

F. Verloove, M. Salas-Pascual & Á. Marrero Rodríguez

New records of alien plants for the flora of Gran Canaria (Canary Islands, Spain)

Abstract

Verloove, F., Salas-Pascual, M. & Marrero Rodríguez, Á.: New records of alien plants for the flora of Gran Canaria (Canary Islands, Spain). — Fl. Medit. 28: 119-135. 2018. — ISSN: 1120-4052 printed, 2240-4538 online.

Recent field work by the authors in Gran Canaria (Canary Islands, Spain) yielded records of non-native vascular plants that were not previously reported in the wild. *Acokanthera oblongifolia*, *Alstroemeria ligtu*, *Capsicum annuum*, *Chasmanthe bicolor*, *Cotyledon orbiculata* var. *spuria*, *Digitaria setigera*, *Phlomis purpurea*, *Setaria pumila* subsp. *pallide-fusca*, *Solanum betaceum*, *S. seaforthianum*, *Syzygium cumini*, *Tecoma ×smithii*, and *Tradescantia spathacea* are newly recorded for the Canary Islands whereas *Bauhinia variegata*, *Chasmanthe floribunda*, *Crassula multicava*, *Cupressus sempervirens*, *Ficus rubiginosa*, *Galinsoga quadriradiata*, *Jacaranda mimosifolia*, *Kalanchoe ×houghtonii*, *Merremia tuberosa*, *Nerium oleander*, *Passiflora morifolia*, *Phytolacca dioica* and *Salvia hispanica* are new records for the flora of Gran Canaria. Although several of these taxa are considered mere ephemerals at present, nearly all of them have the potential to naturalize and/or become invasive.

Key words: chorology, new records, vascular plants, xenophytes.

Introduction

Despite the long tradition of studies on the flora of the Canary Islands (native as well as introduced) there is a constant and almost uninterrupted amount of new taxonomic and distributional data. Particularly the non-native flora is still imperfectly known and the number of new introductions (deliberate as well as accidental) still seems to increase, also in Gran Canaria (see for instance Verloove 2013; Verloove 2017; Verloove & al. 2017). In this paper new records are presented for species and hybrids that are either new to the Canary Islands (and even Macaronesia as a whole) or new to the island of Gran Canaria.

The estimated degree of naturalization of the taxa here presented varies from mere casuals, over locally naturalized to highly invasive aliens. Even those taxa that are reported here as ephemerals have – in most cases – the potential to naturalize or

become invasive in the near future since such behavior has been observed in climatologically similar areas elsewhere in their secondary distribution range.

Several of the taxa treated occur spontaneously in the Botanical Garden 'Viera y Clavijo' in Tafira, Las Palmas de Gran Canaria where they had not been planted in the past. This applies to species such as *Chasmanthe floribunda* (Salisb.) N.E. Br., *Crassula multicava* Lem., *Kalanchoe × houghtonii* D.B. Ward, *Passiflora morifolia* Mast., *Phytolacca dioica* L. or *Solanum seafortianum* L. (all treated in this paper), but also to others that were already previously reported from Gran Canaria, e.g. *Caesalpinia spinosa* (Molina) Kuntze (syn.: *Tara spinosa* (Molina) Britton & Rose), *Eucalyptus camaldulensis* Dehnh., *Lablab purpureus* Sweet, *Ligustrum lucidum* W.T. Aiton, *Pelargonium inquinans* (L.) L'Hér., etc. In other cases, such as *Ficus rubiginosa* Vent., *Grevillea robusta* R. Br., *Jacaranda mimosifolia* or *Pittosporum undulatum* Vent., regeneration has been observed lately from individuals cultivated in the Botanical Garden, as well as in many gardens in peri-urban or rural areas of the island. Environmental conditions as created in the Botanical Garden (arboretum, ponds, waterfalls) are ideal for many frugivorous birds as pigeons, blackbirds, etc. The Botanical Garden doubtlessly perfectly illustrates what is happening in similar habitats elsewhere in Gran Canaria. While within the limits of the Botanical Garden control is permanent and relatively easy, in other areas (e.g. protected natural areas, or private gardens), the situation can be very different, even if the arrival of particular species can be a welcome surprise, for instance the spontaneous occurrence of *Syzygium cumini*, in a private garden.

Material and methods

The new distributional records presented in this paper are mainly the result of field work by the first author in March, April and December 2017. Additional records were provided by the other two authors.

For each record either herbarium specimens or photos were made. Vouchers were deposited either in the herbarium of the Botanic Garden of Meise, Belgium (BR) or the herbarium of the Botanical Garden 'Viera y Clavijo' in Las Palmas de Gran Canaria, Spain (LPA). Relevant herbarium specimens from the latter herbarium were critically revised by the third author.

Each entry includes the name of the taxon (if useful with one or more synonyms), the place and date of the new record and additional information about the geographic distribution (native and introduced area), the behavior in its secondary area, etc. For most taxa photos are also presented.

Taxa are arranged in two parts. The first part includes taxa that were either found in the wild or as weeds in gardens, whereas in the second part taxa are treated that were exclusively observed (as escapes) within the limits of public or private gardens where they are also grown as ornamentals.

Results

Part one: taxa observed either in the wild or as weeds in gardens.

Acokanthera oblongifolia (Hochts.) Codd. (*Apocynaceae*) (Fig. 1a)

Syn.: *A. spectabilis* (Sond.) Hook. f.

GRAN CANARIA: Telde, Las Piletillas, Lomo Los Mudos, small barranco in residential area, 04.04.2017, *F. Verloove* 12857 (BR). – casual.

A species native to southern Africa, *Acokanthera oblongifolia* is widely cultivated as an evergreen ornamental shrub in many warm-temperate and subtropical regions of the world, also in the Canary Islands and elsewhere in Spain (e.g. Sánchez de Lorenzo Cáceres 2010). A single young shrub was found in a shallow barranco in a residential area in Telde (Las Piletillas). Interestingly, this species is already known to escape from cultivation in the Canary Islands since many decades. Kunkel (1972) reported about sexual reproduction in Arucas and La Calzada, also in Gran Canaria. It is still considered an ephemeral alien although a future naturalization is not unlikely, the species probably being dispersed by birds.

Acokanthera oblongifolia is considered a naturalized weed or escape in climatologically suitable areas, for instance in Australia (Randall 2007). In New South Wales it is naturalizing in subtropical rainforest undergoing regeneration and in coastal dunes (Hosking & al. 2011).

