

New vascular plant records for the western part of the Iberian Peninsula (Portugal and Spain)

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Summary:

Recent fieldwork in the western part of the Iberian Peninsula (Portugal: mainly in the coastal area north of Coimbra; Spain: mainly in the valley of river Minho), mostly in 2015, yielded numerous new chorological data, especially of non-native taxa. The following naturalized or (potentially) invasive taxa are reported for the first time from Portugal: *Alocasia macrorrhizos*, *Cardamine occulta*, *Commelina communis*, *Digitaria violascens*, *Eragrostis barrelieri*, *Helianthus tuberosus*, *Juncus tenuis* s.l., *Lippia alba*, *Ludwigia peploides* subsp. *montevidensis*, *Paspalum notatum* var. *saurae*, *Persicaria pensylvanica*, *Sicyos angulatus*, *Solidago gigantea*, *Vitis ×instabilis*, *V. ×novae-angliae*, *Xanthium strumarium* and *Yucca gloriosa*. Nearly all these species are reputed environmental or agricultural weeds in many parts of the world. Several additional ephemeral species are also listed, as are regional chorological novelties according to the regions accepted in the Flora Iberica. For the naturalized and (potentially) invasive taxa information is provided on area and habitats occupied, recognition, problems caused, etc. Many of them are also illustrated. For the remaining taxa, as a rule, only details from the herbarium label are provided.

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Key words: Beira Litoral, Coimbra, Chorology, Douro Litoral, Invasive species, Minho, Miño, Portugal, Spain, Weeds

Resumo:

Uma campanha de campo recente, realizada maioritariamente em 2015 na parte ocidental da Península Ibérica (Portugal: principalmente na zona costeira a norte de Coimbra; Espanha: principalmente no vale do rio Minho), produziu inúmeras novidades corológicas, essencialmente de táxones alóctones. Os seguintes táxones naturalizados ou (potencialmente) invasores são registados pela primeira vez em partir de Portugal: *Alocasia macrorrhizos*, *Cardamine occulta*, *Commelina communis*, *Digitaria violascens*, *Eragrostis barrelieri*, *Helianthus tuberosus*, *Juncus tenuis* s.l., *Lippia alba*, *Ludwigia peploides* subsp. *montevidensis*, *Paspalum notatum* var. *saurae*, *Persicaria pensylvanica*, *Sicyos angulatus*, *Solidago gigantea*, *Vitis ×instabilis*, *V. ×novae-angliae*, *Xanthium strumarium* e *Yucca gloriosa*. Quase todas estas espécies são infestantes de renome em muitas partes do mundo. Adicionalmente, vários efemerófitos foram também listados, como novidades corológicas regionais de acordo com as províncias aceites na Flora Ibérica. Para os táxones naturalizados ou (potencialmente) invasores é fornecida informação sobre a área e habitats ocupados, forma de reconhecimento, os problemas potenciais que podem causar, etc., com ilustrações de muitos deles. Para os restantes táxones, como regra, são fornecidos os registos de herbário detalhados.

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Palavras chaves: Beira Litoral, Coimbra, Corologia, Douro Litoral, Espanha, Espécies invasoras, Infestantes, Minho, Portugal, .

Resumen: Una campaña del campo reciente, durante 2015 principalmente, en la zona occidental de la Península Ibérica (Portugal: principalmente en la zona costera el norte de Coimbra; España: principalmente en el valle del río Minho), facilitó numerosas novedades corológicas, esencialmente de taxones alóctones. Los siguientes taxones naturalizados o (potencialmente) invasores son citados por primera para Portugal continental: *Alocasia macrorrhizos*, *Cardamine occulta*, *Commelina communis*, *Digitaria violascens*, *Eragrostis barrelieri*, *Helianthus tuberosus*, *Juncus tenuis* s.l., *Lippia alba*, *Ludwigia peploides* subsp. *montevidensis*, *Paspalum notatum* var. *saurae*, *Persicaria pensylvanica*, *Sicyos angulatus*, *Solidago gigantea*, *Vitis ×instabilis*, *V. ×novae-angliae*, *Xanthium strumarium* y *Yucca gloriosa*. Casi todas estas especies son importantes especies infestantes de los cultivos agrícolas y de zonas de ambientes naturales en muchas partes del mundo. Adicionalmente otras especies efímeras también aparecen como novedades corológicas regionales según las regiones delimitadas en la Flora Iberica. Para los taxones naturalizados y (potencialmente) invasivos se ofrece información sobre área y hábitat ocupado, reconocimiento, problemas, etc.. Muchos de ellos también se ilustran. Para los taxa restantes, como regla general, se proporcionan sólo los datos de la etiqueta de herbario.

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Palabras clave: Beira Litoral, Corologia, Douro Litoral, España, Invasoras, Minho, Miño, Portugal.

Introduction

The Portuguese non-native flora has received a lot of attention in the past (e.g. Pinto da Silva, 1971). Very useful, detailed accounts were recently prepared by Almeida (1999), subsequently regularly improved and updated (Almeida & Freitas, 2006; 2012). Particular interest has been paid to those species that are considered invasive (e.g. Marchante & al., 2008; 2014).

Nonetheless, the non-native flora of a given territory is never completely understood. There is a never-ending influx of goods and their inevitable stowaways. Also, numerous new species are introduced for horticultural purposes and, as a result of climate change, exotic species are increasingly able to adapt. In addition, taxonomic knowledge constantly increases which enables naturalists to 'discover' species that remained unnoticed in their territory so far. In recent years it has become apparent that a large number of exotic vascular plants naturalized or even became invasive in some parts of the Iberian Peninsula without being reported in national checklists, for a number of reasons. For instance, some species are inconspicuous or are difficult to identify while others are very similar to and have been confused with other exotic or even native species.

Therefore, it is no wonder that two weeks of field work by the first author in September 2015 in three Portuguese provinces and adjacent parts of Spain in Galicia yielded a lot of interesting new chorological data. No less than 17 naturalized taxa are reported for the first time from Portugal and most of these are considered invasive species or tend to become so in a near future. In addition, new distributional data are provided for several other interesting taxa, most of them also non-native.

Material and Methods

The records presented in this paper are mostly the result of field work by the first author in September 2015 in the Portuguese provinces Beira Litoral, Douro Litoral and Minho and in adjacent parts of Spain (Galicia). For many taxa unpublished data by the second author were added, some from 2016. Herbarium collections of taxa relevant for this paper were revised in the herbarium of the University of Porto (PO).

For all taxa mentioned in this paper (except for Cactaceae, for which only photos are available) voucher specimens were collected. These are preserved in the herbaria of the Botanic Garden of Meise, Belgium (BR) and/or the herbarium of the University of Porto, Portugal (PO) (for herbarium acronyms, see Thiers, 2016+). For a few taxa found on the Spanish border of river Minho, vouchers were deposited in the herbarium of the University of Santiago de Compostella (SANT).

Results

Naturalized and (potentially) invasive species

TAXA NEW TO THE FLORA OF PORTUGAL

Alocasia macrorrhizos (L.) G. Don, *Hort. Brit.* (ed. 3): 631. 1839. (ARACEAE)

Alocasia macrorrhizos is native to Malesia (including Peninsular Malaysia, the Philippines and parts of Indonesia), Queensland and the Solomon Islands. Outside of its native distribution range it is widely cultivated as an ornamental, food crop (Giant Taro) or as animal feed and naturalized in many tropical and subtropical regions in North, Central and South America, the West Indies, tropical Africa and the Indo-Pacific Islands. It is, like *Colocasia esculenta* (L.) Schott (Taro), often considered an invasive environmental weed. However, in Europe only the latter is an emerging weed problem (e.g. Dana & al., 2016), while *Alocasia macrorrhizos* probably never has been recorded before in the wild. Both, however, may have been confused. They are distinguished by leaf characters: leaves are peltate in *Colocasia esculenta*, while they are not in *Alocasia macrorrhizos* and leaf tip direction is different (horizontal or upward direction in *Alocasia*, pointing downwards in *Colocasia*). Also, the leaves of *Alocasia* have a shiny surface and it possesses an extended corm.

