelieri*** Daveau (*Poaceae*)
Therophyte, from the Mediterranean Region (Tutin 1980); agriophyte, probably, naturalized in Minho: Ponte de Lima, by the river Lima, where it was recently (2015) discovered (Verloove & Alves 2016).

43. ***Eragrostis mexicana*** (Hornem.) Link (*Poaceae*)
Hemicryptophyte; ruderal epoecophyte, naturalized at Alto Alentejo (Verloove & Sánchez Gullón 2012).

44. ***Euonymus japonicus*** Thunb. (*Celastraceae*)
Phanerophyte, from Japan (Mabberley 2008); diaphyte, introduced and widely cultivated as an ornamental shrub, recently (2015) found escaped from cultivation in the province of Beira Litoral: Praia da Barra (Verloove & Alves 2016).

45. ***Euryops chrysanthemoides*** (DC.) B. Nord. (*Asteraceae*)
Phanerophyte, from South Africa; diaphyte, introduced as an ornamental plant, recently (2015) found escaped from cultivation in the province of Beira Litoral (Verloove & Alves 2016).

46. ***Fallopia*** × ***bohemica*** (Chrtek & Chrtková) J. P. Bailey (*Polygonaceae*)
Epoecophyte, naturalized at Douro Litoral: Vairão (P. Alves in Facebook 2015).

47. ***Fraxinus excelsior*** L. subsp. ***excelsior*** (*Oleaceae*)
Phanerophyte, from Eurasia; diaphyte, found naturalized in Beira Alta: Trancoso (Sampaio 1936) and Trás-os-Montes e Alto Douro: Bragança (Aguiar 2000).

48. ***Fraxinus ornus*** L. (*Oleaceae*)
Phanerophyte, from Eurasia, recently found naturalized in Beira Alta (Andrés 2012).

49. ***Fuchsia boliviana*** Carrière (*Onagraceae*)
Phanerophyte, from South America, found naturalized in Estremadura: Sintra, at least since 2009, possibly as an ergasiophyte (Sánchez Gullón & al., 2017).

50. ***Geitonoplesium cymosum*** (R. Br.) R. Br. (*Asphodelaceae*)
Geophyte; ruderal diaphyte, found escaped from cultivation in Beira Litoral: Botanical Garden of the University of Coimbra, in a calcareous wall (VI.2013, II.2016, own observ. & photos).

51. ***Gnaphalium filagineum*** DC. (= *Gamochaeta filaginea* (DC.) Cabrera) (*Asteraceae*)
Therophyte; from South America (Argentina, Brasil and Uruguay), found naturalized in Estremadura, Costa da Caparica, between Almada and Sesimbra, VI.2010, as an epoecophyte (Sánchez Gullón & Verloove 2015).

52. ***Helianthus tuberosus*** L. (*Asteraceae*)
Cryptophyte (geophyte), from North America; agriophyte; This rhizomatous herb was recently (2015) found naturalized by the rivers Leça, Ferreira and Vouga, in the littoral provinces of Douro Litoral and Beira Litoral (Verloove & Alves 2016); also found present in the province of Beira Alta (Güemes 2019).

53. ***Jacaranda mimosifolia*** D. Don (*Jacaranda ovalifolia* R. Br.) (*Bignoniaceae*)
Phanerophyte, escaped from ornamental cultivation, widely cultivated, found as a casual diaphyte or epoecophyte, subspontaneous or escaped from cultivation in continental Portugal (cf. Marchante & al. 2014), Beira Litoral: Coimbra, at the base of a calcareous wall (X.2010; XI.2018, own observ. & photos).

54. ***Jasminum nudiflorum*** Lindley (*Oleaceae*)
Phanerophyte, from Eurasia (N China); diaphyte, found escaped from cultivation in Beira Litoral: Botanical Garden of the University of Coimbra, in a calcareous Wall (I.2008; II.2016, own observ. & photos).

55. ***Juncus tenuis*** Willd. (*Juncaceae*)
Hemicryptophyte; agriophyte from North America, accidentally introduced, recently found (since 2009) in the provinces of Minho and Trás-os-Montes e Alto Douro (Verloove & Alves 2016; Alves & al. 2018).

56. ***Kalanchoe*** × ***houghtonii*** D. B. Ward (= *K. daigremontiana* Raym.-Hamet & Perrier × *K. delagoensis* Eckl. & Zeyh.) (*Crassulaceae*)
Chamaephyte; epoecophyte or agriophyte, recently recorded in Estremadura near Lisboa, "showing signs of moving from domestic gardens to the natural vegetation in Cascais and Estoril" (Smith & al. 2015); also found subspontaneus in the city of Coimbra (Beira Litoral) (VI.2014, own observ. & photos).

57. ***Lagarosiphon major*** (Ridley) Moss (*Hydrocharitaceae*)
Submersed hydrophyte; agriophyte from South Africa; found naturalized in Beira Litoral, Baixo Alentejo and the Algarve, at least since 2010 (Sánchez Gullón & al. 2010; Carapeto 2016; Plantas invasoras em Portugal 2017).

58. ***Landoltia punctata*** (G. Mey.) Les & D. J. Crawford (= *Lemna punctata* G. Mey. = *Spirodela punctata* (G. Mey.) Tompson) (*Araceae*)
Floating hydrophyte, with a subcosmopolitan distribution, found naturalized in Portugal as an hemiagriophyte: Douro Litoral (Galán 2007b) and Estremadura (Sánchez Gullón & Verloove 2016).

59. ***Lemna minuta*** Kunth (*Araceae*)
Floating hydrophyte; agriophyte from tropical America, collected in Portugal at least since 1941, in Douro Litoral, near Porto, and other places (Galán de Mera & Castroviejo 2005; Galán de Mera & al. 2006; Galán 2007a; Verloove & Alves 2016).

60. ***Linum usitatissimum*** L. (*Linaceae*)
Therophyte; epoecophyte, introduced in the past by culture for domestic and industrial uses, naturalized in several dispersed places of the Iberian Peninsula, including several Portuguese provinces: Alto Alentejo, Algarve, Baixo Alentejo, Beira Baixa, Estremadura, Minho, Ribatejo, Trás-os-Montes e Alto Douro (Franco 1971; Martínez Labarga & Muñoz Garmendia 2015).

61. ***Lippia alba*** (Miller) N. E. Br. ex Britton & P. Wilson (= *Lantana alba* Miller) (*Verbenaceae*)
Phanerophyte, from North America; probably an epoecophyte, introduced as an ornamental plant, recently (2015) found naturalized in Beira Litoral: Sernada (Verloove & Alves 2016).