Alstroemeria ligtu L. (incl. hybrids) (*Liliaceae*) (Fig. 1b)

GRAN CANARIA: Santa María de Guía, Cruce Sta. Cristina, road GC-70 at km 13, roadside, among *Pteridium*, 07.04.2017, *F. Verloove* 12824 (BR). – naturalized.

Alstroemeria ligtu is a taxon native to Chile but widely grown as an ornamental elsewhere in the world. In the Canary Islands a single species of this genus has been reported as an escape from cultivation, *A. pulchella* L. f. (Hansen 1975, Acebes Ginovés & al. 2010). The latter is distinguished from *A. ligtu* in having all perianth segments spotted (vs. only inner perianth segments spotted). Both species are often confused in the horticultural trade and many claims of *A. pulchella* turn out to be *A. ligtu* (Matthews 1986). These days cultivated (and escaped) plants rarely represent wild species but rather complex hybrids.

In Guía a small, apparently established population was seen in a roadside, on the verge of woodland. Identical plants have also been recorded recently in La Palma (Otto & Verloove, in press).

Species of *Alstroemeria* grow often very vigorously, as a result of strong rootstocks with clusters of tubers or rhizomes. They are sometimes classified as invasive environmental weeds, e.g. *A. aurea* Graham (Weber 2017).

Capsicum annuum L. (*Solanaceae*)

GRAN CANARIA: San Bartolomé de Tirajana, Maspalomas (San Fernando), Av. Alejandro del Castillo, street side in urban area, a single individual, 31.03.2017, *F. Verloove* 12798 (BR). – casual.

A taxon native to southern North America, this species is commonly grown as a vegetable (pepper, paprika). It easily germinates from seed and can be seen wherever its seeds are deposited, e.g. near sewage works. A single individual was seen in an urban area in Maspalomas, doubtlessly as a mere casual alien.

This genus and species had not yet been recorded in the wild from the Canary Islands.

Chasmanthe bicolor (Gasp.) N.E. Br. (*Iridaceae*)

(Fig. 1c)

GRAN CANARIA: Valleseco, road GC-21, p.k 20.45, La Laguna – Valleseco, 950-1000 m s.m., roadside and slopes, 28R DS 437 030, 17.03.2018, *Á. Marrero*, LPA: 35205-35206; *Ibidem*, road GC-21, p.k 20, La Laguna - Valleseco 930-945 m s.m., 28R DS 440 032, 18.03.2018, *Á. Marrero*, LPA: 35207-35208; Teror, Mayorazgo, Finca de Osorio, 670 m s.m., 28R DS 462 053, anthropized hillsides along the road and lower edge of the cork oak woodland, scarce, in fruiting stage, *M. Salas, F. Verloove & Á. Marrero*, 24.04.2018, LPA: 35529-35530; *Ibidem*, in fruiting and flowering stage, *Á. Marrero & C. Santiago*, 29.04.2018, LPA: 35531-35533. – naturalized.

Chasmanthe bicolor is endemic to the Western Cape Province of South Africa where it occurs in sheltered ravines and in open woodland near streams. It is highly vulnerable and faces a risk of extinction in the wild. It is, however, widely cultivated as an ornamental beyond its native range. In Gran Canaria it is locally naturalized forming dense hillside stands below Valleseco. This species had not yet been recorded in the wild from the Canary Islands, nor are there records for it from the Euro+Med area (<http://www.emplantbase.org/home.html>). Its presence was recently reported from Italy (Grandis 2016).

Compared with *Chasmanthe floribunda* flower are smaller but more striking. The upper tepals are orange-scarlet, whereas the lower tepals are dark green with a yellow tube. The latter are short and triangular.

Chasmanthe bicolor is considered an environmental weed in Australia (Randall 2007).

Chasmanthe floribunda (Salisb.) N.E. Br. (*Iridaceae*)

(Fig. 1d)

GRAN CANARIA: Gáldar, Juncalillo, road GC-223, roadside ditch, 07.04.2017, *F. Verloove* 12810 (BR); Las Palmas de Gran Canaria, Botanical Garden, 15.05.1971, *E.R. Sventenius*, LPA: 15665; *Ibidem*, Barranquillo de Siete Puertas, below Llanos de María Rivera, 360 m s.m., 28R DS 527 037, fonolitic rocky outcrops, 02.02.2012, *Á. Marrero*, LPA: 30585-30586; Firgas, Lomo San Pedro, La Caldera, 450 m s.m., 28R DS 464 090, 07.01.2018, *Á. Marrero*, s.c.; Teror, Cruz de los Caideros, 640 m s.m. 28R DS 496 028, 10.03.2018, *Á. Marrero*, LPA: 35189; *Ibidem*, Caldera de Pino Santo, 835 m s.m., 28R

DS 475 018, 10.03.2018, *Á. Marrero*, LPA: 35190; *Ibidem*, Osorio, 640 m s.m., 28R DS 467 051, 10.03.2018, *Á. Marrero*, s.c.; Las Tres Acequias, 610 m s.m., 28R DS 470 056, 10.03.2018, *Á. Marrero*, s.c.; Valleseco, Carpinteras, Puerta de La Montaña, 18.03.2018, *Á. Marrero*, LPA: 35209; *Ibidem*, Barranco de La Virgen, 700 m s.m., 28R DS 422 042, 28.10.2017, *Á. Marrero*, s.c. – naturalized.

This member of the southern African genus *Chasmanthe* is commonly grown as an ornamental in climatologically suitable areas in the world. It has long been confused with the similar-looking *C. aethiopica* (L.) N.E. Brown, not only in the Canary Islands (see Otto & Verloove 2016 for details about their separation) but also elsewhere in Europe, for instance in Italy (Grandis 2016). It was shown that most Canarian populations are in fact referable to *C. floribunda*, not to *C. aethiopica*. The latter is a much less attractive species with shorter stems (it barely reaches half the size of the other two species: up to about 60 cm in *C. aethiopica*, compared to 120–150 cm in *C. floribunda* and *C. bicolor*) and smaller flowers. At least in Gran Canaria claims of it need confirmation. The presence of *C. floribunda* in Gran Canaria as a naturalized species is here confirmed. It is in fact commonly naturalized in the entire North and Northeast of the island, ranging in altitude between 300–1000 m s.m.

***Cotyledon orbiculata* var. *spuria* (L.) Toelken (Crassulaceae)**

Syn.: *Cotyledon spuria* L.

GRAN CANARIA: Teror, road of Tamaraceite, La Molineta, 365 m s.m., 28RDS 490 060, 24.03.2018, *Á. Marrero* s.c. – naturalized.

