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New xenophytes from Gran Canaria (Canary Islands, Spain), with emphasis on naturalized and (potentially) invasive species

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Abstract

NEW XENOPHYTES FROM GRAN CANARIA (CANARY ISLANDS, SPAIN), WITH EMPHASIS ON NATURALIZED AND (POTENTIALLY) INVASIVE SPECIES.— Recent fieldwork in Gran Canaria yielded several interesting new records of non-native vascular plants. *Agave attenuata*, *Antigonon leptopus*, *Atriplex nummularia*, *Cascabela thevetia*, *Cenchrus echinatus*, *Cuscuta campestris*, *Diplachne fusca* subsp. *uninervia*, *Diplotaxis tenuifolia*, *Dysphania anthelmintica* (hitherto confused with *D. ambrosioides*), *Eclipta prostrata*, *Euphorbia pulcherrima*, *Fagopyrum esculentum*, *Gossypium barbadense*, *Lablab purpureus*, *Lemna minuta*, *Opuntia leucotricha*, *Passiflora edulis*, *Pennisetum glaucum*, *Phaseolus acutifolius*, *Pluchea carolinensis*, *Prosopis juliflora*, *Salvia microphylla*, *Schinus terebinthifolius*, *Senna spectabilis*, *Solanum chrysotrichum*, *Tecoma stans*, *Tipuana tipu*, *Urochloa mutica*, *U. plantaginea* and *Washingtonia robusta* are reported for the first time from the Canary Islands, while *Alopecurus myosuroides*, *Amaranthus blitoides*, *Bothriochloa ischaemum* var. *songarica*, *Cardamine flexuosa* subsp. *debilis*, *Heliotropium curassavicum*, *Leonotis nepetifolia*, *Medicago lupulina*, *Parkinsonia aculeata*, *Physalis peruviana*, *Phytolacca americana* and *Turnera ulmifolia* are new to the flora of the island of Gran Canaria. Finally, both *Paspalum vaginatum* and *P. distichum* and *Cortaderia selloana* are confirmed from Gran Canaria.

Key words: Canary Islands; chorology; Gran Canaria; new records; vascular plants; xenophytes.

Resumen

NUEVOS XENÓFITOS DE GRAN CANARIA (ISLAS CANARIAS, ESPAÑA), CON ÉNFASIS EN LAS ESPECIES NATURALIZADAS Y (POTENCIALMENTE) INVASORAS.— Trabajos recientes de campo en Gran Canaria han facilitado el descubrimiento de nuevas localidades para plantas vasculares no nativas. *Agave attenuata*, *Antigonon leptopus*, *Atriplex nummularia*, *Cascabela thevetia*, *Cenchrus echinatus*, *Cuscuta campestris*, *Diplachne fusca* subsp. *uninervia*, *Diplotaxis tenuifolia*, *Dysphania anthelmintica* (hasta ahora confundida con *D. ambrosioides*), *Eclipta prostrata*, *Euphorbia pulcherrima*, *Fagopyrum esculentum*, *Gossypium barbadense*, *Lablab purpureus*, *Lemna minuta*, *Opuntia leucotricha*, *Passiflora edulis*, *Pennisetum glaucum*, *Phaseolus acutifolius*, *Pluchea carolinensis*, *Prosopis juliflora*, *Salvia microphylla*, *Schinus terebinthifolius*, *Senna spectabilis*, *Solanum chrysotrichum*, *Tecoma stans*, *Tipuana tipu*, *Urochloa mutica*, *U. plantaginea* y *Washingtonia robusta* se citan por primera vez para las Islas Canarias, mientras que *Alopecurus myosuroides*, *Amaranthus blitoides*, *Bothriochloa ischaemum* var. *songarica*, *Cardamine flexuosa* subsp. *debilis*, *Heliotropium curassavicum*, *Leonotis nepetifolia*, *Medicago lupulina*, *Parkinsonia aculeata*, *Physalis peruviana*, *Phytolacca americana* y *Turnera ulmifolia* son nuevas para la flora de la isla de Gran Canaria. Finalmente, se confirma la presencia de *Paspalum vaginatum*, *P. distichum* y *Cortaderia selloana* en Gran Canaria.

Palabras clave: corología; Gran Canaria; Islas Canarias; nuevas citas; plantas vasculares; xenófitos.

INTRODUCTION

The vascular flora of the Canary Islands in general, and the island of Gran Canaria in particular, has been the subject of numerous publications in the past. Eriksson *et al.* (1974) provided a checklist for the whole of Macaronesia and subsequently chorological, taxonomical and nomenclatural updates were regularly published (see for instance Hansen & Sunding, 1993). A similar checklist, but restricted to the Canary Islands, was recently published by Acebes Ginovés *et al.* (2004, 2009). Information on non-native (predominantly invasive) species from the Canary Islands was provided by Sanz Elorza *et al.* (2004*a*, 2005) and García Gallo *et al.* (2008). Despite this ongoing research on the Canarian flora, new data still come to light. Particularly the non-native flora obviously is still imperfectly known and the number of new introductions (deliberate as well as accidental) still seems to be increasing.

Elton (1958) already suggested that islands were particularly prone to invasion because the paucity of species in island communities reduced their ability to resist invaders. This point of view was subsequently confirmed by numerous studies in the intervening decades. Denslow *et al.* (2009) recently summarized why islands are more vulnerable than comparable mainland areas: high habitat diversity, disharmonic floras, low biotic resistance, high resource availability and mild climates.

In the present paper new records are presented for species that are either new to the Canary Islands (or even Macaronesia) or new to the island of Gran Canaria, and emphasis is put on species that are either naturalized or potentially invasive. Records of (presumably) ephemeral introductions (mostly occasional garden escapes) are only briefly dealt with.

MATERIALS AND METHODS

The records here presented are the result of five weeks of fieldwork in Gran Canaria in November 2011, November 2012 and March 2013. Voucher specimens of all taxa are preserved at the public herbaria of the Jardín Botánico Canario Viera y Clavijo in Las Palmas de Gran Canaria (LPA) and/or the National Botanic Garden of Belgium (BR). Duplicates were often deposited in other relevant herbaria (mainly LG, MA and ORT) or in the private herbarium of the author. Acronyms follow the Index Herbariorum (Thiers, 2013).

The current presence or absence on the island of Gran Canaria of the non-native taxa here presented was each time compared with data provided by Hohenester & Welss (1993) and Acebes Ginovés *et al.* (2004, 2009). For some recently introduced species several additional papers were checked as well.

The present paper is divided into two parts: the first part deals with naturalized or (potentially) invasive species, the second one with (presumably) ephemeral aliens. In each part taxa are presented in alphabetical order, but only in the first part additional information is provided. There, each entry includes the scientific name of the taxon (if useful accompanied by one or more synonyms), the family to which the taxon belongs (see below), kind of chorological novelty and estimated degree of naturalization (*sensu* Richardson *et al.*, 2000), enumeration of herbarium collections, origin of the taxon and details about its secondary distribution and, finally, information on its present occurrence in the island of Gran Canaria. For ephemeral records in the second part only herbarium data are referred to.

Familial and generic circumscriptions are in accordance with APGIII (2009) and Chase *et al.* (2009). Authorities of plant names follow IPNI (2013).

RESULTS

Naturalized and/or (potentially) invasive species

Amaranthus blitoides S. Watson in Proc. Amer. Acad. Arts 12: 273 (1877) (Amaranthaceae).

Spain, Gran Canaria: Cercados de Espinos (El Horno), barranco de Arguineguín, dry gravelly riverbed, locally not rare, 8.11.2011, *F. Verloove 9156* (LPA 28381); El Tablero, Caserío de la Media Fanega, dry gravelly riverbed, very common, 17.11.2011, *F. Verloove 9161* (LPA 28383); Tamaraceite, barranco N of the city, dry gravelly riverbed, very common, 4.11.2012, *F. Verloove 9880* (LPA 28384).

Origin: North America.

Known distribution in the Canary Islands: known so far from Tenerife and Lanzarote (Acebes Ginovés *et al.*, 2009).

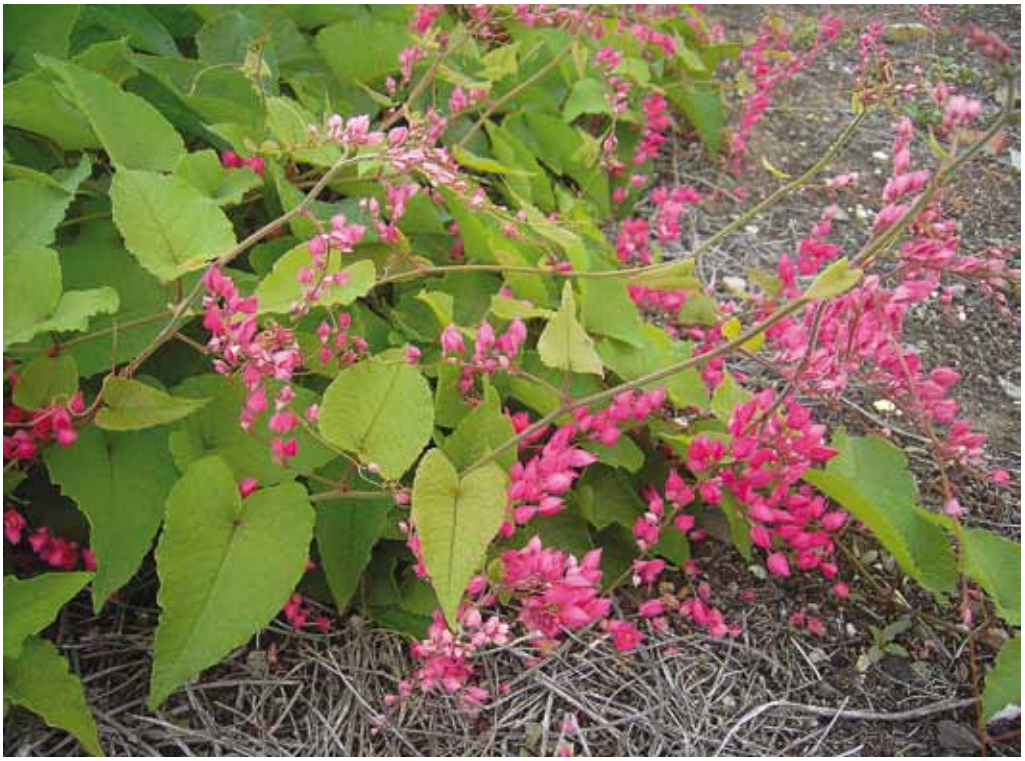

Figure 1. *Antigonon leptopus*, Bañaderos, roadside, November 2012 (Photograph: F. Verloove).

Degree of naturalization: naturalized.

Amaranthus blitoides was repeatedly recorded in widely scattered localities in Gran Canaria, often in abundance. It must have been overlooked so far, especially in the surroundings of Maspalomas. In addition to the localities cited above, *A. blitoides* was also seen in the *barranco* towards Los Palmitos Park, and in a *barranco* W of San Fernando (Maspalomas). In the northernmost part of the island it was also recorded in abundance in an exposed pond near El Toscón (Las Mesas), on rough ground in the city center of Teror, and in barranquillo de Dios in Marzagán.

Amaranthus blitoides obviously is fully naturalized in Gran Canaria, predominantly in gravelly, dry (but temporarily wet) habitats, especially in *barrancos*.

