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Christian Stierstorfer & Markus von Gaisberg

Annotated checklist and distribution of the vascular plants of El Hierro, Canary Islands, Spain

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Addresses of the authors:
Dr Christian Stierstorfer, Augustenhof 11, D-93133 Burglengenfeld;
e-mail: christian.stierstorfer@gmx.de

Dr Markus von Gaisberg, Pariser Str. 6, D-10719 Berlin;
e-mail: markus.v.gaisberg@gmx.de
web: www.hierro-flora.de

The front cover shows El Hierro, diplayed on the historic map of the Canary Islands of Bory de St. Vicent ("Neue Charte der Canarien Inseln nach der Zeichnung von Bory de St. Vicent" – Weimar 1803)

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Abstract

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Flora and vegetation of the Canary Island of El Hierro have been investigated since 1997 by both authors. The floristic inventory of the island has been recorded by means of a grid mapping following the 1 × 1 km² UTM grid. Both indigenous and introduced taxa were examined. The most important cultivated species were also mapped, particularly when they tend to escape into the wild. Beside the corresponding taxonomic literature, many experts were consulted for the identification of the numerous critical taxa. As a result, an annotated checklist of the vascular plants of El Hierro is presented, together with the distribution maps for c. 550 taxa.

Information on endemism, floristic status, life form, record history, altitudinal preferences and selected literature is given. Critical aspects are discussed in the accompanying comments.

The floristic information presented in this study supplements the results of the phytosociological research by the authors, which have already been published. Hence, a complete database on flora and vegetation of El Hierro has been established, which may serve as a basis for further scientific studies and conservation efforts.

Contents

Acknowledgements

The authors are grateful for the long-standing help and support of Prof. Dr P. Schönfelder of the Institute of Botany of the University of Regensburg. Many thanks to Prof. Dr Dr h.c. W. Wildpret de la Torre and the staff of the Departamento de Biología Vegetal, Universidad de La Laguna (Tenerife), for the trust and good will in our cooperation. The director of the Unidad Insular de Medio Ambiente de El Hierro, Javier Armas González, provided further help and the authorisations for the work within protected areas.

Many experts were consulted for the correct identification of the specimens or for advice in taxonomic/chorological questions. Their help is gratefully appreciated and they are listed below. Any remaining mistakes and inconsistencies are the responsibility of the authors of the checklist.

Bañares Baudet, A. (Santa Cruz de Tenerife): *Aeonium*
Beier, B.-A. (Uppsala): *Fagonia*
Bennert, H. W. (Bochum): *Pteridophyta*
Ford-Lloyd, B. (Birmingham): *Patellifolia*
Förther, H. (München): *Ononis*
Grau, J. (München): *Myosotis, Hypochaeris*
Hügin, G. (Denzlingen): *Amaranthus*, *Chamaesyce*
Hanelt, P. (Gatersleben): *Lathyrus, Vicia*
Jahn, R. (Radebeul): *Bartsia* and other Mediterranean taxa
Jury, S. (Reading): *Ammi, Cryptotaenia, Torilis*
Kadereit, J. W. (Mainz): *Papaver, Senecio*
Kretzschmar, H. (Bad Hersfeld): *Orchidaceae*
Matzke-Hajek, G. (Bonn): *Rubus*
Menezes de Sequeira, M. (Funchal, Madeira): *Holcus*
Mesa Coello, R. (Santa Cruz de Tenerife): *Adenocarpus, Cistus*
Molero, J. (Barcelona): *Euphorbia lamarckii*
Nezadal, W. (Erlangen): various species, particularly Mediterranean annuals, seen during an excursion in March 2003
Pérez de Paz, P. L. (La Laguna, Tenerife): *Micromeria, Todaroa*
Rivas-Martínez, S. (Madrid): *Olea,* and many further hints to identification problems
Santos Guerra, A. (Puerto de la Cruz de Tenerife): *Frankenia*
Scholz, H. (Berlin): *Poaceae, Polygonum aviculare* agg.
Schönfelder, P. (Regensburg): many hints about problems in identification and taxonomy
Schuhwerk, F. (München): *Andryala*
Small, E. (Ottawa): *Medicago*
Southam, M. (Gosport): *Seseli*
Uhlich, H. (Dresden): *Orobanche*
Vargas, P. (Madrid): *Olea*
Voggenreiter, V. (†): various species and many chorological hints (e.g. *Cistus chinamadensis*)
Wagenitz, G. (Göttingen): *Filago, Sonchus* (annual taxa), *Volutaria*
Welß, W. (Erlangen): various species, seen during an excursion in March 2003
Wildpret de la Torre, W. (La Laguna, Tenerife): many hints about identification problems
Wörz, A. (Stuttgart): *Galium*

Introduction

The project "Flora and Vegetation of El Hierro" began 10 years ago in September 1996, when the two authors made their first journey to El Hierro. It has been a contribution to the botanical investigation of the Canary Islands, embedded in a long-standing tradition at the University of Regensburg, notably established by Prof. Dr Peter Schönfelder, and also inspired by other German contributions such as by Prof. Dr Adalbert Hohenester († 1999), Prof. Dr Werner Nezadal and Dr Walter Welß, all at the University of Erlangen, and Dr Volker Voggenreiter († 2002), Bonn. The most important prerequisite, however, for the successful work in the Canary Islands was the confiding cooperation with our Spanish colleagues, particularly Prof. Dr Dr h.c. Wolfredo Wildpret de la Torre and his colleagues of the Departamento de Biología Vegetal (Universidad de La Laguna, Tenerife).

Based on this tradition we began to investigate the vegetation of El Hierro (Gaisberg 2005 and Stierstorfer 2005). Since a detailed and complete flora of the Canary Islands is still missing, it was necessary to consult many publications and numerous experts to identify the taxa correctly and to elucidate many questions. Additionally, it became apparent that many problems in identification and taxonomy obviously still lack a satisfying solution. Even "trivial" annual species often reveal an unusual habit, which may either be caused by the special environmental conditions, or by evolutionary processes entailing the first steps of speciation.

Despite the intense mapping of El Hierro gaps certainly remain. However, the distribution patterns of most taxa can be traced with the given maps. The authors wish to invite comments and criticism from anyone interested in the vascular plants of the Canary Islands and particularly El Hierro. Additions to the distribution maps are also welcome. Being fully aware of its incompleteness, this checklist should be considered a further step in the floristic investigation of El Hierro, which may serve as a basis for further scientific studies and conservation efforts

The herbarium specimens of the entire project have been deposited at the herbarium of the Botanic Garden and Botanical Museum Berlin-Dahlem (B), duplicates have been deposited at the herbarium of the Botanische Staatssammlung München (M).

Field work, mapping and taxonomy

Flora and vegetation of El Hierro have been investigated since 1997 in the context of two theses at the Institute of Botany of the University of Regensburg (working group Chorology and Vegetation Science, Prof. Dr Schönfelder). Accordingly, this checklist was accomplished by the equally shared contributions of both authors. The vegetation was researched by a total of nearly 1500 phytosociological plot samples (see Gaisberg 2005 for the low altitudes and Stierstorfer 2005 for the high altitudes). The flora was recorded by means of grid-mapping (UTM 1 × 1 km²). For almost every square kilometre the vascular plants were recorded qualitatively, marking the confirmed taxa in a floristic list. This information was compiled together with the data of the phytosociological relevés in a database (FLOREIN 5.0, Subal 1997). Almost the entire fieldwork was done in three growing seasons (1997-99). In Fig. 1 the state of the investigation is summarised. Short-time excursions followed every year up to 2004 and again in 2006. Small differences to few maps presented in Gaisberg (2005) and Stierstorfer (2005) result in the inclusion of data collected in 2004 and 2006.

In this study El Hierro has been treated in total as a part of the grid zone 28R following Ibañez & Alonso (1990), although the west of the island belongs to 27RYL (cf. Fernández-Palacios & Santos 1996: 45f). The position of the UTM grid follows Servicio Geográfico del Ejército 1997 (WGS-84 ellipsoid). For the localisation the 10 and 1 km coordinates are indicated. For example, the longitude value 90 and the latitude value 60 define UTM 28RAR9060, the values 00 and 70 define UTM 28RBR0070, etc. The vertical orientation of the maps is parallel to the longitudinal lines of the UTM grid, and therefore not exactly aligned to the north. One square in the maps equals 2 × 2 km². The contour lines run along the 200 m isohypses. For more geographical information see Gaisberg (2005: 11ff) and Stierstorfer (2005: 14ff). All UTM coordinates used in this study specify an area (1 × 1 km²), not a distinct point. For example "28RBR0070" refers to the area of 1 km² between the UTM coordinates 28RBR0070 and 28RBR0171.

The checklist of the vascular plants of El Hierro is based on that of Acebes Ginovés & al. (2001, abbreviated with AG), including also the data about subspecies and varieties provided by Hansen & Sunding (1993, abbreviated with HS). In some cases other scientific names are used in accordance with new literature or following expert recommendations, which is then indicated. Some subspecific taxa in AG are additionally listed, including the respective citation in the literature. Only some very common synonyms are given. The use of a reference list as a base of a checklist does not necessarily mean that the taxonomic concept behind the given names is preferred. It should rather be seen as a pragmatic procedure because it was not possible in the context of this study always to find the "best" taxonomic concept for a taxon. For many taxa subjectively selected information about old records and taxonomic literature is added; for some genera and species references to important revisions, recent phylogenetic reconstructions, etc., are cited at the beginning of an entry. However, a complete compilation for every taxon was not intended.

The dots in the distribution maps refer exclusively to the findings confirmed in the course of the grid mapping from 1997-2006. Important additional literature records are listed in the accompanying text. For a historical survey of the botanical investigation of El Hierro see Gaisberg (2005: 72f) and Stierstorfer (2005: 78ff).

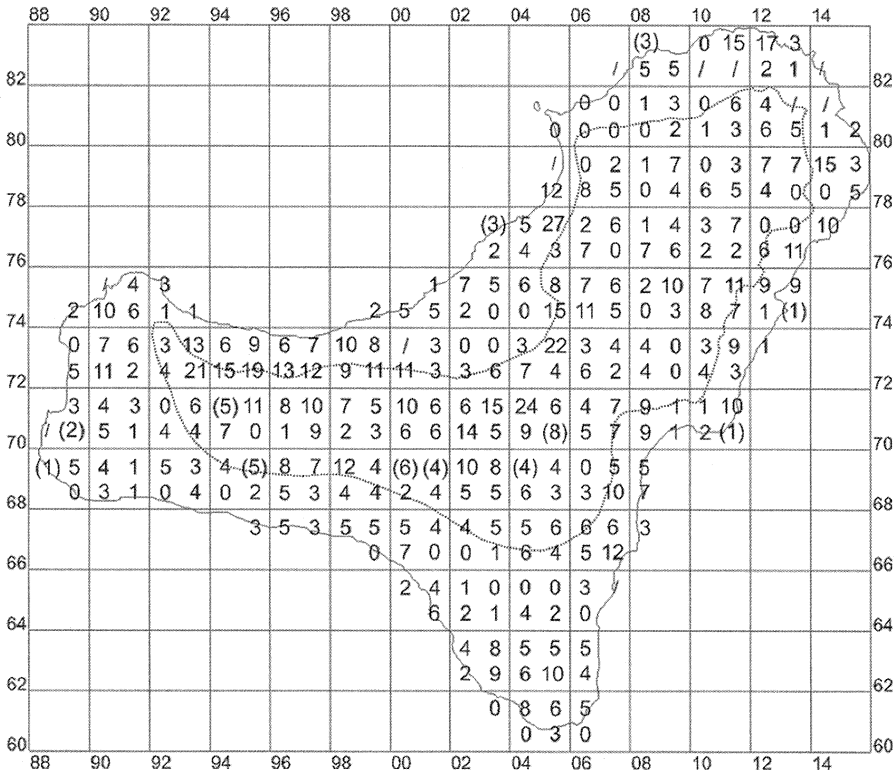


Fig. 1. Distribution of relevés and mapped square kilometres (UTM). – The investigated squares are indicated by the number of relevés; "0" indicates squares only studied floristically (grid mapping), numbers in parentheses indicate squares where only relevés were made (grid mapping missing/insufficient). The border between the Infra- and Thermomediterranean belt is marked by the dotted line (from Arco Aguilar & al. 1996: 455). It roughly traces the demarcation line between the lower and upper study area of Gaisberg and Stierstorfer, respectively.

In many cases critical aspects in taxonomy, nomenclature or identification, and the need for further investigation are indicated. The notes about literature and morphological characteristics should also make the identification results and the chosen names understandable. The data presented in the manuscripts of Voggenreiter (1997a-b, see under 'Unpublished sources') are additionally mentioned in the comments on some taxa. The assignment to Raunkiaer's life forms follows Lems (1960a), Sunding (1972) and Haeupler & Muer (2000); in some cases own experiences have been taken into consideration (cf. Dierschke 1994: 85ff). Important toponyms, names of regions and settlements to which the checklist refers are shown in Fig. 2.

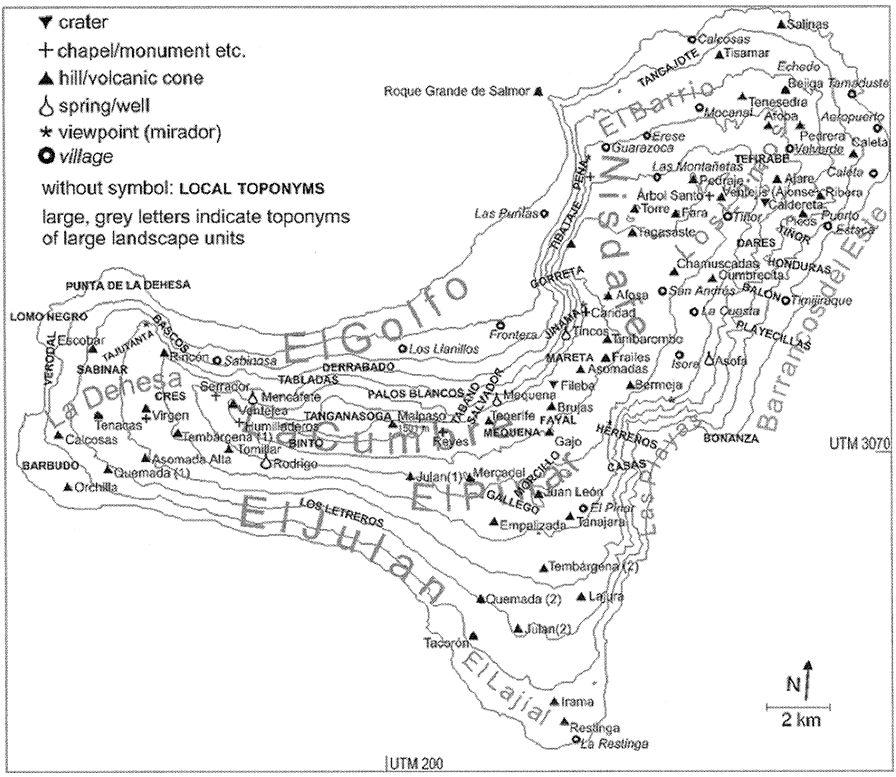


Fig. 2. El Hierro – physical regionalisation, settlements and important toponyms (additives and articles are omitted). – Contour lines along the 200 m isohypses. For more information on the toponyms see Gaisberg (2005: 12ff) and Stierstorfer (2005: 15ff).

The general distribution of each taxon on the Canary and Middle Atlantic Islands is presented in AG and HS, respectively, and therefore not indicated here. Unconfirmed taxa that are listed in the literature have been considered either as overlooked or as not existent on El Hierro. In the latter case it was tried to differentiate between probably extinct taxa and those records that are likely to refer to another, similar taxon.

Endemism and floristic status

The information about endemism of taxa is mainly based on Acebes Ginovés & al. (2001) and Hansen & Sunding (1993). Bearing in mind the critical aspects of the biogeographical "Macaronesia" concept (see, e.g., Lüpnitz 1995, Nicolás & al. 1989, Pott & al. 2003: 17), this term is not used here. Instead, the geographical term "Middle Atlantic Islands" (Mitchell-Thomé 1976: 1) is preferred. None of the endemics that exist on El Hierro occur in all of the archipelagos forming the Middle Atlantic Islands, which supports the criticism of the biogeographical "Macaronesia" concept. For a critical discussion of the "Macaronesian-Moroccan sector" see also Médail & Quézel (1999), the development of the biogeographical term "Macaronesia" and its various definitions in the literature are compiled by Lobin (1982: 72ff), see also Fernández Palacios & Dias (2001). In the present study, the distinction between endemics of the Azores, Madeira, Canaries and/or the Cape Verdes is made to offer more information about their phytogeographical affinities.

According to the biogeographical typology of Rivas-Martínez & al. (1993a: 63ff, 2001b, 2002: 18ff) the Canaries belong to the Mediterranean Region (Canarian Subregion, Canarian Province) and the Azores to the Eurosiberian Region. A similar concept is also presented by Lobin (1982: 98ff). In contrast, Lüpnitz (1995: 91ff) considers the Canary Islands to be a part of the Saharo-Sindian floristic region, emphasising the role of the low altitudes for the designation of the zonal vegetation and the biogeographical assignment (cf. Pott & al. 2003: 16ff).

The specification of the floristic status is performed cautiously and reservedly. Taxa of which the floristic status is rather clear or can at least be estimated with a certain probability have been categorised accordingly, although the status always remains hypothetical to some extent. For the other taxa no determination was made, which is consistent with the approach of Lobin & Zizka (1987), who created a "grey area" in their statistics about the Cape Verdes Islands for species with uncertain status. Besides literature information (see below), the chorological and phytosociological data of El Hierro have been taken into consideration for the analysis of the status. For many non-endemic, Mediterranean species phytosociological information is additionally given in the accompanying text of the maps to justify the suggested status. Information about community affiliation and habitat preferences of most of the species can be derived from Gaisberg (2005) and Stierstorfer (2005). Particularly the synoptical tables and floristic lists at the end of these studies offer the possibility to look at the overall phytosociological behaviour of almost all taxa of El Hierro.

Three major categories have been differentiated: indigenous, introduced (adventive) and cultivated. A further differentiation of the non-indigenous taxa into subcategories such as agriophytes and epecophytes, or archeophytes and neophytes in a strict sense (i.e. plants introduced after c. 1500 AD) etc., has not been performed. For more information on status issues see, e.g., Barthlott & al. (1999), Bergmeier (1991, 1992), Pyšek & al. (2004), Schroeder (1969, 1974) and Usher (2000). Examples for publications about the anthropogenic influence on the flora of the Middle Atlantic Islands are Conert (1987) for the Cape Verdes, Seidel & Gottschlich (1981) for Madeira and Schäfer (2003) for the Azores. The "naturalness" of El Hierro is analysed by Machado (2004). For general floristic statistics about the Middle Atlantic Islands and the Canary Islands in particular see, e.g., Hobohm (2000), Nezadal & al. (1999), Nicolás & al. (1989) and Welß & Lindacher (1994).

The presented suggestions of the specific floristic status have to be seen as provisional statements mainly based on the collected data and the field experience of the present authors. More thorough considerations including detailed information about diaspore vectors, dispersal patterns, general distribution, pre-Hispanic anthropology, etc., are beyond the limits of this study. Particularly palaeoecological and ethnobotanical studies could enlighten the status at least of some species (see, e.g., Machado Yanes 1999, Machado Yanes & Martín Rodríguez 2000).

Acebes Ginovés & al. (2001), Chilton (1994), Hohenester & Welß (1993) and particularly Kunkel (1991, 1992) were consulted for information about the floristic status. Other resources were, e.g., Brandes & Fritzsch (2002), Kunkel (1973, 1976) and Schmid (1976). Kämmer (1976: 332) estimates that almost half of the present species of El Hierro may not be native to this island, the Canaries or the Middle Atlantic Islands. In contrast, a "greater part" of the non-endemic Mediterranean element is considered to be native by Sunding (1979: 34), who states that "too much weight has been put on Man [sic] as a dispersal agent". It is certainly very difficult if not impossible to solve the question about the indigenity of many of the non-endemics, particularly those of Mediterranean origin. Even species restricted to communities that are supported by the activity of humans, e.g., the therophyte communities of seasonal pastures within the forest belt, cannot automatically be stated to have been "introduced". Oberdorfer (1965: 84) correctly hints at the fact that similar habitats existed to a small extent before the anthropogenic change of the landscape, e.g., on exposed, treeless rocks. Since the entire island is highly influenced by humans, the reconstruction of the species composition of the original natural vegetation is hardly possible down to the level of the accompanying annuals. Therefore the differentiation between idiochorophytes or agriophytes is often difficult. The situation on El Hierro may be even more complicated considering the relatively young volcanic activity up to historical times (see, e.g., Carracedo & al. 2001), which created virgin, treeless land open for initial colonisation. The geological history and geomorphological traits play also a major role in the speciation of the island endemics (Gaisberg & Stierstorfer 2005).

Distribution patterns on Hierro

A detailed analysis of distribution patterns of the species on Hierro has not been performed here. Nevertheless, some of the most striking distribution types are listed in the following, being named after one of their most representative species (for the respective maps see main part). For more information on some of the mentioned distribution types see Stierstorfer & al. (2005).

Myosotis latifolia type: restricted to areas with existing laurel forest or fayal-brezal.

Urtica morifolia type: restricted to areas in the El Golfo embayment with existing laurel forests or fayal-brezal.

Asplenium onopteris type: tracing the potential natural area of laurel forest or fayal-brezal.

Bromus rubens subsp. *kunkelii* type: tracing the Canary pine forest zone and the adjacent scrubland.

Brachypodium arbuscula type: inhabiting the steep cliffs in the extreme E and W of the El Golfo embayment.

Echium hierrense type: inhabiting steep and rocky habitats at intermediate altitudes (thermophilous scrub).

Poa bulbosa type: tracing the NE highland (pastureland "Meseta de Nisdafe").

Lolium rigidum type: tracing the total of important pasturelands of El Hierro.

Asparagus asparagoides type: tracing the traditional culture land with settlements in the NE (El Barrio).

Parietaria judaica - *Centranthus ruber* type: tracing important settlements of El Hierro.

Kleinia neriifolia type: avoiding the forest zone and forming a ring at the low and intermediate altitudes.

Lotus glinoides type: restricted to the dry SW, lower parts of El Julan.

Organisation of the checklist, abbreviations

The taxa are presented in the following order: *Pteridophyta, Gymnospermae, Dicotyledoneae* and *Monocotyledoneae*. Within these four groups, the families, genera, species and infraspecific taxa are listed alphabetically. This is a purely pragmatic approach, adopting the order presented by Hansen & Sunding (1993).

Every confirmed and mapped taxon is presented with a distribution map. Most of the cultivated plants were not mapped and are presented without distribution map.

The text corresponding to the maps is composed as follows:

1st line. – Scientific name of the identified taxon and author citation. In some cases the infraspecific taxa listed by AG/HS for El Hierro have not been identified or could not be distinguished in the course of our geobotanical research but are mentioned below in the respective comments.

2nd line (5 categories, separated by ";"). – (1) Endemism; (2) floristic status; (3) life form; (4) record history; (5) altitudinal preference. If there are more than one specifications per category, they are separated by "-", e.g., in record history: "new to Hierro - identification?"

The data for these five categories are coded as follows:

(1) Endemism:

–	non endemic
E Can	endemic to the Canaries
E Hierro	endemic to El Hierro
E Az/Mad/Can/CV	endemic to Azores/Madeira/Canaries/Cape Verdes
E [other Can. island]	endemic to other Canary islands (concerning taxa formerly recorded for El Hierro)

(2) Floristic status:

–	no clear indications about the status, possibly indigenous; the floristic status of not confirmed taxa is also not indicated, if there are no sufficient literature data
I	(probably) indigenous
N	non-indigenous, neophyte (most probably introduced after the Spanish conquest in the 15th century).
Nc	casual, permanent establishment/naturalisation not sure (ephemerophytes)
Ne	escaped from (former) cultivation, now established/naturalised (ergasiophygophytes)
Ni	introduced wild plant (adventive plant, anthropochores without cultivated plants), established/naturalised
(Ni)	presumably introduced wild plant, established/naturalised
NE	cultivated or introduced endemic, originally not indigenous in El Hierro
cult	cultivated or relic of cultivation, not yet established/ naturalised (ergasiophytes)
+	extinct.

(3) Life form:

Thero	theropyhtes (incl. biennials)
Hydro	hydrophte
Geo	geophyte
Hemi	hemicryptophyte
Chamae	chamaephyte
Nano	nanophanerophyte
Phanero	phanerophyte
liana	lianas (as appendix to the above categories)
succ	succulent (as appendix to the above categories)

(4) Record history:

–	the specifications below are not applicable
new Can	new record for the Canaries (reference: AG)
new Hierro	new record for El Hierro (reference: AG)
not AG	taxon not listed in AG but in HS
not AG/HS	taxon not listed in AG and HS
recHS not AG	former record in HS for El Hierro not accepted in AG
x	record in AG not confirmed, probably extinct and/or formerly casual, or overlooked
(x)	the record in AG is formally not confirmed owing to one of the following cases: (1) record in AG may refer to a closely related or new taxon; (2) taxon is aggregated with another, hardly distinguishable taxon in the course of the geobotanical investigations; (3) taxon is now treated as a synonym of another taxon which is also listed in AG/HS; (4) erroneous or doubtful record
changed name!	changes in identification, nomenclature or taxonomy; corrections (reference: AG)
new taxon!	new taxon, not yet mentioned in AG
identification?	taxonomic identification not clear, need for further investigation

(5) Altitudinal preference:

–	no exclusive preference or no data
↓	species grows (almost) exclusively at low altitudes (study area of Gaisberg)
↑	species grows (almost) exclusively at high altitudes (study area of Stierstorfer)

For many taxa various comments and further information are given facultatively. If available, they are presented according to the following scheme:

Syn	[synonyms] common synonyms (only in few frequently used cases)
det/conf	[determined / confirmed] at least one specimen of the respective taxon of El Hierro has been investigated by the mentioned specialist

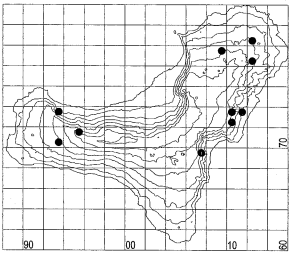
pers. comm.	[personal communication] a specialist has been consulted about the correct name of a taxon or about a specific information given in the comment
AG	Acebes Ginovés & al. 2001: *Pteridophyta, Spermatophyta.* – In: Lista de especies silvestres de Canarias
HS	Hansen & Sunding 1993: Flora of Macaronesia, checklist of vascular plants, ed. 4
AG/HS	further infraspecific differentiations given by Acebes Ginovés & al. (2001) and/or Hansen & Sunding (1993)
Lit	[literature] hints to taxonomic literature; examples of floras, checklists, etc., in which the used name of the taxon is applied. Some names have been changed following Wisskirchen & Haeupler (1998). These authors additionally present information about other floras and checklists using the same name, which is also indicated in some cases: FE = Tutin & al. 1964-80: Flora europaea, ed. 1, vol. 2-5; 1993: ed. 2, vol. 1. Hegi = Hegi, G. 1906ff: Illustrierte Flora von Mitteleuropa, vol. 1-7 (current editions). M-Ch = Greuter & al. 1984ff: Med-Checklist, vol. 1, 3, 4.
R	[record] examples of records in the literature about the respective taxon on El Hierro.
St	[status] additional information on distribution, community affiliation, literature, etc., to justify the suggested status.

Further comments are given in the text below the above points in an informal text passage.

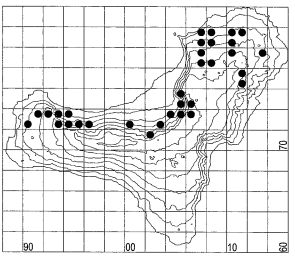
Checklist and distribution

Pteridophyta
Adiantaceae

Adiantum capillus-veneris L.
–; I; Hemi; –; ↑
HS: in El Hierro var. *capillus-veneris*.



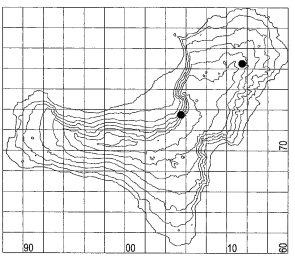
Adiantum reniforme L.
–; I; Hemi; –; –
HS: in Hierro var. *reniforme* and var. *pusillum* Bolle [subsp. *pusillum* (Bolle) Rivas-Mart.] but the varieties have not been distinguished in our study. The plants of the Canary Islands differ from those of Madeira in their chromosome number and "further investigation into the *A. reniforme* complex in Africa and China is required" (Gibby & Paul 1994: 35 f).
R: Benl & Sventenius (1970: 425): both varieties at several localities of El Hierro; Bonalberti Peroni & al. (2001: 292): Frontera (375 m).



Aspleniaceae

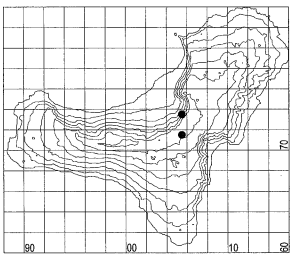
Asplenium aethiopicum subsp. *braithwaitii* Ormonde
E Can; –; Hemi; (x); –
Lit: Ormonde (1991a-b).
Included for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001). The records (e.g., Benl & Sventenius 1970: 445f, Chilton 1994: 2), however, may refer to *A. filare* subsp. *canariense*.

Asplenium anceps Lowe ex Hook. & Grev.
E Az-Mad-Can; I; Hemi; –; ↑
det/conf: H. W. Bennert
R: Benl & Sventenius (1970: 446 f): J. Andreas found in March 1897 few specimens (M) above Sabinosa (Fte. Mencáfete); Page (1971, cited in Bonalberti Peroni & al. 2001: 294): one specimen in El Golfo (1275 m).
A survey for the Canary Islands is in preparation (Horn & al. 2006).

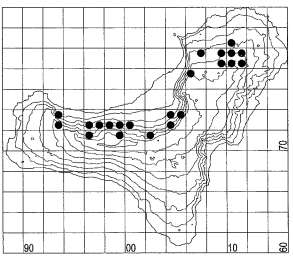


Asplenium billotii F. W. Schultz
–; –; Hemi; (x); –
The species is treated as a synonym of *A. obovatum* subsp. *lanceolatum* (e.g., Wisskirchen & Haeupler 1998: 84), all records may refer to that taxon.

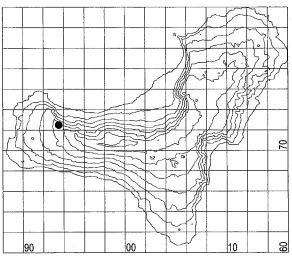
Asplenium filare subsp. *canariense* (Willd.) Ormonde
E Can; I; Hemi; –; ↑
det/conf: H. W. Bennert
Lit: Ormonde (1991a: 298; 1991b: 180ff).
During our fieldwork (growing season 1997-99) the fern was rare, but in March 2003 it was found frequently along the Jinama trail, which may reflect higher precipitation in 2002-03.



Asplenium hemionitis L.
–; I; Hemi; –; ↑
HS: in El Hierro var. *hemionitis;* for the variability of the leaf shape see Benl (1969).
R: Bonalberti Peroni & al. (2001: 294): near the "Holy Tree" (Garoé) at 1100 m.

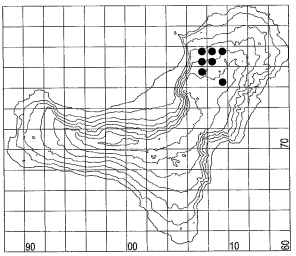


Asplenium marinum L.
–; I; Hemi; –; ↑
det/conf: H. W. Bennert
R: Benl & Sventenius (1970: 448f): in 1905 collected by C. Sobrado (MA), earlier records by C. Bolle, E. Bourgeau and H. de la Perraudière; Bornmüller (1904: 391): "inter Mokanal [sic] et Valverde"; more recent findings are reported by Santos Guerra & Gil Rodríguez (1975: 228) and Bonalberti Peroni & al. (2001: 294): between Jinama and Las Montañetas at 910 m.

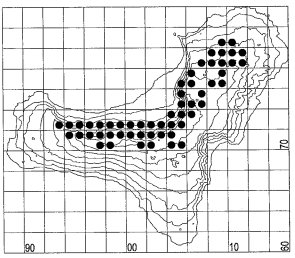


Only few specimens could be found near the trail La Dehesa-Sabinosa at the shady base of a rock at c. 850 m in 2002 and the following years, which is an astonishingly high altitude. Bonalberti Peroni & al. (2001: 294/296) also emphasise the unusual high altitude of their finding. The fern is usually reported as a typical floristic element of the low altitudes near the sea. Nevertheless, the region of the finding in the W is quite consistent with the record of A. Santos Guerra, P. L. Pérez de Paz and E. Barquín (cited in Santos Guerra & Gil Rodríguez 1975: 228), who recorded the species near the "Roque Basco" at c. 500 m.

Asplenium obovatum subsp. *lanceolatum* (Fiori) P. Silva
–; I; Hemi; –;↑
det/conf: H.W. Bennert
R: Lid (1967: 12): N of Tiñor, see also Benl & Sventenius (1970: 450); Bonalberti Peroni & al. (2001: 294): between Valverde and Tiñor (830 m); between Jinama and Las Montañetas (c. 900 m).

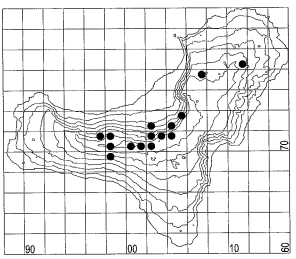


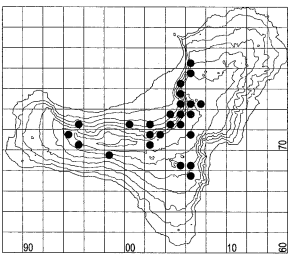
Asplenium onopteris L.
–; I; Hemi; –; ↑
HS: in El Hierro var. *onopteris*.
R: e.g., Bonalberti Peroni & al. (2001: 293): "not rare on the island".



Asplenium scolopendrium L.
–; cult; Hemi; new Hierro x; –
R: Chilton (1994: 2, *"Phyllitis scolopendrium"*): sine loco.
The species is introduced to the Canaries as ornamental plant (Kunkel 1992: 211ff).

Asplenium trichomanes subsp. *quadrivalens* D. E. Mey.
–; I; Hemi; –; ↑
det/conf: H. W. Bennert
R: Benl & Sventenius (1970: 426/450f): mostly at wet, rocky places; Bonalberti Peroni & al. (2001: 294): various places on (humid) rocks. Listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).

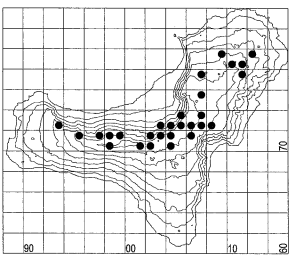




Ceterach aureum (Cav.) Buch
E Can-Mad-CV; I; Hemi; –; ↑
HS: in El Hierro var. *aureum,* but Bonalberti Peroni & al. (2001: 295) identified the plants as "subsp. *parvifolium*", following Ormonde (1990), whereas HS list var. *parvifolium* Benl & G. Kunkel only for Gran Canaria, Tenerife and La Palma.
Lit: Benl & Kunkel (1967). For recent genetic research results see Van Den Heede & al. (2004).
R: Benl & Sventenius (1970: 453f): many localities in El Hierro; Bonalberti Peroni & al. (2001: 295f): "well distributed in El Hierro". Listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).

Athyriaceae

Athyrium filix-femina (L.) Roth
–; –; Hemi; x; –
R: Benl & Sventenius (1970: 454): scattered plants near the trail Sabinosa-La Dehesa at c. 800 m. Listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).
Despite intense search the above records could not be confirmed. Bonalberti Peroni & al. (2001: 295) did not find the fern either.



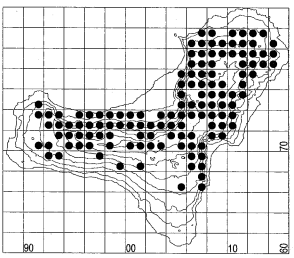
Cystopteris diaphana (Bory) Blasd.
–; I; Hemi; changed name!; ↑
AG: *C. viridula* (Desv.) Desv., HS: *C. fragilis* (L.) Bernh. s.l.;
Lit: Kerguélen (1999), Kunkel (1971: 37f), Gibby & Paul (1994: 48).
R: Benl & Sventenius (1970: 426) and Bonalberti Peroni & al. (2001: 295): at wet places.
In most cases the veins run into emarginations of the leaves, as indicated for this species (see, e.g., Benl 1966b: 42ff).

Blechnaceae

Woodwardia radicans (L.) Sm.
–; –; Hemi; (x); –
The species is not listed for El Hierro in HS (but in AG) and could not be confirmed during our fieldwork. Doubtful record?

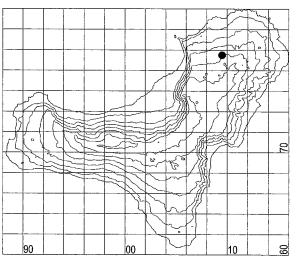
Davalliaceae

Davallia canariensis (L.) Sm.
–; I; Hemi; –; –
R: Bonalberti Peroni & al. (2001: 291): very frequent; they mention the fern also as a curiosity growing on a roof in Valverde.

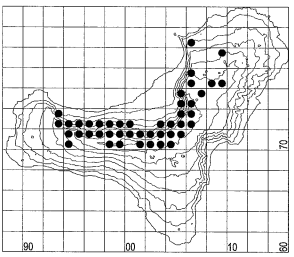


Dryopteridaceae

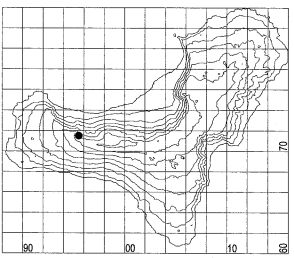
Dryopteris guanchica Gibby & Jermy
–; I; Hemi; new Hierro; ↑
Lit: Gibby & al. (1977).
St: Only one small population in fayal-brezal relics in the NE of Las Montañetas could be confirmed.
R: Voggenreiter (1997a): 28RBR0672 or the surrounding squares.



Dryopteris oligodonta (Desv.) Pic.-Serm.
E Can; I; Hemi; –; ↑
Lit: Gibby & al. (1977).
R: Bonalberti Peroni & al. (2001: 295): "very common in the forests".



Polystichum setiferum (Forssk.) Moore ex Woynar
–; I; Hemi; –; ↑
R: Santos Guerra (1980: 41): "Montes de Sabinosa". The record certainly refers to the population of the cliffs around "Fuente Mencáfete", where the species was found during the fieldwork.

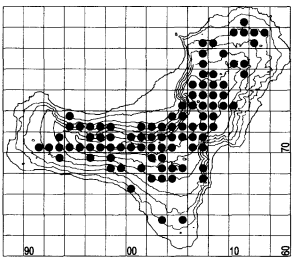


Gymnogrammaceae

Anogramma leptophylla (L.) Link

–; I; Thero; –; –

R: Benl & Sventenius (1970: 425): several localities, locally very frequent; Bonalberti Peroni & al. (2001: 292): frequent in El Hierro.



Hymenophyllaceae

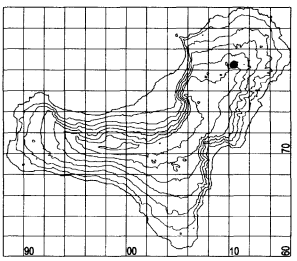
Trichomanes speciosum Willd.

–; I; Hemi; changed name!; ↑

AG: *Vandenboschia speciosa* (Willd.) G. Kunkel

Lit: Bennert (1998: 526), Gibby & Paul (1994: 39), Kerguélen (1999) and Wisskirchen & Haeupler (1998: 526).

R: Kämmer (1972, cited in Santos Guerra 1976: 225): below the "Ventejís" in a small cave with a water pool near the presumed location of the holy tree "Garoé". Bonalberti Peroni & al. (2001: 293): same location. Listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).



The small population near the "Garoé" could be confirmed during our fieldwork. On every field trip (most recently in June 2004 and 2006) it could be encountered in good condition. For conservation issues see Beltrán Tejera & al. (1999).

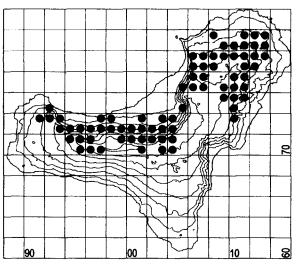
Hypolepidaceae

Pteridium aquilinum (L.) Kuhn

–; I; Geo; –; –

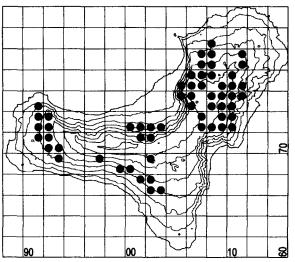
R: e.g., Bonalberti Peroni & al. (2001: 293): very common.

St: The status of the species as native is questioned by Kunkel (1976: 263). However, findings in archaeological sites prove the presence of the fern in the Canaries in prehispanic times (Machado Yanes & Martín Rodríguez 2000: 413ff).



Ophioglossaceae

Ophioglossum lusitanicum L.



–; I; Geo; –; ↑

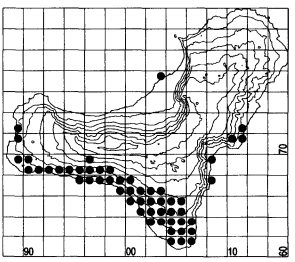
AG/HS: in the Canaries subsp. *lusitanicum*

Lit: Lobin (1986), Santos Guerra & Fernández Galván (1988), Santos Guerra & Gil Rodríguez (1975).

R: Lid (1967: 11), Pérez de Paz & al. (1976: 224) and Santos Guerra & Fernández Galván (1988: 64): several locations at high altitudes of El Hierro.

St: The species is restricted to the higher altitudes of El Hierro (cf. Voggenreiter 1997b) and grows on non-forested sites. Deforestation created additional habitats, but this tiny fern can be considered to be indigenous. It also exists in natural shrub communities, being a part of synusia dominated by annual weeds.

Ophioglossum polyphyllum A. Braun



–; I; Geo; –; ↓

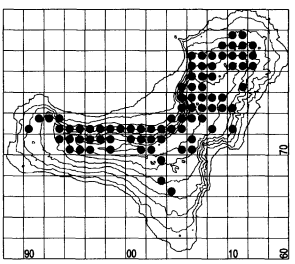
Lit: Lobin (1986), López González (1982), Santos Guerra & Fernández Galván (1988).

R: Pérez de Paz & al. (1976: 223, *"O. azoricum"*) and Santos Guerra & Fernández Galván (1988: 64): several locations in the lower regions of El Hierro. Listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).

St: The species is the counterpart of *O. lusitanicum* at the lower altitudes of El Hierro (cf. Voggenreiter 1997b).

Polypodiaceae

Polypodium macaronesicum A. E. Bobrov



–; I; Hemi; –; –

R: Bonalberti Peroni & al. (2001: 291): frequent in the laurel forest zone.

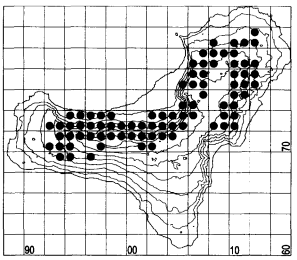
According to Kunkel (1992: 209) this name covers a complex that needs detailed investigation. Therefore in HS "s.l." is added to the name.

Selaginellaceae

Selaginella denticulata (L.) Spring

–; I; Chamae; –; –

R: Benl & Sventenius (1970: 426): at wet places; Bonalberti Peroni & al. (2001: 290f): many findings.



Selaginella kraussiana (Kunze) A. Braun

–; –; Chamae; x; –

R: Page (1965: 56f): "steep cliffside at 3950 feet [1200 m], below the north face of the peak of Malpaso and above the Valverde-Sabinosa road", confirmed by Benl & Sventenius (1970: 429), who report the species from among extensive populations of *S. denticulata* and also intermediate plants. They discuss the possibility that the populations of the Azores and Canaries may be indigenous and probably a separate taxon, whereas AG indicate the species as introduced. Gibby & Paul (1994: 30) consider the species in Madeira to be "possibly native, perhaps originating as an escape from cultivation".

The former records could not be confirmed, but the species may have been overlooked. Bonalberti Peroni & al. (2001: 291) do not present own findings, either.

Selaginella selaginoides (L.) P. Beauv. ex Schrank & Mart.

–; –; Chamae; x; –

R: Page (1971, cited in Bonalberti Peroni & al. 2001: 291).

El Hierro is the only island of the Canaries where the species is reported, probably a former casual.

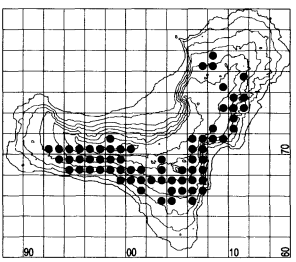
Sinopteridaceae

Cheilanthes guanchica Bolle

–; I; Hemi; –; –

det/conf: H. W. Bennert

Lit: Benl (1966b: 38ff, 1966c), Benl & Sventenius (1970: 440), Rasbach & al. (1983: 52ff) and Sáenz de Rivas & Rivas-Martínez (1979); Bonalberti Peroni & al. (2001: 291f) mention various localities.

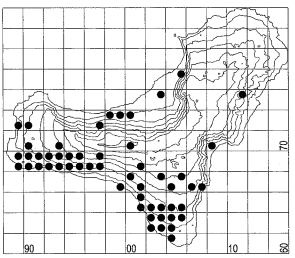


Benl & Sventenius (1970: 440) additionally mention *C. sventenii* Benl for El Hierro, which is considered to be synonymous to *C. guanchica* in HS and Kunkel (1992: 199). It is not always easy to distinguish specimens of *C. guanchica* and *C. pulchella,* because plants with transitional characters exist, but the first is apparently the more frequent

one in El Hierro. *C. guanchica* is allotetraploid, having evolved from *C. maderensis* and *C. pulchella* (both diploid) and can morphologically approximate one of the parent species (W. Bennert, pers. comm. 11/2000). The unequivocal identification of hybrids would have demanded the investigation of the spores and was hence not practised during our fieldwork.

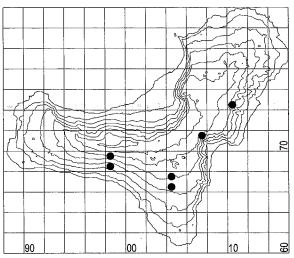
Cheilanthes maderensis Lowe
–; I; Hemi; –; –
det/conf: H. W. Bennert
Lit: Sáenz de Rivas & Rivas-Martínez (1979).

Recorded by Benl & Sventenius (1970: 438ff) as *C. fragrans* subsp. *maderensis* (Lowe) Benl. Their observation that the fern avoids the moist conditions of the trade wind zone could be confirmed.

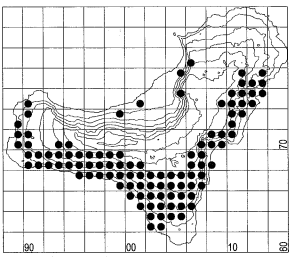


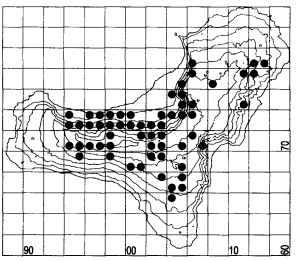
Cheilanthes pulchella Bory ex Willd.
E Can-Mad; I; Hemi; –; ↑
det/conf: H. W. Bennert.
Lit: Benl & Sventenius (1970: 443f), Sáenz de Rivas & Rivas-Martínez (1979); Bonalberti Peroni & al. (2001: 292) present two findings: (1) between Jinama and Las Montañetas (c. 900 m), (2) between El Pinar and La Restinga (515 m).

In El Hierro less frequent than *C. guanchica*. This is consistent with the data of Bonalberti Peroni & al. (2001: 292)



Cosentinia vellea (Aiton) Tod.
–; I; Hemi; changed name!; –
pers. comm. 03/2002: W. Bennert
HS/AS: *Cheilanthes catanensis* (Cos.) H. P. Fuchs (incl. subsp. *bivalens* (Reichst.) A. Hansen & Sunding).
Lit: Bonalberti Peroni & al. (2001: 293), Gibby & Paul (1994: 34), Kerguélen (1999), Kunkel (1992: 199), Pichi Sermolli (1985), Sáenz de Rivas & Rivas-Martínez (1979).
R: Bonalberti Peroni & al. (2001: 293) present two findings: (1) between El Pinar and La Restinga (515 m), (2) near La Restinga (340 m).





Notholaena marantae subsp. *subcordata* (Cav.) G. Kunkel
E Can-Mad-CV; I; Hemi; changed name!; –
pers. comm. 03/2002: W. Bennert
AG/HS: *Cheilanthes marantae* subsp. *subcordata* (Cav.) Benl & Poelt
Lit.: Bonalberti Peroni & al. (2001: 292), Gibby & Paul (1994: 33f), Kunkel (1969a; 1992: 199), Sáenz de Rivas & Rivas-Martínez (1979).

According to HS both var. *subcordata* and var. *cupripaleacea* Benl [subsp. *cupripaleacea* (Benl) Rivas-Mart. & al.] exist on El Hierro, whereas Benl & Sventenius (1970: 441ff) identified all specimens on the island as the latter one, which is characterised by the lower leaf surface being densely covered with copper-coloured scales. Typical specimens of the "*cupripaleacea* type" can be found, e.g., in the badlands of Tanganasoga, where they were already recorded in 1897 by J. Andreas (Benl 1966a: 141). The different taxa (if they exist on El Hierro) were not distinguishable during our field work because of various transitions.

Spermatophyta

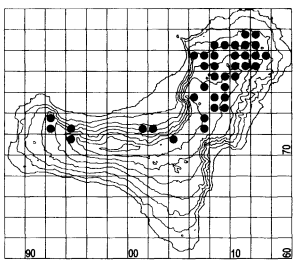
Gymnospermae

Araucariaceae

Araucaria heterophylla (Salisb.) Franco
–; cult; Phanero; –; –

Cultivated in some villages, e.g., in La Restinga (UTM 28RBR0560) or in the NE in the surroundings of Mocanal (UTM 28RBR0980/1080/1281).

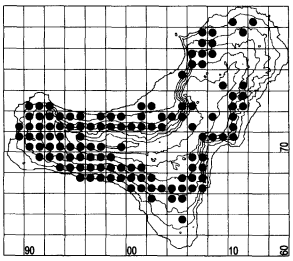
Cupressaceae



Cupressus sp.
–; cult; Phanero; –; –

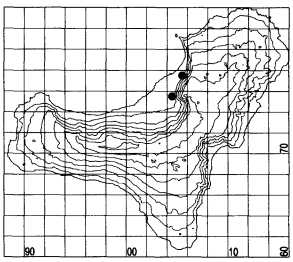
According to AG/HS *C. sempervirens* L. is the only species of the genus on El Hierro and also recorded, e.g., by Reifenberger & Reifenberger (1990: 248), Voggenreiter (1997a) and Viceconsejería de Medio Ambiente (2001: 14/21). Arco Aguilar & al. (1990: 81) additionally mention *C. macrocarpa* Hartw. in the plantations of "La Mareta" near "Hoya de Fileba", along the street Valverde-Frontera.

Juniperus turbinata subsp. *canariensis* (A. L. Guyot) Rivas-Mart. & al.
E Can?; I; Phanero; –; –
HS: *Juniperus phoenicea* L.
Lit: Rivas-Martínez & al. (1993c).
The taxon may also exist on Madeira and Porto Santo (Schönfelder 1997: 64; Press 1994: 55).



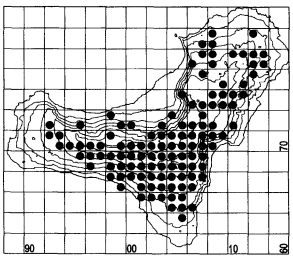
Ephedraceae

Ephedra fragilis Desf.
–; I; Nano; –; ↓
St: The small population at the base of the Risco de Tibataje may probably be indigenous.
R: Santos Guerra (1980: 42): E of El Golfo; also collected by E. Sventenius.