This taxon is native of the southern Little Karoo and south of this region from the vicinity of Albertinia to Worcester. Occasionally, it also occurs on the west coast near Cape Town, as well as along the eastern slopes of the western Cape mountains as far north as the Hantams Mountains (Toelken 1979). Elsewhere in the world it is widely cultivated as an ornamental.

It was recently discovered in an anthropized area in La Molineta (Teror), where it has escaped from gardens and occurs on slopes. It reproduces both sexually and vegetatively. This taxon had not yet been recorded in the wild from the Canary Islands.

Cotyledon macrantha A. Berger is a related species that has been reported from Tenerife (Acebes Ginovés & al. 2010). Its leaves are shiny green, not farinose-glaucous as in *C. orbiculata*.

Cotyledon orbiculata is a significant environmental weed in parts of Australia (Randall 2007).

***Crassula multicava* Lem. (Crassulaceae)**

(Fig. 1e)

GRAN CANARIA: Valleseco, El Molinete, 21.03.2013, *M. Salas Pascual* s.c.; Las Palmas de Gran Canaria, Solana de la Angostura, alongside track, near houses, 09.04.2017, *F. Verloove* & *M. Salas Pascual* 12826 (BR); *Ibidem*, Botanical Garden ‘Viera y Clavijo’,

255 m s.m., 28R DS 546 044, in small groups, 19.03.2018, *Á. Marrero* s.c.; Firgas, La Caldera, 480-490 m s.m., 28R DS 462 090, on rocky slopes along with *Crassula argentea* L. f., very abundant, *Á. Marrero* s.c.; Teror, Cruz de los Caideros, 640 m s.m., 28R DS 496 028, growing over ridges, *Á. Marrero* s.c. – naturalized. *Crassula multicava* – a taxon native to South Africa but commonly cultivated as a garden ornamental worldwide – is known as a naturalized invasive species in Tenerife and La Gomera (Acebes Ginovés & al. 2010), as well as in El Hierro and La Palma (Santos-Guerra et. al. 2014). It had not been recorded before in the wild in Gran Canaria where it can also be classified as locally invasive. It is in fact relatively common in the Middle windward side of the island where it grows over ridges and slopes, forming very dense groups.

***Cupressus sempervirens* L. (Cupressaceae)**

GRAN CANARIA: Las Palmas de Gran Canaria, Tafira, slope N of Calle Lomo de Enmedio, a single individual, 07.12.2017, *F. Verloove* s.c. – casual.

This conifer from the Mediterranean area and adjacent parts of Asia and southwestern Europe is commonly planted as an ornamental tree, also in the Canary Islands. As an escape it has been observed before in El Hierro and La Gomera (Acebes Ginovés & al. 2010). It is here reported for the first time from Gran Canaria.

***Digitaria setigera* Roth (Poaceae)**

GRAN CANARIA: Agaete, at Noni Sports Pádel, plantation weed, 13.12.2017, *F. Verloove* 13106 (BR). – casual.

Digitaria setigera, native to southeastern Asia, is now widely naturalized in the New World tropics and subtropics. It is very similar to *D. ciliaris* but easily distinguished: a lower glume is absent and the upper glume is very short, much less than ½ spikelet length. These species and others related to *D. sanguinalis* are all much alike and some seem to intergrade in some areas. Molecular phylogenetic studies may shed new light on species boundaries in this group.

Digitaria setigera is here reported for the first time from the Canary Islands, although it may have been overlooked so far. Interestingly, in Agaete it grows close to another *Digitaria* species from southeastern Asia, *D. radicata* (J. Presl) Miq. (Verloove 2017). The latter is still present as a weed in the Huerto de las Flores.

***Ficus rubiginosa* Vent. (Moraceae)**

(Fig. 1f)

GRAN CANARIA: Las Palmas de Gran Canaria, Avenida de Escaleritas - Plaza Plácido Álvarez Buylla, 105 m s.m., 28R DS 569 102 and 570 103, spontaneous regeneration in cracks and fissures along walls of gardens or as epiphyte on *Phoenix* spp., 11.11.2012, *Á. Marrero*, LPA: 35222; *Ibidem*, Botanical Garden ‘Viera y



Fig. 1. **a.** *Acokanthera oblongifolia*, Telde, dry riverbed, April 2017, F. Verloove; **b.** *Alstroemeria ligtu*, Guía, roadside, April 2017, F. Verloove; **c.** *Chasmanthe bicolor*. Flower details, Valleseco, March 2018, Á. Marrero; **d.** *Chasmanthe floribunda*, Valleseco, February 2006, M. Salas Pascual; **e.** *Crassula multicava*, Valleseco, March 2013, M. Salas Pascual; **f.** *Ficus rubiginosa*. Las Palmas de Gran Canaria (Escaleritas), foot of wall, November 2012, Á. Marrero.

Clavijo', 250 m s.m., 28R DS 545 046, spontaneous in cracks in rock garden, *Á. Marrero*, LPA: 35215-35216. – casual.

This ornamental tree from Australia is commonly planted as an ornamental in the Canary Islands. It produces numerous figs that birds feed on. As a result the species increasingly escapes from cultivation, although mostly in the vicinity of planted individuals. In the Canary Islands escaped plants had been reported before from Tenerife (Verloove & Reyes-Betancort 2011) and La Palma (Otto & Verloove, in press). In similar circumstances (i.e., epiphytic on palm trees, cracks in concrete, walls, etc.) it is here reported for the first time from Gran Canaria as well.

***Galinsoga quadriradiata* Ruiz & Pav. (Asteraceae)**

(Fig. 2a)

GRAN CANARIA: Las Palmas de Gran Canaria, Tafira, side of the road El Dragonal-La Calzada, 02.02.2013, *M. Salas Pascual* s.c.; Fargas, El Cortijo, cruce a Los Rosales, 295 m s.m., 28R DS 457 106, roadside and adjacent degraded thermophilous shrubland, 05.05.2013, *Á. Marrero* LPA: 30944-30946. – naturalized.

A taxon native to Central Mexico, *Galinsoga quadriradiata* has become a nearly cosmopolitan weed. In the Canary Islands it was previously recorded from La Gomera and Tenerife (Acebes Ginovés & al. 2010), as well as from La Palma (Brandes 2005). Since 2013 it has been observed as a plantation weed in and near the Botanical Garden 'Viera y Clavijo' in Tafira Baja and in Fargas, apparently for the first time in Gran Canaria.