62. ***Lolium remotum*** Schrank (*Poaceae*)
Therophyte; epoecophyte, introduced in the past with the culture of flax, naturalized in continental Portugal (Terrell 1968; Valdés & Scholz 2009).

63. ***Ludwigia peploides*** (Kunth) P. H. Raven subsp. ***montevidensis*** (Sprengel) P. H. Raven (=*Jussiaea montevidensis* Sprengel) (*Onagraceae*)
Helophyte, from South America; agriophyte, also naturalized in some other European and Mediterranean countries (Zotos & al. 2016; von Raab-Straube 2018), was found in the Portuguese province of Beira Litoral: Oliveira do Bairro, margin of the river Cértima, also in rice-fields (Verloove & Alves 2016).

64. ***Lysimachia nummularia*** L. (*Primulaceae*)
Chamaephyte; agriophyte; this species, native from several European and Mediterranean countries, but not from the Iberian Peninsula (Villar 1997), was recently found subespontaneous in Baixo Alentejo, "detectada a alastrar em valas no sul do país", where it is spreading, mainly as an aquatic plant (Marchante & al. 2014).

65. ***Medicago coronata*** (L.) Bartalini (*Fabaceae*)
Therophyte; epoecophyte, probably introduced in the past with some culture, was found in Estremadura near Lisboa: cerca dos Jerónimos and Parque de Monsanto; and Oeiras, pr. Carnaxide (Coutinho 1935; Teles & al. 1973; Almeida 2005).

66. ***Nandina domestica*** Thunb. (*Berberidaceae*)
Phanerophyte, from East Asia; diaphyte, found escaped from cultivation in Beira Litoral: inside the arboretum of the Botanical Garden of the University of Coimbra, VI.2011, III.2016, observ. and photos. Invasive species in the SE of the USA (Mabberley 2008).

67. ***Narcissus*** × ***medioluteus*** Miller (= *Narcissus poeticus* L. × *Narcissus tazetta* L., *Narcissus* × *biflorus* Curtis) (*Amaryllidaceae*)
Cryptophyte (geophyte) of hybrid origin, probably from S. France, introduced as an ornamental plant and found naturalized or escaped from cultivation in continental Portugal (Webb 1980).

68. ***Narcissus pseudonarcissus*** L. subsp. ***pseudonarcissus*** (*Amaryllidaceae*)
Cryptophyte (geophyte), from SW Europe; agriophyte, probably introduced as an ornamental plant, subspontaneous in continental Portugal (Aedo 2013).

69. ***Narcissus tazetta*** L. (*Amaryllidaceae*)
Cryptophyte (geophyte), from the Mediterranean Region; agriophyte, introduced as an ornamental plant, sometimes subspontaneous or escaped from cultivation in continental Portugal (Aedo 2013) and the Azores (Franco & Rocha Afonso 1994).

70. ***Oenothera lindheimeri*** (Engelm. & A. Gray) W. L. Wagner & Hoch (= *Gaura lindheimeri* Engelm. & A. Gray) (*Onagraceae*)
Hemicryptophyte, from North America: USA; epoecophyte or diaphyte, found naturalized in the Algarve: Monchique, Caldas de Monchique, 4.XII.2010 (Verloove & Sánchez Gullón 2012).

71. ***Opuntia leucotricha*** DC. (*Cactaceae*)
Phanerophyte, from North America (Mexico), escaped from ornamental cultivation, found as an escaped casual plant (diaphyte) in Lisboa, Estremadura (Silva & al. 2015b).

72. ***Opuntia stricta*** (Haw.) Haw. (= *Cactus strictus* Haw.) (*Cactaceae*)
Phanerophyte, from North America (Mexico), escaped from ornamental cultivation, found as a naturalized and invasive plant (agriophyte) in the Tapada da Ajuda, Lisboa, Estremadura (Vasconcellos 1940; Monteiro & al. 2005: 193; Silva & al. 2015b).

73. ***Osteospermum ecklonis*** (DC.) Norl. (= *Dimorphotheca ecklonis* DC.) (*Asteraceae*)
Phanerophyte or chamaephyte, from South Africa; diaphyte or ruderal epoecophyte, found naturalized in Portugal in Estremadura: Cascais, since 2012 (Silva & al. 2015a).

74. ***Oxalis dillenii*** Jacq. (*Oxalidaceae*)
Geophyte; epoecophyte, from North America, also presente in several Spanish provinces, and also in several European countries (Sánchez-Pedraja 2015), was found naturalized in lawns very recently (2018), in the province of Trás-os-Montes e Alto Douro (TM): Bragança (Carlos Aguiar, personal communication).

75. ***Paspalum notatum*** Flüggé var. ***saurae*** Parodi (= *Paspalum saurae* (Parodi) Parodi) (*Poaceae*)
Hemicryptophyte; epoecophyte, from South America, was found naturalized in lawns some years ago (2001), and more recently (2015) in the province of Douro Litoral (Verloove & Alves 2016).

76. ***Pelargonium cucullatum*** (L.) L'Hér. subsp. ***cucullatum*** (= *Geranium cucullatum* L.) (*Geraniaceae*)
Phanerophyte, from South Africa; epoecophyte or agriophyte, found in Estremadura, near Cabo da Roca, where it can be locally common (Crespo 2015).

77. ***Pelargonium zonale*** (L.) L'Hér. ex Ait. (= *Geranium zonale* L.) (*Geraniaceae*)
Phanerophyte, from South Africa; diaphyte, found at Estremadura: Setúbal: Vila Nogueira de Azeitão, by J. Gomes Pedro, VI.1980: LISE 89179 (Sousa Dias & al. 1982); sometimes naturalized in some littoral areas of the Iberian Peninsula (Crespo 2015).

78. ***Pennisetum setaceum*** (Forsskål) Chiovenda (= *Phalaris setacea* Forsskål = *Cenchrus setaceus* (Forsskål) Morrone) (*Poaceae*)
Hemicryptophyte, from South Asia and North and East Africa; ruderal epoecophyte, probably introduced as an ornamental species, recently found naturalized in the Algarve (Marchante & al. 2014).

79. ***Persicaria pensylvanica*** (L.) M. Gómez (= *Polygonum pensylvanicum* L.) (*Polygonaceae*)
Therophyte; agriophyte, from North America (USDA, Agricultural Research Service, National Plant Germplasm System 2018), already found subspontaneus in several European countries (Uotila 2017), recently (2015) found naturalized in three littoral provinces of Portugal: Minho, Douro Litoral and Beira Litoral (Verloove & Alves 2016).