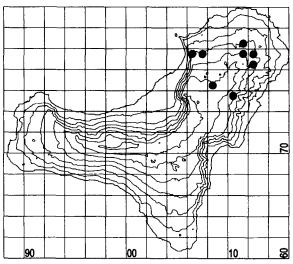


Pinaceae

Pinus canariensis C. Sm. ex DC.
E Can; I; Phanero; –; –
Particularly in the N many trees are presumably planted (Stierstorfer 2005: 164).



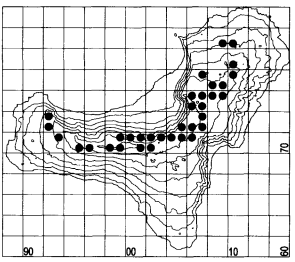
Pinus halepensis Mill.
–; cult; Phanero; –; ↑
R: Arco Aguilar & al. (1990: 77ff): several locations, around San Andrés.



Pinus pinea L.
–; cult; Phanero; not AG/HS; –
R: Arco Aguilar & al. (1990: 82): "Pico de Tenerife-Cruz de Los Reyes". This record could be confirmed (UTM 28RBR0270).

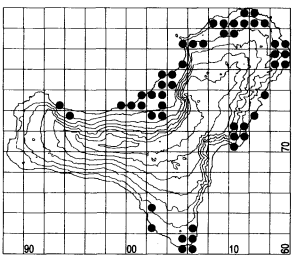
Pinus radiata D. Don
–; cult; Phanero; –; ↑
R: Arco Aguilar & al. (1990: 76ff): various plantations on El Hierro.

Considerable areas of El Hierro have been reafforested with this species. One of the plantations (N of San Andrés) has been destroyed to a large extent by a fire in 1998.

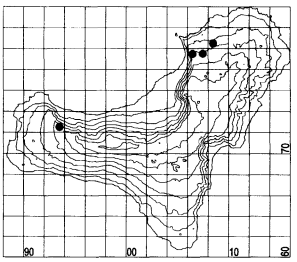


Angiospermae
Dicotyledoneae
Aizoaceae

Aizoon canariense L.
–; –; Chamae-succ; –; ↓

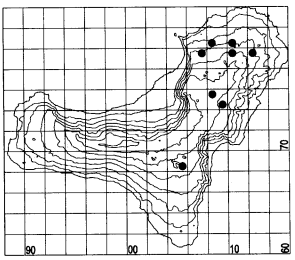


Aptenia cordifolia (L. f.) Schwantes
–; cult; Chamae-succ; –; –
St: The findings in UTM 28RAR9372 are within a laurel forest stand above Sabinosa (relevé 16 in table 5, Stierstorfer 2005: 126 f, 363). There it can also be interpreted as relic of cultivation, which is proved by walls crossing this young forest. The population is apparently not spreading into the wild.



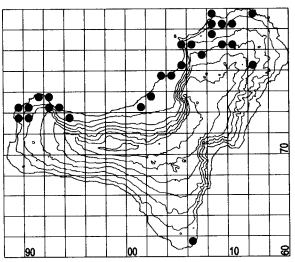
Carpobrotus acinaciformis (L.) L. Bolus
–; cult; Chamae; new Hierro; –
Recorded, e.g., in UTM 28RBR1279;

Carpobrotus edulis (L.) L. Bolus
–; cult; Chamae; new Hierro; –

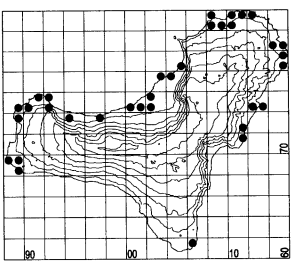


Mesembryanthemum L. [*Cryophytum* N. E. Br.]
The two species of the genus listed below were used for the extraction of soda and are probably introduced (origin: S Africa, see Pott & al. 2003: 26f and Kunkel 1991: 34). However, in AG and Chilton (1994: 3) the species are not indicated as introduced. The status is still in debate.

Mesembryanthemum crystallinum L.
–; (Ni); Thero-succ; –; ↓
St: Jahn & Schönfelder (1995: 74) doubt the status as indigenous to the Mediterranean region; Brandes & Fritzsch (2002): "may be introduced from S Africa" to the Canaries.

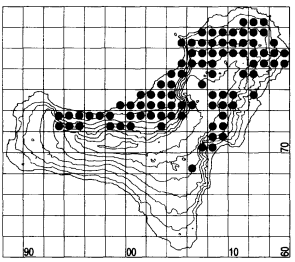


Mesembryanthemum nodiflorum L.
–; (Ni); Thero-succ; –; ↓



Amaranthaceae

Achyranthes aspera L.
–; Ni; Thero; –; –
In the Canaries only var. *sicula* L. (cf. Kunkel 1991: 43). Most authors (e.g. Rutherford & Jury 2002: 122, Schönfelder & Schönfelder 1997: 74, Turland 1994: 77) prefer to treat this taxon as a separate species, *A. sicula* (L.) All.
St: Mostly in ruderal sites, introduced according to Chilton (1994: 3).

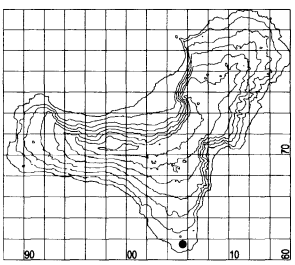


Alternanthera caracasana Kunth
–; cult; Hemi; x; –

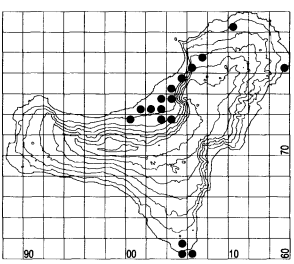
Amaranthus L.
Both species listed below as confirmed for El Hierro were identified by G. Hügin. For the distinction of the species see, e.g., Hügin (1986). Kunkel (1991: 45) considers all species of the genus in the Canary Islands to be introduced.

Amaranthus lividus L.
–; –; Thero; (x); –
AG/HS: in El Hierro subsp. *lividus*.
R: Santos Guerra (1996a: 446): UTM 28RBR1578.
The records may refer to *A. viridis*.

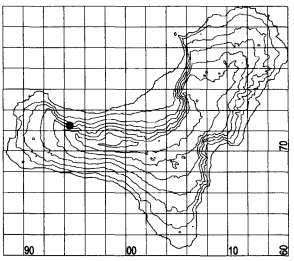
Amaranthus standleyanus Parodi ex Covas
–; Ni; Thero; –; ↓
St: The species is an established weed in the village La Restinga.



Amaranthus viridis L.
–; Ni; Thero; –; ↓
St: Mainly in the surroundings of agricultural land in El Golfo, around the Mirador de La Peña and around La Restinga.



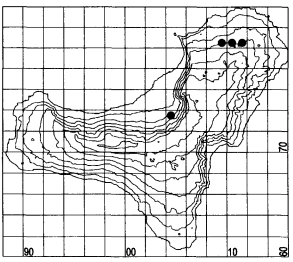
Bosea yervamora L.
E Can; I; Nano; –; ↑
Only one plant above Sabinosa could be found (see Pérez de Paz & al. 1976: 220); conspicuous shrubs on inaccessible cliffs of the "Risco de Tibataje" may also belong to the species.



Anacardiaceae

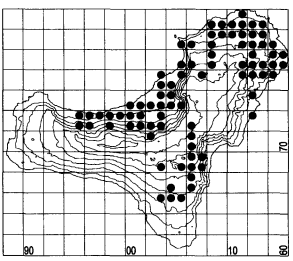
Mangifera indica L.
–; cult; Phanero; not AG/HS; –
Recorded e.g., in UTM 28RBR0375.

Rhus coriaria L.
–; cult; Nano; –; ↑

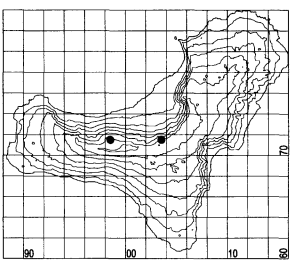


Apiaceae

Ammi majus L.
–; Ni; Thero; –; –
det/conf: S. Jury
St: Mostly in ruderal sites in the surroundings of El Pinar, the settlements in the NE and in El Golfo. Kunkel (1991: 164) lists the species as invasive in cultures and pastures.

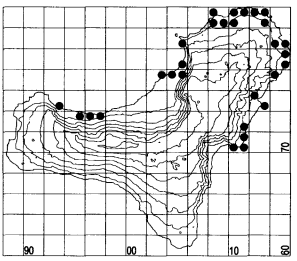


Anthriscus caucalis M. Bieb.
–; Nc; Thero; new Hierro; ↑

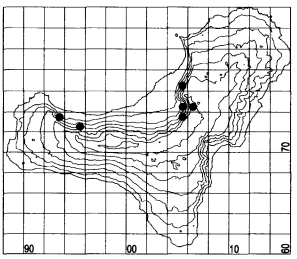


Apium graveolens L.
–; cult; Thero; x; –
R: Lid (1967: 127): Sabinosa, Los Lomos, Valverde and La Caldereta.

Astydamia latifolia (L. f.) Baill.
–; I; Hemi-succ; –; ↓

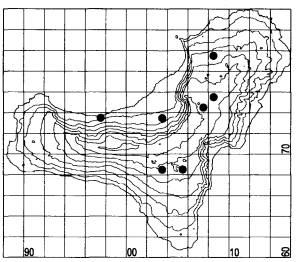


Bupleurum salicifolium R. Br.
E Can-Mad; I; Nano; –; ↑
AG: in El Hierro subsp. *aciphyllum* (Webb ex Parl.) Sunding & G. Kunkel and subsp. *salicifolium;* according to HS only the first subspecies grows in El Hierro. Kunkel (1991: 165) considers it to be the Canarian subspecies in contrast to the typical subspecies of Madeira. Wolff & Rosinski (1999a: 14) identified plants near the mountain trail above Sabinosa (UTM 28RAR9572) as var. *robustum* (Burchard) Cauwet & Sunding of the typical subspecies.



Bupleurum semicompositum L.
–; –; Thero; x; –
R: Santos Guerra (1980: 42): E. Sventenius collected specimens in the W (El Sabinar).

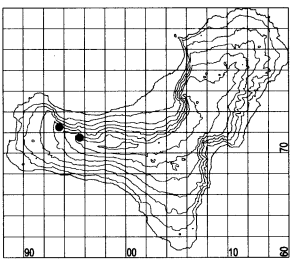
Conium maculatum L.
–; Ni; Thero; –; –
St: Small, scattered populations in nutrient-rich, anthropogenic habitats, introduced to the Canary Islands according to Kunkel (1991: 166).



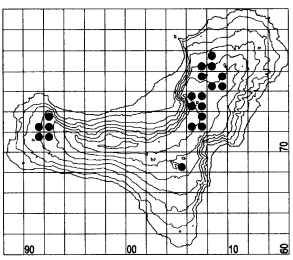
Coriandrum sativum L.
–; cult; Thero; –; –
Recorded, e.g., in UTM 28RBR1279.

Crithmum maritimum L.
–; +?; Chamae-succ; x; –
Despite intense search the species could not be encountered, probably extinct, if ever present on El Hierro.

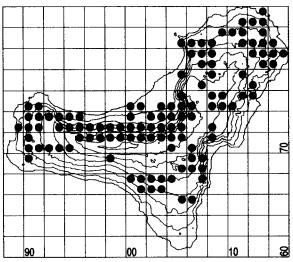
Cryptotaenia elegans Webb ex Bolle
E Can; I; Thero; –; ↑
det/conf: S. Jury



Daucus carota L.
–; (Ni); Thero; –; ↑
AG/HS: in the Canaries subsp. *maximus* (Desf.) Ball, to which all plants of El Hierro may belong. According to Hohenester & Welß (1993: 179) subsp. *parviflorus* (Desf.) Fiori also exists on all islands.



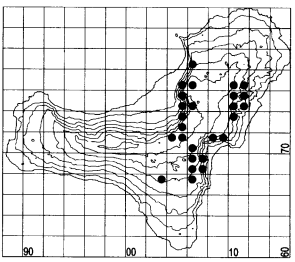
Drusa glandulosa (Poir.) Bornm.
–; I; Thero-liana; –; –
Lit: Mathias & Constance (1965: 55ff).
St: The species was formerly described as *D. oppositifolia* DC., endemic of the Canaries and Madeira and is still listed as endemic to this region by Cannon (1994: 239f). However, Kunkel (1991: 170) and HS do not treat the taxon as endemic, taking isolated populations in E Africa into consideration (Somalia, see Hedge & Miller 1977: 184). In addition, Mathias & Constance (1965: 55ff) mention populations on the Moroccan mainland, but consider these to be "sporadically introduced (?)", whereas in the Canary Islands the species "must surely be indigenous". However, other authors such as Lindinger (1926: 280) consider this species to be adventive in the Canaries. In El Hierro, it is very common in laurel forests and the



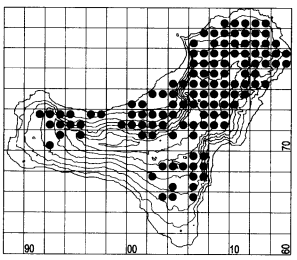
fayal-brezal, but also spreads into the shrub communities of the medium altitudes, supporting its given status as indigenous, although the dispersal of the fruits is certainly promoted additionally by the livestock. The presence of the stalked glochids on the adhesive fruits before the introduction of livestock and in absence of other vectors for epizoochory seems to be an enigma (cf. Schmid 1976: 244).

Following our own observations, the plants in the Canaries are indeed therophytes as indicated by Lems (1960a: 77), whereas Cannon (1994: 239) lists the species as perennial herb in Madeira.

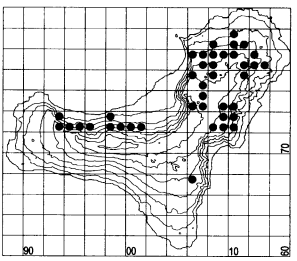
Ferula linkii Webb
E Can; I; Hemi; –; –



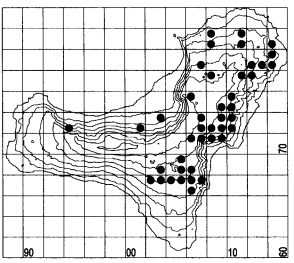
Foeniculum vulgare Mill.
–; Ni; Hemi; –; –
According to Hohenester & Welß (1993: 178) in the Canaries subsp. *piperitum* (Ucria) Cout.
St: Mostly in successional phases of pastures and agricultural land, but also in ruderal sites; invasive taxon according to Kunkel (1991: 167), listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



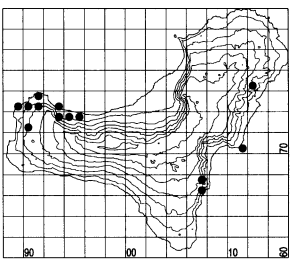
Petroselinum crispum (Mill.) A. W. Hill
–; Ne; Thero; –; –



Scandix pecten-veneris L.
–; Ni; Thero; –; –
AG/HS: in El Hierro subsp. *pecten-veneris*.
St: Mostly in ruderal sites, introduced to the Canaries according to Brandes & Fritzsch (2002) and Kunkel (1991: 169).

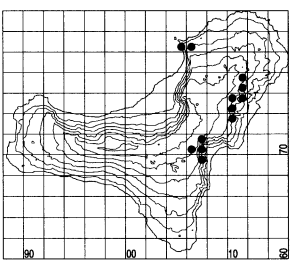


Seseli webbii Coss.
E Can; I; Hemi; –; ↓
det/conf: M. Southam

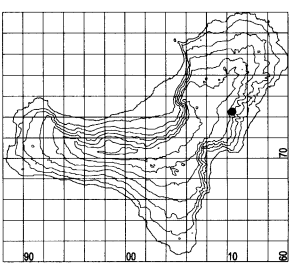


Smyrnium olusatrum L.
–; –; Hemi; x; –
R: Pérez de Paz & al. (1981: 55): "La Cuesta: Isora".

Tinguarra cervariaefolia (DC.) Parl.
E Can; I; Hemi; –; –

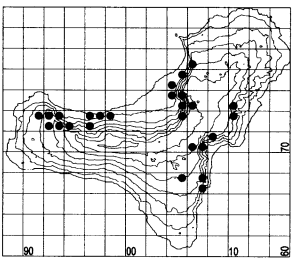


Tinguarra cervariaefolia × *Todaroa aurea* subsp. *suaveolens*
E Can; I; Hemi; not AG/HS; ↑
Only one small, sterile plant growing between the parents was found. It has a leaf shape intermediate of those of the parental species. Hence the identification as a hybrid seems rather convincing. In the same region in the E of El Hierro ("Riscos de Las Playas") Santos Guerra (1980: 43) recorded *"Tinguarra cervariaefolia*



× *T. montana",* which certainly refers to such plants. This hybrid may also occur in La Palma, where both parental taxa exist.

Todaroa aurea subsp. *suaveolens* P. Pérez

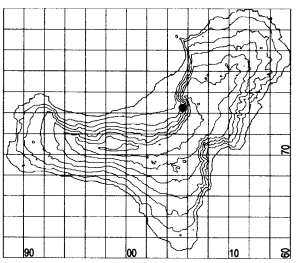


E Can; I; Hemi; changed name!; –
det/conf: P. L. Pérez de Paz
AG/HS: *T. aurea* subsp. *aurea*
R: Marrero Rodríguez (in Bramwell & Bramwell 2001: 238f): "the malpaís between Frontera and Sabinosa"; Santos Guerra (1980: 43): El Golfo and near Timijiraque.

Although the respective plants reveal some variability, e.g., in the leaf shape and hairiness, they apparently belong to one species. However, differences between plants growing in the W and the E of the island need further investigation. Generally, the specimens correspond quite well to the plants described by Pérez de Paz (1990) for La Palma. Nevertheless in the literature there is some confusion concerning the genera *Tinguarra* and *Todaroa,* see, e.g., Domínguez Santana & al. (1991), Kunkel (1991: 169f) and Marrero Rodríguez (2001: 238f); cf. *Todaroa montana.*

Todaroa montana Webb ex Christ.
E Can; I; Hemi; (x); –
HS: *Tinguarra montana* (Webb ex Christ) A. Hansen & G. Kunkel
R: Burchard (1929: 113): "El Andén de Bermejo" [in the W?]; Lid (1967: 132): "La Peña in El Golfo", "Bco. Sabinosa"; Marrero Rodríguez (2001: 238f): El Golfo; Pitard & Proust (1908: 203): "Fuente Tinco", "Riscos de Sabinosa"; E. Zogg in Schmid (1976: 245ff): laurel forest of the NW-facing slopes above Frontera, 600-900 m; all cited locations are in El Golfo. All the records may refer to *Todaroa aurea* subsp. *suaveolens,* see comment there.

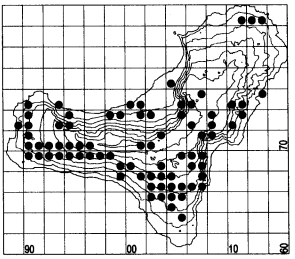
Torilis arvensis subsp. *purpurea* (Ten.) Hayek



–; Nc; Thero; new Hierro; –
det/conf: S. Jury
St: Only few specimens at the foot of the Fuga de Gorreta, probably casual.

The plants represent "var. *heterophylla* (Guss.) ined.", (≡ *T. heterophylla* Guss. ≡ *T. arvensis* subsp. *heterophylla* (Guss.) Thell.) (S. Jury, pers. comm. 07/2001).

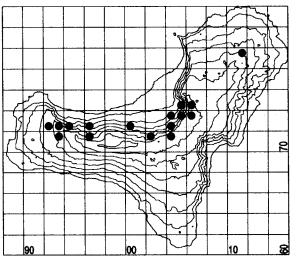
Torilis elongata (Hoffmanns. & Link) Samp.



–; –; Thero; –; –
det/conf: S. Jury
Syn: *T. arvensis* subsp. *elongata* (Hoffmanns. & Link) Cannon
St: The chorological and phytosociological data do not reveal any clue about the floristic status. However, Kunkel (1991: 170) considers all species of the genus to be introduced to the Canaries.

The report of *T. bifrons* (Pomel) Jafri in HS or *T. leptophylla* (L.) Rchb. f. by Kunkel (1991: 170, transl.: "in all major [Canary] islands") may refer to this species, which "frequently occurs in the Canaries" (Cannon 1994: 241). *T. elongata* prefers open sites, mainly at medium and lower altitudes of El Hierro.

Torilis webbii Jury



–; –; Thero; changed name!; ↑
det/conf: S. Jury
AG/HS: *T. nodosa* (L.) P. Gaertn.
Lit: Jury (1987).
St: In contrast to *T. elongata* (see above), *T. webbii* grows exclusively in windward, shady sites within or near stands of laurel forests or fayal-brezal at high altitudes, mainly in El Golfo. As in the case of *T. elongata,* the classification either as idiochorophyte or agriophyte is hardly possible.

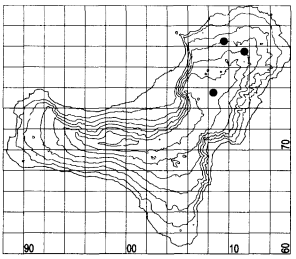
The records of *T. nodosa* (e.g., Pérez de Paz & al. 1981: 56, Kunkel 1991: 170) may refer to this species.

Apocynaceae

Catharanthus roseus (L.) G. Don
–; cult; Nano; new Hierro; –
Recorded, e.g., in UTM 28RBR1279;

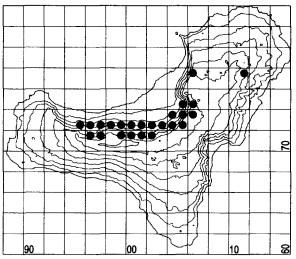
Nerium oleander L.
–; cult; Nano; –; –
R: Voggenreiter (1997a): several locations in the lower zone.
Recorded, e.g., in UTM 28RBR0477.

Vinca major L.
–; Ni; Chamae; –; ↑
R: Lid (1967: 135): surroundings of Valverde.



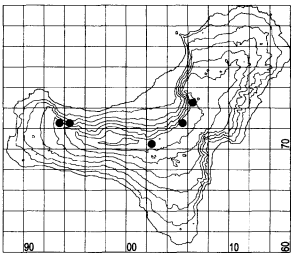
Aquifoliaceae

Ilex canariensis Poir.
E Can-Mad; I; Phanero; –; ↑
HS: in El Hierro var. *canariensis*; see also Kunkel (1977: 21ff).



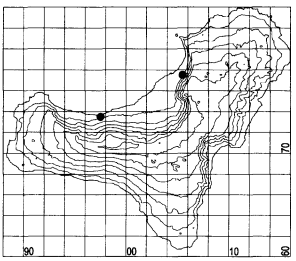
Araliaceae

Hedera helix subsp. *canariensis* (Willd.) Cout.
–; I; Phanero-liana; –; ↑



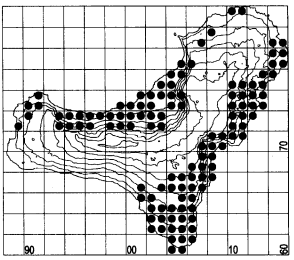
Asclepiadaceae

Ceropegia dichotoma Haw. subsp. *dichotoma*
E Can; I; Nano-succ; –; ↓
The peculiarities in the colour of the flowers of the plants of El Hierro are not considered to have taxonomic value (Bruyns 1986: 453).



Gomphocarpus fruticosus (L.) R. Br.
–; cult; Nano; –; –
Recorded, e.g., in UTM 28RAR9472.

Periploca laevigata Aiton
–; I; Nano; –; ↓
Concerning formerly suggested infraspecific taxa and their geographic distribution see, e.g., Francini & Messeri (1955: 765ff) and Kunkel (1970: 11f, 1972: 44).

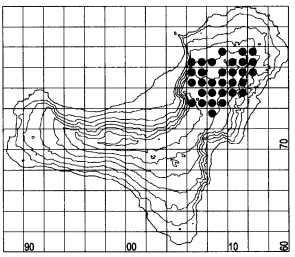


Asteraceae

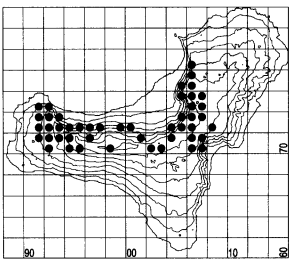
Ageratina adenophora (Spreng.) R. M. King & H. Rob.
–; Ni - +?; Hemi; x; –
The record of Fernández-Pello Martín (1989: 232f) is not regarded in AG/HS. Voggenreiter (1994: 829ff) considers the species to be introduced in the 1980ies, but presents no own records. During our fieldwork the species could not be encountered in El Hierro; it may have been just a casual weed not able to establish itself permanently. Extinct on El Hierro?

Allagopappus dichotomus (L. f.) Cass.
E can; –; Nano; x; –

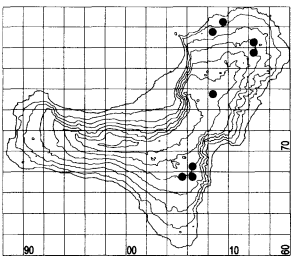
Andryala integrifolia L. var. *integrifolia*
–; (Ni); Thero; –; ↑
det/conf: F. Schuhwerk
St: Exclusively in the pastures in the NE highland.



Andryala pinnatifida Aiton subsp. *pinnatifida*
E Can; I; Chamae; –; ↑
det/conf: F. Schuhwerk
Lit: Rivas-Martínez & al. (1993b: 350).

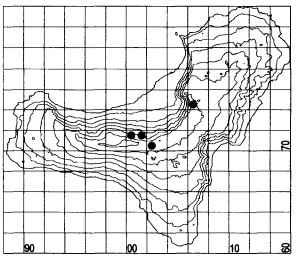


Anthemis cotula L.
–; Ni; Thero; –; –
St: Restricted to anthropogenic habitats near human settlements, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

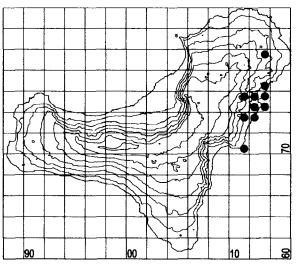


Argyranthemum Webb ex Sch. Bip.
A revision of the genus is presented by Humphries (1976). More recent information regarding phylogenetics on the base of molecular analyses is presented, e.g., by Francisco Ortega & al. (1996).

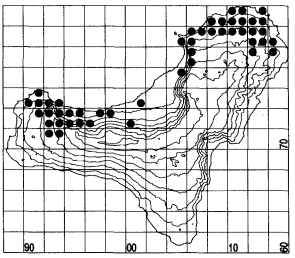
Argyranthemum adauctum subsp. *erythrocarpon* (Svent.) Humphries
E Hierro; I; Nano; –; ↑
R: The population at "Lomo de Tábano" has already been recorded by Pérez de Paz & al. (1981: 49/51), see also Humphries (1976: 234) and Sventenius (1969: 52f). A survey is given by Martín Cáceres & al. (2003: 114 f).
The records in the E (UTM 28RBR0674) refer to a few individuals near the trail of Jinama, the main population is probably in the steep cliffs above.



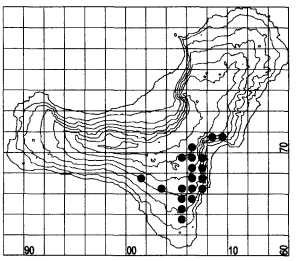
Argyranthemum frutescens (L.) Sch. Bip. subsp. *frutescens*
E Can; I; Nano; –; ↓
For El Hierro the taxon is only recorded at species rank by Humphries (1976: 180ff), but considering the characters given by this author the plants belong to the typical subspecies as indicated by AG/HS. AG additionally record subsp. *succulentum* Humphries for El Hierro.



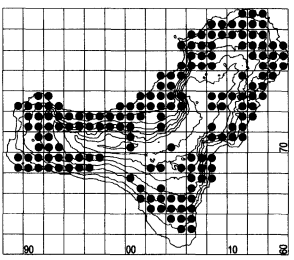
Argyranthemum hierrense Humphries
E Hierro; I; Nano; –; –
Lit: Humphries (1976: 218ff).



Argyranthemum sventenii Humphries & Aldridge
E Hierro; I; Nano; –; –
Lit: Humphries (1976: 211ff), Lucía Sauquillo & al. (1996: 58ff) and Santos Guerra (1996b: 118f).



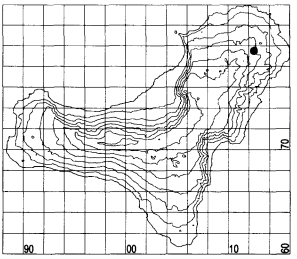
Artemisia thuscula Cav.
E Can; I; Nano; –; –



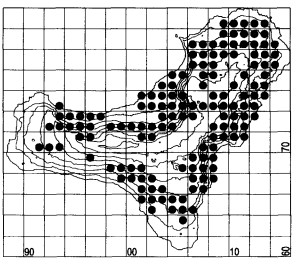
Aster squamatus (Spreng.) Hieron.
–; –; Thero; x; –

Asteriscus sericeus (L. f.) DC.
E Fuerteventura; cult.; Chamae; new Hierro; –
Syn: *Nauplius sericeus* (L. f.) Cass.
R: Voggenreiter (1997a): cultivated in the region of Valverde.
Cultivated, e.g., in La Restinga.

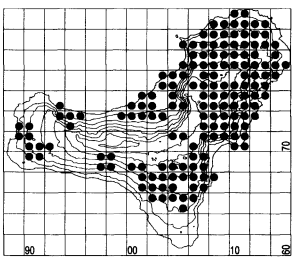
Bidens aurea (Dryand.) Sherff
–; Ni; Hemi; –; ↑
St: The population in Valverde seems to be right on the way to establish itself. Chilton (1994: 4) also lists the species as introduced.



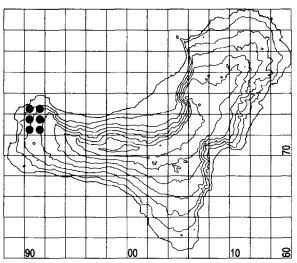
Bidens pilosa L.
–; (Ni); Thero; –; –
St: Very common at medium and lower altitudes, probably introduced and certainly effectively dispersed by the livestock. Chilton (1994: 4) lists the species as introduced.



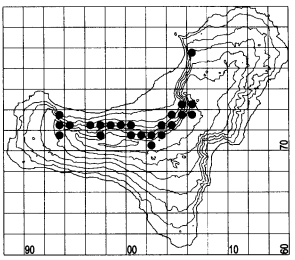
Calendula arvensis L. (incl. *C. aegyptiaca* Desf.)
–; –; Thero; –; –
Whereas Press (1994: 361) treats the two names as conspecific, Kunkel 1991: (239f) treats them as two subspecies, AG as two species. Wolff & Rosinski (1999a: 14) identified several plants at different places of El Hierro as *C. aegyptiaca* and regarded the species as a new record for the island.



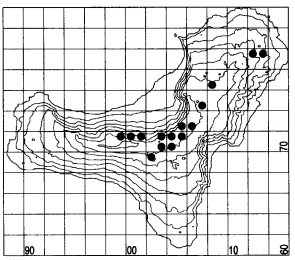
Carduus baeocephalus subsp. *microstigma* Gaisberg & Wagenitz
E Can; I; Thero; new taxon!; ↓
The population of El Hierro and some of those of Gran Canaria have been separated from subsp. *baeocephalus* (Gaisberg & Wagenitz 2002, Gaisberg 2002). In these recent publications the incorrect descriptions of *C. baeocephalus* var. *tomentosa* Pit. and *C. baeocephalus* var. *glabra* Pit. (in Pitard & Proust 1908: 242) have deliberately not been considered.



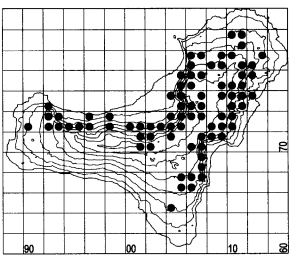
Carduus clavulatus Link
E Can; I; Thero; –; ↑



Carduus tenuiflorus Curtis
–; –; Thero; –; ↑
St: Mostly within the fayal-brezal, but also scattered in the NE highland, agriophyte? Listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

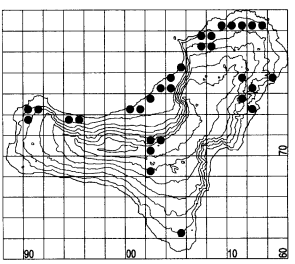


Carlina salicifolia (L.f.) Cav. var. *salicifolia*
E Can-Mad; I; Nano; –; –
Lit: Meusel & Kästner (1994: 46ff).



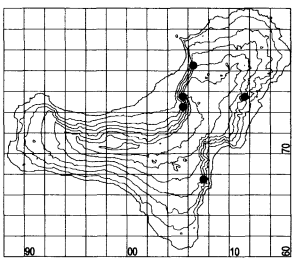
Centaurea calcitrapa L.
–; –; Thero; x; –

Centaurea melitensis L.
–; –; Thero; –; –
St: Mostly at lower altitudes, scattered in natural and anthropogenic shrub communities of El Hierro; listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



Chamaemelum mixtum (L.) All.
–; –; Thero; x; –
R: Lid (1967: 175): surroundings of Valverde.

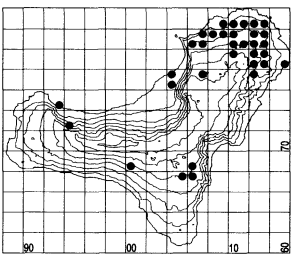
Cheirolophus duranii (Burchard) Holub



E Hierro; I; Nano; –; –
R: Beltrán Tejera & al. (1999), Burchard (1929: 211), Ceballos & Ortuño (1976: 408), Lucía-Sauquillo & al. (1996: 63ff), Santos Guerra (1996b: 176f) and Sventenius (1960b: 13) present additional records above Sabinosa in the W of El Golfo. A survey is given by Rodríguez Delgado & al. (2003: 176f). Listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).

This endemic grows in the cliffs in the E as well as in the "Risco de Tibataje" in El Golfo.

Chrysanthemum coronarium L.

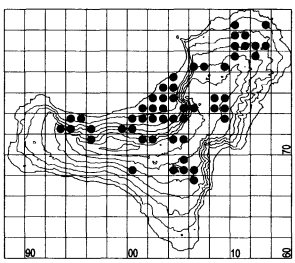


–; Ni; Thero; –; –
St: Mostly in the ruderal vegetation in the surroundings of the main settlements of El Hierro, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

In El Hierro almost exclusively with white-yellow flowers (var. *discolor* d'Urv., see Kunkel 1991: 247).

Cichorium endivia subsp. *divaricatum* (Schousb.) P. D. Sell
–; –; Thero; x; –

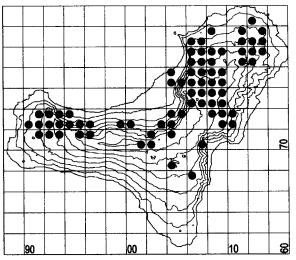
Conyza bonariensis (L.) Cronquist



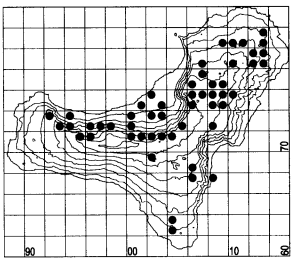
–; Ni; Thero; identification?; –

The correct identification, particularly of juvenile plants, was not easy and the separation from *C. floribunda* may be doubtful for the populations of El Hierro. Probably, the two taxa should be treated as one complex, or even all plants belong to *C. bonariensis* (origin: South America). This species is recorded as the most common one in the Canaries by Kunkel (1991: 248), whereas this author considers the presence of *C. floribunda* in the Canaries to be questionable and the taxonomic designation of the *Conyza* species in the Canaries not clear. Cronquist (1976: 120) indicates *C. floribunda* as "variant" of *C. bonariensis*.

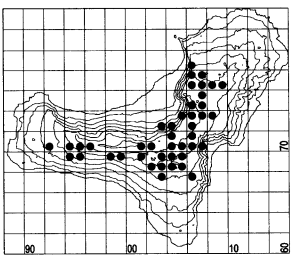
Conyza floribunda Kunth
–; Ni; Thero; new Hierro - identification?; –
See comment on *C. bonariensis*.



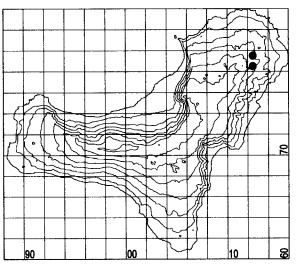
Cotula australis (Spreng.) Hook. f.
–; Ni; Thero; –; –
St: Mainly on urban and rural trails as a typical part of heavily trodden communities.



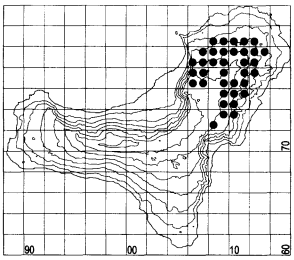
Crepis foetida L.
–; –; Thero; –; ↑



Cynara cardunculus L.
–; cult; Hemi; –; ↑
HS: in El Hierro var. *ferocissima* Lowe



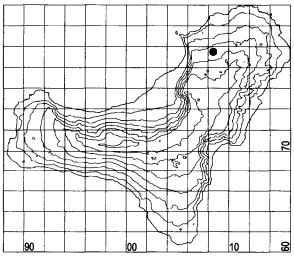
Dittrichia viscosa (L.) Greuter



–; Ni; Nano; –; ↑

St: The species inhabits ruderal sites in the pastureland in the Meseta de Nisdafe, but also grows in natural habitats such as the dry ground of episodic rivulets, hence is most probably an agriophyte. Kunkel (1973: 104, 1976: 260) mentions the species as a successful invader of anthropogenically disturbed or modified soils. The establishment of the species on the Canary Islands is particularly promoted by soil-moving operations of heavy machinery, which took place, e.g., in the NE highland of El Hierro to exploit soil for banana fields in El Golfo. Schmid (1976: 245) considers the species to be introduced, too. Its status as introduced to Fuerteventura is questionable (Brandes & Fritzsch 2002).

Erigeron karvinskianus DC.



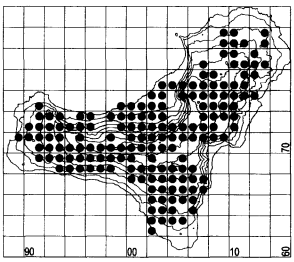
–; Ne; Chamae; new Hierro; ↑

Only a few individuals above the village of Erese.

Evax pygmaea (L.) Brot.

–; –; Thero; x; –

Filago gallica L.



–; –; Thero; changed name!; –

AG/HS: *Logfia gallica* (L.) Coss. & Germ.

Lit: Wisskirchen & Haeupler (1998: 222, Hegi).

The species is very variable in El Hierro; for its variability see, e.g., Wagenitz (1970: 134).

Filago minima (Sm.) Pers.

–; –; Thero; (x); –

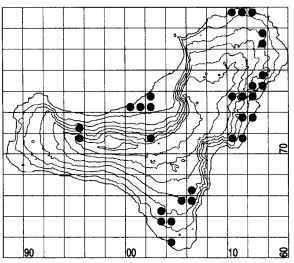
AG/HS: *Logfia minima* (Sm.) Dumort.

Lit: Wisskirchen & Haeupler (1998: 222, Hegi).

R: Kunkel (1991: 262): El Hierro (and Tenerife); Pérez de Paz & al. (1981: 54): "Sabinar de Dehesa".

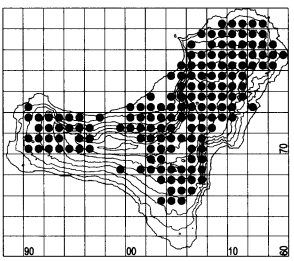
Probably confused with abnormal individuals of *F. gallica*.

Filago pyramidata L.
–; –; Thero; –; –
det/conf: G. Wagenitz
HS: in El Hierro var. *pyramidata*.
Plants of the Canaries often deviate slightly from Mediterranean plants (G. Wagenitz, pers. comm. 02/2000).

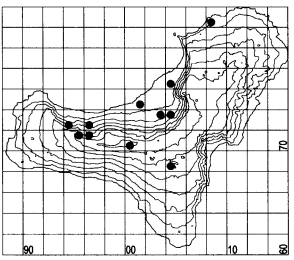


Filago vulgaris Lam.
–; –; Thero; (x); –
R: Pérez de Paz & al. (1981: 53): "Lomo Negro" and "El Cres".
Probably confused with abnormal individuals of *F. gallica* or *F. pyramidata*.

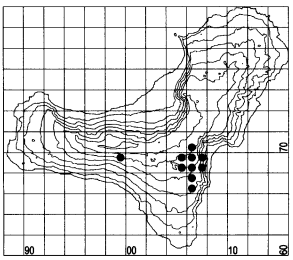
Galactites tomentosa Moench
–; –; Thero; –; –
St: Mainly in pastures, abandoned agricultural land and ruderal sites, but also in natural, non-forest communities; possibly introduced according to Kunkel (1991: 253).



Gamochaeta pensylvanica (Willd.) Cabrera
–; Ni; Thero; –; –
HS: *Gnaphalium pensylvanicum* Willd.
Lit: Devesa (1987: 33), Kerguélen (1999), Press (1994: 342 f).
St: Scattered in ruderal sites (origin: SE North America and South America).

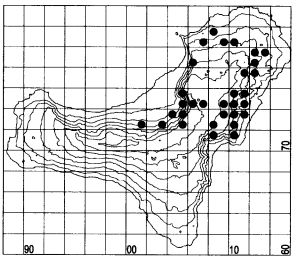


Gonospermum canariense Less.
E Can; I; Nano; –; ↑
R: Santos Guerra (1996b: 310f, "en El Hierro [...] bastante rara"), E. Zogg in Schmid (1976: 245ff) additionally reports findings in the laurel forest of the NW-facing slopes above Frontera, 600-900 m. *"G. elegans"* is listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).

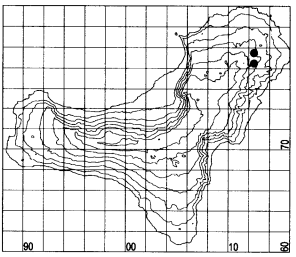


The plants of El Hierro have been treated as separate taxon (*G. elegans* (Cass.) DC., *G. canariense* subsp. *elegans* (Cass.) Febles) by some authors (e.g., Bramwell & Bramwell 2001: 335, García Casanova 2001, see also Kunkel 1991: 255 and Schönfelder & Schönfelder 1997: 226).

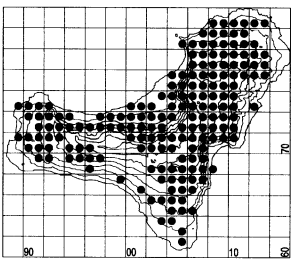
Gonospermum fruticosum (Buch) Less.
E Can; I; Nano; –; –



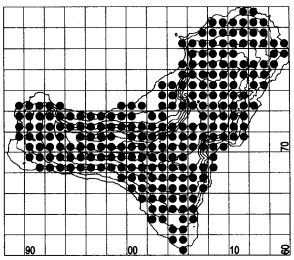
Gymnostyles stolonifera (Brot.) Tutin
–; Ni; Thero; –; ↑
St: On trails in Valverde.



Hedypnois cretica (L.) Dum.-Cours.
–; (Ni); Thero; –; –
St: Mainly in (abandoned) pastures, nutrient-rich and ruderal sites, although spreading somewhat into natural, non-forest communities. Kunkel (1991: 256, transl.) considers the species to be "early introduced" in the Canaries.



Hypochaeris glabra L.



–; –; Thero; –; –

det/conf, pers. comm. 11/2002: J. Grau

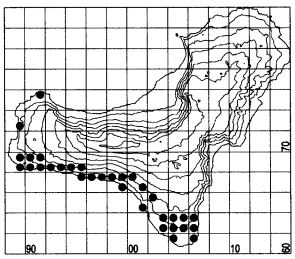
Most plants of El Hierro have only long-beaked achenes with the outer beaks mostly little shorter than the inner ones, which is indicated for *H. radicata* in most common floras (e.g., Haeupler & Muer 2000: 526, Press 1994: 372f, but see DeFilipps 1976: 308ff). Unbeaked outer achenes, which are indicated for *H. glabra* could only be found exceptionally (see also comment on the species in Press 1994: 372f). Nevertheless all respective plants found on El Hierro are apparently annual and belong to *H. glabra*.

Hypochaeris radicata L.

–; –; Hemi; (x); –

R: Pérez de Paz & al. (1981: 53): "El Cres - El Turrón"; but see comment on *H. glabra*.

Ifloga spicata (Forssk.) Sch. Bip.

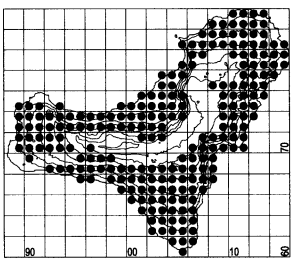


–; I; Thero; –; ↓

AG/HS: in El Hierro subsp. *spicata*

St: Like other species in the Saharo-Sindian region (e.g., *Lotus glinoides*) *I. spicata* is mainly restricted to the dry, coastal regions of SW El Hierro.

Kleinia neriifolia Haw.



E Can; I; Nano-succ; –; –

R: Voggenreiter (1994: 819).

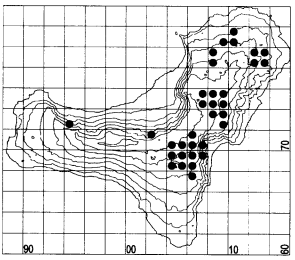
The breadth of the leaves can vary considerably and cultivated plants with broad or very narrow leaves, respectively, maintain this property, which seems to be independent from the environmental conditions. In El Hierro these forms can be found side by side. The taxonomic value of this character is doubtful (Halliday 1986: 280ff).

Lactuca serriola L.

–; Ni; Thero; –; –

St: The species mainly occurs in nutrient-rich and ruderal sites in the surroundings of settlements and in cultivated land.

On El Hierro most plants represent f. *integrifolia* (Gray) Prince & Carter with undivided or shallowly lobed stem leaves.



Launaea arborescens (Batt.) Murb.

–; –; Chamae; x; –

According to Kunkel (1991: 261) the species is absent in El Hierro.

Launaea nudicaulis (L.) Hook. f.

–; –; Chamae; x; –

R: Santos Guerra (1996a: 447): UTM 28RBR1578.

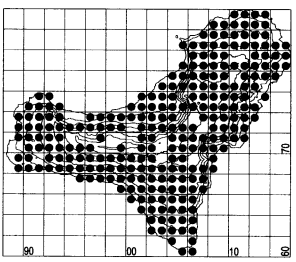
According to Kunkel (1991: 261) the record for El Hierro is questionable.

Leontodon saxatilis Lam.

–; –; Thero; changed name!; –

Syn: *L. taraxacoides* (Vill.) Mérat (Wisskirchen & Haeupler 1998: 289).

AG/HS: in the Canaries *L. taraxacoides* subsp. *longirostris* Finch & P. D. Sell [*L. saxatilis* subsp. *longirostris* (Finch & P. D. Sell) P. Silva, *L. longirostris* (Finch & P. D. Sell) Talavera, *L. taraxacoides* subsp. *hispidus* Kerguélen]; for the various synonyms see, e.g., Kerguélen (1999), Rivas-Martínez & al. (2002: 764).

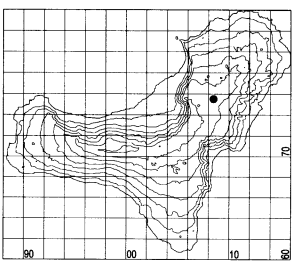


Matricaria recutita L.

–; Ne; Thero; changed name!; ↑

AG/HS: *Chamomilla recutita* (L.) Rausch.

Lit: Wisskirchen & Haeupler (1998: 305, Hegi), Kerguélen (1999).

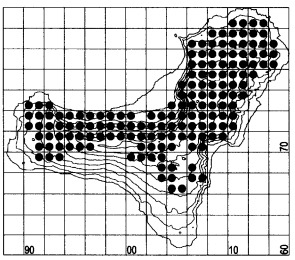


Pericallis D. Don
For recent phylogenetic reconstructions see, e.g., Swenson & Manns (2003).

Pericallis appendiculata (L. f.) B. Nord.
E Can; –; Hemi; (x); –
R: Bramwell & Bramwell (2001: 349): "Laurisilva of Frontera, Camino de Tinco"; Ceballos & Ortuño (1976: 414): "El Golfo". The records may refer to the white form of *P. murrayi,* which is the only species of the genus in El Hierro (Bornmüller 1903: 2f).

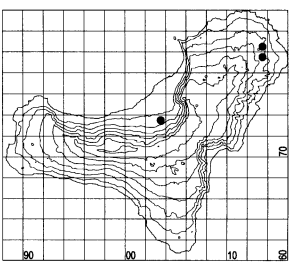
Pericallis cruenta (L'Hér.) Bolle
E Can; –; Hemi; (x); –
R: Knoche (1923: 238): Valverde. The records may refer to the pink/purple form of *P. murrayi,* which is the only species of the genus in El Hierro (Bornmüller 1903: 2f).

Pericallis murrayi (Bornm.) B. Nord.
E Hierro; I; Hemi; –; –

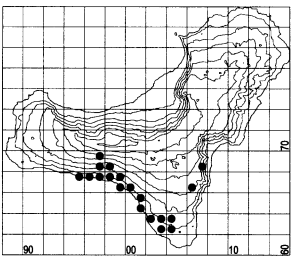


Mostly white flowered, rarely pink or even purple (cf. Stierstorfer 2005: t. 20). Bornmüller (1903: 2) describes the species as white flowered, whereas Lid (1967: 196) indicates the flowers as "usually purple, white-flowering plants were seen at many places, however". Pérez de Paz & al. (1976: 224) again report the purple flowers to be rare, as was observed during our fieldwork. The latter authors wonder whether a fluctuation of the populations may take place. The involucral bracts are often dotted by tubercles, which is in contrast to the original diagnosis of Bornmüller (1903: 2f) who described the involucrum as glabrous. Burchard (1929: 206) indicates the species as annual. Indeed, at least in culture most plants die slowly after flowering and new shoots at the base of the old plant mostly fail to develop. Nevertheless the species is listed as hemicryptophyte by Lems (1960a: 33), which is adequate at least for those plants growing under constantly moist conditions.

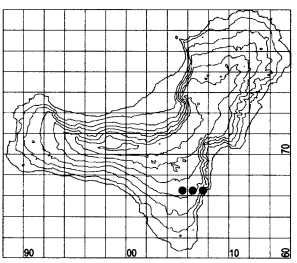
Picris echioides L.
–; Ni; Thero; –; –
Syn: *Helminthotheca echioides* (L.) Holub
St: Exclusively in the surroundings of La Frontera and Valverde.



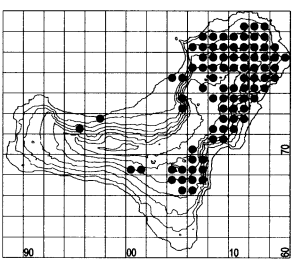
Phagnalon purpurascens Sch. Bip.
–; I; Chamae; –; –
St: This species is probably indigenous and is yet another example of a Saharo-Sindian element growing at the lowest altitudes of the leeward slopes in SW El Hierro (see also, e.g., *Lotus glinoides*)



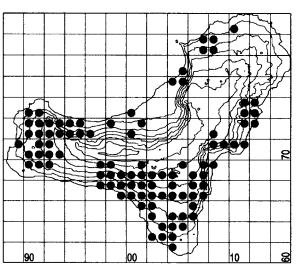
Phagnalon rupestre (L.) DC.
–; Ni; Chamae; –; –
Lit: Devesa (2002: 648).
St: Exclusively in the cultivated land S of El Pinar. The species is not affiliated to any natural community and can therefore be considered introduced.



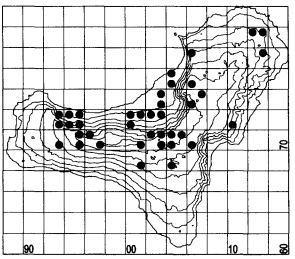
Phagnalon saxatile (L.) Cass.
–; I; Chamae; –; –
Lit: Devesa (2002: 648).
St: Mostly in more or less natural shrub communities of the intermediate altitudes.