Antigonon leptopus Hook. & Arn., Bot. Beechey Voy.: 308 (1838) (Fig. 1) (Polygonaceae).

Spain, Gran Canaria: Bañaderos, GC 331 motorway immediately S of the village, rough ground, roadside, also cultivated nearby, 10.11.2012, *F. Verloove 9885* (BR, LPA 30150).

Origin: Mexico and Central America. Widely cultivated as an ornamental (coral vine) in subtropical regions of the world.

Known distribution in the Canary Islands: never recorded before (*cf*. Acebes Ginovés *et al.*, 2009).

Degree of naturalization: escaped (naturalized?).

Antigonon leptopus is locally cultivated as an ornamental vine in Gran Canaria. In Bañaderos it grows abundantly on rough ground, either as an escape from cultivation or as a garden throw-out. It seems firmly established and a further spread is not unlikely. In many regions worldwide it is considered a very troublesome, invasive weed (see Burke & DiTommaso, 2011 for a recent detailed overview).

Atriplex nummularia Lindl., J. Exped. Trop. Australia: 64 (1848) (Fig. 2) (Amaranthaceae *s. l.*).

Spain, Gran Canaria: Bahía Feliz, Aeroclub de Gran Canaria, bare ground, young plants, several tens (cultivated in the vicinity), 6.11.2011, *F. Verloove 9926* (BR, LPA 30172); Bahía Feliz, at junction of GC 500 and GC 1 motorways, bare

ground, many young plants (self-sown), cultivated in the vicinity, 7.11.2012, *F. Verloove 9945* (BR, LPA 30173, 30174).

Origin: Australia. Widely cultivated for erosion control, forage or as an ornamental in many arid regions of the world.

Known distribution in the Canary Islands: not yet mentioned by Acebes Ginovés *et al.* (2009), but recently recorded for the first time in Fuerteventura (Verloove & Guiggi, 2013).

Degree of naturalization: naturalized (potentially invasive).

Atriplex nummularia is planted as an ornamental shrub at the interchange of motorway GC 1 near Bahía Feliz. Numerous self-sown individuals (of variable age, some profusely flowering and fruiting) occur in the vicinity of these plantations. Some shrubs were also seen alongside GC 1 motorway in the surroundings of Arinaga (in 2012) and alongside an access road near Maspalomas (in 2013).

This shrub might have been overlooked since it is very reminiscent of *Atriplex halimus* L. (also present in Bahía Feliz). However, it is (semi-) dioecious and seems to be more vigorous (taller habit, larger leaves, etc.).

In many areas where it has been introduced, *A. nummularia* escapes and readily behaves as an undesirable environmental weed (e.g. in South Africa; see Henderson, 2007).

Bothriochloa ischaemum (L.) Keng var. ***songarica*** (Rupr. ex Fisch. & C. A. Mey.) Celarier & J. R. Harlan in Bot. J. Linn. Soc. 55 (363): 758 (1958) (Poaceae).

Spain, Gran Canaria: San Agustín towards Playa del Inglés, Barranco de la Fuente, at drive-out GC1 motorway, gravelly slope, one plant, 6.11.2011, *F. Verloove 9220* (BR, LPA 28373); San Agustín towards Playa del Inglés, Barranco de la Fuente, dry, gravelly riverbed, locally several clumps, 24.03.2013, *F. Verloove 10036* (BR, LPA).

Origin: probably China (Vega, 2000).

Known distribution in the Canary Islands: known so far from Tenerife (Verloove & Reyes-Betancort, 2011).

Degree of naturalization: naturalized?

Variety *songarica* differs from var. *ischaemum* in having pubescent nodes (with hairs up to 1 mm long) and leaf blades. Its sessile spikelets are never pitted (occasionally pitted in var. *ischaemum*). It was recently recorded for the first time in the Canary Islands in Tenerife (Verloove & Reyes-Betancort, 2011) where it was previously confused with the similar *Dichanthium annulatum* (Forssk.) Stapf. From this species, *Bothriochloa ischaemum* var. *songarica* is readily distinguished by its sterile pedicellate spikelets (vs. staminate) and by glumes of the sessile spikelet lacking conspicuous bulbous-based hairs on the margin.

This variety is widely cultivated as a forage grass (mostly under its cultivar name "King Ranch Bluestem"; Vega, 2000), which possibly explains its occurrence in the Canary Islands.

Hohenester & Welss (1993) questioned the presence of *B. ischaemum* (doubtlessly var. *ischaemum*) in the Canary Islands ("T[enerife]?", "[Gran] C[anaria]?"). The species was no longer upheld by Acebes Ginovés *et al.* (2004, 2009). Press & Short (1994) also doubt its presence in Madeira.

Cardamine flexuosa With. subsp. ***debilis*** O. E. Schulz in Bot. Jahrb. 32: 478 (1903) (Brassicaceae) (syn.: "Asian" *Cardamine flexuosa*).

Spain, Gran Canaria: San Agustín, Las Burras, close to the beach, irrigated lawn (disturbed), 6.11.2011, *F. Verloove 9215* (LPA).

Origin: Asia. A common but widely overlooked weed in many parts of the world.

Known distribution in the Canary Islands: known so far from Tenerife (Verloove & Reyes-Betancort, 2011).

Degree of naturalization: naturalized.

This Asian subspecies belongs to a critical group of weedy, annual (or short-lived perennial) species (Al-Shehbaz *et al.*, 2010). In general appearance it is reminiscent of *Cardamine flexuosa* but it is subglabrous and its leaflets are, at least in part, trilobed. From *Cardamine hirsuta* L. it is furthermore distinguished by the absence of a basal leaf rosette, among other characters.

It may be rather widespread in the Canary Islands, especially in irrigated lawns and other temporarily damp habitats.

Figure 2. *Atriplex nummularia*, Bahía Feliz, bare ground, November 2012 (Photograph: F. Verloove).

Cenchrus echinatus L., Sp. Pl. 2: 1050 (1753) (Poaceae).

Spain, Gran Canaria: Gáldar, barranco de Gáldar, at junction with barranco de Anzofé, scattered individuals, 15.11.2012, *F. Verloove 9909* (BR, LPA 30164); Santa Maria de Guía towards Gáldar, GC 2 motorway, roadside, under crash barrier, two plants, 14.11.2012, *F. Verloove 9907* (BR, LG, LPA 30163).

Origin: tropical America. A troublesome weed in many warm-temperate and (sub-) tropical regions of the world.

Known distribution in the Canary Islands: never

recorded before (Acebes Ginovés *et al.*, 2009).
Degree of naturalization: naturalized.

Cenchrus echinatus was recorded on two occasions in the surroundings of Gáldar and may well be more widespread in that area. It is an increasing weed in the Mediterranean region (Verloove & Sánchez Gullón, 2012). In Macaronesia it is known from several islands in Cape Verde (Sánchez-Pinto *et al.*, 2005). In many regions worldwide it is a noxious environmental weed, especially in coastal sands.

Cortaderia selloana (Schult. & Schult. f.) Asch. & Graebn., Syn. Mitteleur. Fl. 2(1): 325 (1900) (Poaceae).

Spain, Gran Canaria: Jinámar, barranco de Las Goteras, dry roadside, scattered individuals, self-sown, 16.11.2012, *F. Verloove 9982* (LPA 30180).

Origin: South America. Widely cultivated as an ornamental in many parts of the world.
Known distribution in the Canary Islands: known so far from El Hierro, La Palma, Tenerife and Fuerteventura (Acebes Ginovés *et al.*, 2009). According to Sanz Elorza *et al.* (2004*a*) also widely naturalized in Gran Canaria but this was apparently overlooked by Acebes Ginovés *et al.* (2009).
Degree of naturalization: naturalized and potentially invasive.

Cortaderia selloana is here confirmed once again from Gran Canaria (see above). Especially in coastal areas it is not rare and a future, wider naturalization is very likely. This species is a reputed and increasing environmental weed in the warmer parts of the world, including southern Europe (see for instance Domènech & Vilà, 2007).

Cuscuta campestris Yunck. in Mem. Torrey Bot. Club 18: 138 (1932) (Convolvulaceae).

Spain, Gran Canaria: Telde, barranco de Telde near bridge GC100 motorway, dry gravelly riverbed, parasite on *Artemisia thuscula* Cav., 13.11.2011, *F. Verloove 9177* (LPA 28388).

Origin: North America.
Known distribution in the Canary Islands: never recorded before (Acebes Ginovés *et al.*, 2009).
Degree of naturalization: ephemeral?

Cuscuta campestris is originally native to North America but has become widely naturalized as a weed beyond its original distribution range. Surprisingly, it has never been recorded before in the Canary Islands. In November 2011 few plants were seen on *Artemisia thuscula* in a barranco near Telde. It may have been overlooked before as a result of confusion with native *Cuscuta approximata* Bab. In contrast with the latter it has capitate stigmata.

Diplachne fusca (L.) P. Beauv. ex Roem. & Schult. subsp. ***uninervia*** (J. Presl) P. M. Peterson & N. Snow in Ann. Bot. (Oxford) 109 (7): 1327 (2012) (Poaceae).
≡ *Leptochloa uninervia* (J. Presl) Hitchc. & Chase
≡ *L. fusca* (L.) Kunth subsp. *uninervia* (J. Presl) N. Snow.

Spain, Gran Canaria: Montaña los Vélez, GC191 motorway, garden center, garden weed, 12.11.2011, *F. Verloove 9171* (LPA 28386).

Origin: southern United States to South America.
Known distribution in the Canary Islands: never recorded before (Acebes Ginovés *et al.*, 2009).
Degree of naturalization: ephemeral (potentially weedy).

Diplachne fusca subsp. *uninervia* was first recorded in a plant nursery in Montaña los Vélez (foot of a plant container) in 2011. In the same locality it was confirmed in 2012. It is a reputed agricultural weed (especially in rice) and in rapid expansion in parts of Europe, including the Iberian Peninsula (Monte & Cortés, 2000; Verloove & Sánchez Gullón, 2008; Pérez Chiscano *et al.*, 2010). Up to present, it was unknown from the Canary Islands (and Macaronesia). However, confusion is likely with the superficially similar *Diplachne malabarica* (L.) Merr. that was recently recorded in Maspalomas, also in Gran Canaria (Scholz & Böcker, 1996). The latter is best distinguished by its much longer anthers (1.3–2.7 mm long vs. 0.2–0.6 mm long in *D. fusca* subsp. *uninervia*) but both obviously are closely related. Recent authors tend to include both as subspecies in *Diplachne fusca* (Snow, 2003), as *D. malabarica* subsp. *fusca*.

Figure 3. *Dysphania anthelmintica*, La Sorrueda, exposed pond margin, November 2012 (Photograph: F. Verloove).

Dysphania anthelmintica (L.) Mosyakin & Clemants in Ukrayin's. Bot. Zhurn. 59(4): 382 (2002) (Fig. 3) (Amaranthaceae *s. l.*).
≡ *Chenopodium anthelminticum* L.

Spain, Gran Canaria: Cercados de Espinos (N of the village), barranco de Arguineguín, dry, gravelly riverbed, common, 8.11.2011, *F. Verloove 9158* (LPA 28382).

Origin: North and Central America.

Known distribution in the Canary Islands: never recorded before (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

In its original sense *Dysphania* was a vaguely circumscribed Australian genus of 7–10 species (Aellen, 1930). Mosyakin & Clemants (2002, 2008) considerably expanded *Dysphania* R. Br. and it

now includes all gland-dotted taxa that were formerly accommodated in *Chenopodium* L. As such, *Dysphania* provisionally counts *ca*. 32 species and occurs in tropical, subtropical and warm-temperate regions of the world. In a few years' time this new generic concept has become widely accepted (Mabberley, 2008).

