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

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Abstract

New xenophytes from La Palma (Canary Islands, Spain), with emphasis on naturalized and (potentially) invasive species.— Many years of field work in La Palma (western Canary Islands) yielded a number of interesting new records of non-native vascular plants. *Amaranthus blitoides*, *A. deflexus*, *Aptenia cordifolia*, *Argemone ochroleuca*, *Begonia schmidtiana*, *Capsella rubella*, *Cardamine hamiltonii*, *Centratherum punctatum*, *Cerastium fontanum* subsp. *vulgare*, *Chasmanthe floribunda* (widely confused with *C. aethiopica* and *Crocosmia ×crocosmiiflora* in Macaronesia), *Chenopodium probstii*, *Commelina latifolia* var. *latifolia*, *Dichondra micrantha*, *Dysphania anthelmintica*, *Epilobium ciliatum*, *Erigeron sumatrensis*, *Erodium neuradifolium*, *Eucalyptus globulus*, *Euphorbia hypericifolia*, *E. maculata*, *Gamochaeta antillana*, *Geranium pyrenaicum*, *Hedychium coronarium*, *Hypochaeris radicata*, *Kalanchoe daigremontiana*, *K. delagoensis*, *K. ×houghtonii*, *Kickxia commutata* subsp. *graeca*, *K. spuria* subsp. *integrifolia*, *Lactuca viminea* subsp. *ramosissima*, *Landoltia punctata*, *Malvastrum coromandelianum* subsp. *capitatospicatum*, *Oenothera jamesii*, *Orobanche nana*, *Oxalis latifolia*, *Papaver hybridum*, *P. setigerum*, *Pilea microphylla*, *Podranea ricasoliana*, *Polygonum arenastrum*, *Portulaca granulatostellulata*, *P. nicaraguensis*, *P. nitida*, *P. papillatostellulata*, *Rumex crispus* subsp. *crispus*, *R. pulcher* subsp. *pulcher*, *R. ×pratensis*, *Sechium edule*, *Sida spinosa* var. *angustifolia*, *Silene nocturna*, *Solanum abutiloides*, *S. alatum*, *S. decipiens*, *Sonchus tenerrimus*, *Spergularia marina*, *Stellaria pallida*, *Tragopogon porrifolius* subsp. *australis*, *Tribulus terrestris* and *Trifolium repens* subsp. *repens* are naturalized or (potentially) invasive xenophytes, reported for the first time from either the Canary Islands or from La Palma. 37 additional, presumably ephemeral taxa are reported for the first time from the Canary Islands, whereas 56 ephemeral taxa are new for La Palma.

Key words: Canary Islands; chorology; La Palma; new records; vascular plants; xenophytes.

Resumen

Nuevos xenófitos de La Palma (Islas Canarias, España), con énfasis en las especies naturalizadas y (potencialmente) invasoras.— Varios años de trabajos de campo en La Palma (Islas Canarias occidentales) han posibilitado el descubrimiento de nuevas plantas vasculares no nativas. *Amaranthus blitoides*, *A. deflexus*, *Aptenia cordifolia*, *Argemone ochroleuca*, *Begonia schmidtiana*, *Capsella rubella*, *Cardamine hamiltonii*, *Centratherum punctatum*, *Cerastium fontanum* subsp. *vulgare*, *Chasmanthe floribunda* (ampliamente confundida con *C. aethiopica* y *Crocosmia ×crocosmiiflora* en Macaronesia), *Chenopodium probstii*, *Commelina latifolia* var. *latifolia*, *Dichondra micrantha*, *Dysphania anthelmintica*, *Epilobium ciliatum*, *Erigeron sumatrensis*, *Erodium neuradifolium*, *Eucalyptus globulus*, *Euphorbia hypericifolia*, *E. maculata*, *Gamochaeta antillana*, *Geranium pyrenaicum*, *Hedychium coronarium*, *Hypochaeris radicata*, *Kalanchoe daigremontiana*, *K. delagoensis*, *K. ×houghtonii*, *Kickxia commutata* subsp. *graeca*, *K. spuria* subsp. *integrifolia*, *Lactuca viminea* subsp. *ramosissima*, *Landoltia punctata*, *Malvastrum coromandelianum* subsp. *capitatospicatum*, *Oenothera jamesii*, *Orobanche nana*, *Oxalis latifolia*, *Papaver hybridum*, *P. setigerum*, *Pilea microphylla*, *Podranea ricasoliana*, *Polygonum arenastrum*, *Portulaca granulatostellulata*, *P. nicaraguensis*, *P. nitida*, *P. papillatostellulata*, *Rumex crispus* subsp. *crispus*, *R. pulcher* subsp. *pulcher*, *R. ×pratensis*, *Sechium edule*, *Sida spinosa* var. *angustifolia*, *Silene nocturna*, *Solanum abutiloides*, *S. alatum*, *S. decipiens*, *Sonchus tenerrimus*, *Spergularia marina*, *Stellaria pallida*, *Tragopogon porrifolius* subsp. *australis*, *Tribulus terrestris* y *Trifolium repens* subsp. *repens* son xenófitos naturalizados o (potencialmente) invasores, que se citan por primera vez para las Islas Canarias o para la isla de La Palma. 37 táxones adicionales, probablemente casuales, se dan a conocer por primera vez de las Islas Canarias, y 56 táxones de la isla de La Palma.

Palabras clave: corología; islas Canarias; La Palma; nuevas citas; plantas vasculares; xenófitos.

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INTRODUCTION

The vascular flora of the island of La Palma (Spain, Canary Islands) was thoroughly described by Santos-Guerra (1983) in his monumental work *Vegetación y flora de La Palma*. Since then relatively few new data has been published. Brandes (2005) reported about roadside vegetation on the island and Acebes Ginovés *et al.* (2009) provided an up-to-date checklist for the entire archipelago. New records of Poaceae were presented by Otto & Scholz (2012) and three recent papers dealt with acquisitions to the flora of La Palma, both of native and non-native species (Santos-Guerra *et al.*, 2013*a*, *b*, 2014).

Despite the long tradition of studies on the flora of the Canary Islands, 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 on the increase (see for instance Verloove & Reyes-Betancort, 2011; Verloove, 2013). In this paper new records are presented for species that are either new to the Canary Islands (and even Macaronesia as a whole) or new to the island of La Palma. Records are also provided for several species for which the genuine presence in La Palma required confirmation. Finally, new localities are given for species that were only recently reported for the first time from La Palma.

In this paper the emphasis is on species that are either naturalized, (potentially) invasive or that are otherwise of interest. Records of (mostly) occasional garden escapes or (presumably) ephemeral introductions ("casual alien plants" *sensu* Richardson *et al*., 2000) are only briefly commented.

MATERIALS AND METHODS

Records here presented are the result of many years of field work in La Palma conducted by the first author, mainly between 1998 and 2014. Voucher specimens of most taxa are preserved in the private herbarium of the first author (hereafter as "pers. herb. RO"). Duplicates were often deposited in the herbarium of the Botanic Garden of Meise, Belgium (BR), some also in the herbaria of the Botanical Garden and Botanical Museum of Berlin-Dahlem (B) and the Botanische Staatssammlung München (M), both in Germany (acronyms according to Thiers, 2014).

The actual presence or absence on the island of La Palma of the non-native taxa here presented was each time compared with data provided by Hohenester & Welss (1993), Acebes Ginovés *et al.* (2004, 2009) and the *Banco de Datos de Biodiversidad de Canarias* (http://www.biodiversidadcanarias.es). For some recently introduced species several additional papers were checked as well.

The paper is divided in three parts. The first and major part deals with (probably) naturalized or (potentially) invasive species. 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, enumeration of selected herbarium collections and/or personal observations (often also with exact locality indication, using Google Maps coordinates), origin (primary as well as secondary distribution range), known distribution in the Canary Islands (abbreviated as follows: H = El Hierro, P = La Palma, G = La Gomera, T = Tenerife, C = Gran Canaria, F = Fuerteventura, L = Lanzarote) and its estimated degree of naturalization in La Palma (*sensu* Richardson *et al*., 2000). If relevant, some additional information is also provided (nomenclatural or taxonomic comments, identification keys, etc.). In the second part records of (presumably) ephemeral aliens are presented. These may be either new to the Canary Islands or new to the island of La Palma. For these records only herbarium data are referred to. For convenience, within each of these parts, all taxa are presented in alphabetical order.

Familial and generic classifications are in accordance with APGIII (2009). For the taxa treated herein

this means, for instance, that Agavaceae are included in Asparagaceae, Caesalpinioideae in Fabaceae, Chenopodiaceae in Amaranthaceae, Lemnaceae in Araceae, and Turneraceae in Passifloraceae.

Assessing exact residence status in the Canary Islands in general, or the island of La Palma in particular for each individual species, is not straightforward. All taxa except those that are quoted as surely native (*nativa seguro*) by Acebes Ginovés *et al.* (2009) were considered non-native in this paper.

RESULTS

Naturalized and/or potentially invasive taxa

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

New to the flora of La Palma.

Spain, La Palma: Garafía, Llano Negro, Calle el Rito, roadside, numerous, 903 m, 15.08.2002, *R. Otto 7728* (pers. herb. RO); Breña Alta, San Pedro, edge of parking below Plaza Bujaz, some individuals, 28.662408º N, 17.787544º W, 342 m, 28.08.2008, *R. Otto 14323* (pers. herb. RO, dupl. BR); Tijarafe, LP-1, parking and storage area before SAT Bodegas Noroeste de La Palma, numerous, 28.737936º N, 17.966208º W, 853 m, 09.05.2012, *R. Otto 19173* (pers. herb. RO); Breña Alta near San Pedro, Barranco de la Zarcita, roadside and wasteland on Camino la Muralla, numerous, 28.653029º N, 17.794998º W, 408 m, 23.09.2013, *R. Otto 20656* (pers. herb. RO, dupl. BR).

Origin: North America. Introduced and often completely naturalized in South America, Eurasia and other regions.

Known distribution in the Canary Islands: T, L (Acebes Ginovés *et al.*, 2009), C (Verloove, 2013).

Degree of naturalization: naturalized (locally).

Amaranthus deflexus L., Mant. Pl. 2: 295 (1771) (Amaranthaceae).

New to the flora of La Palma.

Spain, La Palma: Breña Alta, El Porvenir, cobbles, 26.08.1999, *R. Otto 4729* (pers. herb. RO); ibid., San Pedro, roadside, numerous, 15.08.2001, *R. Otto 6726* (pers. herb. RO, dupl. BR); Villa de Mazo, El Pueblo, cemetery, cobbles, 19.08.2005, *R. Otto 11157* (pers. herb. RO); ibid., roadside LP-206, 18.08.2008, *R. Otto 14268* (pers. herb. RO). Also seen on several occasions in other parts of the island, e.g. Sta. Cruz de La Palma, San Andrés y Sauces, Los Llanos de Aridane, Puerto de Tazacorte and Fuencaliente; 03.2014, *R. Otto* (pers. obs.).

Origin: South America. Introduced or naturalized in tropical and warm-temperate regions of the world.

Known distribution in the Canary Islands: H, T, C, F, L (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Aptenia cordifolia (L. f.) Schwantes in Gartenflora 77: 69 (1928) (Aizoaceae).

New to the flora of La Palma.

Spain, La Palma: Breña Baja, Los Cancajos, Calle Salinas, wasteland near the sea, numerous, former throw-out or relic of cultivation (30 years ago), 21.05.2013, *R. Otto 20153* (pers. herb. RO); surroundings of Tijarafe and Garafía, often planted on embankments of vineyards, etc., to prevent erosion and sometimes spreading from there in the vicinity, 21.09.2013, *R. Otto* (pers. obs.); Breña Baja, roadside LP-5, below crash barrier, 26.09.2013, *R. Otto* (pers. obs.); Sta. Cruz de La Palma, Carretera Timibúcar (LP-202), rock facing roadside, 02.10.2013, *R. Otto* (pers. obs.).

Origin: South Africa. Naturalized in parts of America, Europe and Australia.

Known distribution in the Canary Islands: H, G, T, C, F, L (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized (locally).

Aptenia cordifolia is considered an invasive species in many warm-temperate regions of the world (e.g. Cela & Munné-Bosch, 2012).

Argemone ochroleuca Sweet, Brit. Fl. Gard. 3: pl. 242 (1828) (Papaveraceae).

New to the flora of La Palma.

Spain, La Palma: Villa de Mazo, Lodero, weed in border of ornamentals near airport, 25 m, 03.09.2007, *R. Otto 13190* (pers. herb. RO); Sta.

Cruz de La Palma, Barranco de las Nieves parallel Avenida las Nieves, dry gravelly exposed riverbed, in open ruderal vegetation, abundant with *A. mexicana* L., 30 m, 28.04.2012, *R. Otto 19117* (pers. herb. RO, dupl. BR); Breña Baja, Los Cancajos, Calle Salinas, wasteland, with *A. mexicana*, 29.02.2014, *R. Otto* (pers. obs.).

Origin: Mexico. Commonly introduced and naturalized in tropical and temperate regions of the world.

Known distribution in the Canary Islands: T, C (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized in disturbed habitats of the lowest and warmest zone.

Argemone ochroleuca (like *A. mexicana* L.) competes with, and possibly displaces indigenous pioneer species, threatening biodiversity of riparian zones in particular (e.g. Van der Westhuizen & Mpedi, 2011).

Begonia schmidtiana Regel in Gartenflora 28: 321, pl. 990 (1879) (Fig. 1) (Begoniaceae).

New to the flora of the Canary Islands.

Spain, La Palma: San Andrés y Sauces, San Andrés, Calle Abajo, numerous individuals in the gravelly riverbed and on wet or moist rock faces of the Barranco del Agua *ca.* 100 m before mouth of *barranco*, 18.08.2010, *R. Otto 17195* (pers. herb. RO, dupl. BR); Barlovento, near T-junction LP-109 and Calle Lomo Machín Alto, heap of excavation material, 690 m, 29.09.2012, *R. Otto 19801* (pers. herb. RO, dupl. BR); San Andrés y Sauces, Barranco del Agua near El Mulato, roadside LP-105, several, 24.05.2013, *R. Otto 20227* (pers. herb. RO, dupl. BR); Sta. Cruz de La Palma, Barranco de las Nieves parallel Calle Belmaco, moist rock face 05.03.2014, *R. Otto* (pers. obs.).

Origin: Brazil. Widely cultivated as ornamental and increasingly naturalizing in temperate and tropical regions of the world.

Degree of naturalization: naturalized.

This perennial garden ornamental is frequently cultivated in La Palma and readily escapes where-ever planted. Especially in the northern and northeastern

Figure 1. *Begonia schmidtiana* and *Persicaria capitata*, San Andrés, September 2013 (Photographs: R. Otto).

part of the island (e.g. surroundings of San Andrés y Sauces) numerous self-sustaining populations have been observed. The species preferably grows in every kind of damp habitats: shady rocks and walls, ditches, irrigation canals, etc. It often grows along with, among others, *Adiantum raddianum* C. Presl, *A. capillus-veneris* L., *Ageratina adenophora* (Spreng.) R. M. King & H. Rob., *A. riparia* (Regel) R. M. King & H. Rob., *Cyperus eragrostis* Lam., *Commelina diffusa* Burm. f., *Erigeron karvinskianus* DC., *Impatiens walleriana* Hook. f., *Persicaria capitata* (Buch.-Ham. ex D. Don) H. Gross, *Polypogon viridis* (Gouan) Breistr. or *Tradescantia fluminensis* Vell. However, *Begonia schmidtiana* has also been recorded in drier habitats such as on top of walls, in roadsides, and even epiphytic on *Phoenix dactylifera* L.

As a result of artificial crossings the taxonomy of *Begonia* has become very complex and garden plants are hardly identifiable with traditional floras. The plants here referred to are characterized by their cordate leaf bases and red-hairy stems. They most closely resemble *B. schmidtiana* but doubtlessly represent hybrids and/or cultivars of this species, some with pink petals.

Capsella rubella Reut. in Compt. Rend. Trav. Soc. Helv. Sci. Nat. 2: 18 (1853) (Brassicaceae).

New to the flora of La Palma.

Spain, La Palma: Villa de Mazo, El Pueblo, garden, weed in lawn, 21.08.2007, *R. Otto 13314* (pers. herb. RO); Garafía, Roque Faro, wayside, 1030 m, 06.05.2012, *R. Otto 19112* (pers. herb. RO, dupl. BR).

Origin: southern Europe, western Asia.

Known distribution in the Canary Islands: H, G, T?, C (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized, but perhaps rarer than *Capsella bursa-pastoris* (L.) Medik.

Cardamine hamiltonii G. Don, Gen. Hist. 1: 167 (1831) (Brassicaceae).
= *C. flexuosa* With. subsp. *debilis* O. E. Schulz

New to the flora of La Palma.

Spain, La Palma: Breña Baja, Los Cancajos, house garden, 18.08.1999, *R. Otto 4757* (pers. herb. RO, dupl. BR); Breña Alta, San Pedro, public green, flower bed, 22.08.2009, *R. Otto 15454* (pers. herb. RO); Breña Baja, Los Cancajos, Calle Salinas, hotel garden, disc of *Ficus* trunk, 01.09.2010, *R. Otto 17321* (pers. herb. RO, dupl. BR); Breña Alta, San Pedro, weed in market garden, 23.09.2013, *R. Otto* (pers. obs.).

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

Known distribution in the Canary Islands: T (Verloove & Reyes-Betancort, 2011), C (Verloove, 2013).

Degree of naturalization: naturalized.

Cardamine hamiltonii seems to be, to our current knowledge, the correct name to apply at the species level for the weed often referred to as "Asian" *C. flexuosa* (Schulz, 1903).