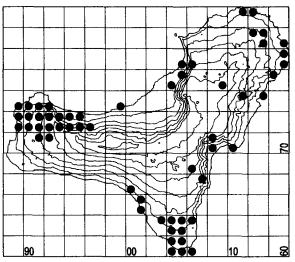
Phagnalon umbelliforme DC.
E Can; I; Chamae; –; –
Lit: León Arencibia & al. (1982).



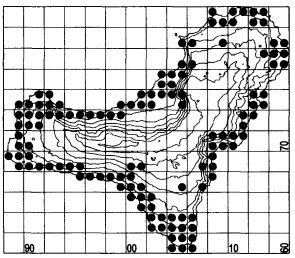
Pseudognaphalium luteoalbum (L.) Hilliard & B. L. Burtt
–; –; Thero; changed name!; –
AG/HS: *Gnaphalium luteoalbum* L.
For a phylogenetic reconstruction placing this species right in *Helichrysum* see Galbany Casals & al. (2004).
Lit: Devesa (2002: 647), Press (1994: 343 f), Hilliard & Burtt (1981), Wisskirchen & Haeupler (1998: 394, FE, Hegi).
St: Moist places.



Reichardia ligulata (Vent.) G. Kunkel & Sunding
E Can; I; Chamae; –; –
Lit: Gallego & al. (1980: 202ff).

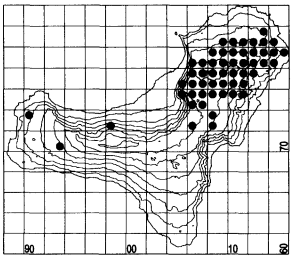


Schizogyne sericea (L. f.) DC.
E Can-Mad; I; Nano; –; –
Regarding the less developed indumentum some individuals in UTM 28RBR1273 may resemble *S. glaberrima* DC. However, the latter species is restricted to Gran Canaria according to Santana & Naranjo (2003: 840 f), or to Gran Canaria and Tenerife according to AG/HS.



Scolymus grandiflorus Desf.
–; –; Thero; (x); –
R: Lid (1967: 194): several locations in the NE, but this author does not list *S. hispanicus,* hence the record may refer to the latter.

Scolymus hispanicus L.
–; Ni; Thero; –; –
St: Exclusively in pastures and their successional phases in the NE highland, introduced to the Canaries according to Brandes & Fritzsch (2002) and Kunkel (1991: 274).
In some years, this thistle forms vast facies in abandoned pastures (Stierstorfer 2005: 272).

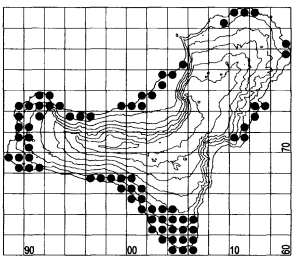


Scolymus maculatus L.
–; –; Thero; x; –

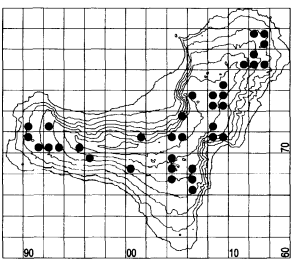
Senecio angulatus L. f.
–; cult; Nano; –; –
Recorded, e.g., in UTM 28RBR1279;

Senecio glaucus subsp. *coronopifolius* (Maire) Alexander
–; –; Thero; (x); –
R: Lid (1967: 195): "*S. coronopifolius* Desf." at the "Punta Norte" and in Tamaduste. The record refers most probably to *S. incrassatus* Lowe. The similarity between these two species is also mentioned by Press (1994: 359).

Senecio incrassatus Lowe
E Can-Mad; I; Thero; –; ↓
det/conf, pers. comm. (02/2000): J. W. Kadereit
The respective plants of El Hierro may all belong to this species (Pérez de Paz & al. 1981: 32ff), see also comment on *S. glaucus* subsp. *coronopifolius*. The taxon is not conspecific with *S. incrassatus* Guss., which is a part of the *S. leucanthemifolius* complex (Alexander 1979: 399ff).

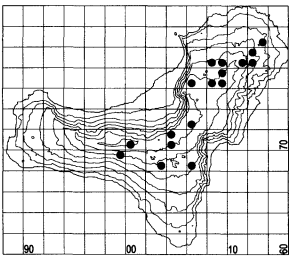


Senecio teneriffae Sch. Bip.
E Can; I; Thero; –; –
det/conf: J. W. Kadereit
The respective plants of El Hierro may all belong to this species (see also Kadereit 1984: 511ff and comment on *Senecio vulgaris*).



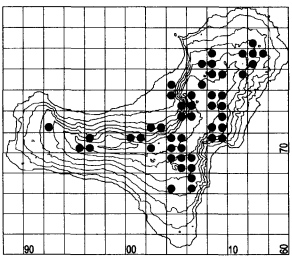
Senecio vulgaris L.
–; –; Thero; (x); –
The records for El Hierro (e.g., Lid 1967: 196) may all refer to *S. teneriffae*.

Silybum marianum (L.) P. Gaertn.
–; Ni; Thero; –; ↑
St: "Subcosmopolitic" and invasive element in the Canaries (Kunkel 1991: 277), which grows mostly along trails and roads, and in abandoned cultivated land. Listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

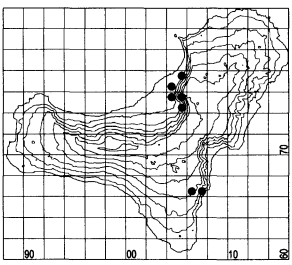


Sonchus L.
The woody *Sonchus* alliance is primarily restricted to the Canary archipelago. Detailed studies are presented, e.g., by Aldridge (1976a-b) and Boulos (1974). More recent information regarding molecular phylogenetics is presented, e.g., by Kim & al. (1999). Kunkel (1991: 276) considers the three herbaceous, non-native species listed below to be invasive elements in the Canary Islands

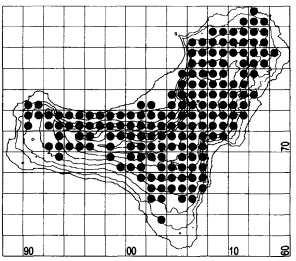
Sonchus asper (L.) Hill
–; (Ni); Thero; new Hierro; –
det/conf: G. Wagenitz
St: The species grows mainly in nutrient-rich sites.
The plants of El Hierro are highly variable and interbreeding with *S. oleraceus* and particularly with *S. tenerrimus* may occur. For an unequivocal identification of intermediate specimens cytological investigations would be necessary (G. Wagenitz, pers. comm. 02/2000). According to AG/HS subsp. *asper* and subsp. *glaucescens* (Jord.) P. W. Ball were found on the Canaries so far.



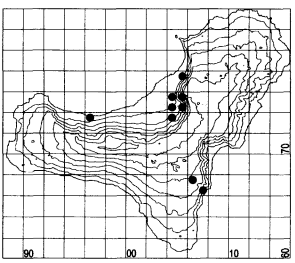
Sonchus gandogeri Pit.
E Hierro; I; Nano; –; ↓
Lit: Aldridge (1976b: 84), Boulos (1974: 33ff), Pitard & Proust (1908: 260f) and Santos Guerra (1996b: 588f). A survey is presented by Mesa Coello & al. (2003c: 510f).
The species "is probably the result of hybridisation between *S. pinnatus* subsp. *canariensis* and *S. hierrensis*" (Aldridge 1976b: 84). It is listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).



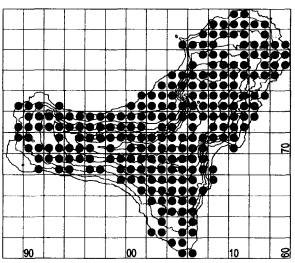
Sonchus hierrensis (Pit.) Boulos
E Can; I; Nano; –; –
HS: in El Hierro (and Gomera) var. *hierrensis,* but Aldridge (1976b: 91) does not recognise the varieties. For the taxonomic and chorological discussion see also Boulos (1974: 11ff) and Kunkel (1991: 280).



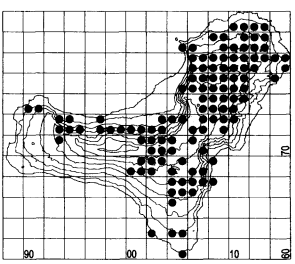
Sonchus lidii Boulos / *S. pitardii* Boulos
E Hierro; I; Nano; –; –
Plants with an intermediate appearance between *S. gandogeri* and *S. hierrensis* (=? *Sonchus gandogeri* × *hierrensis*) could mainly be found at the contact zone of the populations. The two taxa *S. lidii* and *S. pitardii* may refer to these plants (see Boulos 1974: 33ff). In the course of our geobotanical investigation they were not distinguished. Aldridge (1976b: 84) also mentions "these hybrid-like taxa", and criticises that "it seems, however, premature to recognise every variant at the species level". Bramwell & Bramwell (2001: 383) points at the hybrid character of these taxa, too.



Sonchus oleraceus L.
–; –; Thero; –; –
det/conf: G. Wagenitz
In some cases an unequivocal identification was hardly possible (interbreeding with *S. tenerrimus*?), see also comment on *S. asper*.



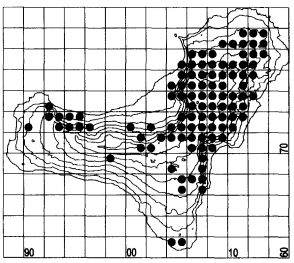
Sonchus tenerrimus L.
–; –; Thero; –; –
det/conf: G. Wagenitz
For the identification problems see comments on *S. asper* and *S. oleraceus*.



Tagetes patula L.
–; cult; Thero; –; ↓
In El Golfo on the way to escape from gardens. Recorded, e.g., in UTM 28RBR0073/0174/0273/0373.

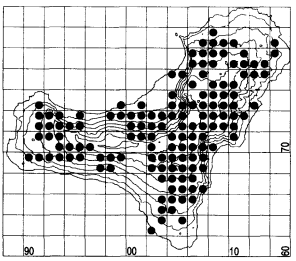
Taraxacum officinale Weber
–; –; Hemi; x; –
AG/HS: The species is recorded for all Canary Islands except El Hierro. Nevertheless it is listed here because toponyms like "Aitemés" may indicate its former existence on the island in the NE highland "meseta alta del Nisdafe" (Trapero 1999: 142). The scientific name is provisionally used to refer to this complex.

Tolpis laciniata (Sch. Bip. ex Webb & Berthel.) Webb
E Can; I; Chamae; identification?; –



The species displays its variability in El Hierro as it does in the rest of the W Canaries (see e.g., Bramwell & Bramwell 2001: 368f, Burchard 1929: 212, Schönfelder & Schönfelder 1997: 252f). The leaf shape shows all transitions between the extreme forms (pinnatifid, lobes linear to lanceolate or shallowly pinnatifid or sinuate-dentate, broad lobes), which reminds of the variability presented for *T. succulenta* (Dryand.) Lowe of Madeira (Press 1994: 370/517). Pérez de Paz (1981: 863) also points at the polymorphism of *Tolpis* in the Canaries. The petioles and involucral bracts vary from almost glabrous to densely white-floccose. Plants with the latter character of the involucrum, mostly large leaves with broad lobes and relatively short stems have been described as *T. proustii* Pit. Indeed they mainly occur in the extremely windy, moist conditions on the cliffs above Sabinosa as indicated in the literature. Some of these plants even resemble *T. glabrescens* Kämmer, but this may be caused by "ecological convergences" (Pérez de Paz 1981: 864, transl.) rather than by genetic properties. Plants in the E of El Hierro are recorded as *T. laciniata* (see, e.g., Burchard 1929: 212f, Pitard & Proust 1908: 248f, Lid 1967: 201). This separation is apparently supported by the distribution map revealing a gap between the populations in the E half of El Hierro *(T. laciniata?)* and those in the NW above Sabinosa (*T. proustii*?). However, the mentioned variability of the plants is also displayed within the NW population, e.g., along the trail from Sabinosa to La Dehesa. Therefore it seems reasonable to treat all of them as one polymorphic species in the course of the geobotanical investigations, and apply provisionally the name *T. laciniata.* Probably, *T. proustii* is another example for a taxon resulting from very recent speciation processes (see *Micromeria varia* subsp. *hierrensis,* which also grows in the cliffs above Sabinosa!). Burchard (1929: 212f) indicates both species as annual/biennial, but the plants are apparently perennial, unless growing under temporarily very dry conditions (e.g., in seasonal pastures). The specimens in the very S near the village of La Restinga (UTM 28RBR0461/0561) are curious, but few plants could be encountered repeatedly in various years and seem to offer no exceptional phenomenon.

Tolpis umbellata Bertol.

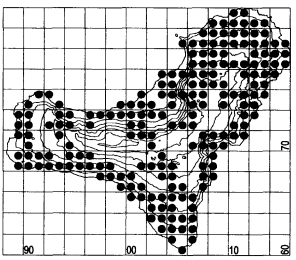


–; –; Thero; changed name!; –
AG/HS: *Tolpis barbata* (L.) P. Gaertn. s.l.
Lit: Díaz de la Guardia (2002: 688f).
R: Lid (1967: 201): various records; Pérez de Paz & al. (1981: 56): in the W.

The plants of El Hierro, as most of those in the other islands (Kunkel 1991: 285f, Schönfelder & Schönfelder 1997: 252f), belong to *T. umbellata,* identified by the "outer involucral bracts almost as long as the inner at anthesis", vs. "outer involucral bracts much longer than the inner at anthesis" in *T. barbata,* cf. Díaz de la Guardia (2002: 689) and Schönfelder & Schönfelder (2002: 244f). Press (1994: 370) treats *T. umbellata* "as a part of the variation within *T. barbata*", whereas Kerguélen (1999) distinguishes them as subspecies, Schönfelder & Schönfelder (1997: 252) and Talavera (1987: 107) as species.

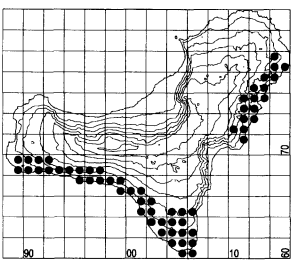
Tolpis proustii Pit.
E Can; I; Chamae; (x); –
See comment on *T. laciniata*.

Urospermum picroides (L.) Scop. ex F. W. Schmidt



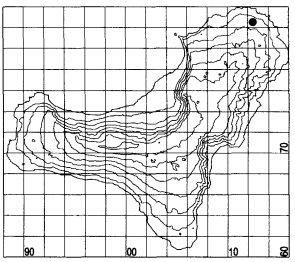
–; –; Thero; –; –
St: Common in anthropogenic and natural communities of El Hierro, possibly introduced to the Canary Islands according to Brandes & Fritzsch (2002) and Kunkel (1991: 287).

Volutaria canariensis Wagenitz



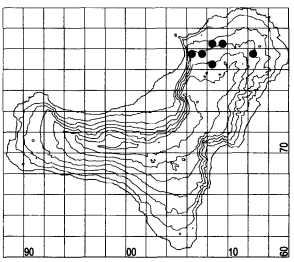
E Can; I; Thero; –; ↓
det/conf: G. Wagenitz
Lit: Wagenitz (1991).
R: Pérez de Paz & al. (1981: 56): near the "Faro de Orchilla".

Volutaria tubuliflora (Murb.) Sennen
–; Ni; Thero; new Hierro; ↓
det/conf: G. Wagenitz
A small population in the extreme N of El Hierro could be discovered and seems to be established.



Basellaceae

Anredera cordifolia (Ten.) Steenis
–; cult; Nano-liana; –; –



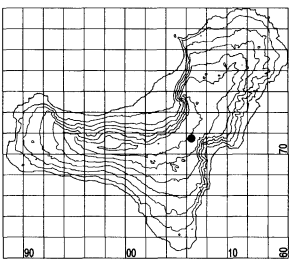
Bignoniaceae

Pyrostegia venusta (Ker-Gawl.) Miers
–; cult; Nano; new Hierro; –
Recorded e.g., in UTM 28RBR1279.

Tecomaria capensis (Thunb.) Spach
–; cult; Nano; new Hierro; –
Recorded e.g., in UTM 28RBR0879.

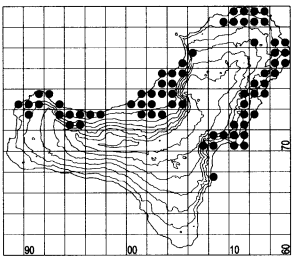
Boraginaceae

Anchusa italica Retz.
–; Nc; Thero; –; ↑



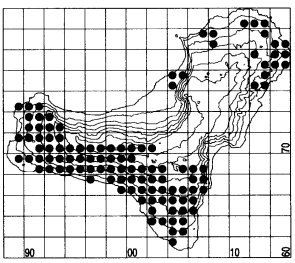
Borago officinalis L.
–; cult; Thero; x; –
R: Lid (1967: 138): near Sabinosa, surroundings of Valverde, etc.

Ceballosia fruticosa (L. f.) G. Kunkel
E Can; I; Nano; –; ↓
HS: in El Hierro var. *fruticosa*.
Lit: Kunkel (1969b).
R: Voggenreiter (1997b) presents an additional record in UTM 28RBR0166.

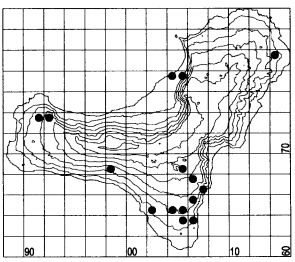


Echium L.
A revision of the genus in the Middle Atlantic Islands has been presented by Bramwell (1972). Anatomy and evolution of the species in the Canaries and Madeira have been analysed for example by Aldridge (1981). A phylogenetic reconstruction on the base of DNA analyses is given, e.g., by Böhle & al. (1996).

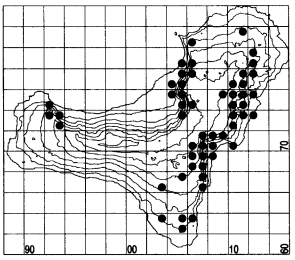
Echium aculeatum Poir.
E Can; I; Nano; –; –



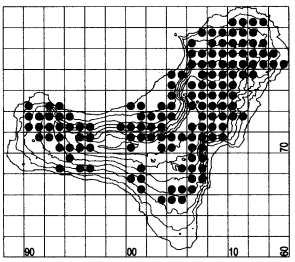
Echium aculeatum × *hierrense* [*E.* ×*taibiquense* P. Wolff & Rosinski]
E Hierro; I; Nano; not AG/HS; –
Lit: Wolff & Rosinski (1999b).



Echium hierrense Webb ex Bolle
E Hierro; I; Nano; –; –
Lit: Lucía Sauquillo & al. (1996: 69ff), Santos Guerra (1996b: 272f).

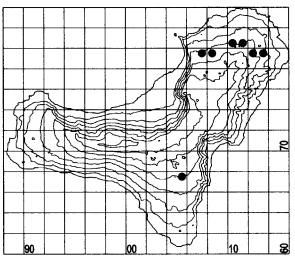


Echium plantagineum L.
–; (Ni); Thero; –; –
St: The status as native to the Canaries is doubtful according to Kunkel (1991: 184). Since the species mainly occurs in pastures, nutrient-rich sites, along streets and other secondary habitats at the high altitudes, it is probably introduced to El Hierro.

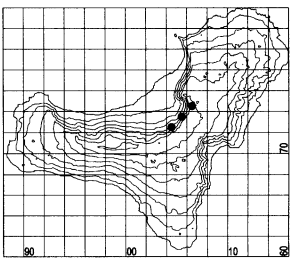


According to S. Rivas-Martínez and W. Wildpret de la Torre (pers. comm. 03/2003) some individuals in the upper region such as Meseta de Nisdafe show atypical features, e.g., particularly large corollas. However, all of them revealed the typical hairs on the veins and lobe margins (cf. Short 1994: 276f).

Echium simplex DC.
E Tenerife; NE; Nano; new Hierro; ↑
St: Cultivated and escaped in the NE of El Hierro, e.g., in Valverde, and along streets. The species is also a successful invader in other parts of the world. It is reported as naturalised in S Australia and in S Africa (Smith & al. 2004: 45ff).

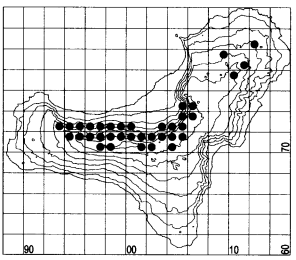


Echium strictum L. f.
E Can; I; Nano; –; ↑
According to AG, HS and Bramwell (1972a: 92f) the plants of El Hierro belong to subsp. *strictum*. However, the colour of the corolla is deep blue as is given for subsp. *exasperatum* (Webb ex Coincy) Bramwell of Tenerife. Although the populations reveal a high variability, the plants of El Hierro seem rather constant in their characters.



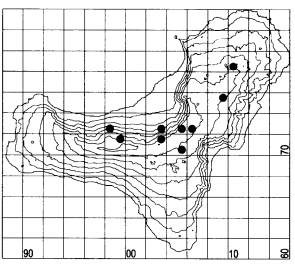
Myosotis discolor subsp. *canariensis* (Pit.) Grau
E Can-Mad; I; Thero; x; –
R: Lid (1967: 144): NE highland, El Pinar and El Golfo; Pérez de Paz & al. (1981: 54): "El Cres-El Turrón"; Santos Guerra (1980: 14ff) described in moist habitats of the forest ground and border of the fayal-brezal of El Hierro the *"Myosotidetum canariensis"*, but in such habitats only the perennial *M. latifolia* could be detected. Since this species is missing in the respective tables the records of Santos Guerra (1980: 14ff) may refer to the latter species. The same may apply to the record of *"Myosotis* cf. *discolor* subsp. *canariensis"* (Arco Aguilar & al. 1996: 470) in the laurel forests of El Hierro. Lid (1967: 144) recorded both species on El Hierro. See also comment on *M. latifolia* and Stierstorfer (2005: 112).

Myosotis latifolia Poir.
–; I; Chamae; –; ↑
det/conf, pers. comm. 11/2002: J. Grau



Very similar to *M. sylvatica* and even treated as a synonym by Kerguélen (1999). There are confusing records and uncertainties about *Myosotis* in the moist sites of the fayal-brezal of El Hierro, e.g., Santos Guerra (1976: 257, "*Myosotis* sp."), see also comments on *M. discolor*. The respective plants are apparently perennial (although annual under dry conditions), which could also be proved in culture, and the size of the flowers clearly exceeds the values for *M. discolor* subsp. *canariensis* given by Grau (1968: 68f). Hence they all may represent *M. latifolia,* which is consistent with the identification by Bornmüller (1903: 8, *"Myosotis sylvatica"*), Ceballos & Ortuño (1976: 245, *"M. macrocalycina"*), Gandullo (1991: 158ff) and E. Zogg in Schmid (1976: 247, *"M. macrocalycina"*). The species is strictly confined to laurel forests and the fayal-brezal.

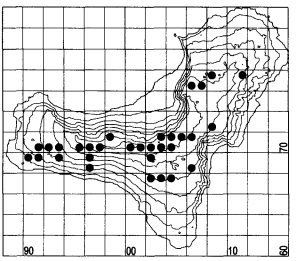
Myosotis ramosissima Rochel
–; –; Thero; new Hierro - recHS not AG; ↑
det/conf, pers. comm. 11/2002: J. Grau
Lit: Grau (1968: 32f) and Short (1994: 275).



The record for El Hierro in HS is not accepted by AG.

Brassicaceae

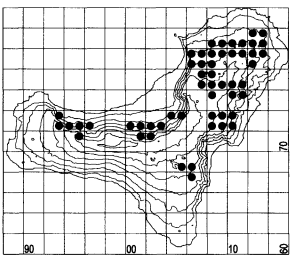
Arabidopsis thaliana (L.) Heynh.
–; –; Thero; –; ↑
HS: in El Hierro var. *thaliana*.



Arabis caucasica Schltdl.
–; cult; Hemi; x; –

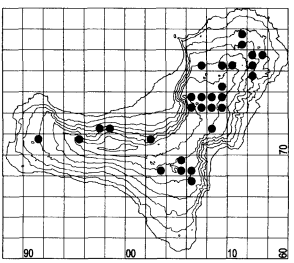
Brassica bourgeaui (Webb ex Christ) Kuntze
E Can; +; Chamae; x; –
Lit: Borgen & Elven (1980); Snogerup & al. (1990: 336ff).
R: The species was collected by E. Bourgeau in 1845 in the "Barranco de Valverde". Marrero Rodríguez (1989: 89) reports findings in the region of Frontera in El Golfo (UTM 28RBR0172), but considers the population to be in danger of extinction due to genetic dilution (hybridisation with *B. oleracea*).

Brassica oleracea L.
–; Ne; Chamae; –; ↑



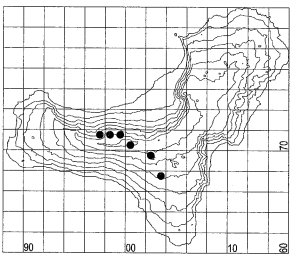
Capsella bursa-pastoris (L.) Medik. / *C. rubella* Reut.
–; Ni; Thero; new Hierro; ↑
St: The plants grow almost exclusively in nutrient-rich, anthropogenic habitats near settlements, on paths frequented by live stock, etc. Both species are probably introduced to the Canaries (Brandes & Fritzsch 2002, Kunkel 1991: 76).

During the fieldwork it was often impossible to make an unequivocal identification. Therefore the two taxa have been aggregated in the course of our geobotanical

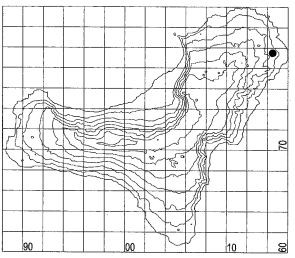


research. Generally speaking, the taxonomic status of *C. rubella* is uncertain (Short 1994: 119). Nevertheless, specimens fitting the characters of the latter taxon seem to be the most frequent, which is consistent with the observations by Wolff & Rosinski (1999a: 12/14). They encountered *C. bursa-pastoris* only rarely above 800 m and also report hybrids between the two species.

Cardamine hirsuta L.
–; –; Thero; new Hierro; ↑



Carrichtera annua (L.) DC.
–; Nc; Thero; new Hierro; ↓

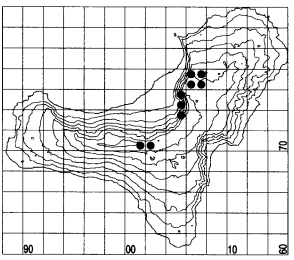


Coronopus didymus (L.) Sm.
–; –; Thero; x; –
R: Lid (1967: 76): "Bco. Morales" below Valverde.

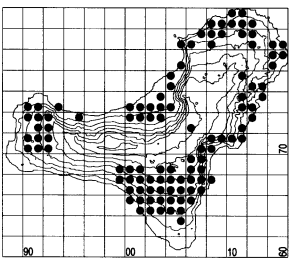
Crambe feuilleei A. Santos
E Hierro; I; Nano; not AG/HS – (x); –
R: García Casanova (2001), Schönfelder & Schönfelder (1997: 96): sine loco. Listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).

Original description doubtful, name not included in IPNI; the plants may refer to *C. strigosa*.

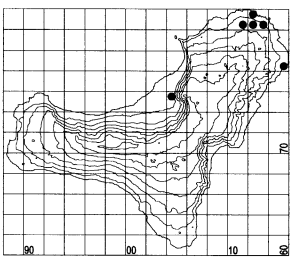
Crambe strigosa L'Hér.
E Can; I; Nano; –; ↑
Lit: Bramwell (1969: 7).
R: Bornmüller (1904: 424f): "Risco de Jinama"; Pitard & Proust (1908): "Fuente Tinco".



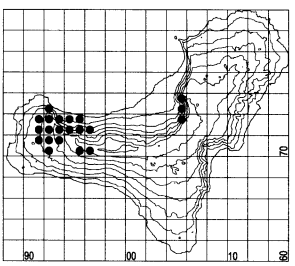
Eruca vesicaria subsp. *sativa* (Mill.) Thell.
–; (Ni); Thero; –; –
St: Existing mainly in ruderal habitats, the formerly cultivated species is probably introduced (Brandes & Fritzsch 2002; Kunkel 1991: 78f).



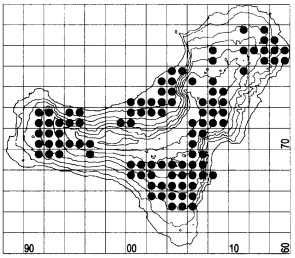
Erucastrum cardaminoides (Webb ex Christ) O. E. Schulz
–; I; Thero; –; ↓
St: Kunkel (1991: 79, transl.) considers *E. cardaminoides* (and *E. canariense*) to be "doubtfully endemic", the first species is also listed for Mauritania by Hohenester & Welß (1993: 96: "*E. varium* Durieu subsp. *cardaminoides* (Webb) Maire").



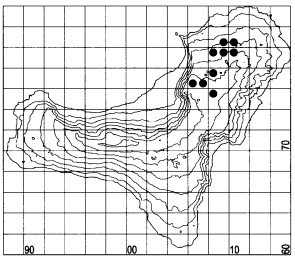
Erysimum bicolor (Hornem.) DC.
E Can-Mad; I; Chamae; –; –
The plants of El Hierro have been described as *E. heritieri* var. *hierrense* Mend.-Heu. [*Dichroanthus virescens* var. *hierrense* (Mend.-Heu.) Hohenester & Welß], see Mendoza-Heuer (1972b: 24f) and Hohenester & Welß (1993: 104). According to Polatschek (1976: 96ff) an infraspecific partition would demand more research.



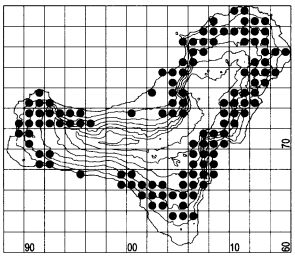
Hirschfeldia incana (L.) Lagr.-Foss.
–; Ni; Thero; –; –
St: The species mostly grows in abandoned pastures, nutrient-rich and ruderal sites. It is considered to be an invasive element in the Canaries by Kunkel (1976: 264, 1991: 79), listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



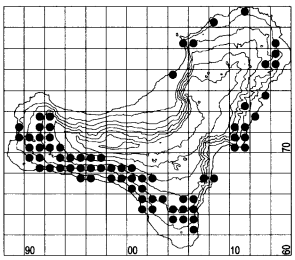
Isatis tinctoria L.
–; Ne; Thero; –; ↑
St: The recent population may come from ancient plantations, because in El Hierro the plant was of economic importance in the past.



Lobularia canariensis subsp. *intermedia* (Webb) L. Borgen
E Can; I; Chamae; –; –
Lit: Borgen (1987: 72ff).

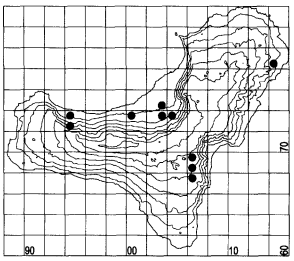


Lobularia libyca (Viv.) C. F. W. Meissn.
–; I; Thero; –; –
Lit: Borgen (1987: 82ff).
St: The species, which also occurs, e.g., in N Africa is particularly frequent at leeward lower altitudes of SW El Hierro and probably native.



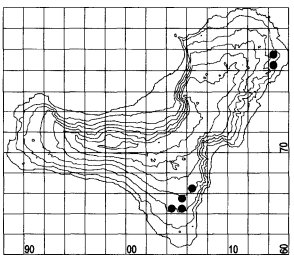
Lobularia maritima (L.) Desv.
–; –; Hemi; new Hierro - (x); –
R: Pérez de Paz & al. (1981: 54): "Hoya del Verodal".
The record, although from 1981, is not listed in AG/HS; considered erroneous?

Matthiola incana (L.) R. Br.
–; cult; Chamae; new Hierro; –
AG/HS: in the Canaries subsp. *incana*.

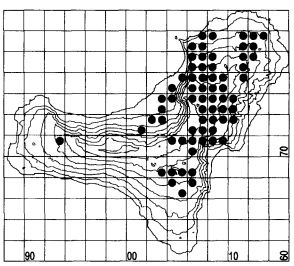


Matthiola parviflora (Schousb.) R. Br.
–; –; Thero; x; –

Notoceras bicorne (Aiton) Amo
–; –; Thero; –; ↓
St: Kunkel (1991: 81, transl.) considers the species to be "obviously native" to the Canary Islands. However, the two populations in El Hierro below El Pinar and Valverde, respectively, may probably be introduced.
R: Santos Guerra (1996a: 447): UTM 28RBR1578.

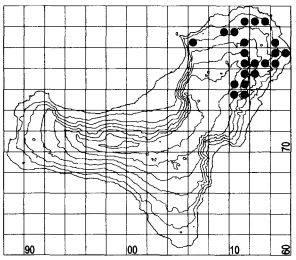


Raphanus raphanistrum subsp. *microcarpus* (Lange) Thell.
–; Ni; Thero; not AG - changed name!; –
det/conf: W. Nezadal, S. Rivas-Martínez
AG: in the Canaries only subsp. *raphanistrum;* HS indicate only subsp. *raphanistrum* for El Hierro, but subsp. *microcarpus* for Lanzarote, Gran Canaria and La Gomera. Most or even all plants of El Hierro may belong to the latter subspecies.
R: Pérez de Paz & al. (1981: 55): subsp. *raphanistrum* near "Tiñor-Roque de los Dares".
St: Common weed in agricultural pasture land, introduced to the Canaries according to Brandes & Fritzsch (2002) and Kunkel (1991: 82).

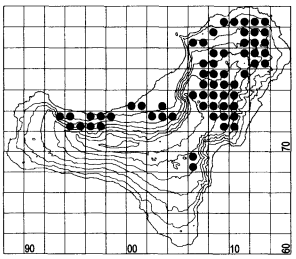


Raphanus sativus L.
–; cult; Thero; x; –

Rapistrum rugosum (L.) All.
–; Ni; Thero; –; –
R: Pérez de Paz & al. (1981: 44/55): Echedo.
St: The invasive species (Kunkel 1991: 82, see also Brandes & Fritzsch 2002) is restricted to agricultural habitats and the surroundings of settlements at intermediate and low altitudes of NE El Hierro.
We did not recognize subspecific taxa of this polymorphic species neither did AG and HS ("*R. rugosum* s.l.").



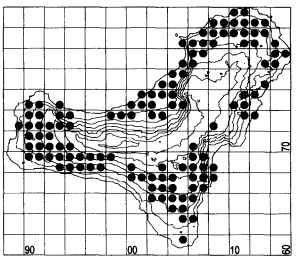
Sinapis alba L.
–; Ni; Thero; –; –
St: Mostly in the pasture land of the NE and in the surroundings of agricultural land in El Golfo. Introduced to the Canaries according to Kunkel (1991: 82).



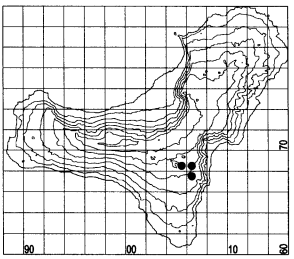
Sinapis arvensis L.
–; –; Thero; new Hierro - (x); –
R: Pérez de Paz & al. (1981: 55): "Sabinar de la Dehesa".
The record, although from 1981, is not listed in AG/HS; considered erroneous?

Sisymbrium L.
Kunkel (1991: 83) states that probably all taxa of the genus in the Canary Islands are introduced.

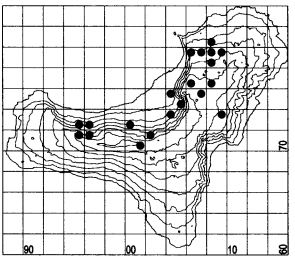
Sisymbrium erysimoides Desf.
–; (Ni); Thero; –; –
St: Mostly in nutrient rich habitats, but also intruding a little into natural shrub communities of medium and lower altitudes.



Sisymbrium irio L.
–; Ni; Thero; –; ↑
St: Exclusively in the surroundings of the village El Pinar.



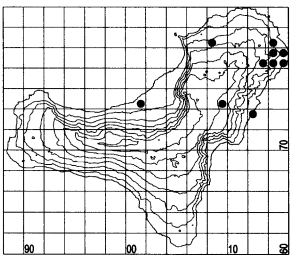
Sisymbrium officinale (L.) Scop.
–; (Ni); Thero; –; –
St: Mostly in ruderal habitats, near trails and in abandoned agricultural land.



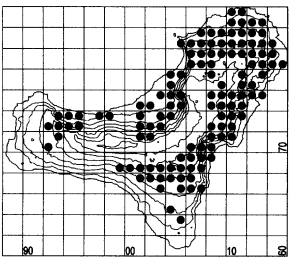
Cactaceae

Hylocereus undatus (Haw.) Britt. & Rose
–; cult; Nano; new Hierro - x; –
R: Voggenreiter (1997a): cultivated in NE El Hierro.

Opuntia dillenii (Ker-Gawl.) Haw.
–; Ne; Phanero-succ; –; ↓

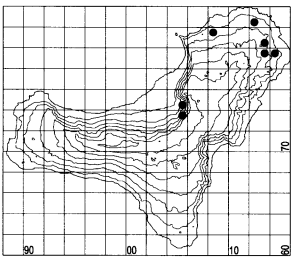


Opuntia maxima Mill.
–; Ne; Phanero-succ; –; –
Syn: *O. ficus-barbarica* Berger, *O. ficus-indica* auct.
HS: *O. ficus-indica* (L.) Mill.
Lit: Berthet (1990: 65f).
The synonymy follows Berthet (1990: 65f) and ANTHOS (2002). However, in the literature mostly the above mentioned synonyms are used to name the respective plants (e.g., Kunkel 1991: 36, Pérez de Paz & Hernández Padrón 1999: 91, Schönfelder & Schönfelder



1997: 152, Turland 1994: 230). In Kerguélen (1999) *O. maxima* is not treated as a synonym of *O. ficus-barbarica* / *O. ficus-indica*. According to W. Wildpret de la Torre (pers. comm. 03/2003) the two taxa should be treated as separate species, which both exist on El Hierro.

Opuntia tomentosa Salm-Dyck
–; cult; Phanero-succ; –; –
The species is apparently not propagating in the wild and the existing old individuals can be considered to be planted.



Caesalpiniaceae

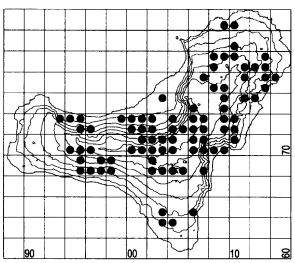
Ceratonia siliqua L.
–; cult; Phanero; x; –

Chamaecrista fasciculata (Michx.) Greene
–; cult; Nano; x; –
HS: *Cassia chamaecrista* L.

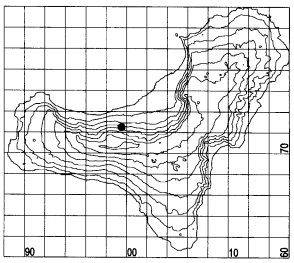
Senna bicapsularis (L.) Roxb.
–; cult; Nano; x; –
HS: *Cassia bicapsularis* L.

Campanulaceae

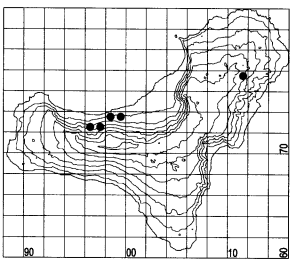
Campanula erinus L.
–; –; Thero; –; –



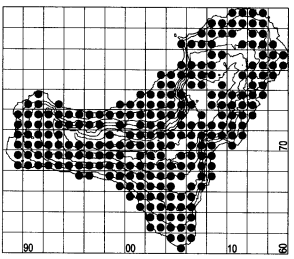
Canarina canariensis (L.) Vatke
E Can; I; Hemi-liana; –; ↑
R: Ceballos & Ortuño (1976: 244): Jinama; Santos Guerra (1980: 42): "Riscos de Tibataje" and cliffs of "Las Playas" within the zone of the Canary pine forest; E. Zogg in Schmid (1976: 245ff): laurel forest of the NW-facing slopes above Frontera, 600-900 m.
Only the finding of Kretzschmar (1998: 6; pers. comm. 09/1998) in El Golfo could be confirmed.



Legousia falcata (Ten.) Fritsch
–; –; Thero; –; –

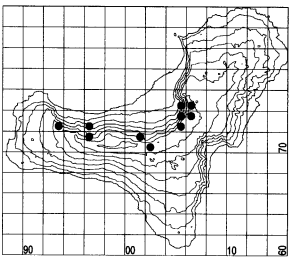


Wahlenbergia lobelioides (L. f.) Link subsp. *lobelioides*
E Can-Mad-CV; I; Thero; –; –
For the author citation (AG: "(L. f) A. DC.") see Kerguélen (1999) and Tebbs (1994: 332).



Capparaceae
Capparis spinosa L.
–; cult; Nano; x; –

Caprifoliaceae
Viburnum rigidum Vent.
E Can; I; Phanero; –; ↑
HS: *Viburnum tinus* subsp. *rigidum* (Vent.) P. Silva

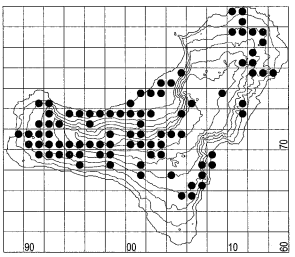


Caricaceae

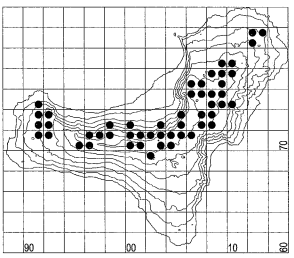
Carica papaya L.
–; cult; Phanero; –; –
Recorded, e.g., in UTM 28RBR0375/1282.

Caryophyllaceae

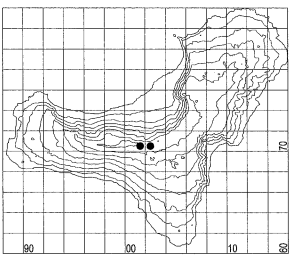
Arenaria leptoclados (Rchb.) Guss.
–; –; Thero; –; –



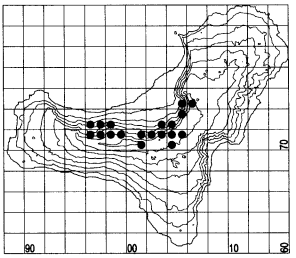
Cerastium glomeratum Thuill.
–; –; Thero; –; ↑
St: Probably introduced to the Canaries (Brandes & Fritzsch 2002, Kunkel 1991: 46). However, the data of El Hierro do not allow an unequivocal statement.



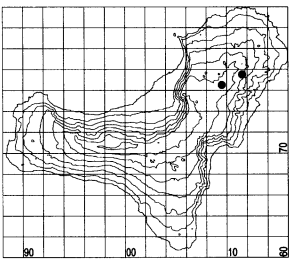
Cerastium sventenii Jalas
E Can; I; Chamae; –; ↑
Originally described as endemic to La Palma by Jalas (1966: 133ff). A survey is given by Mesa Coello & al. (2003a: 634f). The species is listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).



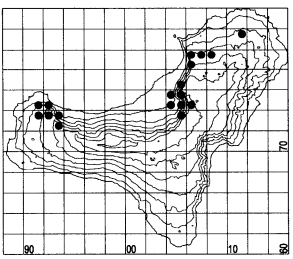
Moehringia pentandra Gay
–; –; Thero; –; ↑
St: In El Hierro almost exclusively restricted to the laurel forests and fayal-brezal, probably introduced to the Canaries according to Kunkel (1991: 49), agriophyte?



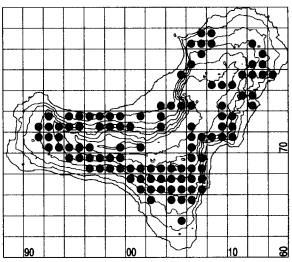
Paronychia argentea Lam.
–; Ni; Chamae; –; ↑
On and near a trail in each of the two locations.
R: Pérez de Paz & al. (1981: 45/54) already recorded the population near "Tiñor-Roque de Los Dares" (UTM 28RBR1177).



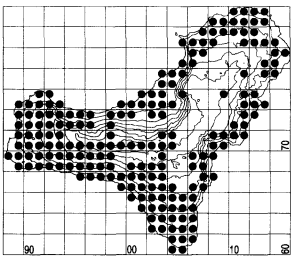
Paronychia canariensis (L. f.) Juss.
E Can; I; Chamae; –; –
HS: in El Hierro var. *canariensis* and var. *orthoclada* Christ
R: Chaudhri (1968: 148ff), Christ (1888: 104): var. *orthoclada* near Valverde.
The varieties have not been distinguished in the course of our geobotanical research.



Petrorhagia nanteuilii (Burnat) P. W. Ball & Heywood
–; –; Thero; –; –



Polycarpaea divaricata (Aiton) Poir.



E Can; I; Chamae; identification?; –

Very variable on El Hierro, especially the shape of the leaves ranges from linear-lanceolate to broadly spathulate or nearly orbicular. The apex of the leaves is acute or (in most cases) mucronate-cuspidate to nearly aristate. Wolff & Rosinski (1999a: 16f) therefore indicate both *P. divaricata* and *P. latifolia* for El Hierro, but also mention intermediate forms. According to Bramwell & Bramwell (2001: 124) *P. latifolia* "may be a robust forest form of *P. divaricata*". The indument of the plants also varies considerably. In El Hierro it seems adequate to treat the entire complex as one polymorphic species, but further studies are needed. Individuals growing in dry sites such as the lapilli fields die after the growing season, whereas those in moist habitats or in culture can survive several years.

Polycarpaea latifolia Willd.

–; –; Chamae; (x); –

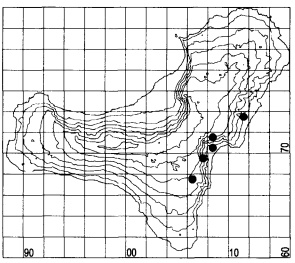
See comment on *P. divaricata*.

Polycarpaea nivea (Aiton) Webb

E Can-CV; –; Chamae; (x); –

R: Schönfelder & Schönfelder (1997: 80f): sine loco; Voggenreiter (1997a) indicates findings in the E near the cliffs of Las Playas as doubtful, according to Bramwell & Bramwell (2001: 126) the species does not exist in El Hierro. Perhaps the records refer to extreme forms of *P. divaricata,* see comment there.

Polycarpaea smithii Link

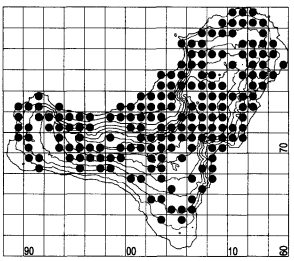


E Can; I; Chamae; –; –

R: E. Sventenius collected additional specimens near Frontera (Santos Guerra 1980: 43), see also Santos Guerra (1996b: 502f).

Typical for wet sites of lava and basalt walls in the E of El Hierro.

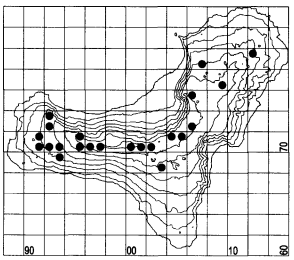
Polycarpon tetraphyllum (L.) L. subsp. *tetraphyllum*



–; –; Thero; changed name!; –
det/conf: S. Rivas-Martínez
AG: in the Canaries only subsp. *diphyllum* (Cav.) O. Bolós & Font Quer.
St: Omnipresent in El Hierro, the status is difficult to determine. Kunkel (1991: 50f) comes to the same conclusion. Listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

In Madeira the typical subspecies is also the most common taxon (Short 1994: 90).

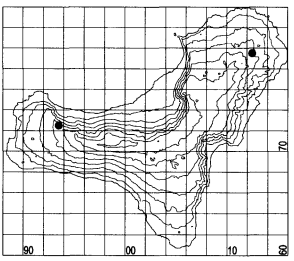
Sagina apetala Ard.



–; –; Thero; identification?; ↑
R: Lid (1967: 66): various locations, mainly in the E; Pérez de Paz & al. (1981: 55): "Tiñor - Roque de los Dares".

The leaves of most plants of El Hierro are markedly ciliate from the base up to 2/3 of their length, occasionally up to the aristate apex, whereas, e.g., Short (1994: 87f) writes "ciliate near the base". The stems and particularly the pedicels are glandular-pubescent, but rarely almost glabrous extreme forms occur, which also lack the cilia of the leaves almost totally. Similar observations have been made by Lid (1967: 66): "the most common form is f. *glandulosa* F. Schulz, other forms occur also, however." The sepals are a little different with the outer two slightly cucullate.

Sagina procumbens L.



–; Ni; Chamae; identification?; ↑
St: On trails, in heavily trodden communities.

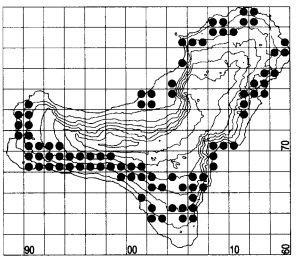
Characterised by the central leaf rosettes, but otherwise very similar to the plants identified as *S. apetala* (see above). Perhaps all the plants of the genus in El Hierro belong to one polymorphic species.

Silene apetala Willd.

–; –; Thero; –; –

St: Very common in many anthropogenic and natural communities at lower altitudes. The preference of the lower altitudes is also mentioned by Kunkel (1991: 52).

Identified by the undulately winged seeds (cf. Talavera 1987: 253).



Silene berthelotiana Webb

E Can; I; Chamae; (x); –

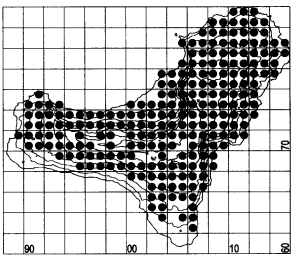
R: Bornmüller (1904: 415), Barquín Diez (1972: 21), Ceballos & Ortuño (1976: 322), Pitard & Proust (1908: 118) and E. Zogg in Schmid (1976: 245ff): all records in the E of El Golfo (Risco de Jinama/Fuente Tinco and the surroundings of San Salvador/Pico de Tenerife).

The records may refer to *S. sabinosae* (see comment there) and are accordingly doubtful as indicated in AG.

Silene gallica L.

–; –; Thero; –; –

St: Omnipresent all over the island, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



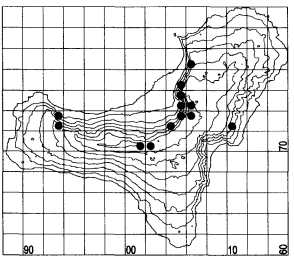
Silene italica (L.) Pers.

–; –; Chamae; (x); –

HS: var. *pogonocalyx* Svent.

The record may refer to *S. sabinosae*. Bramwell & Bramwell (2001: 122) and Kunkel (1991: 52) treat the taxon as a species (*S. pogonocalyx* (Svent.) Bramwell) endemic to La Palma, whereas AG do not separate it from *S. italica.*

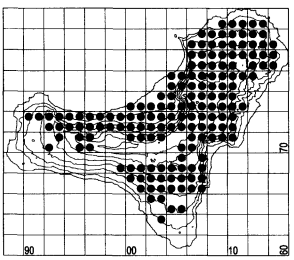
Silene sabinosae Pit.



E Hierro; I; Chamae; identificaion?; †

Pitard & Proust (1908: 118) identified the plants in the W of El Golfo ("Riscos de Sabinosa") as *S. sabinosae,* those in the E as *S. berthelotiana* (see above). During our fieldwork it became apparent that all plants most probably belong to one species, although they show a certain variability. The leaves are always clearly hairy (short hairs, magnifying glass!), which is in contrast to the description of *S. sabinosae* by Pitard & Proust (1908: 118, "Feuilles absolument glabres"). Bramwell & Bramwell (2001: 122) describe the leaves as "glabrous to very lightly papillose-pubescent" and do not recognise *S. berthelotiana* in El Hierro. In contrast, Ceballos & Ortuño (1976: 324) identified all specimens of El Hierro as the latter species because of the hairy leaves and wrote about *S. sabinosae:* "No hemos recogido esta planta". Nevertheless this name is provisionally applied here for the entire complex in the island, which is in accordance with Bramwell & Bramwell (2001: 122) and Santos Guerra (1996b), but more research seems necessary. The species is listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).