In Portugal three localities for *Alocasia macrorrhizos* were recently detected, one in Sarrazola, Cacia (Aveiro), a second in São Pedro da Cova, Gondomar (Porto) and more recently a third in Macieira da Maia (Vila do Conde). In Sarrazola it was found in the marshes adjacent to the Vouga river margin, in São Pedro da Cova it was growing under the canopy of the riparian woodland of river Ferreira and in Macieira da Maia it was detected under the canopy of an oakwood on the margins of river Ave and accompanied in the understory by *Tradescantia fluminensis* Vell. and *Zantedeschia aethiopica* (L.) Spreng. In this last location more than ten specimens were observed. *A. macrorrhizos* is hardier than *Colocasia esculenta* and can grow in areas where the minimum temperature is 2°C whereas the latter does not thrive below 7°C. Nevertheless, both species are limited by temperature in terms of invasiveness.

Material studied:

PORTUGAL (Lu), Beira Litoral: Sarrazola, on the verge of the marshes close to the river, among *Eichhornia crassipes*, 25-10-2015, P. Alves s.n.(BR).

***Cardamine occulta* Hornem., Suppl. Hort. Bot. Hafn.: 71. 1819. (BRASSICACEAE)**

Synonyms:

= *Cardamine hamiltonii* G. Don, *Gen. Hist.* 1: 167. 1831.

= *Cardamine flexuosa* With. subsp. *debilis* O.E. Schulz, *Bot. Jahrb. Syst.* 32(4): 478. 1903.

This Asian weed has long been overlooked in western Europe where it has been confused for quite a long time with native *Cardamine flexuosa* (e.g. Bleeker & al., 2008). It was initially referred to as ‘Asian *Cardamine flexuosa*’, subsequently as *C. hamiltonii* (Bomble, 2014; Dirkse & al., 2015) but finally turned out to be best assigned to as *C. occulta* (Marhold & al., 2016). In the Iberian Peninsula it was first reported from Huelva in Spain (Verloove & Sánchez Gullón, 2012), more recently also from the Valencia region (Mansanet Salvador & al., 2015). It is usually found in highly anthropogenic, often irrigated habitats like ornamental lawns, golf courts or as a garden weed. In Italy it is also known from rice fields (Verloove & Ardenghi, 2015). Occasionally, *Cardamine occulta* occurs in more natural habitats, for instance on exposed lake margins or river banks (Bleeker & al., 2008; Verloove & Ardenghi, 2015).

In September 2015 *Cardamine occulta* was found on several occasions in (sub-) coastal areas in Portugal and adjacent parts of Spain. This species is frequent on gravelly and sandy river banks of rivers Vouga, Lima, Ferreira and Minho and is certainly widely overlooked elsewhere. Given its actual abundance it either must have been introduced quite a long time ago or must expand in a fast way. In addition, it was also collected in irrigated lawns in Maia and Vairão, Vila do Conde.

Material studied:

PORTUGAL (Lu), Beira Litoral: Óis da Ribeira, river Águeda W of the bridge, sandy river bank, very common, 04-09-2015, F. Verloove 11726 (BR)./ *ibidem*: São João de Loure, river Vouga W of the bridge, gravelly river bank, 05-09-2015, F. Verloove 11787 (BR, PO)./ *ibidem*: Serem, river Vouga close to the bridge, sandy river bank, very common, 06-09-2015, F. Verloove 11748 (BR, PO)./ Douro Litoral: Vila do Conde, Vairão (UTM 29T 527406 / 4575268), relvado junto ao edifício do CIBIO [lawn near the CIBIO building], 108 m., 05-10-2015, P. Alves (SANT 72579)./ Minho: Monção, at Hotel Bienestar Termas, river Minho, gravelly river bank, very common, 14-09-2015, F. Verloove 11767 (BR, PO).
SPAIN (Hs), Pontevedra: Fillaboa, confluence of rivers Tea and Minho, Ilha de Fillaboa, gravelly river bank, frequent, 14-09-2015, F. Verloove 11776 (BR, SANT).

***Commelina communis* L., Sp. Pl., 1: 40–41. 1753. (COMMELINACEAE)**

Originally native to Asia, *Commelina communis* has widely spread as a weed to warm-temperate areas of the world. It is not rare at all, for instance, in North America (Faden, 2000). Also in southern Europe it is increasing lately although its presence in the Iberian Peninsula was considered only anecdotic up to few years ago (Talavera & al., 2009). It was classified as a non-established escape from cultivation at river Miño near the city of Ourense in northwestern Spain. In few years of time, however, this species has spread in Galicia and is now classified as an invasive species in Ourense and Pontevedra (Romero & Amigo, 2009). In the valley of river Minho (Portugal) it was recorded on several occasions in September 2015, e.g. in Friestas (Eirado) and Lapela (Monção). In identical circumstances *Commelina communis* was also recorded alongside river Lima in Crasto (Ponte de Lima). This species occurs in *Bidentetiae tripartitae* communities, on damp sandy substrates and looks perfectly established in this area.

Material studied:

PORTUGAL (Lu), Minho: Friestas (Eirado), W of Monção, river Minho, river bank, not rare, also in other localities in the area, 14-09-2015, F. Verloove 11815 (BR).

***Digitaria violascens* Link, Hort. Berol., 1: 229. 1827. (POACEAE)**

Digitaria violascens is a pantropical weed that was able to naturalize in southern Europe in the past decades. It is known now from the Canary Islands, southern France and large parts of Italy and Spain (e.g. Pyke, 2008; Verloove, 2008; Verloove & Sánchez Gullón, 2008; Verloove & Reyes-Betancort, 2011; Verloove & Ardenghi, 2015). It has widely been overlooked as a result of confusion with the European and very similar *D. ischaemum* (Schreb.) Muhl. (Verloove, 2008) and may be a mere tropical variant of the latter. It is, however, highly invasive and fast spreading, often penetrating in valuable habitats, for instance heaths. It is here reported for the first time from Portugal although it is obvious that it must have been introduced some time ago already but has been confused with the native *D. ischaemum*, a very rare species in Portugal. In September 2015 *Digitaria violascens* was seen in Beira Litoral, Douro Litoral and Minho and should be looked for in other Portuguese provinces as well. In addition to the localities cited here under, *Digitaria violascens* was also observed in several other places, often in abundance, for instance in Ovar, Cacia and Vila do Conde. It is particularly common alongside river Minho, both in Portugal and Spain. In this area it occupies open, sandy or gravelly riparian habitats. Elsewhere it was also seen as a weed in irrigated ornamental lawns, especially in peri-urban and urban areas in Douro Litoral.

Material studied:

PORTUGAL (Lu), Beira Litoral: Bairro dos Pescadores (Aveiro), irrigated lawn, close to the sea, frequent, 03-09-2015, *F. Verloove* 11697 (BR, PO). */ibidem*: Ois da Ribeira, river Águeda N of the bridge, track in woodland, alongside river, 04-09-2015, *F. Verloove* 11706 (BR). */ibidem*: Espinhel, Pateira de Farmentelos (E side), lake margin, in several localities, 04.09.2015, *F. Verloove* 11713 (BR)./ Douro Litoral: Porto, Campo Alegre, University of Porto, foot of wall, common, especially as a lawn weed, 08-09-2015, *F. Verloove* 11750 (BR)./ Minho: Cabração, N 201 towards Ponte de Lima, near quarries, track in woodland, roadsides, extremely common, 15-09-2015, *F. Verloove* 11774 (BR). */ibidem*: Monção, at Hotel Bienestar Termas, close to river Minho, irrigated lawns, common, 14-09-2015, *F. Verloove* 11777 (BR, PO). */ibidem*: Friestas, W of Monção, river Minho, lawn close to the river, 14-09-2015, *F. Verloove* 11846 (BR).
 SPAIN (Hs), Pontevedra: Fillaboa, river Tea close to its junction with river Minho, riparian woodland, 14-09-2015, *F. Verloove* 11770 (BR) + *F. Verloove* 11845 (SANT).