Dysphania anthelmintica is a segregate of the *D. ambrosioides* complex and is accepted at species level by many recent authors (see for instance Uotila, 2001; Clemants & Mosyakin, 2003; Iamonico, 2011). *Dysphania ambrosioides* (L.) Mosyakin & Clemants *s. str.* and *D. anthelmintica* are distinguished in the following couplet:

1. Inflorescence leafy to the top (glomerules subtended by leaf-like bracts) .... ***D. ambrosioides***
-. Inflorescence leafless, at least in the upper half (small bracts sometimes present but these usually not subtending glomerules) ……..... ***D. anthelmintica***

In Gran Canaria (and probably elsewhere in the Canary Islands as well), *Dysphania anthelmintica* is the most widespread species of both. It is commonly and often abundantly naturalized in *barrancos*. In November 2011 and 2012 it was also recorded in *barrancos* of or near Agaete, Arguineguín, Arucas, Bañaderos, Cambalud, Cardones, El Roque, El Tablero, Fataga, Firgas, Gáldar, Guayadeque, Guía, Jinámar, La Capellanía, La Sorrueda, Las Palmas de Gran Canaria, Los Dolores, Lujaregos, Marzagán, Maspalomas, Moya, Puerto de Mogán, San Lorenzo, San Nicolás de Tolentino, Santidad, Tamaraceite, Tauro, Tenoya, Teror, Tinocas, Trujillo, etc.

Eclipta prostrata (L.) L., Mant. Pl. Altera: 286 (1771) (Fig. 4) (Asteraceae).

Spain, Gran Canaria: Las Palmas de Gran Canaria (Vegueta), barranco del Guiniguada, riverbed, numerous plants but only locally, 4.11.2012, *F. Verloove 9890* (BR, LPA 30152); Tamaraceite, embalse de Tamaraceite (S of the city), pond margin, 4.11.2011, *F. Verloove 9891* (LPA 30151).

Origin: America. A common weed in many warm-temperate and (sub-) tropical regions of the world.

Known distribution in the Canary Islands: never recorded before (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Two small but apparently well-established populations of *Eclipta prostrata* were recorded in November 2012. This species grows in damp, ruderalized places. The number of suitable habitats is probably restricted in Gran Canaria, except in the northern parts of the island. There, a future wider naturalization is likely. In Macaronesia, *E. prostrata* is also known from Madeira (Borges, 2008) and Cape Verde islands [as *E. alba* (L.) Hassk.; Sánchez-Pinto *et al.*, 2005]. In the Mediterranean area (like in many warm-temperate regions worldwide) it is an upcoming environmental and agricultural weed, for instance in rice fields.

Heliotropium curassavicum L., Sp. Pl.: 130 (1753) (Boraginaceae).

Spain, Gran Canaria: Bahía Feliz (Besudo), Playa del Tarajalillo, garden weed, close to the sea, 6.11.2011, *F. Verloove 9153* (LPA 28379).

Origin: southern United States to South America.

Known distribution in the Canary Islands: known so far from Tenerife and Fuerteventura (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Heliotropium curassavicum is an American weedy species that is widely naturalized in coastal areas in the Mediterranean area. In continental Spain it is most abundant in Levante (see map in Sanz Elorza *et al.*, 2004*a*). In the Canary Islands it was long restricted to Fuerteventura but recently also occurred in Tenerife (Padrón Mederos *et al.*, 2007; Verloove & Reyes-Betancort, 2011). In November 2011 it was repeatedly recorded in Gran Canaria as well, apparently for the first time. In addition to the record cited above, *H. curassavicum* was furthermore seen in San Agustín (Playa Las Burras), Arinaga (plantation weed in Polígono Industrial) and Jinámar (Punta de Jinámar). A future, wider naturalization in coastal habitats in the Canary Islands is feasible.

Lablab purpureus (L.) Sweet, Hort. Brit.: 481 (1826) (Fig. 5) (Leguminosae).
= *Dolichos lablab* L.

Figure 4. *Eclipta prostrata*, Las Palmas de Gran Canaria, barranco del Guiniguada, November 2012 (Photograph: F. Verloove).

Spain, Gran Canaria: Las Palmas de Gran Canaria (Vegueta), barranco del Guiniguada, dry riverbed, locally invasive, 4.11.2012, *F. Verloove 9912* (BR, LG, LPA 30165).

Origin: tropical Africa. Widely cultivated as a legume or ornamental in the warm-temperate and (sub-) tropical regions of the world.

Known distribution in the Canary Islands: never recorded before (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

A massive stand of *Lablab purpureus* was discovered in barranco del Guiniguada near Las Palmas de Gran Canaria. It is a rampant and vigorously twining perennial that competes with, among others,

Figure 5. *Lablab purpureus*, Las Palmas de Gran Canaria, barranco del Guiniguada, November 2012 (Photograph: F. Verloove).

Cardiospermum grandiflorum Sw. It has large, trifoliate leaves, and a long peduncled inflorescence with relatively small purplish flowers.

In Macaronesia it has been recorded before in Madeira (Borges, 2008) and the Cape Verde Islands (Sánchez-Pinto *et al.*, 2005). In the Pacific Islands *Lablab purpureus* is a troublesome weed.

Lemna minuta Kunth, Nov. Gen. Sp. 1: 372 (1816) (Fig. 6) (Araceae).
= *Lemna minuscula* Herter.

Spain, Gran Canaria: Tamaraceite, embalse de Tamaraceite (in barranco de Tamaraceite), pond, along with *Eclipta prostrata*, 4.11.2012, *F. Verloove 9928* (LPA 30179); Teror, barranco de Madrelagua, shallow water, 5.11.2012, *F. Verloove 9943* (LPA 30178).

Origin: temperate to tropical America. Introduced as an aquatic weed in large parts of temperate Eurasia (Landolt, 2000).

Known distribution in the Canary Islands: never recorded before (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized/invasive.

Lemna minuta was recorded twice in Gran Canaria in November 2012, but probably it had been overlooked before as a result of confusion with *L. minor* L. It should be looked for, especially in the damper, northern parts of the island. In Tamaraceite *Lemna minuta* grows in a luxurious, nearly monospecific stand and clearly behaves like an invasive environmental weed. A similar behaviour has been reported in most areas where it is found as a xenophyte (see for instance Njambuya *et al.*, 2011).

Lemna minuta is superficially similar to but easily distinguished from *L. minor*. It has smaller fronds that are up to twice as long as wide with a single, often obscure vein (vs. 3–5 veins). Confusion is more likely with *Lemna valdiviana* Phil., another American species that has repeatedly been documented from Europe (see Iberite *et al.*, 2011 for a recent overview), most often by error. Records of

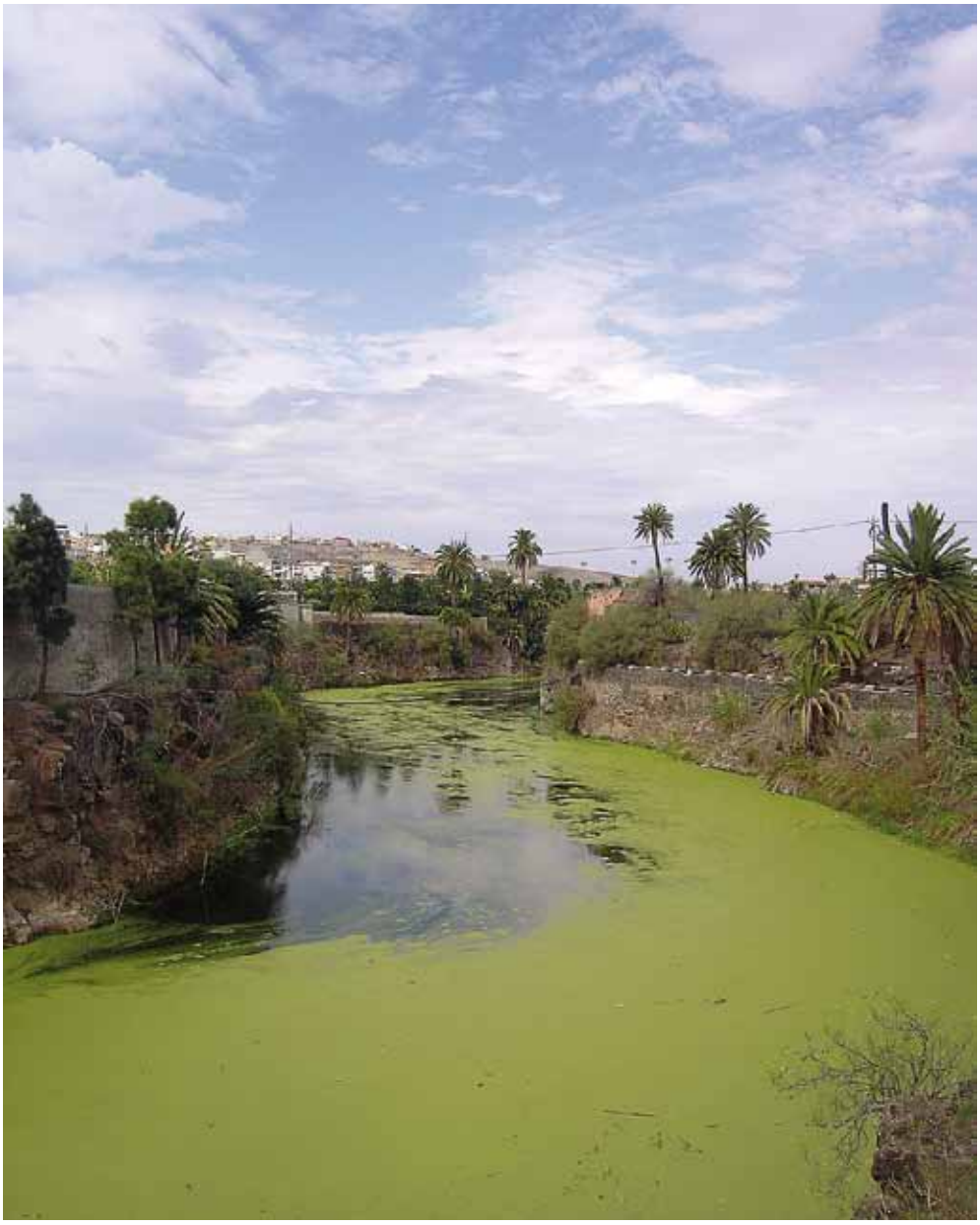

Figure 6. *Lemna minuta*, Tamaraceite, embalse de Tamaraceite, November 2012 (Photograph: F. Verloove).

the latter should be critically assessed since *Lemna valdiviana* is a non-weedy species from stable habitats and rather unlikely to occur outside its native distribution range (E. Landolt, pers. comm., December 2012).

Leonotis nepetifolia (L.) R. Br., Hortus Kew. 3: 409 (1811) (Lamiaceae).

Spain, Gran Canaria: Gáldar, barranco de Gáldar, dry gravelly riverbed, locally common, 16.11.2011, *F. Verloove 9181* (LPA 28390).

Origin: Old World tropics. Widely cultivated as an ornamental in the warm-temperate and (sub-) tropical regions of the world.