***Jacaranda mimosifolia* D. Don (Bignoniaceae)**

GRAN CANARIA: Las Palmas de Gran Canaria, Tafira, Calle de Rafael Rafaeli, cracks in pavement, ca. 5 young individuals (self-sown), 03.12.2017, *F. Verloove* s.c. (photo); Las Palmas de Gran Canaria, Tafira, Carretera General del Centro (Villa Leonor), gravel, numerous saplings under planted tree, 03.12.2017, *F. Verloove* s.c. – casual.

This is a widely planted ornamental tree from south-central South America. It produces large capsules which eventually split open and release numerous flat, winged seeds. In recent years it increasingly reproduces from seed in areas where it was formerly introduced, also in the Canary Islands. In the wild it was observed before, for instance, in Tenerife (Verloove & Reyes-Betancort 2011) and La Palma (Santos-Guerra & al. 2014). It is here reported for the first time from Gran Canaria. In addition to the records cited above, this species is also known to reproduce from seed in the Botanical Garden 'Viera y Clavijo' in Tafira Baja. A future naturalization, especially in the northern parts of the island, in places with sufficient water supply such as *barrancos*, is not unlikely.

J. mimosifolia invades savanna, wooded kloofs, rocky ridges and river banks in South Africa where it competes with and replaces indigenous species (Invasive Species South Africa 2018). It is also considered an invasive species in Florida and eastern Australia (Weber 2017).

Kalanchoe ×houghtonii D.B. Ward (*Crassulaceae*)

K. daigremontiana Raym.-Hamet & H. Perrier × *K. delagoensis* Eckl. & Zeyh.

GRAN CANARIA: Mogán, Arguineguín, close to Avenida Mencey, dry riverbed, two individuals, 10.11.2011, *F. Verloove* s.c.; Ingenio, barranco de Ingenio at Calle Antonio Rodríguez Medina, dry riverbed, 21.12.2017, *F. Verloove* s.c.; Las Palmas de Gran Canaria, road from Siete Puertas to El Zardo, 395 m s.m., 28R DS 532 044, 10.03-2018, *Á. Marrero* s.c.; *Ibidem*, Botanical Garden ‘Viera y Clavijo’, 275 m s.m., 28R DS 547 046, 22.03.2018, *Á. Marrero* s.c.; Artenara, La Portada, Tirma, 675 m s.m., 28R DS 266 012, 17.03.2018, *Á. Marrero* s.c. – naturalized.

This species is morphologically similar to *K. daigremontiana* but distinguishable by the leaf base that is neither auriculate nor cordate (Ward 2006; Wang & al. 2016; Mesquida & al. 2017). Both have been widely confused and *K. ×houghtonii* is in fact much more frequent than the latter these days, in gardens as well as in the wild (as an escape). It is considered a troublesome invasive weed in many warm-temperate regions worldwide (Wang & al. 2016; Mesquida & al. 2017).

In the Canary Islands its presence was noted so far in La Palma (Otto & Verloove 2016) and Tenerife (Verloove, unpublished records). It is here reported for the first time from Gran Canaria where it doubtlessly is relatively frequent but confused with *K. daigremontiana*. The presence of genuine *K. daigremontiana* in the wild in Gran Canaria requires confirmation.

Merremia tuberosa (L.) Rendle (*Convolvulaceae*)

(Fig. 2b)

GRAN CANARIA: Las Palmas de Gran Canaria, Almatriche, Lugar Lomo el Diviso, rough ground, large patch, probably from discarded garden waste, 06.04.2017, *F. Verloove* 12803 (BR, LPA: 34254). – naturalized (?)

This very vigorous vine, native to Mexico and parts of Central America, is frequently grown as an ornamental in Spain (Sánchez de Lorenzo Cáceres 2010). In the Canary Islands it has been recorded as an escape in various parts of Tenerife (Verloove & Reyes-Betancort 2011; pers. obs. F.V. 01.2017). It is here reported for the first time from Gran Canaria as well. It is obviously distributed by humans from discarded cuttings.

Merremia tuberosa is an invasive species in a number of islands in the Pacific and Indian Ocean.

Nerium oleander L. (*Apocynaceae*)

GRAN CANARIA: San Bartolomé de Tirajana, Cercados de Espinos, barranco de Arguineguin, dry riverbed, 03.04.2017, *F. Verloove* 12853 (BR). – casual.

Nerium oleander, a species native to the Mediterranean region, Iran, the Indian subcontinent and southern China, is widely cultivated as an ornamental, also in the Canary Islands. It rarely reproduces from seed which may explain why it has rarely been reported as an escape of cultivation there. It has been known from La Palma since 2013 and since 2014 from Tenerife (Otto & Verloove 2016; Verloove 2017).

It is here reported for the first time from Gran Canaria. In Cercados de Espinos it grows in a dry river bed, probably from washed-up rhizomes.

Passiflora morifolia Mast. (*Passifloraceae*)

(Fig. 2c)

GRAN CANARIA: Las Palmas de Gran Canaria, Tafira Baja, Botanical Garden ‘Viera y Clavijo’, garden weed, frequent, 09.04.2017, *M. Salas Pascual & F. Verloove* 12795 (BR). – naturalized.

A species native to parts of Central and South America, *Passiflora morifolia* is sometimes grown as an ornamental and subsequently naturalizes from seed. It is, however, rarely reported as troublesome. In the Mediterranean area it is known as a naturalized weed from Israel (Joel & Liston, 1986) and it is a rather frequent and undesirable weed in the Botanic Garden and its surroundings in Puerto de la Cruz in Tenerife (Verloove & Reyes-Betancort 2011).

At least since 2014 *Passiflora morifolia* grows in identical circumstances in the Botanical Garden ‘Viera y Clavijo’ in Tafira in Gran Canaria, along with *P. suberosa* L. Both are probably dispersed by birds.

Phlomis purpurea L. (*Lamiaceae*)

GRAN CANARIA : Las Palmas de Gran Canaria, Llanos de Maria Rivera, rocky slope, 09.04.2017, *M. Salas Pascual & F. Verloove* 12854 (BR, LPA: 34258). – naturalized.

Phlomis purpurea is native to Spain, Portugal and Morocco but widely grown as an ornamental elsewhere. A small population of this species was discovered in 2013 on a rocky, sun-exposed slope in Llanos de Maria Rivera. It was doubtlessly introduced on purpose, along with other exotics like *Cistus ladanifer* L. and *Crassula argentea* (Mill.) Druce. It has now established itself in a habitat that closely matches that in its area of origin.