Centratherum punctatum Cass., Dict. Sci. Nat. (ed. 2) 7: 384 (1817) (Asteraceae).
= *C. intermedium* (Link) Less., *Ampherephis mutica* Kunth

New to the flora of the Canary Islands.

Spain, La Palma: Breña Baja, Los Cancajos, Urbanización Las Salinas 1, ruderal *Stenotaphrum* lawn, probably escaped from cultivation, about 10 individuals, 25.04.2012, *R. Otto 18960* (pers. herb. RO, dupl. BR).

Origin: Brazil. Introduced and naturalized for instance in Florida, Central America, West Indies, Hawai, South Africa and Australia.

Degree of naturalization: probably ephemeral but potentially invasive.

This species is very rarely cultivated as an ornamental but easily seems to escape. In favourable climatic circumstances it readily behaves like an aggressive environmental weed, for instance in the Galápagos Islands and the Hawaiian Islands (US Forest Service, 2012).

Cerastium fontanum Baumg., Enum. Stirp. Transsilv. 1: 425 (1816) subsp. ***vulgare*** (Hartm.) Greuter & Burdet in Willdenowia 12(1): 37 (1982) (Caryophyllaceae).
= *Cerastium holosteoides* Fr.

New to the flora of La Palma.

Spain, La Palma: Breña Alta, San Pedro, public green, weed in irrigated lawn, abundant, 22.08.2009, *R. Otto 15453* (pers. herb. RO); ibid., 02.09.2010, *R. Otto 17315* (pers. herb. RO, dupl. BR); ibid., 05.03.2014, *R. Otto* (pers. obs.); Breña Baja, Los Cancajos, Calle Salinas, irrigated border near beach, lawn weed, 07.05.2012, *R. Otto 19128* (pers. herb. RO).

Origin: Europe.

Known distribution in the Canary Islands: T, C (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized (?).

Chasmanthe floribunda (Salisb.) N. E. Br. in Trans. Roy. Soc. South Africa 20(3): 274 (1932) (Fig. 2) (Iridaceae).

New to the flora of the Canary Islands.

Spain, La Palma: Villa de Mazo, Tigalate, roadside LP-2 near T-junction LP-206, 28.547137º N, 17.808956º W, 656 m, 04.03.2014, *R. Otto 20877* (pers. herb. RO); Villa de Mazo, south of La Sabina, roadside LP-206, slope, several clusters, 28.580889º N, 17.784872º W, 596 m, 04.03.2014, *R. Otto* (pers. obs.); Villa de Mazo, roadside LP-206 near km 16.5, 12.03.2014, *R. Otto* (pers. obs.); Breña Alta, above San Isidro, near crossing LP-301 and Canal de Fuencaliente, 28.628773º N, 17.802299º W, 697 m, 10.03.2014, *R. Otto* (pers. obs.).

Degree of naturalization: naturalized, potentially invasive.

Chasmanthe floribunda is very similar to *C. aethiopica* (L.) N. E. Br. and both apparently have frequently been confused (see also Goldblatt *et al.*, 2004). So far, all specimens of *Chasmanthe* seen on La Palma (also in gardens) belong to *C. floribunda*, *C. aethiopica* being rare (or even absent?) in cultivation. This is not surprising, since the latter is much less attractive. This seems to hold true elsewhere in the Canary Islands (and probably in Macaronesia as a whole) as well. Photos displayed as "*C. aethiopica*" are in fact referable to *C. floribunda* (e.g. Flora de Canarias, 2014, or Interreg Bionatura, 2014), or even belong to *Crocosmia* ×*crocosmiiflora* (Lemoine) N. E. Br. (e.g. Silva *et al.*, 2008).

Figure 2. *Chasmanthe floribunda*, San Isidro (left, right); Tigalate (middle), March 2014 (Photographs: R. Otto).

It may be useful to present a key for the identification of the two *Chasmanthe* species and the closely related *Crocosmia* ×*crocosmiiflora* (modified from Cullen, 2011*a*, *b* and Goldblatt *et al*., 2004):

1. Curved perianth tube bilateral symmetric, perianth lobes more or less radially symmetric..... ***Crocosmia* ×*crocosmiiflora***

-. Curved perianth tube and also the perianth lobes bilaterally symmetric **2**

2. Plant of comparatively short size, up to 60 cm tall (seldom more), stem unbranched. Spike simple (or occasionally with 1 branch) arching outward to almost horizontal with 10–16 flowers borne in a single congested row on the upper side of the spike axis. Perianth tube *ca*. 2.8 cm, trumpet-shaped. The lower part (5–)7–10(–15) mm, slender and conspicuously spirally twisted through 360°, abruptly expanded into a wide cylindric upper part 16–25 mm long, whose base is formed by 3 obvious pouches. Dorsal tepal *ca*. 2.5 cm long. Seeds with a fleshy seed coat after the capsule walls split, the seed coat later becomes dry and wrinkled. Capsules often flushed reddish to purple inside ..... ***Chasmanthe aethiopica***

-. Plant robust, up to 120 cm, stem usually branched, the branches ascending. Spike erect, mostly with 30–40 flowers borne in two opposed rows. Perianth-tube 3.8–4 cm, trumpet-shaped, its basal part 7–8 mm, slender and twisted, broadening gradually into

Figure 3. *Chenopodium probstii*, San Pedro, roadside (left); Puntallana, Calle Lomo Estrello, roadside (right), September 2013 (Photographs: R. Otto).

the upper part, slightly pouched at base. Dorsal tepal to 3.3 cm long. Seed coat hard and shiny, never fleshy. Capsule straw-colored inside..... ***Ch. floribunda***

Chenopodium probstii Aellen in Mitt. Naturf. Ges. Solothurn 20(8): 56 (1928) (Fig. 3) (Amaranthaceae).

New to the flora of the Canary Islands.

Spain, La Palma: Breña Alta, St. Pedro, Calle La Habana, wasteland with scattered ruderal vegetation, 25.08.2007, *R. Otto 13183* (pers. herb. RO); ibid., Barranco de la Zarcita, Camino la Muralla, riverbed, 03.06.2013, *R. Otto 20370* (pers. herb. RO); Breña Baja, Las Ledas, roadside LP-206, 10.03.2014, *R. Otto* (pers. obs.); Puntallana, La Galga, Calle Lomo Estrello near LP-1, wayside and storage area, abundant individuals, 25.09.2013, *R. Otto 20699* (pers. herb. RO, dupl. BR); Breña Alta, San Isidro, crossing LP-301 and Camino 1a, roadside, 10.03.2014, *R. Otto* (pers. obs.); Villa de Mazo, San Simón, roadside LP-2, several individuals, 12.03.2014, *R. Otto 21008* (pers. herb. RO); Breña Alta, Camino la Laja del Barranco, wayside, 150 m, 13.03.2014, *R. Otto* (pers. obs.).

Origin: uncertain, probably North America.

Degree of naturalization: naturalized and in significant expansion since some years.

Chenopodium probstii is very similar to *C. album* L. *s. str.* Typical individuals are distinguished by their leaves that are large and leathery and that have a distinct purple pigmentation.

Commelina latifolia Hochst. ex A. Rich., Tent. Fl. Abyss. 2: 340 (1850) var. ***latifolia*** (Figs. 4–7) (Commelinaceae).

New to the flora of the Canary Islands.

Spain, La Palma: San Andrés y Sauces, Camino Puerto Espíndola *ca.* 250 m before Puerto Espíndola, roadside ditch and water channel below wall of rocks, numerous large plants, creeping up to 2 m height, 28.809215º N, 17.763857º W, 32 m, 30.08.2008, *R. Otto 14390* (pers. herb. RO);

Figure 4. *Commelina latifolia*, habit, Los Sauces, roadside, September 2013 (Photograph: R. Otto).

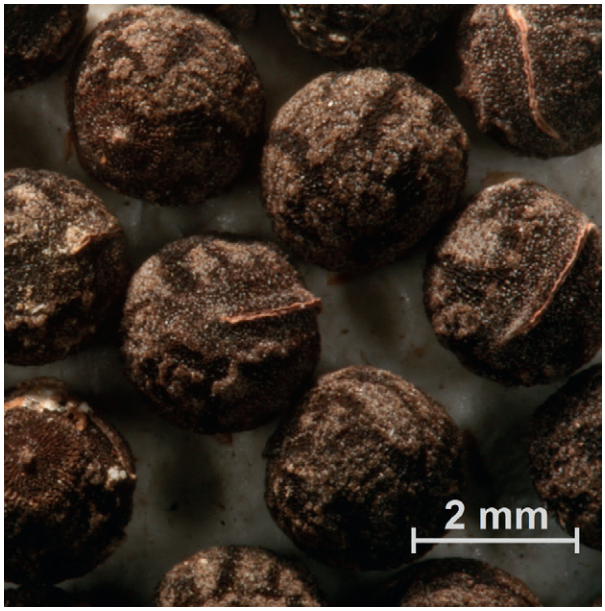

Figure 6. *Commelina latifolia*, seeds, San Andrés, September 2013 (Photograph: R. Otto).

Figure 5. *Commelina latifolia*, leaves and sheaths, San Andrés, September 2013 (Photograph: R. Otto).

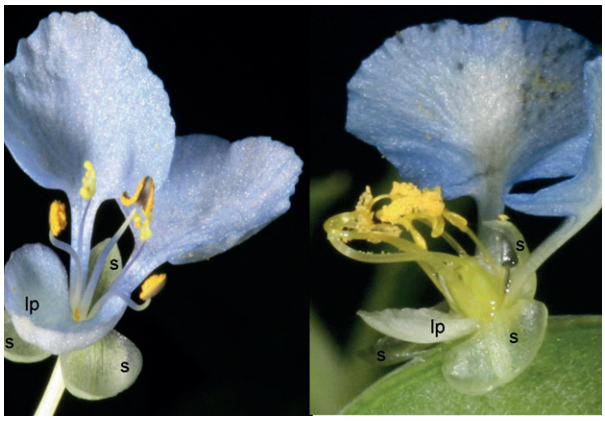

Figure 7. *Commelina diffusa* (left) and *C. latifolia* (right), comparison of flowers: s = sepals, lp = lower petal (Photographs: R. Otto).

ibid., 24.05.2013, *R. Otto 20209* (pers. herb. RO, dupl. BR); San Andrés, Calle Abajo, on the edge of the gravelly moist riverbed and on moist wall bases of the Barranco del Agua *ca.* 150 m before mouth of *barranco*, with *Momordica charantia* L., 28.800965º N, 17.760081º W, 10 m, 03.10.2011, *R. Otto 18731* (pers. herb. RO, dupl. BR); ibid., numerous seedlings, 26.05.2013, *R. Otto 20260* (pers. herb. RO), *20602* (pers. herb. RO); Los Sauces, water channel alongside LP-1 (General Bajamar), 260 m, 07.10.2011, *R. Otto 18783* (pers. herb. RO); San Andrés, wayside Camino Cruz Grande, concrete ditch at base of wall of banana plantation, with *Cyperus esculentus* L., 08.05.2012, *R. Otto 19941* (pers. herb. RO); between San Andrés and Llano del Pino, LP-104 *ca.* 600 m before San Andrés, base of wall of banana plantation, numerous, 28.793662º N, 17.763031º W, 116 m, 25.09.2013, *R. Otto 20693* (pers. herb. RO); between San Andrés and Los Sauces, on many places alongside the entire northern part of LP-104, particularly in roadside ditches, sometimes creeping on road surface, 25.09.2013, *R. Otto* (pers. obs.).

Origin: northeastern Africa and Yemen, reaching northern Tanzania to the south and Rwanda and Burundi to the west. Outside of its native distribution range only known from South Africa (R. Faden, pers. comm., 2013).

Degree of naturalization: naturalized, potentially invasive?

This species was first discovered in 2006 and was subsequently seen on several occasions, always in the surroundings of Los Sauces where it is firmly established nowadays. All known localities are close to banana plantations. The species is probably dispersed by hydrochory (irrigation canals and roadside ditches). In such habitats it locally forms dense, monospecific stands.

Its vector of introduction in La Palma remains uncertain. To our knowledge this species is not cultivated as an ornamental. In East Africa it is grown as a minor crop or pot herb (e.g. Kunkel, 1984; Van der Burg, 2004) and this may explain its occurrence in La Palma. In Barranco del Agua it grows in close proximity to *Momordica charantia* L. and *Cyperus esculentus* L., two species that are also grown as edible or curative plants in La Palma.

Like other species of *Commelina*, it may also be an impurity in commercial birdseed mixtures.

Commelina latifolia often grows along with *C. diffusa* Burm. f. and *Tradescantia fluminensis* Vell. In the absence of flowers these species can easily be intermixed. The three species of *Commelina* known to occur in the Canary Islands, as well as the widespread weed (and possibly overlooked) *C. communis* L., are distinguished as follows (modified from Faden, 1982; R. Faden, pers. comm., 2013):

1. Spathe margins fused at least near the base **2**
-. Spathe margins free to base **3**
2. Leaves sessile, clasping the stem at base, nearly glabrous above and with acicular hairs on the midrib beneath. Flowers with reduced whitish lower (middle) petal and two well developed blue upper petals. Capsule ± square, usually 4-seeded, seeds spherical, markedly textured with many wart-like bumps ..... ***Commelina latifolia*** var. ***latifolia***
-. Leaves mostly petiolate, ovate to ovate-elliptic, base cuneate, both surfaces usually puberulous. Flowers with all petals blue. Capsule oblong-ellipsoid to subquadrate, 5-seeded, seeds shallowly reticulate ..... ***C. benghalensis***
3. Seeds (2–)2.5–3.5 mm long, pitted and often rugose. Lower petal white ..... ***C. communis***
-. Seeds 2–2.5(–3 mm) long, with a raised reticulum. Lower petal blue ..... ***C. diffusa*** var. ***diffusa***

Dichondra micrantha Urban in Symb. Antill. 9(2): 243 (1924) (Convolvulaceae).

New to the flora of La Palma.

Spain, La Palma: Breña Alta, Buenavista de Abajo, garden, between cobbles, 06.08.2006, *R. Otto 14376* (pers. herb. RO); Fuencaliente, below Las Indias, hotel garden, weed (?) in lawn and wayside, abundant, 18.09.2008, *R. Otto 11136* (pers. herb. RO); Garafía, St. Domingo, flower border and wayside, numerous, 06.05.2012, *R. Otto 19119* (pers. herb. RO, dupl. BR); Breña Baja, Los Cancajos, Calle Salinas, hotel garden, weed in lawn, 04.06.2013, *R. Otto 20377* (pers. herb. RO, dupl. BR).

Origin: probably America. Widely introduced and naturalized in the warm-temperate and tropical regions of the world.

Known distribution in the Canary Islands: T, C, F (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized?

Dichondra micrantha is frequently planted as a grass-substitute for lawns in La Palma and easily escapes subsequently. Large-flowered plants have been recorded (e.g. RO 20377). These are somehow reminiscent of *D. recurvata* Tharp & M. C. Johnst. (Tharp & Johnston, 1961) but probably merely represent cultivars of *D. micrantha*.

Dysphania anthelmintica (L.) Mosyakin & Clemants in Ukrajins'k. Bot. Žurn. 59(4): 382 (2002) (Amaranthaceae).
≡ *Chenopodium anthelminticum* L.

New to the flora of La Palma.

Spain, La Palma: Barranco de de las Nieves parallel Avenida las Nieves, exposed dry gravelly riverbed, ruderal site, numerous, 25.05.2013, *R. Otto 20236* (pers. herb. RO); Breña Alta, San Isidro, Barranco de Aduares, wayside, open ruderal vegetation, 27.09.2013, *R. Otto 20713* (pers. herb. RO, dupl. BR).

Origin: North and Central America. Elsewhere cultivated and increasingly naturalizing.

Known distribution in the Canary Islands: C (Verloove, 2013).

Degree of naturalization: naturalized.

Frequently seen in *barrancos*, roadsides, waste places, etc., especially in the lower zones. Often quite abundant and much more frequent than the similar *Dysphania ambrosioides* (L.) Mosyakin & Clemants.

For differentiation between these species see Verloove (2013).

Epilobium ciliatum Raf. *s. l.*, Med. Repos., ser. 2, 5: 361 (1808) (Onagraceae).

New to the flora of the Canary Islands.

Spain, La Palma: Breña Alta, ornamental plant nursery and market garden, numerous as a weed in and between various pots and containers, 01.09.2010, *R. Otto 17323* (pers. herb. RO, dupl. BR).

Origin: North America. Widely naturalized as a weed worldwide.

Degree of naturalization: ephemeral? Potentially invasive.

Epilobium ciliatum is here accepted in a broad sense as to include *E. adenocaulon* Hausskn. and *E. glandulosum* Lehm. The collection cited above appears to belong to *E. ciliatum s. str.* but most collections from La Palma are ± intermediate between the latter (with whitish or pale pinkish petals, stems branched from near base) and *E. adenocaulon* (pedicel in fruit less than 10 mm long, leaves sessile). This holds true for the following collections:

Spain, La Palma: Villa de Mazo, Calle Caridad Salazar, near church, numerous in damp places beside a water channel, 13.08.2010, *R. Otto 17166* (pers. herb. RO, dupl. BR); Breña Alta, Calle la Constitución, moist place nearby public green, about two hundred individuals closely next to each other, 23.09.2013, *R. Otto 20650* (pers. herb. RO, dupl. BR).

Erigeron sumatrensis Retz. in Observ. Bot. 5: 28 (1788) (Asteraceae).

≡ *Conyza sumatrensis* (Retz.) E. Walker

New to the flora of La Palma.