Known distribution in the Canary Islands: known so far from El Hierro, La Palma and Tenerife (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Leonotis nepetifolia is sometimes grown as an ornamental in the Canary Islands and known to be locally naturalized, especially in *barrancos* near urban habitats. Surprisingly, it has not been recorded so far in Gran Canaria. In November 2011 it was found in abundance in barranco de Gáldar between Gáldar and Guía (confirmed in 2012).

Medicago lupulina L., Sp. Pl. 2: 779 (1753) (Leguminosae).

Spain, Gran Canaria: Tamaraceite, parque, lawn weed, 4.11.2012, *F. Verloove 9876* (LPA 30146).

Origin: Eurasia and Africa. Naturalized in parts of America and Australia.

Known distribution in the Canary Islands: known so far from El Hierro, La Palma and Tenerife (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Medicago lupulina was recorded on several occasions as a lawn weed and is probably not rare in Gran Canaria. In addition to the locality in Tamaraceite cited above, it was also seen in lawns in Carrizal, Las Palmas de Gran Canaria, Maspalomas and San Agustin.

Opuntia leucotricha DC. in Mém. Mus. Hist. Nat. 17: 119 (1828) (Cactaceae).

Spain, Gran Canaria: SW of Firgas, barranco Virgen, alongside GC 305 motorway, roadside, small population, 13.11.2012, *F. Verloove 9950* (photo) (BR, LPA).

Origin: Mexico. Widely cultivated as an ornamental in the warm-temperate and (sub-) tropical regions of the world.

Known distribution in the Canary Islands: never recorded before (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

A small, naturalized population of *Opuntia leucotricha* was found in barranco Virgen, south of Firgas, alongside GC-305. The species grew along with *Agave attenuata* Salm-Dyck, most likely as a garden throw-out.

Relatively few *Cactaceae* are known in the wild in the Canary Islands (Acebes Ginovés *et al.*, 2009). The family is obviously poorly studied and largely neglected, while it counts with numerous (potentially) invasive species. Numerous species of Cactaceae have been recorded in climatically similar areas in the Mediterranean basin, several of them as environmental weeds (e.g. Guillot, 2003; Sanz-Elorza *et al.*, 2004*b*, 2006; Guillot Ortiz & Van der Meer, 2006; Guiggi, 2008, 2010; etc.). *Opuntia leucotricha* has been recorded in Italy and Spain by most of these authors.

In many warm-temperate and subtropical regions, *O. leucotricha* has become an invasive environmental weed (e.g. Walters *et al.*, 2011).

Parkinsonia aculeata L., Sp. Pl.: 375 (1753) (Leguminosae).

Spain, Gran Canaria: Tauro, Playa del Tauro, dry, sandy riverbed, close to the sea, one plant, 10.11.2011, *F. Verloove 9142* (LPA 28377).

Origin: southern United States and Mexico. Widely cultivated as an ornamental or for reforestation in the warm-temperate and (sub-) tropical regions of the world.

Known distribution in the Canary Islands: known so far from Tenerife and Fuerteventura (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: ephemeral.

Parkinsonia aculeata is frequently cultivated as a small ornamental tree in the warm-temperate and subtropical regions of the world, including the Canary Islands and the Iberian Peninsula. It is a serious environmental weed in many semi-arid regions in the world, for instance in parts of Australia (Randall, 2007). In the past decades it started escaping and now is considered an invasive species in many regions (in Spain for instance in the Comunidad Valenciana; Sanz Elorza *et al.*, 2011). So far, it had not been recorded outside of cultivation in Gran Canaria. In November 2011 single individuals were seen in two *barrancos* in the southernmost parts of the island: in Tauro (see above) and near El Tablero (barranco near Caserío de la Media Fanega). In November 2012, it was furthermore recorded as an escape on the verge of barranco del Guiniguada near Las Palmas de Gran Canaria.

Paspalum distichum L., Syst. Nat. ed. 10, 2: 855

(1759) and ***P. vaginatum*** Sw., Prodr. 21 (1788) (Poaceae).

[*P. distichum*]: Spain, Gran Canaria: Arucas, presa de la Heredad, exposed pond, 10.11.2012, *F. Verloove 9873* (LPA 30145); Puente de Cardones, barranco (centre of the village), gravelly riverbed, few specimens, 15.11.2011, *F. Verloove 9186* (LPA 28393); La Sorrueda, embalse de Tirajana, exposed pond margin, 7.11.2012, *F. Verloove 9869* (LPA 30144).

Origin: (sub-) tropical America.

Known distribution in the Canary Islands: uncertain, as a result of confusion between both species.

Degree of naturalization: naturalized?

These two species have widely been confused in the Canary Islands. Most local checklists and floras erroneously use the binomial *Paspalum distichum* to designate *P. vaginatum* (Hohenester & Welss, 1993; Acebes Ginovés *et al.*, 2009). *Paspalum distichum* is the correct name for *P. paspalodes* (Michx.) Thell. Both species are now confirmed in Gran Canaria. *Paspalum vaginatum* is mostly found in irrigated lawns and was probably introduced on purpose: according to Allen & Hall (2003) it is sometimes grown for turf or in lawn trials. *Paspalum vaginatum* readily escapes to adjacent *barrancos*, etc. (like *Paspalum notatum* Flüggé, *Pennisetum clandestinum* Hochst. ex Chiov. and others). See also Otto & Scholz (2012).

Paspalum distichum probably is much rarer in the Canary Islands and its presence required confirmation (see Hansen, 1971; Verloove & Reyes-Betancort, 2011). In 2011 and 2012, populations of both species were found in *barrancos* or on exposed pond margins, possibly for the first time in Gran Canaria.

They are easily distinguished in the following couplet:

1. Upper glumes glabrous .... ***P. vaginatum***

-. Upper glumes short pubescent on the back .... ***P. distichum***

Phaseolus acutifolius A. Gray, Pl. Wright. 1: 43 (1850) (Leguminosae).

Spain, Gran Canaria: Santa María de Guía, Lomo de Bethencourt, barranco SW of the city, naturalized liana, twining in shrubs, 15.11.2011, *F. Verloove 9949* (BR).

Origin: southwestern United States and Mexico. Widely cultivated as a vegetable (tepary bean) in the warm-temperate regions of the world.

Known distribution in the Canary Islands: never recorded before (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

A fairly large population of *Phaseolus acutifolius* was discovered in a *barranco* near Santa María de Guía. Plants of this species were twining over several tens of meters on shrubs and small trees, and they looked perfectly naturalized.

There seems to be remarkably little information about its escape from cultivation, although it is very widely cultivated. In the Cape Verde Islands another domesticated species of *Phaseolus* L. is considered an invasive species, *P. lunatus* L. (lima or butter bean) (Sánchez-Pinto *et al.*, 2005). Both species are very reminiscent (pods with distinct sutures, tiny cream corollas, etc.). However, *Phaseolus lunatus* has a paniculate inflorescence (vs. a few-flowered pseudoraceme) and flower buds are hairy (vs. glabrous).

The plants seen in Gran Canaria belong to the cultivated, broad-leaved race, known as var. *latifolius* G. F. Freeman (Freytag & Debouck, 2002).

Phytolacca americana L., Sp. Pl.: 441 (1753) (Fig. 7) (Phytolaccaceae).

Spain, Gran Canaria: Arucas, barranco de Arucas (S of the city), moist, shady roadside, one plant (also seen elsewhere in this area), 15.11.2011, *F. Verloove 9194* (LPA 28395).

Origin: North America. Widely cultivated as an ornamental in the warm-temperate regions of the world.

Known distribution in the Canary Islands: known so far from El Hierro and Tenerife (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Phytolacca americana is a popular garden plant in many warm-temperate regions of the world. Its berries are eaten by birds, which facilitates dis-

Figure 7. *Phytolacca americana*, Arucas, barranco de Arucas, November 2012 (Photograph: F. Verloove).

persal to remote, natural areas. In parts of Europe *Phytolacca americana* is now considered a noxious environmental weed. In the Canary Islands it is probably less frequently cultivated and confined to the more humid islands. It was known so far from El Hierro (Acebes Ginovés *et al.*, 2009), whereas reports from Tenerife require confirmation; there it might have been confused with *Phytolacca dioica* L. (Verloove & Reyes-Betancort, 2011). In 2011 and 2012, *Phytolacca americana* was seen on several occasions in Gran Canaria, apparently for the first time. In addition to the records around Arucas (at least three localities, mainly in barranco de Arucas; see above), it was also observed in Teror (barranco) and Bañaderos (barranco Los Palmitos). It is perhaps more widespread in the damp valleys in the northern parts of the island.

Pluchea carolinensis (Jacq.) G. Don, Hort. Brit., ed. 3: 350 (1839) (Fig. 8) (Asteraceae).

Spain, Gran Canaria: Arguineguín towards Soria (GC 505 motorway), barranco de Arguineguín (km 4–5), dry, gravelly riverbed, one plant, 10.11.2011,

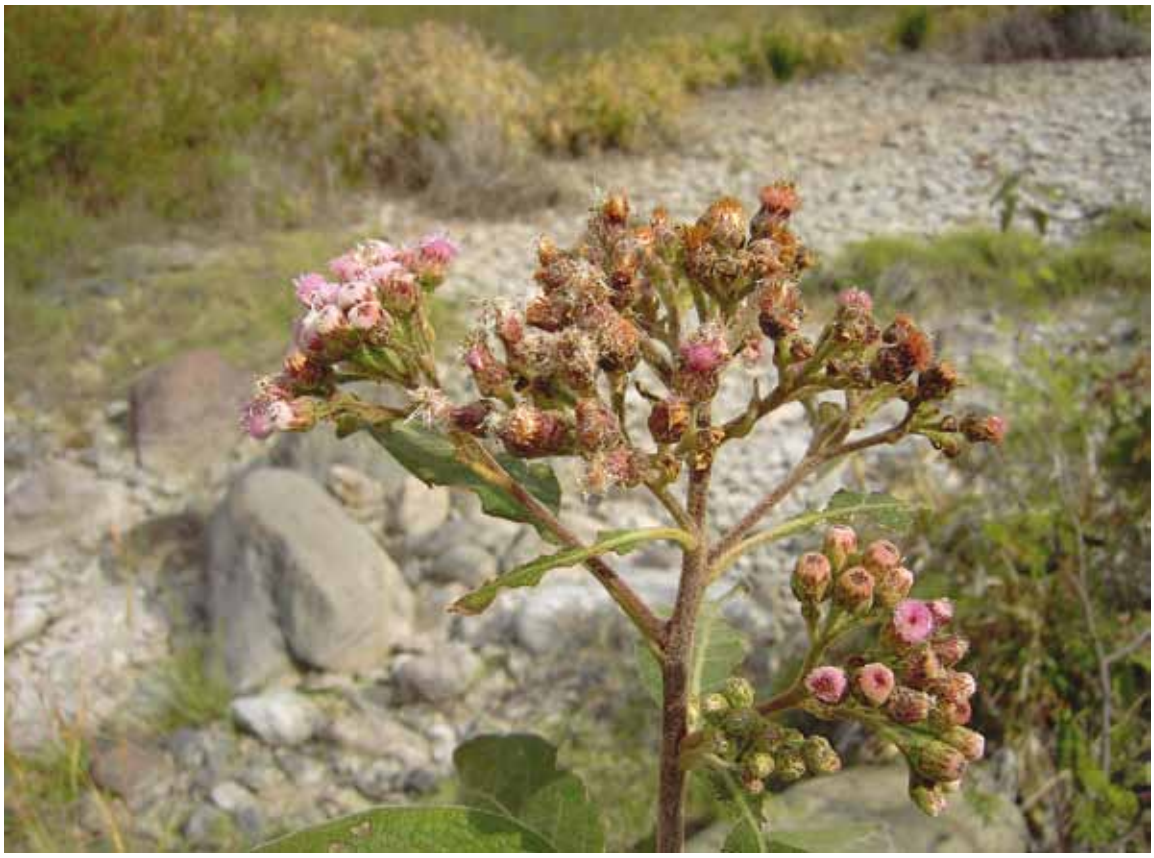

Figure 8. *Pluchea carolinensis*, Arguineguín, barranco de Arguineguín, March 2013 (Photograph: F. Verloove).