80. ***Platycladus orientalis*** (L.) Franco (= *Thuja orientalis* L.) (*Cupressaceae*)
Phanerophyte, from East Asia; diaphyte or epoecophyte, subspontaneous in continental Portugal (Franco 1986; von Raab-Straube 2014).

81. ***Psilotum nudum*** (L.) P. Beauv. (= *Lycopodium nudum* L.) (*Psilotaceae*)
Rhizomatous geophyte or chamaephyte, from the Intertropical Regions (Castroviejo 1986); diaphyte or ruderal epoecophyte, introduced by cultivation in the Botanical Garden of Coimbra (Beira Litoral), from where it have been escaping and spreading in the city of Coimbra. (2010–2016, own observ. & photos).

82. ***Pyracantha crenulata*** (D. Don) M. Roemer (*Rosaceae*)
Phanerophyte, from Eurasia; diaphyte or epoecophyte, subspontaneous or escaped from cultivation in continental Portugal: Beira Litoral: Figueira da Foz, Serra da Boa Viagem (IX.2015, own observ. and photos).

83. ***Rhus typhina*** L. (*Anacardiaceae*)
Phanerophyte, from North America: Canada and USA; agriophyte, possibly, naturalized in the Portuguese province of Trás-os-Montes e Alto Douro (Güemes & Sánchez-Gómez 2015).

84. ***Romulea rosea*** (L.) Ecklon (= *Ixia rosea* L.) (*Iridaceae*)
Criptophyte (bulbous geophyte), from South Africa; possibly a diaphyte, introduced as an ornamental bulbous plant, found naturalized in the Portuguese province of Minho, 2013 (Araújo 2013).

85. ***Salix alba*** L. var. ***vitellina*** (L.) Ser. (= *Salix vitellina* L.) (*Salicaceae*)
Phanerophyte, from unknown origin, introduced by cultivation, possibly at all the

Portuguese provinces, near streams (Portela-Pereira in Flora-On: Flora de Portugal Interactiva 2014), also cultivated in gardens and for economic reasons (Bingre & al. 2007), frequently planted in Europe, including Portugal (Pereira Coutinho 1899; Rechinger & Akeroyd 1993; Blanco 1993).

86. ***Sedum pachyphyllum*** Rose (*Crassulaceae*)
Chamaephyte, from North America: Mexico; diaphyte, introduced as an ornamental plant, found escaped in Estremadura: Oeiras, with other Crassulaceae (VI.1999, own observ. and photos).

87. ***Senecio inaequidens*** DC. (*Asteraceae*)
Hemicryptophyte; agriophyte, from South Africa, of probable casual recent introduction (2009), present in the Littoral North of continental Portugal: provinces of Minho and Douro Litoral (Alves & Verloove in Flora-On 2018; Lourenço & al. 2018).

88. ***Senecio tamoides*** DC. (*Asteraceae*)
Scandent phanerophyte, from South Africa, Swaziland and Zimbabwe; this climbing plant was found naturalized in continental Portugal: Douro Litoral, Estremadura and Minho (Honrado & al. in Andresen & al. 2004; Marchante & al. 2014; Silva & al. 2015b). Greuter (2006+; 2008) doesn't mention the naturalization oe the presence of this species in Europe or in the Mediterranean Region.

89. ***Sicyos angulatus*** L. (*Cucurbitaceae*)
Therophyte; agriophyte, from North America, established as an alien in many European countries (Henning & al. 2017), recently (2015) found naturalized in river margins and basins of rivers of two Portuguese provinces: Minho and Douro Litoral (Verloove & Alves 2016).

90. ***Solanum chacoense*** Bitter subsp. ***chacoense*** (*Solanaceae*)
Geophyte, from South America; epoecophyte, introduced in Douro Litoral: Botanical Garden of Porto, starting to become invasive and slowly spreading in the vicinity (P. Alves in Facebook 14.VII.2014).

91. ***Solanum sisymbriifolium*** Lam. (*Solanaceae*)
Therophyte, from South America; epoecophyte, already naturalized in Spain (Del Monte & Aguado 2003; Sanz-Elorza & al. 2004; Sobrino Vesperinas & Sanz-Elorza 2012; Valdés 2012), recently found in Terra Quente, province of Trás-os-Montes e Alto Douro (Jardim Botânico da Universidade de Trás-os-Montes e Alto Douro 2018); this species has been used frequently as as trap crop for potato cyst nematodes (Scholte 2000; Timmermans 2005; Cabral 2015).

92. ***Solidago gigantea*** Aiton (*Asteraceae*)
Cryptophyte (Geophyte), from North America; agriophyte or epoecophyte, introduced as an ornamental, in the Algarve (Sánchez Gullón & Verloove 2013; Aedo 2019), and also in the province of Beira Litoral (Verloove & Alves 2016).

93. ***Symphyotrichum laeve*** (L.) Á. Löve & D. Löve (= *Aster laevis* L.) (*Asteraceae*)
Hemicriptophyte, from North America; ruderal epoecophyte naturalized in the Algarve: Monchique (Verloove & Sánchez Gullón 2012).

94. ***Symphyotrichum pilosum*** (Willd.) G. L. Nesom (= *Aster pilosus* L.) (*Asteraceae*)
Hemicriptophyte, from North America; ruderal epoecophyte naturalized in the Algarve: São Brás de Alportel, Serra do Caldeirão (Quinto Canas 2014).

95. ***Symphyotrichum* × *salignum*** (Willd.) G. L. Nesom (= *Aster* × *salignus* Willd.) (*Asteraceae*)
Hemicriptophyte, from hybrid origin; ruderal epoecophyte naturalized in Douro Litoral: Área Metropolitana do Porto (Honrado & al. in Andresen & al. 2004). Greuter (2006+; 2008) confirms the naturalization of this hybrid in almost all Europe.

96. ***Tanacetum balsamita*** L. (*Asteraceae*)
Hemicryptophyte, from the Eastern Mediterranean Region; diaphyte, traditionally cultivated as a medicinal plant, already cited for several provinces of continental Portugal by Brotero (1804) and Mariz (1894), also recently considered as a subspontaneous exotic species in Northern Portugal (province os Trás-os-Montes e Alto Douro) and the Iberian Peninsula by Soriano (2019).

97. ***Taxodium distichum*** (L.) Rich. (= *Cupressus disticha* L.) (*Cupressaceae*)
Phanerophyte, from North America; agriophyte, found well naturalized and seeming to spread in the margin of Lagoa das Braças (Beira Litoral: Figueira da Foz, Quiaios) (XI.2015, own observ. & photos).