Spain, La Palma: Sta. Cruz de La Palma, harbour, roadside, several, 22.08.1999, *R. Otto 4442* (pers. herb. RO); Breña Baja, LP-5 near airport, dry roadside, abundant, 60 m, 19.08.2006, *R. Otto 12014* (pers. herb. RO); Barlovento, Calle Lomo Machín Alto, dry roadside, abundant, 720 m, 19.08.2008, *R. Otto 14275* (pers. herb. RO); Breña Baja, La Montaña, Calle La Montaña, dense ruderal vegetation, 560 m, abundant, 22.08.2008, *R. Otto 14290* (pers. herb. RO, dupl. BR); ibid., cemetery, ruderal vegetation near parking, numerous, 22.08.2008, *R. Otto 14299* (pers. herb. RO); Breña Baja, El Socorro, roundabout, abundant in plantation of ornamentals, 70 m, 22.08.2008, *R. Otto 14305* (pers. herb. RO); Villa de Mazo, El Pueblo, roadside LP-206, abundant, 22.08.2008, *R. Otto* 14291 (pers. herb. RO, dupl. BR); Puntallana, Cubo de la Galga, wayside path, laurisilva, 23.08.2008 *R. Otto 14310* (pers. herb. RO); Breña Alta, San Isidro, roadside, numerous, 614 m, 30.08.2008, *R. Otto 14372* (pers. herb. RO); Tijarafe, Camino Bellido, abundant as weed in vineyard and roadside, *ca.* 1000 m, 23.05.2013, *R. Otto* (pers. obs.).

Origin: South America. Introduced and naturalized in Central and North America, Europe, Asia and Africa.

Known distribution in the Canary Islands: C, L (Acebes Ginovés *et al*., 2009).

Degree of naturalization: invasive.

Erigeron sumatrensis is a very typical plant in disturbed places of the lower and middle altitudes, on roadsides, wasteland, etc. It also occurs as weed in gardens and agricultural areas and is invading the natural vegetation as well. In La Palma this species is more common than the similar *E. floribundus* (Kunth) Sch.-Bip.

The American annual or biennial species of *Erigeron* ("*Conyza*") known to occur in the Canary Islands are distinguished as follows:

1. Leaves nearly glabrous above or with scattered hairs along midrib only, margins distinctly ciliate (at least in lower third, ciliae often 1 mm long). Involucral bracts nearly glabrous. Capitulae *ca.* 2–4 mm wide at anthesis **2**

-. Leaves densely shortly pubescent above, margins hardly ciliate (ciliae, if present, very

short). Involucral bracts softly hairy. Capitulae *ca.* 4–10 mm wide at anthesis **3**

2. Inner (tubular) florets mostly 4-lobed, *ca.* 10–15 per capitulum. Ligules always present, white, distinctly exceeding involucre. Inflorescence often cylindric, much longer than wide. Plant annual, usually yellowish-green, stem not hirsute ..... ***Erigeron canadensis***

-. Inner (tubular) florets mostly 5-lobed, *ca.* 4–6 per capitulum. Ligules absent or rudimentary, not exceeding involucre. Inflorescence much broader, usually only slightly longer than wide. Plant annual or short-lived perennial, dull greyish-green, stem hirsute ..... ***E. floribundus***

3. Leaves narrow, less than 5 mm wide, the uppermost linear. Inflorescence often with greatly enlarged side branches overtopping the main axis. Apex of involucral bracts often purplish. Capitulae *ca.* 6–10 mm at anthesis. Pappus brownish ..... ***E. bonariensis***

-. Most leaves wider, 3–20 mm wide, never linear. Side branches of the inflorescence not overtopping the main axis. Apex of involucral bracts not purplish. Capitulae *ca.* 4–6 mm at anthesis. Pappus whitish ..... ***E. sumatrensis***

Erodium neuradifolium Delile ex Godr. in Mém. Sect. Méd. Acad. Sci. Montpellier 1: 425 (1853) (Geraniaceae).

New to the flora of La Palma.

Spain, La Palma: Sta. Cruz de La Palma, harbour, sandy storage area, with *Erodium chium* (L.) Willd., 24.08.2000, *R. Otto 4745* (pers. herb. RO, dupl. BR); ibid., Barranco de las Nieves parallel Avenida las Nieves, dry gravelly riverbed, ruderal site, 25.05.2013, *R. Otto 20238* (pers. herb. RO, dupl. BR); Breña Alta, Avenida Bajamar, unpaved parking site before the S exit of the new road tunnel, several individuals, 10.03.2014, *R. Otto 20898* (pers. herb. RO, dupl. BR); Puerto de Tazacorte, Barranco de las Angustias parallel Avenida Taburiente, river bank, 10.03.2014, *R. Otto 21016* (pers. herb. RO).

Known distribution in the Canary Islands: T, C, F, L (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Erodium neuradifolium is a rare element of the ruderal vegetation, perhaps only in the costal areas in the climatologically mildest parts of the island.

Eucalyptus globulus Labill., Voy. Rech. Pérouse 1: 153, pl. 13 (1799) (Myrtaceae).

New to the flora of La Palma.

Spain, La Palma: Puntallana, rocky slope on Calle Lomo Estrello, several young trees, 25.09.2013, *R. Otto* (pers. obs.); ibid., Barranco Hondo de Nogales, Calle el Corcho, rocky slope and escarpment, several young trees, tall old trees nearby roadside, 09.03.2014, *R. Otto 20935* (pers. herb. RO, dupl. BR); Villa de Mazo, above Tigalate, roadside LP-206, in the vicinity of some old planted trees abundant seedlings and young trees up to 2 m tall after a forest fire in 08.2012, 28.563979º N, 17.796733º W, 670 m, 12.03.2014, *R. Otto 21007* (pers. herb. RO).

Origin: Australia. Extensively planted worldwide and increasingly naturalizing.

Known distribution in the Canary Islands: H, G, T, C (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Eucalyptus globulus is a potentially very invasive species (e.g. Calviño-Cancela & Rubido-Bará, 2013).

Euphorbia hypericifolia L., Sp. Pl. 1: 454 (1753) (Euphorbiaceae).
≡ *Chamaesyce hypericifolia* (L.) Millsp.; incl. *E. glomerifera* (Millsp.) L. C. Wheeler

New to the flora of La Palma.

Spain, La Palma: Breña Alta, Avenida Bajamar, parking and storage area before the S entrance of the former road tunnel, small population *ca.* 10 individuals, 9 m, 24.08.2000, *R. Otto 4672* (pers. herb. RO); Breña Alta, Calle Rosal, between pavement slobs, scattered individuals, 15.08.2007, 265 m, *R. Otto 13336* (pers. herb. RO); Breña Alta, Avenida Bajamar, up to *ca.* 50 m S of the exit of the new road tunnel, *ca.* 30 plants, *R. Otto 14369* (pers. herb. RO); ibid.,15.08.2010, *R. Otto 17179* (pers. herb. RO, conf. *H.J. Esser* 2011, dupl. M, BR); ibid., from the tunnel exit alongside the former football arena over a distance of 300 m *ca.* 100 plants in cracks of pavement and asphalt, etc., partially up to 80 cm tall, with *Chloris pycnothrix* Trin., 01.10.2013 and 10.03.2014, *R. Otto* (pers. obs.); Sta. Cruz de La Palma, port, pier of cruisers, border, 03.03.2014, *R. Otto 20981* (pers. herb. RO).

Origin: America. A common and increasing weed in many temperate and subtropical regions in the Old World.

Known distribution in the Canary Islands: H, T, C, F (Acebes Ginovés *et al.*, 2009), recently also recorded in G (Santos-Guerra *et al.*, 2013*b*).

Degree of naturalization: naturalized?

Euphorbia hypericifolia was no longer seen in 2008 in the second population cited above. However, in Breña Alta (Avenida Bajamar) its persistence and increase have been noticed. The plants are woody at base, strongly rooted and therefore difficult to eradicate (they readily sprout after cutting). At present, it still is a rare element of the ruderal vegetation but a future expansion, predominantly in the coastal areas in the climatically mildest parts of the island, is very likely.

The plants here concerned are quite glabrous and belong to *E. glomerifera* (like all plants seen from the Canary Islands) if this species is regarded at specific status.

Euphorbia maculata L., Sp. Pl. 1: 455 (1753) (Euphorbiaceae).
≡ *Chamaesyce maculata* (L.) Small

New to the flora of La Palma.

Spain, La Palma: El Paso, Calle Sagrado Corazón, planter, 17.08.2007, *R. Otto 13371* (pers. herb. RO); Breña Baja, Los Cancajos, Calle Salinas, border near beach, abundant, 18.08.2007, *R. Otto 13369* (pers. herb. RO); ibid., El Socorro, roundabout Calle Cantillo, bare ground in palm plantation, numerous individuals with *E. serpens* Kunth, 19.08.2008, *R. Otto 14284* (pers. herb. RO, dupl. BR); Breña Alta, Carretera de la Cumbre (LP-3), roadside, numerous, 13.08.2008, *R. Otto 14252* (pers. herb. RO); Breña Baja, Los Cancajos, hotel garden, weed in lawn, 27.08.2009, *R. Otto 14336* (pers. herb. RO); Breña Alta, Avenida Bajamar, roadside, 15.08.2010, *R. Otto 15422* (pers. herb. RO, dupl. BR); Villa de Mazo, Callejones, roadside LP-2 near T-junction Carretera Dr. Morera Bravo, several, 12.03.2014, *R. Otto 21004* (pers. herb. RO).

Origin: North America. Widely introduced as a weed in many parts of the world.

Known distribution in the Canary Islands: T, C (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Gamochaeta antillana (Urb.) Anderb. in Opera Bot. 104: 157 (1991) (Asteraceae).
≡ *Gnaphalium antillanum* Urb.; incl. *Gamochaeta subfalcata* (Cabrera) Cabrera

New to the flora of La Palma.

Spain, La Palma: Garafía, San Antonio del Monte, Zona Recreativa next Ermita de San Antonio, patchy ruderal vegetation along the enclosing wall, 15.08.2006, *R. Otto 11752* (pers. herb. RO, dupl. BR); Villa de Mazo, Calle Caridad Salazar, cobblestone pavement in front of church, numerous, 15.08.2009, *R. Otto 15417* (pers. herb. RO, dupl. BR); Barlovento, Laguna de Barlovento, wasteland and embankment of roadside, numerous, 20.08.2011, *R. Otto 17241* (pers. herb. RO); Barlovento, near T-junction LP-109 and Calle Lomo Machín Alto, heap of excavation material, 690 m, 06.05.2012, *R. Otto 19101* (pers. herb. RO, dupl. BR); San Andrés y Sauces, San Andrés, Calle Abajo, gravelly moist riverbed of the Barranco del Agua *ca.* 150 m before mouth of *barranco*, several individuals, 08.05.2012, *R. Otto 19159* (pers. herb. RO, dupl. BR).

Origin: America. Introduced and naturalized as a weed in Europe and New Zealand.

Known distribution in the Canary Islands: H, T (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Gamochaeta antillana is much increasing in the past years and locally frequent, for instance in the area around Barlovento, Breña Alta and Mazo, where it occurs in disturbed habitats and as a weed in agricultural fields and gardens. Up to present it probably has been confused with *G. pensylvanica* (Willd.) Cabrera in La Palma. The latter has obovate-spathulate leaves.

Geranium pyrenaicum Burm. f., Spec. Bot. Geran.: 27 (1759) (Geraniaceae).

New to the flora of the Canary Islands.

Spain, La Palma: Barlovento, Fuente Boleo on LP-109, roadside and on slopes in the vicinity of the source, several individuals, with *Geranium molle* L., 06.05.2012, *R. Otto 19108* (pers. herb. RO, dupl. BR).

Origin: Eurasia and North Africa. Locally naturalized elsewhere, for instance in North America (Aedo, 2001).

Degree of naturalization: naturalized?

Hedychium coronarium J. König in Observ. Bot. 3: 73 (1783) (Fig. 8) (Zingiberaceae).

New to the flora of the Canary Islands.

Spain, La Palma: San Andrés y Sauces, near Llano del Pino, moist rockface 5 m above level of LP-104, population of some m², old escape from cultivation, 28.793232º N, 17.767403º W, 175 m, 20.09.2013, *R. Otto 20629* (pers. herb. RO, dupl. BR).

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

Degree of naturalization: ephemeral? Potentially invasive (see Silva *et al*., 2008) for the Azores.

Hypochaeris radicata L., Sp. Pl. 2: 811 (1753) subsp. ***radicata*** (Asteraceae).

New to the flora of La Palma.

Spain, La Palma: Barlovento, roadside LP-1, 580 m, numerous, 20.08.2004, *R. Otto 10132* (pers. herb. RO); Sta. Cruz de La Palma, Mirca, 300 m, roadside, 20.08.2004, *R. Otto 10140* (pers. herb. RO); Tijarafe, Camino Bellido, roadside and vineyard, *ca*. 1000 m, 17.08.2010, *R. Otto 17208* (pers. herb. RO); Breña Alta, Risco de la Concepción, fallow field, 05.03.2011, *R. Otto 17651* (pers. herb. RO); Breña Baja, Los Cancajos, waste land, numerous, 13.03.2011 *R. Otto 17793* (pers. herb. RO, dupl. BR); El Paso, near roundabout on LP-3, wasteland, 09.05.2012, *R. Otto 19267* (pers. herb. RO).

Figure 8. *Hedychium coronarium*, San Andrés, moist rock face, September 2013 (Photographs: R. Otto).

Origin: Eurasia. Introduced and naturalized in North America and Australia.

Known distribution in the Canary Islands: H, G, T, F (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Kalanchoe daigremontiana Raym.-Hamet & H. Perrier in Ann. Mus. Colon. Marseille, sér. 3, 2: 128–132 (1914) (Fig. 9) (Crassulaceae).

New to the flora of La Palma.

Spain, La Palma: San Andrés y Sauces, near Puerto Espíndola, roadside, several individuals, 22.05.2013, *R. Otto* (pers. obs.); Sta. Cruz de La Palma, Calle Sebastián Arozena, many individuals on rocky slope, 07.03.2014, *R. Otto* (pers. obs., photo det. *D. Guillot Ortiz & J. López-Pujol* 2015).

Origin: Madagascar. Widely cultivated as an ornamental and increasingly escaping in warm-temperate and subtropical regions of the world.

Known distribution in the Canary Islands: C (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized?

Kalanchoe daigremontiana is considered an invasive species having impacts principally in dry and arid areas of the world (e.g. Herrera *et al.*, 2011). However, compared with *K.* ×*houghtonii* D. B. Ward, this species seems to be less common in horticulture and in the wild on La Palma.

Kalanchoe delagoensis Eckl. & Zeyh., Enum. Pl. Afr. Austral. 3: 305 (1837) (Fig. 10) (Crassulaceae).
= *Kalanchoe tubiflora* (Harvey) Hamet

New to the flora of La Palma.

Spain, La Palma: Villa de Mazo, El Pueblo, Barranco de Blas, several individuals on stone wall of *barranco*, 04.05.2012, *R. Otto* (pers. obs.); San Andrés y Sauces, near Llano del Pino, rocky slope alongside LP-104, small population, 20.09.2013, *R. Otto* (pers. obs.); Breña Baja, Los Cancajos, weed in planter, 21.09.2013, *R. Otto 20793* (pers. herb. RO); San Andrés y Sauces, Puerto Espíndola, parking and wayside, cultivated nearby, 25.09.2013, *R. Otto* (pers. obs., photo conf. *D. Guillot Ortiz* 2014); Villa de Mazo, La Salemera, wayside and rocky slope (partially dump) close to the sea, abundant individuals with *Euphorbia tirucalli* L. and *Kalanchoe* ×*houghtonii*, 02.10.2013, *R. Otto* (pers. obs.); Breña Baja, Los Cancajos, Calle Los Cancajos, rocky slope, 01.03.2014, *R. Otto 21017* (pers. herb. RO).

Origin: Madagascar. Widely cultivated as an ornamental and increasingly escaping in

Figure 9. *Kalanchoe daigremontiana*, Sta. Cruz de la Palma, May 2013 (right); *Kalanchoe* ×*houghtonii*, Sta. Cruz de La Palma, rooftop, June 2013 (left); *Kalanchoe* ×*houghtonii*, Los Cancajos, epiphyte on *Phoenix canariensis*, September 2013 (middle) (Photographs: R. Otto).

Figure 10. *Kalanchoe delagoensis*, San Andrés, rocky slope, September 2013 (Photograph: R. Otto).

warm-temperate and subtropical regions of the world.

Known distribution in the Canary Islands: T, C (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized?

In La Palma this species is found in similar habitats as *Kalanchoe* ×*houghtonii* D. B. Ward. It is an aggressive weed with a high invasive potential, especially in pastures, grasslands, open woodlands and disturbed land in subtropical, tropical and warmer temperate regions of the world (e.g. Batianoff & Butler, 2002).

Kalanchoe* ×*houghtonii D. B. Ward in Cact. Succ. J. 78(2): 94 (2006) (Fig. 9) (Crassulaceae).
= *Kalanchoe daigremontiana* Raym.-Hamet & H. Perrier × *K. delagoensis* Eckl. & Zeyh.

New to the flora of the Canary Islands.