F. Verloove 9930 (LPA 30171); Arguineguín towards Soria (GC 505 motorway), barranco de Arguineguín (km 4–5), dry, gravelly riverbed, one plant, 12.11.2012, *F. Verloove 9905* (pers. herb. FV, ORT); Arguineguín towards Soria (GC 505 motorway), barranco de Arguineguín (km 4–5), dry, gravelly riverbed, one plant, 19.03.2013, *F. Verloove 10035* (pers. herb. FV, BR, LPA 30188).

Origin: from southern United States (Florida) to northern South America. Introduced and naturalized in Pacific Islands (Nesom, 2006) and Taiwan (Peng *et al.*, 1998).

Known distribution in the Canary Islands: never recorded before (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: ephemeral? (potentially invasive).

A single young shrub of *Pluchea carolinensis* (non-flowering) was first found in barranco de Arguineguín in 2011. It apparently first flowered in 2012 and was also seen in flower in March 2013. Provided that its seeds are dispersed by wind, it is likely expected to become established in this area and future invasive behaviour is also predictable (comparable with the congeneric *Pluchea ovalis* DC. in Tenerife). Both species are superficially similar but differ in leaf characters: leaves of *Pluchea carolinensis* have (sub-) entire margins and are velvety to the touch while those of *P. ovalis* have a serrate margin and are glandular sticky.

Despite its remoteness, barranco de Arguineguín seems to be prone to plant invasion. Exotic plants such as *Acacia farnesiana* (L.) Willd., *Cyperus involucratus* Poir., *Desmanthus virgatus* (L.) Willd., etc. are exceedingly prolific in this area.

The vector of introduction of *Pluchea carolinensis* in Gran Canaria is unknown, but it was probably accidentally introduced. Unlike *P. ovalis* in Tenerife (Padrón Mederos *et al.*, 2007; Verloove & Reyes-Betancort, 2011), it is not cultivated as an ornamental.

Prosopis juliflora (Sw.) DC., Prodr. 2: 447 (1825) (Fig. 9) (Leguminosae).

Spain, Gran Canaria: Bahía Feliz, Aeroclub de Gran Canaria, arid roadside, three young plants, self-sown (planted nearby), 7.11.2011, *F. Verloove 9927* (LPA 30175); Bahía Feliz, at junction of GC 500 and GC 1 motorways, bare ground, +/− 10 juvenile plants, planted nearby, 9.11.2012, *F. Verloove 9944* (BR, LPA 30176).

Origin: Mexico, South America and the Caribbean. Widely cultivated as an ornamental or for reforestation in the warm-temperate and (sub-) tropical regions of the world.

Known distribution in the Canary Islands: never recorded before (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: ephemeral? (potentially invasive).

Prosopis juliflora (mesquite) is planted as an ornamental tree at the interchange of motorway GC 1 near Bahía Feliz. Young, self-sown plants were seen on several occasions in 2011 and 2012 in the vicinity of these plantations. Due to its very bad reputation as a noxious environmental weed (it is one of the world's top 100 least wanted species), a future naturalization and spread in the drier parts of Gran Canaria are very likely.

The taxonomy of *Prosopis juliflora* and related species is very complex. Plants from Gran Canaria correspond rather well with the true *P. juliflora*, but populations from Cape Verde proved to belong to the very similar *P. pallida* (Humb. & Bonpl. ex Willd.) Kunth (Landeras *et al.*, 2006).

Schinus terebinthifolius Raddi in Mem. Mat. Fis. Soc. Ital. Sci. Modena, Pt. Mem. Fis. 18: 399 (1820) (Anacardiaceae).

Spain, Gran Canaria: San Agustín, barranco, dry gravelly riverbed, self-sown, commonly planted and frequently escaping, 6.11.2011, *F. Verloove 9214* (LPA 28396).

Origin: South America (Brazil, Paraguay). Widely cultivated as an ornamental in the warm-temperate and (sub-) tropical regions of the world.

Known distribution in the Canary Islands: never recorded before (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized?

Despite being unknown outside of cultivation in the Canary Islands, *Schinus terebinthifolius* was frequently encountered in Gran Canaria. In addition to the record mentioned above, it was also observed in Las Burras, Arguineguín, Puerto Rico, Taurito, Vecindario, Cardones, El Roque, Guía, between Maspalomas and Ayagaures, Maspalomas (San Fernando), Las Palmas de Gran Canaria, Jinámar, Gáldar, Bahía Feliz, Bañaderos, La Aldea, Firgas, etc. *Schinus terebinthifolius* seems to be widely escaping in coastal areas. So far it is mostly found with few individuals, but a future naturalization is very likely.

Schinus terebinthifolius is much reminiscent of native *Pistacia atlantica* Desf., especially in the non-flowering stage. Both might well have been confused up to date. They are best distinguished on flower characters: petals are lacking in *Pistacia*, whereas they are small but distinct in *Schinus*. Moreover, *S. terebinthifolius* evidently occurs in more disturbed habitats close to human habitations (often *barrancos*). It is also known from Cape Verde (Sánchez-Pinto *et al.*, 2005).

Solanum chrysotrichum Schltdl. in Linnaea 19: 304 (1846) (Fig. 10) (Solanaceae).

Spain, Gran Canaria: Gáldar, barranco de Gáldar, close to the sea (Bocabarranco), gravelly riverbed, naturalized among *Ricinus communis* L., 6.11.2012, *F. Verloove 9896* (BR, LPA 30157).

Origin: Mexico, Central America (i.e. Costa Rica, Guatemala, Nicaragua and Panama). Naturalized in South Africa (Welman, 2003) and Australia (Symon, 1981; Bean, 2004).

Known distribution in the Canary Islands: never recorded before (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

A small, naturalized population of *Solanum chrysotrichum* was found in barranco de Gáldar, close to the sea. Most plants were ca. 200–300 cm tall and grew intermixed with *Ricinus communis* L. A few younger plants were found elsewhere in the *barranco*. This species is also known in Macaronesia from the Azores (Silva *et al.*, 2005).

The vector of introduction of *S. chrysotrichum* in

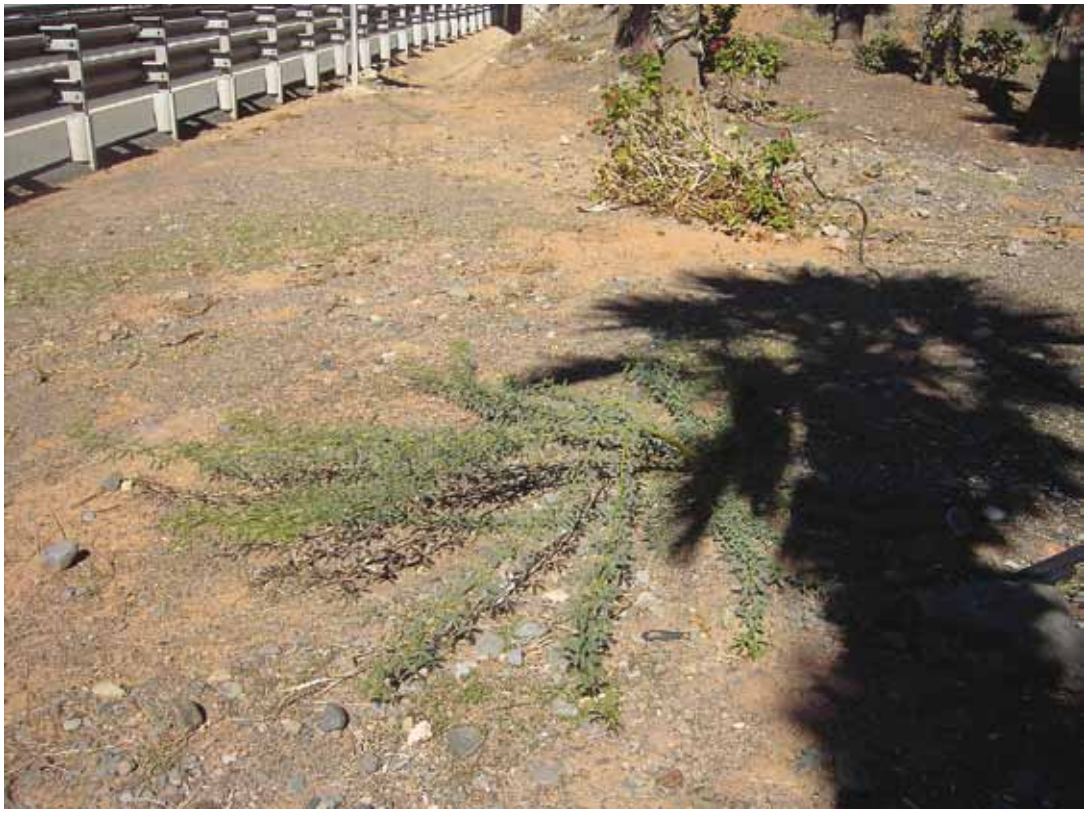

Figure 9. *Prosopis juliflora*, Bahía Feliz, bare stony ground, November 2012 (Photograph: F. Verloove).

Gáldar remains obscure. It is sometimes planted as an ornamental in the Canary Islands (for hedging) but not widely so, and no cultivated plants were observed in the vicinity. A nearby sewage station could also have been responsible for its introduction, although *S. chrysotrichum* is not known to be an edible plant.

Wherever *S. chrysotrichum* has occurred outside its native distribution range (Africa, Australia), it has been declared a noxious weed.

Tecoma stans (L.) Kunth, Nov. Gen. Sp. Pl. 3: 144 (1818) (Bignoniaceae).

Spain, Gran Canaria: Bahía Feliz (Besudo), vacant lot, close to the sea, one self-sown plant (planted in the vicinity), 6.11.2011, *F. Verloove 9144* (LPA 28378).

Origin: southern United States to South America. Widely cultivated as an ornamental in the warm-temperate and (sub-) tropical regions of the world.

Known distribution in the Canary Islands: never recorded before (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: ephemeral?

Tecoma stans is a commonly cultivated shrub in the Canary Islands but apparently has not been recorded outside of cultivation so far. In November 2011 it was repeatedly seen but always with solitary plants. In addition to the collection cited above, it was also observed in *barrancos* or on rough ground near San Agustín, Arguineguín, Mogán and Puerto Rico (all localities in coastal areas in the climatically mildest parts of the island).

Tecoma stans is an increasing weed causing problem in many warm-temperate and tropical regions of the world (e.g. Cunningham, 2008).

Turnera ulmifolia L., Sp. Pl. 1: 271 (1753) (Passifloraceae).