Phytolacca dioica L. (*Phytolaccaceae*)

GRAN CANARIA: Las Palmas de Gran Canaria, Tafira Baja, barranco de Guiniguada close to Palmeral, dry riverbed, two individuals (self-sown), 09.04.2017, *M. Salas*

Pascual & F. Verloove 12808 (BR); Las Palmas de Gran Canaria, Tafira Baja road, access to the Botanical Garden ‘Viera y Clavijo’, 325-330 m s.m., 28R DS 549 045, 12.04.2018, *Á. Marrero* s.c. – casual.

This ornamental tree is native to the Pampa of South America and is much grown in the Canary Islands and other climatologically suitable areas. It has been known as an escape in the Canary Islands since about 2010 when it was recorded as abundantly escaping in Barranco Martiánez in Puerto de la Cruz in Tenerife (Verloove & Reyes-Betancort 2011).

In similar circumstances self-sown trees were discovered recently in Tafira Baja in Gran Canaria, for instance in the dry riverbed of Guinguada river and other places near to the Botanical Garden ‘Viera y Clavijo’. To our knowledge this species was never planted in the Botanical Garden in the past. The young spontaneous trees most likely originate from planted individuals in nearby private gardens from where they were dispersed by berry-eating birds.

In order to prevent a future naturalization of *Phytolacca dioica* in this area, attempts to control or eradicate the plants are developed, just as for *Passiflora* sp. pl.

***Salvia hispanica* L. (Lamiaceae)**

GRAN CANARIA: Telde, La Mareta, near road GC-116, drain, from sewage water, three individuals with *Cucurbita* sp., *Solanum lycopersicum*, etc., 09.04.2017, *M. Salas Pascual & F. Verloove* 12796 (BR, LPA: 34261). – casual.

A species native to central and southern Mexico and Guatemala, *Salvia hispanica* is now widely grown for its edible seeds (‘chia’). As a result, these days it is regularly seen on sewage sludge, on exposed river banks, etc., also in the Canary Islands. It has been reported on various occasions from Tenerife (Verloove 2017). In 2017 it was also seen in Gran Canaria, apparently for the first time. It often grows along with typical sewage plants such as *Cucurbita* spec. and *Solanum lycopersicum* L.

Salvia hispanica will probably be recorded again in the Canary Islands but at least at present there are no signs of an incipient naturalization process.

***Setaria pumila* subsp. *pallide-fusca* (Schumach.) B.K. Simon (Poaceae)**

Syn.: *Setaria pallide-fusca* (Schumach.) Stapf & C.E. Hubb.

GRAN CANARIA: Arucas, Santidad, Camino La Guitarrilla, by track, close to houses, small population, 10.04.2017, *F. Verloove* 12811 (BR). – casual.

This taxon, a (sub-) tropical variant of the more temperate nominal species, has a debated taxonomic value. It is sometimes accepted as a distinct species (e.g. Meredith 1955, Gibbs Russell & al. 1991) while other authors merely subsume it under *S. pumila* (e.g. Morrone & al. 2014).

The small population discovered in 2017 in Gran Canaria is characterized by having very narrow inflorescences (resembling those of *S. parviflora* (Poir.) Kerguélen but plants are clearly annuals) with small spikelets ca. 2 mm long. These features are characteristic of subsp. *pallide-fusca* (see, for instance, Rominger 2003), a taxon that apparently had not been recorded before in the Canary Islands.

Setaria pumila subsp. *pallide-fusca* is a common weed throughout the subtropics. It is particularly noxious in Africa, in Senegal, Sudan, Uganda and Zambia (Holm & al. 1979).

***Solanum betaceum* Cav. (Solanaceae)**

(Fig. 2d)

Syn.: *Cyphomandra betacea* (Cav.) Sendtn.

GRAN CANARIA: Firgas, Casa Blanca, barranco near sewage work, dry riverbed, four small spontaneous trees, 10.04.2017, *F. Verloove* 12814 (BR, LPA: 34262). – casual.

Solanum betaceum, the tree tomato or tamarillo, is native to Andean South America. It is widely grown as a minor fruit crop in the subtropical and warm-temperate regions of the world. Like other fruits and vegetables, it sometimes can be observed near sewage works.

Four young trees were found spontaneously growing in the depth of a barranco near Firgas, along with other sewage plants like *Cucurbita* sp. and *Solanum lycopersicum* L. This record probably represents the first record of this species in the wild in the Canary Islands.

This species is naturalizing in areas where it has been introduced, for instance in Australia, New Zealand and parts of Asia and Africa (e.g. Symon 1981). It is probably nowhere considered an invasive species yet although it is increasingly observed in (near-) natural areas.

Tree tomato was segregated from the genus *Solanum* L. for quite a long time and then accommodated in the genus *Cyphomandra* Mart. ex Sendtn. Based on chloroplast DNA sequence data, however, it has been shown to be a well-supported major group in *Solanum* (Bohs 2007).

***Solanum seaforthianum* L. (Solanaceae)**

GRAN CANARIA: Las Palmas de Gran Canaria, Tafira Baja, Botanical Garden ‘Viera y Clavijo’, near the Research Center, 315 m s.m., 28R DS 548 045, 01.07.2011, *Á. Marrero*, LPA: 27356. – casual.

Of somewhat uncertain origin, *Solanum seaforthianum* is probably native to the islands of the West Indies and coastal northern South America in Colombia and Venezuela, perhaps also on the Caribbean slope of Central America and Mexico (Knapp 2013). It is cultivated as an ornamental vine and naturalized in many tropical and subtropical areas, often as an aggressive environmental weed, for instance in South Africa and Australia (e.g. Foxcroft & al. 2003; Randall 2007). It is a very vigorous liana and plants are known to produce large numbers of seeds which can be easily dispersed by birds.

It has been recorded in the Botanical Garden ‘Viera y Clavijo’ as a subsontaneous weed of unknown provenance. It had not been recorded before in the Canary Islands and apparently is a very exceptional alien in the entire E+M Plantbase area where it is only known to be naturalized in Sicily (Galasso & al. 2018).

Solanum seafortianum is a liana with showy violet corollas and pinnatifid to deeply pinnatifid leaves with up to four pairs of leaflets (Knapp 2013). It cannot be confused with other members of the genus in the Canary Islands, native as well as introduced.

Tecoma* ×*smithii W. Watson (*Bignoniaceae*) (Fig. 2e)
Putative parentage: *Tecoma capensis* (Thunb.) Lindl. × *T. stans* (L.) Kunth

GRAN CANARIA: Agüimes, Llano Blanco, Av. de la Banda, roadside and adjacent fallow field, ca. 25 self-sown individuals (planted nearby), 21.12.2017, *F. Verloove* 13121 (BR). – naturalized (?).