98. ***Triglochin palustre*** L. (*Juncaginaceae*)
Helophyte, from Eurasia and North America (Holoarctic); diaphyte; plant from mountain bogs, probably introduced (VI.1886) and now extinct in continental Portugal: Minho (Talavera 2010).

99. ***Vitex agnus-castus*** L. (*Verbenaceae*)
Phanerophyte, from the Mediterranean Region; agriophyte, naturalized at the margins of streams in Southern Portugal (Gomes 2014), possibly subspontaneous in Trás-os-Montes e Alto Douro: "quasi spontanea in paludosis nonnulis Transmontanae." (Brotero 1804; Coutinho 1913; Coutinho 1939; Sampaio 1947); Not cited for Portugal by the recent floras and studies about exotic flora, ethnobotany or flora and vegetation: (Tutin 1972; Franco 1984; Aguiar 2000; Almeida 1999; Almeida & Freitas 2003; Almeida & Freitas 2006; Almeida & Freitas 2012; Carvalho 2005; Flora-On; World Checklist of Selected Plant Families 2010; Euro+Med PlantBase 2015) except in Flora Iberica (Plaza & Pujadas Salvà 2010) who gives this species as possibly spontaneous in Trás-os-Montes e Alto Douro, maybe based on the reference of Brotero (1804), and Aguiar & al. (2007) as an alien species.

100. ***Vitis* × *instabilis*** Ardenghi, Galasso, Banfi & Lastrucci (= *Vitis riparia* Michaux × *Vitis rupestris* Scheele) (*Vitaceae*)

Phanerophyte, hybrid of two North American species, escaped from cultivation, found naturalized as an agriophyte or an epoecophyte (2015) in the provinces of Douro Litoral and Beira Litoral (Verloove & Alves 2016).

101. ***Vitis* × *koberi*** Ardenghi, Galasso, Banfi & Lastrucci (= *Vitis berlandieri* Planchon × *Vitis riparia* Michaux) (*Vitaceae*)
Phanerophyte, hybrid of two North American species, escaped from cultivation, found naturalized as an epoecophyte or diaphyte at Estremadura: Palmela (Silva & al. 2015a).

102. ***Vitis* × *novae-angliae*** Fernald (= *Vitis labusca* L. × *Vitis riparia* Michaux) (*Vitaceae*)
Phanerophyte, artificial hybrid of two North American species, escaped from cultivation, found naturalized as an agriophyte in riparian woodland, since 2015, in the provinces of Minho and Douro Litoral (Verloove & Alves 2016).

103. ***Vitis rupestris*** Scheele (*Vitaceae*)
Phanerophyte, North American species, escaped from cultivation, found naturalized as an epoecophyte or diaphyte at Estremadura: Palmela (Silva & al. 2015a).

104. ***Yucca gloriosa*** L. (*Asparagaceae*)
Phanerophyte, escaped from ornamental cultivation; North American species, recently (2015) found naturalized, probably as an epoecophyte, in the province of Beira Litoral (Verloove & Alves 2016).

105. ***Yucca gigantea*** Lem. (*Yucca elephantipes* Regel ex Trel.) (*Asparagaceae*)
Phanerophyte, escaped from ornamental cultivation, widely cultivated, found as a casual diaphyte at Estremadura and Ribatejo (Chodat 1909; Portela Pereira 2013; Silva & al. 2015b).

Acknowledgements

I wish to thank my friends Carlos Aguiar, Paulo Alves, Jorge Capelo, António Xavier Pereira Coutinho, Maria Gabriela Pereira, Maria João Pereira, Ana Beatriz Pereira, Maria Antónia Soares, Helena Freitas, João Abreu Marques, Arménio Costa Matos, Filipe Covelo, Sara Rodrigues, Jael Palhas, Augusto Coimbra, James Molina, Carlos Silva and Filip Verloove, for good company and help in the field excursions and for discovering many interesting species, and for information, suggestions and useful comments about several exotic species.
The comments and suggestions of Filip Verloove, who reviewed the manuscript, contributed greatly to improve the quality of this paper.

References

Aedo, C. 2013: *Narcissus* L. – Pp. 340-397. In: Castroviejo, S. (Coord.); Rico, E., Crespo, M. B., Quintanar, A., Herrero, A. & Aedo, C. (eds), Flora Iberica, **20.** – Madrid.
— 2019: *Solidago* L. – Pp. 2040-2044. In: Castroviejo, S. (Coord.); Benedí C., Buira, A., Rico, E., Crespo, M. B., Quintanar, A. & Aedo, C. (eds), Flora Iberica, **16(3).** – Madrid.

Aguiar, C. F. G. 2000: Flora e vegetação da Serra de Nogueira e do Parque Natural de Montesinho. – Dissertação de doutoramento em Engenharia Agronómica. – Lisboa.

Aguiar, F. C., Ferreira, M. T., Albuquerque, A. & Moreira, I. 2007: Alien and endemic flora at reference and non-reference sites in Mediterranean-type streams in Portugal. – Aquatic Conserv. Marine Freshwater Ecosyst. **17:** 335-347.

Almeida, J. D. 1999. Flora exótica subespontânea de Portugal continental (plantas vasculares). 2nd edition. Catálogo das plantas vasculares exóticas que ocorrem subespontâneas em Portugal continental e compilação de informações sobre estas plantas. – Dissertação de Mestrado. Faculdade de Ciências da Universidade de Coimbra. – Coimbra.

— 2005: Adiciones corológicas a Flora Iberica VII (II). – Bot. Complutensis **29:** 43-46.

— 2009: Flora e Vegetação das Serras Beira-Durienses. (Serras e planaltos de Arada/Freita/São Macário/Arestal, Caramulo, Chavães, Montemuro/Leomil/Nave/Lapa, Penedono/Trancoso, Senhora do Monte, Senhora do Viso e outras serras menores, de altitude superior a 700 m, situadas entre os rios Douro e Mondego). – Dissertação de doutoramento. Faculdade de Ciências e Tecnologia da Universidade de Coimbra. – Coimbra.

— & Freitas, H. 2000: A flora exótica e invasora de Portugal. – Portugaliae Acta Biol. **19:** 159-176.

— & — 2001: The exotic and invasive flora of Portugal. – Bot. Complutensis **25:** 317-327.

— & — 2003: Acerca de algumas plantas vasculares invasoras em Portugal continental. – Stud. Bot. (Salamanca) **21:** 27-35 (2002).