***Eragrostis barrelieri* Daveau, J. Bot.(Morot), 8: 289. 1894. (POACEAE)**

This species originally has a Mediterranean distribution but it is widely introduced elsewhere as a weed, for instance in Australia and North America (Peterson, 2003; Palmer & al., 2005). Although it is considered 'native' in Portugal by Euro+Med Plantbase (<http://www.emplantbase.org/home.html>) it seems to have never been recorded there so far, not even as an alien (e.g. Almeida & Freitas, 2012). Numerous plants were seen in September 2015 on the sandy banks of river Lima in Ponte de Lima. Taken into account the species distribution pattern elsewhere in the Iberian Peninsula (Spain, see: <http://www.anthos.es>), this record probably represents a non-native occurrence.

Material studied:

PORTUGAL (Lu), Minho: Ponte de Lima, river Lima between the two bridges, sandy river bank, locally frequent, 15-09-2015, *F. Verloove* 11779 (BR, PO).

***Helianthus tuberosus* L., Sp. Pl., 2: 905. 1753. (ASTERACEAE)**

A native of central-eastern North America, *Helianthus tuberosus* probably arose via hybridization between tetraploid *H. hirsutus* Raf. and diploid *H. grosseserratus* M. Martens (Bock & al., 2014). It is widely cultivated for its edible roots (Jerusalem Artichoke) and as an ornamental, also in large parts of Europe. It is a very vigorous species that is often considered invasive, especially in riparian habitats (e.g. Fehér, 2005). In the Iberian Peninsula it was only known so far from Spain, with the highest population densities found in the northeastern part of the country (e.g. Sanz Elorza & al., 2009). In Portugal *Helianthus tuberosus* has not yet been reported so far, although it probably has been overlooked, owing to confusion with the congeneric *H. xlaetiflorus* Pers., the latter being known since 1990 (Almeida & Freitas, 2006). Both species are indeed similar in general appearance; however, *H. tuberosus* has phyllaries that are long acuminate and more or less spreading whereas phyllaries of *H. xlaetiflorus* are acute at apex and are tightly appressed. Moreover, cauline leaves of *H. tuberosus* are much wider (ovate with broadly cuneate base vs. lanceolate to lance-ovate).

Helianthus tuberosus was recorded in September 2015 in riparian habitats alongside rivers Vouga, Leça and Ferreira. At least in the latter locality this species is abundant and behaves like an invasive environmental weed. Along rivers Ferreira and Leça *H. tuberosus* is one of the dominant species in the more disturbed river sections, near urban and agricultural areas. It is accompanied by other ruderal

species such as *Persicaria lapathifolia* (L.) Gray and *P. pensylvanica* (L.) M. Gómez, forming dense summer-autumnal hygrotriphilous communities.

Material studied:

PORTUGAL (Lu), Beira Litoral: São João de Loure, river Vouga W of the bridge, river side, small population, 05-09-2015, F. Verloove 11795 (BR).



Lamina 1.– Select species studied: **a)** *Alocasia macrorrhizos*, Sarrazola, on the verge of the marshes close to the river, October 2015, D. Silva; **b)** *Cardamine occulta*, Serem, river Vouga, muddy river bank, September 2015, F. Verloove; **c)** *Commelina communis*, Friestasn river Minho, sandy river bank, September 2015, F. Verloove; **d)** *Helianthus tuberosus*, São João de Loure, river Vouga, river side, September 2015, F. Verloove; **e)** *Lippia alba*, Sernada, track towards river Vouga, September 2015, F. Verloove; **f)** *Ludwigia peploides*, Amoreira do Repolão, riverlet Cértima, shallow water, September 2015, F. Verloove.

***Juncus tenuis* group (JUNCACEAE)**

The *Juncus tenuis* group is widely distributed in the New World with most representatives found in North America (Brooks & Clemants, 2000; Kirschner, 2002a; Kirschner, 2002b). It is a complex assemblage of closely related, often poorly understood species. The species most widely distributed outside of its native range is *J. tenuis* Willd. s.str. It has become a common naturalized species in large parts of Europe and often occupies natural habitats (woodlands, heaths, etc.). However, in the Iberian Peninsula it is much less frequent and mostly confined to the northern and central parts of Spain, being absent from Portugal (Romero Zarco, 2010). Moreover, the exact identity of each individual population should be critically reassessed. The very similar *J. dichotomus* Elliott (*J. tenuis* subsp. *dichotomus* (Elliott) Verloove & Lambinon) was only recently recognized in Europe, at first in Italy (Verloove, 2010), subsequently in several parts of eastern Europe and Belgium as well (Hoste & Verloove, 2016). It has much shorter leaf sheath auricles (0,1-2 mm long) that are rounded at apex and its capsules are slightly smaller. At least part of the plants currently found in the Iberian Peninsula (including those seen in Galicia) display similar characteristics (see Romero Zarco, l.c.) and may well belong to *J. dichotomus*.

In Portugal *Juncus tenuis* s.l. has been recorded since 2009 on several occasions in the Minho province in northwestern Portugal, including Paredes de Coura, Ponte de Lima and Viana do Castelo. More recently, it was detected in several locations in the river Vez basin (PROJECT "IND_CHANGE", 2014). In September 2015 a small population of *Juncus tenuis* s.l. was found on the banks of river Minho in Peso. Leaf sheath auricles of these plants were severely damaged which impedes an accurate identification. Capsule characters, however, suggest that these plants also may belong to *J. dichotomus*.

Material studied:

PORTUGAL (Lu), Minho: Peso, W of Melgaço, river Minho at the bridge, crack in concrete, close to the river, scattered individuals, 16-09-2015, F. Verloove 11836 (BR, PO).

***Lippia alba* (Mill.) N.E. Br. ex Britton & P. Wilson, Bot. Porto Rico, 6(1): 141. 1925. (VERBENACEAE)**

Lippia alba is originally native to the warm-temperate and (sub-) tropical parts of the New World. It is widely cultivated as an ornamental or for its aromatic foliage and it is also used medicinally. As a result of this, it was able to escape and naturalize outside of its area of origin, for instance in Australia and India (Munir, 1993). To our knowledge it has not been reported yet in the wild from Europe. Scattered bushes of *Lippia alba* were found alongside a path that leads to the Vouga river in Sernada.

Lippia alba is a popular bush, also in the Iberian Peninsula (e.g. Sánchez de Lorenzo-Cáceres, 2015), and may have been overlooked. In general appearance it is very similar to *Lantana camara* L., both being spreading shrubs with spicate inflorescences, often subcapitate during anthesis and elongating in fruit. Nevertheless, *Lantana* may easily be distinguished by its stem and leaves being harshly pubescent and prickly and its drupaceous fruit (Munir, 1993). Flower color in *Lippia alba* is variable; in the Portuguese population, however, corollas were lilac, a color rarely encountered in *Lantana camara*.

Material studied:

PORTUGAL (Lu), Beira Litoral: Sernada, close to railway station, track towards river Vouga, 4-5 bushes, 06-09-2015, F. Verloove 11754 (BR, PO).

***Ludwigia peploides* (Kunth) P.H. Raven subsp. *montevidensis* (Spreng.) P.H. Raven, Reinwardtia, 6(4): 395. 1963. (ONAGRACEAE)**

Originally native in South America and further north reaching the southern parts of the United States, this aquatic ornamental has been introduced in numerous warm-temperate and subtropical regions across the world in the past decades. It is a very vigorous species that readily escapes or is discarded in ponds and water courses. As such, it has become a problem plant of major concern in many regions, also in Europe (e.g. Dandelot & al., 2005). In the Iberian Peninsula, *Ludwigia peploides* has been known from Spain (provinces of Barcelona and Gerona) since 1956 although it long remained unnoticed, as a result of confusion with the congeneric *L. grandiflora* (Michaux) Greuter & Burdet (Verloove & Sánchez Gullón, 2008). In September 2015 it was recorded in the valley of riverlet Cértima near Oliveira do Bairro, apparently for the first time in Portugal, where it locally invades water courses and adjacent rice fields. It seems to be a recent introduction there but a future, wider naturalization is predictable.