Silene vulgaris (Moench) Garcke



–; –; Hemi; –; –

AG: in El Hierro four subspecies: subsp. *angustifolia* (Mill.) Hayek, subsp. *commutata* (Guss.) Hayek (the most common one in the Canaries according to Kunkel 1991: 52f), subsp. *macrocarpa* Turrill (recorded by Wolff & Rosinski 1999a: 12f) and subsp. *vulgaris* (recorded by Pérez de Paz & al. 1981: 55, "El Cres-El Turrón"). Wolff & Rosinski (1999a: 12f) indicate subsp. *vulgaris* as the most common one of El Hierro. They also present a short discussion of the confusing records in the Canaries and state the necessity of further investigation. In the course of the geobotanical investigation the subspecies were not distinguished. The species is tetraploid in the Canaries and mentioned as an example for "cryptic polyploidy" by Bramwell (1972b: 158).

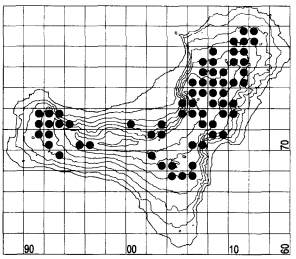
St: The species prefers pastures and their successional phases, ruderal sites, but also extends into natural non-forest communities, mainly at intermediate and upper altitudes, agriophyte? Listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

Spergula arvensis L.

–; (Ni); Thero; –; ↑

St: Mainly in pastures and ruderal sites at the high altitudes of El Hierro, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

The species grows almost exclusively at the upper altitudes of El Hierro and is replaced by *Spergularia fallax* at lower altitudes. The same distribution pattern is presented by Voggenreiter (1997a); see also Pérez de Paz & al. (1981: 55).



Spergula pentandra L.

–; –; Thero; x; –

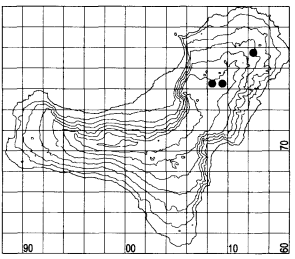
Spergularia bocconei (Scheele) Asch. & Graebn.

–; Ni; Thero; –; ↑

R: Lid (1967: 69): "*Spergula rubra* (L.) Dietr." in the NE ("Tefirabe", "Lomo south of Pico Ajonce" [Ventejís]).

In IPNI (1999-) and Short (1994: 92) the epithet is spelled "bocconii", in the original description it is "bocconi" (see Kerguélen 1999).

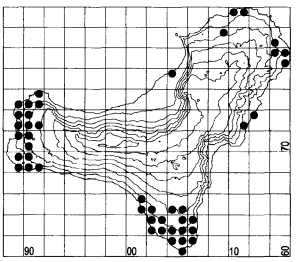
Only a few populations near San Andrés and Valverde.



Spergularia fallax Lowe

–; –; Thero; –; ↓

Distribution: see comment on *S. arvensis*.

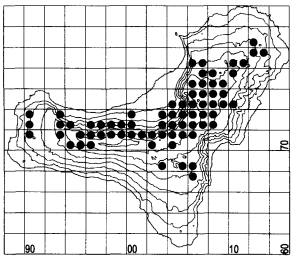


Spergularia media (L.) C. Presl

–; –; Hemi; x; –

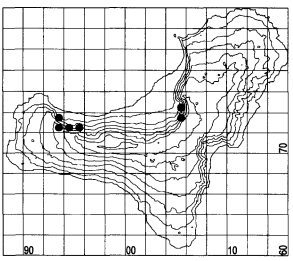
R: Chilton (1994: 4): sine loco.

Stellaria media (L.) Cirillo
–; (Ni); Thero; –; –
St: The taxon is affiliated with laurel forests, the fayal-brezal and their surroundings in El Golfo, but occurs also outside the forests in their potential area, e.g., in the pastureland in the NE. As in the case of *Solanum villosum* subsp. *alatum* the specification of the status is somewhat tricky. Brandes & Fritzsch (2002) and Kunkel (1991: 54) consider the species to be introduced to the Canary Islands. Indeed, it may be an agriophyte.



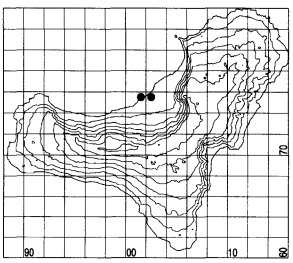
Casuarinaceae
Casuarina equisetifolia L.
–; cult; Phanero; new Hierro; ↑
Recorded e.g., in UTM 28RBR1178/1279.

Celastraceae
Maytenus canariensis (Loes.) G. Kunkel & Sunding
E Can; I; Phanero; –; –
R: Kämmer (1976: 337), Santos Guerra (1980: 26): El Golfo.

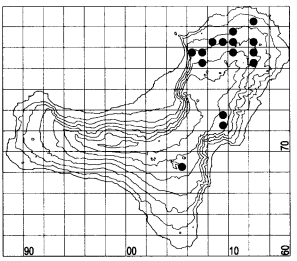


Chenopodiaceae
Atriplex glauca subsp. *ifniensis* (Caball.) Rivas-Mart. & al.
–; –; Nano; x; –
Lit: Rivas-Martínez & al. (1993b: 351).

Atriplex semibaccata R. Br.
–; Ni; Thero; new Hierro; ↓
R: Wolff & Rosinski (1999a: 14): UTM 28RBR0275.
St: Origin: Australia (Kunkel 1991: 40).

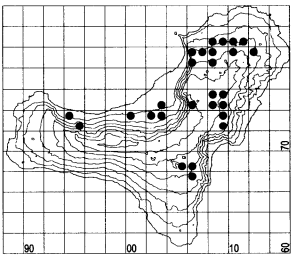


Beta vulgaris subsp. *maritima* (L.) Arcang.
–; Ni; Hemi; changed name!; –
AG/HS, M-Ch.: *B. maritima* L.
Lit: Chilton (1994: 4), Press (1994: 69) and Wisskirchen & Haeupler (1998: 96, FE).
St: Restricted to nutrient-rich, anthropogenic habitats in settlements and cultivated land.

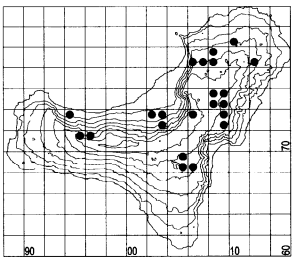


Chenoleoides tomentosa (Lowe) Botsch.
–; –; Chamae; x; –
R: Nogales & al. (1990: 161): Roque Grande de Salmor.

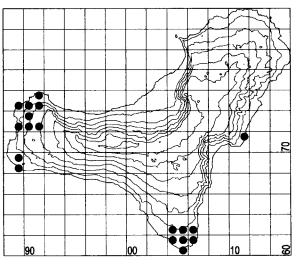
Chenopodium album L.
–; Ni; Thero; –; –
R: Wolff & Rosinski (1999a: 14): several locations.
St: Almost exclusively within nutrient-rich, anthropogenic habitats near settlements of El Hierro, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



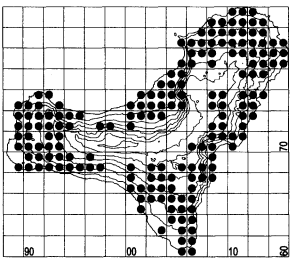
Chenopodium ambrosioides L.
–; Ne; Thero; –; –



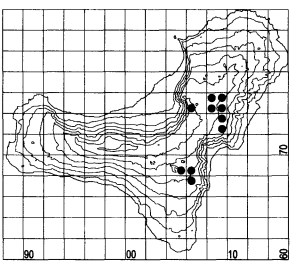
Chenopodium coronopus Moq.
E Can; I; Thero; –; ↓
Lit: León Arencibia & al. (1982).
R: Delile (cited in Knoche 1923: 39), Pérez de Paz & al. (1981: 30ff), Santos (1980: 42).



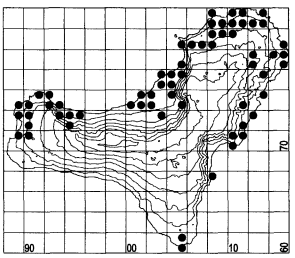
Chenopodium murale L.
–; –; Thero; –; –
St: Since the species is widely distributed in both anthropogenic and natural communities, particularly at lower altitudes, its status in El Hierro is uncertain. Listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



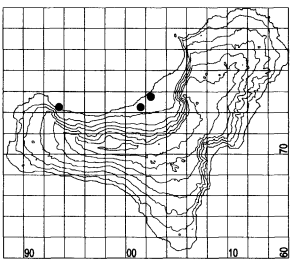
Chenopodium vulvaria L.
–; Ni; Thero; –; ↑
St: Almost exclusively within nutrient-rich, anthropogenic habitats near settlements.



Patellifolia patellaris (Moq.) A. J. Scott & al.
–; I; Thero; –; ↓
det/conf: B. Ford-Lloyd
Lit: A. J. Scott & al. (1977), J. T. Williams & al. (1976)
St: Native to the Canaries according to Kunkel (1991: 42).
The identification of the species is difficult as it is just a tetraploid cytotype of *P. procumbens* (B. Ford-Lloyd, pers. comm. 02/2003).



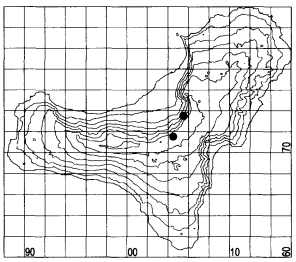
Patellifolia procumbens (C. Sm. ex Hornem) A. J. Scott & al.
E Can-Mad-CV; I; Chamae; –; ↓
det/conf: B. Ford-Lloyd
Many transitions exist to forms described as *P. webbiana;* hence, in the course of our geobotanical research the plants that may represent *P. webbiana* have been aggregated with *P. procumbens*. *P. webbiana* and *P. procumbens* represent two extremes of a continuous variation and are therefore actually conspecific (B. Ford-Lloyd, pers. comm. 02/2003).



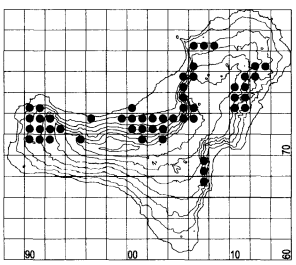
Patellifolia webbiana (Moq.) A. J. Scott & al.
E Can; I; Chamae; (x); –
Extreme forms of the *P. webbiana-P. procumbens* complex that rather clearly represent plants described as *P. webbiana* exist on El Hierro, but see comment on *P. procumbens*.
R: Wolff & Rosinski (1999a: 16): "Arenas Blancas", UTM 28RAR9275.

Cistaceae

Cistus chinamadensis Bañares & P. Romero
E Can; I; Nano; new Hierro - identification?; ↑
Lit: Bañares Baudet & Romero Manrique (1990), Marrero Gómez & al. (2003: 186 f).
The records of *C. symphytifolius* (e.g., Santos Guerra 1976: 256, 1980: 38) may refer to this taxon. This author gives an additional record for the cliffs of Las Playas, where it is also recorded by Arco Aguilar & al. (1990: 70, "acantilados del SE", 1996: 473, "on the scarp of Las Playas"). The taxonomic status of the population in El Hierro is not clear and there is a need for further investigation. The plants may be closely related to subsp. *gomerae* Bañares & P. Romero or even belong to it although they show certain peculiarities (V. Voggenreiter, pers. comm. 04/1999; R. Mesa Coello, pers. comm. 06/2000). Marrero Gómez & al. (2003: 186f) also provisionally apply the name *C. chinamadensis* subsp. *gomerae* to the respective plants of El Hierro.



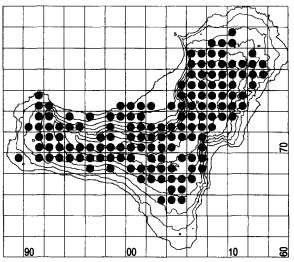
Cistus monspeliensis L.
–; –; Nano; –; –
St: According to Kunkel (1991: 69) the status as a native species of the Canaries is doubtful.



Cistus symphytifolius Lam.
E Can; –; Nano; (x); –
See comment on *C. chinamadensis*.

Helianthemum canariense (Jacq.) Pers.
–; –; Chamae; x; –
R: Pérez de Paz & al. (1976: 223): "Fuga de Gorreta", above the cliff.

Tuberaria guttata (L.) Fourr.
–; –; Thero; –; –
Some authors (e.g., Galán de Mera & al. 2000) use the genus name *Xolantha* Rafin. (nom. rej.) instead of *Tuberaria* (Dunal) Spach (nom cons.), see Kerguélen (1999).

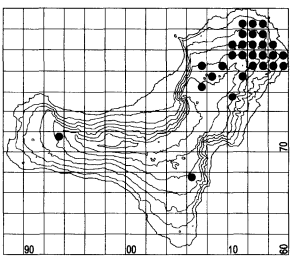


Cneoraceae

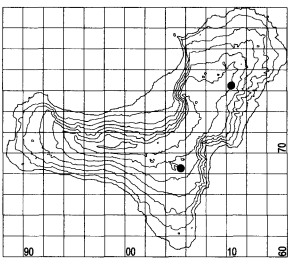
Neochamaelea pulverulenta (Vent.) Erdtm.
E Can; –; Nano, x; –
R: Ceballos & Ortuño (1976: 353): "Dehesa Sabinosa" at the coast.
Despite intense search the records could not be confirmed.

Convolvulaceae

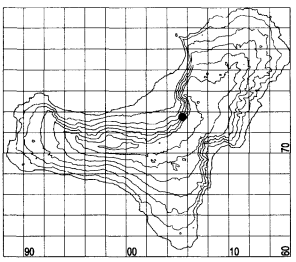
Convolvulus althaeoides L.
–; Ni; Hemi-liana; –; –
St: The species is part of the degraded vegetation in the NE and introduced to the Canary Islands according to Brandes & Fritzsch (2002) and Kunkel (1991: 182).



Convolvulus arvensis L.
–; Nc; Hemi-liana; –; –
AG/HS: In the Canaries only subsp. *arvensis*.
The species could only be found in June 2004 near the main street in El Pinar and additionally in June 2006 near the road from San Andrés to Valverde.

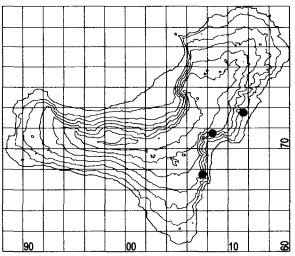


Convolvulus canariensis L.
E Can; I; Phanero-liana; –; –
R: Pérez de Paz & al. (1976: 221): El Golfo at 500 m within degraded fayal-brezal.
St: One individual was found in March 2003 near the Jinama trail at c. 650 m at the border between UTM 28RBR0573 and 0473.

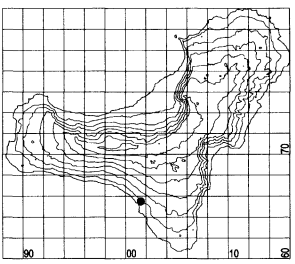


Convolvulus floridus L. f.
E Can; NE; Nano; –; ↑
HS: in El Hierro var. *floridus*.
The species could not be found in the wild, but is cultivated in gardens, e.g., in Valverde (UTM 28RBR1279, also recorded by Voggenreiter 1997a).

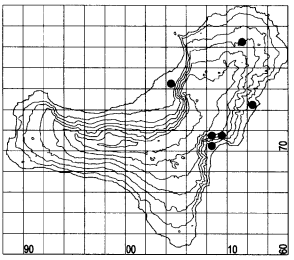
Convolvulus fruticulosus Desr.
E Can; I; Nano-liana; identification?; –
R: Pérez de Paz & al. (1981: 42, "*C.* gr. *fruticulosus*") and Santos Guerra (1980: 42, *"C.* cf. *fruticulosus"*). Further taxonomic investigation of the specimens of El Hierro may be interesting. The taxon is listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).



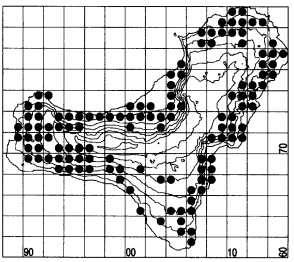
Convolvulus scoparius L. f.
E Can; I; Nano; new Hierro; ↓



Convolvulus siculus L.
–; –; Thero-liana; –; –
AG/HS: in El Hierro subsp. *siculus*
St: The status of the taxon in the Canaries is uncertain according to Kunkel (1991: 182), and also its distribution on El Hierro provides no clue.
"Rarely twining" (Turland 1994: 270).



Cuscuta planiflora Ten.
–; –; Thero; –; –
St: "Registered as native in the islands" (Kunkel 1976: 265).



Ipomoea cairica (L.) Sweet
–; cult ; Geo; new Hierro - x; –
R: Voggenreiter (1997a): Valverde.

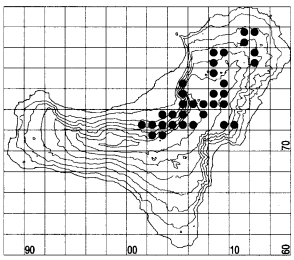
Ipomoea indica (Burm. f.) Merrill
–; cult; Nano; new Hierro - x; –
R: Voggenreiter (1997a): near Eremita de La Peña.

Crassulaceae

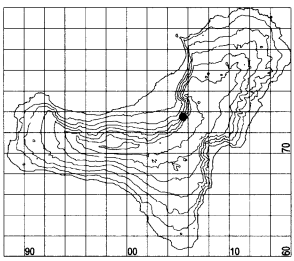
Aeonium Webb & Berthel.

There are various, partly contradictory taxonomic concepts in some of the *Aeonium* species (see, e.g., Praeger 1932, Lems 1960b and Liu 1989). In this checklist the species concept presented in AG is applied, which is rather consistent with the recent list of Nyffeler (2003: 11ff). The authors, however, follow Mes (1995: 41) by accepting the genus *Greenovia*. Lösch (1990: 193ff) presents detailed data about the physiological adaptations of the various species. Recent phylogenetic reconstructions on the base of DNA analyses of *Aeonium* and *Greenovia* are presented, e.g., by Jorgensen & Frydenberg (1999), Mes & 't Hart (1996), Mes & al. (1996) and Mort & al. (2001). Bañares Baudet (1986, 1990, 1996) presents much information on hybrids.

Aeonium arboreum var. *holochrysum* H. Y. Liu
E Can; I; Nano-succ; –; ↑
HS distinguish *A. arboreum* and *A. manriqueorum* Bolle (treated as synonyms by Liu 1989: 65) and indicate both for El Hierro.
Lit: Liu (1989: 65ff), Nyffeler (2003: 13f), Praeger (1932: 162ff: "*A. holochrysum* Webb & Berthel.").



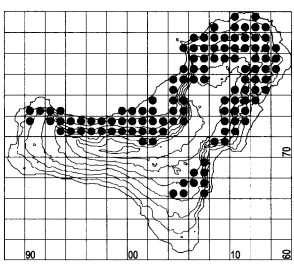
Aeonium arboreum var. *holochrysum* × *A. canariense* var. *palmense* [*A.* ×*wildpretii* Bañares]
E Can; I; Nano-succ; not AG; ↑
HS: "*Aeonium palmensis* Webb ex Christ × *vestitum* Svent.", following the originally description in Bañares Baudet (1986: 61) for the plants in La Palma.
R: Bañares Baudet (1996: 192f): near Guarazoca.
Some individuals that may represent this hybrid were found in March 2003 near the Jinama trail (beneath the Fuente Tinco). They grew between individuals of the parental species.



Aeonium arboreum var. *holochrysum* × *A. hierrense* [*A.* ×*isorense* Bañares]
E Can; I; Nano-succ; not AG/HS - x; –
R: Bañares Baudet (1996: 184ff): near Isora.

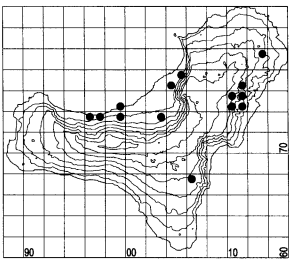
Aeonium arboreum var. *holochrysum* × *A. spathulatum* [*A.* ×*holospathulatum* Bañares nothovar. *holospathulatum*]
E Can; I; Nano-succ; not AG - x; –
R: Bañares Baudet (1996: 184): near San Andrés.

Aeonium canariense var. *palmense* (Webb ex Christ) H. Y. Liu
E Can; I; Chamae-succ; –; –
pers. comm. 11/2002, 04/2003: A. Bañares Baudet.
Lit: Liu (1989: 56ff), Nyffeler (2003: 14), Praeger (1932: 136ff: "*A. palmense* Webb.").
The plants of El Hierro were described originally as *A. palmense* subsp. *longithyrsum* Burchard [≡ *A. longithyrsum* (Burchard) Svent.] (Kunkel 1991: 93).

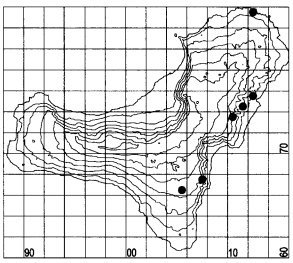


Aeonium canariense var. *palmense* × *A. hierrense* [*A.* ×*jacobsenii* Bramwell & Rowley]
E Can; I; Nano-succ; not AG; –
Lit: Bañares Baudet (1986: 64; 1990: 73), Praeger (1932: 171).

The hybrid probably also occurs in La Palma, in case the existence of *A. hierrense* (see comment there) on this island is accepted.

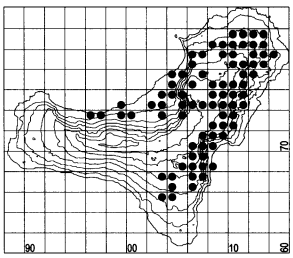


Aeonium canariense var. *palmense* × *A. valverdense* [*A.* ×*lambii* Bramwell & Rowley]
E Hierro; I; Nano-succ; not AG; ↓
Lit: Bañares Baudet (1990: 67), Praeger (1932: 138).

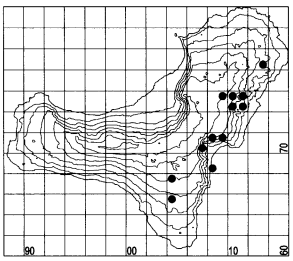


Aeonium hierrense (R. P. Murray) Pit. & Proust
E Can; I; Nano-succ; – ; –
pers. comm. 11/2002, 04/2003: A. Bañares Baudet
Lit: Nyffeler (2003: 17).

AG follow Liu (1989: 90f) who includes the population of La Palma in that species; in contrast, Praeger (1932: 167ff) found the *"urbicum*-like plant of Palma [...] to be always a large unbranched form of *ciliatum"* and Liu (1989: 91) at least states that "the La Palma population [...] is poorly collected and needs an additional study". Nevertheless, in AG *A. hierrense* is no longer listed as endemic to El Hierro. The species prefers moister conditions in comparison with *A. valverdense* and therefore avoids the arid zones near sea level, but can reach up to c. 1000 m (cf. Lösch 1990: 36ff, 252f).

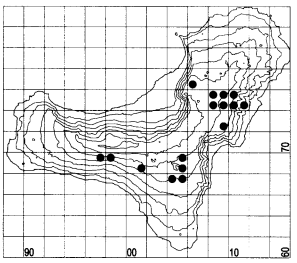


Aeonium hierrense × *A. valverdense* [*A.* ×*ombriosum* Bramwell & Rowley]
E Hierro; I; Nano-succ; not AG; ↓
Lit: Bañares Baudet (1990: 67), Praeger (1932: 171).



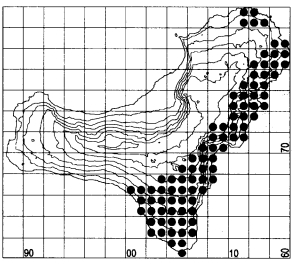
Aeonium spathulatum (Hornem.) Praeger
E Can; I; Chamae-succ; –; ↑
Lit: Nyffeler (2003: 19f).

According to HS var. *cruentum* (Webb & Berthel.) Praeger and var. *spathulatum* grow in El Hierro, according to Praeger (1932: 201ff) only the first variety; Liu (1989: 48ff) does not maintain the varieties.



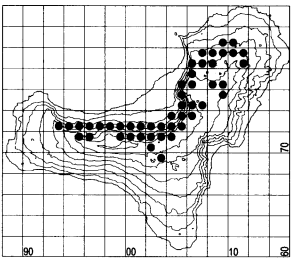
Aeonium valverdense (Praeger) Praeger
E Hierro; I; Nano-succ; –; ↓
Lit: Liu (1989: 89f), Nyffeler (2003: 20), Praeger (1932: 171ff), Santos Guerra (1996b: 74f).

The species can cope with the arid conditions of the low altitudes and can inhabit sites near sea level, but does not reach as high as *A. hierrense* (cf. Lösch 1990: 36ff, 255ff).

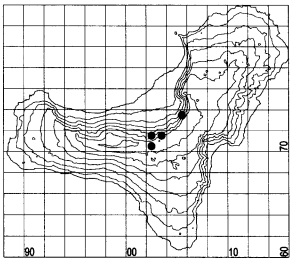


Aichryson Webb & Berthel.
The basic works about morphology, nomenclature and taxonomy are those by Bramwell (1968) and Praeger (1932: 104ff). See also Nyffeler (2003: 21ff). Lösch (1990: 163ff) presents detailed data about the physiological adaptations of the various species. Recent phylogenetical results are presented by Fairfield & al. (2004).

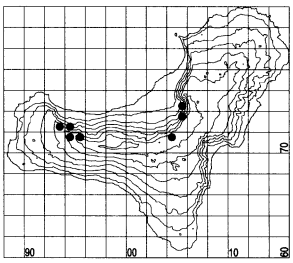
Aichryson laxum (Haw.) Bramwell
E Can; I; Thero-succ; –; ↑
Syn: *A. dichotomum* (DC.) Webb & Berthel.
Lit: Nyffeler (2003: 23).



Aichryson laxum × *A. punctatum* [*A.* ×*intermedium* Bramwell & Rowley]
E Can; I; Thero-succ; not AG; ↑
Lit: Bañares Baudet (1990: 68f), Praeger (1932: 112): *"A. dichotomum* × *punctatum"*.
R: Bañares Baudet (1990: 69): "El Derrabado".

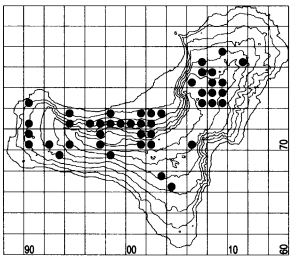


Aichryson pachycaulon Bolle
E Can; I; Thero-succ; new Hierro - identification?; ↑
Lit: Nyffeler (2003: 23).



Praeger (1932: 123f) treats the taxon as a variety of *A. punctatum* and the plants of El Hierro may indeed represent a "wet-soil form" of this species in moist habitats of the laurel forest, because transitional individuals are numerous. This is confirmed by findings in the moist growing season of 2003 (e.g., in UTM 28RBR0471) where many individuals resembled *A. pachycaulon*. The specimens could not be identified as one of the subspecies described by Bramwell (1977). Chromosome counts may illuminate the situation. In cultivation the plants can survive for years by layering. Santos Guerra (1980: 41) also mentions these plants for the mountains above Sabinosa and considers them to represent *A. pachycaulon*. See also comment on *A. punctatum*.

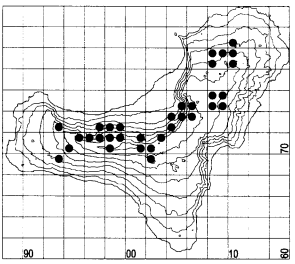
Aichryson parlatorei Bolle
E Can; I; Thero-succ; identification?; –
Lit: Bramwell (1968: 209f), Nyffeler (2003: 23f).



The respective plants of El Hierro may represent a "dry-soil form" (Praeger 1932: 122) of *A. punctatum;* the data of Lösch (1990: 185) are consistent with this view. Santos Guerra (1980: 41) identified the respective plants as *A. parlatorei* and collected them above Las Montañetas. In El Hierro numerous transitions occur (see comment on *A. punctatum*).

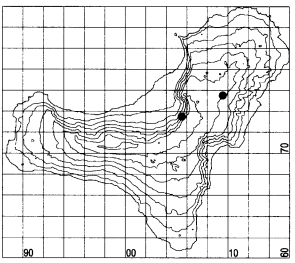
Aichryson punctatum (C. Sm. ex Buch) Webb & Berthel.
E Can; I; Thero-succ; –; ↑
Lit: Bramwell (1968: 210f), Nyffeler (2003: 24).

As mentioned above, *A. punctatum* may be the only species of the genus on El Hierro besides *A. laxum*. There are numerous transitions, sometimes even found only one metre apart, between extreme forms, which resemble *A. parlatorei* on the dry end and *A. pachycaulon* on the moist end of the scale (cf. Lösch 1990: 182ff).

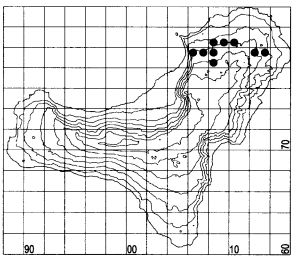


Crassula campestris (Eckl. & Zeyh.) Endl. ex Walp.
–; Ni; Thero-succ; –; –

This introduced species (origin: S Africa) could be confirmed in a few places. It grows, e.g., along the Jinama trail. Its presence may be somewhat underestimated, because stunted, non flowering plants can easily be confused with *C. tillaea,* see comment there.

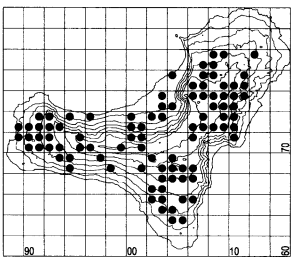


Crassula lycopodioides Lam.
–; cult; Chamae-succ; new Hierro; ↑



Crassula tillaea Lest.-Garl.
–; –; Thero-succ; –; –

For the correct differentiation of *C. campestris* and *C. tillaea* see Brullo & al. (1998) and Fernandes (1997: 99ff). However, during our fieldwork it was sometimes impossible to make an unequivocal identification, because very young or stunted plants, drying out before flowering, could hardly be distinguished. Nevertheless, *C. tillaea* seems to be much more frequent than *C. campestris* on El Hierro. In particular *C. tillaea* seems to be omnipresent at least at the high altitudes in growing seasons with high precipitation like those of 2002-03. Hence, the scattered distribution in the map reflects the situation of the relative dry years 1997-99.



Greenovia Webb

Mes (1995: 41) placed the respective species into *Aeonium* sect. *Greenovia* (Webb & Berthel.) T. H. M. Mes. The taxonomic differentiation of the species of this group is not yet solved satisfactorily according to Nyffeler (2003: 15f). Despite of contradictory records in the literature there is apparently only one species on El Hierro, which most probably represents *G. diplocycla* (see below). For ecophysiological traits of the genus see Lösch (1990: 321ff).

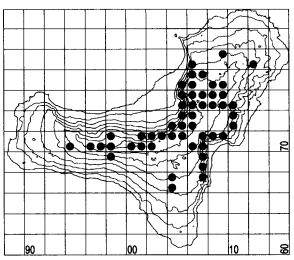
Recent phylogenetic reconstructions based on DNA analyses of *Aeonium* and *Greenovia* present, e.g., Jorgensen & Frydenberg (1999), Mes & 't Hart (1996), Mes & al. (1996) and Mort & al. (2001).

Greenovia aurea (C. Sm. ex Hornem.) Webb & Berthel.

E Can; I; Chamae-succ; (x); –

Repeatedly recorded in the literature (e.g., Burchard 1929: 142, Ceballos & Ortuño 1976: 337, Knoche 1923: 122, E. Zogg in Schmid 1976: 245ff). Praeger (1932: 216ff) recorded both *G. aurea* and *G. diplocycla* for El Hierro. According to Santos Guerra (1983: 184) the records of *G. aurea* in El Hierro are doubtful and actually refer to *G. diplocycla* (Santos Guerra 1976: 258ff). *G. aurea* is also not listed for El Hierro by Lösch (1990: 326). The confusion is completed by two doubtful species allegedly endemic to El Hierro: *G. ferrea* Webb and *G. polypharmica* Webb (cf. Christ 1888: 114 and Hohenester & Welß 1993: 111). See also comments on *G. diplocycla* below.

Greenovia diplocycla Webb ex Bolle



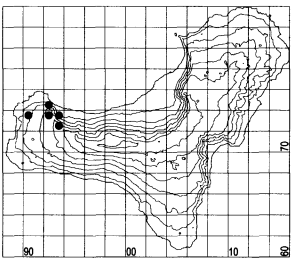
E Can; I; Chamae-succ; identification?; †

Using the diagnostic features presented by Praeger (1932: 214ff, cf. Bramwell & Bramwell 2001: 175) all plants on El Hierro may represent *G. diplocycla* because the flowers are mostly 16-19(-20)-parted (vs. 25-30 and more in *G. aurea*) and the margins of the leaves are ciliate, although the latter character is often weakly developed or the cilia are even missing. However, many plants on the island develop more than one rosette per stem. Older individuals are often much-branched, carrying more than 10 rosettes and forming compact tufts (cf. pictures in Kunkel 1991: 96, Santos Guerra 1983: 186 and Stierstorfer 2005: t. 16). This is in contrast to the standard descriptions (e.g., Praeger 1932: 216/218: "rosette always single"/"never branches normally"; cf. Bramwell & Bramwell 2001: 175) and may have led to the confusing records in the literature. According to Nyffeler (2003: 15f) the species is hardly distinguishable from *G. aurea*. Voggenreiter (1997a) identified all respective plants of El Hierro as *G. diplocycla,* which is consistent with the results of Santos Guerra (1976: 258f). See also Stierstorfer (2005: 218ff) and comments above.

Monanthes Haw.

A revision of the genus is presented by Nyffeler (1992); cf. Nyffeler (2003: 190ff). Lösch (1990: 330ff) presents ecophysiological characteristics of the various species.

Monanthes laxiflora (DC.) Bolle

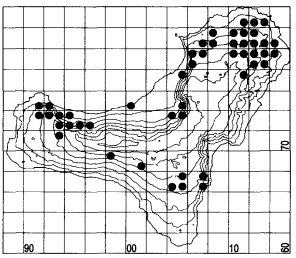


E Can; I; Chamae-succ; new Hierro - recHS not AG; –

HS: in El Hierro var. *laxiflora*

Infraspecific taxa are not recognised by Nyffeler (1992: 76ff), who does not present any records for El Hierro; neither does Praeger (1932: 235): "apparently absent from the two most western islands", consequently the record for the island in HS is not maintained in AG. Nevertheless, the findings in rocky habitats in the W clearly represent the species.

Monanthes muralis (Webb ex Bolle) Hook. f.



E Can; I; Chamae-succ; –; –

Monanthes pallens (Webb ex Christ) Christ

E Can; –; Chamae-succ; recHS not AG - (x); –

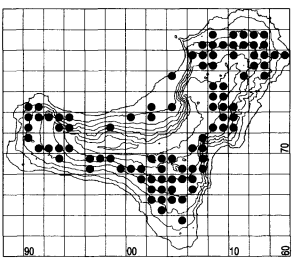
R: Praeger (1932: 230ff): sine loco; Nyffeler (1992: 70f) could not confirm the findings.

The record for El Hierro is apparently erroneous and not maintained in AG. As given in AG, Nyffeler (2003: 192f) lists the species for Gomera and Tenerife.

Sedum rubens L.

–; –; Thero-succ; x; –

Umbilicus horizontalis (Guss.) DC.



–; I; Geo; –, –

St: As in the other islands this species grows in rock communities or in respective synusia within other communities.

Rivas-Martínez & al. (2002: 245) proposes a "taxonomic correction: *Umbilicus horizontalis* (Guss.) DC should be *Umbilicus gaditanus* Boiss." Sunding (1968: 13), however, stated about *U. gaditanus* "that this taxon

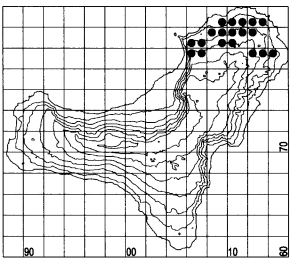
is not separable from *U. horizontalis*." Walker (2003: 382f) indicates *U. horizontalis* var. *horizontalis* for the Canary Islands.

Cucurbitaceae

Bryonia verrucosa Dryand.

E Can; I?; Geo-liana; –; –

St: In El Hierro this species exists almost exclusively near and within the settlements at intermediate altitudes of the NE. Its status as indigenous is therefore questionable.



Cucurbita pepo L.

–; cult; Thero; new Hierro; –

Cultivated, e.g., in El Pinar (UTM 28RBR0568).

Lagenaria siceraria (Molina) Standl.

–; cult; Thero; not AG/HS - x; –

R: Voggenreiter (1997a): near Guarazoca.

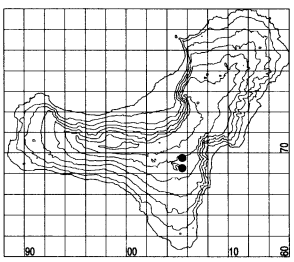
Dipsacaceae

Pterocephalus dumetorum (Brouss. ex Willd.) Coult.

E Can; NE; Nano; new Hierro - identification?; ↑

AG/HS: *P. dumetorus*, but "*dumetorum*" is genitive plural of "dumetum" (= thorn-shrub, thicket), see Stearn (2000: 403).

St: The plants are cultivated in El Pinar for ornamental purposes and represent most probably *P. dumetorum,* hitherto recorded as endemic to Gran Canaria and Tenerife. The species is apparently just on its way to escape into the wild in El Hierro.



Scabiosa atropurpurea L.

–; Nc; Thero; –; –

Syn: *Sixalix atropurpurea* (L.) Greuter & Burdet (see, e.g., Jahn & Schönfelder 1995: 293, Kerguélen 1999).

R: Pérez de Paz & al. (1976: 224): a small population in the surroundings of the Mirador de La Peña ("subsp. *maritima* (L.) Jahand. & Maire").

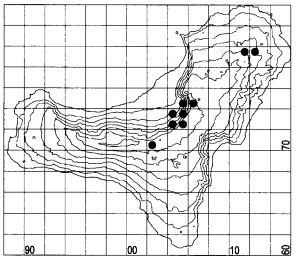
The species could only be confirmed in June 2004 and 2006 (28RBR0568) along the main street through El Pinar and is probably a casual garden escape.

Ericaceae

Arbutus canariensis Veill.

E Can; I; Phanero; –; ↑

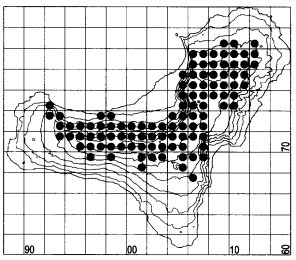
The trees in UTM 28RBR1179 may be those already recorded by Knoche (1923: 124: "in Mocanero" [= Mocanal?]). Bornmüller (1903: 11) may refer to the same population and reports that it was founded by man using juveniles from the mountains.



Erica arborea L.

–; I; Phanero; –; –

The Canary populations are planned to be separated as "subsp. *canariensis*" (Rivas-Martínez & al. 2002: 605/745).



Erica platycodon (Webb & Berthel.) Rivas-Mart. & al.

E Can; I; Phanero; x; –

Syn: *Erica scoparia* subsp. *platycodon* (Webb & Berthel.) A. Hansen & G. Kunkel

Lit: Rivas-Martínez & al. (1993b: 355).

R: Burchard (1929: 167): surroundings of "San Salvador"; Ceballos & Ortuño (1976: 365 f): N slopes of the "Pico de Tenerife".

Particularly in the El Golfo some individuals have a suspicious appearance due to the regular arrangement of the leaf rows and almost glabrous twigs. However, they all were identified as *E. arborea,* e.g., by the basal appendages of the anthers (Hohenester & Welß 1993: 180).

Euphorbiaceae

Chamaesyce scordifolia (Jacq.) Fennane

–; –; Chamae; changed name!; ↓

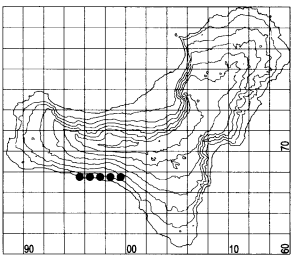
det/conf, pers. comm. 02/2000: G. Hügin

AG/HS: *Euphorbia scordifolia* Jacq.

Lit (regarding the genus concept): Benedí & Orell (1992), McVaugh (1993), Webster (1994), Wisskirchen & Haeupler (1998: 142).

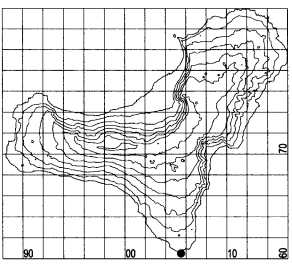
R: Santos Guerra (1983b): "las laderas áridas del Julán"

St: This species grows also in coastal regions of W Africa and seems to match with the distribution pattern of

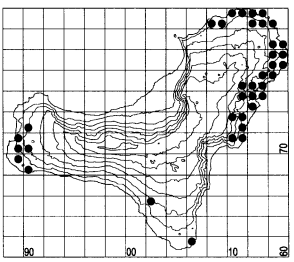


plants of the coastal region in the SW of El Hierro, which are probably indigenous (e.g., *Dichanthium foveolatum, Lotus glinoides* and *Phagnalon purpurascens*). However, the species does not exist on the other Canary Islands, and its status seems therefore somewhat obscure.

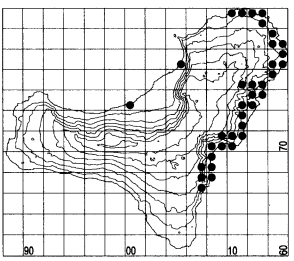
Chamaesyce serpens (Kunth) Small subsp. *serpens*
–; Ni; Thero; changed name!; ↓
det/conf, pers. comm. 02/2000: G. Hügin
AG/HS: *Euphorbia serpens* (Kunth)
For literature regarding the genus concept see above.
St: The species could only be found in between paving stones in La Restinga, but the population seems to be established.
R: Santos Guerra (1996a: 446): UTM 28RBR1579.



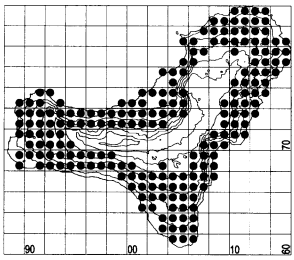
Euphorbia balsamifera Aiton subsp. *balsamifera*
–; I; Nano-succ; –; ↓
The records in UTM 28RBR0265 and 0661 refer to cultivated plants (Gaisberg 2005: 127). For discussion of the current distribution pattern on El Hierro see Gaisberg (2003). In E Africa/Arabia *E. balsamifera* subsp. *adenensis* (Defl.) Bally exists, see Bally (1965: 31ff).



Euphorbia canariensis L.
E Can; I; Nano-succ; –; ↓
The records in UTM 28RBR0074, 0578 and 1478 refer to cultivated plants (Gaisberg 2005: 127). For discussion of the current distribution pattern on El Hierro see Gaisberg (2003).



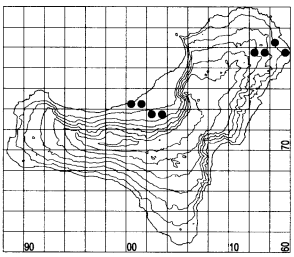
Euphorbia lamarckii subsp. *wildpretii* (Molero & Rovira) Rivas-Mart. & Gaisberg



E Can; I; Nano-succ; changed name!; –
pers. comm. 11/2002, 04/2003: J. Molero Briones
AG: *Euphorbia obtusifolia* var. *wildpretii* Molero & Rovira
HS: *E. obtusifolia* Poir. var. *obtusifolia*
Lit: Molero & Rovira (1998a: 325f, 1998b, 2004), Molero & al. (2002).

The correct name of the species is still in debate, depending on the final identification of the type specimen. According to the majority of the Committee for Spermatophyta (Brummitt 2000), *E. broussonetii* may be the correct name as applied in Bramwell & Bramwell (2001: 209). The specimens of Hierro belong to the taxon named *E. obtusifolia* var. *wildpretii* Molero & Rovira (1998a). According to Molero & Rovira (2004) they have to be named *E. lamarckii* var. *broussonettii* (Link) Molero & Rovira. The use of the species name *E. lamarckii* follows the recommendation of J. Molero Briones (pers. comm.), for the new status of "var. *wildpretii*" see Rivas-Martínez & Gaisberg (2006).

Euphorbia peplus L.

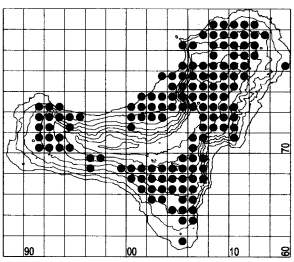


–; Ni; Thero; –; –
St: Surroundings of La Frontera and Valverde, apparently introduced to El Hierro, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

Euphorbia pterococca Brot.
–; –; Thero; x; –

Euphorbia pulcherrima Willd. ex Klotzsch
–; cult; Phanero; –; –
Recorded e.g., in UTM 28RBR0174.

Euphorbia terracina L.

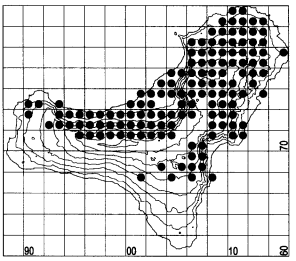


–; –; Thero; –; –
St: Kunkel (1991: 146, transl.) considers the species to be "apparently native" to the Canaries. However, in El Hierro the species predominately occurs in pasturelands and ruderal habitats, which may indicate the possibility of an anthropogenic introduction.

Mercurialis annua L.

–; –; Thero; –; –

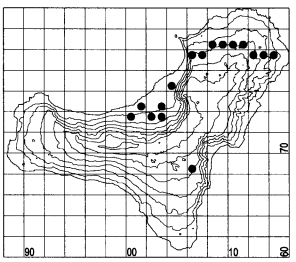
St: Mostly in the fayal-brezal, but also in natural shrub communities at lower altitudes (particularly in the N), agriophyte? Listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



Ricinus communis L.

–; cult; Phanero; –; –

Kunkel (1973: 104, 1976: 263f) already mentions the process of expansion of this species.



Fabaceae

Adenocarpus foliolosus (Aiton) DC.

E Can; I; Nano; x; –

HS: in El Hierro var. *foliolosus*

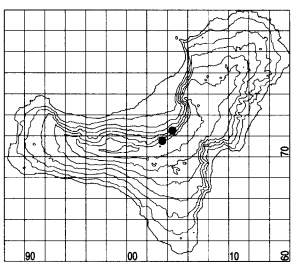
Lit: Gibbs (1967: 102ff)

R: Santos Guerra (1996a: 445f) reports about plants found near Mocanal (UTM 28RBR1180) that show properties of the hybrid between *A. foliolosus* and *A. viscosus,* although both species are not further known from El Hierro.

Adenocarpus ombriosus Ceballos & Ortuño

E Hierro; I; Nano; –; ↑

R: Barquín Diez (1972: 15), Ceballos & Ortuño (1976: 341), Pérez de Paz & al. (1976), Santos Guerra (1996b: 42 f): N slope of "Pico de Tenerife", surroundings of San Salvador; R. Mesa Coello (pers. comm. 06/2000) gives further records near the "Hoya de Fireba" and "La Mareta" (UTM 28RBR0572/0673). A survey is presented by Mesa Coello & Marrero Gómez (2003: 568f). Listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).



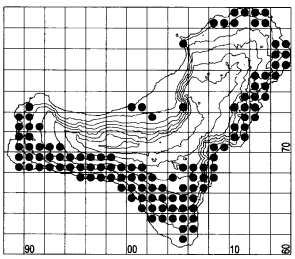
Near the "Eremita de San Salvador" (UTM 28RBR0371) individuals of this rare species are planted by the environmental authority, but a wild population still exists, although the species was considered to be (almost) extinct by Gibbs (1967: 103) and Lems (1958: 356).

Anagyris latifolia Brouss. ex Willd.
E Can; –; Nano; recHS not AG - (x); –
Kunkel (1991: 111) considers the record for El Hierro to be erroneous, and the species is not listed for the island by Beltrán Tejera (1999), Mesa Coello & al. (2003b: 90f) and Pérez de Paz (1975).

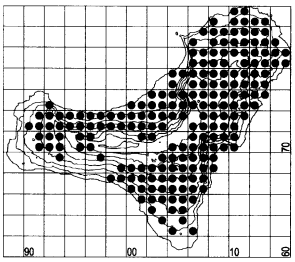
Astragalus boeticus L.
–; –; Thero; x; –
R: Wolff & Rosinski (1999a: 14): UTM 28RBR0666.
Probably casual and now extinct.

Astragalus hamosus L.
–; –; Thero; x; –

Astragalus pelecinus (L.) Barneby subsp. *pelecinus*
–; –; Thero; changed name!; –
AG/HS: *Biserrula pelecinus* L.
Lit: Podlech (1994: 84ff)



Bituminaria bituminosa (L.) C. H. Stirt.
–; –; Nano; –; –
HS: *Aspalthium bituminosum* (L.) Fourr.
Lit: Cannon & Turland (1994: 161), Chilton (1994: 8), Stirton (1981: 317f)
St: As already mentioned by Kunkel (1976: 263) for the eastern islands, the species can successfully grow in steep cliffs within the natural vegetation in El Hierro, too. "The opinion of botanists as to whether this plant is introduced or not is still rather divided" (Kunkel 1976: 263).



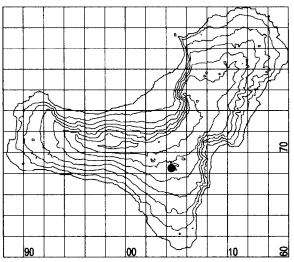
Many plants in El Hierro reach heights of more than 1 m, developing a woody trunk; therefore the species is classified as nanophanerophyte (cf. Schönfelder & Schönfelder 1997: 120 f).

Chamaecytisus proliferus (L. f.) Link

A revision of the species is presented by Acebes Ginovés & al. (1992). More detailed information about ecogeography, ecology, historical aspects, morphology, germplasm properties, nomenclature, etc. is presented, e.g., by Francisco Ortega & al. (1991, 1992, 1993 a-b, 1994), Sanchez-Yelamo & al. (1995) and Santos Guerra & Francisco Ortega (1994).

Chamaecytisus proliferus subsp. *angustifolius* (Kuntze) G. Kunkel

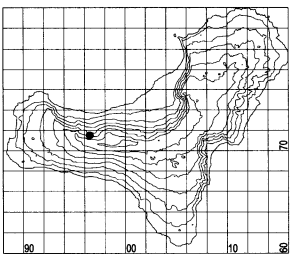
E Can; NE?; Nano; new Hierro; †



Recorded for Tenerife and La Gomera so far; in El Hierro only one doubtfully native population at the edge of the Canary pine wood near the "Hoya de Gallego" was found. However, the habitat of that population can be considered natural, since the taxon is also typical for the Canary pine forests in Tenerife (Rivas-Martínez & al. 1993b: 227ff). Perhaps the few individuals are a relic or – more probably – an initial stage of colonisation (cf. Stierstorfer 2005: 160 and relevés 51/61 in table 11).

Chamaecytisus proliferus subsp. *meridionalis* Acebes

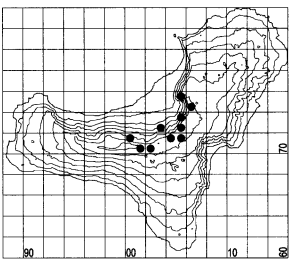
E Gran Canaria; NE; Nano; new Hierro; †



So far recorded for Gran Canaria. In El Hierro only one individual was found SE of Sabinosa ("Las Tabladas") within cultural land, apparently cultivated.