— & — 2006: Exotic flora of continental Portugal – a reassessment. – Bot. Complutensis **30:** 117-130.

— & — 2012. Exotic flora of continental Portugal – a new assessment. – Bocconea **24:** 231-237.

Almeida, M. T. F. 1986: Azolla Lam. Pp. 155-157. In: Castroviejo, S., Laínz, M., López González, G., Montserrat, P., Muñoz Garmendia, F., Paiva, J. & Villar, L. (eds), Flora Iberica, **1.** – Madrid.

Alves, P., Lourenço, J. & Pereira, A. J. 2018: *Juncus tenuis* Willd. – Mapa de distribuição. Flora-On: Flora de Portugal Interactiva, Sociedade Portuguesa de Botânica. – http://www.flora-on.pt/#wJuncus+tenuis [Last Accessed 20.8.2018]

Andrés, C. 2012: *Fraxinus* L. Pp. 143-151. In: Castroviejo, S. (Coord.); Talavera, S., Andrés, C., Arista, M., Fernández Piedra, M. P., Gallego, M. J., Ortiz, P. L., Romero Zarco, C., Salgueiro, F. J., Silvestre, S. & Quintanar, A. (eds), Flora Iberica, **11.** – Madrid.

APG III 2009: An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG III. The Angiosperm Phylogeny Group. – Bot. J. Linn- Soc. **161:** 105-121. doi: 10.1111/j.1095-8339.2009.00996.x

APG IV. 2016: An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG IV. The Angiosperm Phylogeny Group. – Bot. J. Linn. Soc. **181(1):** 1-20. doi: 10.1111/boj.12385.

Araújo, P. V. 2013. "Cor de rosa quando foge". In Blog Dias com Árvores, 13.05.2013, http://dias-com-arvores-blogspot.com/2013/05/cor-de-rosa-quando-foge.html [*Romulea rosea* (L.) Eckl.]. [Last Accessed 31.10. 2014]

Benedí, C. 2019: *Artemisia* L. – Pp. 1718-1753. In: Castroviejo, S. (Coord.); Benedí, C., Buira, A., Rico, E., Crespo, M. B., Quintanar, A. & Aedo, C. (eds), Flora Iberica, **16(3).** – Madrid.

Bingre, P., Aguiar, C., Espírito-Santo, M. D., Arsénio, P. & Monteiro-Henriques, T. 2007: Guia de árvores e arbustos de Portugal. – Lisboa.

Blanco, P. 1993: *Salix* L. – Pp. 477-517. In: Castroviejo, S., Aedo, C., Cirujano, S., Laínz, M., Montserrat, P., Morales, R., Muñoz Garmendia, F., Navarro, C., Paiva, J. & Soriano, C. (eds), Flora Iberica, **3.** – Madrid.

Brotero, F. A. 1804: Flora Lusitanica, **1-2.** – Lisboa.

Cabral, A. T. 2015: Interações entre nemátodes-de-quisto da batateira e *Solanum sisymbriifolium.* – Dissertação de Mestrado. Departamento de Ciências da Vida, Faculdade de Ciências e Tecnologia, Universidade de Coimbra. – Coimbra.

Carapeto, A. 2016: New records of alien vascular plant species in mainland Portugal. – Acta Bot. Malacitana **41:** 281-286.

Carvalho, A. M. P. 2005: Etnobotánica del Parque Natural de Montesinho. Plantas, tradición y saber popular en un territorio del nordeste de Portugal. Tesis doctoral. Universidad Autónoma de Madrid. Facultad de Ciencias – Departamento de Biología. – Madrid.

Castroviejo, S. 1986: Psilotum Swartz. – Pp. 30-31. In: Castroviejo, S., Laínz, M., López González, G., Montserrat, P., Muñoz Garmendia, F., Paiva, J. & Villar, L. (eds), Flora Iberica, **1.** – Madrid.

— & al. (eds): 1986-2019: Flora Iberica, **1-21.** – Madrid.

Chodat, R. 1909: Excursions botaniques en Espagne et au Portugal. – Genève.

— 1913: Voyage d'études géobotaniques au Portugal. – Le Globe, Mém. **52:** 59-146.

Christenhusz, M. & von Raab-Straub, E. 2013: Polypodiopsida. – In: Euro+Med Plantbase – the information resource for Euro-Mediterranean plant diversity. http://ww2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?NameCache=Polypodiopsida&PTRefFk=7500000 [Last Accessed 11.11.2018]

Crespo, M. B. 2015: Pelargonium L'Hér. – Pp. 373-382. In: Castroviejo, S. (Coord.); Muñoz Garmendia, F. & Navarro, C. (eds), Flora Iberica, **9.** – Madrid.

Del Monte, J. P. & Aguado, P. L. 2003: Survey of the non-native plant species in the Spanish Iberia in the period 1975-2002. – Fl. Medit. **13:** 241-259.

Euro+Med PlantBase 2015: Euro+Med PlantBase. The information resource for Euro-Mediterranean plant diversity. http://ww2.bgbm.org/EuroPlusMed/. [Last Accessed 15.7.2015]

Flora-On: Flora de Portugal Interactiva. 2014: Flora-On: Flora de Portugal Interactiva. Sociedade Portuguesa de Botânica. http://www.flora-on.pt [Last Accessed 31.12.2014]

— 2015: Flora-On: Flora de Portugal Interactiva. Sociedade Portuguesa de Botânica. http://www.flora-on.pt. [Last Accessed 15.7.2015]

— 2018: Flora-On: Flora de Portugal Interactiva. Sociedade Portuguesa de Botânica. http://www.flora-on.pt [Last Accessed 11.11.2018]

Franco, J. A. 1943: Dendrologia Florestal. – Lisboa.

— 1968: *Crataegus* L. – Pp. 73-77. In: Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M. & Webb, D. A. (eds), Flora Europaea **2.** – Cambridge.

— 1971: Nova Flora de Portugal (Continente e Açores), **1.** – Lisboa.

— 1984: Nova Flora de Portugal (Continente e Açores), **2.** – Lisboa.

— 1986: *Platycladus* Spach. – P. 179. In: Castroviejo, S., Laínz, M., López González, G., Montserrat, P., Muñoz Garmendia, F., Paiva, J. & Villar, L. (eds), Flora Iberica, **1.** – Madrid.

— & Rocha Afonso, M. L. 1971: *Pteridophyta.* – Pp. 1-35. In: Franco, J. A., Nova Flora de Portugal (Continente e Açores), **1.** – Lisboa.