A small population with about 25 individuals of *T. ×smithii* was discovered by a roadside and in the adjacent fallow field in Agüimes (Llano Blanco) in December 2017. It evidently escaped from a nearby plantation.

This shrub is thought to be a hybrid between the central Mexican *Tecoma stans* (var. *velutina* DC.) and the South African *Tecoma* [*Tecomaria*] *capensis* (Watson 1893). It indeed combines features of what was formerly called *Tecomaria* and *Tecoma* s.str.: the leaf rachis is distinctly winged, leaflets are numerous (up to 15) and leathery and the corolla is orange, not yellow (*Tecomaria*); anther thecae, however, are divaricate (*Tecoma*). Some authors suggest an alternative parentage for *T. ×smithii*, *T. arequipensis* (Sprague) Sandwith × *T. stans* (Sánchez de Lorenzo Cáceres 2018), which seems – on morphological grounds – less likely.

T. ×smithii freely reproduces from seed (its hybrid nature therefore has been questioned) (Watson 1893). This is quite obvious in the locality where it was discovered in Gran Canaria.

Tradescantia spathacea Sw. (*Commelinaceae*)
Syn. *Rhoeo spathacea* (Sw.) Stearn

GRAN CANARIA: Teror, road of Tamaraceite, La Molineta, 360 m s.m., 28RDS 489 059, 24.03.2018, *Á. Marrero* s.c. – naturalized (?).

Tradescantia spathacea is native to Mexico and Central America (Hunt 1994). It is grown as an ornamental and naturalized in Florida, Texas, Hawaii, Cuba and other oceanic islands (Govaerts 2004). It invades and disrupts native plant communities creating a dense groundcover on the forest floor which prevents native plants from germinating. As a result, it locally is declared a noxious environmental weed (e.g. Randall 2007).

It was recently discovered in an anthropized area in La Molineta (Teror), where it has escaped from gardens and occurs on slopes. It reproduces solely vegetatively. This taxon had not yet been recorded in the wild from the Canary Islands.

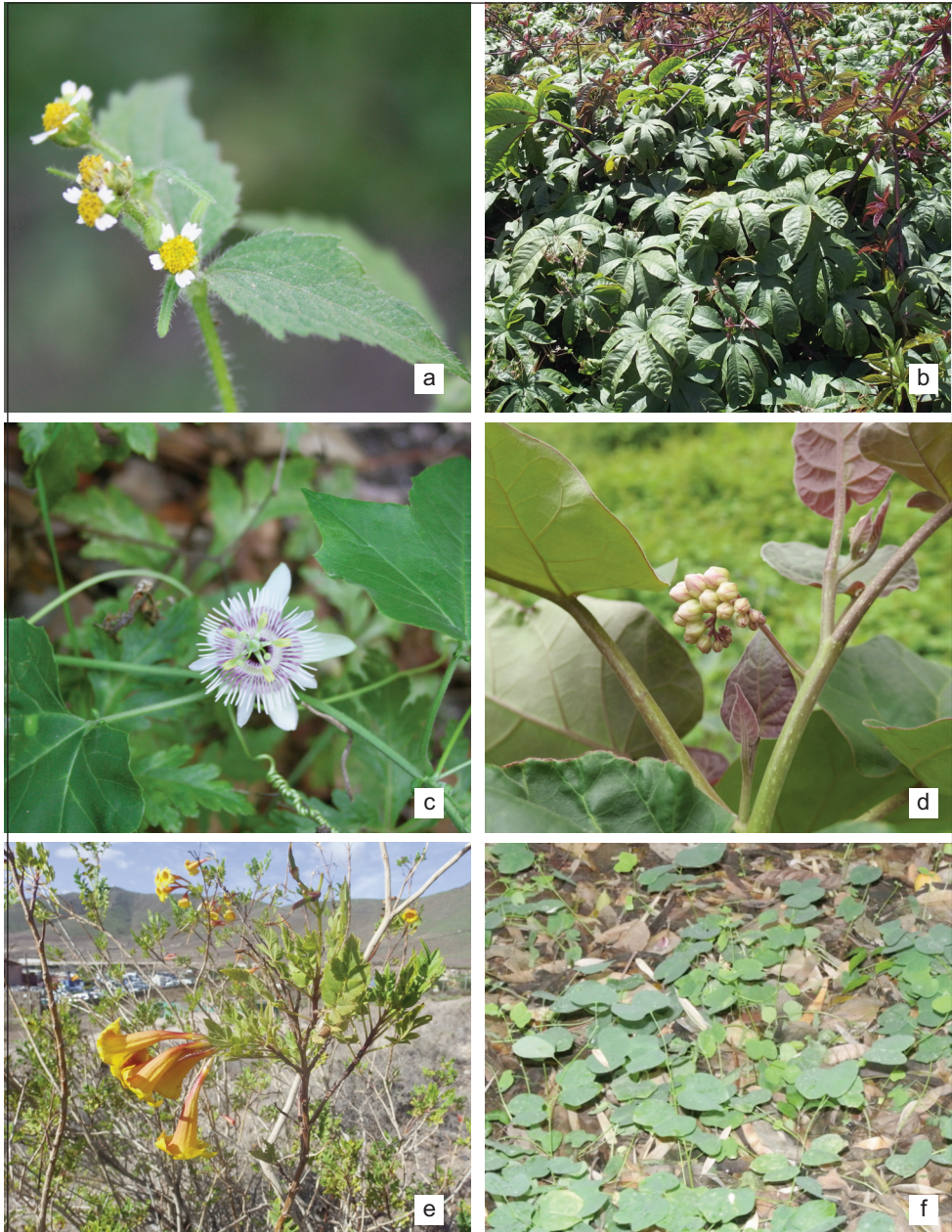


Fig. 2. **a.** *Galinsoga quadriradiata*, Tafira, roadside close to the Botanic Garden, February 2013, M. Salas Pascual.; **b.** *Merremia tuberosa*, Las Palmas de Gran Canaria, rough ground, April 2017, F. Verloove; **c.** *Passiflora morifolia*, Las Palmas de Gran Canaria, Botanic Garden, September 2014, M. Salas Pascual; **d.** *Solanum betaceum*, Fargas, dry riverbed, April 2017, F. Verloove; **e.** *Tecoma × smithii*, Agüimes, fallow field, December 2017, F. Verloove; **f.** *Bauhinia variegata*, Agaete, understorey of Huerto de las Flores, December 2017, F. Verloove.