Spain, La Palma: Breña Alta, near Calle San Miguel, Barranco de Laja de Llanito, edge of dry gravelly riverbed, several individuals, 23.05.2013, *R. Otto* (pers. obs.); Sta. Cruz de La Palma, Calle el Lomo, rooftop between tiles, 04.06.2013, *R. Otto* (pers. obs.); Breña Baja, Los Cancajos, Urbanización Las Salinas, numerous in cracks and joints of pavement and sidewalk, with *Phyllanthus tenellus* Roxb., 20.09.2013, *R. Otto* (pers. obs.); ibid., Calle Las Salinas, epiphytic on trunk of *Phoenix canariensis* Chabaud, 23.09.2013, *R. Otto* (pers. obs.); ibid., rocky slopes alongside LP-5, several colonies, 26.09.2013, *R. Otto* (pers. obs.); Villa de Mazo, La Salemera, wayside and rocky slope (partially dump) close to the sea, abundant individuals with *Euphorbia tirucalli* and *Kalanchoe delagoensis*, 29.09.2013, *R. Otto* (pers. obs.); ibid. Camino Playa el Pocito, roadside, several individuals, 02.03.2014, *R. Otto* (pers. obs.); Tazacorte, Puerto, Barranco Tenisca, rocky slope, abundant, 06.03.2014, *R. Otto 20894* (pers. herb. RO); Sta. Cruz de La Palma, LP-401 crossing Barranco del Carmen Dorador, abundant on a rocky slope below LP-401, 250 m, 08.03.2014, *R. Otto 20925* (pers. herb. RO). Photos of all these populations det. *D. Guillot Ortiz & J. López-Pujol* 2015.

Origin: Artificial hybrid. Widely cultivated as an ornamental and increasingly escaping in warm-temperate and subtropical regions of the world.

Degree of naturalization: naturalized.

In contrast to *Kalanchoe daigremontiana*, one of its putative parents, this artificial hybrid seems to be not rare at all in dry disturbed habitats close to habitations, often on rocky slopes, in roadsides, by foot of walls, in cracks of pavement but also on roofs, between cobbles, as a weed in flower pots and sometimes epiphytic on palm trunks.

Kalanchoe ×houghtonii is here reported for the first time from the Canary Islands but it surely has widely been confused with *K. daigremontiana*. Compared with the latter, it has narrowly deltoid to broadly lanceolate leaf blades and dark red corollas *ca.* 20–25 mm long (Ward, 2008). In parts of Spain (incl. Balearic Islands) *K. ×houghtonii* is considered an invasive alien (e.g. Guillot Ortiz, 2008, Guillot *et al*., 2014).

Kickxia commutata (Bernh. ex Reichenb.) Fritsch, Exkursionsfl. Österreich: 492 (1897) subsp. ***graeca*** (Bory & Chaub.) R. Fernandes in Bot. J. Linn. Soc. 64: 74 (1971) (Plantaginaceae).

New to the flora of La Palma.

Spain, La Palma: Villa de Mazo, Lodero, airport, public green on parking, 24.08.1999, *R. Otto 4695* (pers. herb. RO); Breña Alta, Subida al Mirador de la Concepción, public green, numerous, 21.08.2004, *R. Otto 10099* (pers. herb. RO); ibid., San Pedro, Camino la Muralla, wasteland, numerous, 30.08.2008, *R. Otto 14383* (pers. herb. RO); Breña Alta, wasteland between Calle Nr. 6 and Calle Nr. 8, on bare ground, hundreds of specimens, 05.06.2012, *R. Otto* (pers. obs.).

Origin: Aegean region and Balkan Peninsula.

Known distribution in the Canary Islands: T, C (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

All specimens of *Kickxia commutata* seen so far in La Palma belong to subsp. *graeca*. (Ghebrehiwet, 2000). Although very disjunct, this is in accordance with other Canarian records.

Kickxia spuria (L.) Dumort., Fl. Belg.: 35 (1827) subsp. ***integrifolia*** (Brot.) R. Fernandes in Bot. J. Linn. Soc. 64: 74 (1971) (Plantaginaceae).

Subspecies new to the flora of the Canary Islands.

Spain, La Palma: Villa de Mazo, Lodero, public green at parking of the airport, 18.08.2000, *R. Otto 4680* (pers. herb. RO); Breña Alta, Buenavista, Subida al Mirador de la Concepción, public green, with *Kickxia commutata* subsp. *graeca*, 21.08.2004, *R. Otto 10099* (pers. herb. RO); ibid., Buenavista, former airport, wasteland, ground heap, 02.10.2011, *R. Otto 18728* (pers. herb. RO); San Andrés y Sauces, Los Sauces, Barranco del Agua, former cultivated land and terrace wall, abundant, 14.10.2011, *R. Otto 18802* (pers. herb. RO, dupl. BR); Barlovento, near crossroad LP-109/Calle Lomo Machín Alto, ground heap, 690 m, 29.09.2012, *R. Otto 19803* (pers. herb. RO, dupl. BR).

Origin: southern Europe.

Degree of naturalization: naturalized.

All specimens of *Kickxia spuria* seen so far in La Palma belong to subsp. *integrifolia*, while so far only subsp. *spuria* was known to occur in the Canary Islands (Acebes Ginovés *et al.*, 2009).

Lactuca viminea (L.) J. Presl. & C. Presl., Fl. Čech.: 160 (1890) subsp. ***ramosissima*** (All.) Arcang., Fl. Ital.: 424 (1882) (Asteraceae).

Subspecies new to the flora of the Canary Islands.

Spain, La Palma: Puntallana, roadside LP-4, *ca.* 1950 m, numerous, 16.08.2009, *R. Otto 15406* (pers. herb. RO), *15407* (pers. herb. RO, dupl. BR); Garafía, Carretera al Roque de los Muchachos, parking before observatory headquarters, 2145 m, 16.08.2009, *R. Otto 15407* (pers. herb. RO, dupl. BR); ibid., Mirador de Los Andenes, *ca.* 2280 m, alongside the path to Pared de Roberto, several, 27.05.2013, *R. Otto* (pers. obs.); Garafía, roadside LP-4, 1878 m, 27.05.2013, *R. Otto 20298* (pers. herb. RO).

Origin: Mediterranean area.

Degree of naturalization: naturalized.

Lactuca viminea subsp. *ramosissima* is characterized by its basally branched stems 15–50 cm tall, with numerous short, divaricate branches (Feráková, 1977). Populations from localities provided by Santos-Guerra

(1983) from similar habitats should be checked; they may also be referable to this taxon.

Landoltia punctata (G. Mey.) Les & D. J. Crawford in Novon 9(4): 532 (1999) (Figs. 11 and 12) (Araceae).
≡ *Spirodela punctata* (G. Meyer) C. H. Thompson

New to the flora of the Canary Islands.

Spain, La Palma: Sta. Cruz de La Palma, Cuesta del Llano de la Cruz, water reservoir in orchard, 28.697543º N, 17.777891º W, 290 m, abundant with *Azolla filiculoides* Lam. and *Hydrilla verticillata* (L. f.) Royle, 01.09.2008, *R. Otto 14419* (pers. herb. RO); San Andrés y Sauces, San Andrés, Calle Abajo, common in puddles and small ponds of the gravelly riverbed of the Barranco del Agua near mouth of *barranco*, 18.08.2010, *R. Otto 17192* (pers. herb. RO); ibid., between San Andrés and Charco Azul, small water reservoir, 03.10.2011, *R. Otto 18734* (pers. herb. RO, dupl. BR); San Andrés y Sauces, near Llano del Pino, LP-104, roadside ditch, 28.793232º N, 17.767403º W, 175 m, 20.09.2013, *R. Otto 20636* (pers. herb. RO).

Origin: possibly native to southeastern Asia and Australia. Now invading all Nearctic, Afrotropical and Neotropical regions of the world (Landolt, 2000).

Degree of naturalization: invasive.

In La Palma (and probably in the other Canarian Islands as well) *Landoltia punctata* is an overlooked species or it may have been misidentified (as *Lemna gibba* L. or *L. minor* L.). Particularly on the northeast side of La Palma it is a relatively frequent aquatic weed in water reservoirs, roadside ditches, etc. Sometimes it even extends to riverbeds in *barrancos*. It is a reputed aggressive weed and the first aquatic plant species that has developed resistance to certain herbicides (Koschnick *et al.*, 2006).

Figure 11. *Landoltia punctata*, *Eichhornia crassipes*, *Helosciadium nodiflorum* and *Polypogon viridis*, San Andrés, October 2013 (Photograph: R. Otto).

Figure 12. *Landoltia punctata*, detail of fronds, August 2011 (Photographs: R. Otto).

Recently, another non-native duckweed was recorded for the first time from the Canary Islands (*Lemna minuta* Kunth in Gran Canaria; see Verloove, 2013). It may be useful to present a simplified identification key for the species thus far known to occur:

1. Roots absent ..... ***Wolffia arrhiza***
-. Roots present **2**
2. Roots 2–6. Mature fronds 3–5(–8) mm across, obovate, *ca.* 1.5–2 times longer than wide, lower surface often reddish…. ***Landoltia punctata***
-. Roots solitary **3**
3. Fronds with a single vein ..... ***L. minuta***
-. Fronds with 3–5 veins **4**
4. Fronds gibbous (swollen) ..... ***L. gibba***
-. Fronds not gibbous ..... ***L. minor***

Malvastrum coromandelianum (L.) Garcke in Bonplandia (Hannover) 5(18): 295, 297 (1857) subsp. ***capitatospicatum*** (Kuntze) S. R. Hill in Brittonia 32(4): 476 (1980) (Fig. 13) (Malvaceae).

Subspecies new to the flora of the Canary Islands.

Spain, La Palma: Tazacorte, weed in banana plantation, 15.08.2000, *R. Otto 4749* (pers. herb. RO, dupl. BR); Puerto de Tazacorte, Barranco Tenisca, near the sewage station, dry roadside, numerous individuals, with *Sida spinosa* L., 28.656278º N,

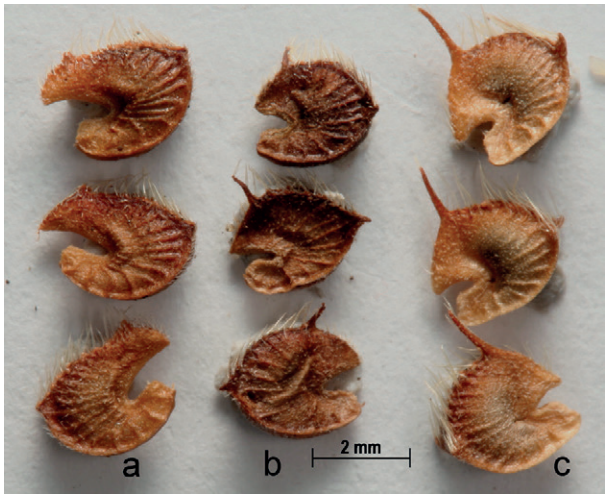

Figure 13. Mature carpels of the three taxa of *Malvastrum* on La Palma: *M. corchorifolium* (a), San Andrés, August 2009, priv. herb. *R. Otto* 18764; *M. coromandelianum* subsp. *coromandelianum* (b), Sta. Cruz de La Palma, March 2014, priv. herb. *R. Otto* 20886; *M. coromandelianum* subsp. *capitatospicatum* (c), Puerto de Tazacorte, March 2014, priv. herb. *R. Otto* 20892 (Photograph: R. Otto).

17.940412º W, 16.08.2006, *R. Otto 11986* (pers. herb. RO, dupl. BR); ibid., numerous, 06.03.2014, *R. Otto 20892* (pers. herb. RO, dupl. BR).

Origin: Argentina, Bolivia and Galápagos Islands.

Degree of naturalization: naturalized.

The collections cited above correspond in every detail with subsp. *capitatospicatum*, not with subsp. *coromandelianum*. They are characterized by having dense, glomerate axillary inflorescences (vs. flowers usually solitary), larger leaves with adaxial leaf surface with 4-rayed hairs (simple hairs absent) and its very prominently cuspidate fruits (Hill, 1982).

Subsp. *coromandelianum* also occurs in La Palma, although perhaps less frequently so. For instance:

Spain, La Palma: Sta. Cruz de La Palma, Barranco de las Nieves parallel Avenida de las Nieves, gravelly riverbed with *Waltheria indica* L., several, 05.03.2014, *R. Otto 20886* (pers. herb. RO, dupl. BR).

The three taxa of *Malvastrum* known to occur in the Canary Islands are distinguished as follows (modified from Hill, 1982; and Correll & Correll, 1982):

1. Mature carpels without apical awn, at most with a blunt protuberance less than 0.2 mm. Staminal column sparsely pubescent. Adaxial leaf surface mostly with 4(–5) rayed stellate hairs …….. ***M. corchorifolium***

-. Mature carpels with an apical awn more than 0.2 mm and two dorsal spines. Staminal column glabrous. Adaxial leaf surface with 4 rayed stellate or with simple hairs **2**

2. Annual or perennial herb with several main stems to about 1 m tall. Flowers solitary in leaf axils, somewhat apically congested with age. Adaxial leaf surface usually covered with simple hairs ..... ***M. coromandelianum*** subsp. ***coromandelianum***

-. Mostly perennial herb with single main stem up to 1.5 m tall. Flowers in congested axillary racemes. Adaxial leaf surface usually covered with bilateral 4 rayed stellate hairs ..... ***M. coromandelianum*** subsp. ***capitatospicatum***

Oenothera jamesii Torr. & A. Gray, Fl. N. Amer. 1(3): 493 (1840) (Fig. 14) (Onagraceae).

New to the flora of La Palma.

Spain, La Palma: Breña Alta, San Isidro, roadside LP-301, *ca.* 600 m, 5 individuals, 30.08.2004, *R. Otto 10094* (pers. herb. RO, det. *K. Rostański* 2005 as *Oenothera longissima* Rydb.); ibid., three plants, 28.09.2012, *R. Otto 19795* (pers. herb. RO); Villa de Mazo, rocky slope of roadside LP-206, several individuals, self-sown, 28.629832º N, 17.779039º W, 410 m, 15.08.2009, *R. Otto 15416*

Figure 14. *Oenothera jamesii*, Mazo, roadside, September 2010 (left); San Isidro, roadside at night, August 2004 (right) (Photographs: R. Otto).

(pers. herb. RO); ibid., two fruiting individuals and several rosettes, 12.03.2014, *R. Otto 20997* (pers. herb. RO); Breña Alta, Barranco de la Zarcita, Camino la Muralla, wasteland in dry gravelly riverbed, *ca.* 25 plants, self-sown, 01.09.2010, *R. Otto 17322* (pers. herb. RO, dupl. BR).

Origin: North America, naturalized in Japan, South Africa and in the Canary Islands (Dietrich *et al.*, 1997).

Known distribution in the Canary Islands: T (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized?

Perhaps initially a garden escape, *Oenothera jamesii* is here confirmed from the Canary Islands. This species and *O. longissima* Rydb. are closely related and not easily separated. However, in the La Palma specimens, flower buds are quadrangular and floral tubes persistent on the ovary after anthesis, characteristic features of *O. jamesii*. Other characters (capsule and seed, leaf width; see Dietrich *et al*., 1997) seem to be less reliable.

Oenothera jamesii has been reported from Tenerife before but this species probably no longer occurs there (A. Reyes-Betancort, pers. comm., 2009).

Orobanche nana (Reut.) Beck in Biblioth. Bot. 19: 91 (1890) (Orobanchaceae).
≡ *Phelipanche nana* (Reut.) Soják

New to the flora of La Palma.

Spain, La Palma: Villa de Mazo, Camino Monte de Pueblo, sweet potato field, several individuals, 08.03.2001, *R. Otto 17691* (pers. herb. RO); ibid., flower garden, several, 12.03.2014, *R. Otto 20996* (pers. herb. RO).

Origin: S Europe, N Africa, W Asia and Macaronesia.

Known distribution in the Canary Islands: H, G, T, C (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized?

Oxalis latifolia Kunth, Nov. Gen. Sp. 5: 237, t. 467 (1821) (Oxalidaceae).

New to the flora of La Palma.

Spain, La Palma: Villa de Mazo, El Pueblo, potato field, numerous, 15.08.2005, *R. Otto 11243* (pers. herb. RO); San Andrés y Sauces, Charco Azul, banana plantation, 23.08.2009, *R. Otto 15458* (pers. herb. RO); ibid., Los Sauces, Calle Higueritas, sweet potato field, 330 m, 02.10.2012, *R. Otto 19821* (pers. herb. RO, dupl. BR); ibid., Los Sauces, public green opposite townhall, weed in flower bed, abundant, 04.09.2013, *R. Otto* (pers. obs.).

Origin: Mexico and Peru. Widely naturalized as a weed in mild climates.

Known distribution in the Canary Islands: T, C, F (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: invasive.

Oxalis latifolia is a very common and troublesome weed in gardens, public greens, agricultural fields, orchards, etc.

Papaver hybridum L., Sp. Pl. 1: 506 (1753) (Papaveraceae).

New to the flora of La Palma.

Spain, La Palma: Tijarafe, Camino Bellido, abundant as weed in vineyard, *ca.* 1000 m, 26.08.2010, *R. Otto 17283* (pers. herb. RO); ibid., Lomo de las Breveras, wasteland, numerous, *ca.* 1100 m, with *P. setigerum* DC., 23.05.2013, *R. Otto 20413* (pers. herb. RO, dupl. BR).

Origin: Mediterranean area, Macaronesia. Naturalized in North America.

Known distribution in the Canary Islands: H, G, T, C, F, L (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Papaver setigerum DC., Fl. Franc. ed. 3, 5: 585 (1815) (Papaveraceae).
≡ *Papaver somniferum* L. subsp. *setigerum* (DC.) Arcang.

New to the flora of La Palma.

Spain, La Palma: Tijarafe, Camino Bellido, as weed in vineyard, *ca.* 1000 m, 23.09.2007, *R. Otto 13329* (pers. herb. RO); Barlovento, Laguna de Barlovento, wasteland and storage area, 06.05.2012, *R. Otto 19100* (pers. herb. RO); Tijarafe, Lomo de las Breveras, wasteland, *ca.* 1100 m, with *P. hybridum* L., 23.05.2013, *R. Otto 20194* (pers. herb. RO, dupl. BR).