— & — 1994: *Amaryllidaceae.* – Pp. 106-124. In: Franco, J. A. & Rocha Afonso, M. L., Nova Flora de Portugal (Continente e Açores), **3(1).** – Lisboa.

Galán, A. 2007a: *Lemna* L. – Pp. 312-315. In: Castroviejo, S. (Coord.); Castroviejo, S., Luceño, M., Galán, A., Jiménez Mejías, P., Cabezas, F. & Medina, L. (eds), Flora Iberica, **18.** – Madrid.

— 2007b: *Spirodella* Schleid. – Pp. 316-318. In Castroviejo, S. (Coord.); Castroviejo, S., Luceño, M., Galán, A., Jiménez Mejías, P., Cabezas, F. & Medina, L. (eds), Flora Iberica, **18.** – Madrid.

Galán de Mera, A. & S. Castroviejo. 2005: Acerca del tratamiento de *Lemnaceae* en Flora Iberica. – Acta Bot. Malacitana **30:** 248-249.

— , Aedo, C., Castroviejo, S. & Sánchez Pedraja, Ó. 2006: Dos nuevas citas de *Lemnaceae* para la flora ibérica. – Acta Bot. Malacitana **31:** 241.

Gomes, J. 2014: "A árvore da castidade". In Blog Sementes de Portugal, 12.02.2014, http://sementes-deportugal.blogspot.pt/2014/02/a-árvore-da-castidade.html. [Last Accessed 15.7.2015]

Greuter, W. 2002: Notices of publications. – Pp. (1)-(48). In: Iriondo, J. M. & De Hond, L. J. OPTIMA Newsletter **36.**

— 2006+: *Compositae* (*pro parte majore*). – In: Greuter, W. & von Raab-Straube, E. (eds), Compositae. The Euro+Med Plantbase – the information resource for Euro-Mediterranean plant diversity. http://ww2.bgbm.org/EuroPlusMed/ [Last Accessed 11.11.2018]

— & von Raab-Straube, E. (eds) 2008: Med-Checklist, **2.** – Palermo, Genève & Berlin.

Güemes, J. 2019: *Helianthus* L. – Pp. 2174-2178. In: Castroviejo, S. (Coord.); Benedí, C., Buira, A., Rico, E., Crespo, M. B., Quintanar, A. & Aedo, C. (eds), Flora Iberica, **16(3).** – Madrid.

— & Sánchez-Gómez, P. 2015: *Rhus* L. – Pp. 95-99. In: Castroviejo, S. (Coord.); Muñoz Garmendia, F. & Navarro, C. (eds), Flora Iberica, **9.** – Madrid.

Henning, T., Holstein, N. & von Raab-Straube, E. 2017: *Cucurbitaceae*. – In: Euro+Med Plantbase – the information resource for Euro-Mediterranean plant diversity. http://ww2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?NameCache=Cucurbitaceae&PTRefFk=7500000. [Last Accessed 11.11.2018]

Honrado, J., Lomba, Â., Alves, P., Torres, J., Séneca, A., Vieira, C., Hespanhol, H. & Barreto Caldas, F. 2004: Anexo B. – Flora. In: Andresen, T. (Coord.), Estrutura Ecológica da Área Metropolitana do Porto. ICETA – Instituto das Ciências e Tecnologias Agrárias e Agro-alimentares. – Porto.

Jardim Botânico da Universidade de Trás-os-Montes e Alto Douro: 2018. https://jb.utad.pt/especie/Solanum_sisymbriifolium; https://jb.utad.pt/multimedia/Solanum_sisymbriifolium [Last Accessed 11.11.2018]

Kornas, J. 1990: Plant invasions in Central Europe – Pp. 105-133. In: Di Castri, F. & al. (eds), Biological Invasions in Europe and the Mediterranean Basin. – Dordrecht.

Lawalrée, A. (ed. 1), revised by Akeroyd, J. R. & Paul, A. M. (ed. 2). 1993: *Adiantum* L. – Pp. 13-14. In: Tutin, T. G., Burges, N. A., Chater, A. O., Edmondson, J. R., Heywood, V. H., Moore, D. M., Valentine, D. H., Walters, S. M. & Webb, D. A. (eds), Flora Europaea, ed. 2, **1.** – Cambridge.

Lawalrée, A. & Jermy, A. C. 1993: *Azolla* Lam. – P. 33. In: Tutin, T. G., Burges, N. A., Chater, A. O., Edmondson, J. R., Heywood, V. H., Moore, D. M., Valentine, D. H., Walters, S. M. & Webb, D. A. (eds), Flora Europaea, ed. 2, **1.** – Cambridge.

López González, G. 2014: *Carthamus* L. – Pp. 304-313. In Castroviejo, S. (Coord.); Devesa, J. A., Quintanar, A. & García, M. Á. (eds), Flora Iberica, **16(1).** – Madrid.

Lourenço, J., Alves, P. & Araújo, P. V. 2018: *Senecio inaequidens* DC. – Mapa de distribuição. Flora-On: Flora de Portugal Interactiva, Sociedade Portuguesa de Botânica. http://www.flora-on.pt/#wSenecio+inaequidens [Last Accessed 11.11.2018]

Mabberley, D. J. 2008: Mabberley's Plant-Book. A portable dictionary of plants, their classification and uses. Third edition. – Cambridge.

Marchante, H., Morais, M., Freitas, H. & Marchante, E. 2014: Guia Prático para a Identificação de Plantas Invasoras de Portugal. – Coimbra.

Marhold, K. 2011: *Brassicaceae*. – In: Euro+Med Plantbase – the information resource for Euro-Mediterranean plant diversity. http://ww2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?NameId=14691&PTRefFk=7200000. [Last Accessed 11.11.2018]

Mariz, J. 1894: Subsidios para o estudo da Flora Portugueza. As Compostas de Portugal. (Extracto do Boletim da Sociedade Broteriana, IX, X, XI). – Coimbra.

Martínez Labarga, J. M. & Muñoz Garmendia, F. 2015: *Linum* L. – Pp. 173-266. In: Castroviejo, S. (Coord.); Muñoz Garmendia, F. & Navarro, C. (eds), Flora iberica, **9.** – Madrid.

Monteiro, A., Cheia, V. M., Vasconcelos, T. & Moreira, I. 2005: Management of the invasive species *Opuntia stricta* in a Botanical Reserve in Portugal. – Weed Res. (2005) **45:** 193-201.

Muñoz Garmendia, F., Navarro, C. & Aedo, C. 1998: *Crataegus* L. – Pp. 404-414. In: Castroviejo, S. (Coord.); Muñoz Garmendia, F. & Navarro, C. (eds), Flora Iberica, **6.** – Madrid.