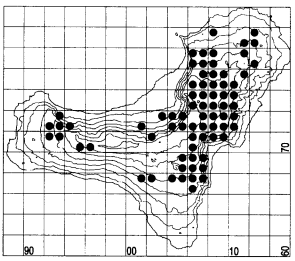
Chamaecytisus proliferus subsp. *proliferus* var. *hierrensis* (Pit.) Acebes

E Hierro; I; Nano; –; †



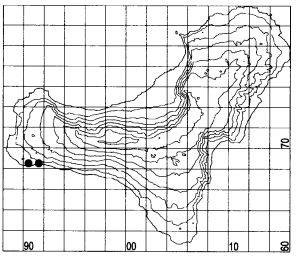
The taxon is restricted to the rocky habitats in the steep cliffs of El Golfo.

Chamaecytisus proliferus subsp. *proliferus* var. *palmensis* (Christ) A. Hansen & Sunding
E La Palma; NE; Nano; –; ↑
This variety, originally from La Palma, is widely cultivated as fodder plant and for soil regeneration (Burchard 1929: 150 and Francisco Ortega & al. 1991; 1993b).



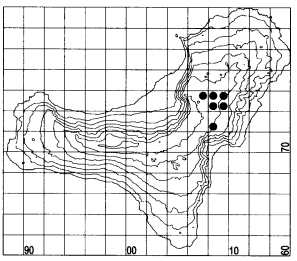
Dorycnium eriophthalmum Webb & Berthel.
E Can; I; Nano; x; –
R: Bramwell & Bramwell (2001: 199): "Fuente de Tincos" in the E of El Golfo; Marrero (1992: 153): "Pie de Risco, Frontera"; Santos Guerra (1980: 42) could not confirm the findings of E. Sventenius, who collected specimens also near Frontera, but Santos Guerra (1996b: 252f) still records the population in El Golfo. Listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).

Hippocrepis multisiliquosa L.
–; (Ni); Thero; –; ↓
St: In the surroundings of the Faro de Orchilla.
R: Wolff & Rosinski (1999a: 15): UTM 28RAR9069/9068.

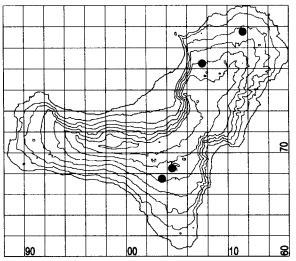


Lathyrus L.
All species of the genus in the Canaries are considered by Kunkel (1991: 126f) to be introduced, which can be confirmed for El Hierro from the distribution and phytosociological affiliation of each taxon.

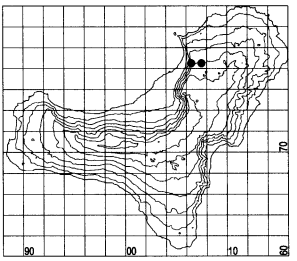
Lathyrus angulatus Willd.
–; Ni; Thero-liana; –; ↑
St: Perhaps recently introduced, growing in the surroundings of San Andrés.



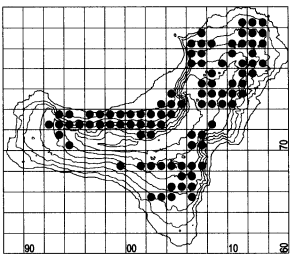
Lathyrus annuus L.
–; Ni; Thero-liana; –; ↑
St: Scattered populations in the Meseta de Nisdafe and W of El Pinar.



Lathyrus aphaca L.
–; Ni; Thero-liana; –; ↑
St: Only one population in the W of the Meseta de Nisdafe.

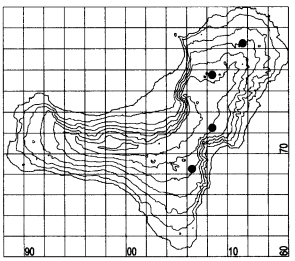


Lathyrus articulatus L.
–; Ni; Thero-liana; –; ↑
det/conf: P. Hanelt
St: The species is widely distributed at intermediate altitudes. It prefers ruderal sites, but grows also within substitutional shrub communities such as the *Hypericum canariense* scrub in El Golfo.



L. articulatus and *L. clymenum* are often treated as subspecies (e.g., Kerguélen 1999) or are even indicated as "not clearly distinguishable" (Goyder 1994: 170). However, the plants of El Hierro mostly have white or pink wings being brighter than the rest of the corolla, therefore representing the *"articulatus"* type (cf. Hohenester & Welß 1993: 146f).

Lathyrus cicera L.
–; Ne; Thero-liana; –; ↑

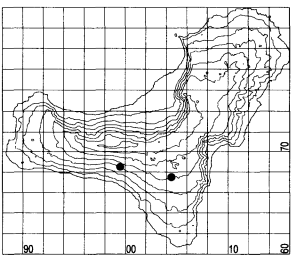


Lathyrus clymenum L.
–; –; Thero-liana; (x); –
R: Lid (1967: 89): "at many places".
The records may refer to *L. articulatus,* see comment there.

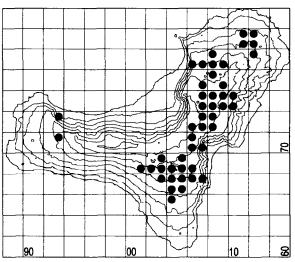
Lathyrus odoratus L.
–; cult; Thero; x; –
R: Lid (1967: 89): several, widely scattered places.

Lathyrus sativus L.
–; cult; Thero; x; –
R: Lid (1967: 89): several places in the NE and in El Julan.

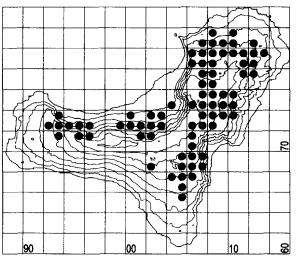
Lathyrus setifolius L.
–; Ni; Thero-liana; new Hierro; ↑



Lathyrus sphaericus Retz.
–; Ni; Thero-liana; –; ↑
St: Widely distributed at the (formerly) cultivated upper altitudes of E El Hierro. In ruderal sites and successional phases of pastures, but also intruding somewhat into natural communities.

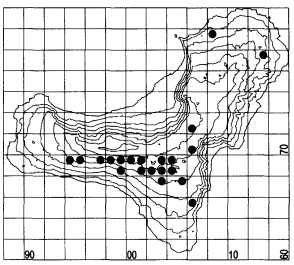


Lathyrus tingitanus L.
–; Ni; Thero-liana; new Hierro; –
St: The species is conspicuous and widespread in El Hierro, but surprisingly not recorded for the island in AG/HS. It prefers ruderal sites and abandoned land with successional communities.



Lens culinaris Medik.
–; –; Thero; (x); –
R: Lid (1967: 90): near El Pinar and in El Julan, also near "La Caldera" (= La Caldereta?).
The records may either refer to *L. nigricans* (see comment there) or to former casual garden escapes.

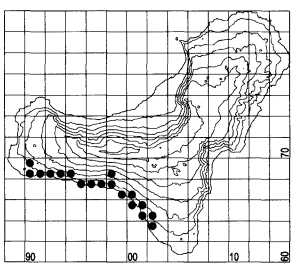
Lens nigricans (M. Bieb.) Godr.



–; –; Thero; –; ↑
St: Kunkel (1991: 127) considers the record of *L. nigricans* of La Palma to refer to introduced casuals. However, in El Hierro this species is a typical component of the ground layer of the Canary pine forest. This is also reflected by its distribution area. Therefore its designation as introduced can not be justified by the phytosociological and chorological data.
Distinguished from *L. culinaris* by the toothed stipules (vs. entire) and the seed diameter of 2.5-3 vs. 5-6 mm, see, e.g., Hohenester & Welß (1993: 1993: 145) and Jahn & Schönfelder (1995: 151).

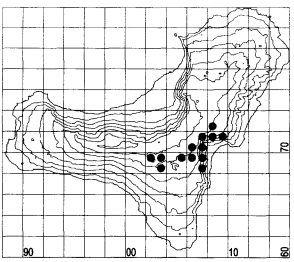
Lotus glaucus Dryand.
E Can-Mad; –; Chamae; (x); –
HS: in El Hierro var. *glaucus*.
R: Lid (1967: 91): several localities near the coast; Nogales & al. (1990: 161): "Roques del Salmor"; Santos Guerra (1980: 30): "Riscos Bascos"; Pitard & Proust (1908: 168) mention for El Hierro only "var. *villosissimus* Pit.", whereas "var. *sessilifolius* Pit." [*L. sessilifolius* DC.] is only indicated for Tenerife. According to Bramwell & Bramwell (2001: 184ff) only *L. glaucus* exists on El Hierro, whereas *L. sessilifolius* (see comment there) is restricted to Tenerife. Allan & al. (2004: 125) indicate *L. glaucus* as the only endemic *Lotus* species on El Hierro.
Probably all records refer to *L. sessilifolius*.

Lotus glinoides Delile



–; I; Thero; –; ↓
St: This Saharo-Sindian element is probably indigenous in the Canaries (Kunkel 1991: 116) and illustrates the relation between the Canary succulent scrub with shrub communities in N Africa (Otto & al. 2001: 245); see also distribution of *Dichanthium foveolatum* and *Phagnalon purpurascens*.
R: Reifenberger & Reifenberger (1990: 237): El Julan.

Lotus hillebrandii Christ



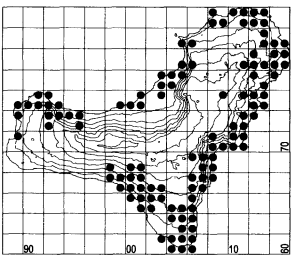
E Can; I; Chamae; identification?; ↑

R: Arco Aguilar & al. (1996: 472), Santos Guerra (1976: 256): *"L.* cf. *hillebrandii"*, zone of the Canary pine forest.

Comparing the plants of El Hierro with specimens of *L. hillebrandii* of La Palma and *L. campylocladus* of Tenerife, they clearly resemble those of La Palma. However, the leaflets of the specimens of El Hierro measure up to c. 1 cm in, whereas in standard floras (e.g., Bramwell & Bramwell 2001: 185, Schönfelder & Schönfelder 1997: 124, see also the original description by Christ 1888: 122) 2-4 mm are indicated for *L. hillebrandii*.

Although the plants are perennial, they often occur only temporarily after disturbances such as forest fires. Some years after such events the populations diminish or even disappear (cf. Stierstorfer 2005: 156ff and t. 9).

Lotus sessilifolius DC.

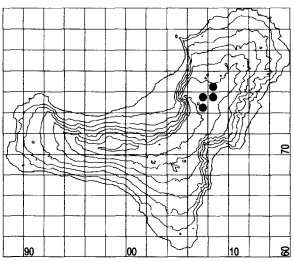


E Can; I; Chamae; identification?; –

HS: in El Hierro var. *pentaphyllus* (Link) Davis and var. *sessilifolius*.

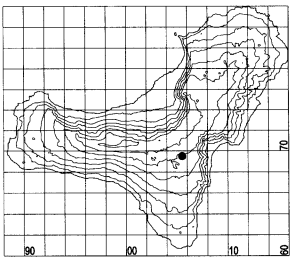
The plants of El Hierro form a very variable complex with continuous transitions between extreme forms, regarding, e.g., the hairiness of the plants or the size of the leaflets. Considering the constantly sessile (or shortly petiolate) leaves, all plants may belong to *L. sessilifolius*. This name is provisionally applied to all respective plants of the island, which is consistent with the determination by Pérez de Paz & al. (1981: 28). Bornmüller (1903: 4) described the plants of El Hierro as "var. *villosa*". In contrast, Bramwell & Bramwell (2001: 184ff) and Allan & al. (2004: 125) designate the plants of El Hierro as *L. glaucus* (see comment there).

Lupinus albus L.



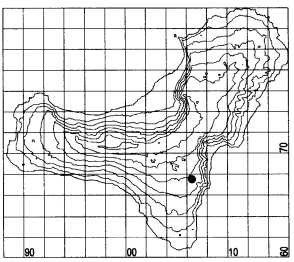
–; cult; Thero; –; ↑

Lupinus angustifolius L.
–; cult; Thero; –; ↑
R: Santos Guerra (1996a: 447): UTM 28RBR0669.

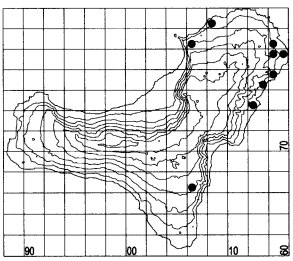


Medicago L.
A synopsis of the genus is given by Small (1989). All species are considered by Kunkel (1991: 121) to be introduced.

Medicago arborea L.
–; cult; Nano; –; ↑
det/conf: E. Small
A few plants near El Pinar; they belong to *M. arborea* var. *arborea,* "where one recognises var. *citrina* as a variety of *M. arborea* rather than a separate species" (E. Small, pers. comm. 02/2000).

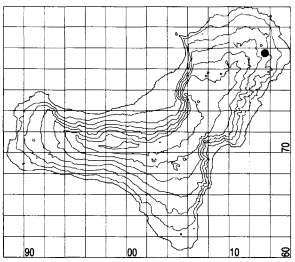


Medicago laciniata (L.) Mill.
–; (Ni); Thero; –;
det/conf: E. Small

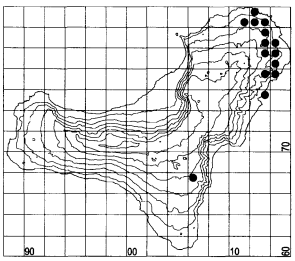


Medicago littoralis Rhode ex Loisel.
–; –; Thero; x; –
R: Lid (1967: 93): above Tamaduste, "Los Picos".

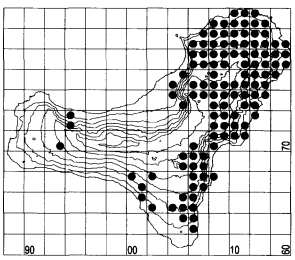
Medicago lupulina L.
–; Nc; Thero; new Hierro; ↑
St: Probably a casual in Valverde.



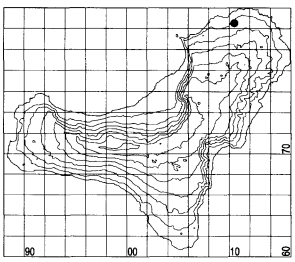
Medicago minima (L.) Bartal.
–; Ni; Thero; –; –
St: Region below Valverde, one finding in El Pinar.
det/conf: E. Small



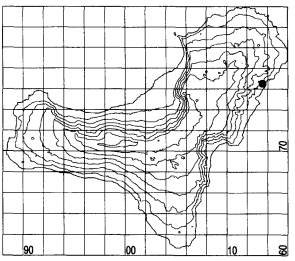
Medicago polymorpha L.
–; (Ni); Thero; –; –
St: The species mainly grows on nutrient-rich and ruderal sites.
det/conf: E. Small



Medicago sativa L. subsp. *sativa*
–; Nc; Thero; new Hierro; ↓
det/conf: E. Small



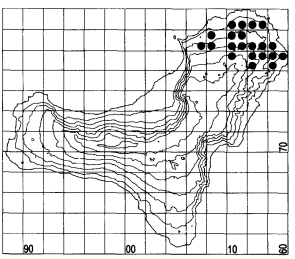
Medicago tornata (L.) Mill.
–; Nc; Thero; new Hierro; ↓
St: Probably casual, near the coast in the E.
det/conf: E. Small



Medicago truncatula P. Gaertn.
–; –; Thero; x; –
R: Wolff & Rosinski (1999a: 15): UTM 28RBR1283.

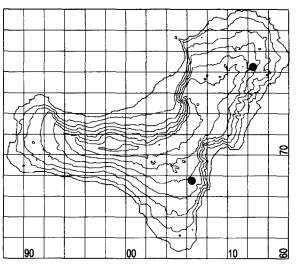
Melilotus Mill.
The genus *Melilotus* must be treated as masculine (Art. 62.1, Ex. 1, of the International Code of Botanical Nomenclature, Greuter & al. 2000; cf., e.g., Jahn & Schönfelder 1995: 156). Kunkel (1991: 122) considers all species on the Canaries to be introduced.

Melilotus indicus (L.) All.
–; Ni; Thero; –; –
St: Widely distributed at medium altitudes in the NE with old and intense anthropogenic activity.



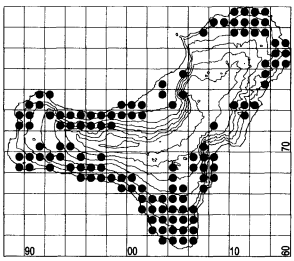
Melilotus infestus Guss.
–; –; Thero; x; –

Melilotus sulcatus Desf.
–; Ni; Thero; –; –
St: Restricted to few places in El Pinar and Valverde.

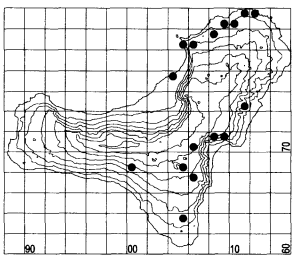


Ononis L.
The status of the species as introduced or native is uncertain according to Kunkel (1991: 119), and neither chorological and nor phytosociological data of El Hierro bear any clue for this question.

Ononis dentata Sol. ex Lowe
–; –; Thero; –; –
det/conf: H. Förther.

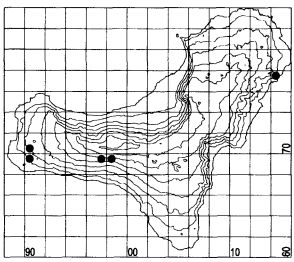


Ononis diffusa Ten.
–; –; Thero; –; –
det/conf: H. Förther.

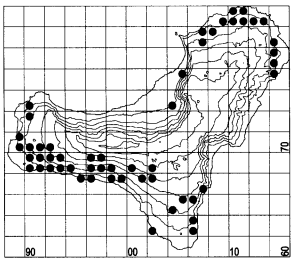


Ononis mitissima L.
–; –; Thero; x; –

Ononis reclinata L.
–; –; Thero; –; –
det/conf: H. Förther.

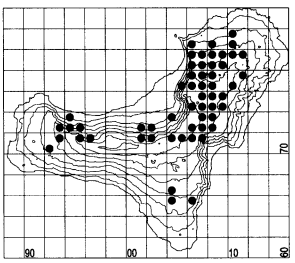


Ononis serrata Forssk.
–; –; Thero; –; –
det/conf: H. Förther.
HS: in El Hierro var. *erecta* Webb & Berthel.

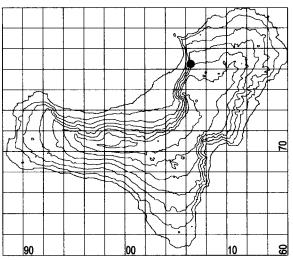


Ononis viscosa L.
–; –; Thero; x; –

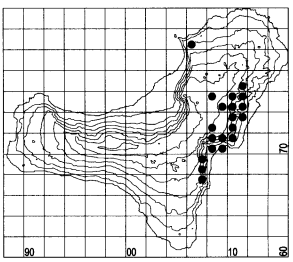
Ornithopus compressus L.
–; (Ni); Thero; –; –
Almost exclusively in pastures and their successional phases, or in ruderal habitats.



Ornithopus pinnatus (Mill.) Druce
–; Nc; Thero; new Hierro; ↑
St: Only one small population near the crest of the Risco de Tibataje in the surroundings of the Eremita de La Peña, probably casual.

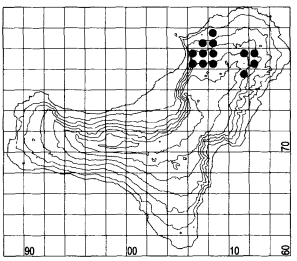


Retama rhodorhizoides Webb & Berthel.
E Can; I; Nano; –; –
Syn: *Retama raetam* (Forssk.) Webb & Berthel.
In contrast to AG, HS do not indicate the taxon as endemic, see also Zohary (1959: 6f): *R. raetam* var. *raetam* "from Canary Islands to Arabia".

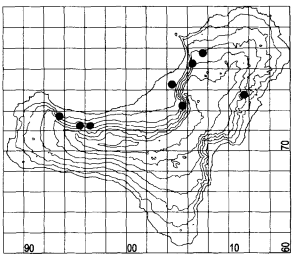


Scorpiurus muricatus L.
–; –; Thero; x; –
HS: in El Hierro var. *subvillosus* (L.) Fiori.

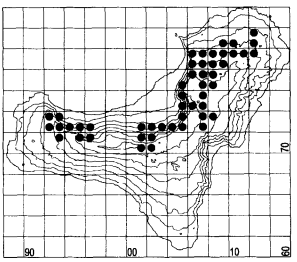
Spartium junceum L.
–; Ne; Nano; –; –



Spartocytisus filipes Webb & Berthel.
E Can; I; Nano; –; –

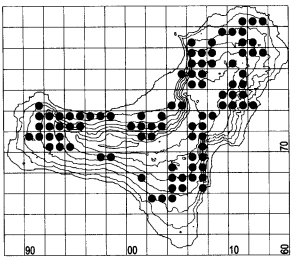


Teline stenopetala subsp. *microphylla* (Pit. & Proust) del Arco
E Can; I; Nano; –; –
Lit: Arco Aguilar (1983: 211ff, 1993), Gibbs & Dingwall (1971: 282ff).
R: Santos Guerra (1980: 19): in rock communities

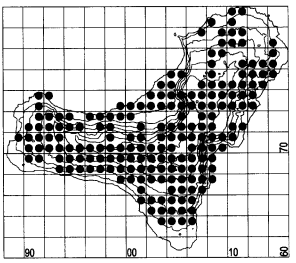


Trifolium L.
Kunkel (1991: 123) considers all species of the genus in the Canary Islands to be probably introduced. However, many of them are present in various or even most plant communities and widely distributed. In these cases, the definition of the floristic status is omitted.

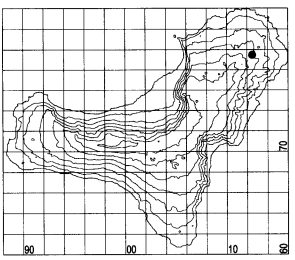
Trifolium angustifolium L.
–; –; Thero; –; –



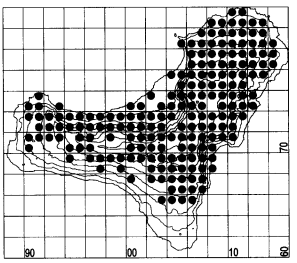
Trifolium arvense L.
–; –; Thero; –; –



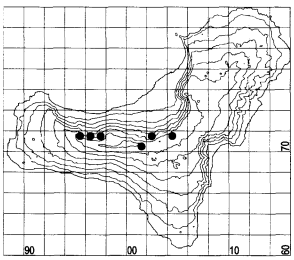
Trifolium bocconei Savi
–; –; Thero; –; –
R: Voggenreiter (1997a): in the regions of El Pinar and Sabinosa, respectively.
A small population could be encountered in June 2004 above Valverde.



Trifolium campestre Schreb.
–; –; Thero; –; –

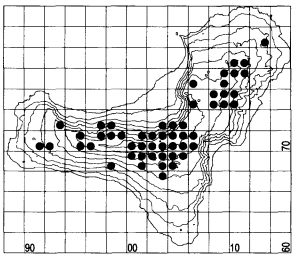


Trifolium cernuum Brot.
–; Nc/Ni; Thero; new Can; ↑
St: The species is a new record for the Canaries, found 1997 and 1998 as well as in June 2004 on and near trails of the uppermost region. Its status as a casual weed is therefore questionable, it may be on its way to establish itself in the long term.

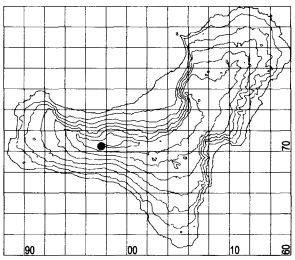


Trifolium cherleri L.
–; –; Thero; x; –

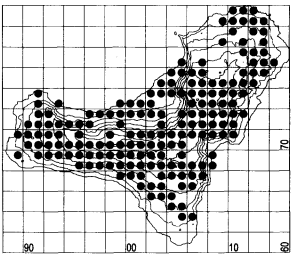
Trifolium dubium Sibth.
–; –; Thero; –; ↑



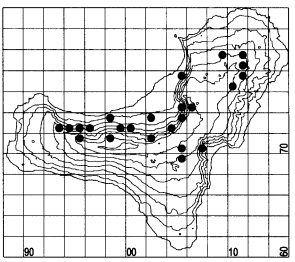
Trifolium gemellum Pourr. ex Willd.
–; Nc; Thero; –; ↑
R: Wolff & Rosinski (1999a: 17): UTM 28RBR0766.



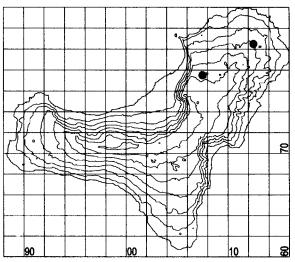
Trifolium glomeratum L.
–; –; Thero; –; –



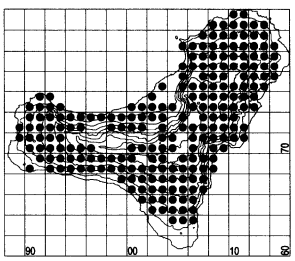
Trifolium ligusticum Balb. ex Loisel.
–; –; Thero; –; –



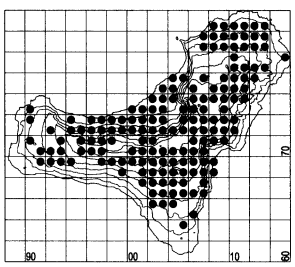
Trifolium repens L.
–; Nc; Hemi; new Hierro; ↑
Apparently recently introduced with horticultural waste, most probably casual.



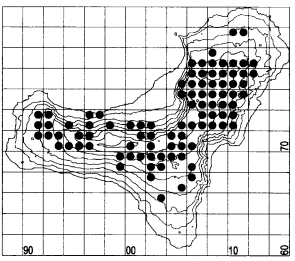
Trifolium scabrum L.
–; –; Thero; –; –



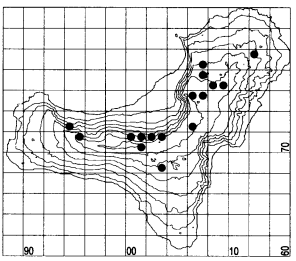
Trifolium striatum L.
–; –; Thero; –; –



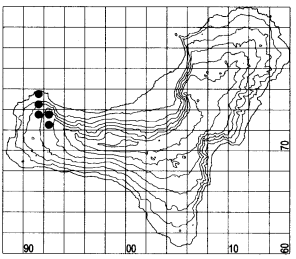
Trifolium subterraneum L.
–; –; Thero; –; –



Trifolium suffocatum L.
–; Ni; Thero; –; ↑
Almost exclusively on trails in heavily trodden communities.

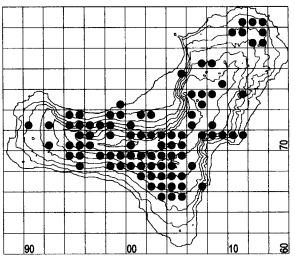


Trifolium tomentosum L.
–; (Ni); Thero; –; –
Scattered in the pastureland around the Mirador de Bascos and the region beneath.

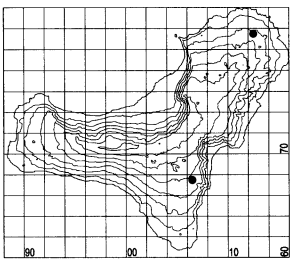


Vicia L.
Kunkel (1991: 128) considers all of the non-endemic species of the genus in the Canaries as neophytes. However, as in *Trifolium,* some widespread species also occur in natural communities and their identification either as idiochorophyte or agriophyte is hardly possible.

Vicia angustifolia L.
–; –; Thero; changed name!; –
det/conf, pers. comm. 02/2000: P. Hanelt
AG/HS: *V. sativa* subsp. *nigra* (L.) Ehrh.
Lit: Wisskirchen & Haeupler (1998: 543, Hegi).
St: Weak local character species of the Canary pine forest of El Hierro, agriophyte?



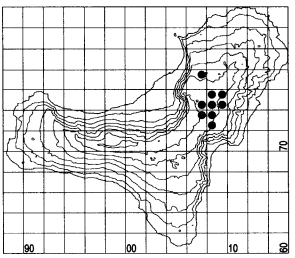
Vicia articulata Hornem.
–; Ni; Thero; –; ↑
Exclusively in the surroundings of El Pinar and N of Valverde.

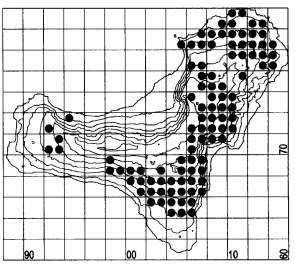


Vicia benghalensis L.
–; (Ni); Thero; –; ↑
det/conf: P. Hanelt
St: Both "taxa" grow mostly in (abandoned) pastures and ruderal sites.

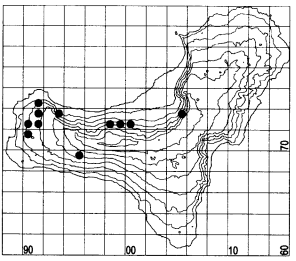
Most of the plants of El Hierro have few-flowered peduncles and may represent *V. atlantica* J. G. Costa [*V. costae* A. Hansen] (see Goyder 1994: 165). These taxa are nowadays considered to belong to *V. benghalensis*, see second map.

The "true" *V. atlantica* Pomel from Algeria has yellow flowers (P. Hanelt, pers. comm. 02/2000). Nevertheless, plants of the *"atlantica"* type were distinguished from the rarer typical plants that form a rather discrete distribution area between San Andrés and Isora, see first map.

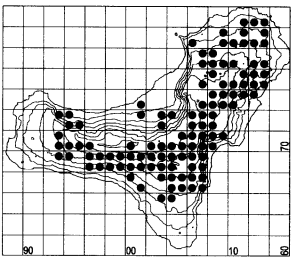




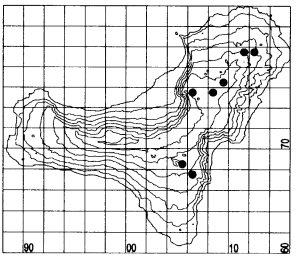
Vicia cirrhosa C. Sm. ex Webb & Berthel.
E Can; I; Thero; –; –
R: Burchard (1929: 158): El Golfo; E. Zogg in Schmid (1976: 245ff): laurel forest of the NW-facing slopes above Frontera, 600-900 m.



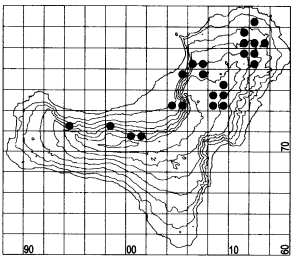
Vicia disperma DC.
–; –; Thero; –; –
St: In El Hierro the species is a local character species of the Canary pine forests, which is consistent with the findings of Sunding (1972: table 29) who indicates *V. disperma* even as character species of the order/class of the pine forest communities (cf. Stierstorfer 2005: 166). Its status as a neophyte as suggested by Kunkel (1991: 128) for all non endemic *Vicia* species could therefore not be confirmed.



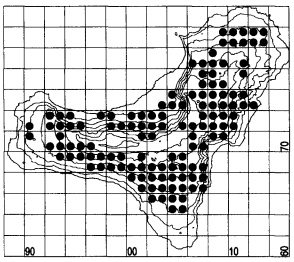
Vicia faba L.
–; cult; Thero; new Hierro; –
Cultivated at several places, e.g., near Valverde, San Andrés and El Pinar.



Vicia hirsuta (L.) Gray
–; (Ni); Thero; –; –
Mainly in the surroundings of San Andrés and Valverde, but also scattered in El Golfo.

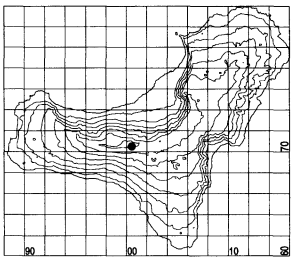


Vicia lutea subsp. *lutea*
–; –; Thero; –; –
det/conf: P. Hanelt
HS: *V. lutea* var. *lutea*
Lit: Goyder (1994: 164).
R: Wolff & Rosinski (1999: 13): "var. *amphicarpa* Goiran" in UTM 28RBR0468.

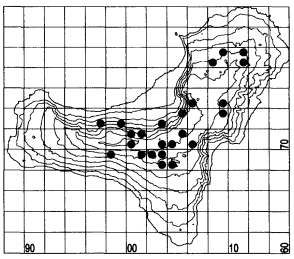


Vicia monantha Retz.
–; –; Thero; x; –
R: Voggenreiter (1997a): in the extreme N, region of El Pinar and El Julan.

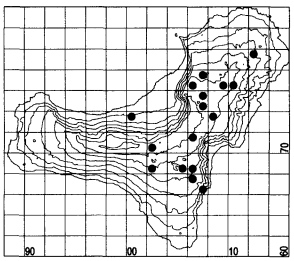
Vicia parviflora Cav.
–; Nc; Thero; new Hierro, changed name!; ↑
det/conf, pers. comm. 02/2000: P. Hanelt
AG/HS: *V. tenuissima* (M. Bieb.) Schinz & Thell.
Lit: Goyder (1994: 166), Wisskirchen & Haeupler (1998: 543, M-Ch)
St: Only one small population within the Canary pine forest, most probably casual.



Vicia pubescens (DC.) Link
–; –; Thero; –; ↑
det/conf: P. Hanelt
R: Lid (1967: 105): in the NE ("Tenecedra" and "Mt. Ajares") and near El Pinar.

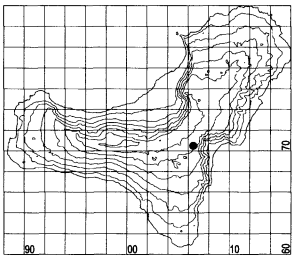


Vicia sativa subsp. *sativa*
–; Ni; Thero; –; –
det/conf: P. Hanelt
R: Wolff & Rosinski (1999a: 17): UTM 28RBR0666.
St: Almost exclusively in nutrient-rich and ruderal sites.



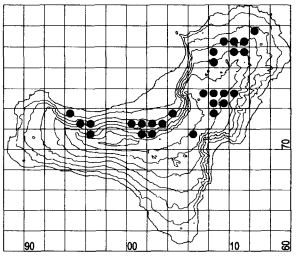
Vicia tetrasperma (L.) Schreb.
–; –; Thero; (x); –
R: Knoche (1923: 226): "*Ervum tetraspermum* L." near Valverde. The record probably refers to *V. pubescens*.

Vicia villosa Roth subsp. *villosa*
–; Nc; Thero; new Hierro; ↑
det/conf: P. Hanelt
The species is a new record for El Hierro (probably casual), the subsp. *villosa* is not listed in AG/HS.

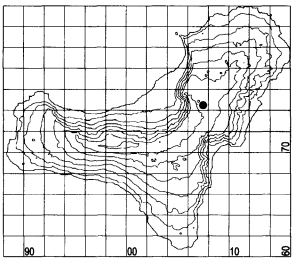


Fagaceae

Castanea sativa Mill.
–; cult; Phanero; –; ↑



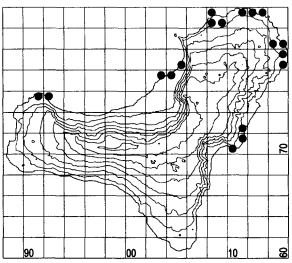
Quercus ilex L.
–; cult; Phanero; new Hierro; ↑
Only one small individual W of San Andrés near the street. It represents most probably *Q. rotundifolia* Lam., which is indicated as a subspecies of *Q. ilex* by Kerguélen (1999); cf. Reifenberger & Reifenberger (1990: 246f).



Frankeniaceae

Frankenia capitata Webb & Berthel.
–; –; Chamae; (x); –
Syn: *F. laevis* (AG/HS); according to A. Santos Guerra (pers. comm. 10/2001) *F. capitata* can be well differentiated from *F. laevis* L.
R: Lid (1967: 123): near "La Peña" at the coast; Voggenreiter (1997a): several places near the coast; all these records may refer to *F. ericifolia,* see comment there.

Frankenia ericifolia C. Sm. ex DC.
–; I; Chamae; –; ↓
det/conf: A. Santos Guerra
AG/HS: in El Hierro subsp. *ericifolia*. All specimens of the genus collected on El Hierro have been identified as *F. ericifolia*. The identification at infraspecific level was not possible and further investigation is needed (A. Santos Guerra, pers. comm. 10/2001). All respective plants of El Hierro apparently belong to one taxon.

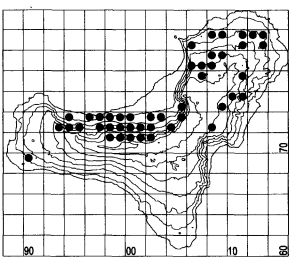


Frankenia pulverulenta L.
–; –; Thero; (x); –
R: Lid (1967: 123): "La Peña" at the coast; see comment on *F. ericifolia*.

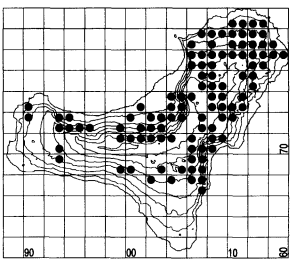
Fumariaceae

Fumaria bastardii Boreau
–; –; Thero; (x); –
R: Lid (1967: 72): near "Las Lajas" and N of "Tefirabe"; Pérez de Paz & al. (1981: 53): in the NE (Erese, Guarazoca).
The records may refer to *F. coccinea*.

Fumaria coccinea Lowe ex Pugsley
E Can; I; Thero; –; –
Lit: Lidén (1986: 71 f).

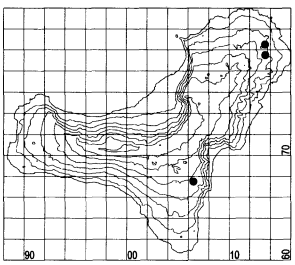


Fumaria montana Schmidt (incl. *F. praetermissa* Pugsley)
E Can-Mad-CV; I; Thero; –; –
R: Wolff & Rosinski (1999a: 15): UTM 28RAR9074.
F. praetermissa is included in *F. montana* by Lidén (1986: 72f).



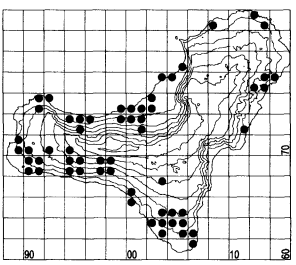
Fumaria muralis Sond. ex Koch
–; –; Thero; (x); –
AG/HS: in El Hierro subsp. *muralis*.
R: Lid (1967: 72): "rather common"; Pérez de Paz & al. (1981: 53): "Monte del Derrabado".
Former records may refer to *F. montana* (cf. Hohenester & Welß 1993: 90).

Fumaria parviflora Lam.
–; Ni; Thero; –; ↑
Restricted to a few places in Valverde and El Pinar, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

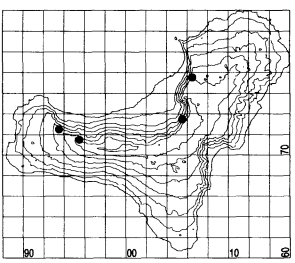


Gentianaceae
Centaurium erythraea Rafn
–; –; Thero; (x); –
R: Pérez de Paz & al. (1976: 220): near Echedo; Pérez de Paz & al. (1981: 52): "Los Lajiales".
The record refers probably to *C. tenuiflorum*.

Centaurium tenuiflorum (Hoffmanns. & Link) Fritsch
–; –; Thero; –; –
AG/HS: in the Canaries subsp. *tenuiflorum*.
R: Pérez de Paz & al. (1981: 52): "Hoya del Verodal".
According to Kunkel (1991: 171) the Canary plants may represent *C. pulchellum,* whereas AG/HS treat the latter as synonym of the above taxon.

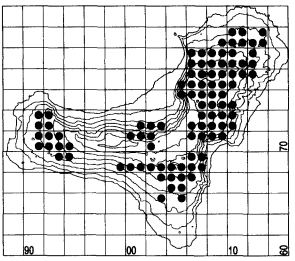


Ixanthus viscosus (Sm.) Griseb.
E Can; I; Nano; –; ↑
R: Lid (1967: 135): "La Gatera in Los Lomos".



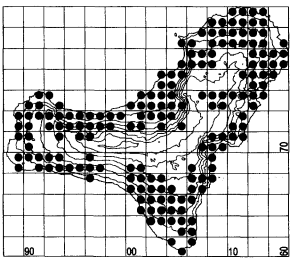
Geraniaceae

Erodium botrys (Cav.) Bertol.
–; (Ni); Thero; –; –
St: Very common in the pasturelands in the NE highland and the W of El Hierro, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

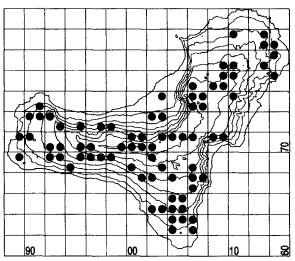


Erodium brachycarpum (Godr.) Thell.
–; –; Thero; x; –

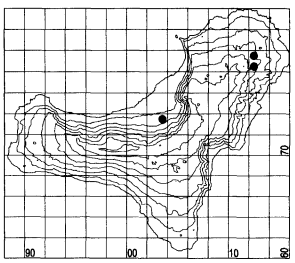
Erodium chium (L.) Willd.
–; –; Thero; –; –
AG/HS: in El Hierro subsp. *chium*.
St: Very common at the intermediate and lower altitudes, in ruderal sites, but also in natural shrub communities.



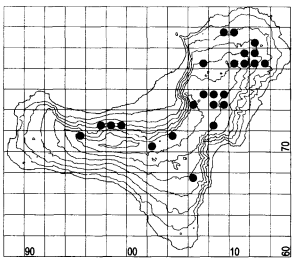
Erodium cicutarium (L.) L'Hér.
–; (Ni); Thero; –; –
AG/HS: in El Hierro subsp. *cicutarium*.
St: Common in pastures and ruderal sites, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



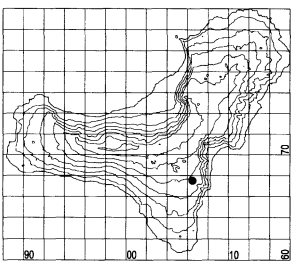
Erodium malacoides (L.) L'Hér.
–; Ni; Thero; –; –
St: The species could only be confirmed in/near the villages Valverde and La Frontera. It can therefore be considered to be (recently?) introduced.



Erodium moschatum (L.) L'Hér.
–; (Ni); Thero; –; ↑
St: The species mainly grows on or near trails at high altitudes; listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

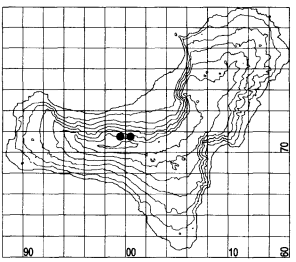


Erodium salzmannii Delile
–; Nc; Thero; –; ↑
Found near a rubble dump in El Pinar.
R: Wolff & Rosinski (1999a: 15): UTM 28RBR0766.

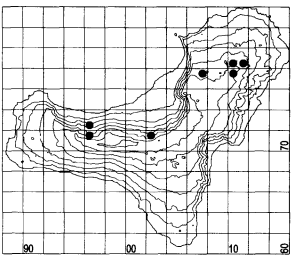


Geranium L.
The non-endemic, annual species of the genus are probably all introduced to the Canaries according to Kunkel (1991: 160). However, most of them are widely distributed and occur in natural and anthropogenic communities in El Hierro. A reasonable statement about the status is therefore difficult.

Geranium canariense Reut.
E Can; I; Hemi; –; ↑
R: Bramwell & Bramwell (2001: 203): "laurel forests and pine woods of the Cumbre and El Golfo region"; Ceballos & Ortuño (1976: 245): Jinama; E. Zogg in Schmid (1976: 245ff): laurel forest of the NW-facing slopes above Frontera, 600-900 m.



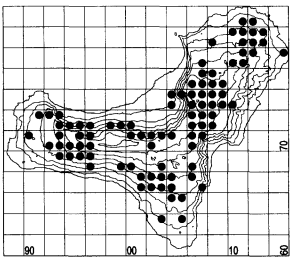
Geranium dissectum L.
–; –; Thero; –; ↑



Geranium molle L.

–; –; Thero; –; –

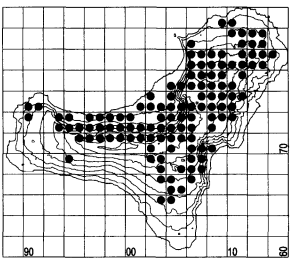
Identified by the wrinkled, glabrous mericarps (Short 1994: 194 f).



Geranium purpureum Vill.

–; –; Thero; identification?; –

All plants of El Hierro most probably represent *G. purpureum,* identified by the mericarps with dense wrinkle-like ridges and 2-3(-4) deep collar-like ridges at the apex, yellow anthers, mostly thickened pedicels and petals not exceeding 10 mm (see, e.g., Haeupler & Muer 2000: 359, Short 1994: 195f, Rich & Rich 1988: 43, Stace 1991: 564ff). However, the petals occasionally exceed 10 mm and the plants have a strong smell, which is also typical for *G. robertianum* according to Haeupler & Muer (2000: 359).



Geranium robertianum L.

–; –; Thero; (x); –

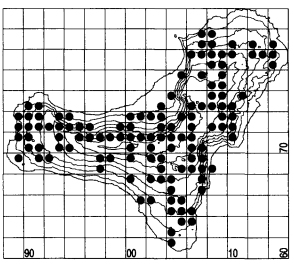
R: Gandullo (1991: 157ff): several places in the fayal-brezal; E. Zogg in Schmid (1976: 245ff): laurel forest of the NW-facing slopes above Frontera 600-900 m.

The records may refer to *G. purpureum,* see comment there and Kunkel (1991: 160).

Geranium rotundifolium L.

–; –; Thero; –; –

Identified by the smooth, pubescent mericarps (Short 1994: 194f); sterile plants can be recognised by the red glandular spots near the diverging points of the leaf segments.



Pelargonium graveolens (Thunb.) L'Hér.

–; cult; Chamae; new Hierro; –

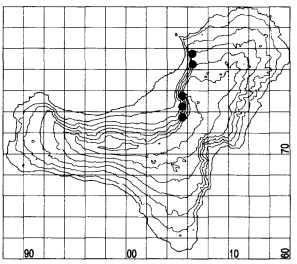
Recorded, e.g., W of San Andrés near the street at the base of Mña. de Afosa (UTM 28RBR0774).

Globulariaceae

Globularia salicina Lam.

E Can-Mad; I; Nano; –; –

R: Pérez de Paz & al. (1976: 222) and Santos Guerra (1980: 42) additionally report findings above Sabinosa in the W of El Golfo.



Haloragaceae

Myriophyllum spicatum L.

–; –; Hydro; new Hierro - x; –

R: Chilton (1994: 7): sine loco.

Hydrangeaceae

Hydrangea macrophylla (Thunb.) Ser.

–; cult; Nano; new Hierro - x; –

R: Chilton (1994: 8): sine loco.

Hydrophyllaceae

Wigandia caracasana Kunth

–; cult; Phanero; new Hierro -x; –

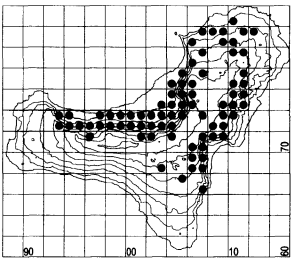
R: Chilton (1994: 8).

Hypericaceae

Hypericum canariense L.

E Can-Mad; I; Nano; –; –

R: Bornmüller (1903: 9): *H. canariense* with forms transitional to "*H. floribundum* Aiton" near "Las Lapas"; Lid (1967: 120): *"H. floribundum"* in the NE ("La Gatera north of Tefirabe").



HS lists var. *canariense* and var. *floribundum* (Aiton) Bornm. for El Hierro, but according to Robson (1996: 134ff) "it is not possible to recognise more than one variable species, *H. canariense* L." in the Canaries. Anyway, most plants of El Hierro have broad, rounded sepals and therefore represent the *"canariense"* type.

Hypericum grandifolium Choisy

E Can-Mad; I - +?; Nano; x; –

R: Ceballos & Ortuño (1976: 244), Fernández-Pello Martín (1989: 182f/232f), Lid (1967: 120), and E. Zogg in Schmid (1976: 245ff): almost all records in El Golfo. The population is apparently considerably reduced or even extinct.

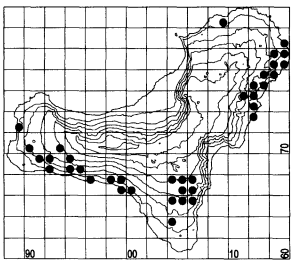
Hypericum reflexum L. f.
E Can; I; Nano; recHS not AG - (x); –
HS: in El Hierro var. *reflexum*. This record is neither confirmed by Robson (1996: 193ff) nor is there any record for El Hierro in Bramwell & Bramwell (2001: 220) and Ceballos & Ortuño (1976: 328). According to Kunkel (1991: 64) the species exists on the island. Erroneous record?

Juglandaceae

Juglans regia L.
–; cult; Phanero; new Hierro; –
Recorded, e.g., in UTM 28RBR0472 ("Hoya Pequeña").

Lamiaceae

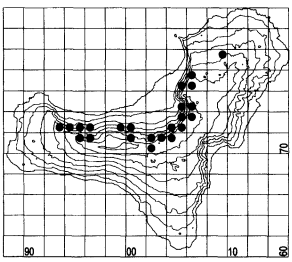
Ajuga iva (L.) Schreb.
–; –; Chamae; –; ↓
HS: in the Canaries var. *pseudiva* (DC.) Benth.



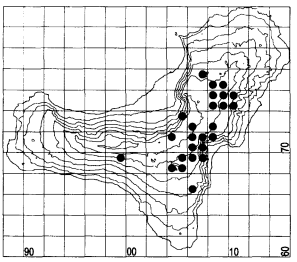
Ballota nigra L.
–; –; Hemi; x; –
AG/HS: in El Hierro subsp. *uncinata* (Fiori & Bég.) Patzak
R: E. Zogg in Schmid (1976: 245ff): laurel forest of the NW-facing slopes above Frontera, 600-900 m.
Probably casual and now extinct.

Bystropogon L'Her.
A revision of the genus is presented by La Serna Ramos (1984).

Bystropogon canariensis var. *smithianus* (Webb) Bornm.
E Can; I; Nano; –; ↑

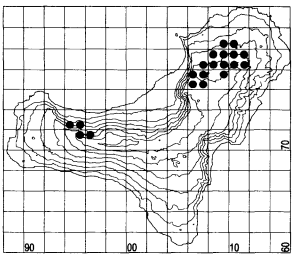


Bystropogon origanifolius var. *ferrensis* (Ceballos & Ortuño) La Serna
E Hierro; I; Nano; –; ↑
Lit: La Serna Ramos (1980: 102ff).
R: Arco Aguilar & al. (1996: 472) present a record in UTM 28RAR9969 (typus relevé of the Bystropogo-Pinetum). This population could be confirmed. However, it seems to be an exceptional case looking at the general distribution of the taxon. For the discussion of the role of *B. origanifolius* var. *ferrensis* as a character species of the Canary pine forest of El Hierro see Stierstorfer (2005: 162ff).

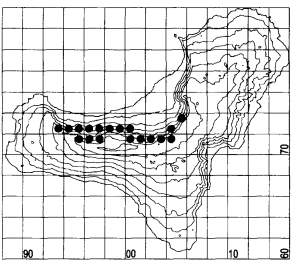


Bystropogon plumosus (L. f.) L'Hér.
–; –; Nano; recHS not AG - (x); –
The records refer to *B. origanifolius* var. *ferrensis*.

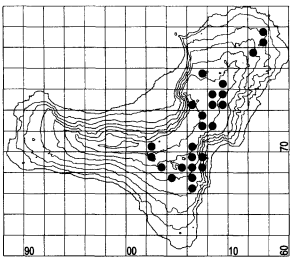
Calamintha sylvatica Bromf.
–; –; Chamae; –; ↑
AG/HS: in the Canaries subsp. *ascendens* (Jord.) P. W. Ball [*C. ascendens* (Jord.) Samp.]
Lit: La Serna Ramos (1976).