Origin: Eurasia.

Known distribution in the Canary Islands: T, C, F, L (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Pilea microphylla (L.) Liebm. in Danske Vidensk. Selsk. Skr. ser. 5, 2: 296 (1851) (Urticaceae).

New to the flora of the Canary Islands.

Spain, La Palma: Los Llanos de Aridane, Argual, T-junction LP-1and LP-2, weed in irrigated green space, roadside and roadside ditch, numerous individuals, 16.08.2006, *R. Otto 8772* (pers. herb. RO, dupl. BR); Fuencaliente, gas station on LP-2, roadside and green space, 738 m, 22.08.2006, *R. Otto 9317* (pers. herb. RO, dupl. BR); Villa de Mazo, Lodero, roadside in front of banana plantation near airport, 20.08.2009, *R. Otto* (pers. obs.); Breña Baja, Los Cancajos, hotel garden, weed in lawn, numerous in disc of palm trunks, 30.08.2009, *R. Otto 15528* (pers. herb. RO, dupl. BR); Sta. Cruz de La Palma, harbour mole, weed in planters, 12.10.2011, *R. Otto 18796* (pers. herb. RO, dupl. BR); Breña Alta, San Pedro, ornamental plant nursery and market garden, numerous in various pots, 09.10.2013, *R. Otto* (pers. obs.).

Origin: tropical America. Widely cultivated ornamental ("artillery plant") but also a troublesome weed in garden centers and nurseries.

Degree of naturalization: naturalized (locally)?

Podranea ricasoliana (Tanfani) Sprague, Fl. Cap. 4(2): 450 (1904) (Fig. 15) (Bignoniaceae).

New to the flora of the Canary Islands.

Spain, La Palma: Barlovento, former cultivated land on Travesía Casco Urbano, now widely overgrown, 29.09.2012, *R. Otto 19802* (pers. herb. RO, dupl. BR); Breña Alta, San Pedro, slope alongside Camino de Barranco de Aguacencio, 23.05.2013, *R. Otto 20180* (pers. herb. RO); Sta. Cruz de La Palma, alongside Carretera Timibúcar, rock facing a former cultivated area, now overgrown with *Sechium edule* (Jacq.) Sw., *Cardiospermum grandiflorum* Sw. and *Hylocereus undatus* (Haw.) Britton & Rose, *ca.* 80 m, 02.10.2013, *R. Otto 20748* (pers. herb. RO).

Origin: South Africa. Widely cultivated in the tropics and subtropics as a climbing ornamental.

Degree of naturalization: naturalized (locally), potentially invasive?

Podranea ricasoliana is a frequent escape from cultivation, especially in the lower zones (up to *ca.* 600 m), mostly in the eastern and northern parts of the island. It overgrows rocks, stone walls

Figure 15. *Podranea ricasoliana*, Barlovento, September 2013 (Photographs: R. Otto).

and embankments, former agricultural fields and gardens. This species grows so vigourously that wild and planted populations are often hard to distinguish.

Polygonum arenastrum Boreau, Fl. Centre France (ed. 3), 2: 559 (1857) (Polygonaceae).
= *P. aviculare* subsp. *depressum* (Meisn.) Arcang.

New to the flora of the Canary Islands.

Spain, La Palma: Villa de Mazo, Lodero, near airport, roadside LP-205, 24.08.1999, *R. Otto 1464* (pers. herb. RO, conf. *R. Wißkirchen* 2013); Breña Alta, near San Pedro, Barranco de la Zarcita, wasteland alongside Camino la Muralla, 03.09.2010, *R. Otto 17330* (pers. herb. RO, det. *R. Wißkirchen* 2013, dupl. BR); ibid., San Isidro, roadside LP-301, near km 18, 13.10.2011, *R. Otto 18801* (pers. herb. RO, conf. *R. Wißkirchen* 2013); San Andrés y Sauces, on LP-104 (TF-V-8113) from Bermúdez (resp. LP-1) 150 m towards San Andrés, agricultural storage areas with *Chloris pycnothrix* Trin., 215 m, 26.05.2013, *R. Otto 20271* (pers. herb. RO, dupl. BR); Breña Alta, Carretera de la Cumbre (LP-3), Zona Industrial El Molino, wasteland with ruderal vegetation, several, 230 m, 03.06.2013, *R. Otto 20385* (pers. herb. RO, dupl. BR); Tijarafe, Aguatavar, parking roadside LP-1, several individuals, 04.09.2013, *R. Otto 20760* (pers. herb. RO, dupl. BR).

Origin: Europe. Widely naturalized in North America.

Degree of naturalization: naturalized.

Portulaca granulatostellulata (Poelln.) C. Ricceri & Arrigoni in Parlatorea 4: 93 (2000) (Portulacaceae).
≡ *P. oleracea* L. subsp. *granulatostellulata* (Poelln.) Danin & H. G. Baker

New to the flora of La Palma.

Spain, La Palma: Breña Baja, Los Cancajos, public green, 07.09.2005, *R. Otto 11103* (pers. herb. RO); Sta. Cruz de La Palma, El Puente, pavement, 28.08.2007, *R. Otto 19419* (pers. herb. RO, det *J. Walter* 2013); ibid., harbour, cobbles, 01.09.2007, *R. Otto 19327* (pers. herb. RO, conf. *J. Walter* 2013); Breña Baja, Los Cancajos, Calle Salinas, sandy beach, 17.05.2012, *R. Otto 19326* (pers. herb. RO, conf. *J. Walter* 2013); San Andrés y Sauces, Puerto Espíndola, harbour, parking, 02.10.2012, *R. Otto 19833* (pers. herb. RO); Breña Alta, Zona Industrial El Molino, roadside and wasteland with ruderal vegetation alongside the street, several, 230 m, 09.10.2012, *R. Otto 19862* (pers. herb. RO); Fuencaliente, Las Indias, near Playa de Zamorra, roadside, between banana plantations, numerous, 31.05.2013, *R. Otto 20341* (pers. herb. RO, dupl. BR); Breña Alta near San Pedro, Barranco de la Zarcita, roadside and wasteland on Camino la Muralla, 03.06.2013, *R. Otto 20323* (pers. herb. RO); Villa de Mazo, Lodero, roadside, between banana plantation, 09.10.2013, *R. Otto 20785* (pers. herb. RO) [selection of about 35 collections].

Origin: subcosmopolitan. Probably the most common microspecies of the *Portulaca oleracea* aggregate (Danin *et al*., 1978).

Known distribution in the Canary Islands: H, T, C, L (Acebes Ginovés *et al*., 2009).

Degree of naturalization: naturalized.

Portulaca granulatostellulata appears to be the most common (micro-) species of the genus in La Palma. However, the separation of this taxon and *P. papillatostellulata* (Danin & H. G. Baker) Danin is not always straightforward and specimens with intermediate seed morphology have frequently been observed. This holds true for the following collections:

Spain, La Palma: Tazacorte, El Time, Barranco de Las Angustias, roadside, 02.09.2006, *R. Otto 19423* (pers. herb. RO, det. *J. Walter* 2013); San Andrés y Sauces, Puerto Espíndola, harbour, parking, 15.08.2007, *R. Otto 19424* (pers. herb. RO, det. *J. Walter* 2013); Sta. Cruz de La Palma, harbour, cobbles, 01.09.2007, *R. Otto 19422* (pers. herb. RO, det. *J. Walter* 2013); San Andrés y Sauces, San Andrés, Calle Abajo, numerous individuals in the gravelly moist riverbed of the Barranco del Agua *ca.* 100 m before mouth of *barranco*, 10 m, 18.08.2010, *R. Otto 19328* (pers. herb. RO, det. *J. Walter* 2013); Breña Baja, Los Cancajos, Calle Las Salinas, parking, rough border, 30.08.2010, *R. Otto 17305* (pers. herb. RO, det. *J. Walter* 2013); Fuencaliente, Las Indias, near hotel, roadside, between banana plantations, 07.05.2012, *R. Otto 19150* (pers. herb. RO, det. *J. Walter* 2013).

Similar intermediate seed morphology also occurs in the species pair *Portulaca nitida* (Danin & H. G. Baker) C. Ricceri & Arrigoni / *P. oleracea* L. [= *Portulaca oleracea* subsp. *stellata* Danin & H. G. Baker, *P. stellata* (Danin & H. G. Baker) Ricceri & Arrigoni] (J. Walter, pers. comm., 2013). The taxonomy of the *Portulaca oleracea* species complex is not uncontested. The existence of plants with more or less intermediate seed morphology may suggest that a lower taxonomic rank for these taxa is perhaps more appropriate.

Portulaca nicaraguensis (Danin & H. G. Baker) Danin in Lagascalia 26: 73 (2006) (Fig. 16) (Portulacaceae).
≡ *P. oleracea* L. subsp. *nicaraguensis* Danin & H. G. Baker

New to the flora of La Palma.

Spain, La Palma: Tazacorte, Puerto de Tazacorte, planter, 26.08.2006, *R. Otto 19322* (pers. herb. RO, conf. *J. Walter* 2013); Tijarafe, El Time, roadside LP-1, 20.08.2007, *R. Otto 19356* (pers. herb. RO, conf. *J. Walter* 2013); Tazacorte, Barranco de las Angustias, roadside LP-1, 02.09.2007, *R. Otto 19320* (pers. herb. RO, conf. *J. Walter* 2013); Sta. Cruz de La Palma, Avenida Marítima, cobbles, 02.09.2008, *R. Otto 19323* (pers. herb. RO, conf. *J. Walte*r 2013); Fuencaliente, Las Indias, Carretera la Costa Cerca Vieja, *ca.* 1 km away from hotels, roadside, alongside banana plantation, 07.05.2012, *R. Otto 19148* (pers. herb. RO, conf. *J. Walter* 2013); ibid., Playa de Zamorra, roadside between banana plantations, 31.05.2013, *R. Otto 20342* (pers. herb. RO, dupl. BR); Breña Baja, Los Cancajos, Calle Salinas, parking place, rough border, with *Digitaria radicosa* (J. Presl) Miq., 14.08.2010, *R. Otto* (pers. obs.).

Figure 16. *Portulaca nicaraguensis*, Las Indias, May 2013 (Photograph: R. Otto).

Origin: probably Central America (Nicaragua, Mexico). Now also as a weed in the warm-temperate and subtropical regions of the Old World.

Known distribution in the Canary Islands: T (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

This seems to be the most thermophilous (micro-) species from the *Portulaca oleracea* L. aggregate in La Palma. It is restricted to the hottest and driest zones of the island. With its bluish metallic seeds covered with wax, it also is one of the easiest to distinguish.

Portulaca nitida (Danin & H. G. Baker) C. Ricceri & Arrigoni in Parlatorea 4: 93 (2000) (Portulacaceae).
≡ *P. oleracea* L. subsp. *nitida* Danin & H. G. Baker

New to the flora of La Palma.

Spain, La Palma: Sta. Cruz de La Palma, La Dehesa, wayside, 12.08.2007, *R. Otto 13318* (pers. herb. RO, conf. *J. Walter* 2013); ibid., in mango plantation, 12.08.2007, *R. Otto 13420* (pers. herb. RO, conf. *J. Walter* 2013); Tazacorte, Puerto de Tazacorte, planters, 08.2008, *R. Otto* (pers. obs.); Sta. Cruz de La Palma, Calle Díaz Pimienta, planters, 01.10.2013, *R. Otto 20735* (pers. herb. RO, dupl. BR).

Origin: probably North America. Now widely naturalized as a weed elsewhere.

Known distribution in the Canary Islands: T, L (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Portulaca papillatostellulata (Danin & H. G. Baker) Danin in Lagascalia 26: 76 (2006) (Portulacaceae).
≡ *P. oleracea* L. subsp. *papillatostellulata* Danin & H. G. Baker

New to the flora of La Palma.

Spain, La Palma: San Andrés y Sauces, Puerto Espíndola, harbour, rough border, 15.08.2007, *R. Otto 13419* (pers. herb. RO); Breña Alta, new hospital, border, 01.09.2007, *R. Otto 17858* (pers. herb. RO, conf. *J. Walter* 2013), Sta. Cruz de La Palma, La Dehesa, mango plantation, storage area, numerous individuals, 01.06.2013, *R. Otto 20346* (pers. herb. RO, dupl. BR).

Origin: New World (essentially northern and Central America). Widely introduced and naturalized elsewhere.

Known distribution in the Canary Islands: T (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Rumex crispus L., Sp. Pl. 1: 335 (1753) subsp. ***crispus*** (Polygonaceae).

New to the flora of La Palma.

Spain, La Palma: Breña Baja, San Antonio, fallow land, 15.08.2001, *R. Otto 6752* (pers. herb. RO); Breña Alta, San Pedro, Camino de Barranco de Aguacencio, fallow land and wayside, 15.08.2001, *R. Otto 6756* (pers. herb. RO); Sta. Cruz de La Palma, Carretera las Nieves, wasteland, 18.08.2005, *R. Otto 11133* (pers. herb. RO); Breña Alta, San Isidro, Camino la Piedad, embankment, numerous, 12.05.2012, *R. Otto* (pers. obs.); ibid., above San Isidro, near crossing LP-301and Canal de Fuencaliente, fallow land, numerous individuals, 27.09.2013, *R. Otto 20711* (pers. herb. RO, dupl. BR); Garafía, San Antonio del Monte, fallow land, numerous, 30.09.2013, *R. Otto* (pers. obs.).

Origin: Eurasia. Introduced and naturalized almost worldwide.

Known distribution in the Canary Islands: G, T, C, L (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Rumex crispus is a fast spreading weed in La Palma.

Rumex pulcher L., Sp. Pl. 1: 336 (1753) subsp. ***pulcher*** (Polygonaceae).

Subspecies new to the flora of the Canary Islands.

Spain, La Palma: Garafía, San Antonio del Monte, several individuals in the surroundings of the Ermita de San Antonio, on bare ground, 920 m, 15.08.2001, *R. Otto 6753* (pers. herb. RO); ibid., Llano Negro, potato field, 1000 m, 15.08.2003, *R. Otto 8561* (pers. herb. RO, dupl. BR); ibid., San Antonio del Monte, roadside Calle San Antonio, ruderal vegetation, 01.09.2005, *R. Otto 11218* (pers. herb. RO, dupl. BR); Barlovento, Barranco de Topaciegas, roadside LP-1, 30.09.2013, *R. Otto 20721* (pers. herb. RO).

Origin: southern and western Europe, North Africa, Southwest Asia. Widely introduced and naturalized elsewhere, for instance in North America.

Degree of naturalization: naturalized.

In the northern parts of La Palma subsp. *pulcher* seems to be more frequent than subsp. *divaricatus* (L.) Arcang.

Rumex ×***pratensis*** Mert. & W. D. J. Koch, Deutschl. Fl. ed. 3, 2: 609 (1826) (Polygonaceae).
= *Rumex obtusifolius* L. subsp. *obtusifolius* × *R. crispus* L.

New to the flora of the Canary Islands.

Spain, La Palma: Breña Alta, San Isidro, near crossing LP-301 and Canal de Fuencaliente, roadside, with the parent species, three individuals, 28.05.2013, *R. Otto 20308* (pers. herb. RO, dupl. BR); ibid., near San Pedro, Barranco de la Zarcita, roadside and wasteland on Camino la Muralla, 23.09.2013, *R. Otto 20649* (pers. herb. RO).

Degree of naturalization: naturalized.

This mostly sterile hybrid may occur where-ever the parent species grow in close proximity.

Sechium edule (Jacq.) Sw., Fl. Ind. Occid. 2(2): 1150 (1800) (Cucurbitaceae).

New to the flora of La Palma.

Spain, La Palma: near Puerto Tazacorte, slope of Barranco de las Angustias, 15.08.2001, *R. Otto 6720* (pers. herb. RO); Breña Alta, San Isidro, roadside, 24.08.2005, *R. Otto 11146* (pers. herb. RO); Puntallana, La Galga, El Pósito, former cultivated land, with *Delairea odorata* L., 20.09.2013, *R. Otto* (pers.

obs.); ibid., slopes on Calle Lomo Estrello near Punto Limpio, abundant wild individuals overgrowing the *barranco*, 25.09.2013, *R. Otto 20700* (pers. herb. RO); Breña Alta, San Pedro, alongside Camino de Barranco de Aguacencio, 23.05.2013, *R. Otto* (pers. obs.); Sta. Cruz de La Palma, alongside Carretera Timibúcar, rock facing a former cultivated area, *ca.* 80 m, 02.10.2013, *R. Otto* (pers. obs.).

Origin: tropical America. Widely cultivated for its edible fruit elsewhere and frequently escaping and naturalizing.

Known distribution in the Canary Islands: C (Acebes Ginovés *et al.*, 2009), T (Verloove & Reyes-Betancort, 2011).

Degree of naturalization: naturalized and locally invasive.

Especially in the lower zones in the northern part of La Palma *Sechium edule* locally behaves like an aggresive invader (a transformer in the sense of Richardson *et al.*, 2000). Elsewhere a frequent but ephemeral escape (see also Verloove & Reyes-Betancort, 2011).

Sida spinosa L., Sp. Pl. 2: 683–684 (1753) var. ***angustifolia*** (Lam.) Griseb., Fl. Brit. W. I. 1: 74 (1859) (Malvaceae).
≡ *S. angustifolia* Lam.

New to the flora of the Canary Islands.