All plants seen so far in Europe are densely covered with long spreading hairs and belong to subsp. *montevidensis* (Raven, 1963).

Material studied:

PORTUGAL (Lu), Beira Litoral: Amoreira do Repolão (Oliveira do Bairro), riverlet Cértima, riverlet, also in adjacent rice fields, common, 13-09-2015, *F. Verloove* 11768 (BR, PO).

Paspalum notatum Flüggé, var. *saurae* Parodi, *Revista Argent. Agron.*, 15: 55, f. 1B. 1948. (POACEAE)

Synonym:

=*Paspalum saurae* (Parodi) Parodi, *Darwiniana*, 15(1-2): 106. 1969.

This taxon, originally native to South America (southern Brazil, Bolivia, Uruguay and Argentina; (Zuloaga & al., 2004)), is widely grown in the warm-temperate and subtropical areas of the world (as Bahiagrass). It is good forage and makes a relatively low-maintenance turf as well. In recent times it has been repeatedly recorded from southern Europe, for instance in Spain (incl. Canary Islands), Greece, Italy and France (incl. Corse) (e.g. Carretero, 1987; Verloove, 2003; Böhling & Scholz, 2004; Verloove, 2005; Verloove & Reyes-Betancort, 2011; Tison, 2012; Vázquez Pardo, 2014; Stinca & al., 2016). In September 2015 it was seen twice in the coastal area south of Porto, always in disturbed lawns. In addition to the locality cited here under it was also seen north of Espinho and in the herbarium of the University of Porto (PO) a record from Porto (Bom Sucesso) from 2001 is stored.

Material studied:

PORTUGAL (Lu), Douro Litoral: Francelos towards Miramar, Praia de Francemar, lawn, close to the sea, frequent, 08-09-2015, *F. Verloove* 11739 (BR, PO) / *ibidem*: Porto near Bom Sucesso market, 06-2001, *P. Alves* s.n. (PO).

Persicaria pensylvanica (L.) M. Gómez, *Anales Inst. Segunda Ensenanza Habana*, 2: 278. 1896. (POLYGONACEAE)

This American weed is increasingly found in recent times in parts of Europe, for instance in the Czech Republic and Italy (e.g. Kubát & Jehlík, 2003; Verloove & Ardenghi, 2015). In the Iberian Peninsula (Spain) it has been known since 1982 (Carretero & Costea, 1998; Patino & Valencia, 2000). *Persicaria pensylvanica* is not only found as weed of agricultural fields; in fact, it is often also seen in riparian habitats (mud flats, exposed sand banks, etc.) and can be classified as invasive species.

In September 2015 it was seen in such type of habitats in Portugal, apparently for the first time. However, in most localities where it was detected it was so common that it must have been overlooked since quite some time. Especially in the valley of river Vouga *Persicaria pensylvanica* is often co-dominant in riparian ruderal vegetation. In addition to the localities cited here under it was also seen in Eirol, Lamas do Vouga, Pontilhão, Sérem, Sernada do Vouga, Taboeira (pateira) and Cabeço. Between Travassó and Lamas do Vouga it was also seen as a weed in maize fields. In many parts of the valley of river Ferreira (e.g. between Barraca and Gens, near Gondomar and near Pedrogo) it is quite abundant, colonizing sediment bars with *Persicaria lapathifolia* (L.) Gray.

This species is much reminiscent of the common native *Persicaria lapathifolia* and both obviously have been confused in Portugal. Compared with the latter the peduncle is stipitate-glandular, the tepals are prominently veined with veins that are not anchor-shaped and the flowers usually are a brighter pink.

Material studied:

PORTUGAL (Lu), Beira Litoral: Macinhata, river Vouga close to the bridge, sandy river bank, very common in this area, 06-09-2015, *F. Verloove* 11747 (BR) / *ibidem*: Ois da Ribeira, river Águeda W of the bridge, sandy river bank, 04-09-2015, *F. Verloove* 11718 (BR, PO) / *ibidem*: São João de Loure, river Vouga E of the bridge, sandy river bank, common, 05-09-2015, *F. Verloove* 11735 (BR) / Minho: Friestas (Eirado), W of Monção, river Minho, sandy river bank, only locally (probably a recent introduction), 14-09-2015, *F. Verloove* 11765 (BR).

Sicyos angulatus L., *Sp. Pl.*, 2: 1013. 1753. (CUCURBITACEAE)

A native of eastern North America, *Sicyos angulatus* is an increasing agricultural and environmental weed in many areas across the world. It grows among forage crops (e.g. maize) and natural vegetation, often riparian woodlands. In such habitats it has become a very invasive species, also in parts of Europe (EPP0, 2010). In the Iberian Peninsula it is a recent introduction, known only from Spain. Fàbregas & al. (1996) reported about its occurrence alongside river Ter near Gerona. It was subsequently also observed in Vizcaya, Lérida and Cantabria (Ascaso & al., 2013). In September 2015 *Sicyos angulatus* was discovered in riparian woodland alongside river Minho in Friestas (Eirol). It is highly invasive there

but, at least at present, confined to a rather small area, doubtlessly indicating a relatively recent introduction. A further spread along river Minho, in Portugal as well as Spain, is predictable. It was also seen colonizing riparian woodlands in the vicinity of river Ave (Vila do Conde) and river Uíma (Santa Maria da Feira) and in the basin of river Leça, more precisely along Ribeira do Arquinho near Maia, where monospecific colonies were detected, also in 2015. However, the large size of this population suggests an older introduction and it was probably overlooked before.

In the latter locality *Sicyos angulatus* was initially confused with *Lagenaria siceraria* (Molina) Standl. and further Portuguese claims of the latter may also belong to *Sicyos angulatus*.

Material studied:

PORTUGAL (Lu), Minho: Friestas (Eirado), W of Monção, river Minho, riparian woodland, extremely invasive but (so far) only locally, 14-09-2015, *F. Verloove* 11766 (BR).

Solidago gigantea Aiton, *Hort. Kew.*, 3: 211. 1789. (ASTERACEAE)

A native of North America, *Solidago gigantea* is widely cultivated as an ornamental in many temperate regions across the world. It is very vigorous and its rhizomes are often discarded by garden owners. It easily establishes itself subsequently, naturalizing and finally becoming an invasive species in numerous areas, also in Europe (e.g. Weber & Jakobs, 2005). In the Iberian Peninsula it is mostly confined to the colder and damper regions in the northern part, mostly the Basque Country, Catalunya and Cantabria (e.g. Aymerich & Boixader, 1998; Campos & Herrera, 1998). In Portugal only one non-native species from this genus has been recorded so far, *S. rugosa* Mill. (Almeida, 1999; Almeida & Freitas, 2012).

Solidago gigantea was recorded twice in September 2015 in Beira Litoral. In addition to the locality cited here under, it was also seen on rough ground adjacent to river Vouga in Cabeço. At present, this species does not yet seem to be genuinely naturalized (only in the first locality, close to gardens, it looks established) but precaution seems relevant, especially in the more northern regions like Minho.

Material studied:

PORTUGAL (Lu), Beira Litoral: Mira, barrinha (E side), track alongside the lake, 09-09-2015, *F. Verloove* 11782 (BR).

Vitis ×instabilis Ardenghi, Galasso, Banfi & Lastrucci, *Phytotaxa*, 166(3) : 182–183. 2014. (VITACEAE)

Synonym:

= *Vitis riparia* Michx. × *V. rupestris* Scheele

This artificial hybrid was seen on two occasions in September 2015, apparently for the first time in Portugal (Beira Litoral). It may, however, have been overlooked so far. In recent times it was able to naturalize and become invasive in parts of southern Europe, for instance in France, Greece, Italy and Spain (Ardenghi & al., 2014; Tison & de Foucault, 2014). It is often one of the most vigorous taxa of this genus in the wild and probably is more widespread in Portugal as well. Its distinguishing features are thoroughly discussed by Ardenghi & al. (2014). More recently it was detected in several other areas where it appears to be quite common, namely in the valleys of river Cavado (Minho), river Ferreira and river Marão (Douro Litoral). Besides its invasive behavior in natural biotopes, it is also very common along the road verges in the Northwest of Portugal. The spread of this nothotaxon in the Northwest of Portugal might be enhanced by its capability of producing fruits, in opposition to other species of *Vitis* L. used as rootstocks.