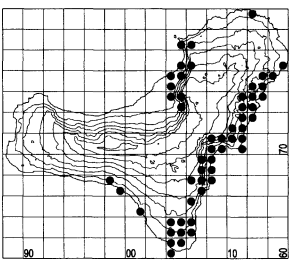
Cedronella canariensis (L.) Webb & Berthel.
E Can-Mad-Az; I; Hemi; –; ↑
Lit: Losada Lima & al. (1990).



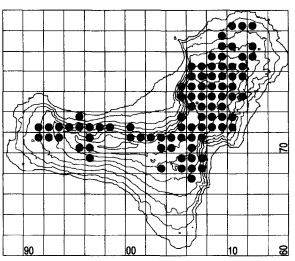
Lamium amplexicaule L.
–; Ni; Thero; –; ↑
St: The species mostly grows in nutrient-rich and ruderal sites, introduced to the Canaries according to Brandes & Fritzsch (2002) and Kunkel (1991: 193).



Lavandula multifida subsp. *canariensis* Mill.
E Can-CV; I; Nano; –; ↓
Lit: León Arencibia & Wildpret de la Torre (1983).



Marrubium vulgare L.
–; Ni; Chamae; –; –
St. Typical successional element of pastures. Formerly used as medicinal plant, dispersed by sheep (Hohenester & Welß 1993: 209; Kunkel 1991: 195; Pérez de Paz & Hernández Padrón 1999: 117).

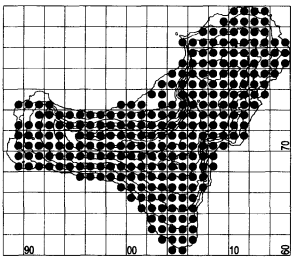


Mentha sp.
–; cult; Hemi; new Hierro; –
Few, sterile plants occur in UTM 28RBR1178 and may represent *M. arvensis* L. The plants are obviously the rest of a cultivation.

Micromeria

For the debate about the generic name see Willemse (1991) and Pérez de Paz (1994).

Micromeria hyssopifolia Webb & Berthel. var. *hyssopifolia*



E Can; I; Chamae; –; –

HS: *Satureja kuegleri* var. *hyssopifolia* (Webb & Berthel.) Willemse

Lit: Pérez de Paz (1978: 208ff, 1994).

The species is omnipresent and frequent at all altitudes. It reveals a considerable variability in habit, leaf shape and flower colour. In sunny habitats the plants are lax shrublets, whereas in moist and windy conditions (e.g., around Mirador del Basco) they are very dense like a cushion plant. See also comment on *M. varia* subsp. *hierrensis.*

Micromeria varia subsp. *hierrensis* P. Pérez

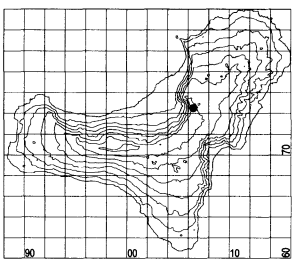
E Hierro; I; Chamae; (x); –

HS: *Satureja varia* subsp. *hierrensis* (P. Pérez) A. Hansen & Sunding

Lit: Pérez de Paz (1978: 184 f, 1994).

Pérez de Paz (1978: 184f) described this taxon as an endemic of El Hierro because of morphological/habitual peculiarities of the plants growing in particularly moist and windy conditions (direct influence of the trade winds) in the extreme E and W of El Golfo. He also mentions the existence of plants transitional to *M. hyssopifolia*. Perhaps the taxon is a mere modification of *M. hyssopifolia* due to the extreme climatic conditions (P. L. Pérez de Paz, pers. comm. 03/2000). Alternatively, these plants may be an example for a taxon in statu nascendi (Pérez de Paz 1978: 197, "adaptación progresiva"). Due to the difficult differentiation all plants of the genus in El Hierro have been aggregated into *M. hyssopifolia* var. *hyssopifolia* in the course of our geobotanical research.

Origanum vulgare subsp. *virens* (Hoffmanns. & Link) Ietsw.



–; Ne; Hemi; new Hierro; ↑

Lit: Ietswaart (1980: 115f).

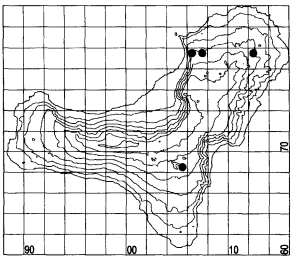
St: Only one small population near the "Mirador de Jinama", already recorded by Voggenreiter (1997a).

Rosmarinus officinalis L.

–; cult; Nano; –; ↑

Recorded, e.g., in UTM 28RBR1177.

Salvia canariensis L.



E Can; NE; Nano; –; ↑

R: Bramwell & Bramwell (2001: 300) "common in the xerophytic, lower zone" in all of the W Canaries and Gran Canaria. The species is not recorded for El Hierro by Hedge (1974: 49ff).

St: In El Hierro the species could be confirmed, e.g., near the Mirador de La Peña (also recorded by Voggenreiter 1997a) and in El Pinar. All findings certainly result from garden escapes.

Salvia leucantha Cav.

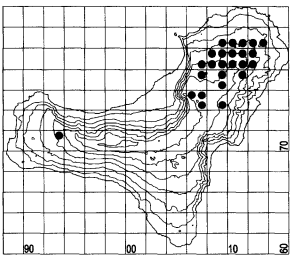
–; cult; Nano; new Hierro; –

Recorded, e.g., W of San Andrés near the street at the base of Mña. de Afosa (UTM 28RBR0774).

Salvia triloba L. f.

–; cult; Nano; x; –

Salvia verbenaca L.



–; Ni; Hemi; –; ↑

St: Almost exclusively in ruderal sites of the pastures in the NE highland, introduced to the Canary Islands according to Brandes & Fritzsch (2002) and Kunkel (1991: 202).

Sideritis L.

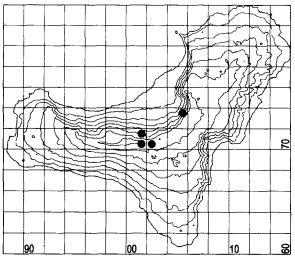
A revision of *Sideritis* subg. *Marrubiastrum* is presented by Pérez de Paz & Negrín Sosa (1992). Recent phylogenetic reconstructions of *Sideritis* in Middle Atlantic Islands based on DNA analyses were published, e.g., by Barber & al. (2000, 2002).

Sideritis barbellata Mend.-Heuer

E La Palma; –; Nano; recHS not AG - (x); –

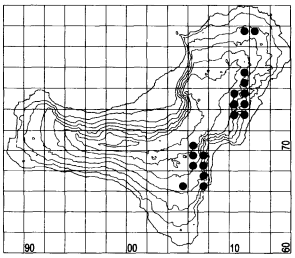
The records for El Hierro in HS refer to *S. ferrensis* (Pérez de Paz & Negrín Sosa 1992: 169ff).

Sideritis canariensis L.
E Can; I; Nano; –; –
HS: in El Hierro var. *canariensis,* but Pérez de Paz & Negrín Sosa (1992: 123ff) do not maintain the infraspecific taxa.
R: Pérez de Paz & al. (1976: 224) "Lomo de Tábano".

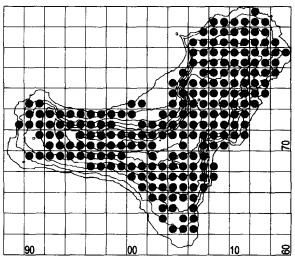


Sideritis dendro-chahorra Bolle
E Tenerife; –; Nano; recHS not AG - (x); –
The records for El Hierro in HS refer to *S. ferrensis*.

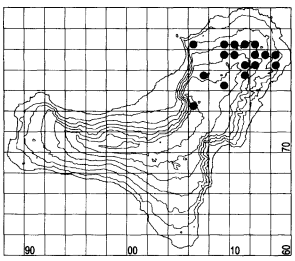
Sideritis ferrensis P. Pérez & Negrín
E Hierro; I; Nano; –; –
R: Pérez de Paz & Negrín Sosa (1992: 174ff), Marrero Rodríguez (1992: 153): cliffs in the E of El Hierro and additionally in the El Golfo (surroundings of the Risco de Jinama, Frontera).



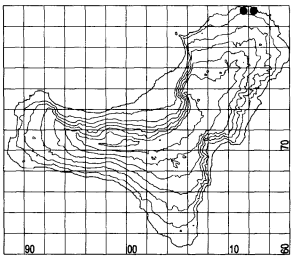
Stachys arvensis (L.) L.
–; –; Thero; –; –
St: Omnipresent in El Hierro; listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



Stachys ocymastrum (L.) Briq.
–; Ni; Thero; –; –
St: Mostly in ruderal sites in the NE. The surroundings of Valverde seem to be the centre of the invasion. Listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



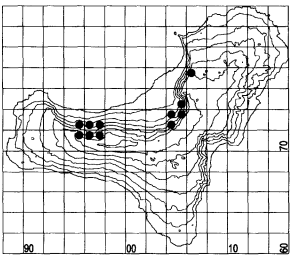
Teucrium heterophyllum subsp. *hierrense* Gaisberg
E Hierro; I; Nano; new taxon!; ↓
Lit: Gaisberg (2000).



The population of El Hierro has been separated recently as an endemic subspecies from those of the other islands (subsp. *brevipilosum* Gaisberg) and Madeira (subsp. *heterophyllum*). Today only one population, in NE Hierro, seems extant. According to Santos Guerra (1980), the species was collected by Sventenius also near Tamaduste and Sabinosa, while he himself observed it above Las Playas. At these localities the species was not found during our field work on El Hierro, populations extinct? A specimen collected by H. de la Perraudière in 1855 indicates another population in the region of El Golfo, which apparently has disappeared, too.

Lauraceae

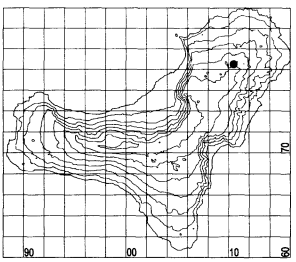
Apollonias barbujana (Cav.) Bornm.
E Can-Mad; I; Phanero; –; ↑
AG/HS: in El Hierro subsp. *barbujana*.



Laurus novocanariensis Rivas-Mart. & al.
–; I; Phanero; new taxon!; ↑
Syn: *L. canariensis* Webb & Berthel. (1846), non Willd. (1809)
AG/HS: *Laurus azorica* (Seub.) Franco, HS: in El Hierro var. *azorica*
Lit: Rivas-Martínez & al. (2002: 703)
R: Voggenreiter (1994: 825).

The geographical range of this species, whether endemic to the Canaries or not, depends on the classification of the respective populations in Morocco. Prior to the description of *L. novocanariensis* they had been placed into *L. azorica* together with the populations of the Azores, Madeira and the Canaries.

Ocotea foetens (Aiton) Baill.



E Can-Mad-Az; I; Phanero; –; ↑

R: Burchard (1929: 93): El Golfo, "Paso de San Salvador". An ancient population growing on the crests of "Tigalate" [=Tibataje?] was already recorded as extinct by Berthelot (1880: 44). Santos Guerra (1976: 255) mentions the species as rare. On the presumed location of the ancient holy tree "Garoé" nowadays a planted "til" grows. According to local people (N. Quintero, pers. comm. 03/2003) the species still exists in the wild above Sabinosa in the W of El Golfo.

Persea americana Mill.

–; cult; Phanero; –; –

Recorded, e.g., in UTM 28RBR0375;

Persea indica (L.) C. K. Spreng.

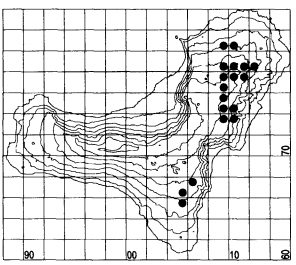
E Can-Mad-Az; I - +?; Phanero; x; –

R: Bramwell & Bramwell (2001: 131): "laurel woods of El Golfo region, Jinamar, Frontera, Fuente de Tinco"; Ceballos & Ortuño (1976: 244): Jinama; E. Zogg in Schmid (1976: 245ff): laurel forest of the NW-facing slopes above Frontera, 600-900 m. Arco Aguilar & al. (1996: 471) consider the species to be "virtually absent on the island", Santos Guerra (1976: 255, 1980: 36) mentions it as rare; also recorded by Urtusáustegui (1779: 37).

Unfortunately, the species could not be found during our fieldwork; extinct?

Linaceae

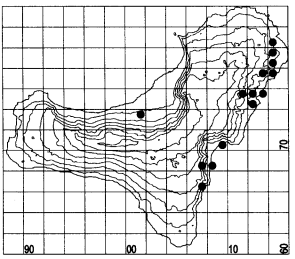
Linum bienne Mill.



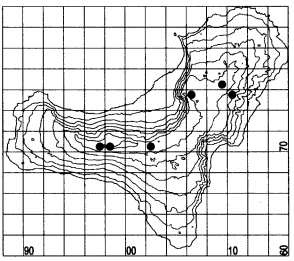
–; (Ni); Thero; –; ↑

St: Restricted to the pastures in the NE highland and the surroundings of El Pinar, probably introduced to the Canaries according to Kunkel (1991: 151).

Linum strictum L.
–; I; Thero; –; ↓
St: Scattered in natural communities near the coast in the E of El Hierro, probably native to the Canaries according to Kunkel (1991: 151).



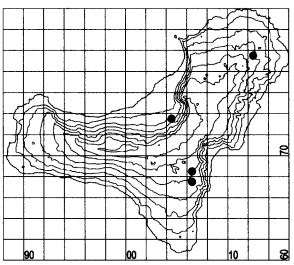
Radiola linoides Roth
–; –; Thero; –; ↑



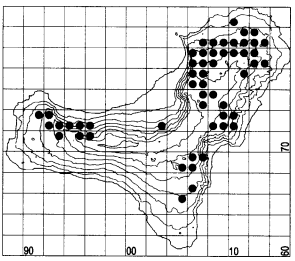
Lythraceae
Lythrum hyssopifolia L.
–; –; Thero; x; –
R: Pérez de Paz & al. (1987: 25, table 12, rel. 98): Las Albercas near San Andrés.

Malvaceae
Abutilon grandifolium (Willd.) Sweet
–; cult; Nano; x; –

Lavatera arborea L.
–; Ne; Thero; new Hierro;↑

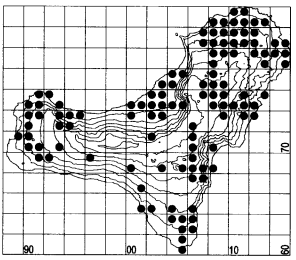


Lavatera cretica L.
–; Ni; Thero; –; –
St: The species is typical for ruderal sites, abandoned cultivated land, etc., and considered to be introduced by Brandes & Fritzsch (2002) and Kunkel (1991: 67).

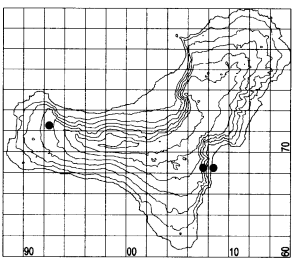


Malva neglecta Wallr.
–; –; Thero; x; –

Malva parviflora L.
–; Ni; Thero; –; –
HS: in the Canaries var. *parviflora*.
St: Widely distributed at nutrient-rich and ruderal sites. Kunkel (1991: 67) considers all species of the genera in the Canaries to be introduced.



Malva pusilla Sm.
–; Ni; Thero; –; –
St: Only two locations, S of El Pinar and in the pastureland La Dehesa.



Meliaceae

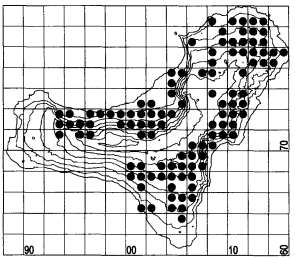
Melia azedarach L.
–; cult; Phanero; x; –
R: Pérez de Paz & al. (1981: 54): "Fuente de Tinco".

Mimosaceae

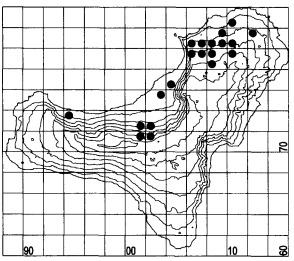
Acacia sp.
–; cult; Phanero; –; –
According to AG/HS *A. dealbata* Link is the only species of the genus on El Hierro and also recorded by Reifenberger & Reifenberger (1990: 248) above Valverde. *A. cyclops* A. Cunn. ex G. Don. is planted, e.g., near the "Eremita de La Virgen" in the W of the island (UTM 28RAR9271).

Moraceae

Ficus carica L.
–; cult; Phanero; –; –

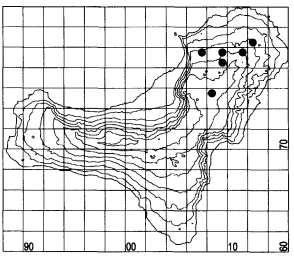


Morus nigra L.
–; cult; Phanero; –; –



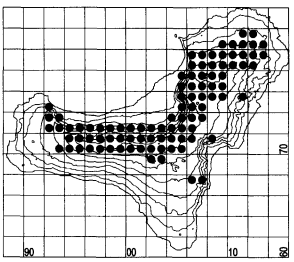
Myoporaceae

Myoporum laetum G. Forst.
–; cult; Phanero; –; ↑

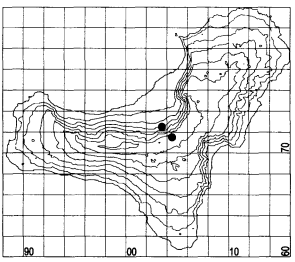


Myricaceae

Myrica faya Aiton
–; I; Phanero; –; ↑



Myrica rivas-martinezii A. Santos



E Can; I; Phanero; –; ↑

Lit: Bañares Baudet & al. (1985); Romero Manrique (1990); Santos Guerra (1980: 45 f).

The species is included in the "Proyecto Life" and the environmental authorities support the regeneration of the population of El Hierro (Naranjo Morales 2000), see also Beltrán Tejera & al. (1999), Santos Guerra (1996b: 460f) and Viceconsejería de Medio Ambiente (2000). A survey is presented by Carqué Álamo & al. (2003: 406f). For the results of genetic investigations see Batista & al. (2004). The taxon is listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001). For the phytosociological aspects of the population of El Hierro see Stierstorfer (2005: 142).

Myrsinaceae

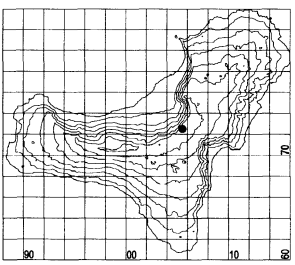
Heberdenia excelsa (Aiton) Banks ex DC.

E Can-Mad; I - +?; Phanero; x; –

R: Bramwell & Bramwell (2001: 244), Kämmer (1976: 339): "Laderas de Jináma"; Santos Guerra (1980: 26/31): sine loco. These records may refer to the single population, which unfortunately could not be found during our fieldwork; extinct? The species is already mentioned for El Hierro by the chronicler Abreu Galindo in the 16th century (Abreu Galindo c. 1600).

Myrtaceae

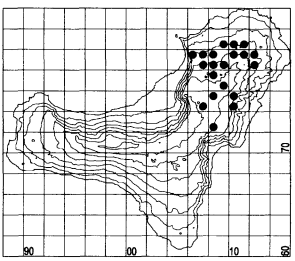
Eucalyptus camaldulensis Dehnh.



–; cult; Phanero; –; ↑

St: The species could be confirmed near "La Mareta" (UTM 28RBR0572), where it was already recorded by Arco Aguilar & al. (1990: 81). Apparently, it does not propagate.

Eucalyptus globulus Labill.



–; Ne; Phanero; new Hierro; ↑

St: On El Hierro most of the *Eucalyptus* trees belong to this species. The plants are often proliferating with numerous juveniles around the old trees. There even exist small *E. globulus* forests, e.g., near the village of Las Montañetas.

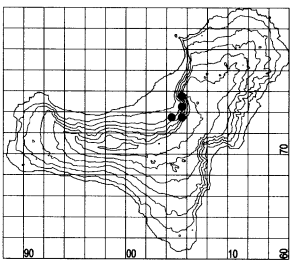
Nyctaginaceae

Bougainvillea glabra Choisy
–; cult; Nano; new Hierro; –
Recorded e.g., in UTM 28RBR1279

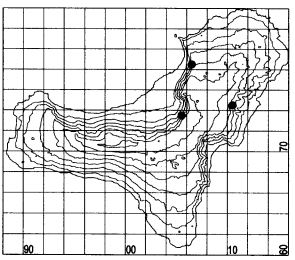
Mirabilis jalapa L.
–; cult; Geo; –; ↓
In the E of El Golfo on the way to establish outside of gardens.
Recorded e.g., in UTM 28RBR0374/0475/0477.

Oleaceae

Jasminum odoratissimum L.
E Can-Mad; I; Nano; –; –



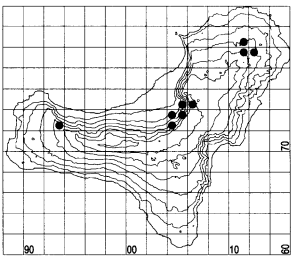
Olea cerasiformis Rivas-Mart. & del Arco
E Can; I; Phanero; changed name!; –
det/conf: P. Vargas; pers. comm. (11/2002): S. Rivas-Martínez
Syn: *O. europaea* subsp. *guanchica* Vargas & al.
AG/HS: *O. europaea* subsp. *cerasiformis* (Webb & Berthel.) G. Kunkel & Sunding
Lit: Rivas-Martínez & al. (2002: 705), Vargas & al. (2001).
R: Kämmer (1976: 337): E of El Golfo in the Risco de Tibataje and the nearby cliffs.



Besides the population in the region of the Risco de Tibataje, in the cliffs in the E of El Hierro (UTM 28RBR1974) one isolated tree, hitherto not mentioned in the literature, was found following the hint of a herdsman.

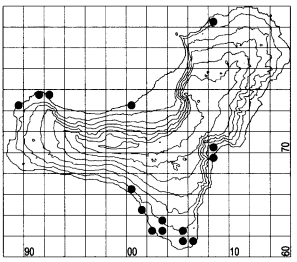
Olea europaea L. subsp. *europaea*
–; cult; Phanero; x; –

Picconia excelsa (Aiton) DC.
E Can-Mad; I; Phanero; –; ↑
In UTM 28RBR1279 the trees are apparently planted.



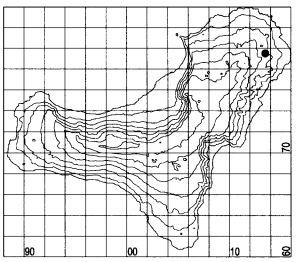
Orobanchaceae

Orobanche berthelotii Webb & Berthel.
E Can; I; Geo; new Hierro; ↓
det/conf: H. Uhlich
Lit: Uhlich (1994)
R: Wolff & Rosinski (1999a: 15): "*Orobanche cernua* var. *desertorum*" at many places in the lowland.

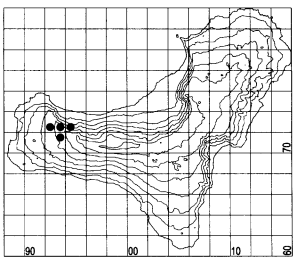


Orobanche cernua Loefl.
–; –; Geo; (x); –
The record in AG may refer to *O. berthelotii*.

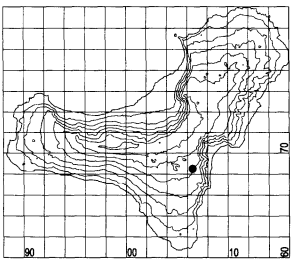
Orobanche crenata Forssk.
–; Ni; Thero; –; ↑
det/conf: H. Uhlich
R: Lid (1967: 161) presents additional records in the W (S of Sabinosa).
St: Only a few individuals in an abandoned vegetable patch near Valverde could be found in May 1999, parasiting on *Lens nigricans* (relevé 14 in table 30, Stierstorfer 2005: 286, 370).



Orobanche minor Sm.
–; (Ni); Geo; –; ↑
det/conf: H. Uhlich
R: Collected by E. Sventenius in W El Hierro (Santos Guerra 1980: 43).
St: Exclusively in the pastureland "El Cres", parasiting, e.g., on *Bituminaria bituminosa*.
The plants of El Hierro belong to var. *genuina* Beck (H. Uhlich, pers. comm. 02/2000).

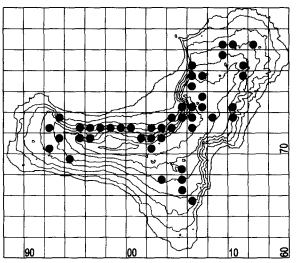


Orobanche mutelii F. W. Schultz



–; Ni; Thero; new Hierro; ↑
det/conf: H. Uhlich
St: Only one small population could be found in March 2000 in an abandoned vegetable patch in El Pinar.
R: Wolff & Rosinski (1999a: 16) record the species additionally at several places in El Golfo.

Orobanche nana (Reut.) Noë ex Beck



–; –; Thero; –; ↑
det/conf: H. Uhlich
All plants may belong to f. *manostachys* Beck. *O. mutelii* and *O. nana* belong to the *O. ramosa* complex and are often treated as subspecies of the latter (e.g., Kerguélen 1999). During our fieldwork almost all plants were identified as *O. nana*.
St: In relatively shady habitats, e.g., in the fayal-brezal or the laurel forests, agriophyte? The Mediterranean species of the genera are introduced or at least doubtfully native to the Canaries according to Kunkel (1991: 219).

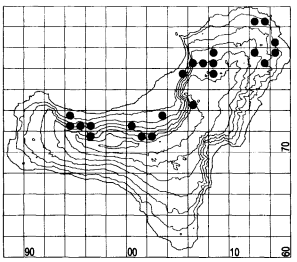
Orobanche purpurea Jacq.
–; –; Geo; x; –
R: Lid (1967: 162), Pérez de Paz & al. (1981: 54): Several places all over El Hierro.

Orobanche ramosa L.
–; –; Thero; (x); –
R: Lid (1967: 162): In the NE and W of El Hierro; E. Zogg in Schmid (1976: 245ff): laurel forest of the NW-facing slopes above Frontera, 600-900 m. These records most probably refer to *O. nana*.

Oxalidaceae

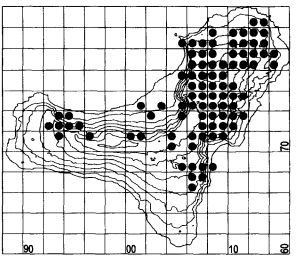
Oxalis L.
According to Kunkel (1991: 158f) all species of the genus growing on the Canary Islands are introduced.

Oxalis corniculata L.
–; Ni; Thero; –; –
St: Mostly on and near paths, at the base of walls, etc.



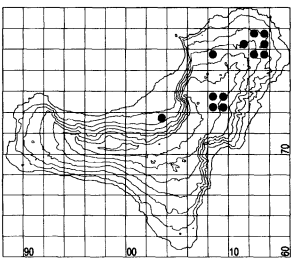
Oxalis corymbosa DC.
–; –; Hemi; new Hierro? - (x); –
Recorded in the list of Chilton (1994: 10) instead of *O. corniculata,* which is missing in that list; mistake? AG/HS do not present any record of the species for El Hierro.

Oxalis pes-caprae L.
–; Ni; Hemi; –; –
St:. As already mentioned by Kunkel (1973: 103, 1976: 261ff), the species is a successful invader (origin: S Africa) in various habitats (even laurel forests and fayal-brezal) in the moister N part of the Canary Islands, which can be confirmed in El Hierro.
Besides the typical plants the double-flowered form is also frequent, but less common.

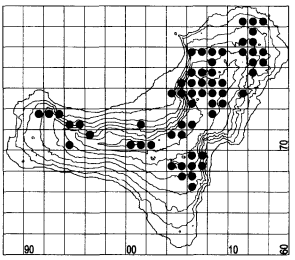


Papaveraceae
Chelidonium majus L.
–; –; Hemi; x; –

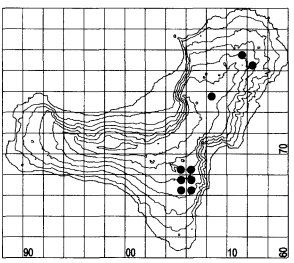
Eschscholzia californica Cham.
–; Ni; Thero; –; –
St: The species is a recent introduction to the Canary Islands according to Kunkel (1973: 105). This is confirmed by the distribution area in El Hierro, where it is mainly restricted to the surroundings of two villages (San Andrés and Valverde).



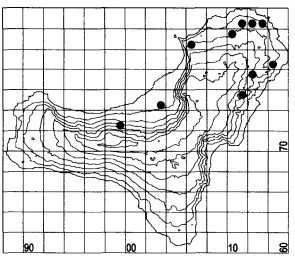
Papaver dubium L.
–; –; Thero; –; –
det/conf: J. W. Kadereit
St: Mostly in ruderal sites, but also scattered in natural, non-forest communities. Listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



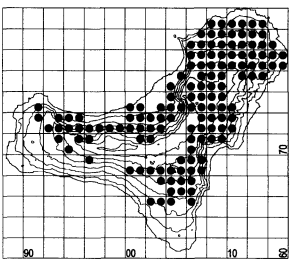
Papaver hybridum L.
–; (Ni); Thero; –; ↑
St: In the surroundings of the villages El Pinar, San Andrés and Valverde.



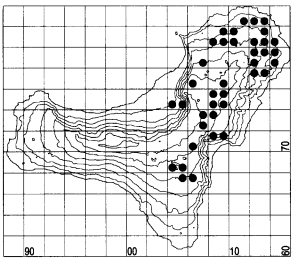
Papaver pinnatifidum Moris
–; –; Thero; –; ↓
det/conf: J. W. Kadereit



Papaver rhoeas L.
–; –; Thero; –; –
St: Mostly in ruderal sites and abandoned cultural land, but also scattered in natural, non-forest communities and in the Canary pine forest of El Hierro. Listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



Papaver somniferum L.
–; Ni; Thero; –; –
det/conf: J. W. Kadereit
The plants of El Hierro may all belong to subsp. *setigerum* (DC.) Corb. (J. W. Kadereit, pers. comm. 02/2000), although AG/HS and Chilton (1994: 10) indicate only subsp. *somniferum* for the island.

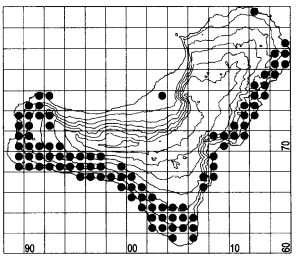


Phytolaccaceae

Phytolacca americana L.
–; cult; Hemi; x; –

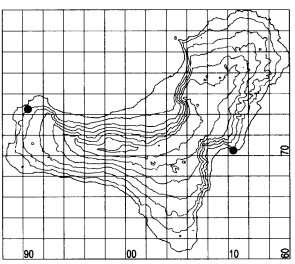
Plantaginaceae

Plantago afra L.
–; –; Thero; –; ↓
Syn: *Psyllium afrum* (L.) Mirb.
HS: in the Canaries var. *afra*.
Species characterised, e.g., by stems with opposite leaves (vs. leaves in basal rosettes) are sometimes treated as belonging to the separate genus *Psyllium* Mill. (e.g., *P. afrum* and *P. arborescens,* see e.g., Kunkel 1991: 208 f). The genus concept is still in debate, see, e.g., Rahn (1996) and Wisskirchen (1998: 366 f).



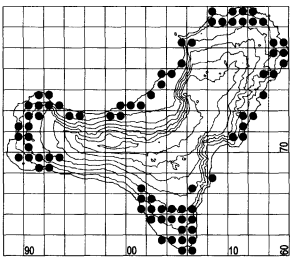
Plantago amplexicaulis Cav.
–; –; Thero; x; –
R: Knoche (1923: 259): sine loco.

Plantago arborescens Poir.
E Can; I; Chamae; –; ↓
Syn: *Psyllium arborescens* (Poir.) Mirb.
AG/HS: in El Hierro subsp. *arborescens*, HS further presents the varieties and indicates var. *arborescens* for the island. For the genus concept see *P. afra*.



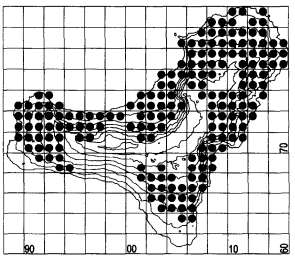
Plantago bellardii All.
–; –; Thero; new Hierro - x; –
R: Chilton (1994: 10): sine loco. This record is not listed in AG.

Plantago coronopus L.
–; –; Thero; –; ↓



The plants of the Canaries were described as belonging to the endemic species *P. aschersonii* Bolle, which is considered to be synonymous to *P. coronopus* in AG/HS; for the discussion see also Kunkel (1991: 207f) and Press (1994: 321). According to S. Rivas-Martínez and W. Wildpret de la Torre (pers. comm. 03/2003) *P. aschersonii* and *P. coronopus* represent well differentiated taxa being both existent on El Hierro, e.g., the first near Punta Grande and the latter around the Mirador de Bascos. In the course of our geobotanical research the two taxa have not been distinguished due to various transitional forms.

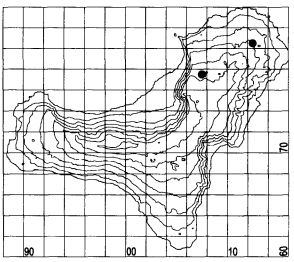
Plantago lagopus L.
–; –; Thero; –; –



St: Omnipresent in lower and intermediate altitudes, probably native to the Canaries according to Kunkel (1991: 207).

Particularly in the W of El Hierro some plants are remarkably vigorous and may represent *P. lusitanica* L., which is considered to be a variety or even a synonym of *P. lagopus* (Hohenester & Welß 1993: 239; Kerguélen 1999, Silvestre 1987: 479).

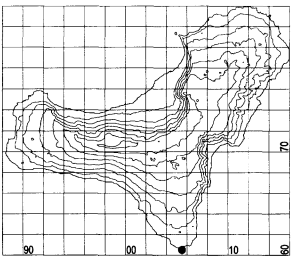
Plantago lanceolata L.
–; Ni; Hemi; new Hierro; ↑



Near horticultural waste, just on its way to establish.

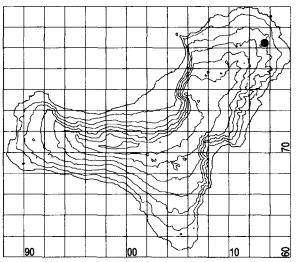
Plantago loeflingii L.
–; –; Thero; x; –
R: Lid (1967: 165): “Pico Ajonce” [Ventejís] and “Fuente Lomo in El Pinar”.

Plantago major L.
–; Nc; Hemi; –, ↓
HS: in El Hierro var. *major*
The species was only found in September 2002 in flowerbeds at the quayside street in La Restinga, probably casual.

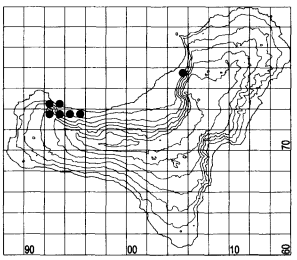


Plumbaginaceae

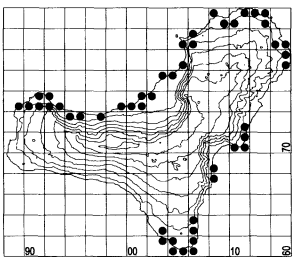
Limonium brassicifolium (Webb & Berthel.) Kuntze subsp. *brassicifolium*
E Gomera; NE; Chamae; –; –
St: Apparently escaped from cultivation near Valverde. According to AG/HS this plant grows on El Hierro and La Gomera. However, in El Hierro this taxon could not be confirmed as indigenous. It can therefore be considered an endemic of La Gomera solely, which is consistent with the information given by Mesa Coello & al. (2003d: 742f).



Limonium brassicifolium subsp. *macropterum* (Webb & Berthel.) G. Kunkel
E Hierro; I; Chamae; –; –
R: Bornmüller (1904: 461), Burchard (1929: 191f), Ceballos & Ortuño (1976: 367), Knoche (1923: 257), La Serna Ramos & al. (1982: 59f), Lucía Sauquillo & al. (1996: 81ff), Pitard & Proust (1908: 319) and Santos Guerra (1996b: 386f): in steep, rocky cliffs above Sabinosa in the E of El Golfo. A survey is presented by Mesa Coello & al. (2003e: 744f).
This endemic is also cultivated, e.g., near the "Mirador de La Peña" (UTM 28RBR0679 and 0779).



Limonium pectinatum var. *solandri* (Webb & Berthel.) Kuntze
E Can; I; Chamae; –; ↓
Taking into consideration the remarks of Taylor (1981) all plants of El Hierro may belong to var. *solandri,* although the typical variety is also recorded for the island by HS and Kunkel & Sunding (1967: 15ff).

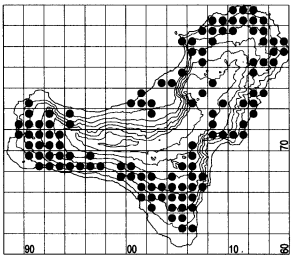


Polygonaceae

Emex spinosa (L.) Campd.

–; (Ni); Thero; –; –

St: The species prefers nutrient-rich sites and ruderal communities, mainly at intermediate and lower altitudes of El Hierro. The status as probably introduced from S Europe (Brandes & Fritzsch 2002, Kunkel 1991: 55) seems therefore justified.



Fallopia convolvulus (L.) A. Löve

–; –; Thero-liana; x; –

R: Lid (1967: 54): Sabinosa

Polygonum aviculare agg.

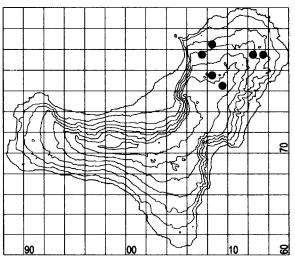
–; Ni; Thero; new Hierro; –

det/conf: H. Scholz

R: AG, Wolff & Rosinski (1999a: 17): UTM 28RAR 9472.

St: Only in a few places in settlements and cultivated land.

Specimens with small leaves may represent *P. arenastrum* subsp. *microspermum* (Jord. ex Boreau) H. Scholz, those with larger leaves *P. aviculare* subsp. *rectum* Chrtek. Both occasionally grow side by side.

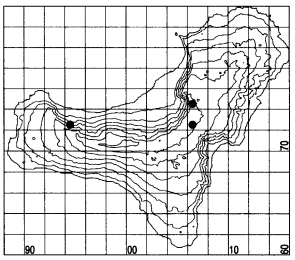


Rumex acetosella L.

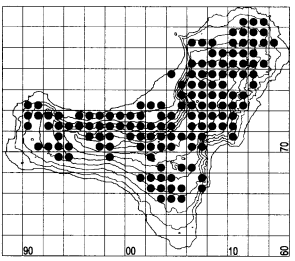
–; Ni; Hemi; new Hierro; ↑

AG/HS: in the Canaries subsp. *angiocarpus* (Murb.) Murb.

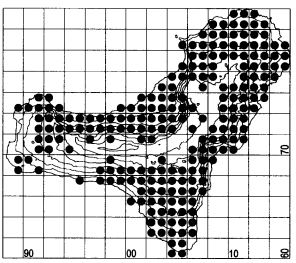
St: Only a few populations in pastures and ruderal sites. Certainly introduced to the Canaries according to Brandes & Fritzsch (2002) and Kunkel (1991: 57).



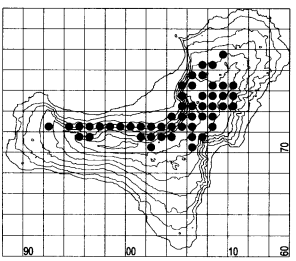
Rumex bucephalophorus subsp. *canariensis* (Steinh.) Rech. f.
E Can-Mad-Az; I; Thero; –; –
AG does not list the varieties, but HS lists var. *canariensis* for El Hierro.
Lit: Press (1988, 1994: 68)
Kunkel (1991: 55) applies the name *Bucephalophora aculeata* (L.) Pau for the species.



Rumex lunaria L.
E Can; I; Nano; –; –
Fernández Galvan & Mendez (1989) analyse the role of the "Vinagrera" as a fodder plant in arid and semiarid areas.

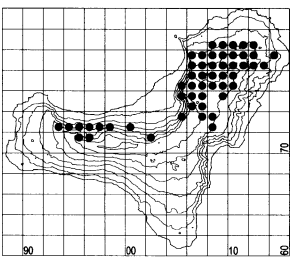


Rumex maderensis Lowe
E Can-Mad; I; Nano; –; –



Rumex obtusifolius L. subsp. *obtusifolius*
–; –; Hemi; x; –

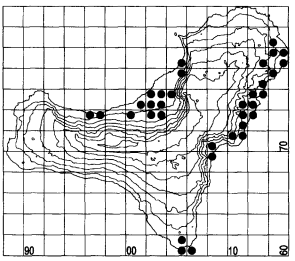
Rumex pulcher L.
–; (Ni); Thero; –; ↑
AG/HS: in the Canaries subsp. *divaricatus* (L.) Murb.
St: Almost exclusively in pastures and their successional phases at higher altitudes, apparently introduced to the Canaries according to Kunkel (1991: 57).



Rumex vesicarius L.
–; –; Thero; x; –
HS: in the Canaries var. *rhodophysa* Ball
R: Lid (1967: 55): "Bco. Sabinosa".

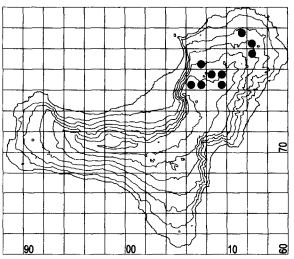
Portulacaceae

Portulaca oleracea L.
–; (Ni); Thero; –; ↓
St: Mostly in nutrient-rich sites at low altitudes, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

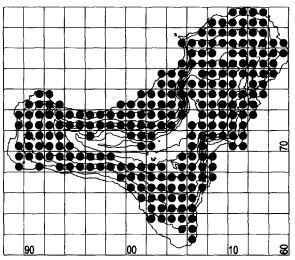


Primulaceae

Anagallis arvensis L. f. *arvensis*
–; (Ni); Thero; –; ↑
St: The red form occurs only exceptionally in the pastures in the NE highland.



Anagallis arvensis f. *azurea* Hyl.
–; –; Thero; –; –
St: Almost omnipresent in El Hierro, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

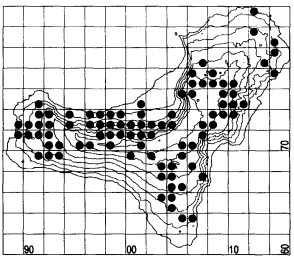


The blue form is the most frequent one on El Hierro (as in La Gomera, see Reifenberger & Reifenberger 1990: 240). The corolla lobes are always fringed with numerous small, mostly 3-celled hairs, which is the most important diagnostic character for this species in the standard floras (vs. corolla lobe with sparse, 4-celled hairs in *A. foemina* Mill.). Therefore, all blue-flowered specimens apparently belong to *A. arvensis*. A similar situation is reported for Madeira by Short (1994: 252). However, some of the plants reveal characters mentioned for *A. foemina* in the literature: corolla lobes relatively narrow, hence the calyx lobes are visible along their total length, e.g., Schönfelder & Schönfelder (2002: 144); pedicels 0.6-1.2 × as long as the bract (vs. 1.2-2 in *A. arvensis*) and corolla apex erose (vs. rounded or subentire), Haeupler & Muer (2000: 196). A compilation and discussion of the differentiation characters in some floras is presented by Ahrens (2001).

Asterolinon linum-stellatum (L.) Duby

–; –; Thero; –; –

Lit: Short (1988), Valdés (1980).



All the specimens collected have 5-valved capsules, although some 4-valved and even (very rarely) 3-valved ones can occur in the same plant (the latter may be the result of the fusion or incomplete separation of valves). Since the corolla mostly consists of "5 united pieces" and the fruit pedicels are mostly recurved, all these plants may represent *A. linum-stellatum*. See also comment on *Pelletiera wildpretii*.

Pelletiera wildpretii Valdés

–; –; Thero; x; –

R: Collected on El Hierro (El Golfo and in the W) by Lowe and Sventenius (Short 1988: 3, Valdés 1980: 645).

Although Short (1988, 1994: 251) reports about peculiarities of some Canary specimens having 4-valved instead of 3-valved capsules, and taking into consideration the possible variation of the corolla segments, all the respective plants found during our fieldwork may represent *A. linum-stellatum* (see comment there).

Punicaceae

Punica granatum L.

–; cult; Phanero; –; –

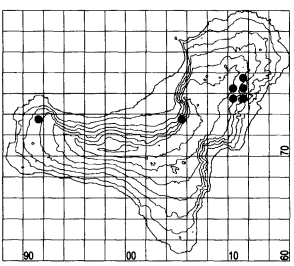
Rafflesiaceae

Cytinus hypocistis (L.) L.

–; –; Hemi; –; –

Chilton (1994: 11): in El Hierro subsp. *hypocistis;* Kunkel (1991: 141): in the Canary Islands subsp. *subexsertum* Finschow & G. Kunkel.

Lit: Kunkel (1980: 360f).



Ranunculaceae

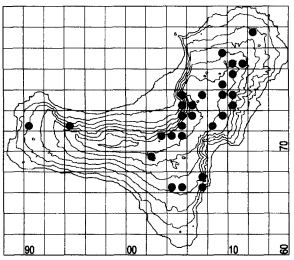
Consolida regalis Gray subsp. *regalis*

–; –; Thero; x; –

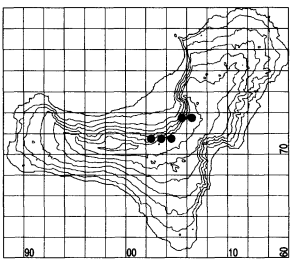
Ranunculus L.

According to Kunkel (1991: 22) all species of the genus except *R. cortusifolius* are probably introduced to the Canary Islands.

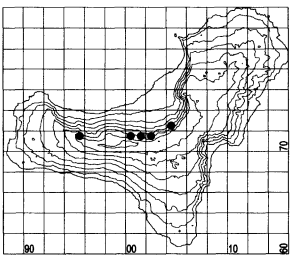
Ranunculus cortusifolius Willd.
E Can-Mad-Az; I; Hemi; –; –
Most authors use the above spelling, but, see e.g., IPNI, Lems (1960a: 68), Lowe (1857) and Pérez de Paz & al. (1981: 54): *R. cortusaefolius*.



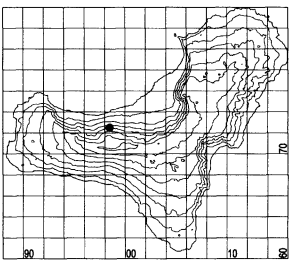
Ranunculus muricatus L.
–; (Ni); Thero; –; ↑
St: On and near trails within the fayal-brezal.
The plants are apparently annual in accordance with the information given by Hohenester & Welß (1993: 84f) and Press (1994: 96ff), whereas Lems (1960a: 68) lists the species as hemicryptophyte.



Ranunculus parviflorus L.
–; (Ni); Thero; –; ↑
St: On and near trails within the fayal-brezal, also in open and disturbed stands.

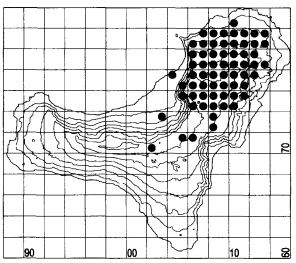


Ranunculus trilobus Desf.
–; (Ni); Thero; –; ↑
HS: in El Hierro var. *trilobus*.
R: Pérez de Paz & al. (1981: 49/55): "Carretera San Andrés-El Barrio".



Resedaceae

Reseda luteola L.



–; –; Thero; –; –

St: The species is a typical element of the pastureland Meseta de Nisdafe in the NE but not restricted to purely anthropogenic habitats; possibly native according to Kunkel (1991: 84).

Rhamnaceae

Rhamnus crenulata Aiton

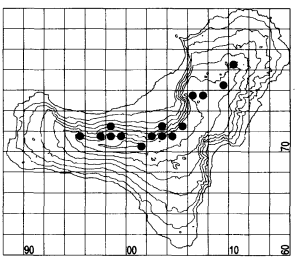
E Can; I - +?; Nano; x; –

R: Bramwell & Bramwell (2001: 216f), Ceballos & Ortuño (1976: 355) and Kunkel (1991: 150): very rare in El Hierro; Pérez de Paz & al. (1992: 92ff) present a distribution map where the species is indicated for the extreme E and W of El Golfo, respectively.

Despite of intense search no plants could be found. The species is apparently very rare or even extinct on El Hierro.

Rosaceae

Aphanes microcarpa (Boiss. & Reut.) Rothm.



–; I; Thero; –; ↑

St: Mainly in sparse and thinned stands of the fayal-brezal, native to the Canaries according to Kunkel (1991: 103). This is confirmed by the data of El Hierro: the species is distributed in the regions around the uppermost crests of the island and prefers sparse stands of fayal-brezal, which are partly natural in these areas. In contrast, Schmid (1976: 245) considers the species to be introduced.

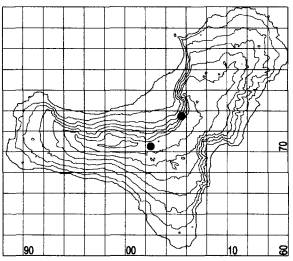
Bencomia caudata (Aiton) Webb & Berthel.

E Can-Mad; –; Nano; (x); –

R: Bornmüller (1903: 8, 1904: 433): "Risco de Jinama"; Burchard (1929: 148): "Fuente Tinco am Passe von Jinama"; Ceballos & Ortuño (1976: 244): "Jinama".

The old records are doubtful and refer most probably to *B. sphaerocarpa* (Kunkel 1991: 101, Sventenius 1960a: 19ff).

Bencomia sphaerocarpa Svent.



E Hierro; I; Nano; –; ↑

R/St: The records of Bramwell & Bramwell (1974, cited in Beltrán Tejera & al. 1999) for La Palma ("subsp. *sventenii*", unpubl.) are ignored in most of the literature, e.g., Bramwell & Bramwell (2001: 178), Ceballos & Ortuño (1976: 339), Lucía-Sauquillo & al. (1996: 84f), Santos Guerra (1983a: 187, 1996b: 138f). The records for La Palma could not be confirmed in the course of the campaign for endangered species of the Canaries, Proyecto AFA (Atlas de Flora Amenazada) (V. E. Martín Osorio, pers. comm. 06/2002). Instead, *B. exstipulata* is recorded now for La Palma by AG. Therefore *B. sphaerocarpa* is treated as an endemic of El Hierro here in contrast to HS, but in accordance with Martín Osorio & al. (2003: 142f). It is listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).

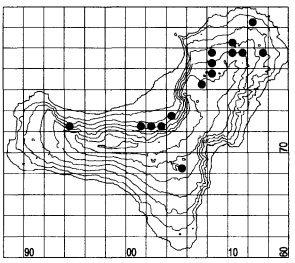
Beltrán Tejera & al. (1999) and Martín Osorio & al. (2003: 142f) report a third population from El Hierro ("Laderas bajo Hoya Fileba") besides those in UTM 28RBR0573/0270. There are conflicting reports about the sex repartition: Sventenius (1960a: 19ff) indicates the species as monoecious, although he describes the section "*Eubencomia* Svent.", to which *B. sphaerocarpa* and *B. caudata* belong, as "plantae dioicae". Accordingly there is conflicting information in the literature about *B. sphaerocarpa*, e.g., Schönfelder & Schönfelder (1997: 110f): monoecious, Hohenester & Welß (1993: 121): dioecious. Lucía-Sauquillo (1996: 84f) describes the flowers of *B. sphaerocarpa* as unisexual monoecious, which obviously is correct.

Cydonia oblonga Mill.

–; cult; Phanero; x; –

R: Voggenreiter (1997a): surroundings of El Pinar and Valverde.