Spain, Gran Canaria: Maspalomas, Sonnenland (Lomo los Azules), rough ground, scattered spe-

cimens, self-sown, 7.11.2011, *F. Verloove 9155* (LPA 28380).

Origin: Pantropical. Widely cultivated as an ornamental in the warm-temperate and (sub-) tropical regions of the world.

Known distribution in the Canary Islands: known so far from Tenerife (Verloove & Reyes-Betancort, 2011).

Degree of naturalization: naturalized.

Turnera ulmifolia is a very popular garden plant in the Canary Islands. It produces a lot of viable seed and recently started escaping in the vicinity of flowerbeds (mostly in urban areas: cracks in pavement, base of walls, etc.). It was recently reported for the first time from Tenerife (Verloove & Reyes-Betancort, 2011) but it probably occurs throughout the Canary Islands as a recent introduction. In Gran Canaria it has been frequently observed since November 2011. In addition to the collection cited above, it was also found in Bahía Feliz, Playa Águila, San Agustín, Arguineguín, Tauro, Puerto de Mogán, Vecindario, etc. In most cases, *T. ulmifolia* grows in small number and its presence is often merely ephemeral. However, in a barranco near Maspalomas (San Fernando) at least 50 plants were observed in 2011 (and confirmed in the same locality in 2013).

It has become an invasive weed in many warm-temperate and (sub-) tropical regions worldwide.

Urochloa mutica (Forssk.) T. Q. Nguyen in Novosti Sist. Vyssh. Rast. 3: 13 (1966) (Fig. 11) (Poaceae).
≡ *Brachiaria mutica* (Forssk.) Stapf.

Spain, Gran Canaria: Jinámar, barranco de las Goteras, riverbed, close to the sea, very invasive, 16.11.2012, *F. Verloove 9897* (LPA 30154); San Andrés (El Roque), barranco del Pagador, riverbed, close to the sea, nearly monospecific stands, with *Paspalidium geminatum* (Forssk.) Stapf, 16.11.2011, *F. Verloove 9172* (BR, LPA 28369); San Andrés (El Roque), barranco del Pagador, close to the sea, riverbed, very invasive in two adjacent barrancos, 6.11.2012, *F. Verloove 9883* (pers. herb. FV); Tinocas (Arucas), barranco de Tenoya, riverbed, close to the sea, very invasive, 15.11.2012, *F. Verloove 9893* (BR, LPA 30153).

Origin: Africa.

Known distribution in the Canary Islands: never recorded before (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: invasive.

Urochloa mutica (para grass) is a tall, stoloniferous grass species from swampy places. In 2011 and 2012 it was observed on numerous occasions in Gran Canaria. In addition to the records cited above, it was also found in Arucas (Presa de la Heredad de Aguas), Marzagán (barranquillo de Dios) and Trujillo (Presa de Trujillo). In most cases *Urochloa mutica* grows in nearly monospecific stands (often also competing with *Arundo donax* L.). Despite being a recent newcomer it is already firmly established and behaves like an invasive weed.

In the non-flowering phase, plants of *U. mutica* are reminiscent of *Pennisetum purpureum* Schumach.: both are robust perennials with hairy sheaths. However, *U. mutica* is a stoloniferous plant with long-straggling stems and its ligules are shorter (1–1.5 mm, vs. 1.5–5 mm).

The origin of these populations is unknown. According to Veldkamp (1996), *U. mutica* is sometimes cultivated for fodder, ground cover, for land reclamation or to prevent soil erosion. However, once established it readily becomes weedy and difficult to eradicate.

Urochloa mutica now has become a widespread weed in (sub-) tropical and warm temperate regions of the world. In Macaronesia it is also known from Madeira (Borges, 2008). According to Dobignard & Chatelain (2010) it is native in Macaronesia, which is very unlikely.

Urochloa plantaginea (Link) R. D. Webster in Syst. Bot. 13(4): 606 (1988) (Poaceae).
≡ *Brachiaria plantaginea* (Link) Hitchc.

Spain, Gran Canaria: Arucas, barranco de Arucas close to junction of GC20 and GC300 motorways, ditch, scattered specimens, 15.11.2011, *F. Verloove 9159* (BR, LPA 28366, 28397); Arucas, barranco de Arucas close to junction of GC20 and GC300 motorways, riverbed, few plants, 10.11.2012, *F. Verloove 9895* (BR, LPA 30156).

Origin: West Africa.

Known distribution in the Canary Islands: never recorded before (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: ephemeral? (potentially invasive).

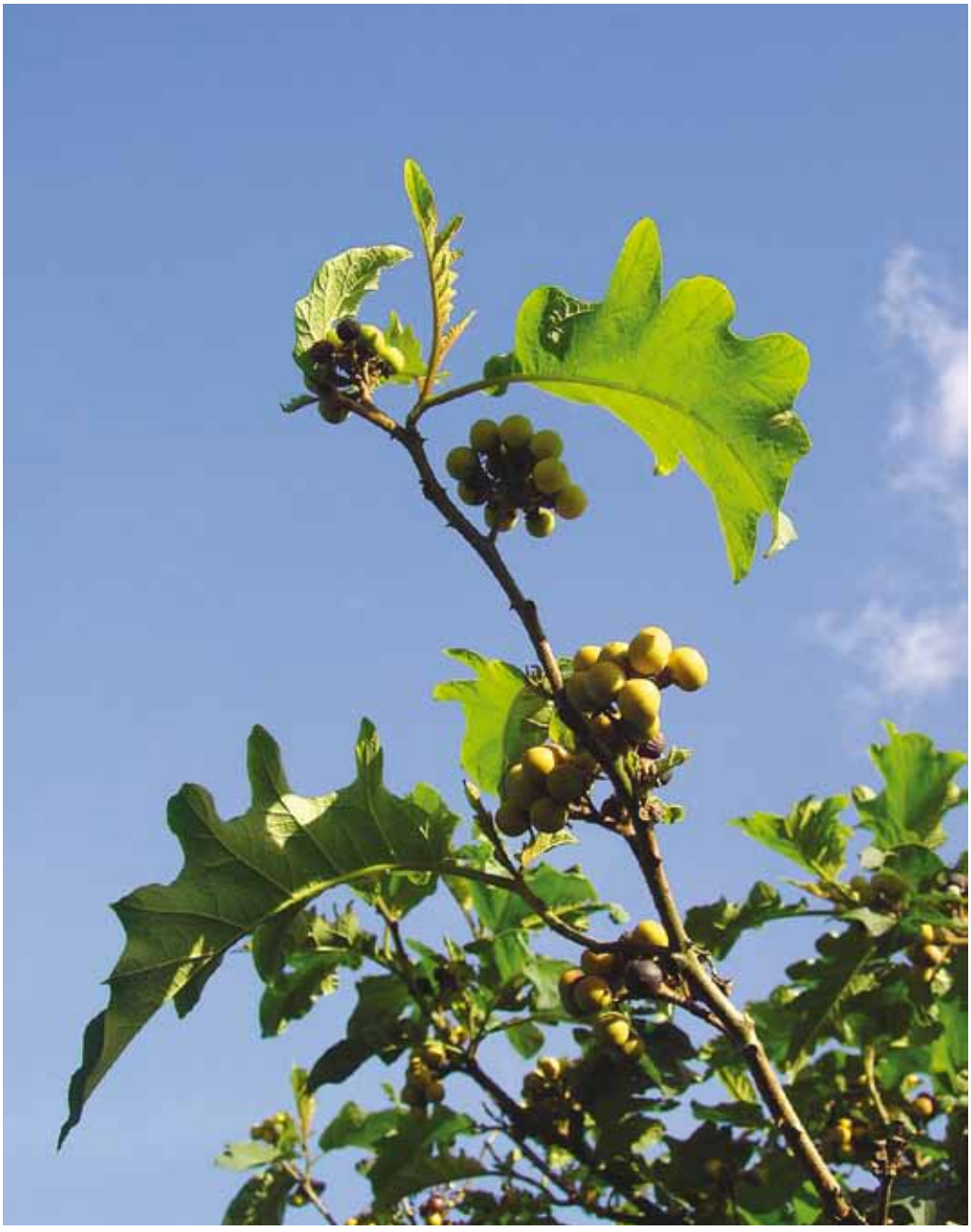

Figure 10. *Solanum chrysotrichum*, Gáldar, barranco de Gáldar, November 2012 (Photograph: F. Verloove).

Scattered individuals of *Urochloa plantaginea* were recorded in a ditch in barranco de Arucas (both in 2011 and 2012), along with several other birdseed and food refuse aliens, such as *Cucurbita* sp., *Nicandra physalodes* (L.) Gaertn., *Physalis peruviana* L., *Solanum lycopersicon* L., etc. They obviously germinated from sewage sludge. Similar records are known from western Europe, for instance from Belgium (Verloove, 2012).

Unlike *Urochloa mutica*, this species is a more delicate annual and rather unlikely to survive in a frequently disturbed habitat. However, in the Cape Verde Islands (Santiago) it recently naturalized (Sánchez-Pinto, 2005). In many parts of the world, especially in South America, *U. plantaginea* is an invasive weed (e.g. Zenni & Ziller, 2011).

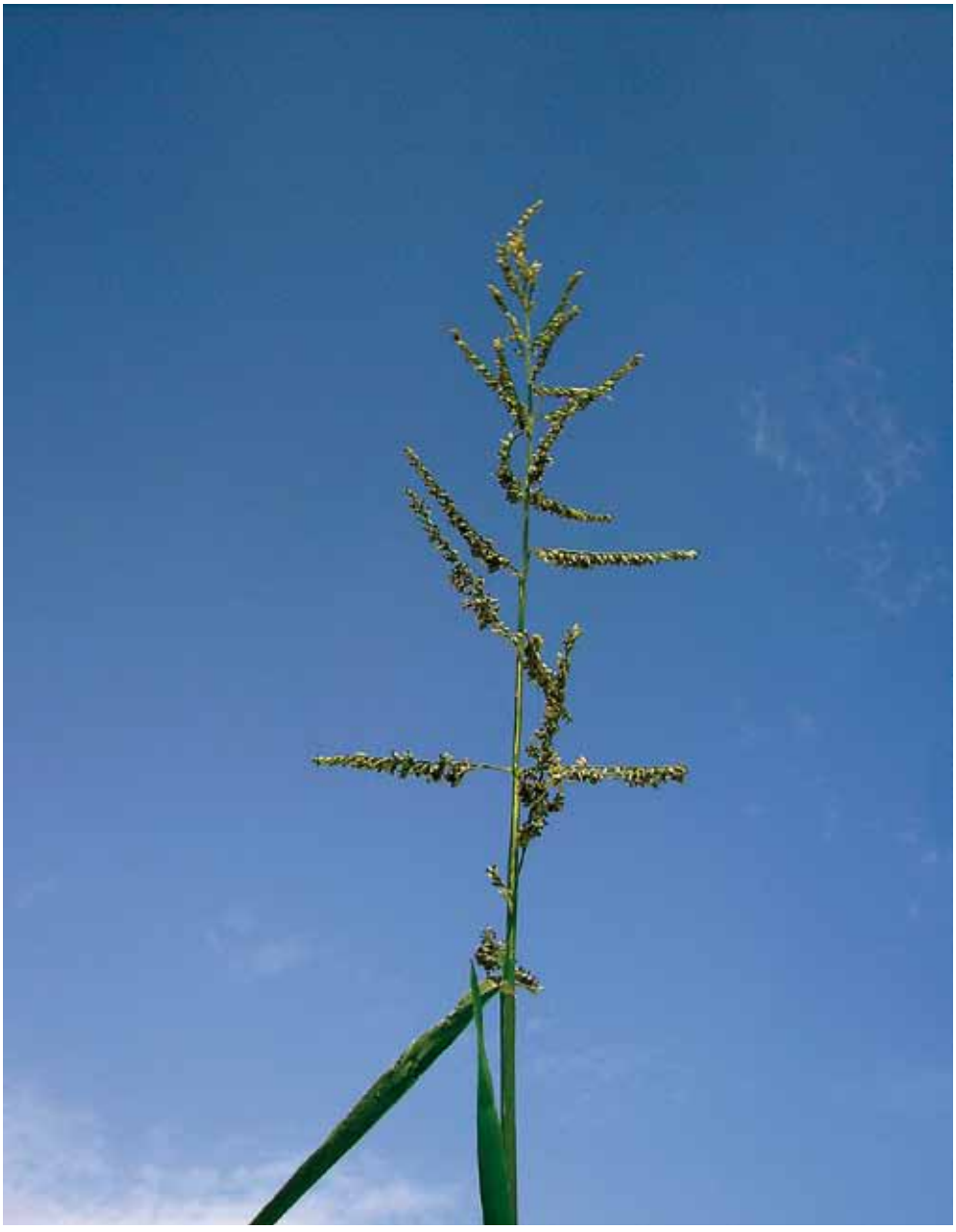

Figure 11. *Urochloa mutica*, San Andrés, barranco del Pagador, November 2012 (Photograph: F. Verloove).