Spain, La Palma: Tazacorte, Puerto de Tazacorte, Barranco Tenisca, surroundings of the sewage station on LP-120, in ruderal vegetation of roadside, numerous, with *Sida rhombifolia* L. var. *maderensis* (Lowe) Lowe and *Malvastrum coromandelianum* (L.) Garcke subsp. *capitatospicatum* (Kuntze) S. R. Hill, 16.08.2006, *R. Otto 12019* (pers. herb. RO, dupl. BR); ibid., roadside, 28.656239º N, 17.940446º W, 37 m, *ca.* 100 individuals, 06.03.2014, *R. Otto 20891* (pers. herb. RO, dupl. BR).

Origin: pantropical.

Degree of naturalization: naturalized (locally).

Silene nocturna L., Sp. Pl. 1: 416 (1753) (Caryophyllaceae).

New to the flora of La Palma.

Spain, La Palma: Breña Alta, San Pedro, therophyte association beside the road, 14.03.2011, *R. Otto 17816* (pers. herb. RO, dupl. BR).

Origin: Mediterranean area, western Asia, Macaronesia. Introduced as a weed in North America.

Known distribution in the Canary Islands: G, T, C, F, L (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized?

Solanum abutiloides (Griseb.) Bitter & Lillo in Repert. Spec. Nov. Regni Veg. 12: 136 (1913) (Fig. 17) (Solanaceae).

New to the flora of La Palma.

Spain, La Palma: Breña Alta, Miranda, near Calle Camelias, weed in orchard, several shrubs, with *Solanum mauritianum* L., 26.08.2005, *R. Otto 20553* (pers. herb. RO, dupl. BR); ibid., garden wall, 05.05.2012, *R. Otto 19073* (pers. herb. RO); ibid., near Calle San Miguel, Barranco de Laja de Llanito, edge of dry gravelly riverbed, several small individuals and one bush about 2 m tall, 12.05.2012, *R. Otto 19207* (pers. herb. RO); ibid., Camino la Laja del Barranco, riverbed beneath Carretera el Zumacal, some tree-like bushes up to 3 m tall, 13.03.2014, *R. Otto* (pers. obs.).

Origin: Argentina and Bolivia.

Known distribution in the Canary Islands: T (Verloove & Reyes-Betancort, 2011).

Degree of naturalization: naturalized. Potentially an invasive weed.

In recent years *Solanum abutiloides* is increasing in the surroundings of El Llanito, San Miguel and Miranda (Breña Alta).

Solanum alatum Moench, Methodus: 474 (1794) (Solanaceae).
= *S. villosum* Mill. subsp. *miniatum* (Bernh. ex Willd.) Edmonds

New to the flora of La Palma.

Spain, La Palma: Garafía, Parque Cultural La Zarza, several, 15.08.2001, *R. Otto 6705* (pers. herb. RO); Puntallana, Cubo de la Galga, laurisilva, wayside, several, 15.08.2002, *R. Otto 7703* (pers. herb. RO); San Andrés y Sauces, Los Sauces, roadside, 15.08.2003, *R. Otto 8540* (pers. herb. RO);

Figure 17. *Solanum abutiloides*, San Miguel, May 2013 (Photographs: R. Otto).

Sta. Cruz de La Palma, LP-4, roadside, 650 m, 05.09.2008, *R. Otto 14402* (pers. herb. RO); Breña Alta, above San Isidro, LP-301, roadside, 900 m, numerous, 12.10.2011, *R. Otto 18787* (pers. herb. RO, dupl. BR); ibid., near Refugio del Pilar, parking, Pinar, several, 1450 m, 14.05.2012, *R. Otto 19236* (pers. herb. RO).

Origin: Old World. Now a cosmopolitan weed.

Known distribution in the Canary Islands: H, T, C, L (Acebes Ginovés *et al.*, 2009). See also Verloove & Reyes-Betancort (2011).

Degree of naturalization: naturalized.

Solanum decipiens Opiz, Ökon. Fl. Böhm. 3: 24 (1841) (Solanaceae).
= *Solanum nigrum* L. subsp. *schultesii* (Opiz) Wessely

New to the flora of the Canary Islands.

Spain, La Palma: Breña Alta, above San Isidro, near Refugio del Pilar, parking, Pinar, several individuals, 1450 m, 14.05.2012, *R. Otto 19520* (pers. herb. RO, dupl. BR).

Origin: precise origin unknown (see Edmonds & Chweya, 1997), distributed in Australia and Europe.

Degree of naturalization: ephemeral? Potentially weedy.

Solanum decipiens is perhaps overlooked in the Canary Islands because of its great similarity to *S. nigrum* L. Both species are easily distinguished by their hair types: *S. decipiens* is abundantly hairy with hairs mostly glandular and patent, whereas *S. nigrum* is usually sparsely hairy with hairs appressed and eglandular.

Sonchus tenerrimus L., Sp. Pl. 2: 794 (1753) (Asteraceae).

New to the flora of La Palma.

Spain, La Palma: Breña Alta, new hospital, roadside and ornamental flower bed, weedy, 15.08.2004, *R. Otto 10128* (pers. herb. RO); Breña Alta, Avenida Bajamar, roadside and public green, 13.08.2009, *R. Otto 15412* (pers. herb. RO); Sta. Cruz de La Palma, Las Nieves, edge of parking, spreading in dense ruderal vegetation, 04.03.2011, *R. Otto 17628* (pers. herb. RO, dupl. BR); Breña Alta, Buenavista, former airport, excavation material overgrown with ruderal vegetation, abundant, 10.03.2011, *R. Otto 17613* (pers. herb. RO); ibid., 10.03.2011, *R. Otto 17725* (pers. herb. RO, dupl. BR); ibid., San Pedro, public green before Museo de Puros, weedy, also as epiphyte on trunks of *Phoenix canariensis*, 28.04.2012, *R. Otto 18975* (pers. herb. RO).

Origin: Mediterranean area, Macaronesia. Introduced elsewhere as a weed, for instance in North America and Australia.

Known distribution in the Canary Islands: H, G, T, C, F, L (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Sonchus tenerrimus is a frequent and very variable species of disturbed habitats, roadsides, rocks and walls. It was also seen epiphytic on *Phoenix canariensis* Chabaud.

Spergularia marina (L.) Griseb., Spic. Fl. Rumel. 1: 213 (1843) (Caryophyllaceae).

New to the flora of La Palma.

Spain, La Palma: Breña Baja, Los Cancajos, Calle Salinas near beach, cracks in pavement, 12.08.2008, *R. Otto 14259* (pers. herb. RO); Breña Alta, Calle el Fuerte, ruderal beach area below Zona Industrial, numerous, 28.08.2008, *R. Otto 14368* (pers. herb. RO); Breña Baja, Los Cancajos, Calle Salinas, small ruderal wasteland, 21.05.2013, *R. Otto 20152* (pers. herb. RO, dupl. BR); ibid., wasteland near former sewage works, 25.05.2013, *R. Otto 20254* (pers. herb. RO); Sta. Cruz de La Palma, Calle Abenguareme, coastal zone, bare ground, 02.10.2013, *R. Otto* (pers. obs.).

Origin: Eurasia. It has become subcosmopolitan.

Known distribution in the Canary Islands: T, C, F, L (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Stellaria pallida (Dumort.) Crépin, Man. Fl. Belgique (ed. 2): 19 (1866) (Caryophyllaceae).
≡ *S. media* (L.) Vill. subsp. *pallida* (Dumort.) Asch. & Graebn.

New to the flora of La Palma.

Spain, La Palma: Breña Baja, Los Cancajos, Calle Salinas, border of flower bed, 13.03.2011, *R. Otto 17790* (pers. herb. RO); San Andrés y Sauces, San Andrés, Calle Plaza, numerous in plantation of palms, 29.04.2012, *R. Otto 18976* (pers. herb. RO); Breña Alta, San Pedro, Calle del Cura, cobbles, abundant, 30.04.2012, *R. Otto 18999* (pers. herb. RO, dupl. BR); Sta. Cruz de La Palma, Calle el Pilar, cobbles, 12.03.2014, *R. Otto* (pers. obs.).

Origin: Europe. Introduced and naturalized in North America and Mexico.

Known distribution in the Canary Islands: L (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized.

Stellaria pallida seems to be not rare but overlooked and/or often confused with the very similar *S. media* (L.) Vill.

Tragopogon porrifolius L., Sp. Pl. 2: 789 (1753) subsp. ***australis*** (Jord.) Nyman, Consp. Fl. Eur.: 462 (1879) (Asteraceae).

Subspecies new to the flora of La Palma.

Spain, La Palma: Tijarafe, Camino Bellido, weedy in vineyard, several individuals, 28.08.2008, *R. Otto 14360* (pers. herb. RO, dupl. BR); Garafía, Las Tricias, Calle Cruz de Llanito near church, roadside, 790 m, 06.05.2012, *R. Otto 19127* (pers. herb. RO, dupl. BR).

Origin: Europe, western Asia, North Africa. Introduced and naturalized in North America, Pacific Islands and Australia.

Known distribution in the Canary Islands.: G, T, C (Acebes Ginovés *et al.*, 2009, without indication of subspecies).

Degree of naturalization: naturalized.

All specimens of *Tragopogon porrifolius* seen so far in La Palma belong to this subspecies.

Tribulus terrestris L., Sp. Pl. 1: 387 (1753) (Zygophyllaceae).

New to the flora of La Palma.

Spain, La Palma: Puerto de Tazacorte, Barranco de las Angustias, roadside, 15.08.2001, *R. Otto 6668* (pers. herb. RO, dupl. BR); Los Llanos de Aridane, LP-2 near Argual, wasteland and roadside, 20.08.2007, *R. Otto 13339* (pers. herb. RO); LP-2, between Argual and Tazacorte, roadside, numerous individuals, 27.08.2008, *R. Otto 14365* (pers. herb. RO).

Origin: warm-temperate and tropical regions of the Old World. Widely naturalized as a weed in the New World.

Known distribution in the Canary Islands: T, C, F (Acebes Ginovés *et al.*, 2009).

Degree of naturalization: naturalized on the west side of La Palma.

Trifolium repens L., Sp. Pl. 2: 767 (1753) subsp. ***repens*** (Fabaceae).

New to the flora of La Palma.

Spain, La Palma: Breña Alta, new hospital, weed in lawn, several, 18.08.2001, *R. Otto 6715* (pers. herb. RO); Breña Baja, Los Cancajos, Calle Salinas, near beach, lawn weed, 07.05.2012, *R. Otto* (pers. obs.); Garafía, La Mata, roadside, 1040 m, 27.05.2013, *R. Otto* (pers. obs.); Breña Alta, San Pedro, storage area for construction material, 30.05.2013, *R. Otto* (pers. obs.); Breña Alta, Avenida Bajamar, weed in lawn, 05.03.2014, *R. Otto 20887* (pers. herb. RO); Breña Alta, Barranco de la Zarcita, grass-covered path, 07.03.2014, *R. Otto 20912* (pers. herb. RO); Breña Alta, San Isidro, Barranco de Aduares, overgrown path, 11.03.2014, *R. Otto* (pers. obs.).

Origin: Europe. Widely naturalized in Africa, America, Asia and Australia.

Known distribution in the Canary Islands: H, C, F (Acebes Ginovés *et al.*, 2009), recently also recorded in T (Santos-Guerra *et al.*, 2013*b*).

Degree of naturalization: naturalized.

Trifolium repens is introduced as lawn weed and much increasing in the past years. It is also spreading to natural habitats. Confusion with the related and very similar *T. occidentale* Coombe, recently also found in identical habitats in La Palma (see below), is not unlikely (Coombe, 1961; Coombe & Morisset, 1967).

Ephemeral taxa

New to the flora of the Canary Islands

Ajuga reptans L. (Lamiaceae).

Spain, La Palma: Los Llanos de Aridane, Calle Díaz Pimienta, weed in lawn, 27.08.2010 and 29.05.2013, *R. Otto* (pers. obs.); ibid., Calle Real, abundant as weed in lawn, 29.05.2013, *R. Otto 20333* (pers. herb. RO).

Avena hispanica Ard. [= *Avena strigosa* Schreb. subsp. *agraria* (Brot.) Tab. Morais] (Poaceae).

Spain, La Palma: Breña Alta, San Isidro, LP-301 below Montaña La Pavóna, San Isidro, near crossing LP-301 and Canal de Fuencaliente, fallow land and roadside, scattered individuals, 680 m, 30.08.2008, *R. Otto 14375* (pers. herb. RO).

Bellis perennis L. (Asteraceae).

Spain, La Palma: Breña Baja, Los Cancajos, hotel garden, weed in *Stenotaphrum* lawn, scattered individuals, 04.06.2013, *R. Otto 20375* (pers. herb. RO).

Buddleja davidii Franch. (Scrophulariaceae).

Spain, La Palma: Breña Alta, Calle el Rosal, rough building area, three small bushes, 15.08.2007, *R. Otto 13320* (pers. herb. RO); Breña Alta, San Isidro, Camino la Pavóna, fallow land, 24.08.2007, *R. Otto 13325* (pers. herb. RO).

Canna glauca L. (Cannaceae).

Spain, La Palma: San Andrés y Sauces, LP-104 near San Andrés, 200 m N of T-junction LP-1042, small moist *barranco* between banana plantations, with *Canna indica* L. and *Colocasia esculenta* (L.) Schott, 70 m, 25.09.2013, *R. Otto 20691* (pers. herb. RO; photo conf. *D. Guillot Ortiz* 2014).

Carica papaya L. (Caricaceae).

Spain, La Palma: San Andrés y Sauces, LP-104 near Llano del Pino, crack in concrete roadside ditch, *ca.* 60 cm tall and flowering, repeatedly truncated and therefore with sidebranches and bushy, 22.09.2013, *R. Otto 20646* (pers. herb. RO).

Chaenorhinum minus (L.) Lange subsp. ***minus*** (Plantaginaceae).

Spain, La Palma: Tijarafe, Camino Bellido, *ca.* 1000 m, rare as weed in vineyard, 23.08.2007, *R. Otto 13269* (pers. herb. RO, dupl. BR).

Chenopodium opulifolium Schrad. ex. W. D. J. Koch & Ziz (Amaranthaceae).

Spain, La Palma: Breña Alta, above San Isidro, near crossing LP-301 and Canal de Fuencaliente, dense ruderal vegetation by roadside, numerous, 690 m, 25.08.2005, *R. Otto 11224* (pers. herb. RO, dupl. BR); ibid., 25.08.2005, *R. Otto 11231* (pers. herb. RO, dupl. BR).

Citrullus lanatus (Thunb.) Matsum. & Nakai (Cucurbitaceae).

Spain, La Palma: Breña Alta, Calle Rosal, roadside, 22.08.2005, *R. Otto 11164* (pers. herb. RO); Breña Baja, Los Cancajos, wasteland near former sewage works, 25.05.2013, *R. Otto 20247* (pers. herb. RO).

Coccoloba uvifera (L.) L. (Polygonaceae).

Spain, La Palma: Sta. Cruz de La Palma, Plaza de San Fernando, public green and wayside, many seedlings between fallen leaves under the parent bushes, 04.06.2013, *R. Otto 20393* (pers. herb. RO, dupl. BR); Breña Baja, Los Cancajos, Calle Salinas, many seedlings, weedy in border, 09.03.2014, *R. Otto 20958* (pers. herb. RO).

Crassula tetragona L. (Crassulaceae).

Spain, La Palma: Breña Alta, Buenavista, former airport, edge of the former airstrip, some individuals of different age close to each other, 08.03.2014, *R. Otto 20928* (pers. herb. RO; photo conf. *D. Guillot Ortiz* 2014).

Cucumis melo L. (Cucurbitaceae).

Spain, La Palma: Breña Alta, Miranda, roadside LP-202, three individuals, 23.05.2013, *R. Otto 20184* (pers. herb. RO, dupl. BR).

Cucurbita moschata Duchesne (Cucurbitaceae).

Spain, La Palma: San Andrés y Sauces, Camino Puerto Espíndola *ca.* 250 m before Espíndola, moist ditch and water channel below wet rocks, several large individuals creeping some meters over the dense vegetation, with *Anredera cordifolia* (Ten.) Steenis, *Bidens pilosa* L., *Cyperus eragrostis* Lam., *Galium aparine* L., *Helosciadium nodiflorum* (L.) W. D. J. Koch, *Melia azedarach* L., *Sechium edule* (Jacq.) Sw., *Solanum nigrum* L., 28.809215º N, 17.763857º W, 32 m, 24.05.2013, *R. Otto 20210* (pers. herb. RO). Also seen several times in similar locations, e.g. Los Sauces (Barranco del Agua), San Pedro (Barranco de la Zarcita) and Sta. Cruz de La Palma (Barranco de las Nieves), 10.2013, *R. Otto* (pers. obs.).

Probably native to Central America, now widely cultivated as vegetable. In La Palma it is the most commonly cultivated *Cucurbita* species and sometimes escaping. Wild occurrences are probably related with sewage works or birdseed.

Cuphea hyssopifolia Kunth (Lythraceae).

Spain, La Palma: Breña Alta, San Pedro, public green, irrigated lawn, formerly planted nearby as ornamental in flowerbeds and now spreading, 22.08.2009, *R. Otto 15455* (pers. herb. RO, dupl. BR); ibid., 05.03.2014, *R. Otto* (pers. obs.).

Digitaria nuda Schumach. (Poaceae).

Spain, La Palma: Breña Baja, Los Cancajos, Calle Amargavinos, newly arranged disc of palm trunks, 17.05.2012, *R. Otto 19259* and *19260* (pers. herb. RO, dupl. BR).