Material studied by N. Ardenghi:

PORTUGAL (Lu), Beira Litoral: Perraes [Oliveira do Bairro], S of Pateira de Fermentelos, track alongside rice field, 04-09-2015, *F. Verloove* 11710 (BR)./ *ibidem*: Praia de Vagueira, vacant lot in coastal dunes, covering a large surface, 03-09-2015, *F. Verloove* 11698 (BR)./

Additional material studied: PORTUGAL (Lu), Douro Litoral: Candemil (Amarante), near river Marão, 29T/586927/4566535, 10-6-2016, *P. AlvesPO-V62352*.

Vitis ×novae-angliae Fernald, *Rhodora*, 19: 146–147. 1917. (VITACEAE)

Synonym:

= *Vitis labrusca* L. × *V. riparia* Michx.

This artificial hybrid is here reported for the first time from Portugal although it may have been confused with its parental species, *Vitis labrusca* L. and *V. riparia* Michx. Out of these only the former has been known before from Portugal (Almeida, 1999). *Vitis ×novae-angliae* can be distinguished mainly on the basis of disposition of tendrils, indumentum of vegetative parts, leaf blade color and consistency and size of seeds and berries, adherence of exocarp to mesocarp and flavor of ripe berries (see Ardenghi & al., 2015 for details).

Vitis ×novae-angliae can be considered (locally) naturalized in France and Italy and this probably also holds true for Portugal. In September 2015 it was recorded in riparian woodland alongside river Minho near Monção. It looks well-established there but was only seen locally. It was also recorded in river Marão (Douro Litoral) and river Âncora (Minho), being more abundant in the last location. It competes with the apparently much more vigorous *Sicyos angulatus* L.

Material studied by N. Ardenghi:

PORTUGAL (Lu), Minho: Friestas (W of Monção), river Minho, riparian woodland, 14-09-2015, F. Verloove 11753 (BR).

Additional material studied: PORTUGAL (Lu), Douro Litoral: Candemil (Amarante), near river Marão, 29T/586927/4566535, 10-6-2016, P. Alves PO-V62353.

***Xanthium strumarium* L., Sp. Pl., 2: 987. 1753. (ASTERACEAE)**

This species is originally native in the New World where it is a weed of waste places and agricultural fields. Its taxonomy is confusing and recent American authors opted to accept it in a wide sense, including – among others – *X. italicum* Moretti, *X. orientale* L., etc. (Strother, 2006). European authors, however, tend to adopt a (much) narrower species concept, accepting microspecies (often ‘endemics’) like *X. albinum* (Widd.) Scholz & Sukopp, *X. saccharatum* Wallr. and others (e.g. Wisskirchen, 1989). From this complex two taxa had been recorded so far from Portugal, *X. italicum* and *X. orientale* (Almeida & Freitas, 2006). In Amoreira do Repolão very typical plants of *X. strumarium* s.str. were seen on the verge of a sorghum field in September 2015. It probably is much less frequent than the other members of this group in Portugal.

Material studied:

PORTUGAL (Lu), Beira Litoral: Amoreira do Repolão (Oliveira do Bairro), valley of riverlet Cértima, edge of sorghum field, common, 13-09-2015, F. Verloove 11764 (BR).

***Yucca gloriosa* L., Sp. Pl., 1: 319. 1753. (AGAVACEAE)**

Yucca gloriosa is originally native in a relatively narrow area in the southeastern parts of the United States. It is, however, widely grown as an ornamental in most temperate zones across the world. It was shown to be the product of intersectional hybridization between *Y. aloifolia* L. and *Y. filamentosa* L. (Rentsch & Leebens-Mack, 2012). Although indigenous yucca moths are required for pollination (Pellmyr, 2003), this species was able to naturalize outside its original distribution range, as a result of strong clonal growth. This also holds true for parts of Europe, including the Iberian Peninsula, from where it is known from the Valencia area (Guillot & Van der Meer, 2003). Up to present, it had not been recorded yet from Portugal although it might have been confused with *Y. aloifolia*, the only species known so far from that country (Almeida & Freitas, 2006). In September 2015 *Y. gloriosa* was observed on several occasions in coastal habitats in Beira Litoral. In addition to the locality cited here under, it was also recorded in Praia da Barra, Figueira da Foz and Seixo (Mira). This species probably is a recent newcomer; a wider naturalization in coastal dunes is feasible and local invasive behavior cannot be ruled out.

Material studied:

PORTUGAL (Lu), Beira Litoral: Bairro dos Pescadores (Costa Nova do Prado), S Aveiro, coastal dunes, close to habitations, locally naturalized, 03-09-2015, F. Verloove 11778 (BR).

NEW REGIONAL RECORDS

***Artemisia verlotiorum* Lamotte, Mém. Assoc. Franç. Congr. Clermont Ferrand, 1876: 511. 1876. (ASTERACEAE)**

This Far Eastern environmental weed is fast spreading in southern Europe, especially in the past decades. It is most invasive in riverine habitats and usually forms dense, monospecific stands. In Portugal *Artemisia verlotiorum* is a relatively recent invader, apparently found for the first time in 1967 in Marvão (Alto Alentejo) (Malato-Béliz, 1973). It was subsequently also reported from Baixo Alentejo and is considered a potentially invasive species (Almeida, 1999).

In September 2015 *Artemisia verlotiorum* was observed on several instances, mostly in riparian communities. All records are from Beira Litoral, Douro Litoral and Minho, provinces from where it had not been reported before apparently. In addition to the localities cited here under it was also seen alongside river Vouga (locally very invasive already in São João de Loure, Eirol, Lamas do Vouga, Macinhata do Vouga, Sernada do Vouga, Sarrazola, Cabeço), in Amoreira do Repolão in the valley of river

Cértima, in the valley of river Minho (highly invasive, on the Portuguese as well as on the Spanish border of the river, in Monção, Fillaboa, Friestas, Arbo, Peso, As Neves) and in the valley of river Lima (Ponte de Lima, Crasto). Near Travassô it was also seen as a weed in maize fields. It is obvious that this species no longer is potentially but genuinely invasive in Portugal.

Material studied:

PORTUGAL (Lu), Beira Litoral: Requeixo, river Águeda towards Ois da Ribeira, river bank, small population (not common yet in this area), 04-09-2015, *F. Verloove* 11720 (BR)./ *ibidem*: Sarrazola (Aveiro), Baixa Vouga Lagunares, track close to Vouga river, in dense populations (form with narrow leaf segments), 06-09-2015, *F. Verloove* 11850 (BR, PO)./ Douro Litoral: Esmoritz, estuary, grassland, small population, 10-09-2015, *F. Verloove* 11833 (BR).

Conyza bilbaoana E.J. Rémy, *Fl. Chil.*, 4(1): 75–76. 1849. (ASTERACEAE)

A South American native, this species has long been confused with both *Conyza canadensis* (L.) Cronquist and *C. sumatrensis* (Retz.) E. Walker and is more or less intermediate between these species. Few years ago it was reported for the first time from Portugal but it surely had been overlooked before (Alves & Aguiar, 2012). In September 2015 *C. bilbaoana* was seen in nearly every visited locality and probably is the most widespread species of this genus in northwestern Portugal. Exactly the same applies to adjacent parts of Spain (Galicia) (González-Martínez, 2015).

Material studied:

PORTUGAL (Lu), Beira Litoral: Praia de Vagueira (Vagos), margin of abandoned maize field, close to the sea dunes, very common in this area, 03-09-2015, *F. Verloove* 11704 (BR).