Washingtonia robusta H. Wendl. in Gart.-Zeitung (Berlin) 2: 198 (1883) (Fig. 12) (Palmae).

Spain, Gran Canaria: El Tablero towards Los Palmitos Park, La Media Fanega, gravelly riverbed, scattered specimens (self-sown in rather remote area), 17.11.2011, *F. Verloove 9180* (LPA 28389).

Origin: Mexico. Widely cultivated as an ornamental in the warm-temperate and (sub-) tropical regions of the world.

Known distribution in the Canary Islands: not mentioned yet by Acebes Ginovés *et al.* (2009) but recently also recorded in Fuerteventura and Lanzarote (A. Reyes-Betancort, pers. comm., 2011).

Degree of naturalization: naturalized.

Washingtonia robusta (Mexican fan palm) is widely cultivated in warm areas throughout the world, including the Canary Islands. In the past years it apparently started escaping from cultivation and is

Figure 12. *Washingtonia robusta*, El Tablero, gravelly riverbed, November 2011 (Photograph: F. Verloove).

now found in *barrancos*, on rough ground, in urban areas (cracks in pavement), etc. Young plants are mostly seen in the vicinity of planted specimens but records in more remote areas also seem to increase (for instance in a barranco between El Tablero and Los Palmitos Park; see above).

In Gran Canaria, *W. robusta* has frequently been recorded in numerous, widely scattered localities, for instance in San Agustín (barranco Las Burras), Maspalomas (several *barrancos*), Arinaga (beach), Bahía Feliz (roadside), Arguineguín (*barranco*), Palavaca (*barranco*), Tauro (*barranco*), Puerto Rico (*barranco*), Carrizal (barranco de Guayadeque), Arucas (city center), El Altillo (*barranco*), Galdár (*barranco*), El Tablero (*barrancos*), Las Palmas de Gran Canaria (*barranco*), Tamaraceite (*barranco*), Jinámar (*barranco*), etc. *Washingtonia robusta* usually occurs in small number but small populations have also been observed, especially in the surroundings

of Maspalomas. It seems to be restricted to the climatically milder coastal areas.

Similar records are also available from the Ebro Delta in continental Spain (Sobrino *et al.*, 2003). The escape of *W. robusta* in other Mediterranean countries is surely neglected. Future invasive behaviour cannot be ruled out since it is extremely drought tolerant, grows quickly and produces copious amounts of seed. Once established in natural areas, it is out-competing native plants and it quickly forms dense thickets.

Some records might be referable to the related species *Washingtonia filifera* (Linden ex André) H. Wendl. Mature trees of both are easy to distinguish when cultivated side by side (Zona, 2000) but juvenile specimens may be confused. The latter has been recorded in the Comunidad Valenciana since 2000 (Sanz Elorza *et al.*, 2011).

Ephemeral species

Agave attenuata Salm-Dyck. (Asparagaceae *s. l.*, Agavoideae).

Spain, Gran Canaria: Moya, GC75 motorway towards Fontanales, depth of a barranco, three young plants, 15.11.2011, *F. Verloove 9254* (BR, LPA).

Alopecurus myosuroides Huds. (Poaceae).

Spain, Gran Canaria: Agaete (N-side), entrance of the village, GC2 motorway, lawn weed, 16.11.2011, *F. Verloove 9173* (LPA 28387).

Cascabela thevetia (L.) Lippold [= *Thevetia peruviana* (Pers.) Schumann] (Apocynaceae).

Spain, Gran Canaria: Arguineguín towards Soria, barranco de Arguineguín (GC 505 motorway, km 4–5), roadside, one plant, 12.11.2012, *F. Verloove 9920* (BR, LPA 30168).

Diplotaxis tenuifolia (L.) DC. (Brassicaceae).

Spain, Gran Canaria: Arguineguín towards Patalavaca, barranco, dry riverbed, one plant, 19.11.2011, *F. Verloove 9182* (LPA 28391).

Euphorbia pulcherrima Willd. ex Klotzsch (Euphorbiaceae).

Spain, Gran Canaria: Puente de Cardones towards Santidad, GC302 motorway, roadside, scattered bushes, with *Abutilon grandifolium* (Willd.) Sweet, 15.11.2011, *F. Verloove 9216* (LPA).

Fagopyrum esculentum Moench (Polygonaceae).

Spain, Gran Canaria: Jinámar, park alongside barranco de las Goteras, weed in plantation, 16.11.2012, *F. Verloove 9922* (LPA 30169).

Gossypium barbadense L. (Malvaceae).

Spain, Gran Canaria: Agaete, barranco de Agaete between the village and the sea, dry, gravelly riverbed, few plants, 8.11.2011, *F. Verloove 9884* (LPA 30149).

Passiflora edulis L. (Passifloraceae).

Spain, Gran Canaria: Gáldar, junction of barranco de Gáldar and barranco de Anzofé, dry, gravelly riverbed, one plant, 15.11.2012, *F. Verloove 9921* (BR, LPA 30170).

Pennisetum glaucum (L.) R. Br. (Poaceae).

Spain, Gran Canaria: Las Palmas de Gran Canaria, parque Las Rehoyas, rough ground, from discarded birdseed, 10.11.2012, *F. Verloove 9901* (pers. herb. FV, LPA 30158).

Physalis peruviana L. (Solanaceae).

Spain, Gran Canaria: Tamaraceite, barranco SE of the city, exposed riverbed, scattered specimens, 18.11.2011, *F. Verloove 9164* (LPA 28385).

Salvia microphylla Kunth (Lamiaceae).

Spain, Gran Canaria: Fontanales, at the entrance of the village (N-side), GC 75 motorway, roadside, scattered specimens, 15.11.2011, *F. Verloove 9185* (LPA 28392).

Senna spectabilis (DC.) H. S. Irwin & Barneby (Leguminosae).

Spain, Gran Canaria: Tamaraceite, close to barranco N of the city, roadside, four specimens, relic of cultivation (?), planted nearby, 4.11.2012, *F. Verloove 9902* (LPA 30159).

Tipuana tipu (Benth.) Kuntze (Leguminosae).

Spain, Gran Canaria: Las Palmas de Gran Canaria (San Juan), Autovía del Centro, roadside, under crash barrier, one young specimen, selfsown (but also planted in the vicinity), 4.11.2012, *F. Verloove 9906* (BR, LPA 30162).

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REFERENCES

Acebes Ginovés, J. R., Arco Aguilar, M. del, García Gallo, A. *et al*. 2004. Pteridophyta, Spermatophyta. In: Izquierdo, I., Martín, J. L., Zurita, N. & Arechavaleta, M. (Eds.), *Lista de especies silvestres de Canarias (hongos, plantas y animales*

terrestres). Gobierno de Canarias, La Laguna: 96–143

Acebes Ginovés, J. R., León Arencibia, M. C., Rodríguez Navarro, M. L. *et al*. 2009. Pteridophyta, Spermatophyta. In: Arechavaleta, M., Rodríguez, S., Zurita, N. & García, A. (Eds.), *Lista de especies silvestres de Canarias (hongos, plantas y animales terrestres)* (2nd ed.). Gobierno de Canarias, La Laguna: 119–172.

Aellen, P. 1930. Die systematische Stellung und Gliederung der R. Brownschen Gattung *Dysphania*. *Botanische Jahrbücher für Systematik* 63: 483–490.

Allen, C. M. & Hall, D. W. 2003. *Paspalum*. In: Flora of North America Editorial Committee (Eds.), *Flora of North America North of Mexico* 25. Oxford University Press, New York & Oxford: 566–599.

Al-Shehbaz, I. A., Marhold, K. & Lihová, J. 2010. *Cardamine*. In: Flora of North America Editorial Committee (Eds.), *Flora of North America North of Mexico* 7. Oxford University Press, New York & Oxford: 464–484.

APG III 2009. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants. APG III. *Botanical Journal of the Linnean Society* 161: 105–121.

Bean, A. R. 2004. The taxonomy and ecology of *Solanum* subg. *Leptostemonum* (Dunal) Bitter (Solanaceae) in Queensland and far north-eastern New South Wales, Australia. *Austrobaileya* 6: 639–816.

Borges, P. A. 2008. *Listagem dos fungos, flora e fauna terrestres dos arquipélagos da Madeira e Selvagens*. Direcção Regional do Ambiente da Madeira and Universidade dos Açores, Funchal & Angra do Heroísmo.

Burke, J. M. & DiTommaso, A. 2011. Corallita (*Antigonon leptopus*): Intentional introduction of a plant with documented invasive capability. *Invasive Plant Science and Management* 4: 265–273.

Chase, M. W., Reveal, J. L. & Fay, M. F. 2009. A subfamilial classification for the expanded asparagalean families Amaryllidaceae, Asparagaceae and Xanthorrhoeaceae. *Botanical Journal of the Linnean Society* 161: 132–136.

Clemants, S. E. & Mosyakin, S. L. 2003. *Dysphania*. In: Flora of North America Editorial Committee (Eds.), *Flora of North America North of Mexico* 4. Oxford University Press, New York & Oxford: 267–275.

Cunningham, P. L. 2008. *Tecoma stans* a potential invasive alien in Namibia? *Dinteria* 30: 33–39.

Denslow, J. S., Space, J. C. & Thomas, P. A. 2009. Invasive exotic plants in the tropical Pacific Islands: Patterns of diversity. *Biotropica* 41: 162–170.

Dobignard, A. & Chatelain, C. 2010. *Index synonymique Flore d'Afrique du Nord* 1. Conservatoire et Jardin Botaniques, Genève.

Domènech, R. & Vilà, M. 2007. *Cortaderia selloana* invasion across a Mediterranean coastal strip. *Acta Oecologica* 32: 255–261.

Elton, C. S. 1958. *The Ecology of invasions by animals and plants*. University of Chicago Press, Chicago.

Eriksson, O., Hansen, A. & Sunding, P. 1974. *Flora of Macaronesia. Check-list of vascular plants*. University of Umeå, Umeå.