Page, C. N. & Bennell, F. M. 1986: *Christella* Léveillé. – P. 43. In: Walters, S. M., Brady, A., Brickell, C. D., Cullen, J., Green, P. S., Lewis, J., Matthews, V. A., Webb, D. A., Yeo, P. F. & Alexander, J. C. M. (eds), The European Garden Flora, **1.** – Cambridge.

Pereira Coutinho, A. X. 1899: Subsidios para o estudo das Salicaceas de Portugal. – Bol. Soc. Brot. **16:** 5-34.

— 1913: Flora de Portugal (plantas vasculares) disposta em chaves dichotomicas. – Lisboa.

— 1935: Suplemento da Flora de Portugal (Plantas Vasculares). – Bol. Soc. Broteriana, Sér. 2, **10:** 43-194.

— 1939: Flora de Portugal (plantas vasculares) disposta em chaves dicotómicas, 2nd ed-, directed by Ruy Telles Palhinha. – Lisboa.

Pinto da Silva, A. R. 1940: Notas soltas sobre a flora portuguesa. – Agron. Lusit. **2:** 225-231.

— & Rainha, B. V. 1948: *Azolla caroliniana* Willd. – Agron. Lusit. **10(1):** 80.

Plantas invasoras em Portugal. 2017: *Lagarosiphon major*. http://invasoras.pt/gallery/lagarosiphon-major/ [Last Accessed 11.11.2018]

— 2017a: *Baccharis spicata.* http://invasoras.pt/gallery/baccharis-spicata/ [Last Accessed 11.11.2018]

Plaza, L. & Pujadas Salvà, A. 2010: *Vitex* L. – Pp. 21-24. In Castroviejo, S. (Coord.); Morales, R., Quintanar, A., Cabezas, F., Pujadas, A. J. & Cirujano, S. (eds), Flora Iberica, **12.** – Madrid.

Portela Pereira, E. 2013: Análise Geobotânica dos Bosques e Galerias Ripícolas da Bacia Hidrográfica do Tejo em Portugal. Tese de Doutoramento em Geografia Física. IGOT-UL. – Lisboa.

Quinto Canas, R. J. 2015: Flora y vegetación de la Serra do Caldeirão. Tesis doctoral presentada por: Ricardo Jorge Quinto Canas. Dirigida por: Dr. D. Carlos Pinto Gomes; Dr. D. Eusebio Cano Carmona. Jaén, 5 de Mayo de 2015. / Flora e vegetação da Serra do Caldeirão – Aproximação fitossociológica. Dissertação de candidatura para a obtenção do grau de Doutor em Análise e Gestão de Ecossistemas apresentada à Faculdade de Ciências Experimentais da Universidade de Jaén. – Jaén.

Raab-Straube, E. von 2014: *Gymnospermae*. – In: Euro+Med Plantbase – the information resource for Euro-Mediterranean plant diversity. http://ww2.bgbm.org/EuroPlusMed/PTaxonDetail.asp [Last Accessed 11.11.2018]

— 2018: *Onagraceae.* – In: Euro+Med Plantbase – the information resource for Euro-Mediterranean plant diversity. http://ww2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?NameId=26049&PTRefFk=7100000 [Last Accessed 11.11.2018]

Raunkiaer, C. 1934: The Life forms of plants and plant geography. – Oxford.

Rechinger, K. H. (Revised by Akeroyd, J. R.). 1993: *Salix* L. – Pp. 53-64. In: Tutin, T. G., Burges, N. A., Chater, A. O., Edmondson, J. R., Heywood, V. H., Moore, D. M., Valentine, D. H., Walters, S. M. & Webb, D. A. (eds), Flora Europaea, ed. 2, **1.** – Cambridge.

Reed, C. F. 1962: *Marsileaceae, Azollaceae* e *Isoetaceae* de Portugal. – Bol. Soc. Brot., Sér. 2., **36:** 73-94.

Rocha Afonso, M. L. 1990: *Casuarina* Adanson. – Pp. 50-52. In: Castroviejo, S., Laínz, M., López González, G., Montserrat, P., Muñoz Garmendia, F., Paiva, J. & Villar, L. (eds), Flora Iberica **2.** – Madrid.

Sampaio, G. 1936: Flora vascular de Trancoso. – Anais Fac. Ciências Porto **20(3):** 129-154; **20(4):** 209-223.

— 1947: Flora Portuguesa. 2nd edition, directed by A. Pires de Lima. – Porto.

Sánchez Gómez, P. & Güemes, J. 2015: *Acer* L. – Pp. 77-93. In: Castroviejo, S. (Coord.); Muñoz Garmendia, F., Navarro, C., Quintanar, A. & Buira, A. (eds), Flora Iberica, **9.** – Madrid.

Sánchez Gullón, E., Verloove, F. & Pérez Chiscano, J. L. 2010: *Lagarosiphon major* (Ridley) Moss (*Hydrocharitaceae*) naturalizada en la cuenca baja del Guadiana (SW Península Ibérica). – Lagascalia **30:** 489-492.