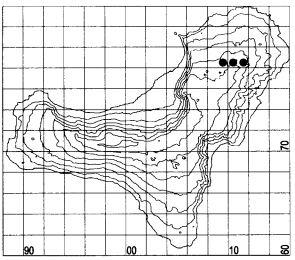
Eriobotrya japonica (Thunb.) Lindl.



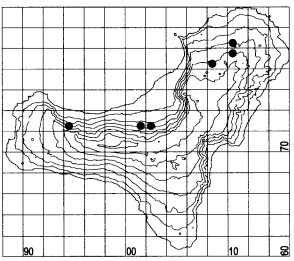
–; cult; Phanero; new Hierro; ↑

In abandoned cultivated land the species sometimes grows together with indigenous trees (e.g., relevé 25 in table 6, Stierstorfer 2005: 132f, 363).

Fragaria vesca L.
–; Ni; Hemi; new Hierro; ↑
Small populations around the historic place of the holy tree "Garoé".



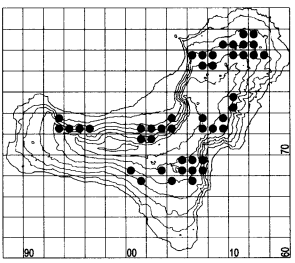
Malus domestica Borkh.
–; cult; Phanero; –; –
R: Voggenreiter (1997a): several locations; E. Zogg in Schmid (1976: 245ff): laurel forest of the NW-facing slopes above Frontera 600-900 m.



Prunus armeniaca L.
–; cult; Phanero; –; –
R: Voggenreiter (1997a).

Prunus domestica L.
–; cult; Phanero; new Hierro - x; –
R: Voggenreiter (1997a): "subsp. *italica* (Borkh.) Gams" near El Pinar.

Prunus dulcis (Mill.) D. A. Webb
–; cult; Phanero; new Hierro; ↑
R: Voggenreiter (1997a): Many locations.

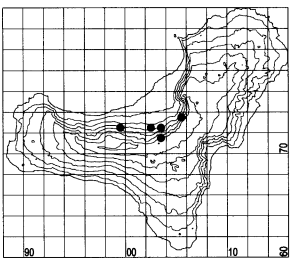


Prunus lusitanica subsp. *hixa* (Willd.) Franco
E Can-Mad; I? - x?; Phanero; x; –
R: Bramwell & Bramwell (2001: 181), Kunkel (1991: 102): sine loco.
Probably extinct if ever existent on El Hierro.

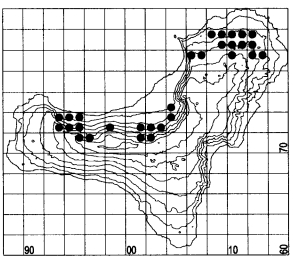
Prunus persica (L.) Batsch
–; cult; Phanero; –; –
Recorded e.g., in UTM 28RBR0475/0574/1282;

Pyrus communis L.
–; cult; Phanero; new Hierro; –
Recorded e.g., in UTM 28RBR0172/0272/09/80/1080;

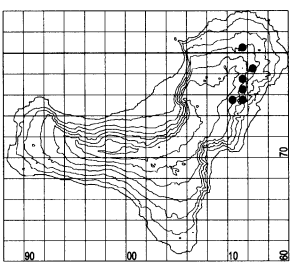
Rubus bollei Focke
E Can-Mad; I; Phanero-liana; –; ↑
det/conf: G. Matzke-Hajek
Lit: Matzke-Hajek & Weber (1999) Matzke-Hajek (2001).
In many cases (e.g., in the surroundings of Fuente Tinco), the plants behave like lianas climbing on rocks and trees, and reach remarkable dimensions.



Rubus ulmifolius Schott
–; (Ni); Phanero-liana; –; –
det/conf: G. Matzke-Hajek
HS: *Rubus inermis* Pourr.
Lit: Matzke-Hajek (2001), Monasterio-Huelin & Weber (1996).
St: Probably introduced to El Hierro for hedgerows (Knoche 1923: 128). Kunkel (1973: 104) mentions the species as "cosmopolitan disease". "The species may have been native in the Canaries for centuries before really 'exploding', and nobody knows when or how it reached the islands" (Kunkel 1976: 264). Rivas-Martínez (1993b: 223) also considers the species to be probably introduced.



Sanguisorba megacarpa (Lowe) Muñoz Garm. & C. Navarro
E Can-Mad-Az; I; Hemi; –; ↑
HS: *Sanguisorba minor* subsp. *magnolii* (Spach) Briq.
Lit: Bornmüller (1904: 433f), Muñoz & Navarro (1998: 176).
Muñoz & Navarro (1998: 176) investigated specimens from the Canaries and Madeira to confirm the status of this Middle Atlantic Islands species as a separate taxon. Probably, the record for Pico (Azores) in HS also refers to this taxon.
R: Pérez de Paz & al (1981: 55): "Tiñor – Roque de los Dares".

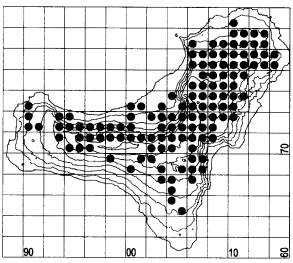


Rubiaceae

Galium aparine L.

–; –; Thero-liana; –; –

St: Very common in the laurel forest and fayal-brezal, but also in successional phases of pastures, etc., agriophyte? Listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



Galium geminiflorum Lowe

E Can-Mad; I; Thero; (x); –

R: Voggenreiter (1997a): several places in El Golfo, but see comment on *G. parisiense*.

Galium murale (L.) All.

–; –; Thero; (x); –

R: Lid (1967: 168): NE highland, surroundings of Valverde; Pérez de Paz & al. (1981: 53): "El Cres-El Turrón"; Voggenreiter (1997a): El Golfo, but see comment on *G. parisiense*.

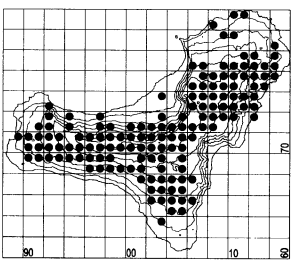
Galium parisiense L.

–; –; Thero; –; –

det/conf, pers. comm. 02/2000: A. Wörz

St: Very common, mainly at intermediate and high altitudes. Listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

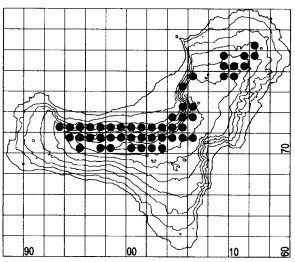
The plants reveal a remarkable variability, which may have led to confusion with similar species, e.g., *G. geminiflorum* or *G. murale*. Nevertheless, all collected specimens represented *G. parisiense*.



Galium scabrum L.

–; I; Chamae; –; ↑

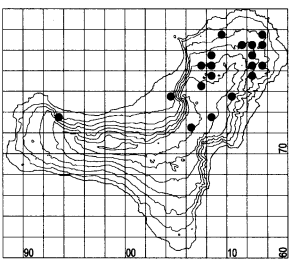
St: The species is mainly restricted to the laurel forest and fayal-brezal, where it is very common.



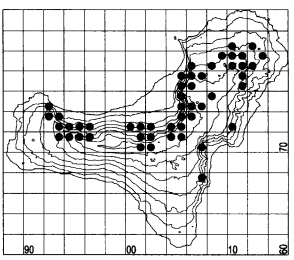
Galium setaceum Lam.
–; –; Thero; new Hierro - (x); –
R: Pérez de Paz & al. (1981: 53): "El Cres-El Turrón".
The record, although from 1981, is not listed in AG/HS; considered erroneous?

Galium spurium L.
–; –; Thero; new Hierro - (x); –
R: Pérez de Paz & al. (1981: 53): "El Cres-El Turrón".
The record, although from 1981, is not listed in AG/HS; considered erroneous?

Galium verrucosum Huds.
–; (Ni); Thero; –; –
The species mainly occurs in the NE pastureland and at ruderal sites.



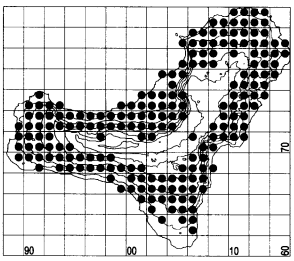
Phyllis nobla L.
E Can-Mad; I; Nano; –; –
Plants growing in deep soil are nanophanerophytes, whereas those in rock habitats are often very small and appear like chamaephytes.



Phyllis viscosa Webb ex Christ
E Can; I; Nano; x; –
R: Burchard (1929: 194), Ceballos & Ortuño (1976: 374): Sabinosa. Mendoza-Heuer (1972a: 7) as well as V. Voggenreiter (pers. comm. 1999) doubt the records for the island.

Plocama pendula Aiton
E Can; I - +; Nano; x; –
R: Burchard (1929: 193f): El Julan. Ceballos & Ortuño (1976: 374) could not confirm the earlier record and the species may be extinct on the island. Nevertheless toponyms such as "Balón" or "Balos" indicate the former existence of this shrub on El Hierro, see Marrero Gómez & al. (2000a) and Trapero & al. (1999: 200 f).

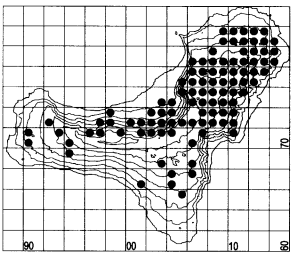
Rubia fruticosa Aiton subsp. *fruticosa*
E Can-Mad; I; Nano; –; –



Rubia peregrina subsp. *agostinhoi* (Dans. & P. Silva) Valdés & G. López
–; I - +?; Chamae-liana; x; –
R: Bramwell & Bramwell (2001: 259): "Forests above Frontera". Cardona & Sierra-Rèfols (1981: 565ff), who treat the taxon as a species, do not present any records for El Hierro; cf. Kunkel (1991: 225): "en todas las islas mayores".

In El Hierro the species could not be encountered during our fieldwork. Probably extinct if ever existent on the island.

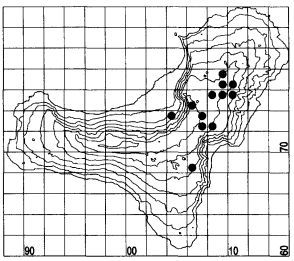
Sherardia arvensis L.
–; –; Thero; –; ↑
St: Omnipresent in many anthropogenic and natural communities at the high altitudes, invasive plant according to Kunkel (1991: 224), listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



Valantia hispida L.
–; –; Thero; x; –
R: Pitard & Proust (1908: 213): El Golfo, "Las Lapas", additionally they cite a record by Bornmüller for Valverde, but this is not mentioned in Bornmüller (1904: 477).

Rutaceae
Citrus limon (L.) Burm. f.
–; cult; Phanero; –; –
Recorded, e.g., in UTM 28RBR0775/1380;

Ruta chalepensis L.
–; Ni; Hemi; –; ↑
Chilton (1994: 12): in El Hierro subsp. *chalepensis*.
St: Mainly in ruderal habitats, perhaps cultivated in the past. Brandes & Fritzsch (2002) and Kunkel (1991: 156) consider the species to be probably introduced to the Canaries.

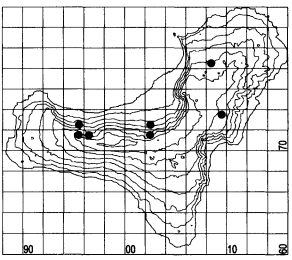


Salicaceae

Populus alba L.
–; cult; Phanero; new Hierro - x; –
R: Voggenreiter (1997a): Valverde.

Salix canariensis C. Sm. ex Link
E Can-Mad; I - +?; Phanero; x; –
Lit: Rodriguez Piñero & al. (1987)
R: Knoche (1923: 127): above Sabinosa; Bramwell & Bramwell (2001: 106): "forests of El Golfo, Fuente de Tinco". Listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).
Unfortunately, the species could not be confirmed in the surroundings of Fuente de Tinco, extinct?

Salix fragilis L.
–; cult; Phanero; –; ↑



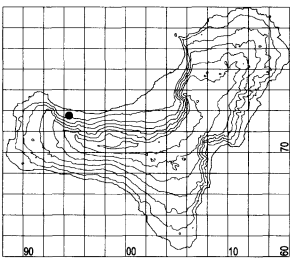
Sapotaceae

Sideroxylon mirmulano R. Br.
E Can-Mad-CV; I; Phanero; x - changed name!; –
AG/HS: *Sideroxylon marmulano* Banks ex Lowe, HS: in the Canaries var. *mirmulano* [*"marmulano"*].
Lit: According to Mabberley (2002) the correct name of the species is "*S. mirmulano* R. Br." instead of "*S. marmulano* Lowe" as usually cited.
R: Marrero (1992: 153): "Pie del Risco"/"Riscos de Jinama"; Santos Guerra (1996a: 448): UTM 28RBR0677; the record of Kämmer (1976: 339) probably refers to the same population. Listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).

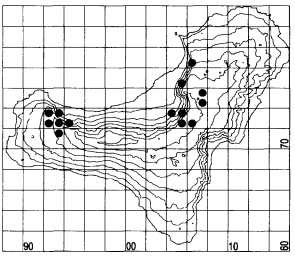
According to Mabberley (2002) the correct name of the species is "*S. mirmulano* R. Br." instead of "*S. marmulano* Lowe" as usually cited. Despite the intense "hunt" for the species it could not be confirmed during our fieldwork.

Scrophulariaceae

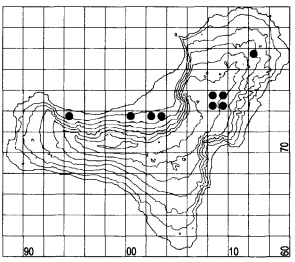
Antirrhinum majus L.
–; cult; Chamae; –; –
Cultivated in most settlements, occasionally propagating along walls and streets, e.g., in Sabinosa (UTM RAR9473).



Bartsia trixago L.
–; –; Thero; changed name!; ↑
det/conf: R. Jahn.
AG/HS: *Bellardia trixago* (L.) All.
Lit: Benedí (2002: 585), Short (1994: 315f).
In El Hierro the plants flower exclusively yellow, apparently representing the yellow form with obtuse calyx teeth (Benedí 2002: 560, cf. Jahn & Schönfelder 1995: 274), and not *Parentucellia viscosa*.

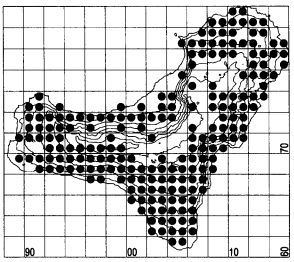


Cymbalaria muralis P. Gaertn. & al.
–; Ni; Hemi; –; –
St: Almost exclusively on walls within settlements (cf. Stierstorfer 2005: 244).



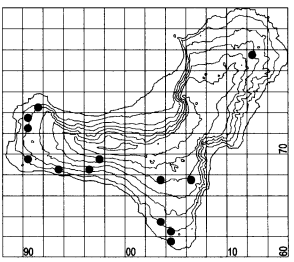
Linaria spartea (L.) Willd.
–; –; Thero; x; –
R: Wolff & Rosinski (1999a: 15): UTM 28RAR9573.

Misopates orontium (L.) Raf.
–; –; Thero; –; –
HS: in the Canaries var. *orontium*
Lit: Sutton (1988: 146ff).
St: Omnipresent in anthropogenic and many natural communities of the lower and intermediate altitudes of El Hierro. The status seems therefore not clear, although Kunkel (1991: 212) considers the species to be probably introduced.

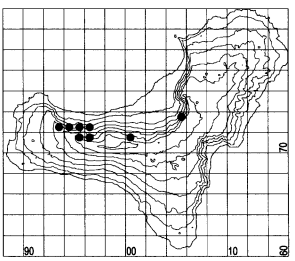


Parentucellia viscosa (L.) Caruel
–; –; Thero; (x); –
R: Lid (1967: 159): "Vista Sabinosa at the ridge east of La Dehesa"; confusion with the yellow form of *Bartsia trixago* (see comment there)?

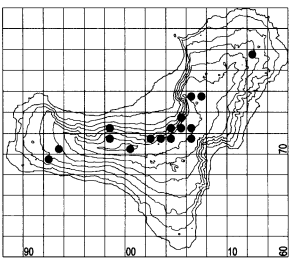
Scrophularia arguta Sol. ex Aiton
–; I; Thero; –; ↓
St: Scattered presence in various communities of the lower altitudes, native to the Canaries according to Kunkel (1991: 213).



Scrophularia smithii subsp. *hierrensis* Dalgaard
E Hierro; I; Hemi; –; ↑
R: Dalgaard (1979: 28f): The type specimen was collected near the "Vivero Forestal" in El Golfo; E. Zogg in Schmid (1976: 245ff): laurel forest of the NW-facing slopes above Frontera 600-900 m.
The biggest population in El Hierro could be confirmed in the W of El Golfo above Sabinosa.



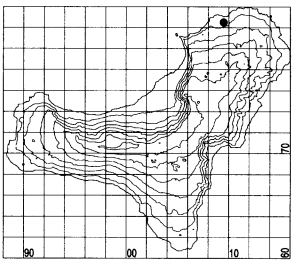
Veronica arvensis L.
–; –; Thero; –; ↑
St: Mostly at the highest altitudes of El Hierro, e.g., in sparse stands of the fayal-brezal (like *Aphanes microcarpa*). Brandes & Fritzsch (2002) and Kunkel (1991: 214) count the species as probably introduced.



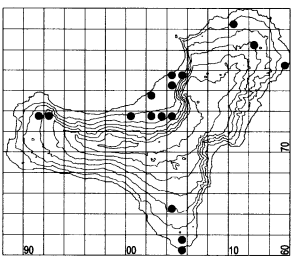
Solanaceae

Datura stramonium L.
–; cult; Thero; new Hierro; –
R: Wolff & Rosinski (1999a: 14): UTM 28RBR0273
Recorded, e.g., in UTM 28RBR0477/0770/0870/1479;

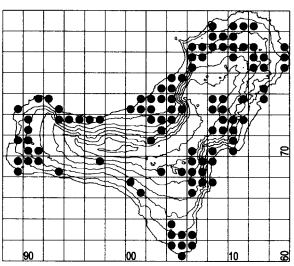
Hyoscyamus albus L.
–; Ne; Thero; –; ↓



Lycopersicon esculentum Mill.
–; Ne; Thero; –; ↓
R: Wolff & Rosinski (1999a: 15): El Golfo and La Dehesa.
All plants revealed fruits not exceeding the size of a cherry, hence belonging to "var. *humboldtii* Willd." (Hohenester & Welss 1993: 226)."

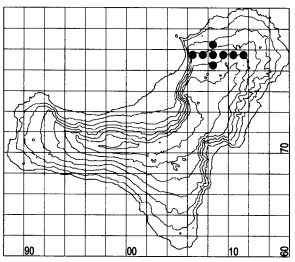


Nicotiana glauca Graham
–; Ni; Phanero; –; –
Lit: Brandes (2002).
St: Introduced to the Canaries (Tenerife, origin: South America,) in the early 19th century (Kunkel 1973: 104; 1976: 260).



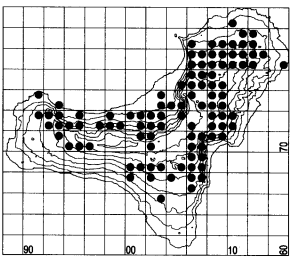
Nicotiana tabacum L.
–; cult; Thero; –; –
Recorded e.g., in UTM 28RBR0667.

Physalis peruviana L.
–; Ne; Nano; –; –

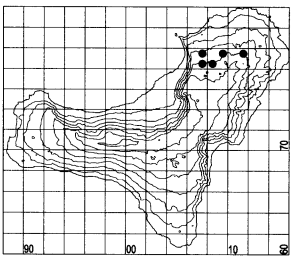


Solanum luteum Mill.
–; –; Thero; (x); –
The records for El Hierro may refer to *S. villosum* subsp. *alatum*.

Solanum nigrum L.
–; (Ni); Thero; –; –
St: Mostly in ruderal sites, but rarely also in natural non-forest communities. Kunkel (1991: 177) considers the species among others of the genus to be invasive in the Canary Islands; listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

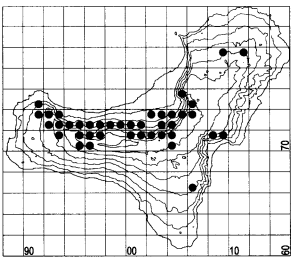


Solanum pseudocapsicum L.
–; Ne; Nano; –; ↑
Origin: South America.

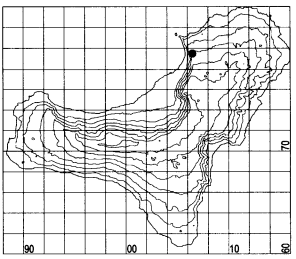


Solanum tuberosum L.
–; cult; Geo; new Hierro; –
R: Voggenreiter (1997a): several locations.

Solanum villosum subsp. *alatum* (Moench) Edmonds
–; –; Thero; changed name!; ↑
Syn: *S. villosum* subsp. *miniatum* (Bernh. ex Willd.) Edmonds
AG/HS: *S. alatum* Moench
Lit: Short (1994: 299), Wisskirchen & Haeupler (1998: 480).
R: Wolff & Rosinski (1999a: 17): UTM 28RBR0072/ RAR9671.
St: The taxon is strongly affiliated with laurel forests, the fayal-brezal and their surroundings in El Golfo, and occurs only exceptionally far outside. The specification of its status is therefore tricky. Nevertheless, Kunkel (1991: 177) considers the species among others of the genus to be invasive in the Canary Islands, and it is listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002). Indeed, it can not be excluded to represent an agriophyte.



Withania aristata (Aiton) Pauquy
–; I; Phanero; –; ↑
Only one small population could be found near Guarazoca (also recorded by Voggenreiter 1997a), probably the rest of the natural population.

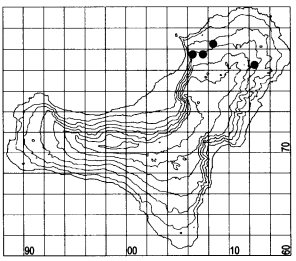


Tamaricaceae

Tamarix africana Poir.
–; cult; Nano; new Hierro; –
Recorded e.g., in UTM 28RBR0779.

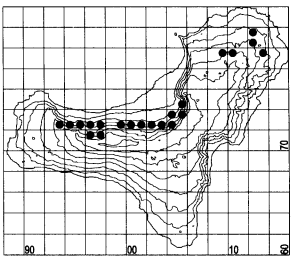
Tetragoniaceae

Tetragonia tetragonioides (Pall.) Kuntze
–; Ne; Chamae; new Hierro; –
St: Origin: New Zealand



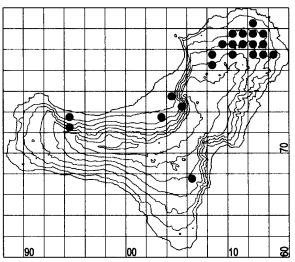
Theaceae

Visnea mocanera L. f.
E Can-Mad; I; Phanero; –; –
R: The huge trees of El Hierro, especially along the trail of the "Risco de Jinama", are frequently mentioned in the literature, e.g., Bornmüller (1903: 8; 1904: 448), Burchard (1929: 98), Ceballos & Ortuño (1976: 152/326f), Knoche (1923: 129), Pitard & Proust (1908: 135f) and Schmid (1976: 234).



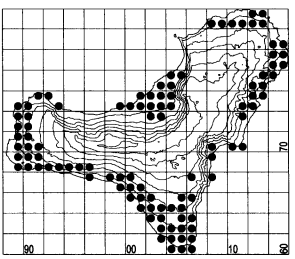
Tropaeolaceae

Tropaeolum majus L.
–; Ne; Thero; –; –

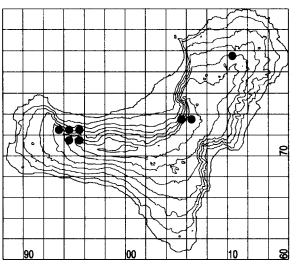


Urticaceae

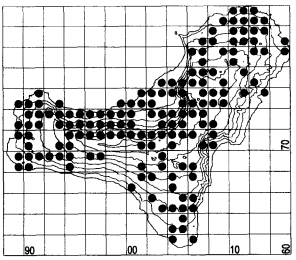
Forsskaolea angustifolia Retz.
E Can; I; Chamae; –; ↓
Lit: Lobin & Roessler (1985: 386ff).



Gesnouinia arborea (L. f.) Gaud.
E Can; I; Nano; –; ↑



Parietaria debilis G. Forst.



–; –; Thero; identification?; –

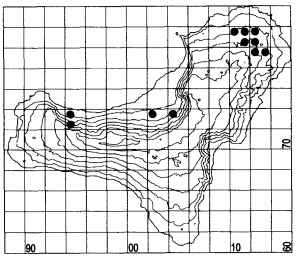
R: Bornmüller (1903: 10, 1904: 412); Lid (1967: 51); Voggenreiter (1997a) and Zogg in Schmid (1976: 245ff): Many locations on El Hierro.

St: Common in the fayal-brezal and the laurel forests, but also widespread in other communities, even in the lower regions, agriophyte? Listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

Very common in El Hierro; the species shows a confusing variability of the habit depending on the environmental conditions: e.g., small leaves, very hairy in open, exposed habitats; bigger leaves, less hairy in shady, moist habitats. Nevertheless all plants belong to *P. debilis* following the keys in the common floras and probably represent the two varieties (var. *micrantha* (Ledeb.) Wedd. and var. *gracilis* (Lowe) Wedd.) recorded for Madeira by Press (1994: 60f).

According to Kerguélen (1999) *P. debilis* is a synonym of *P. lusitanica* subsp. *lusitanica*. Indeed the properties of the latter given by Paiva (1993: 268ff) match quite well with the plants of El Hierro.

Parietaria judaica L.



–; Ni; Hemi; –; –

Lit: Brandes (1998).

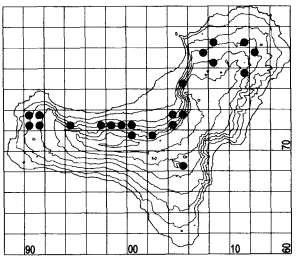
St: On walls in and near the villages La Frontera, Sabinosa and Valverde (cf. Stierstorfer 2005: 244).

Parietaria mauritanica Durieu

–; –; Thero; x; –

R: Pérez de Paz & al. (1981: 39/54): "Lomo Negro" in the W.

Urtica membranacea Poir.

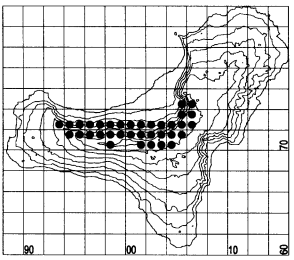


–; –; Thero; –; –

St: The plants grow mostly within the fayal-brezal, but rarely also outside in the potential area of the laurel forests; agriophyte? Listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

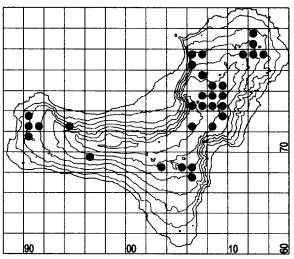
Identified by the inflated axis of the male racemes in the upper part of the plant and by the 2 stipules at each node (see Press 1994: 59f).

Urtica morifolia Poir.
E Can-Mad-Az; I; Nano; –; ↑

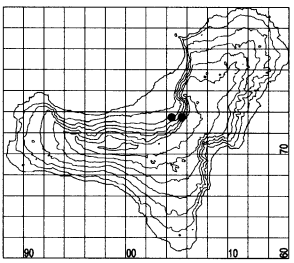


Urtica stachyoides Webb & Berthel.
E Can; I - +?; Thero; x; –
R: Bornmüller (1903: 10, 1904: 412): "Los Llanillos", "El Golfo, Las Lapas"; Bramwell & Bramwell (2001: 108): "Valverde, central region, El Golfo, lower zone"; Burchard (1929: 222): El Golfo; Lid (1967: 52): "La Gatera" [N of Tefirabe], "Bco. Jamones"; Pitard & Proust (1908: 346): "Valverde, Los Corchos, Los Llanillos, Sabinosa".
The species could neither be encountered on El Hierro during our fieldwork, nor on the other islands in the course of excursions. Probably extinct on El Hierro?

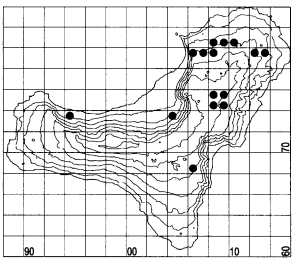
Urtica urens L.
–; Ni; Thero; –; –
Almost exclusively in nutrient-rich habitats, near cattle sheds, etc., listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



Valerianaceae
Centranthus calcitrapae (L.) Dufr.
–; Ni; Thero; –; ↑
The population in La Frontera is apparently established.



Centranthus ruber (L.) DC.
–; Ne; Chamae; –; –
This species is strongly associated with settlements.

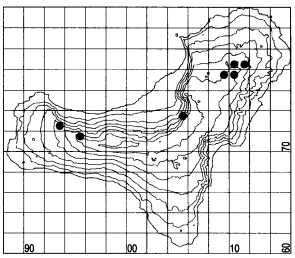


Verbenaceae

Lantana camara L.
–; cult; Nano; new Hierro - x; –
R: Voggenreiter (1997a): near Erese in the NE.

Violaceae

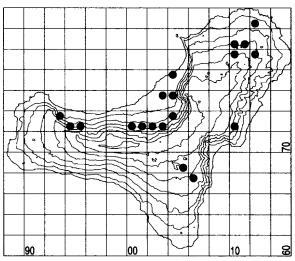
Viola riviniana Rchb.
–; I; Hemi; –; ↑
R: Pérez de Paz & al. (1976: 220): "*V. reichenbachiana* Jordan ex Boreau" near the trail Sabinosa-Dehesa; E. Zogg in Schmid (1976: 245ff): "*Viola silvestris* Lam." in the laurel forest of the NW-facing slopes above Frontera, 600-900 m. These records certainly refer to *V. riviniana*.
St: Oberdorfer (1965: 71) mentions the species *("Viola silvestris")* to hint at the common roots of the Canary laurel forests with the temperate forests of Europe. In El Hierro, *V. riviniana* indeed occurs in the tiny rests of relatively undisturbed laurel forests in the W of El Golfo. It also succeeds to survive in relative moist sites in the pastureland of the NE in the surroundings of the ancient holy tree "Garoé" of the prehispanic population. There, moist laurel forests presumably covered the mountains before being cut in the first decades of the 17th century.



Identified by the conspicuous appendages of the sepals and the furrowed spur (Haeupler & Muer 2000: 143, Short 1994: 224).

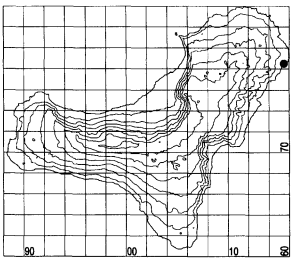
Vitaceae

Vitis vinifera L.
–; cult; Nano; –; –



Zygophyllaceae

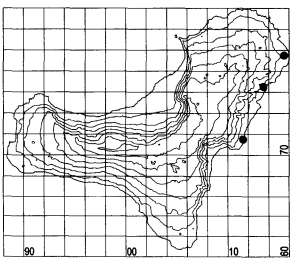
Fagonia cretica L.



–; Ni; Chamae; identification?; ↓

The plants of El Hierro have pale violet (lilac) petals, the margins of which are not overlapping. This taxon was recorded for the Canaries (Gran Canaria, Tenerife) and Morocco by El Hadidi (1974: 392f) as *F. sinaica* var. *albiflora* (Chev.) Hadidi. In contrast Schönfelder & Schönfelder (1997: 128), who use the name *F. albiflora* Chev., state that it has been overlooked in the Canaries so far and *F. cretica* is much rarer there. According to the recent revision by Beier (2005: 242), *F. albiflora* is a synonym of *F. latifolia* Delile, a species found in the Cape Verde Islands and N Africa, but not on the Canary Islands, where the genus is represented by *F. cretica* only. The plants could only be found along streets in La Caleta (28RBR1578) and can therefore be considered to be introduced.

Zygophyllum fontanesii Webb & Berthel.



–; I; Nano; –; ↓

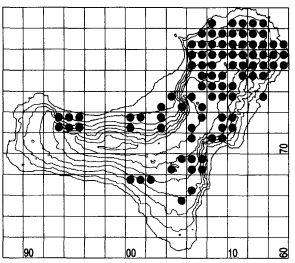
R: Arco Aguilar & Wildpret de la Torre (1990: 100): Two little populations in El Hierro [sine loco].

St: The individuals in 28RBR1376 are certainly introduced within a plantation, those in 28RBR1171 grow near a road, whereas those in 28RBR1579 represent a tiny population in a natural habitat. At least the latter may be indigenous.

Monocotyledoneae

Agavaceae

Agave americana L.



–; Ne; Nano-succ; –; –

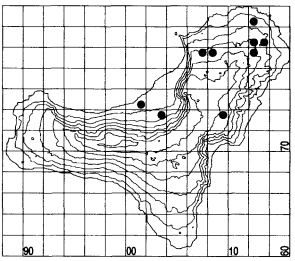
Agave attenuata Salm-Dyck

–; cult; Nano; –; –

Recorded, e.g., in UTM 28RBR0872/1279/1280/1282.

Agave sisalana (Engelm.) Perr.
–; cult; Nano; new Hierro; –
Recorded e.g., in UTM 28RBR0373/1578.

Dracaena draco L.



E Can-Mad-Az?-CV; NE; Phanero; –; –
AG: In El Hierro subsp. *draco*.
R: Santos Guerra (1983a: 308): sine loco.
St: The few plants, e.g., near Frontera or in gardens of Valverde, are most probably cultivated (González Henríquez & al. 1986: 173). See also Abreu Galindo (c. 1600: 83): "No produce esta tierra dragos". Almeida Pérez (2003: 680f) also considers only the populations of Tenerife (and one individual in Gran Canaria) to be natural. According to the latter authors *D. draco* only exists in the Canaries, Cape Verde Islands and Madeira, whereas HS also lists the species for the Azores. The nativeness to the Azores is, however, doubtful (Schäfer 2003). In Morocco subsp. *ajgal* occurs (Benabid & Cuzin 1997).

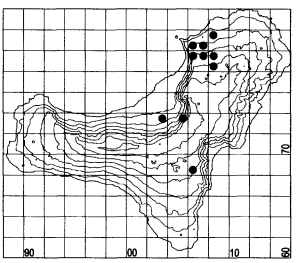
Sansevieria trifasciata Prain
–; cult; Nano; new Hierro - x; –
R: Voggenreiter (1997a): near the E coast.

Amaryllidaceae

Pancratium canariense Ker-Gawl.
E Can; –; Geo; x; –
R: Bramwell & Bramwell (2001: 396): sine loco. Wildpret de la Torre (1970) does not present any record for El Hierro.

Araceae

Dracunculus canariensis Kunth
E Can; I; Geo; –; –

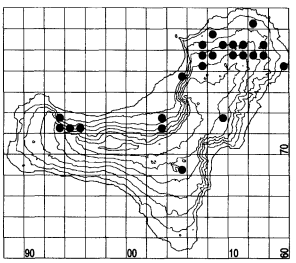


Arecaceae

Phoenix canariensis Chabaud

E Can; I; Phanero; –; –

The species may be indigenous to El Hierro taking into consideration the remarks by Abreu Galindo (c. 1600: 83): "... poblada de mucha arboleada ... y algunas palmas." Nevertheless most of the existing individuals seem to be planted by man.



Bromeliaceae

Ananas comosus (L.) Merr.

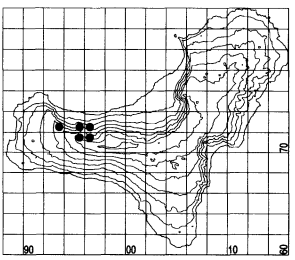
–; cult; Nano; not AG/HS; –

Recorded, e.g., in UTM 28RBR0375.

Cyperaceae

Carex canariensis Kük.

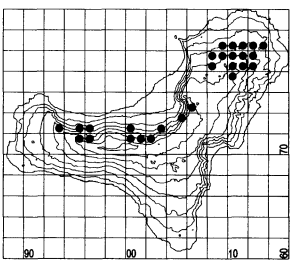
E Can; I; Hemi; –; ↑



Carex divulsa subsp. *divulsa*

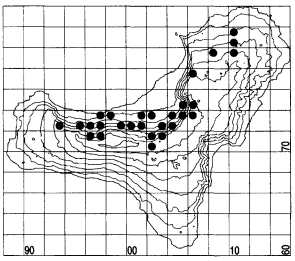
–; –; Hemi; –; ↑

R: Wolff & Rosinski (1999a: 14): UTM 28RAR9671/ RBR0071.



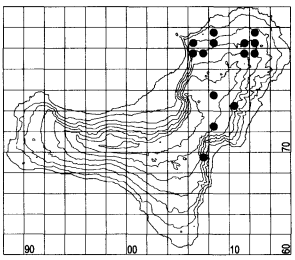
Dioscoreaceae

Tamus edulis Lowe
E Can-Mad; I; Geo; –; –

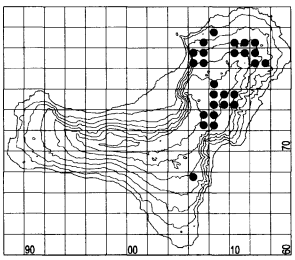


Iridaceae

Ferraria crispa Burm.
–; Ne; Geo; –; –
R: The population of this neophyte (origin: S Africa) in NE El Hierro was also recorded by Lid (1967: 48) and Pérez de Paz & al. (1976: 222).



Gladiolus italicus Mill.
–; Ni; Geo; –; –
Cultivated in gardens, but also widely naturalised, usually in (formerly) cultivated ground, as, e.g., in Madeira (Press 1994: 397).

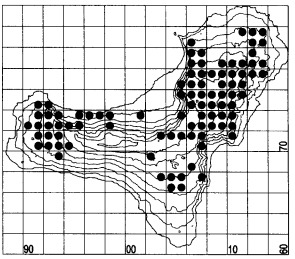


Iris germanica L.
–; cult; Hemi; new Hierro; –
Recorded, e.g., W of San Andrés near the street at the base of Mña. de Afosa (UTM 28RBR0774).

Romulea columnae Sebast. & Mauri

–; I; Geo; identification?; –

St: The species occurs in seasonal pastures, but also in natural rock communities and is probably native.



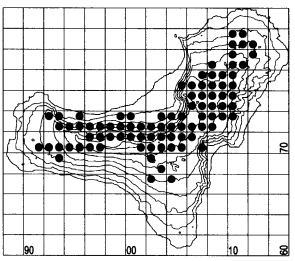
According to HS "*R. grandiscapa* Gay" [sic] is synonymous to *R. columnae*. Press (1994: 398f) distinguishes *R. columnae* subsp. *columnae* from subsp. *grandiscapa* (Webb) G. Kunkel (≡ *R. columnae* var. *grandiscapa* (Webb) Pit. ≡ *R. grandiscapa* (Webb) Gay), listing the latter taxon for the Canaries. The confusing information about the genus in the Canaries is summarised by Kunkel (1992: 281f). The complex in the Middle Atlantic islands may need further investigation. According to Abraham (1988: 505) the plants of El Hierro ("*R. hartungii* subsp. *hierroensis*") reveal certain peculiarities in their habit.

Juncaceae

Ebingeria elegans (Lowe) Chrtek & Krísa

E Can-Mad; I; Thero; –; –

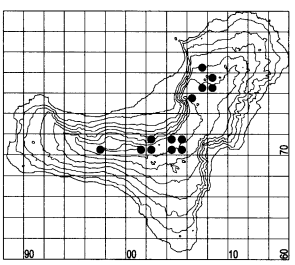
Lit: Ebinger (1963).



Juncus bufonius L.

–; –; Thero; –; ↑

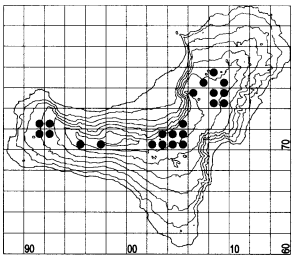
St: In moist sites within and outside the forests of the uppermost region of El Hierro, the status is uncertain. Listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



Juncus capitatus Weigel

–; –; Thero; –; ↑

The population of this species may fluctuate considerably between years with dry growing seasons (e.g., 1998-99) and those with high precipitation (2002-03).

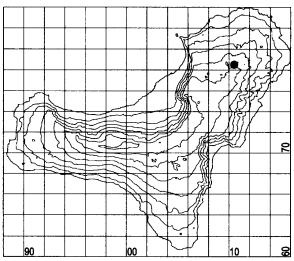


Lemnaceae

Lemna gibba L.

–; Ni; Hydro; new Hierro; ↑

The species has been confirmed in the pools around the holy tree ("Garoé") since 2002. Flat forms are hardly distinguishable from *L. minor* L. (Haeupler & Muer 2000: 583), so that the presence of the latter species cannot be excluded. Both species are introduced to the Canaries according to Kunkel (1992: 238).



Liliaceae

Allium cepa L.

–; cult; Geo; new Hierro; –

Recorded, e.g., in UTM 28RBR0976.

Allium roseum L.

–; –; Geo; (x); –

The record may refer to *A. subvillosum*.

Allium subhirsutum L. subsp. *subhirsutum*

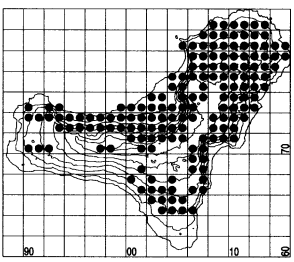
–; –; Geo; (x); –

The record may refer to *A. subvillosum*.

Allium subvillosum Salzm. ex Schultes

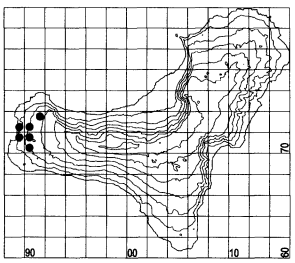
–; –; Geo; –; –

R: Pérez de Paz & al. (1981: 51): "*Allium subhirsutum* L. subsp. *subvillosum* (Salzm.) Wilde-Duyfjes, El Cres-Turrón". Identified by the stamens being slightly shorter or (in most plants of El Hierro) slightly longer than perianth segments, the ciliate leaves and the foveolate outer tunics of the bulbs (Pastor 1987: 454; Stearn 1980: 49ff).



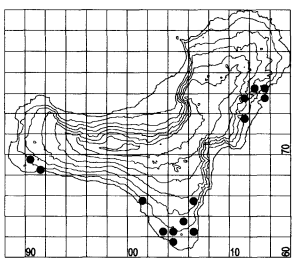
Aloe vera (L.) Burm. f.
–; cult; Nano; new Hierro; –
Recorded, e.g., in UTM 28RAR9472 and RBR0375.

Androcymbium hierrense A. Santos
E Can; I; Geo; –; ↓
R: Santos Guerra (1983c: 55, 1996b: 92f): La Dehesa. A survey is presented by Martín Cáceres & al. (2003: 574f). Listed for El Hierro in the catalogue of endangered species of the Canary Islands (García Casanova 2001).

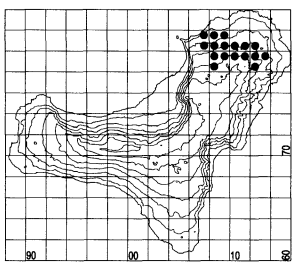


Reifenberger (1990) separated the plants of Gomera as subsp. *macrospermum,* which is not accepted by Pedrola-Monfort & Caujapé-Castells (1998). AG follow Santos Guerra (1996b: 92f) and list subsp. *hierrense* only for El Hierro and subsp. *macrospermum* for La Gomera and La Palma. In contrast, Martín Cáceres & al. (2003: 574ff) list subsp. *hierrense* for El Hierro and La Palma, and subsp. *macrospermum* only for La Gomera.

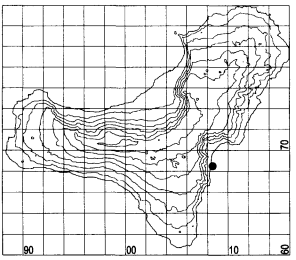
Asparagus arborescens Willd.
E Can; I; Nano; –; ↓
Lit: Valdés (1979: 77ff).



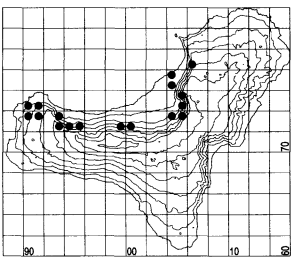
Asparagus asparagoides (L.) W. Wight
–; Ne; Nano-liana; –; ↑



Asparagus scoparius Lowe
E Mad-Can-CV; I; Nano; –; ↓
Lit: Valdés (1979: 92ff).

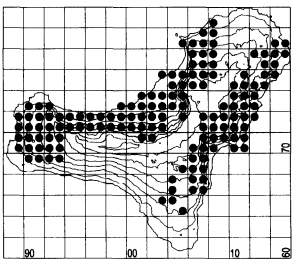


Asparagus umbellatus Link
E Can; I; Nano-liana; –; –
AG/HS: in El Hierro subsp. *umbellatus*. HS further distinguishes varieties and indicates var. *umbellatus* for the island following the concept of Valdés (1979: 80ff).

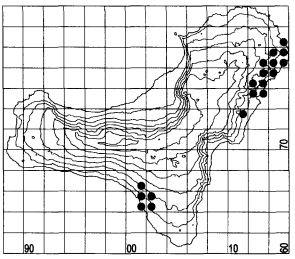


Asphodelus fistulosus L.
–; –; Geo; recHS not AG, (x); –
Díaz Lifante & Valdés (1996: 144) present no records about the species for El Hierro, although it is present in the Canaries. Former records may refer to *A. tenuifolius*.

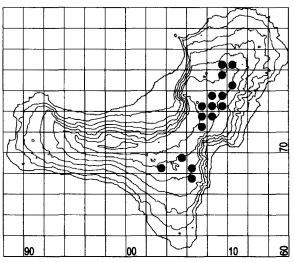
Asphodelus ramosus subsp. *distalis* Z. Díaz & Valdés
–; –; Geo; –; –
HS: *A. aestivus* Brot.
Lit: Díaz Lifante & Valdés (1994, 1996: 61ff).



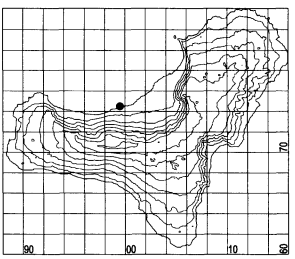
Asphodelus tenuifolius Cav.
–; –; Geo; –; ↓
R: Díaz Lifante & Valdés (1996: 159) present a list of specimens from several locations; Lid (1967: 45): "around Puerto Estaca"; Pérez de Paz & al. (1981: 51): "Sabinar de la Dehesa".



Muscari comosum (L.) Mill.
–; (Ni); Geo; changed name!; ↑
AG/HS: *Leopoldia comosa* (L.) Parl.
Lit: Wisskirchen & Haeupler (1998: 317, FE, Hegi).
In El Hierro the species is mainly restricted to pastures, but occurs occasionally in ruderal sites, too. According to Kunkel (1992: 267) the indigenity of the species is doubtful; it is listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

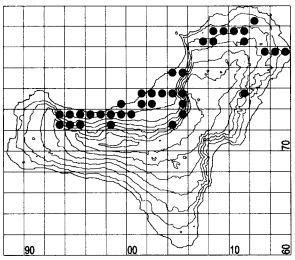


Nothoscordum gracile (Aiton) Stearn
–; Nc; Geo; new Hierro; ↓



Scilla haemorrhoidalis Webb & Berthel.
–; –; Geo; (x); –
R: Bramwell & Bramwell (2001: 391), Burchard (1929: 231): sine loco; Gandullo (1991: 160f): UTM 28RBR1278; Knoche (1923: 268): near Valverde; Lid (1967: 47): "San Pedro", "above Tamaduste" and "Bco. Santiago", all locations are in the NE.
Although Kunkel (1992: 268) records *S. haemorrhoidalis* as the most frequent species of the genus in all Canary islands, the findings could not be confirmed for El Hierro. The records may refer to *S. latifolia*.

Scilla latifolia Willd.

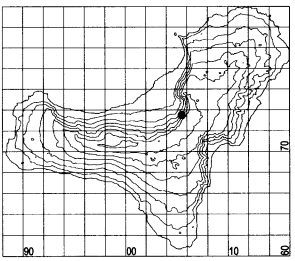


–; I; Geo; –; –

R: Santos Guerra (1976: 259, 1980: 43): surroundings of La Frontera and Sabinosa, near the coast.

The many-flowered, robust plant may be the only representative of the genus on El Hierro, see comment on *S. haemorrhoidalis*.

Semele androgyna (L.) Kunth.



E Can-Mad; I; Nano; –; ↑

R: Santos Guerra (1980: 43): "Fuente de Tincos", cliffs below "San Salvador"; E. Zogg in Schmid (1976: 245ff): laurel forest of the NW-facing slopes above Frontera, 600-900 m.

The surroundings of the Fuente Tincos is the only locality where the species could be confirmed. The inflorescences arise at the margins of the cladodes. The plants of El Hierro therefore represent the species in the strict sense and not *S. gayae* (Webb) Svent. & G. Kunkel with the inflorescences in the middle of the cladodes. *S. gayae* is restricted to Gran Canaria according to AG/HS, whereas Hohenester & Welß (1993: 297) list the taxon as doubtfully existent on El Hierro.

Smilax aspera L.

–; –; Nano-liana; (x); –

R: Ceballos & Ortuño (1976: 244): Jinama; E. Zogg in Schmid (1976: 245ff): var. *altissima* in the laurel forest of the NW-facing slopes above Frontera, (600–900 m).

According to Bramwell & Bramwell (2001: 388, "subsp. *mauritanica* Moris & De Not."), Hohenester & Welß (1993: 299: "*S. mauritanica* Poir."), Kunkel (1992: 272, "var. *altissima* Moris & De Not.") and Schönfelder & Schönfelder (1997: 266, "subsp. *mauritanica* (Poir.) Arc.") this taxon exists in all Canary Islands, except Lanzarote. HS list var. *altissima* only for Gomera and var. *aspera* for all Canary Islands except Lanzarote, which may be a mistake. The other species, *S. canariensis* Willd., does not exist on El Hierro according to AG, the above mentioned authors and Santos Guerra (1980: 36).

Despite intense search *S. aspera* could not be encountered during our fieldwork in El Hierro. The records may be the result of a confusion with the frequent *Tamus edulis*.

Musaceae

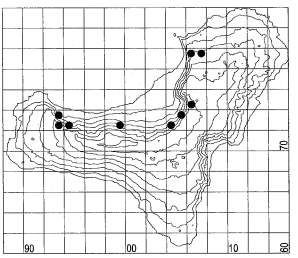
Musa acuminata Colla

–; cult; Phanero (herbaceous); –; –

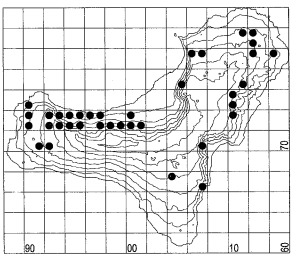
The cultivation of bananas is of increasing economic importance in El Hierro (mainly in El Golfo).

Orchidaceae

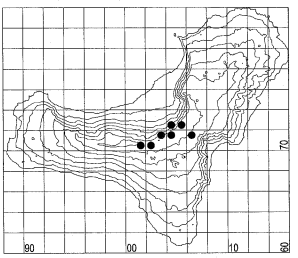
Gennaria diphylla (Link) Parl.
–; I; Geo; –; ↑
R: Kretzschmar (1998: 7f): several locations in El Golfo.



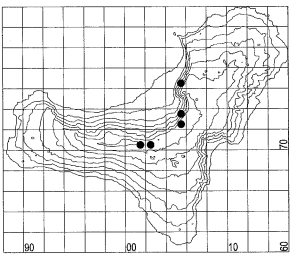
Habenaria tridactylites Lindl.
E Can; I; Geo; –; –
R: Kretzschmar (1998: 6f): Many locations in the N of El Hierro.