Part two: taxa exclusively observed within the limits of public or private gardens where they are grown for ornament.

***Bauhinia variegata* L. (Caesalpiniaceae)** (Fig. 2f)

GRAN CANARIA: Agaete, Huerto de las Flores, numerous saplings under planted tree, 12.12.2017, *F. Verloove* s.c. (photo) – casual.

Bauhinia variegata – a species native to southeastern Asia (China, India, Nepal, Thailand and Vietnam) – is widely cultivated as an ornamental tree in the tropics and subtropics, also in the Canary Islands. It is increasingly reproducing from seed in areas where it was formerly introduced. It now has become a troublesome invasive weed in, for instance, the southern United States, South Africa and eastern Australia (Weber 2017).

In the Canary Islands its escape was recently noticed in La Palma (Otto & Verloove, in press) and it is here reported for the first time from Gran Canaria. Numerous saplings were recorded in the Huerto de las Flores in Agaete. A future naturalization in the Canary Islands is likely, especially in areas with sufficient water supply.

***Syzygium cumini* (L.) Skeels (Myrtaceae)**

GRAN CANARIA: Las Palmas de Gran Canaria, Tafira Alta, 370 m s.m., 28R DS 546 037, spontaneous in gardens at the foot of the parental tree, 11.03.2018, *Á. Marrero* s.c.; Firgas, La Caldera, 445 m s.m., 28R DS 463 092 and 464 092, next to the parental plant in anthropic environments, 07.01.2018, *Á. Marrero*, LPA: 35210-35211. – casual.

Native to southeastern Asia, this species is widely grown as an ornamental tree (less frequently for its edible fruit or timber), also in the Canary Islands. It has the ability to form a dense cover, excluding all other species which allowed *Syzygium cumini* to become invasive in Hawaii, the Cook Islands and French Polynesia (Global Invasive Species Database 2018). In Gran Canaria it was only found so far in the vicinity of planted individuals. In micro-habitats or under the canopy of the adult plants it reproduces normally, sometimes even explosively.

The congeneric *Syzygium jambos* (L.) Alston is known to reproduce from seed in La Palma (Otto & Verloove, in press) and Gran Canaria, but on this island no naturalization process has been observed so far.

Acknowledgements

Field work by the first author in March-April 2017 was granted by COST Action TD 1209. We are indebted to Jordi López-Pujol (Barcelona, Spain) for identifying *Kalanchoe ×houghtonii*. Rainer Otto (Gundelsheim, Germany) is thanked for providing valuable information on Canarian xenophytes.

References

Acebes Ginovés, J. R., León Arencibia, M. C., Rodríguez Navarro, M. L., Del Arco Aguilar, A., García Gallo, P. L., Pérez de Paz, O., Rodríguez Delgado, V., Martín Osorio V. E. & Wildpret

- de la Torre, W. 2010: Pteridophyta, Spermatophyta. – Pp. 119-172 in: Arechavaleta, M., Rodríguez, S., Zurita, N. & García, A. (eds). Lista de especies silvestres de Canarias (hongos, plantas y animales terrestres) (2nd ed.) – La Laguna.
- Bohs, L. 2007: Phylogeny of the Cyphomandra clade of the genus *Solanum* (*Solanaceae*) based on ITS sequence data. – *Taxon* **56(4)**: 1012-1026. doi: 10.2307/25065901.
- Brandes, D. 2005: Some Contributions to the Spontaneous Flora of Roadsides on La Palma. Available online at: <http://www.ruderal-vegetation.de> [Last Accessed: 27 February 2018].
- Foxcroft, L. C., Henderson, L., Nichols, G. R. & Martin, B. W. 2003: A revised list of alien plants for the Kruger National Park. – *Koedoe* **46(2)**: 21-44.
- Gibbs Russell, G. E., Watson, L., Koekemoer, M., Smook, L., Barker, N. P., Anderson, H. M. & Dallwitz, M. J. 1991: Grasses of Southern Africa. – *Mem. Bot. Survey South Africa* **58**: 1-437.
- Global Invasive Species Database. 2018: Species profile: *Syzygium cumini*. Available online at: <http://www.iucngisd.org/gisd/species.php?sc=505> [Last Accessed: 14 March 2018].
- Govaerts, R. 2004: World Checklist of Monocotyledons Database. – Kew.
- Grandis, M. 2016: Sulla presenza di *Chasmanthe floribunda* e *Chasmanthe aethiopica* in Italia. – *Acta Plantarum Notes* **4**: 137-139.
- Hansen, A. 1975: Contributions to the flora of the Canary Islands. – *Cuad. Bot. Canar.* **25**: 3-14.
- Holm, L., Pancho J. V., Herberger J. P. & Plucknett D. L. 1979: A Geographical Atlas of World Weeds – New York.
- Hosking, J. R., Conn, B. J., Lepschi, B. J. & Barker, C. H. 2011: Plant species first recognised as naturalised or naturalising for New South Wales in 2004 and 2005. – *Cunninghamia* **12(1)**: 85–114.
- Hunt, D. R. 1994: *Commelinaceae*. – Pp. 157-173 in: Davidse, G., Sousa Sánchez, M. & Chater, A. O. (eds), *Flora Mesoamericana*. – México.
- Galasso, G., Conti, F., Peruzzi, L., Ardenghi, N. M. G., Banfi, E., Celesti-Grappo, L., Albano, A., Alessandrini, A., Bacchetta, G., Ballelli, S., Bandini Mazzanti, M., Barberis, G., Bernardo, L., Blasi, C., Bouvet, D., Bovio, M., Cecchi, L., Del Guacchio, E., Domina, G., Fascetti, S., Gallo, L., Gubellini, L., Guiggi, A., Iamónico, D., Iberite, M., Jiménez-Mejías, P., Lattanzi, E., Marchetti, D., Martinetto, E., Masin, R. R., Medagli, P., Passalacqua, N. G., Peccenini, S., Pennesi, R., Pierini, B., Podda, L., Poldini, L., Prosser, F., Raimondo, F. M., Roma-Marzio, F., Rosati, L., Santangelo, A., Scoppola, A., Scortegagna, S., Selvaggi, A., Selvi, F., Soldano, A., Stinca, A., Wagensommer, R. P., Wilhalm, T. & Bartolucci, F. 2018: An updated checklist of the vascular flora alien to Italy. – *Pl. Biosyst.* **152**: 556-592. doi:10.1080/11263504.2018.1441197
- Invasive Species South Africa 2018: Available online at: <http://www.invasives.org.za/> [Last Accessed: 17 January 2018].
- Joel, D. M. & Liston, A. 1986: New adventive weeds in Israel. – *Israel J. Bot.* **35**: 215-223.
- Knapp, S. 2013: A revision of the Dulcamaroid Clade of *Solanum* L. (*Solanaceae*). – *PhytoKeys* **22**: 1-432.
- Kunkel, G. 1972: Novedades en la Flora Canaria VI. Adiciones y Nuevas Descripciones. – *Cuad. Bot. Canar.* **16**: 39-45.
- Matthews, V. A. 1986: *Alstroemeria*. – Pp. 208-210 in: Walters, S. M. Brady, A., Brickell, C.D., Cullen, J., Green, P. S., Lewis, J., Matthews, V. A., Webb, D. A., Yeo, P. F. & Alexander, J. C. M. (eds), *The European Garden Flora*, **1**. – Cambridge.
- Meredith, D. 1955: *The Grasses and Pastures of South Africa*. – Cape Town.
- Mesquida, V., Gómez-Bellver, C., Guillot, D., Herrando-Moraira, S., Nualart, N., Sáez, L. & López-Pujol, J. 2017: El gènere *Kalanchoe* (*Crassulaceae*) a Catalunya: situació i distribució potencial del tàxon invasor *K. ×houghtonii*. – *Orsis* **31**: 37-64. doi: 10.5565/rev/orsis.42.
- Morrone, O., Aliscioni, S. S., Veldkamp, J. F., Pensiero, J. F., Zuloaga, F. O. & Kellogg, E. A. 2014: Revision of the Old World Species of *Setaria* (*Poaceae: Panicoideae: Paniceae*). – *Syst. Bot. Monogr.* **96**: 1-161.