Cyperus brevifolius (Rottb.) Endl. ex Hassk., *Cat. Hort. Bot. Bogor.*: 24. 1844. (CYPERACEAE)

This pantropical weed is known from Portugal since the end of the 19th century and now occurs in the provinces Douro Litoral, Estremadura, Minho and Trás-os-Montes e Alto Douro (Verloove, 2014). It is here reported from the Beira Litoral province, apparently for the first time. It is a troublesome weed in irrigated ornamental lawns.

Material studied:

PORTUGAL (Lu), Beira Litoral: Ovar, Praia Douromar, lawn, 10-09-2015, *F. Verloove* 11746 (BR).

Dichondra micrantha Urb., *Symb. Antill.*, 9(2): 243. 1924. (CONVOLVULACEAE)

Probably of American origin (Austin, 1998) this creeping ornamental is widely grown in warm-temperate and subtropical regions of the world, especially for ground cover. It is known in Portugal since 1999 (Almeida & Freitas, 2006) and seems to be reported for the first time from Minho province here.

Material studied:

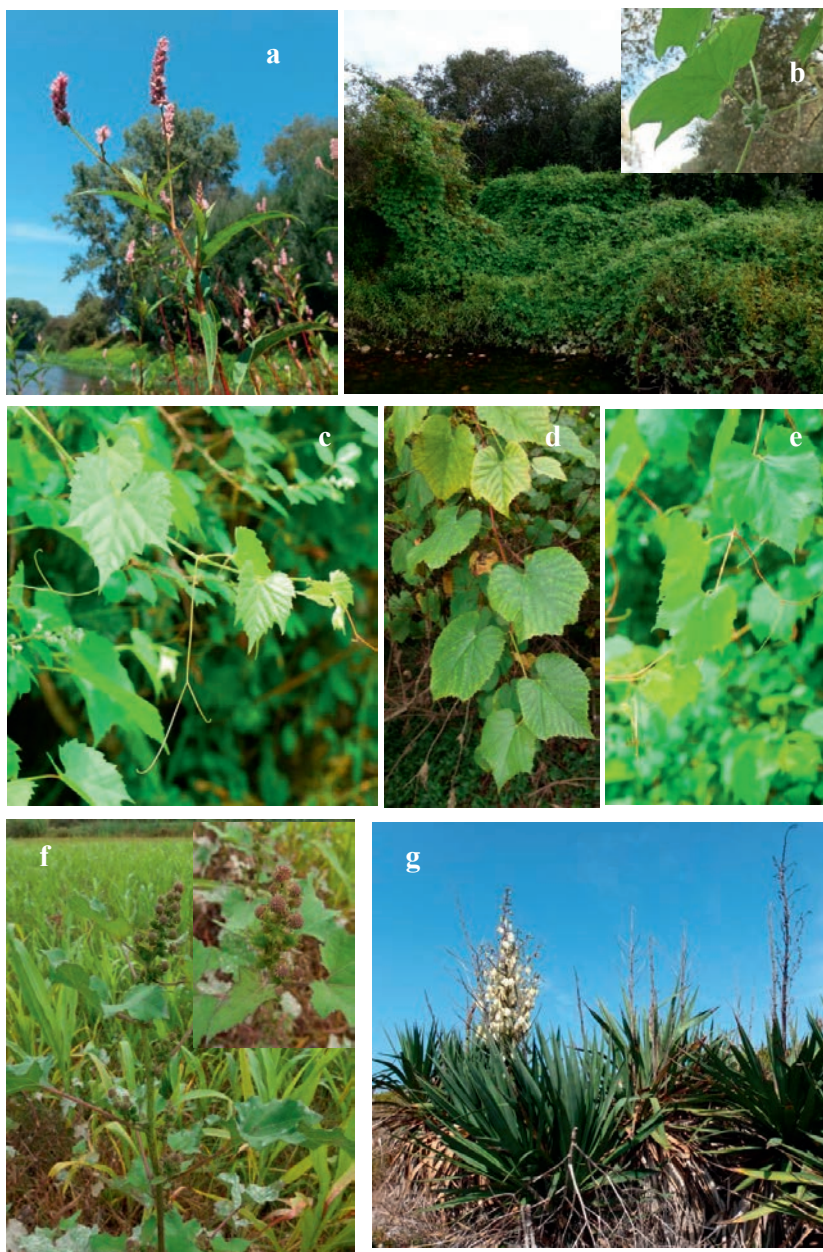
PORTUGAL (Lu), Minho: Ponte de Lima, quay of river Lima, cracks in concrete, common, 15-09-2015, *F. Verloove* 11772 (BR).

Digitaria ciliaris (Retz.) Koeler, *Descr. Gram.*: 27. 1802. (POACEAE)

This (sub-) tropical counterpart of *Digitaria sanguinalis* (L.) Scop. long remained unrecorded from Portugal. It was not included in a catalogue of non-native plants of Portugal (Almeida, 1999), nor in any of the supplements published subsequently (Almeida & Freitas, 2006; Almeida & Freitas, 2012). Yet, the presence of *D. ciliaris* in Portugal had been confirmed by Wilhalm (2009) from Algarve. In September 2015 this species was repeatedly recorded in several, widely scattered localities, in Portugal as well as in adjacent parts of Spain (Galicia). It was recorded in a wide variety of habitats, ranging from arid, gravelly and sun-exposed railway grounds to rather damp, riparian woodlands. This species obviously has been overlooked so far in this area and probably is not rare.

Material studied:

PORTUGAL (Lu), Beira Litoral: Bairro dos Pescadores (Aveiro), irrigated lawn, 03-09-2015, *F. Verloove* 11849 (BR)./ *ibidem*: Sernada, railway station, bare gravelly area, locally common, 09-09-2015, *F. Verloove* 11804 (BR, PO)./ Minho: Friestas, W of Monção, river Minho, riparian woodland, 14-09-2015, *F. Verloove* 11847 (BR).
SPAIN (Hs), Pontevedra: Fillaboa, river Tea close to its junction with river Minho, riparian woodland, 14-09-2015, *F. Verloove* 11770 (BR) + *F. Verloove* 11845 (SANT).



Lamina 2.- Select species studied: **a)** *Persicaria pensylvanica*, Macinhata, river Vouga, sandy river bank, September 2015, F. Verloove; **b)** *Sicyos angulatus*, Friestas (Eirado), river Minho, riparian woodland, September 2015, F. Verloove; **c)** *Vitis xinstabilis*, Candemil (Amarante), near river Marão, June 2016, D. Silva; **d)** *Vitis novae-angliae*, Friestas, river Minho, riparian woodland, September 2015, F. Verloove; **e)** *Vitis novae-angliae*, Candemil (Amarante), near river Marão, June 2016, D. Silva; **f)** *Xanthium strumarium*, Amoreira do Repolão, edge of sorghum field, September 2015, F. Verloove; **g)** *Yucca gloriosa*, Bairro dos Pescadores, coastal dunes, September 2015, F. Verloove.

Eleocharis bonariensis Nees, *J. Bot.* (Hooker), 2: 398. 1840. (CYPERACEAE)

This species is originally native to South America. It is rarely seen outside of its original distribution range although it is naturalized since quite a long time in southwestern France. In the Iberian Peninsula it was long confused with native *Eleocharis acicularis* (L.) Roem. & Schult. (Pérez Badia & al., 1995). It turned out to be fairly widespread with a remarkable concentration of records in Galicia. In Portugal it is a recent introduction, apparently cited for the first time by Jiménez Mejías & Luceño (2007) and known only from Beira Litoral. However, it may have been overlooked elsewhere. Along river Minho (Melgaço) it is known since at least 2002 and its presence in the valley of river Minho was confirmed in 2015. *E. bonariensis* is in fact rather frequent, at least between Eirado and Melgaço, and often occurs in dense, nearly monospecific stands. In identical circumstances it also grows on the Spanish side of the river, for instance in Arbo (Pontevedra).

Material studied:

PORTUGAL (Lu), Minho: Friestas (Eirado), W of Monção, river Minho, sandy river bank, common, 14-09-2015, *F. Verloove* 11758 (BR, PO)./ *ibidem*: frequent, 14-09-2015, *F. Verloove* 11814 (BR, PO)./ *ibidem*: exposed bank of temporarily pond, frequent, 14-09-2015, *F. Verloove* 11816 (BR, PO)./ *ibidem*: E of Monção, river Minho near Rua da Floresta, on the margin of temporary pools, on sand, common, 16-09-2015, *F. Verloove* 11838 (BR, PO).

Eragrostis curvula (Schrad.) Nees, *Fl. Afr. Austral. Ill.*: 397. 1841. (POACEAE)

A South African native, *Eragrostis curvula* is widely introduced in the warm-temperate regions of the world, either as an ornamental grass, for forage or for erosion control. It is very prolific and often considered an environmental weed. In Portugal it is known so far from Alto Alentejo, Beira Litoral and Estremadura (Almeida, 1999; Verloove & Sánchez Gullón, 2012). In September 2015 it was recorded in abundance alongside the A3 motorway in Minho province where it possibly has been introduced initially for soil stabilization.

Material studied:

PORTUGAL (Lu), Minho: Coura, A3 motorway S of river Coura, roadside, frequent between rivers Coura and Lima (total distance of ca. 15 km), 17-09-2015, *F. Verloove* 11761 (BR, PO).

Gazania rigens (L.) Gaertn., *Fruct. Sem. Pl.*, 2: 451. 1791. (ASTERACEAE)

A South African native, *Gazania rigens* had been recorded before in Portugal from Bajo Alentejo (Almeida, 1999) and Estremadura (Silva & al., 2015). At the Sernada railway station, on more or less abandoned, gravelly and sun-exposed substrate a small colony seems to persist well.

Gazania rigens is here considered in a broad sense, as to include numerous cultivars and probably hybrids of complex parentage as well (compare with Laguna & Ferrer Gallego, 2013).

Material studied:

PORTUGAL (Lu), Beira Litoral: Sernada, railway station, bare gravelly area, ca. 10-15 individuals, 09-09-2015, *F. Verloove* 11802 (BR, PO).

Lemna minuta Kunth in Humboldt, Bonpland & Kunth, *Nov. Gen. Sp.* (quarto ed.), 1: 372. 1816. (ARACEAE)

This American aquatic weed is fast spreading in Europe in recent times, although it is still frequently overlooked. In the Iberian Peninsula it was said to be known from scattered localities, in Portugal from Beira Alta, Beira Litoral, Douro Litoral and Bajo Alentejo (Galán, 2007; Vázquez Pardo, 2016). In addition, the very similar *Lemna valdiviana* Phil. was reported from Beira Litoral. The latter, however, is a non-weedy species unlikely to occur outside of its native area in South America (pers. comm. E. Landolt); claims for it in Europe therefore require confirmation.

In September 2015 *Lemna minuta* was seen on several occasions, all in Beira Litoral. In the valley of river Águeda it was recorded in Óis da Ribeira and Espinhel, in Perrães, Amoreira do Repolão and Silveiro in the valley of river Cértima and in coastal lakes in Mira and Tocha. It was seen in standing water of rivers, lakes and in rice fields, often in abundance. In addition, it was also seen in Fillaboa (Spain, Galicia), at the confluence of rivers Tea and Minho (Ilha de Fillaboa); it had not been recorded yet from Galicia, apparently (Romero, 2007).

Material studied:

PORTUGAL (Lu), Beira Litoral: Espinhel, river Águeda E of the bridge, shallow water, frequent, 04-09-2015, F. Verloove 11707 (BR).

***Mollugo verticillata* L., Sp. Pl., 1: 89. 1753. (MOLLUGINACEAE)**

This weed from tropical America had been recorded before in Portugal in Douro Litoral and Minho (Gonçalves, 1990). Almeida (1999) further cited a record from Trás-os-Montes e Alto Douro. All records are from exposed river and lake margins and railway infrastructure. In September 2015 *Mollugo verticillata* was repeatedly and commonly recorded alongside river Vouga, always on exposed sandy river banks, apparently for the first time in Beira Litoral. In addition to the locality cited here under, it was also seen in Cabeço, Eirol, Macinhata do Vouga, Sérem and Sernada do Vouga. It is obviously very well established in this river valley and can be considered an invasive species.

Material studied:

PORTUGAL (Lu), Beira Litoral: São João de Loure, river Vouga, E bridge, sandy river bank, common, 05-09-2015, F. Verloove 11737 (BR).

***Opuntia elata* Link & Otto ex Salm-Dyck, Hort. Dyck.: 361. 1834. (CACTACEAE)**

Originally native in South America in parts of Argentina, Brazil, Paraguay and Uruguay, *Opuntia elata* is widely cultivated as ornamental elsewhere in the warm-temperate regions of the world. This species easily naturalizes in natural, usually coastal habitats (e.g. Walters & al., 2011). In Portugal it was only recently recognized (Freitas & al., 2010; Almeida & Freitas, 2012), without further chorological details. It was probably introduced in Portugal at the beginning of the 20th century but was overlooked for quite a long time. Compared with the superficially similar *O. ficus-indica* (L.) Mill., its cladodes are green often suffused purplish and much thicker. Moreover, its corollas are always orange. The shape of the fruit is also a diagnostic feature used to distinguish between *O. ficus-indica* and *O. elata*: the fruit of *O. elata* is obovoid, much longer than wide, while the fruit of *O. ficus-indica* is clearly ovoid. The exact distribution of *Opuntia elata* in Portugal should be critically assessed since it is a potentially invasive species in coastal dunes.

Material studied:

PORTUGAL (Lu), Beira Litoral: Tocha, Lagoa Salgueira, by sandy track in coastal dunes, on the verge of pine wood, 12-09-2015, F. Verloove s.c. (photo)

***Setaria faberi* R.A.W. Herrm., Beitr. Biol. Pflanzen., 10(1): 51. 1910. (POACEAE)**

Originally a weed from East Asia, *Setaria faberi* has spread to many areas of the world, including the Americas and Europe (Morrone & al., 2014). It is a troublesome agricultural weed, especially in maize and soybean fields. In the Iberian Peninsula it is a relatively recent introduction, known since the 1980's (Recasens & Conesa, 1995; Romero, 2007). From Portugal it has been reported before from Douro Litoral, Estremadura and Ribatejo (Almeida, 1999). In September 2015 it was also seen on several occasions in the provinces Beira Litoral and Minho, apparently for the first time. Interestingly, in these areas it is often found on exposed sandy river banks, in dynamic but natural habitats. In addition to the locality cited here under, *S. faberi* was also seen in other places in the valley of river Águeda, as well as in the valleys of rivers Vouga and Minho and in the surroundings of Mira.

Material studied:

PORTUGAL (Lu), Beira Litoral: Requeixo, Ponte de Requeixo, river Águeda, sandy river bank, 04-09-2015, F. Verloove 11702 (BR).

***Spartina patens* (Aiton) Muhl., Descr. Gram.: 55. 1817. (POACEAE)**

This North American, highly invasive species was cited from Portugal by Almeida & Freitas (2012), without further chorological details. It has been known since 1900 and was erroneously considered to be a native species, *Spartina versicolor* E. Fabre (e.g. Prieto & al., 2011). Since it shows an invading behavior, playing a clear and evident role in the transformation of the habitats that it colonizes, it is essential to correctly assess its current distribution in Portugal. In September 2015 *S. patens* was found in dense monospecific stands in coastal salt marshes and brackish waters in the provinces Beira Litoral (Aveiro) and Douro Litoral (Esmoritz, Sarrazola).

Material studied:

PORTUGAL (Lu), Beira Litoral: Esmoritz, Barrinha, estuary, extremely invasive but only non-flowering plants, 10-09-2015, F. Verloove 11742 (BR).



Lamina 3.- Select species studied: **a)** *Eleocharis bonariensis*, Arbo, river Miño, muddy river bank, September 2015, F. Verloove.; **b)** *Lemna minuta*, Espinhel, river Águeda, shallow water, September 2015, F. Verloove; **c)** *Gazania rigens*, Sernada, railway station, gravelly area, September 2015, F. Verloove; **d)** *Opuntia elata*, Tocha, verge of pine wood in coastal dunes, September 2015, F. Verloove; **e)** *Citrullus lanatus*, Aveiro, sewage sludge, September 2015, F. Verloove; **f)** *Cleome sesquiorrygalis*, Fillaboa, gravelly river bank, September 2015, F. Verloove.

Symphytotrichum lanceolatum (Willd.) G.L. Nesom, *Phytologia*, 77(3): 284. 1995. (ASTERACEAE)Basionym:= *Aster lanceolatus* Willd., Sp. Pl., 3(3): 2050. 1803.

This North American ornamental has been known from Portugal since 1976 (Almeida & Freitas, 2006). It has been reported from Douro Litoral, Minho, Ribatejo and Trás-os-Montes e Alto Douro and is considered an invasive species (Almeida, 1999). In September 2015 *Symphytotrichum lanceolatum* was also repeatedly seen in Beira Litoral, apparently for the first time, mostly in riparian habitats. In addition to the localities cited here under, it was also observed in Eírol, Lamas do Vouga, São João de Loure, Taboeira (all in the valley of Vouga river) and in Amoreira do Repolão and Silveiro (valley of river Cértima). It usually forms dense, monospecific stands.

This species and its putative hybrid with *Symphytotrichum novi-belgii* (L.) G.L. Nesom, *S. ×salignum* (Willd.) G.L. Nesom, are much alike and sometimes hard to distinguish. The latter has been recorded also in the Beira Litoral province and may have been overlooked elsewhere.

Material studied:

PORTUGAL (Lu), Beira Litoral: Perrães, S of Panteira de Fermentelos, valley of river Cértima, canal bank, frequent, 04-09-2015, *F. Verloove* 11801 (BR)./ *ibidem*: Requeixo, Ponte de Requeixo, river Águeda, river bank and riparian woodland, rather frequent, 04-09-2015, *F. Verloove* 11800 (BR).

Vitis labrusca L., *Sp. Pl.*, 1: 203. 1753. (VITACEAE)

In Portugal this North American vine had been recorded before from Douro Litoral (Almeida, 1999). It is here reported from the valley of river Vouga in Beira Litoral where its highly invasive behavior was observed. This species is omnipresent in riparian woodland and seems to reproduce vegetatively as well as from seed.

In most parts of Europe *Vitis labrusca* is probably less frequent than its hybrids, e.g. *V. ×novae-angliae* (see there). It is known, for instance, from Greece, Italy (Lombardy), Sicily and Spain (Ardenghi, 2010; Ardenghi & Galasso, 2013; Ardenghi & al., 2014; Ardenghi & Cauzzi, 2015).

Material studied by N. Ardenghi:

PORTUGAL (Lu), Beira Litoral: São João de Loure, river Vouga S of the bridge, twining in trees in woodland, very invasive, 05-09-2015, *F. Verloove* 11724 (BR).

Verbena incompta P.W. Michael, *Telopea*, 6(2–3): 181–183. 1995. (VERBENACEAE)

An enigmatic species, probably originating in South America, *Verbena incompta* was relatively recently described as a species new to science (Michael, 1995). It is more or less intermediate between *V. bonariensis* L. and *V. brasiliensis* Vell. With the former it shares the broadly sessile cauline leaves, with the latter the very tiny corollas. Like *V. brasiliensis* it is a weed, not an ornamental. *V. incompta* is probably overlooked in southern Europe. It was known so far from Italy and Spain (Verloove, 2011) and was recently also reported for the first time from Portugal (Cascais in Estremadura; Silva & al., 2015). In September 2015 it was observed in Cabeço and Porto, respectively in Beira Litoral and Douro Litoral. It probably has been confused and may be more widespread.

Verbena bonariensis was also recorded during our field work in September 2015 but seems less frequent and may be a mere ephemeral escape from cultivation, found on rough ground from discarded garden waste. It was seen in São João de Loure and Aveiro.

Material studied:

PORTUGAL (Lu), Beira Litoral: Cabeço, river Vouga, rough ground, close to the river, 11-09-2015, *F. Verloove* 11812 (BR, PO)./ Douro Litoral: Porto, Campo Alegre, University of Porto, abandoned lawn, 08-09-2015, *F. Verloove* 11797 (BR).

Ephemerals

Cenchrus clandestinus (Hochst. ex Chiov.) Morrone, *Ann. Bot. (Oxford)*, n.s.106: 127. 2010. (POACEAE)

Basionym:

=*Pennisetum clandestinum* Hochst. ex Chiov., *Annuario Reale Ist. Bot. Roma*, 8(1): 41, pl. 5, f. 2. 1903.

Material studied:

PORTUGAL (Lu), Beira Litoral: Cacia (Aveiro), railway station, lawn, few plants (probably as an impurity), 11-09-2015, *F. Verloove* 11835 (BR).

Citrullus lanatus (Thunb.) Matsum. & Nakai, *Cat. Sem. Spor. Hort. Bot. Univ. Imp. Tokyo* 30, no. 854. 1916. (CUCURBITACEAE)

Material studied:

PORTUGAL (Lu), Beira Litoral: Aveiro, S of the city, N 109 × N 235, sewage sludge, 05-09-2015, *F. Verloove* 11762 (BR).



Lamina 4.– Select species studied: **a)** *Cucurbita moschata*, Aveiro, sewage sludge, September 2015, F. Verloove; **b)** *Euryops chrysanthemoides*, Espinhel, Pateira de Fermentelos, lake margin, September 2015, F. Verloove; **c)** *Melia azedarach*, Ilhavo, quarry, September 2015, F. Verloove.

Cleome sesquiorrygalis Naudin ex C. Huber, *Rev. Hort.* (Paris), 46: 458, 467. 1874. (CAPPARACEAE)

Material studied:

SPAIN (Hs), Pontevedra: Fillaboa, confluence of rivers Tea and Minho, Ilha de Fillaboa, gravelly river bank, a single individual, 14-09-2015, F. Verloove 11819 (BR).

Cucurbita moschata Duchesne, *Essai Hist. Nat. Courges*, 7 : 15–16. 1786. (CUCURBITACEAE)

Material studied:

PORTUGAL (Lu), Beira Litoral: Aveiro, S of the city, N 109 × N 235, sewage sludge, several plants, 05-09-2015, F. Verloove 11837 (BR).

Euonymus japonicus Thunb., *Nova Acta Regiae Soc. Sci. Upsal.*, 3: 208. 1780. (CELASTRACEAE)

Material studied:

PORTUGAL (Lu), Beira Litoral: Praia da Barra, close to the bridge, coastal dunes, a single shrub (not planted), 03-09-2015, F. Verloove 11721 (BR).

Euryops chrysanthemoides (DC.) B. Nord., *Opera Bot.*, 20: 365–370, f. 62C–G, 63C. 1968. (ASTERACEAE)

Material studied:

PORTUGAL (Lu), Beira Litoral: Espinhel, Pateira de Fermentelos (E side), lake margin, levelled soil, a single individual (doubtlessly from discarded garden waste), 04-09-2015, F. Verloove 11731 (BR).

Melia azedarach L., *Sp. Pl.*, 1: 384–385. 1753. (MELIACEAE)

Material studied:

PORTUGAL (Lu), Beira Litoral: Ilhavo, rua Tomé Barros Quieros, quarry, a single individual, 04-09-2015, F. Verloove 11711 (BR).

Native species

Schoenoplectus triqueter (L.) Palla, *Verh. K.K. Zool.-Bot. Ges. Wien*, 38(Sitzungsber.): 49. 1888. (CYPERACEAE)

Basionym:

= *Scirpus triqueter* L., *Mant. Pl.*: 29. 1767.

Material studied:

PORTUGAL (Lu), Minho: Friestas (Eirado), W of Monção, river Minho, river side, frequent, 14-09-2015, F. Verloove 11757 (BR, PO).

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