Freytag, G. F. & Debouck, D. G. 2002. *Taxonomy, distribution, and ecology of the genus Phaseolus (Leguminosae-Papilionoideae) in North America, Mexico and Central America* (Sida, Botanical Miscellany, 23). Botanical Research Institute of Texas, Fort Worth.

García Gallo, A., Wildpret de la Torre, W. & Martín Rodríguez, V. 2008. Especies vegetales consideradas invasoras de hábitats, en la Historia Natural de Canarias. *Lazaroa* 29: 49–67.

Guiggi, A. 2008. Catalogo delle Cactaceae naturalizzate in Italia con osservazioni tassonomiche, nomenclaturali e corologiche. *Rivista Piemontese di Storia Naturale* 29: 103–140.

Guiggi, A. 2010. Aggiunte e correzioni al Catalogo delle Cactaceae naturalizzate in Italia. *Rivista Piemontese di Storia Naturale* 31: 35–54.

Guillot, D. 2003. Sobre la presencia de 17 táxones de la familia Cactaceae en la Comunidad Valenciana. *Flora Montiberica* 24: 6–13.

Guillot Ortiz D. & Van der Meer P. (2006) Algunos taxones nuevos del género *Opuntia* Mill. en la Comunidad Valenciana. *Flora Montiberica* 32: 39–50.

Hansen, A. 1971. Floristic notes from the Canary Islands (mostly Tenerife). *Cuadernos de Botánica Canaria* 13: 1–7.

Hansen, A. & Sunding, P. 1993. *Flora of Macaronesia. Checklist of vascular plants. 4. Revised edition* (Sommerfeltia, 17). Natural History Museum, Oslo.

Henderson, L. 2007. Invasive, naturalized and casual alien plants in southern Africa: a summary based on the Southern African Plant Invaders Atlas (SAPIA). *Bothalia* 37: 215–248.

Hohenester, A. & Welss, W. 1993. *Exkursionsflora für die Kanarischen Inseln*. Verlag Eugen Ulmer, Stuttgart.

Iamonico, D. 2011. *Dysphania anthelmintica* (Amaranthaceae), new to the non-native flora of Italy, and taxonomic considerations on the related species. *Hacquetia* 10: 41–48.

Iberite, M., Iamonico, D., Abati, S. & Abbate, G. 2011. *Lemna valdiviana* Phil. (Araceae) as a potential invasive species in Italy and Europe: Taxonomic study and first observations on its ecology and distribution. *Plant Biosystems* 145: 751–757.

IPNI (International Plant Names Index) 2013. Retrieved April, 2013, from http://www.ipni.org/

Landeras, G., Alfonso, M., Pasiecznik, N. M., Harris, P. J. C. & Ramírez, L. 2006. Identification of *Prosopis juliflora* and *Prosopis pallida* accessions using molecular markers. *Biodiversity and Conservation* 15: 1829–1844.

Landolt, E. 2000. Lemnaceae. In: Flora of North America Editorial Committee (Eds.), *Flora of North America North of Mexico* 22. Oxford University Press, New York & Oxford: 143–153.

Mabberley, D. J. 2008. *Mabberley's plant-book* (3rd ed.). Cambridge University Press, Cambridge.

Monte, J. P. del & Cortés, J. A. 2000. Acerca de las especies del género *Leptochloa*, como malas hierbas de los arrozales y su distribución en España. *Boletín de Sanidad Vegetal – Plagas* 26: 599–604.

Mosyakin, S. L. & Clemants, S. E. 2002. New nomenclatural combinations in *Dysphania* R.Br. (Chenopodiaceae): taxa occurring in North America. *Ukrainian Botanical Journal* 59: 380–385.

Mosyakin, S. L. & Clemants, S. E. 2008. Further transfers of glandular-pubescent species from *Chenopodium* subg. *Ambrosia* to *Dysphania* (Chenopodiaceae). *Journal of the Botanical Research Institute of Texas* 2: 425–431.

Nesom, G. L. 2006. *Pluchea*. In: Flora of North America Editorial Committee (Eds.), *Flora of North America North of*

Mexico 19. Oxford University Press, New York & Oxford: 478–484.

Njambuya, J., Stiers, I. & Triest, L. 2011. Competition between *Lemna minuta* and *Lemna minor* at different nutrient concentrations. *Aquatic Botany* 94: 158–164.

Otto, R. & Scholz, H. 2012. *Paspalum vaginatum* Sw. In: Greuter, W. & Raab-Straube, E. von (Eds.), Euro+Med Notulae 6. *Willdenowia* 42: 285.

Padrón Mederos, M. A., Reyes-Betancort, J. A., González González, R., León Arencibia, M. C. & Pérez de Paz, P. L. 2007. Adiciones y comentarios a la flora vascular de Canarias. *Vieraea* 35: 43–50.

Peng, C.-I., Chen, C.-H., Leu, W.-P. & Yen, H.-F. 1998. *Pluchea* Cass. (Asteraceae: Inuleae) in Taiwan. *Botanical Bulletin of Academia Sinica* 39: 287–297.

Pérez Chiscano, J. L., Snow, N. & Sánchez Gullón, E. 2010. Comentario sobre el género *Leptochloa* P. Beauv. (Poaceae, Eragrostideae) en Extremadura y Andalucía (España). *Acta Botanica Malacitana* 35: 189–192.

Press, J. R. & Short, M. J. 1994. *Flora of Madeira*. The Natural History Museum, London.

Randall, R. P. 2007. *The introduced flora of Australia and its weed status*. Department of Agriculture and Food, Western Australia, Adelaide.

Richardson, D. M., Pyšek, P., Rejmánek, M., Barbour, M. G., Panetta, F. D. & West, C. J. 2000. Naturalization and invasion of alien plants: concepts and definitions. *Diversity and Distributions* 6: 93–107.

Sánchez-Pinto, L., Leticia Rodríguez, M., Rodríguez, S., Martín, K., Cabrera, A. & Cármen Marrero, M. 2005. Pteridophyta, Spermatophyta. In: Arechavaleta, M., Zurita, N., Marrero, M. C. & Martín, J. L. (Eds.), *Lista preliminar de especies silvestres de Cabo Verde (hongos, plantas y animales terrestres)*. Consejería de Medio Ambiente y Ordenación Territorial, Gobierno de Canarias: 38–57.

Sanz Elorza, M., Dana Sánchez, E. D. & Sobrino Vesperinas, E. 2004*a*. *Atlas de las plantas alóctonas invasoras en España*. Dirección General para la Biodiversidad, Madrid.

Sanz-Elorza, M., Dana Sánchez, E. D. & Sobrino Vesperinas, E. 2004*b*. Sobre la presencia de cactáceas naturalizadas en la costa meridional de Cataluña. *Anales del Jardín Botánico de Madrid* 61: 27–33.

Sanz Elorza, M., Dana, E. D. & Sobrino, E. 2005. Aproximación al listado de plantas vasculares alóctonas invasoras reales y potenciales en las islas Canarias. *Lazaroa* 26: 55–66.

Sanz-Elorza, M., Dana Sánchez, E. D. & Sobrino Vesperinas, E. 2006. Further naturalised Cactaceae in northeastern Iberian Peninsula. *Anales del Jardín Botánico de Madrid* 63: 7–11.

Sanz Elorza, M., Guillot Ortiz, D. & Deltoro, V. 2011. La flora alóctona de la Comunidad Valenciana (España). *Botanica Complutensis* 35: 97–130.

Scholz, H. & Böcker, R. 1996. Ergänzungen und anmerkungen zur grasflora (Poaceae) der Kanaren. *Willdenowia* 25: 571–582.

Silva, L., Pinto, N., Press, B., Rumsay, F., Carine, M., Henderson, S. & Sjögren, E. 2005. *Lista das plantas vasculares (Pteridophyta e Spermatophyta)*. In: Borges, P. A. V., Cunha, R., Gabriel, R., Martins, A. F., Silva, L. & Vieira, V. (Eds.), *A list of the terrestrial fauna (Mollusca and Arthropoda) and flora (Bryophyta, Pteridophyta and Spermatophyta) from the Azores*. Direcção Regional do Ambiente and Universidade dos Açores, Horta, Angra do Heroísmo & Ponta Delgada: 131–156.

Snow, N. 2003. *Leptochloa*. In: Flora of North America Editorial Committee (Eds.), *Flora of North America North of Mexico* 25. Oxford University Press, New York & Oxford: 51–60.

Sobrino, E., Sanz-Elorza, M. & Dana, E. D. 2003. *Washingtonia robusta* Wendl. y *Phoenix canariensis* Chabaud (Arecaceae): dos palmeras alóctonas naturalizadas en el Parque Natural del Delta del Ebro. *Anales del Jardín Botánico de Madrid* 60: 233–234.

Symon, D. E. 1981. A revision of the genus *Solanum* in Australia. *Journal of the Adelaide Botanic Gardens* 4: 1–367.

Thiers, B. 2013. *Index Herbariorum: A global directory of public herbaria and associated staff*. The New York Botanical Garden, New York. Retrieved April, 2013, from http://sweetgum.nybg.org/ih/

Uotila, P. 2001. *Chenopodiaceae*. In: Jonsell, B. (Ed.), *Flora Nordica* 2. The Bergius Foundation, Stockholm: 1–57.

Vega, A. S. 2000. Revisión taxonómica de las especies americanas del género *Bothriochloa* (Poaceae: Panicoideae: Andropogoneae). *Darwiniana* 38: 127–186.

Veldkamp, J. F. 1996. *Brachiaria*, *Urochloa* (Gramineae-Paniceae) in Malesia. *Blumea* 41: 413–437.

Verloove, F. 2012. *Manual of the alien plants of Belgium*. National Botanic Garden of Belgium, Meise. Retrieved 2012, from http://alienplantsbelgium.be/content/urochloa-0

Verloove, F. & Guiggi A. 2013. Some new xenophytes from Fuerteventura (Canary Islands, Spain). *Bouteloua* 13: 38–42.

Verloove, F. & Reyes-Betancort, J. A. 2011. Additions to the flora of Tenerife (Canary Islands, Spain). *Collectanea Botanica (Barcelona)* 30: 63–78.

Verloove, F. & Sánchez Gullón, E. 2008. New records of interesting xenophytes in the Iberian Peninsula. *Acta Botanica Malacitana* 33: 147–167.

Verloove, F. & Sánchez Gullón, E. 2012. A taxonomic revision of non-native *Cenchrus* s.str. (Paniceae, Poaceae) in the Mediterranean area. *Willdenowia* 42: 67–75.

Walters, M., Figueiredo, E., Crouch, N. R., Winter, P. J. D., Smith, G. F., Zimmermann, H. G. & Mshope, B. K. 2011. *Naturalised and invasive succulents of southern Africa* (ABC Taxa, 11). The Belgian Development Cooperation, Brussels.

Welman, W. G. 2003. The genus *Solanum* (Solanaceae) in southern Africa: subgenus *Leptostemonum*, the introduced sections *Acanthophora* and *Torva*. *Bothalia* 33: 1–18.

Zenni, R. D. & Ziller, S. R. 2011. An overview of invasive plants in Brazil. *Revista Brasileira de Botânica* 34: 431–446.

Zona, S. A. 2000. *Arecaceae*. In: Flora of North America Editorial Committee (Eds.), *Flora of North America North of Mexico* 22. Oxford University Press, New York & Oxford: 95–123.