Possibly overlooked and/or confused with *Digitaria ciliaris* (Retz.) Koeler. The six species of *Digitaria* known to occur in the Canary Islands are distinguished as follows (modified from Clayton & Renvoize, 1982; Goetghebeur & Van der Veken, 1989; Verloove, 2008; and Wilhalm, 2009):

1. Most spikelets ternate (in groups of three on the rachis). Upper glume about as long as spikelet. Upper lemma dark brown at maturity ..... ***Digitaria violascens***
-. Most spikelets binate (in pairs on the rachis). Upper glume always distinctly shorter than spikelet. Upper lemma pale at maturity **2**
2. Plant perennial, caespitose. Culm erect ..... ***D. nodosa***
-. Plant annual (rarely short lived perennial). Culms often straggling **3**
3. Rachis smooth (or with few very small prickles). Plant slender, with 2–3(–4) racemes ..... ***D. radicosa***
-. Rachis scabrous throughout, with numerous, very distinct prickles. Plant usually with more numerous racemes..... **4**

4. Lower glume absent or an obscure rim (at most 0.1 mm long). Spikelets 1.7–2.5(–2.8) mm long ..... ***D.nuda***
-. Lower glume always present, at least 0.2 mm long. Spikelets 2.5–3.5 mm long **5**
5. Lateral nerves of lower lemma scabrous (almost) throughout. Upper glume at most ½ as long as spikelet ..... ***D. sanguinalis***
-. Lateral nerves of lower lemma smooth (or rarely with a few prickles in the upper third). Upper glume usually more than ½ as long as spikelet ..... ***D. ciliaris***

Eichhornia crassipes (Mart.) Solms (Fig. 11) (Pontederiaceae).

Spain, La Palma: San Andrés y Sauces, San Andrés, small water reservoir, several individuals, with *Landoltia punctata* (G. Mey.) Les & D. J. Crawford, *Helosciadium nodiflorum* W. D. J. Koch, *Polypogon viridis* (Gouan) Breistr. and algal bloom, 03.09.2013, *R. Otto 20750* (pers. herb. RO).

Euphorbia leucocephala Lotsy (Euphorbiaceae).

Spain, La Palma: Breña Baja, Los Cancajos, between pavement slabs alongside a front garden, some individuals, 01.10.2012, *R. Otto 19819* (pers. herb. RO).

Euphorbia tirucalli L. (Euphorbiaceae).

Spain, La Palma: Breña Baja, above Los Cancajos, some small individuals alongside LP-5 and on the rocky slope, originating from specimens planted as ornamentals, 23.09.2012, *R. Otto* (pers. obs.); Sta. Cruz de La Palma, Miranda, small and partially filled *barranco* on LP-4, with *Agave* sp., *Ipomoea indica* (Burm.) Merr., *Kleinia neriifolia* Haw., *Opuntia* sp. and *Rumex lunaria* L., shrub *ca.* 150 cm tall, 09.03.2014, *R. Otto 20955* (pers. herb. RO); Villa de Mazo, La Salemera, some small individuals on a rocky slope (partially dump) close to the sea, with *Kalanchoe ×houghtonii*, throw-out, 02.10.2013, *R. Otto* (pers. obs.).

Possibly overlooked and under-recorded. Fallen branches easily root and throw-outs may survive for many years on *barranco* slopes, wasteland, etc.

Felicia amoena Levyns subsp. ***amoena*** (Asteraceae).

Spain, La Palma: Breña Alta, Las Breñas, roadside, foot of wall, small bush, escaped from cultivation, 30.08.2008, *R. Otto 14378* (pers. herb. RO, dupl. BR).

Kalanchoe fedtschenkoi Raym.-Hamet & H. Perrier (Crassulaceae).

Spain, La Palma: Breña Baja, Los Cancajos, surroundings of Urbanización Las Salinas 3, wasteland, former throw-out, several flowering individuals, 02.03.2014, *R. Otto 20841* (pers. herb. RO; photo conf. *D. Guillot Ortiz* 2014); San Andrés y Sauces, San Andrés, water channel alongside Calle San Sebastián, 09.03.2014, *R. Otto 20947* (pers. herb. RO; photo conf. *D. Guillot Ortiz* 2014).

Lotus corniculatus L. (Fabaceae).

Spain, La Palma: Breña Alta, San Pedro, public green, as weed in lawn, with *Cerastium fontanum* Baumg. subsp. *vulgare* (Hartm.) Greuter & Burdet and *Lolium perenne* L., 15.08.2003, *R. Otto 8601* (pers. herb. RO, dupl. BR).

Maurandya barclaiana Lindl. [≡ *Asarina barclaiana* (Lindley) Pennell] (Plantaginaceae).

Spain, La Palma: Sta. Cruz de La Palma, El Puente, construction site, joint of step, 03.10.2012, *R. Otto 19839* (pers. herb. RO, dupl. BR); ibid., 10.10.2013, *R. Otto* (pers. obs.).

Medicago ×varia Martyn (Fabaceae).

Spain, La Palma: Breña Baja, Los Cancajos, dry wasteland near former sewage station, several individuals, 23.09.2013, *R. Otto 20665* (pers. herb. RO, dupl. BR).

Melampodium montanum Benth. (Asteraceae).

Spain, La Palma: Breña Alta, San Pedro, roadside near public green, some individuals, 19.08.2006, *R. Otto 11371* (pers. herb. RO, dupl. BR).

Nerium oleander L. (Apocynaceae).

Spain, La Palma: San Andrés y Sauces, Puerto Espíndola, Camino Puerto Espíndola, a two years old individual about 30 cm tall, roadside between foot of a stone wall and asphalted surface, 28.09.2013, *R. Otto* (pers. obs.); Breña Baja, Los Cancajos, Calle Los Cancajos, foot of wall, 02.03.2014, *R. Otto* (pers. obs.); Sta. Cruz de La Palma, Barranco de las Nieves alongside Avenida Manuel Gónzales Méndez, two fruiting individuals of 2 m tall in cracks of foot of concrete wall, 05.03.2014, *R. Otto 20883* (pers. herb. RO, dupl. BR).

Oxalis adenophylla Gillies ex Hook. & Arn. (Oxalidaceae).

Spain, La Palma: Tijarafe, Camino Bellido, vineyard, under planted *Juniperus* bushes, probably introduced with plant containers, scattered individuals, 21.08.2009, *R. Otto 15450* (pers. herb. RO).

Pascalia glauca Ortega [≡ *Wedelia glauca* (Ortega) Hicken] (Asteraceae).

Spain, La Palma: Sta. Cruz de La Palma, Caserío Miranda, dry waste land, *ca.* 15 plants, 15.08.2002, *R. Otto 12482* (pers. herb. RO); ibid., 08.2003, *R. Otto* (pers. obs.).

Passiflora mollissima (Kunth) L. H. Bailey (Fig. 18) (Passifloraceae).

Spain, La Palma: Puntallana, Barranco de la Galga, trail to Cubo de la Galga, *ca.* 1.5 km uphill parking, edge of the riverbed, one (?) vigorous plant climbing in *Rubus* scrub, 23.08.2008, *R. Otto 14318* (pers. herb. RO, dupl. BR).

Phacelia tanacetifolia Benth. (Boraginaceae).

Spain, La Palma: Breña Alta, Avenida Bajamar, scattered in freshly sown grass border, 19.08.2007, *R. Otto 13294* (pers. herb. RO).

Plerandra elegantissima (Veitch ex Mast.) Lowry, G. M. Plunkett & Frodin [≡ *Schefflera elegantissima* (Veitch ex Mast.) Lowry & Frodin ≡ *Dizygotheca elegantissima* (Veitch ex Mast.) R. Vig. & Guillaumin] (Araliaceae).

Spain, La Palma: Sta. Cruz de La Palma, El Puente, seedling as weed in *Dracaena* pot, 24.09.2013, *R. Otto* (pers. obs.); Breña Baja, Los Cancajos, Calle Salinas, hotel garden and in front of hotel, many seedlings and small individuals, weedy under bushes and in disturbed lawn, also in cracks of pavement, cultivated specimens nearby, 10.03.2014, *R. Otto 21013* (pers. herb. RO, dupl. BR).

Rumex cristatus DC. (Polygonaceae).

Spain, La Palma: Breña Alta, Camino la Piedad, embankment, 28.645845º N, 17.800424º W, *ca.* 10

Figure 18. *Passiflora mollissima*, Barranco de la Galga, August 2008 (Photographs: R. Otto).

vigorous plants, 12.05.2012, *R. Otto 19202* (pers. herb. RO, dupl. BR); ibid., 09.03.2014, *R. Otto* (pers. obs.).

Sagina apetala Ard. subsp. ***erecta*** (Hornem.) F. Herm. (= *Sagina micropetala* Rauschert = *S. filicaulis* Jord. ≡ *S. apetala* auct. non Ard.) (Caryophyllaceae).

Spain, La Palma: Breña Baja, Los Cancajos, Calle Amargavinos, disc of palm trunks, numerous with *Digitaria radicosa* (J. Presl) Miq., 17.05.2012, *R. Otto 19256* (pers. herb. RO, dupl. BR).

In the Canary Islands this species may have been overlooked and/or confused with the very similar *Sagina apetala* subsp. *apetala* L.

Silene armeria L. (Caryophyllaceae).

Spain, La Palma: Breña Baja, Los Cancajos, Calle Cantillo, roadside, foot of retaining wall, several individuals, 21.05.2013, *R. Otto 20141* (pers. herb. RO).

Tradescantia sillamontana Matuda (Commelinaceae).

Spain, La Palma: San Andrés y Sauces, San Andrés, Barranco del Agua, on top of retaining wall of banana plantation, 03.09.2013, *R. Otto 20754* (pers. herb. RO); Breña Baja, Los Cancajos, Calle Salinas, waste land, throw-out, small individual, 02.03.2014, *R. Otto 20856* (pers. herb. RO).

Trifolium occidentale Coombe (Fabaceae).

Spain, La Palma: Breña Alta, Avenida Bajamar, freshly sown grass border, several, with *Trifolium repens*, 19.08.2007, *R. Otto 13272* (pers. herb. RO); ibid., abundant in lawn, 24.09.2013, *R. Otto 20671* (pers. herb. RO, dupl. BR).

Xanthium cf. ***saccharatum*** Wallr. (Asteraceae) (det. *R. Wisskirchen*).

Spain, La Palma: Sta. Cruz de La Palma, Barranco de las Nieves below Plaza San Fernando, dry exposed gravelly riverbed, a single individual, 25.05.2013, *R. Otto 20231* (pers. herb. RO, dupl. BR).

Zoysia pacifica (Goudswaard) M. Hotta & Kuroki [≡ *Zoysia matrella* (L.) Merr. var. *pacifica* Goudswaard] (Poaceae).

Spain, La Palma: Puerto de Tazacorte, T-junction Avenida del Emigrante and LP-2, creeping out of the green space with *Stenotaphrum* Trin. lawn nearby, 30.04.2012, *R. Otto 19095* (pers. herb. RO); Los Llanos de Aridane, Argual, junction LP-1and LP-2, many patches in the holey asphalt of the Camino del Álamo and roadside, creeping out of the green space with *Stenotaphrum* lawn nearby, 285 m, 30.09.2012, *R. Otto 19807* (pers. herb. RO, dupl. BR).

New to the flora of La Palma

Acacia cyclops A. Cunn. ex G. Don (Fabaceae).

Spain, La Palma: Villa de Mazo, El Pueblo, Barranco de Blas, slope, escape from nearby plantation, 04.05.2012, *R. Otto 19057* (pers. herb. RO, dupl. BR).

Acalypha supera Forssk. (= *Acalypha brachystachya* Hornem.) (Euphorbiaceae).

Spain, La Palma: Breña Baja, Los Cancajos, as weed in hotel garden (also abundant in greenhouse), 01.09.2008, *R. Otto 14396* (pers. herb. RO, conf. *H. J. Esser* 2011, dupl. M, BR).

Acanthus mollis L. (Acanthaceae).

Spain, La Palma: Barlovento, Laguna de Barlovento, waste land, embankment of dumping site for excavation material, 20.08.2010, *R. Otto 17254* (pers. herb. RO); San Andrés y Sauces, Los Sauces, Camino Mirador de Llano Clara, rocky slope, wayside, small population, *ca.* 470 m, relic of cultivation?, 02.06.2013, *R. Otto 20360* (pers. herb. RO, dupl. BR).

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

Spain, La Palma: Breña Baja, Los Cancajos, Barranco Amargavino, 18.08.2000, *R. Otto* (pers. obs.); Sta. Cruz de La Palma, LP-401 crossing Barranco del Carmen Dorador, forest track, two rosettes, 260 m, 24.09.2013, *R. Otto* (pers. obs.); Breña Alta, San Pedro, Camino Barranco de Aguacencio, wayside, some overgrown individuals, *R. Otto* (pers. obs.); ibid., Breña Baja, El Socorro, Barranco de Aguacencio, Camino la Laja del Barranco, riverbed, several rosettes, with *Sansevieria trifasciata* Prain.,13.03.2014, *R. Otto* (pers. obs.).

Aloe maculata All. [= *Aloe saponaria* (Aiton) Haw.] (Xanthorrhoeaceae *s. l.*, Asphodeloideae).

Spain, La Palma: Breña Alta, embankment on LP-202 between San Pedro y Las Ledas, 24.05.2013, *R. Otto* (pers. obs.; photo det. *D. Guillot Ortiz* 2014); ibid., Camino la Piedad, rocky slope, wayside, 30.05.2013, *R. Otto* (pers. obs.); Sta. Cruz de La Palma, LP-401 crossing Barranco del Carmen Dorador, rocky slope between roadside and forest path in the riverbed, some several years old clusters, with numerous *Kalanchoe ×houghtonii* nearby, 255 m, 24.09.2013, *R. Otto* (pers. obs.).

Some of the plants found in the wild in La Palma may belong to hybrid complexes involving *Aloe maculata*, rather than the true species itself.

Amaranthus blitum L. subsp. ***emarginatus*** (Salzm. ex Moq.) Carretero, Muñoz Garm. & Pedrol (Amaranthaceae).

Spain, La Palma: Breña Baja, Los Cancajos, wasteland near former sewage works, 23.09.2013, *R. Otto 20664* (pers. herb. RO, dupl. BR).

Amaranthus graecizans L. subsp. ***sylvestris*** (Vill.) Brenan (Amaranthaceae).

Spain, La Palma: Garafía, Franceses, corn field, numerous individuals, with *Malva nicaeensis* All., 20.08.2002, *R. Otto 7528* (pers. herb. RO, dupl. BR).

Amaranthus muricatus (Moq.) Hieron. (Amaranthaceae).

Spain, La Palma: Breña Baja, Los Cancajos, beach, border and planting of palm trees and other ornamentals close to the sea, numerous, 23.08.2000, *R. Otto 4688* (pers. herb. RO, dupl. BR); Garafía, Llano Negro, Calle Cueva de Agua, roadside, numerous, 01.09.2005, *R. Otto 11240* (pers. herb. RO).

Amaryllis belladonna L. [= *Brunsvigia rosea* (Lam.) L. S. Hannibal] (Amaryllidaceae).

Spain, La Palma: Barlovento, Travesía Casco Urbano, former cultivated land, numerous, 25.09.2013, *R. Otto 20715* (pers. herb. RO); surroundings of Barlovento, several times and often numerous and large clumps by roadsides, embankments, near abandoned houses, former gardens, etc., 25.09.2013, *R. Otto* (pers. obs. RO); Breña Alta, Barranco de la Zarcita, wasteland in riverbed, small clumps, probably former throwout, 23.09.2013, *R. Otto* (pers. obs.); Garafía, La Mata, former cultivated land alongside the LP-1, 04.09.2013, *R. Otto* (pers. obs.).

Anacyclus clavatus (Desf). Pers. (Asteraceae).

Spain, La Palma: Breña Alta, San Isidro, Barranco de Aduares, dirt road, 12.05.2012, *R. Otto 19213* (pers. herb. RO); ibid., San Pedro, Barranco de la Zarcita, Camino la Muralla, fallow land, 23.09.2013, *R. Otto 20654* (pers. herb. RO).

Antigonon leptopus Hook. & Arn. (Polygonaceae).

Spain, La Palma: Los Llanos de Aridane, LP-1 from Argual to Barranco de las Angustias, roadside, cracks in concrete drain gutter and foot of retaining wall, some specimens escaped from nearby cultivation, 16.08.2006, *R. Otto 12029* (pers. herb. RO).

Avena strigosa Schreb. subsp. ***strigosa*** (Poaceae).

Spain, La Palma: Breña Alta, above San Isidro, LP-301 near km 4, fallow land and roadside, abundant, 670 m, 12.05.2012, *R. Otto 19203* (pers. herb. RO, dupl. BR).

Brassica nigra (L.) W. D. J. Koch (Brassicaceae).

Spain, La Palma: Garafía, St. Domingo, construction site, ruderal vegetation on excavation material, several plants, 06.05.2012, *R. Otto 19123* (pers. herb. RO, dupl. BR).

Cascabela thevetia (L.) Lippold [= *Thevetia peruviana* (Pers.) Schum.] (Fig. 19) (Apocynaceae).

Spain, La Palma: Breña Baja, Los Cancajos, near Urbanización Las Salinas 3, former cultivated land, shrubby ruderal vegetation with *Artemisia thuscula* Cav. and *Kleinia neriifolia* Haw. alongside Calle Salinas, solitary shrub, 03.05.2012, *R. Otto 19046* (pers. herb. RO, dupl. BR).

Chlorophytum comosum (Thunb.) Jacques (Asparagaceae *s. l.*, Agavoideae).

Spain, La Palma: Villa de Mazo, El Pueblo, Barranco de Blas parallel Calle Caridad Salazar, several individuals growing out the stone wall and at foot of wall, with *Centranthus ruber* (L.) DC., *Crassula multicava* Lem., *Impatiens walleriana* Hook. f. and *Kalanchoe delagoensis* Eckl. & Zeyh. nearby, 11.03.2014, *R. Otto 20986* (pers. herb. RO).