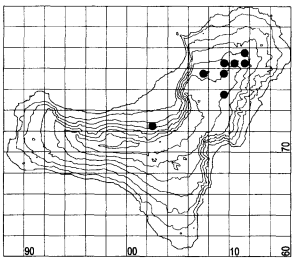
Neotinea maculata (Desf.) Stearn
–; I; Geo; –; ↑
St: Mainly restricted to natural rock communities of the uppermost altitudes.
R: Kretzschmar (1998: 7), Lid (1967: 50, "*N. intacta* (Link) Rchb. f.") and Santos Guerra (1980: 43): all records in the high mountains in the centre of the island.



Orchis patens subsp. *canariensis* (Lindl.) Sunding & G. Kunkel
E Can; I; Geo; –; ↑
R: Burchard (1929: 226), Kretzschmar (1998: 8f), and Santos Guerra (1976: 260): several locations at the high altitudes in the centre of El Hierro; Voggenreiter (1997a): additional records in the cliffs of Las Playas.

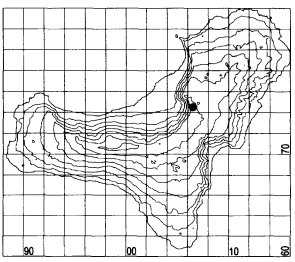


Serapias mascaensis H. Kretzschmar & al.
E Can; I; Geo; changed name!; ↑
det/conf: H. Kretzschmar
AG/HS: *S. parviflora* Parl., but the plants of El Hierro rather represent *S. mascaensis* (H. Kretzschmar, pers. comm. 09/1998, 02/2000, see also Kretzschmar & al. 1993: 32ff). According to Hohenester & Welß (1993: 317: *"S. occultata"*) the plants of El Hierro show a glossy yellow labellum, which could be encountered only rarely. Most individuals have a brownish red labellum.

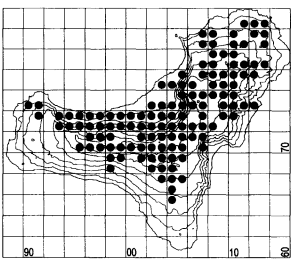


Poaceae

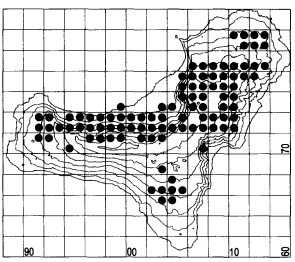
Agrostis castellana Boiss. & Reut.
– ; Ni; Hemi; new Hierro; ↑
det/conf: H. Scholz.
St: One established population near the Mirador de Jinama in a pasture, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



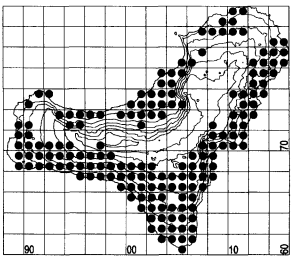
Aira caryophyllea L.
–; –; Thero; –; –
AG/HS: in the Canaries subsp. *caryophyllea*.



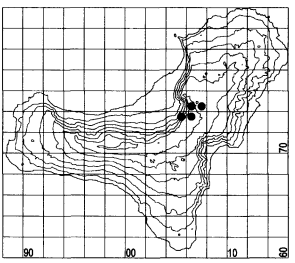
Anthoxanthum aristatum Boiss.
–; –; Thero; –; –



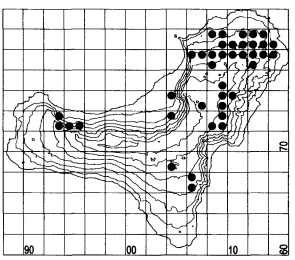
Aristida adscensionis subsp. *coerulescens* (Desf.) Auquier & J. Duvign.
–; I; Hemi; –; –
det/conf: H. Scholz
In HS the two taxa *A. adscensionis* L. s. str. and *A. adscensionis* subsp. *coerulescens* [*A. coerulescens* Desf.] are not distinguished, Cope (1994: 442) treats them even as synonymous. Auquier & Duvigneaud (1976) mention the first only for Lanzarote, whereas subsp. *coerulescens* is apparently common in the Canaries (H. Scholz, pers. comm. 01/2002, see also Brullo & al. 1997).



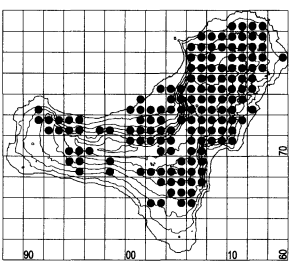
Arrhenatherum elatius var. *bulbosum* (Willd.) Spenn.
–; Ni; Hemi; changed name!; ↑
AG/HS: subsp. *bulbosum* (Willd.) Schübl. & Mart.
Lit: Wisskirchen & Haeupler (1998: 80), Conert (1998).
St: Along the street Valverde-Frontera between km 20-22.



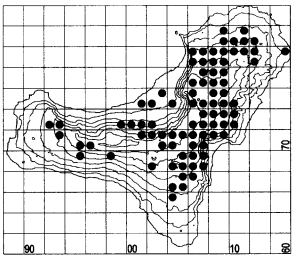
Arundo donax L.
–; Ne; Nano; –; ↑



Avena barbata Pott ex Link
–; –; Thero; –; –
St: Very common, mainly in pastures and ruderal sites, but also in some natural communities, agriophyte?



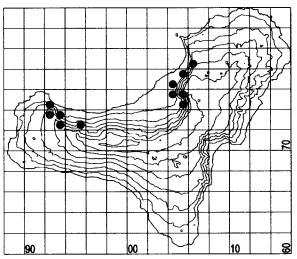
Avena fatua subsp. *meridionalis* Malcev
–; (Ni); Thero; –; –
Syn: *A. occidentalis* Durieu (regarding the discussion about the taxonomic status of *A. occidentalis* see, e.g., Cope (1994: 427) and Scholz (1977: 4, 1991).
St: Mostly in (abandoned) agricultural land, ruderal sites and pastures of El Hierro, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



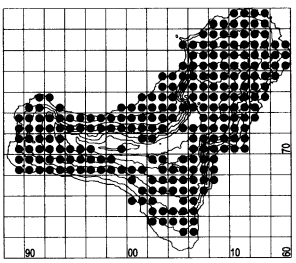
Avena maxima C. Presl
–; –; Thero; recHS not AG; –
Syn: *A. sterilis* subsp. *atherantha* (C. Presl) H. Scholz (cf. Scholz 1991).
Recorded for El Hierro and Lanzarote in HS, but omitted in AG.

Avena sterilis subsp. *atherantha* (C. Presl) H. Scholz
–; –; Thero; x; –

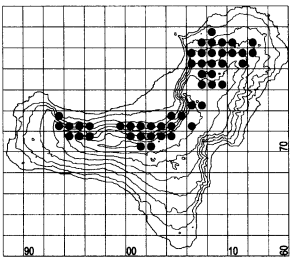
Brachypodium arbuscula Knoche
E Can; I; Chamae; –; –
det/conf: H. Scholz



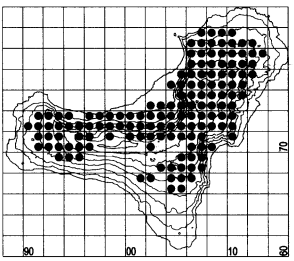
Brachypodium distachyon (L.) P. Beauv.
–; –; Thero; –; –
HS: *Trachynia distachya* (L.) Link
Lit: Chilton (1994: 13), Cope (1994: 438, "*B. distachyum*"), Jahn & Schönfelder (1995: 387f), Kerguélen (1999) and Schippmann (1991).



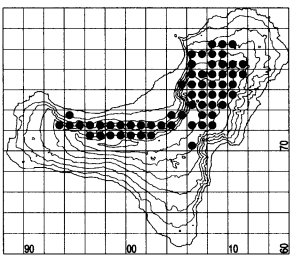
Brachypodium sylvaticum (Huds.) P. Beauv.
–; I; Hemi; –; ↑
St: Like *Viola riviniana,* this species may be another hint to the common roots of the Canary laurel forests and the temperate forests of Europe. As in the case of *Asplenium onopteris,* the species perfectly traces the potential area of the laurel forests of El Hierro.



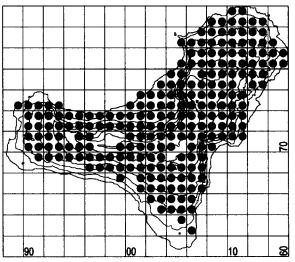
Briza maxima L.
–; –; Thero, –; –
St: Very common, particularly at high altitudes of El Hierro, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).



Briza minor L.
–; –; Thero; –; ↑



Bromus diandrus Roth
–; –; Thero; –; –
det/conf: H. Scholz
Lit: Scholz & Böcker (1996: 574).
St: Almost omnipresent in El Hierro, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002)



Bromus hordeaceus subsp. *molliformis* (Lloyd) Maire & Weiller

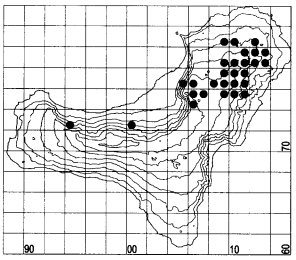
–; (Ni); Thero; –; ↑

Syn: *B. hordeaceus* subsp. *divaricatus* auct. non (Bonnier & Layens) Kerguélen (for more information on the misapplied epithet *"divaricatus"* see Scholz (1998a) (cf. Wisskirchen & Haeupler 1998: 104).

det/conf: H. Scholz

Lit: Scholz (1998a).

St: Almost exclusively in the pastures in the NE highland.



Bromus lanceolatus Roth

–; –; Thero; x; –

HS: in El Hierro var. *lanceolatus*.

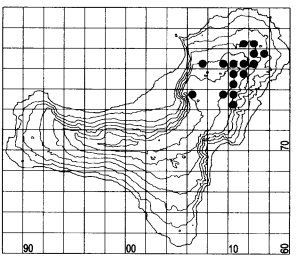
Lit: Scholz (1998b: 148ff)

Bromus madritensis L. subsp. *madritensis*

–; (Ni); Thero; –; ↑

det/conf: H. Scholz

St: Exclusively in the degraded vegetation and near streets in the NE highland.

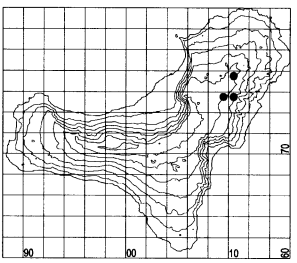


Bromus madritensis subsp. *madritensis* ×*B. rubens* subsp. *kunkelii*

–; –; Thero; not AG/HS - identification?; ↑

det/conf: H. Scholz

In the contact zone of the distribution areas of the two taxa intermediate plants could be found and may represent hybrids, but this hypothesis needs further investigation (H. Scholz, pers. comm. 08/2001). Similar observations in the Canary Islands are already mentioned by Scholz & Böcker (1996: 579).

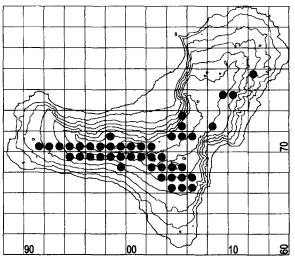


Bromus rigidus Roth

–; –; Thero; (x); –

The records may refer to *B. diandrus*. For the correct differentiation see, e.g., Scholz & Böcker (1996: 574). For alternative taxonomic concepts see Sales (1993: 7ff) and Acedo & Llamas (1999: 165ff).

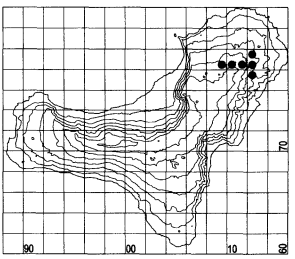
Bromus rubens subsp. *kunkelii* (H. Scholz) H. Scholz
–; I; Thero; –; ↑
det/conf: H. Scholz
HS: *B. madritensis* subsp. *kunkelii* H. Scholz
Lit: Scholz & Böcker (1996: 578 f).
St: The species mainly exists within the sparse stands of Canary pine wood and adjacent scrub communities in the S of El Hierro. The population reveals a well established distribution pattern, favouring this distinct niche in these relatively natural communities. The status as indigenous seems therefore justified.



Originally the taxon was considered to be an endemic of the Canaries (Scholz 1981: 251ff) but later it has been recorded from Spain and N Africa, where it occurs sympatrically with *B. rubens* subsp. *rubens,* which is apparently missing in the Canaries.

Bromus rubens subsp. *rubens*
–; –; Thero; (x); –
The records may refer to subsp. *kunkelii,* see comment there and Scholz & Böcker (1996: 578f).

Catapodium rigidum (L.) C. E. Hubb.
–; Ni; Thero; –; –
det/conf, pers. comm. 07/2006 H. Scholz
St: The species is restricted to the surroundings of Valverde and nearby pastureland in the SW of the village, where it was already recorded by Lid (1967: 24: "La Gatera north of Tefirabe 850 m").

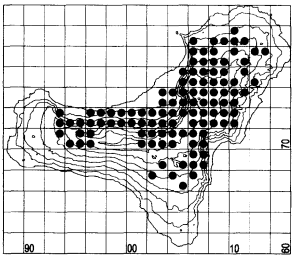


Cenchrus ciliaris L.
–; I; Hemi; –; ↓
St: Probably native to the Canaries (Kunkel 1992: 247).

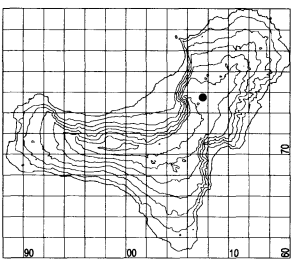
Cortaderia selloana (Schult. & Schult. f.) Asch. & Graebn.
–; cult; Hemi; new Hierro - identification?; –
R: Voggenreiter (1997a): in the NE.
One sterile tussock above Sabinosa (UTM 28RAR9572), but identification uncertain.

Cynodon dactylon (L.) Pers.
–; cult; Hemi; –; –
R: Lid (1967: 25): near "La Gatera north of "Tefirabe"; Voggenreiter (1997a): in the NE.
No plants could be confirmed in the wild, but the species is cultivated in gardens, e.g., around the Parador de Las Playas (UTM 28RBR0869).

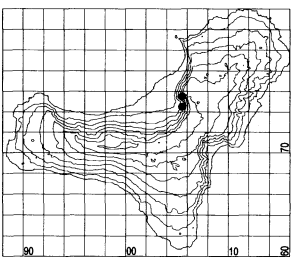
Cynosurus echinatus L.
–; –; Thero; –; –
St: Widely distributed in anthropogenic, but also in natural non-forest communities, particularly at high altitudes, agriophyte?



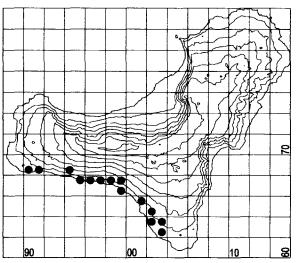
Dactylis glomerata L.
–; Ni; Hemi; new Hierro; ↑
One small population in a ditch near San Andrés. P. Schönfelder (pers. comm.) collected specimens above Sabinosa.



Dactylis smithii subsp. *smithii*
E Can; I; Chamae; new Hierro; –
det/conf: H. Scholz
R: Bramwell & Bramwell (2001: 407f), Lems (1960a: 83): sine loco; Marrero (1992: 153): E of El Golfo ("Pie del Risco", "Riscos de Jinama").
Although mentioned in the above literature for El Hierro, these records are not considered in AG/HS.

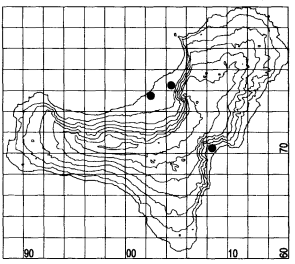


Dichanthium foveolatum (Delile) Roberty
–; I; Hemi; changed name!; ↓
Syn: *Eremopogon foveolatus* (Delile) Stapf (the change of the generic name follows H. Scholz (pers. comm. 05/2003).
Lit: Clayton & Renvoize (1982: 723), Setshogo (2002: 38ff).
St: In El Hierro, the species is restricted to the dry coastal region in the SW. It grows also on the W coast of Africa, underlining the relationship between the Canary succulent scrub with shrub communities there (Otto & al. 2001: 245), see also distribution of, e.g., *Lotus glinoides*.

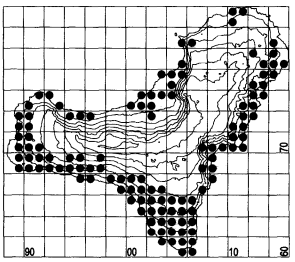


Digitaria ciliaris (Retz.) Koeler
–; –; Thero; x; –
R: Wolff & Rosinski (1999a: 15): UTM 28RBR0273, one small individual.

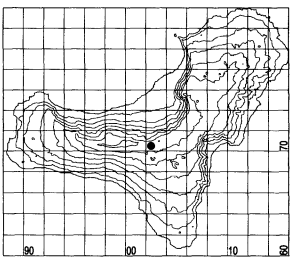
Digitaria sanguinalis (L.) Scop.
–; –; Thero, new Hierro; ↓



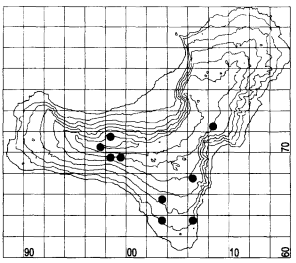
Eragrostis barrelieri Daveau
–; –; Thero; –; ↓



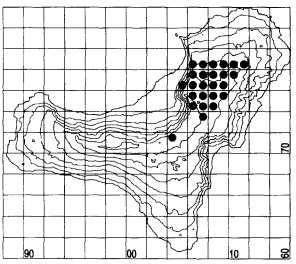
Festuca agustinii Linding.
E Can; I; Hemi; –; ↑
In the original description of Lindinger (1926: 298) the grass was named *F. agustini,* but according to Art. 60.11 and recommendation 60C.1 of the International Code of Botanical Nomenclature (Greuter & al. 2000), the spelling used here and by most authors is correct.



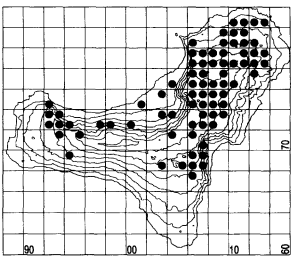
Gastridium phleoides (Nees & Meyen) C. E. Hubb.
–; –; Thero; new Hierro; –
det/conf: H. Scholz
All records in AG/HS for *G. ventricosum* (Gouan) Schinz & Thell. may refer to *G. phleoides* (Scholz & Böcker 1996: 575, see also Cope 1994: 434). For the correct differentiation of the species see Scholz (1986b).



Holcus mollis subsp. *hierrensis* Stierst.
E Hierro?; I; Chamae; new Can - new taxon!; ↑
Lit: Stierstorfer (2001)
The taxon has been described recently and may probably represent a neoendemic of El Hierro. *H. mollis* has not yet been cited for the Canaries in the literature. Further investigations about the genus confirmed the status of the population of El Hierro as a separate taxon. It may even deserve the rank of species (M. Menezes de Sequeira, pers. comm. 05/2005).

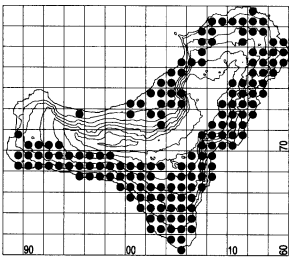


Hordeum murinum subsp. *leporinum* (Link) Arcang.
–; Ni; Thero; –; –
The author citation in AG/HS (subsp. *leporinum* (Link) Asch. & Graebn.) is changed following, e.g., Cope (1994: 440), Romero Zarco (2003: 811f) or Wisskirchen & Haeupler (1998: 266). Scholz (1977: 4f) treats the taxon as separat species *H. leporinum* Link.
St: The species mainly grows on nutrient-rich sites in (formerly) cultivated land and along trails, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

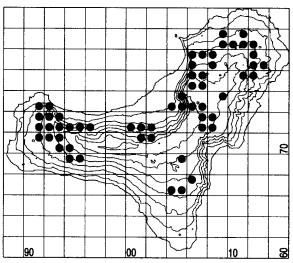


Hordeum vulgare L.
–; cult; Thero; new Hierro; –
Lit: Scholz & Böcker (1996: 575).
Recorded, e.g., in UTM 28RBR0773/0774.

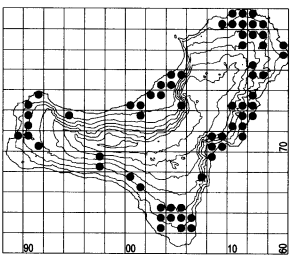
Hyparrhenia sinaica (Delile) Llauradó ex G. López
–; I; Hemi; changed name!; –
AG/HS: *Hyparrhenia hirta* (L.) Stapf
Lit: López González (1994), Díez-Garretas & Asensi (1999).
St: Kunkel (1992: 252) lists the species as native, which is consistent with our observations on El Hierro. In contrast, Schmid (1976: 245) considers this grass to be introduced.



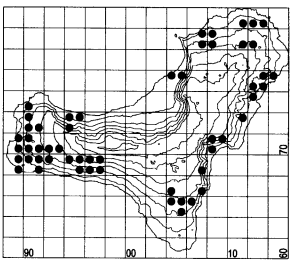
Lagurus ovatus L.
–; Ni; Thero; –; –
St: Mainly in abandoned pastures and ruderal sites, introduced and even cultivated in the Canaries according to Kunkel (1992: 255).



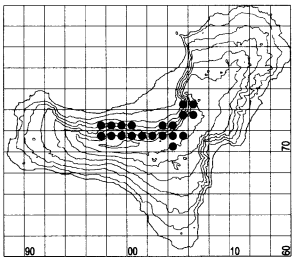
Lamarckia aurea (L.) Moench
–; –; Thero; –; ↓



Lolium canariense Steud.
E Mad-Can-CV; I; Thero; –; –
Recorded for Porto Santo by Cope (1994: 417). See also comment on *L. edwardii*.



Lolium edwardii H. Scholz, Stierst. & Gaisberg



E Can; I; Thero; new taxon!; ↑

Lit: Scholz & al. (2000).

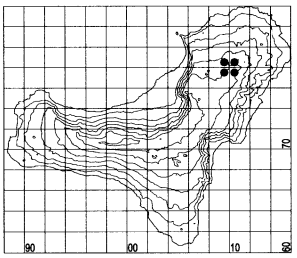
This species was recently separated from *L. canariense,* which grows exclusively in the lower regions of El Hierro. In contrast, *L. edwardii* is confined to the shady habitats within the laurel forests and the *Myrica-Erica* scrubs of the higher altitudes of the island. The separation of *L. canariense* and *L. edwardii* is additionally supported by recent findings of endophytes. The endophyte *Neotyphodium typhinum* var. *canariense* is probably restricted to *L. edwardii* (A. Stewart pers. comm. 12/2003).

Lolium multiflorum Lam.

–; –; Thero; (x); –

R: Lid (1967: 29): many locations all over the island; E. Zogg in Schmid (1976: 245ff): laurel forest of the NW-facing slopes above Frontera 600-900 m; see comment on *L. rigidum*.

Lolium perenne L.



–; (Ni); Hemi; –; ↑

det/conf: H. Scholz

R: Lid (1967: 30): "Fuente Lazarus 1 km north of Valverde"; E. Zogg in Schmid (1976: 245ff): laurel forest of the NW-facing slopes above Frontera 600-900 m.

St: Kunkel (1992: 255) considers all species of the genus except the endemics to be probably introduced, which matches with the situation in El Hierro.

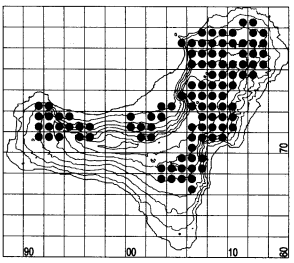
In the NE highland of El Hierro some of the respective plants are apparently perennial and therefore represent *L. perenne*. Nevertheless, especially in dry years, when they fail to survive the summer, it is often not easy to distinguish them from extreme forms of *L. rigidum*. Difficulties in the differentiation of the two species in some cases are also mentioned by Terrell (1968: 9/16ff). See also comment on *L. rigidum*.

Lolium remotum Schrank

–; –; Thero; x; –

R: Lid (1967: 30): in El Golfo ("Las Lajas near Risco Tibataje"), "Tesoro" (region in the NE around Echedo).

Lolium rigidum Gaudich.



–; (Ni); Thero; –; –
det/conf: H. Scholz
St: The species prefers pastures, ruderal habitats and abandoned fields. It can therefore considered to be probably introduced, which is in accordance with Kunkel (1992: 255).

Probably all plants formerly recorded as *L. multiflorum* refer to the *L. rigidum* complex. Respecting the differentiation of extreme forms of these two species and *L. perenne* see Terrell (1968: 16): *"L. rigidum* intergrades also with *L. perenne* and *L. multiflorum." L. parabolicae* Senn. ex Samp has also been collected in El Hierro, but is considered to be "simply a local, maritime extreme" of *L. rigidum* (Terrell 1968: 19f). The variability of *L. rigidum* is also discussed by Conert (1998: 642ff).

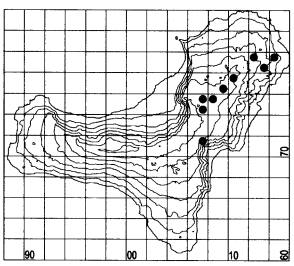
Lolium temulentum L.
–; –; Thero; x; –
R: Lid (1967: 30): near Valverde and El Pinar.

Pennisetum setaceum subsp. *orientale* (Rich.) Maire
–; Nc - +?; Hemi; x; –
R: García-Gallo & al. (1999: 149): few individuals near the airport and the street Puerto Estaca - Valverde, cf. Pérez de Paz & al. (1999: 17f).

The taxon is not listed in HS and may (hopefully) be extinct in El Hierro.

Phalaris L.
A revision of the genus is presented by Baldini (1995). Generally, *Phalaris* species are regarded as good fodder grasses and may therefore have been be introduced deliberately into the Canaries (Kunkel 1992: 257).

Phalaris aquatica L.



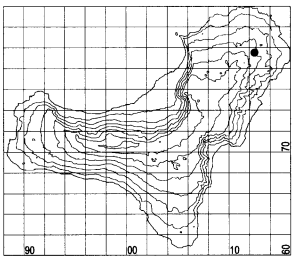
–; Ni; Hemi; –; –
St: Relatively moist habitats in abandoned cultivated land, successional phases of pastures, and ruderal sites.

Phalaris brachystachys Link

–; Ni; Thero; –; ↑

St: Only one population at the upper periphery of Valverde could be confirmed.

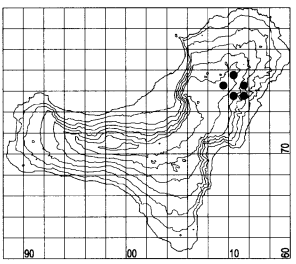
The plants are characterised by very short sterile lemmas, whereas those of *P. canariensis* are about ½ the length of the fertile ones. Formerly, the species was considered to be a variety of the latter (Baldini 1995: 287ff).



Phalaris caerulescens Desf.

–; Ni; Hemi; –; ↑

St: Habitat preferences similar to *P. aquatica*.



Phalaris canariensis L.

–; –; Thero; (x); –

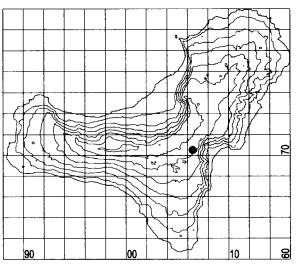
R: Lid (1967: 32): near Valverde. The record, however, may refer to *P. brachystachys* (see comment there), because the latter species is not listed by Lid (1967).

The species is cultivated in many parts of the world to produce birdseed (Kunkel 1992: 257).

Piptatherum caerulescens (Desf.) P. Beauv.

–; Nc; Hemi; new Hierro; ↑

St: Only one individual was found in May 1998 at the edge of the cliffs of Las Playas, most probably casual.

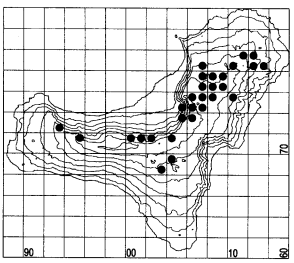


Piptatherum miliaceum (L.) Coss.

–; –; Hemi; (x); –

The record for El Hierro is doubtful (Kunkel 1992: 258). Since proper habitats (abandoned cultivated land at high altitudes) are frequent, particularly in the NE highland of El Hierro, the extinction of a former population of this aggressive invader seems improbable. It seems reasonable to assume that the species never existed on the island.

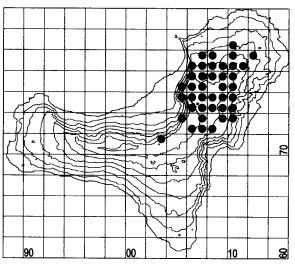
Poa annua L.



–; Ni; Thero; –; ↑
det/conf, pers. comm. 04/2003: H. Scholz
St: Almost exclusively on and near trails and other heavily trodden places; listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

The collected specimens of El Hierro were identified as *P. annua* s. str. Some specimens seemed to resemble *P. infirma* Kunth. However, the anthers of these plants exceeded 0.6 mm (vs. 0.2-0.5 mm in *P. infirma,* see Scholz 1986a: 398). Scholz & Böcker (1996: 579f) record var. *raniglumis* Fröhner for La Palma.

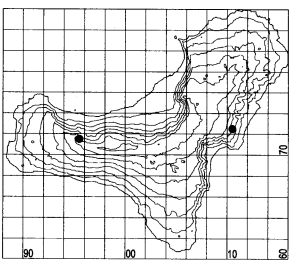
Poa bulbosa L.



–; –; Hemi; –; ↑
det/conf: H. Scholz
St: Frequent in seasonal pastures; the distribution pattern of the species is perfectly tracing the formerly forested pastureland Meseta de Nisdafe in the NE highland. However, natural, non-forested habitats such as the surroundings of the young volcano Chamuscada near San Andrés could also serve for initial, natural colonisation of this region (cf. Stierstorfer 2001: 55). According to Kunkel (1992: 258, transl.) the species may be "native or not".

In contrast to the other islands very common on El Hierro, a fact already mentioned by Scholz (1983). The species is a typical element of seasonal pastures of the NE highland. The closely related endemic *P. pitardiana* H. Scholz could not be found. Apparently, all plants of the island represent *P. bulbosa* s. str., because viviparous spikelets could never be observed ("var. *vivipara* Koeler", "subsp. *vivipara* (Koeler) Arcang.", "*P. vivipara* (Koeler) Willd."). Scholz (1987) discusses the function of the bulbous base of the species as propagulum and states that ecologically the species behaves as a therophyte.

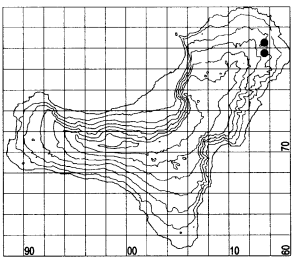
Polypogon fugax Nees ex Steud.



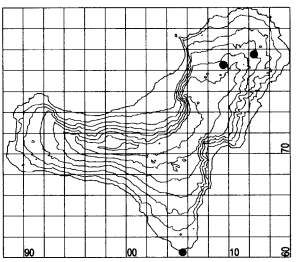
–; –; Thero?; new Hierro; ↑
det/conf: H. Scholz
St: Rare in wet places in El Hierro (Fte. Mencáfete NE of Sabinosa, Fte. Afosa near Isora).

Lems (1960a: 84) and Hohenester & Welß (1993: 332) consider the species as perennial, whereas Cope (1994: 435) considers it to be annual.

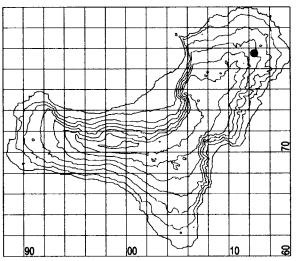
Polypogon monspeliensis (L.) Desf.
–; Ni; Thero?; new Hierro; ↑
det/conf: H. Scholz
St: Only found in the surroundings of Valverde. Lems (1960a: 84) considers the species as perennial, whereas Cope (1994: 435) and Hohenester & Welß (1993: 332) consider it to be annual.



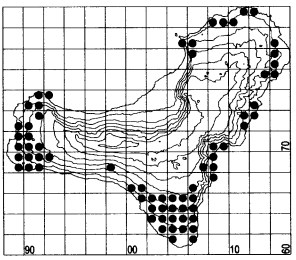
Polypogon viridis (Gouan) Breistr.
–; Ni; Hemi; –; –
R: Lid (1967: 34): "La Gatera north of Tefirabe on a wet rock".
St: Besides the apparently casual individuals found in a flowerbed in La Restinga (UTM 28RBR0560), the species has also been found in Valverde in the surroundings of the church near irrigated flower beds in June 2004 (UTM 28RBR1279). A major and apparently permanent population, discovered in June 2004, is below the "Holy Tree" near the pools of the "Fuente de los Frailes" (near E borderline of UTM 28RBR0978).



Rostraria cristata (L.) Tzvelev
–; Ni; Thero; changed name!; ↑
det/conf, pers. comm. (02/2000): H. Scholz
AG/HS: *Lophochloa cristata* (L.) Hyl.
Lit: Kerguélen (1999), Cope (1994: 427f).
St: Only one population found on and near a trail in Valverde.



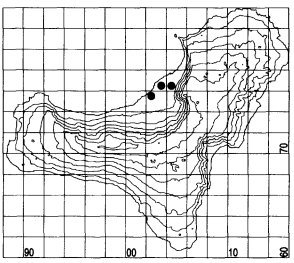
Rostraria pumila (Desf.) Tzvelev
–; –; Thero; changed name!; ↓
det/conf, pers. comm. 02/2000: H. Scholz
AG/HS: *Lophochloa pumila* (Desf.) Bor
Lit: Cope (1994: 427f)
St: Widely distributed in various communities of the lower regions.



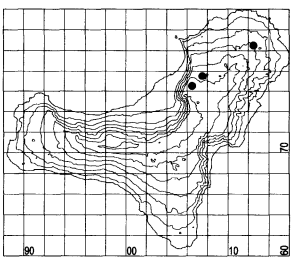
Schismus barbatus (L.) Thell.
–; –; Thero; x; –
Lit: Conert & Türpe (1974).
R: Lid (1967: 34): "Rocky slope south of Puerto Estaca".

Secale cereale L.
–; cult; Thero; –; –
Recorded, e.g., in UTM 28RBR0668/0772/0773/0976.

Setaria adhaerens (Forssk.) Chiov.
–; Ni; Thero; new Hierro; ↓
det/conf: H. Scholz
Lit: Scholz (1977: 8).
St: In ruderal sites in the surroundings of agricultural land (ananas, bananas etc.) in the lower parts of the E of El Golfo, listed among the species probably introduced to Fuerteventura (Brandes & Fritzsch 2002).

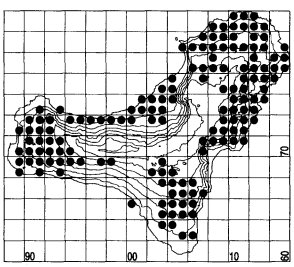


Sorghum halepense (L.) Pers.
–; Ni; Hemi; new Hierro; ↑

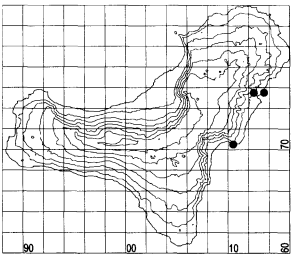


Stipa capensis Thunb.
–; I?; Thero; –; –
Lit: Vázquez & Devesa (1996: 155ff).
St: The origin of the species is obscure according to Kunkel (1992: 259f). In El Hierro it is well established in the lower regions, indigenous?

The species is apparently annual, as indicated by Kunkel (1992: 260), Cope (1994: 413) and Schönfelder & Schönfelder (1997: 280), but it is listed among the perennial grasses by Lems (1960a: 84) as "*S. tortilis* Desf."

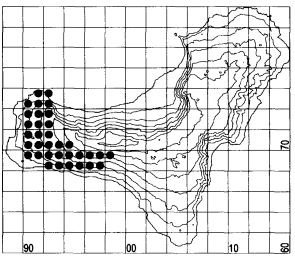


Tragus racemosus (L.) All.
–; –; Thero; –; ↓



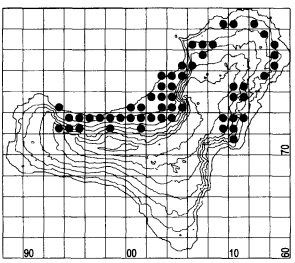
Tricholaena teneriffae (L. f.) Link
–; –; Hemi; x; –
R: Afonso López & Wildpret de la Torre (1976: 128ff): sine loco; Lid (1967: 36): "Vulcano Tenacas", below the church in La Dehesa; Rodríguez Delgado & al. (1998: 33) indicate the Cenchro ciliaris-Hyparrhenietum hirtae tricholaenetosum teneriffae for El Hierro.

Trisetaria lapalmae H. Scholz
E Can; I; Thero; –; –
det/conf: H. Scholz
R: Marrero Rodríguez & Montelongo (2000), Wolff & Rosinski (1999a: 17): exclusively in the W of El Hierro.

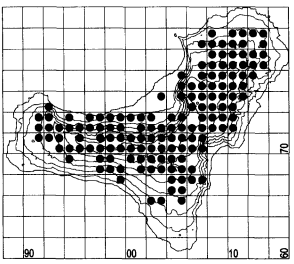


The species was originally discovered in the SW of La Palma. The remarkable dimorphism of the glumes (glabrous vs. pilose) could also be confirmed in the population of El Hierro (cf. Scholz & Böcker 1996: 571ff). The species also exists on Lanzarote and Fuerteventura (Marrero Rodríguez & Montelongo 2000).

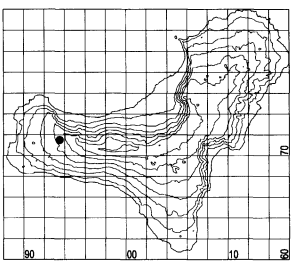
Trisetaria panicea (Lam.) Paunero
–; –; Thero; changed name!; –
det/conf, pers. comm. 02/2000: H. Scholz
AG/HS: *Trisetum panicum* (Lam.) Pers.
Lit: Romero Zarco (1987: 318ff).
R: Lid (1967: 37): "*T. canariensis* (Parl.) Pignatti" near "Punta Norte", between Mocanal and Valverde and La Dehesa. This name is treated as synonymous to *T. panicea* in AG/HS, but Scholz & Böcker (1996: 580f) mention the possible existence of at least two distinguishable taxa within the complex of *T. panicea* on the Canaries.



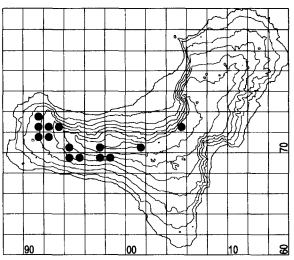
Vulpia bromoides (L.) Gray
–; –; Thero; –; –
det/conf: H. Scholz
Identified by the lower glume (1/3-)1/2-3/4 as long as the upper (Conert 1998: 648ff; Cope 1994: 418f).



Vulpia ciliata Dumort.
–; Nc; Thero; new Hierro; ↑
St: Only few individuals could be found in the W.

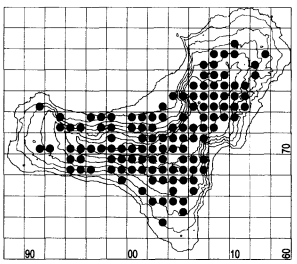


Vulpia membranacea (L.) Dumort.
–; –; Thero; new Hierro; –
det/conf: H. Scholz
"Some of the El Hierro specimens [...] exhibit lemmas with a high dorsal scabrosity in the distal 1/3-2/3 [...]. This feature is very unusual for *V. membranacea* and not mentioned in the literature" (Scholz & Raus 2001).



Vulpia muralis (Kunth) Nees
–; –; Thero; x; –
Although many specimens of "*V. myurus* s. l." (Hohenester & Welß 1993: 340f) were collected, all of them represented either *V. myuros* or *V. bromoides*. Nevertheless, *V. muralis* may have been overlooked during the relatively dry periods of the fieldwork because countless stunted plants were not easy to identify.

Vulpia myuros (L.) C. C. Gmel.
–; –; Thero; –; –
det/conf: H. Scholz



Identified by the inflorescence usually not fully exserted from the uppermost sheath, the lower glume (1/20-) 1/10-2/5 as long as the upper which is about 1/2 of the adjacent lemma (Conert 1998: 648ff; Cope 1994: 418f and Feinbrun-Dothan 1986: 236ff). For the ending of the epithet (AG: *"myurus"*) see Greuter & al. (2000: Art. 26, Ex. 2), Kerguélen (1999), Cope (1994: 419) and Wisskirchen & Haeupler (1998: 548).

Zea mays L.
–; cult; Thero; new Hierro; –
Cultivated on a small scale in gardens.

Unpublished sources

Voggenreiter, V. 1997a: Atlas fitocorológico ilustrado de El Hierro (Islas Canarias) en cuadricula U.T.M. 5 km × 5 km, mscr. – Archiv, Bundesamt für Naturschutz, Bonn.

— 1997b: Atlas fitocorológico de El Hierro (Islas Canarias) en cuadricula U.T.M. 1 km × 1 km, 100 mapas (excerpta), mscr. – Archiv, Bundesamt für Naturschutz, Bonn.

References

Abraham, A. 1988: Romuleas on the Canaries. – Feddes Repert. **99:** 503-506.

Abreu Galindo, J. de c. 1600: Historia de la conquista de las siete Islas de Canaria [reprint 1977 based on the orig. mscr. around 1600]. – Santa Cruz de Tenerife.

Acebes Ginovés, J. R., Arco Aguilar, M. J. del & Wildpret de la Torre, W. 1992: Revisión taxonómica de *Chamaecytisus proliferus* (L. fil.) Link en Canarias. – Vieraea **20:** 191-202.

— , —, García Gallo, A., León Arencibia, M. C., Pérez de Paz, P. L., Rodríguez Delgado, O. & Wildpret de la Torre, W. 2001: *Pteridophyta, Spermatophyta.* – Pp. 98-140 in: Izquierdo, I., Martín, J. L., Zurita, N. & Arechavaleta, M. (ed.), Lista de especies silvestres de Canarias (hongos, plantas y animales terrestres). – La Laguna de Tenerife.

Acedo, C. & Llamas, F. 1999: The genus *Bromus* L. *(Poaceae)* in the Iberian Peninsula. – Phanerog. Monogr. **22.**

Afonso López, R. & Wildpret de la Torre, W. 1976: *Rhynchelytrum repens* (Willd.) C. E. Hubb. y *Elymus caput-medusae* L., dos adiciones al catálogo florístico del archipiélago Canario. – Vieraea **6:** 121-138.

Ahrens, W. 2001: Zur Unterscheidung der blau blühenden Sippen *Anagallis arvensis* L. f. *azurea* und *Anagallis foemina* Miller. – Published on the Internet http://www. nordharzev.de/anagallis.htm.

Aldridge, A. E. 1976a: A critical reappraisal of the Macaronesian *Sonchus* subgenus *Dendrosonchus* s.l. *(Compositae-Lactuceae).* – Bot. Macarones. **2:** 25-57.

— 1976b: Macaronesian *Sonchus* subgenus *Dendrosonchus* s. l. *(Compositae-Lactuceae),* including a reappraisal of the species concept and new combinations. – Bot. Macarones. **2:** 81-93.

— 1981: Anatomy and evolution in Macaronesian *Echium (Boraginaceae).* – Pl. Syst. Evol. **138:** 9-22.

Alexander, J. C. M. 1979: The Mediterranean species of *Senecio* sections *Senecio* and *Delphinifolius.* – Notes Roy. Bot. Gard. Edinburgh **37:** 387-428.

Allan, G. J., Francisco Ortega, J., Santos Guerra, A., Boerner, E. & Zimmer, E. A. 2004: Molecular phylogenetic evidence for the geographic origin and classification of Canary Island *Lotus (Fabaceae: Loteae).* – Molec. Phylog. Evol. **32:** 123-138.

Almeida Pérez, R. S. 2003: *Dracaena draco.* – Pp. 680-681 in: Bañares, Á, Blanca, G., Güemes, J., Moreno, J. C., & Ortiz, S. (ed.), Atlas y Libro Rojo de la flora vascular amenazada de España. – Madrid.

ANTHOS 2002: Proyecto Anthos – Systema de información sobre las plantas de España. – Published on the Internet http://www.programanthos.org.

Arco Aguilar, M. J. del 1983: Catálogo actualizado de los táxones del género *Teline* Medicus en la región Macaronésica. Adiciones y nuevas combinaciones. – Vieraea **12:** 193-232.

— 1993: New combinations in the genus *Teline* Medicus. Typification of *Cytisus pallidus* Poiret. – Itin. Geobot. **7:** 507-512.

— & Wildpret de la Torre, W. 1990: Contribución al conocimiento de la vegetación litoral del archipiélago Canario. I. Las comunidades de *Ruppia maritima, Salsola oppositifolia, Zygophyllum fontanesii* y *Z. gaetulum*. – Pp. 97-115 in: Serv. Publ. Univ. La Laguna (ed.), Homenaje al Professor Dr. Telesforo Bravo I. – La Laguna de Tenerife.

— , Pérez de Paz, P. L., Wildpret de la Torre, W., Lucia Sauquillo, L. & Salas Pascual, M. 1990: Atlas cartográfico de los pinares canarios. I. La Gomera y El Hierro. – Santa Cruz de Tenerife.

— , Acebes, J.-R., Pérez de Paz, P. L. 1996 & Marrero, M. C. 1999: Bioclimatology and climatophilous vegetation of the Island of El Hierro (Canary Islands). – Phytocoenologia **26:** 445-479, **29:** 253-290.

Auquier, P. & Duvigneaud, J. 1976: Sur les distribution des *Aristida adscensionis* L. et *A. coerulescens* Desf. – Soc. Échange Pl. Vasc. Eur. Occ. Bassin Médit. **16:** 133-138.

Baldini, R. M. 1995: Revision of the genus *Phalaris* L. *(Gramineae).* – Webbia **49:** 265-329.

Bally, P. R. O. 1965: Miscellaneous notes on the flora of tropical East Africa, including descriptions of new taxa, 23-28. – Candollea **20:** 13-41.

Bañares Baudet, A., 1986: Híbridos interspecíficos del género *Aeonium* Webb & Berth. *(Crassulaceae)* en las Islas Canarias. Novedades y datos corológicos. – Vieraea **16:** 57-71.

— 1990, 1996: Híbridos de la familia *Crassulaceae* en las Islas Canarias. Novedades y datos corológicos II-III. – Vieraea **18:** 65-85, **25:** 181-195.

— & Romero Manrique, P. 1990: *Cistus chinamadensis*, sp. nov. *(Cistaceae),* nuevo endemismo canario. – Studia Bot. **9:** 119-128.

— , Lecuona Neumann, R. M., La Serna Ramos, I. & Beltrán Tejera, E. 1985: Sobre la presencia de *Myrica rivas-martinezii* A. Santos en la Isla de Gomera (Islas Canarias). Estudio corológico, ecológico y palinológico. – Vieraea **14:** 41-55.

Barber, J. C., Francisco Ortega, J., Santos Guerra, A., Marrero, A. & Jansen, R. K. 2000: Evolution of endemic *Sideritis (Lamiaceae)* in Macaronesia: insights from a chloroplast DNA restriction site analysis. – Syst. Bot. **25:** 633-647.

— , —, —, Turner, K. G. & Jansen, R. K. 2002: Origin of Macaronesian *Sideritis* L. *(Lamioideae: Lamiaceae)* inferred from nuclear and chloroplast sequence datasets. – Molec. Phylogenet. Evol. **23:** 293-306.

Barquín Diez, E. 1972: Impresiones botánicas, con algunas citas zoológicas, de un viaje a la Isla del Hierro. – Vieraea **1:** 10-24.

Barthlott, W., Biedinger, N., Braun, G., Feig, F., Kier, G. & Mutke, J. 1999: Terminological and methodological aspects of the mapping and analysis of the global biodiversity. – Acta Bot. Fenn. **162:** 103-110.

Batista, F., Bouza, N., Gonzalez Pérez, M. A., Caujape Castells, J. & Sosa, P. A. 2004: Genetic variation within and between populations of two endangered endemic species of the laurel forest from the Canary Islands, *Myrica rivas-martinezii (Myricaceae)* and *Sideritis discolor (Lamiaceae).* – Austral. J. Bot. **52:** 471-480.

Beier, B. A. 2005: A revision of the desert shrub *Fagonia (Zygophyllaceae).* – Syst. Biodivers. **3:** 221-263

Beltrán Tejera, E., Wildpret de la Torre, W., León Arencibia, M. C., García Gallo, A., Reyes Hernández, J. 1999: Libro Rojo de la flora Canaria contenida en la Directiva-Hábitats Europea. – La Laguna.

Benabid, A. & Cuzin, F. 1997: Dragon tree (*Dracaena draco* subsp. *ajgal* Benabid et Cuzin) populations in Morocco. Taxonomical, biogeographical and phytosociological values. – Compt. Rend. Acad. Sci. Sér. 3, Sci. Vie **320:** 267-277.

Benedí, C. 2002: *Bartsia* L. – P. 585 in: Valdés, M, Rejdali, M., Achhal El Kadmiri, A., Jury, S. L. & Montserrat, J. M. (ed.), Catalogue des plantes vasculaires du Nord du Maroc, incluant des clés d'identification. Checklist of vascular plants of N Morocco with identification keys. – Madrid.

— & Orell, J. J. 1992: Taxonomy of the genus *Chamaesyce* S. F. Gray *(Euphorbiaceae)* in the Iberian Peninsula and the Balearic Islands. – Collect. Bot. (Barcelona) **21:** 9-55.

Benl, G. 1966a: Über die neue Varietät *cupripaleacea* von *Cheilanthes marantae* subsp. *subcordata (Sinopteridaceae).* – Nova Hedwigia **12:** 137-144.

— 1966b: Weitere Bemerkungen zur Taxonomie kanarischer Farne. – Mitt. Bot. Staatssamml. München **6:** 33-45.

— 1966c: Ein fertiler Farnbestand der Gattung *Cheilanthes* aus Makaronesien. – Nova Hedwigia **12:** 145-148.

— 1969: Zur Variabilität der Blattgestalt bei *Asplenium hemionitis* L. – Ber. Naturwiss. Ges. Bayreuth **13:** 63-68.

— & Kunkel, G. 1967: Zur Taxonomie der Gattung *Ceterach* auf den Kanarischen Inseln. – Ber. Schweiz. Bot. Ges. **77:** 257-265.

— & Sventenius, E. R. S. 1970: Beiträge zur Kenntnis der Pteridophyten-Vegetation und -Flora in der kanarischen Westprovinz (Tenerife, La Palma, Gomera, Hierro). – Nova Hedwigia **20:** 413-462.

Bennert, H. W. 1998: *Trichomanes* L. *(Hymenophyllaceae).* – Pp. 142, 375-380 in: Wisskirchen, R. & Haeupler, H. (ed.), Standardliste der Farn-und Blütenpflanzen Deutschlands. – Stuttgart.

Bergmeier, E. 1991: Ein Vorschlag zur Verwendung neu abgegrenzter Statuskategorien bei floristischen Kartierungen. – Göttinger Florist. Rundbr. **25:** 126-137.

— (ed.) 1992: Grundlagen und Methoden floristischer Kartierungen in Deutschland. – Göttinger Florist. Rundbr., Beih. **2.**

Berthet, P. 1990: *Opuntia.* – Pp. 62-70 in: Castroviejo, S., Laínz, M., López González, G., Montserrat, P., Muñoz Garmendia, F., Paiva, J. & Villar, L. (ed.), Flora Ibérica **2.** – Madrid.

Berthelot, S. 1880: Árboles y bosques. – La Laguna, Tenerife [reprint 1995].

Böhle, U-R., Hilger, H. H. & Martin, W. 1996: Island colonization and evolution of the insular woody habit in *Echium* L. *(Boraginaceae).* – Proc. Natl. Acad. Sci. USA **93:** 11740-11745.

Bonalberti Peroni, C. