New records of interesting vascular plants (mainly xenophytes) in the Iberian Peninsula. IV

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Summary:
In 2011-2012 new research on alien vascular plants (or Iberian plants occurring beyond their native distribution range) was carried out, mainly in the provinces Huelva (Spain) and Algarve (Portugal). Several new provincial or regional data are presented. The global and local distribution, ecological preferences, (possible) previous records and degree of naturalization are provided for each taxon. *Amaranthus tuberculatus* is reported for the first time from Spain. *Bidens bipinnata* and *Mollugo verticillata* are apparently first recorded from Andalusia (Spain) while *Moricandia arvensis* and *Solidago gigantea* seem to be new for the Algarve (Portugal). The presence of *Diplotaxis siifolia* and *Kyllinga brevifolia* in Huelva is confirmed. Finally, *Gypsophila pilosa* and *Tripleurospermun maritimun* subsp. *inodorum* turn out to be new for the province of Huelva and *Ambrosia psilostachya* for the province of Alicante.
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Key word: Portugal, Spain, Xenophytes.

Resumen:
Se citan diferentes novedades corológicas provinciales localizadas entre 2011-2012, centradas principalmente en la provincia de Huelva (SO Andalucía, España) y el Algarve (Portugal), continuación de una serie de trabajos previos realizados sobre xenófitos naturalizados o adventicios en España y la Península Ibérica, así como plantas nativas naturalizadas fuera de su área natural. Para cada uno de ellos se indica su distribución general, hábitat, frecuencia y citas previas. Se añaden comentarios breves referentes al tipo de xenotipo observado en estos taxones. *Amaranthus tuberculatus* se cita por primera vez para España. *Bidens bipinnata* y *Mollugo verticillata* se citan probablemente por primera vez para Andalucía (España). *Moricandia arvensis* y *Solidago gigantea* se citan por primera vez para la comarca natural del Algarve (Portugal). La presencia de *Diplotaxis siifolia* y *Kyllinga brevifolia* se confirman para Huelva. Para terminar, *Gypsophila pilosa* y *Tripleurospermun maritimun* subsp. *inodorum* aparecen como novedad para la provincia de Huelva y *Ambrosia psilostachya* para la provincia de Alicante.
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Palabras clave: España, Portugal, Xenoflora.

Introduction

The worldwide study of non-native vascular plants has much increased in the past years. The expansion of xenophytes is considered to be a major threat for native biodiversity: vulnerable, specialized, native species are increasingly out-competed by more aggressive, usually banal non-native species. The early detection and correct identification of xenophytes is an essential tool in the battle against noxious invaders.

In the course of 2011-2012 the first author (ESG) continued his research on xenophytes in the province of Huelva (mostly in heavily disturbed or other man-made habitats, viz road verges, public lawns, port areas, etc.). In addition the revision of a historical herbarium of Don Andrés Sánchez Jurado, preserved at the University of Huelva, also yielded an interesting record. As a result several new data about the non-native vascular flora of the Spanish provinces Alicante, Huelva and the region of Algarve (Portugal) are here presented.

This paper is the fourth in a series of papers dealing with non-native vascular plants in the Iberian Peninsula (see also: Verloove & Sánchez Gullón, 2008; Sánchez Gullón & Verloove, 2009 and Verloove & Sánchez Gullón, 2012).

Material and Methods

The floristic novelties here presented are mainly the result of fieldwork by both authors in various parts of the Iberian Peninsula between 2011 and 2012 and a concise revision of the historical herbarium of Don Andrés Sánchez Jurado. Voucher specimens of all taxa are preserved in the private herbaria of the authors (Enrique Sánchez Gullón and Filip Verloove, further abbreviated as ESG and FV respectively). Duplicates were deposited in other relevant herbaria, mainly those of the University of Sevilla (SEV), the Royal Botanical Garden of Madrid (MA) and/or the National Botanic Garden of Belgium (BR).

Results

All taxa are presented in alphabetical order. Each entry includes the scientific name of the taxon (if useful accompanied by one or more synonyms), the family to which the taxon belongs, the estimated degree of naturalization (sensu Kornás, 1990), an enumeration of herbarium collections and, finally, information on its origin, actual occurrence in the Iberian Peninsula, taxonomical and/or nomenclatural remarks, identification aids, etc.

Amaranthus tuberculatus (Moq. ex DC.) J.D.Sauer, *Madroño* 13: 18. 1955. (AMARANTHACEAE) - Ephemerophyte (?)-

Synonym:
incl. *Amaranthus tamariscinus* Nutt., *Trans. Amer. Philos. Soc.* ser. 2, 5: 165. 1835.

A North American therophyte, *Amaranthus tuberculatus* is often introduced in Europe and other continents, mostly in disturbed areas (see Mosyakin & Robertson, 2003). It is often associated with soybeans and cereals in port areas. However, in some areas, for instance alongside river Po in Italy, *Amaranthus tuberculatus* is naturalized and dramatically expanding in natural plant communities (see Iamonico 2010 for a recent overview).
Amaranthus tuberculatus is much reminiscent of *A. palmeri* S.Watson, the only other dioecious amaranth known to occur in the Iberian Peninsula. Both are distinguished in the table beneath:

Characters	*Amaranthus tuberculatus*	*Amaranthus palmeri*
Pistillate flowers	Tepals absent or 1-2, 1-3 mm long; bracts 1-2 mm long	Tepals (4-) 5, 1.7-3.8 mm long; bracts 4-6 mm long
Staminate flowers	Tepals 5, 2-3 mm long; bracts 1-2 mm long	Tepals 5, 2-4 mm long; bracts 4 mm long

Table 1. Main characters of discrimination between *Amaranthus tuberculatus* (Moq. ex DC.) J.D.Sauer and *Amaranthus palmeri* S.Watson.

In Huelva it was detected in port areas near grain silos and unloading quays for cereals. It has not been recorded before in the Iberian Peninsula (see Carretero, 1990).

Material studied:
Amaranthus tuberculatus (Moq. ex DC.) J.D.Sauer,
HS (Spain): Huelva (H): Nuevo Puerto, Palos de la Frontera, cuneta zona portuaria, 29SPB8516. 15-IX-2011. 10 msm, *E. Sánchez Gullón* (priv. herb. ESG 326, dupl. BR).

Ambrosia psilostachya DC., *Prodr*. 5: 526. 1836. (ASTERACEAE) –Holoagriophyte-

Synonym:
= *Ambrosia coronopifolia* Torr. & A.Gray, *Fl. N. Amer*. 2: 271. 1842.

Amor Morales & al. (2012) provided a recent overview of *Ambrosia* in the Iberian Peninsula. *Ambrosia psilostachya* is known from a few northern provinces and some in Levante. From Alicante it has not been reported before.
Ambrosia psilostachya seems locally naturalized on sandy, more or less ruderalized beaches in Denia.

Material studied:
Ambrosia psilostachya DC.
HS (Spain): Alicante (A): Denia, Los Marines ruderalized beach, 31S248491 19-IX-2011, 0 msm. *F. Verloove* 9039 (MA).

Bidens bipinnata L.*, Sp. Pl.*2: 832. 1753.(ASTERACEAE) –Ephemerophyte-

Synonym:
≡ *Kerneria bipinnata* (L.) Godron & Grenier, *Fl. France* 2: 169. 1850.

Of uncertain origin, *B. bipinnata* is probably native in eastern Asia and introduced in South America, Europe, Asia, and Pacific Islands (Strother & Weedon, 2006). During a revision of the historical herbarium of Don Andrés Sanchez Jurado (a local pharmacist who collected plants in Huelva province between 1940-1990) an old, apparently first record of this species came to light. This is a very rare species in the Iberian Peninsula, known from Alicante (Nebot Cerdá & Serra Laliga, 1990), Catalunya (Monserrat, 1962), and León (Acedo & Llamas, 2006).

Material studied:
Bidens bipinnata L.
HS (Spain): Huelva (H): Proximidades de Mazagón, IX-1969, 29SPB91, *A. Sánchez Jurado* (Herbarium Universidad de Huelva).

Diplotaxis siifolia G.Kunze, in *Flora (Regensburg)* 29: 685.1846. (BRASSICACEAE) -Metaphyte-

Species mainly native in sandy, ruderal habitats in coastal regions (Atlantic coast of the Iberian Peninsula, N of Morocco and NW of Algeria). It was surprisingly omitted for Huelva in Flora Iberica by Martínez Laborde (1993), in spite of the fact that he had mentioned it before (Martínez Laborde, 1988). Its presence in Huelva is proved by a lot of previous notes. However, it was initially confined to the Natural Space Doñana, where it is known since quite a long time (Valdés & al., 2007; Santa Barbara & al., 1994). Clemente Muñoz & Hidalgo (1987) mention *Diplotaxis siifolia* for the entire province but this probably is an excessive extrapolation of its genuine distribution in Huelva province, where it turns out to be restricted to coastal areas. Its presence in nature reserves on the western coast of Huelva (Laguna del Portil and Marshes of the Odiel) is here confirmed.

Material studied:
Diplotaxis siifolia G.Kunze
HS (Spain): Huelva (H): Punta Umbría, Laguna del Portil, cuneta carretera suelo arenoso sistema dunar junto retamal costero (*Retama monosperma*), 29SPB7320, IV-2010, 10 msm. *E. Sánchez Gullón* (priv. herb. ESG 355, dupl. BR).

Gypsophila pilosa Huds., in *Philos. Trans*. 56: 252. 1767. (CARYOPHYLLACEAE) –Hemiagriophyte-

Weed cited before from Spain, however without previous references from Huelva province (López González, 1990). The first record from Andalusia (Jaen) goes back to Martínez Parras & al. (1988). Soon afterwards also reported from Cordoba (García Montoya & Muñoz, 1990). It is here cited for the first time from Huelva where it has been found in weed communities from arable land (mostly in *Triticum* and *Helianthus annuus* fields).

Material studied:
Gypsophila pilosa Huds.
HS (Spain): Huelva (H): Moguer, campos de cereal, 29SPB8628, 20 msm 10-VI-2012. *E. Sánchez Gullón*, (priv. herb. ESG 382, dupl. SEV, MA, BR).

Kyllinga brevifolia Rottb., *Descr. Ic. Rar. Pl.*: 13, tab. 4 fig. 3. 1773**.** (CYPERACEAE) – Hemiagriophyte-

Synonym:

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

Kyllinga brevifolia is a pantropical species. In the Iberian Peninsula it is known from a few provinces: Douro Litoral, Estremadura and Minho in Portugal, and Cádiz and Huelva in Spain (Castroviejo, 2007). However, the record for the province of Huelva was erroneous and the result of confusion with *Kyllinga odorata* Vahl (Sanchez Gullón, 1999). In 2012 it was found as a fully naturalized lawn weed, eventually confirming its current presence in this province. It often grows along with *Kyllinga odorata* and is in expansion in this region in irrigated lawns, gardens, golf courts, etc.. It is often accompanied by other subtropical weeds like *Axonopus fissifolius* (Raddi) Kuhlm., *Digitaria violascens* Link, *Paspalum dilatatum* Poir., *Soliva sessilis* Ruíz & Pavón, etc.

Material studied:

Kyllinga brevifolia Rottb.

HS (Spain): Huelva (H): Palos de la Frontera, Monasterio de La Rábida, en césped ornamental, 20SPB8420, 10 msm, 20-IX-2012, *E. Sánchez Gullón* (priv. herb. ESG 383, dupl. SEV 280977, MA, BR).

Mollugo verticillata L., *Sp. Pl.*: 2. 1753. (MOLLUGINACEAE) –Holoagriophyte-

Mollugo verticillata is a therophyte from tropical America but naturalized in various points of the central and western Iberian Peninsula (Gonçalves, 1990; Almeida & Freitas, 2006). It is here reported for the first time from Andalusia in the province of Huelva. A large population was detected on the exposed bank of a water reservoir. It grows on sandy, temporarily flooded soils, along with *Cyperus michelianus* (L.) Link*, Ammannia robusta* Heer & Regel*, Mentha pulegium* L.*, Eragrostis barrelieri* Daveau*, Eragrostis pilosa* (L.) P.Beauv.*,* etc.

Material studied:

Mollugo verticillata L.

HS (Spain): Huelva (H): Lepe, Pantano de los Machos, orillas embalse, 29SPB5732, 50 msm, 25-IX-2012, *E. Sánchez Gullón* (priv. herb. ESG 384, dupl. SEV 280979, MA, BR).

Moricandia arvensis (L.) DC., *Syst. Nat.* 2: 626. 1821. (BRASSICACEAE) -Ephemerophyte (?)-

This therophyte is native in many parts of southern Europe and northwestern Africa. In the Iberian Peninsula it is mostly confined to the central, southern and eastern parts (Sobrino Vesperinas, 1993). In Portugal it was only known so far from Beira Baixa. It is here confirmed from Algarve as well. It colonizes the southern hillsides at the castle of Silves. This record possibly refers to an accidental introduction and may turn out to be merely ephemeral.

Material studied:

Moricandia arvensis (L.) DC.

LU (Portugal): Algarve (Ag): Silves, laderas del castillo sobre suelo básico, 29SNB51, 12-V-2011, *E. Sánchez Gullón* (priv. herb. ESG 385, dupl. BR).

Solidago gigantea Aiton, *Hortus Kew.* 3: 211. 1789. (ASTERACEAE) –Hemiagriophyte-

This composite is originally native in North America but widely naturalized in large parts of (cold-) temperate Europa (Pignatti, 1982; Pyšek & al., 2002; Verloove, 2006). This record from Algarve appears to be the first from Portugal (Almeida & Freitas, 2006). It grows by roadsides, accompanied by *Conyza bonariensis* (L.) Cronq., *Conyza sumatrensis* (Retz.) E.Walker, *Dittrichia viscosa* (L.) Greuter, *Symphyotrichum squamatum* (Spreng.) G.L.Nesom, etc.

Material studied:

Solidago gigantea Aiton

LU (Portugal): Algarve (Ag): Playa Cabezo, 29SPB3416, 10 msm, 10-IX-2011, *E. Sánchez Gullón* (priv. herb. ESG 356, dupl. BR, SEV280981).

Tripleurospermum maritimum (L.) W.D.J.Koch subsp. **inodorum** (L.) Appleq., *Taxon* 51(4): 760. 2003. (ASTERACEAE) -Ephemerophyte (?)-

Synonymous:
≡ *Matricaria inodora* L., *Fl. Suec.,* ed. 2 (Linnaeus): 297. 1755.
= *Matricaria perforata* Mérat, *Nouv. Fl. Env. Paris* 332. 1812.
= *Dibothrospermum pusillum* Knaf, *Flora* 29: 299. 1846.
= *Tripleurospermum maritimum* var. *pusillum* (Knaf) Briq. & Cavill., in Burnat, *Fl. Alpes Marit*. 6(1): 134. 1916.
≡ *Matricaria maritima* L. subsp. *inodora* (L.) Soó, *Acta Geobot. Hung*. 4: 193. 1941; *nom. altern.* ("var." *vel* "subsp.")
≡ *Matricaria maritima* L. var. *inodora* (L.) Soó, *Acta Geobot. Hung*. 4: 193. 1941; *nom. altern.* ("subsp." *vel* "var.")
= *Tripleurospermum perforatum* (Mérat) Laínz, *Anal. Jard. Bot. Madrid* 39(2): 412. 1983.

Eurasian therophyte not mentioned before from western Andalusia. In the Iberian Peninsula it is distributed in southeastern and eastern regions, often as an agricultural weed (see Guillot Ortíz, 2010; Blanca, 2011; Sanz Elorza, 2001). In Huelva it was found locally by roadsides, in fields, waste places, port areas, but also on sand dunes.

Material studied:
Tripleurospermum maritimum (L.) W.D.J.Koch subsp. **inodorum** (L.) Appleq.
HS (Spain): Huelva (H): Palos de la Frontera, Nuevo Puerto, en cuneta zona portuaria, 29SPB8516, 10 msm, 10-VI-2011, *E. Sánchez Gullón* (priv. herv. ESG 329, dupl. BR).

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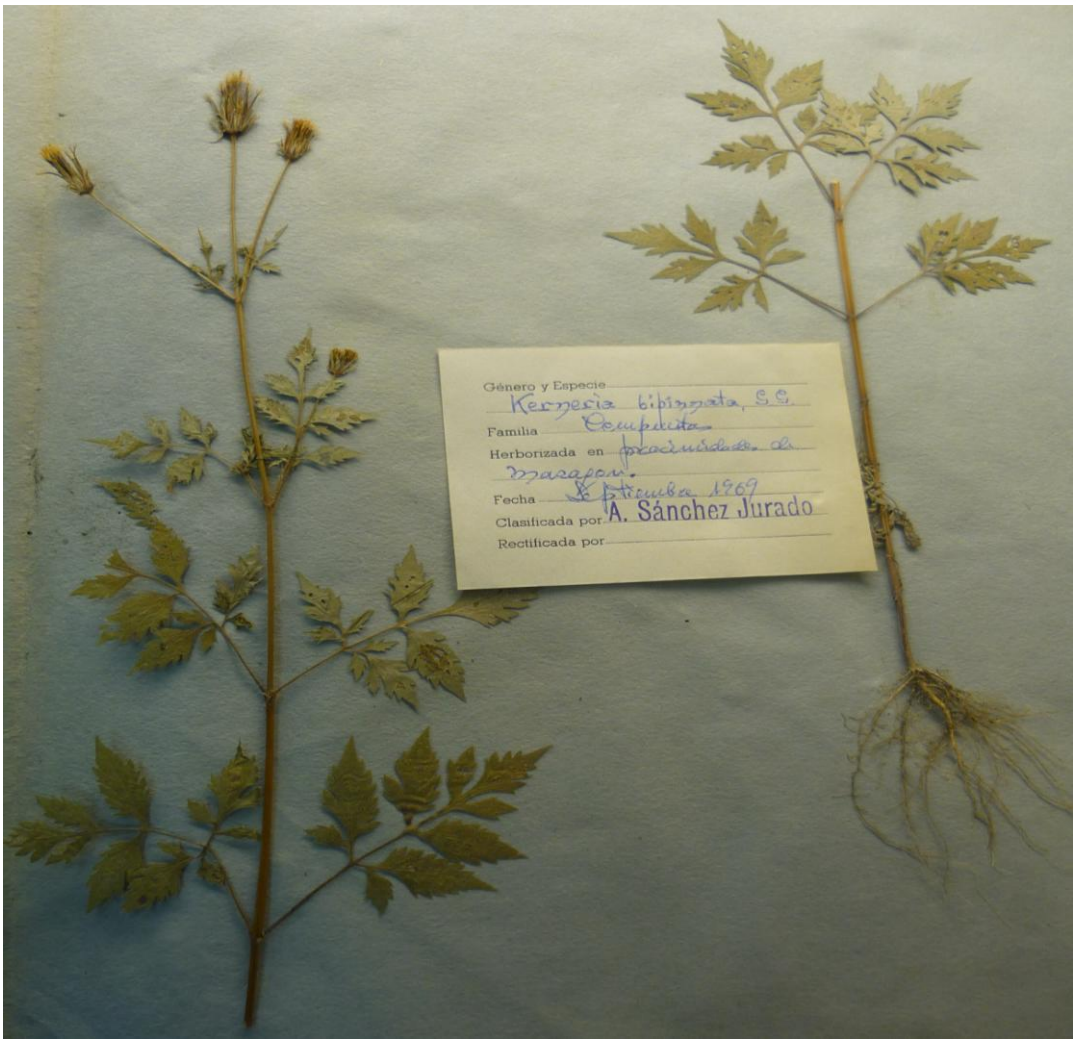

Figure 1. Picture of the material preserved in the herbarium ASJ (Andrés Sánchez Jurado): *Bidens bipinnata* L.