- Otto, R. & Verloove, F. 2016: New xenophytes from La Palma (Canary Islands, Spain), with emphasis on naturalized and (potentially) invasive species. – *Collect. Bot.* **35**: e001. doi: 10.3989/collectbot.2016.v35.001.
- & — in press: New xenophytes from La Palma (Canary Islands, Spain), with emphasis on naturalized and (potentially) invasive species – Part 2. – *Collect. Bot.*
- Randall, R. P. 2007: The introduced flora of Australia and its weed status. – Adelaide.
- Rominger, J. M. 2003: *Setaria*. – Pp. 539-558 in: Barkworth, M. E., Capels, K. M., Long, S., Piep & M. B. (eds), *Flora of North America north of Mexico*, **25**. – New York-Oxford.
- Sánchez de Lorenzo Cáceres, J. M. 2010: *Apocynaceae* and *Convolvulaceae*. Pp. 132-172 and 380-399 in: Sánchez de Lorenzo Cáceres, J. M. (ed.), *Flora Ornamental Española*, **6**. – Madrid.
- Sánchez de Lorenzo Cáceres, J. M. 2018: *Tecoma* in: *Arboles ornamentales*. – Available online at: <http://www.arbolesornamentales.es/Bignoniaceae.htm> [Last Accessed: 17 January 2018].
- Santos-Guerra, A., Padrón Mederos, M. A., Mesa Coello, R., Ojeda Land, E. & Reyes-Betancort, J. A. 2014: Establecimiento de plantas introducidas en la flora vascular silvestre canaria II (Dicotiledóneas). – *Acta Bot. Malacit.* **39**: 227-237.
- Symon, D. E. 1981: The solanaceous genera, *Browallia*, *Capsicum*, *Cestrum*, *Cyphomandra*, *Hyoscyamus*, *Lycopersicon*, *Nierembergia*, *Physalis*, *Petunia*, *Salpichroa* and *Withania*, naturalised in Australia. – *J. Adelaide Bot. Gard.* **3(2)**: 133-166.
- Toelken, H. R. 1979: A re-evaluation of the *Cotyledon orbiculata* Complex. – *Bothalia* **12(4)**: 615-620.
- Verloove, F. 2013: New xenophytes from Gran Canaria (Canary Islands, Spain), with emphasis on naturalized and (potentially) invasive species. – *Collect. Bot.* **32**: 59-82.
- Verloove, F. 2017: New xenophytes from the Canary Islands (Gran Canaria and Tenerife; Spain). – *Acta Bot. Croatica* **76(2)**: 120-131. doi: 10.1515/botcro-2017-0013.
- & Reyes-Betancort, J. A. 2011: Additions to the flora of Tenerife (Canary Islands, Spain). – *Collect. Bot.* **30**: 63-78. doi: 10.3989/collectbot.2011.v30.007.
- , Marrero-Rodríguez, A., Salas-Pascual, M. & Guiggi, A. 2017: New records of *Cactaceae* from Gran Canaria (Canary Islands, Spain). – *Haseltonia* **23**: 79-91.
- Wang, Z-Q, Guillot, D., Ren, M-X & López-Pujol, J. 2016: *Kalanchoe* (*Crassulaceae*) as invasive aliens in China – new records, and actual and potential distribution. – *Nordic J. Bot.* **34(3)**: 349-354. doi: 10.1111/njb.01052.
- Ward, D. B. 2006: A name for a hybrid *Kalanchoe* now naturalized in Florida. – *Cact. Succ. J.* **78**: 92-95. doi: 10.2985/0007-9367(2006)78
- Watson, W. 1893: *Tecoma smithii*. – *Gardeners' Chronicle*, ser. 3, **14**: 649-650.
- Weber, E. 2017: *Invasive Plant Species of the World* (2nd ed.). A reference guide to environmental weeds. – Wallingon & Boston.

Addresses of the authors:

Filip Verloove¹, Marcos Salas-Pascual² & Águedo Marrero Rodríguez³,

¹Botanic Garden of Meise, Nieuwelaan 38, B-1860 Meise, Belgium. Email: filip.verloove@botanicgardenmeise.be

²Instituto de Estudios Ambientales y Recursos Naturales (i-UNAT), Campus Universitario de Tafira, Universidad de las Palmas de Gran Canaria, E-35017. Las Palmas de Gran Canaria, Gran Canaria, Canary Islands, Spain. Email: marcossalas-pascual@gmail.com

³Jardín Botánico Canario Viera y Clavijo, Unidad Asociada al CSIC, c/ El Palmeral nº 15, Tafira Baja, E-35017. Las Palmas de Gran Canaria, Gran Canaria, Canary Islands, Spain. E-mail: agmarrero@grancanaria.com