— & — 2013: New records of interesting vascular plants (mainly xenophytes) in the Iberian Peninsula. IV. – Folia Bot. Extremadurensis **7:** 29-34.
— & — 2015: New records of interesting xenophytes in the Iberian Peninsula. V. – Lazaroa **36:** 43-50.
— & — 2016: New records of interesting xenophytes in the Iberian Peninsula. VI. – Folia Bot. Extremadurensis **10:** 49-56.
—, — & Silva, V. 2017: New records of interesting xenophytes in the Iberian Peninsula. VII. – Folia Bot. Extremadurensis **11:** 39-50.
Sánchez-Pedraja, Ó. 2015: *Oxalis* L. – Pp. 383-405. In: Castroviejo, S. (Coord.); Muñoz Garmendia, F., Navarro, C., Quintanar, A. & Buira, A. (eds), Flora Iberica, **9.** – Madrid.
Sanz-Elorza, M., Dana Sánchez, E. D. & Sobrino Vesperinas, E. 2004: Atlas de las Plantas Alóctonas Invasoras en España. – Madrid.
Scholte, K. 2000: Growth and development of plants with a potential for use as trap crop for potato cyst nematode and their effects on the numbers of juveniles in cysts. – Ann. Appl. Biol. **137:** 31-42.
Silva, V., Laguna Lumbreras, E. & Guillot Ortiz, D. 2015a: Algunos datos sobre neófitos en Portugal. – Bouteloua **20:** 76-96.
—, Figueiredo, E. & Smith, G. F. 2015b: Alien succulents naturalised and cultivated on the central west coast of Portugal. – Bradleya **33(2015):** 58-81.
Smith, G. & Figueiredo, E. 2007: Naturalized species of *Agave* L. (*Agavaceae*) on the southeastern coast of Portugal. – Haseltonia **13:** 52-60.
— , — & Silva, V. 2015: *Kalanchoe* × *houghtonii* (*Crassulaceae*) recorded near Lisbon, Portugal. – Bouteloua **20:** 97-99.
Sobrino Vesperinas, E. & Sanz-Elorza, M. 2012: *Solanum* L. – Pp. 166-195. In: Castroviejo, S. (Coord.); Talavera, S., Andrés, C., Arista, M., Fernández Piedra, M. P., Gallego, M. J., Ortiz, P. L., Romero Zarco, C., Salgueiro, F. J., Silvestre, S. & Quintanar, A. (eds), Flora Iberica, **11.** – Madrid.
Soriano, I. 2019: *Tanacetum* L. – Pp. 1829-1843. In: Castroviejo, S. (Coord.); Benedí C., Buira, A., Rico, E., Crespo, M. B., Quintanar, A. & Aedo, C. (eds), Flora iberica **16(3).** – Madrid.
Sousa Dias, M. R., Lucas, M. T. & Lopes, M. C. 1982: *Fungi Lusitaniae* XXIX. – Agron. Lusit. **41(3-4):** 175-192.
Talavera, S. 2010: *Triglochin* L. – Pp. 44-51. In: Castroviejo, S. (Coord.); Talavera, S., Gallego, M. J., Romero Zarco, C. & Herrero, A. (eds), Flora Iberica **17.** – Madrid.
— & Balao, F. J. 2010: *Alisma* L. – Pp. 7-11. In Castroviejo, S. (Coord.); Talavera, S., Gallego, M. J., Romero Zarco, C. & Herrero, A. (eds), Flora Iberica **17.** – Madrid.
— & Talavera, M. 2017: *Cichorium* L. – Pp. 1308-1316. In: Castroviejo, S. (Coord.); Talavera, S., Buira, A., Quintanar, A., García, M. Á., Talavera, M., Fernández Piedra, P. & Aedo, C. (eds), Flora Iberica, **16(2).** – Madrid.
Teles, A. N., Ramos Lopes, M. H. & Martins, J. M. 1973: *Medicago coronata* (L.) All. – Agron. Lusit. **34:** 190.
Terrell, E. E. 1968: A taxonomic revision of the genus *Lolium.* – Tech. Bull. US Dept. Agric. **1392:** 1-65.
Timmermans, B. G. H. 2005: *Solanum sisymbriifolium* (Lam.): a trap crop for potato cyst nematodes. PhD Thesis. University of Wageningen. – Wageningen, The Netherlands.
Tutin, T. G. 1972: *Vitex* L. – P. 122. In: Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M. & Webb, D. A. (eds), Flora Europaea **3.** – Cambridge.
— 1980: *Eragrostis* N. M. Wolf. – Pp. 256-257. In: Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M. & Webb, D. A. (eds), Flora Europaea, **5.** – Cambridge.
— , Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M. & Webb, D. A. (eds) 1980: Flora Europaea, **5.** – Cambridge.

Uotila, P. 2017: *Polygonaceae.* In: Euro+Med Plantbase – the information resource for Euro-Mediterranean plant diversity. http://ww2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?NameId=27790&PTRefFk=7300000 [Last Accessed 11.11.2018]

USDA, Agricultural Research Service, National Plant Germplasm System 2018: Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. URL: https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?id=409773. [Last Accessed 11.11.2018]

Valdés, B. 2012: *Solanaceae.* – In: Euro+Med Plantbase – the information resource for Euro-Mediterranean plant diversity. http://ww2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?NameId=100493&PTRefFk=7100000 [Last Accessed 11.11.2018]

— & Scholz, H., with contributions from Raab-Straube, E. von & Parolly, G. 2009: *Poaceae* (pro parte majore). — In: Euro+Med Plantbase – the information resource for Euro-Mediterranean plant diversity.http://ww2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?NameCache=Poaceae&PTRefFk=7100000 [Last Accessed 11.11.2018]

Vasconcellos, J. C. 1940: Anotações do Herbário do Instituto Superior de Agronomia. – An. Inst. Sup. Agron. **11:** 7-17.

Verloove, F. & Alves, P. 2016: New vascular plant records for the western part of the Iberian Peninsula (Portugal and Spain). – Folia Bot. Extremadurensis **10:** 7-25.

— & Sánchez Gullón, E. 2008: New records of interesting xenophytes in the Iberian Peninsula. – Acta Bot. Malacitana **33:** 1-21.

— & — 2010: Further notes on *Cyperaceae* in the Iberian Peninsula: corrections, adjustments and additions. – Fl. Medit. **20:** 141-147.

— & — 2012: New records of interesting vascular plants (mainly xenophytes) in the Iberian Peninsula. II. – Fl. Medit. **22:** 5-24.

— , Dana, E. D. & Alves, P. 2017: *Baccharis spicata* (*Asteraceae*), a new potentially invasive species to Europe. – Pl. Biosyst. **152(3):** 416-426. doi: 10.1080/11263504.2017.130300.

Villar, L. 1997: *Lysimachia* L. – Pp. 46-51. In: Castroviejo, S., Aedo, C., Laínz, M., Morales, R., Muñoz Garmendia, F., Nieto Feliner, G. & Paiva, J. (eds), Flora Iberica **5.** – Madrid.

Webb, D.A. 1980: *Narcissus* L. – Pp. 78-84. In: Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M. & Webb, D. A. (eds), Flora Europaea **5.** – Cambridge.

World Checklist of Selected Plant Families 2010: World Checklist of Selected Plant Families. The Board of Trustees of the Royal Botanic Gardens. – Kew.

Wilhalm, T. 2009: *Digitaria ciliaris* in Europe. – Willdenowia **39(2):** 247-259.

Zotos, A., Sarika, M., Lucas, E. & Dimopoulos, P. 2006: *Ludwigia peploides* subsp. *montevidensis,* a new allien taxon for the flora of Greece and the Balkans. – J. Biol. Res. **5:** 71-78.

Address of the author:
João Domingues de Almeida,
Centre for Functional Ecology/Centro de Ecologia Funcional. Department of Life Sciences/Departamento de Ciências da Vida. University of Coimbra/Universidade de Coimbra, Portugal. E-mail: jddalmeida@hotmail.com