Coffea arabica L. (Rubiaceae).

Spain, La Palma: Barranco de Juan Mayor, edge of banana plantation, several seedlings below a many years old planted bush and also in the gravelly riverbed nearby, 07.10.2013, *R. Otto 20772* (pers. herb. RO).

Figure 19. *Cascabela thevetia*, Los Cancajos, former cultivated land with dense shrubby ruderal vegetation, with *Kleinia neriifolia* and *Artemisia thuscula,* May 2013 (Photographs: R. Otto).

Crassula ovata (Mill.) Druce (= *Crassula argentea* Thunb.) (Crassulaceae).

Spain, La Palma, Breña Baja, alongside Calle los Cancajos, several individuals on escarpments and rocky slopes, 16.08.2008, *R. Otto* (pers. obs.); Villa de Mazo, El Pueblo, Barranco de Blas parallel Calle Caridad Salazar, slope and stonewall, escaped from cultivation nearby, several individuals, 04.05.2012, *R. Otto* (pers. obs.; photo det. *D. Guillot Ortiz* 2014); Sta. Cruz de La Palma, Caserío la Portada, *barranco* slope, throw-out, several individuals, 09.03.2014, *R. Otto 20946* (pers. herb. RO).

Euphorbia cyathophora Murray (Euphorbiaceae).

Spain, La Palma: Sta. Cruz de La Palma, El Puente, weedy in flower pot, several seedlings and small individuals, 01.10.2013, *R. Otto 20738* (pers. herb. RO); Breña Baja, Los Cancajos, base of wall and edge of parking, several small bushes in dense ruderal vegetation, with *Sida rhombifolia* L. var. *canariensis* K. Schum. and *Tithonia diversifolia* A. Gray, 03.10.2013, *R. Otto* (pers. obs.).

Farfugium japonicum (L.) Kitam. [= *Ligularia tussilaginea* (Burm. f.) Makino] (Asteraceae).

Spain, La Palma: Breña Baja, Los Cancajos, small parking, several vigorous plants in cracks of pavement, *ca.* 50 m away from cultivated plants (there also many seedlings), 20.09.2013, *R. Otto 20792* (pers. herb. RO).

Fumaria officinalis L. (Papaveraceae).

Spain, La Palma: Barlovento, Laguna de Barlovento, overgrown heaps of excavation material and construction waste, several individuals climbing in dense ruderal vegetation, 26.08.2009, *R. Otto 15482* (pers. herb. RO, dupl. BR); Sta. Cruz de La Palma, La Dehesa, mango plantation, many individuals between trees and on rocky slopes, 03.10.2011, *R. Otto 18742* (pers. herb. RO, dupl. BR).

Grevillea robusta A. Cunn. ex R. Br. (Proteaceae).

Spain, La Palma: Sta. Cruz de La Palma, El Puente, construction site, joint of paved stairs,

07.10.2012, *R. Otto* (pers. obs.); ibid., Velhoco, roadside LP-101, seedling *ca.* 50 cm tall, growing out of a retaining wall, 19.09.2013, *R. Otto 20627* (pers. herb. RO); ibid., La Dehesa, parking before sport centre, many seedlings under planted tree but also some individuals along nearby roadside, 24.09.2013, *R. Otto 19262* (pers. herb. RO); Villa de Mazo, El Pueblo, Calle Caridad Salazar, some seedlings in cobbles and also in the *barranco* nearby, 22.05.2013, *R. Otto 20160* (pers. herb. RO).

Guizotia abyssinica (L. f.) Cass. (Asteraceae).

Spain, La Palma: Barlovento, Laguna de Barlovento, roadside near entrance to the camping site, 27.08.2007, *R. Otto 13256* (pers. herb. RO).

Helianthus annuus L. (Asteraceae).

Spain, La Palma: Breña Baja, Los Cancajos, wasteland near former sewage station, 25.05.2013, *R. Otto 20250* (pers. herb. RO).

Hydrilla verticillata (L. f.) Royle (Hydrocharitaceae).

Spain, La Palma: Sta. Cruz de La Palma, Cuesta del Llano de la Cruz, water reservoir in orchard, 28.697543º N, 17.777891º W, 290 m, with *Landoltia punctata* (G. Mey.) Les & D. J. Crawford and *Azolla filiculoides* Lam., 15.08.2003, *R. Otto 14420* (pers. herb. RO, dupl. BR).

Much reminiscent of *Elodea canadensis* Michx. and possibly overlooked.

Impatiens sodenii Engl. & Warb. (= *I. oliveri* C. H. Wright ex W. Watson) (Fig. 20) (Balsaminaceae).

Figure 20. *Impatiens walleriana*, San Andrés, September 2011 (left) and *Impatiens sodenii,* Don Pedro, September 2013 (right) (Photographs: R. Otto).

Spain, La Palma: San Andrés y Sauces, San Andrés, Camino Cruz Grande, between banana plantations, 35 m, 03.09.2013, *R. Otto* (pers. obs.); Garafía, La Mata, roadside LP-1, 1040 m, 04.09.2013, *R. Otto 20764* (pers. herb. RO); Villa de Mazo, Calle Caridad Salazar near church, walls of Barranco de Blas, 01.06.2013, *R. Otto* (pers. obs.); Garafía, Calle Don Pedro between LP-1 and Don Pedro, roadside, escaped from cultivation, *ca.* 800 m, 30.09.2013, *R. Otto 20719* (pers. herb. RO, dupl. BR).

Cultivated as ornamental but less frequently so than *Impatiens walleriana* Hook. f. and much rarer as an escape.

Lobelia erinus L. (Campanulaceae).

Spain, La Palma: Sta. Cruz de La Palma, El Puente, several seedlings between cobbles, 15.05.2012, *R. Otto 19486* (pers. herb. RO, dupl. BR).

Malcolmia maritima (L.) R. Br. (Brassicaceae).

Spain, La Palma: Breña Baja, Los Cancajos, public green, several individuals in lawn, with *Lobularia maritima* (L.) Desv. and *Commelina diffusa* Burm. f., weedy, 19.9.2013, *R. Otto 20619* (pers. herb. RO).

Malva nicaeensis All. (Malvaceae).

Spain, La Palma: Barlovento, Franceses, weed in corn field, several individuals, with *Amaranthus graecizans* L., 20.08.2002, *R. Otto 7812* (pers. herb. RO, dupl. BR).

Medicago sativa L. *s. l.* (Fabaceae).

Spain, La Palma: Breña Baja, Montaña de Breña, edge of parking, several, 530 m, 03.09.2002, *R. Otto 7507* (pers. herb. RO, dupl. BR).

Melilotus albus Medik. (Fabaceae).

Spain, La Palma: Fuencaliente, Los Canarios, LP-209, parking, dry bare ground, several individuals, 07.05.2012, *R. Otto* (pers. obs.); Breña Alta, Carretera de la Cumbre (LP-3), Zona Industrial El Molino, dry waste area with gappy ruderal vegetation alongside the street, several individuals, 230 m, 21.05.2013, *R. Otto 20142* (pers. herb. RO, dupl. BR).

Mentha ×piperita L. var. ***citrata*** (Ehrh.) Briq. (Lamiaceae).

Spain, La Palma: Puntallana, Casco Urbano, sidewalk, growing out of water pipe, 25.09.2013, *R. Otto 20694* (pers. herb. RO, dupl. BR).

Morus alba L. (Moraceae).

Spain, La Palma: Puntallana, La Galga, Barranco de la Galga, wayside, several shrubs, 05.10.2012, *R. Otto 19848* (pers. herb. RO).

Ocimum basilicum L. (Lamiaceae).

Spain, La Palma: Sta. Cruz de La Palma, Barranco de las Nieves parallel Avenida las Nieves, dry gravelly riverbed, gappy ruderal vegetation, two individuals, 25.05.2013, *R. Otto 20245* (pers. herb. RO, dupl. BR); San Andrés y Sauces, near San Andrés, rocky slope on LP-104, several individuals, 25.09.2013, *R. Otto 20686* (pers. herb. RO).

Opuntia monacantha (Willd.) Haw. (= *O. vulgaris* Mill.) (Cactaceae).

Spain, La Palma: Breña Alta, San Isidro, small *barranco* alongside LP-301, 700 m, 10.03.2014, *R. Otto 20964* (pers. herb. RO); ibid., Miranda, wayside at foot of stone wall, cultivated nearby, 24.05.2013, *R. Otto* (pers. obs.; photo conf. *D. Guillot Ortiz* 2014).

Pallenis spinosa (L.) Cass. subsp. ***maroccana*** (Aurich & Podlech) Greuter [≡ *Asteriscus spinosus* (L.) Sch. Bip. subsp. *maroccanus* Aurich & Podlech] (Fig. 21) (Asteraceae).

Spain, La Palma: Tijarafe, Camino Bellido, several individuals on dry wasteland alongside a vineyard, 1100 m, 23.08.2007, *R. Otto 13289* (pers. herb. RO, dupl. BR).

Figure 21. *Pallenis spinosa* subsp. *spinosa* (left), Breña Alta, August 2008, priv. herb. *R. Otto* 14329 and *Pallenis spinosa* subsp. *maroccana* (right), Tijarafe, August 2007, priv herb. *R. Otto* 20964 (Photograph: R. Otto).

Passiflora edulis L. (Passifloraceae).

Spain, La Palma: Sta. Cruz de La Palma, Barranco de las Nieves parallel Avenida las Nieves, edge of dry gravelly riverbed, some vigorous and fruiting individuals, 03.10.2012, *R. Otto 19837* (pers. herb. RO, dupl. BR).

Phalaris minor Retz. (Poaceae).

Spain, La Palma: El Paso, Centro de Visitantes del Parque Nacional, border near entrance, 30.04.2012, *R. Otto 18992* (pers. herb. RO).

Plumbago auriculata Lam. (Plumbaginaceae).

Spain, La Palma: Breña Baja, Los Cancajos, Urbanización Las Salinas 2, ruderal wasteland alongside Calle Salinas, small shrub, 03.05.2012, *R. Otto 19044* (pers. herb. RO); Sta. Cruz de La Palma, Carretera Timibúcar (LP-202), damp rock facing roadside, 02.10.2013, *R. Otto* (pers. obs.); ibid., Calle Sebastián Arozena, rocky slope, little shrub, 02.10.2013, *R. Otto* (pers. obs.).

Portulaca oleracea L. [= *Portulaca oleracea* subsp. *stellata* Danin & H. G. Baker = *Portulaca stellata* (Danin & H. G. Baker) C. Ricceri & P. V. Arrigoni] (Portulacaceae).

Spain, La Palma: Sta. Cruz de La Palma, La Dehesa, mango plantation, storage area, numerous individuals, 01.06.2013, *R. Otto 20340* (pers. herb. RO, dupl. BR).

Schinus molle L. (Anacardiaceae).

Spain, La Palma: Sta. Cruz de La Palma, Barranco de las Nieves, crack of wall, 28.05.2013, *R. Otto 20395* (pers. herb. RO, dupl. BR).

Schinus terebinthifolius Raddi (Anacardiaceae).

Spain, La Palma: Sta. Cruz de La Palma, La Dehesa, small *barranco* between fruit plantations, planted specimens nearby, 24.09.2013, *R. Otto 20669* (pers. herb. RO); Puntallana, Casco Urbano, wasteland, 25.09.2013, *R. Otto* (pers. obs.).

Senecio angulatus L. f. (Asteraceae).

Spain, La Palma: Puerto Naos, wasteland between houses, in ruderal vegetation, escape from nearby cultivation, 29.05.2013, *R. Otto 20420* (pers. herb. RO); Garafía, La Mata, 1040 m, spreading in roadside of LP-1, 04.09.2013, *R. Otto 20763* (pers. herb. RO).

Senna bicapsularis (L.) Roxb. (Fabaceae).

Spain, La Palma: Sta. Cruz de La Palma, Plaza de San Fernando, public green, many seedlings under bushes and scattered in cracks of sidewalk, 25.05.2013, *R. Otto 20233* (pers. herb. RO).

Sisymbrium orientale L. (Brassicaceae).

Spain, La Palma: Garafía, St. Domingo, ruderal vegetation on construction waste, roadside, several plants, 06.05.2012, *R. Otto 19125* (pers. herb. RO, dupl. BR).

Solandra maxima (Sessé & Moc.) P. S. Green (Fig. 22) (Solanaceae).

Spain, La Palma: Sta. Cruz de La Palma, *barranco* slope near San Telmo on Carretera Timibúcar, roadside, climbing out of overgrown garden, 05.03.2011, *R. Otto 17650* (pers. herb. RO); Sta. Cruz de La Palma, crossroads LP-1 and Caserío Miranda, waste ground, overgrows *ca.* 200 m² of ruderal vegetation (with e.g. *Ricinus communis* L., *Nicotiana glauca* Graham and *Kleinia neriifolia* Haw.), 28.698606º N, 17.761019º W, 127 m, 09.03.2014, *R. Otto 20934* (pers. herb. RO).

Solanum bonariense L. (Solanaceae).

Spain, La Palma: Breña Alta, San Pedro, embankment at the edge of parking below Plaza Bujaz, *ca.* 5 bushes up to 2 m tall in dense ruderal vegetation, 27.09.2012, *R. Otto 19779* (pers. herb. RO, dupl. BR); ibid., only two small shrubs left after partial destruction of the location, 01.10.2013, *R. Otto* (pers. obs.).

Solanum chenopodioides Lam. (= *S. gracile* Dunal = *S. sublobatum* Willd. ex Roem. & Schult.) (Fig. 23) (Solanaceae).

Spain, La Palma: Breña Alta, San Isidro, nearby junction of Carretera de San Isidro and Camino 1a, foot of enclosure wall, bush *ca.* 1 m tall,

Figure 22. *Solandra maxima*, Sta. Cruz de La Palma, overgrows *ca*. 200 m² of ruderal vegetation, March 2014 (Photographs: R. Otto).

Figure 23. *Solanum chenopodioides*, San Isidro, September 2010 (Photographs: R. Otto).

02.09.2010, *R. Otto 17314* (pers. herb. RO, dupl. BR). The very same plant, but partially truncated, also seen 28.09.2012, *R. Otto* (pers. obs.).

Solanum mauritianum L. (Solanaceae).

Spain, La Palma: Breña Alta, Miranda, near Calle Camelias, weed in orchard with *Solanum abutiloides* Bitter & Lillo, several tall bushes, 26.08.2005, *R. Otto 11128* (pers. herb. RO); Barlovento near Cuesta Baja, Barranco de Abreu, embankment, 07.10.2011, *R. Otto 18765* (pers. herb. RO).

Tecoma stans (L.) Juss. ex Kunth (Fig. 24) (Bignoniaceae).

Spain, La Palma: Fuencaliente, Las Indias, surroundings of hotels, several shrubs up to 50 cm, gutter and foot of retaining wall, planted nearby, 31.05.2013, *R. Otto 20339* (pers. herb. RO); Breña Baja, Los Cancajos, Urbanización Las Salinas 3, wasteland and small tip near housing area, several seedlings and small shrubs, a planted individual in a front garden on the other side of the street, 22.09.2013, *R. Otto 20644* (pers. herb. RO).

Tecomaria capensis (Thunb.) Spach (Bignoniaceae).

Spain, La Palma: Breña Alta, slope of a small *barranco* between San Miguel and San Pedro, 23.05.2013, *R. Otto 20181* (pers. herb. RO); Breña Alta, near San Isidro, roadside LP-301, escaped on rocky slope, 20.09.2013, *R. Otto 20790* (pers. herb. RO).

Tradescantia pallida (Rose) D. R. Hunt (≡ *Setcreasea pallida* Rose) (Commelinaceae).

Spain, La Palma: Puntallana, near El Granel, roadside LP-1, base of retaining wall, small carpet, 25.09.2013, *R. Otto 20701* (pers. herb. RO).

Trifolium suffocatum L. (Fabaceae).

Spain, La Palma: Barlovento, Laguna de Barlovento, wasteland and dirt road near entrance of

Figure 24. *Tecoma stans*, Las Indias, May 2013 (Photographs: R. Otto).

camping site, numerous individuals, 01.05.2012, *R. Otto 19015* (pers. herb. RO, dupl. BR).

Ulmus minor Mill. (Ulmaceae).

Spain, La Palma: Breña Alta, San Pedro, Camino Barranco de Aguacencio, some wild bushes on slopes of the dry riverbed, 23.05.2013, *R. Otto 20182* (pers. herb. RO, dupl. BR).

Veronica persica Poir. (Plantaginaceae).

Spain, La Palma: Breña Alta, Avenida Bajamar, newly arranged border, scattered individuals, perhaps indroduced with grass seed, 19.08.2007, *R. Otto 13268* (pers. herb. RO); ibid., San Pedro, Barranco de la Zarcita, wayside, numerous individuals, 07.03.2014, *R. Otto 20907* (pers. herb. RO).

Vicia sativa L. subsp. ***sativa*** (Fabaceae).

Spain, La Palma: Breña Alta, San Isidro, as weed in sweet potato field, 13.10.2011, *R. Otto 18799* (pers. herb. RO); ibid., fallow land, perhaps former oat field, 13.10.2011, *R. Otto* (pers. obs.); ibid., waste land, in ruderal vegetation, 12.05.2012, *R. Otto 19210* (pers. herb. RO).

Xanthium spinosum L. [≡ *Acanthoxanthium spinosum* (L.) Fourr.] (Asteraceae).

Spain, La Palma: Breña Alta, near San Pedro, Barranco de la Zarcita, wasteland along Camino la Muralla, several individuals, 30.08.2008, *R. Otto 14388* (pers. herb. RO); ibid., several seedlings, 03.06.2013, *R. Otto* (pers. obs.).

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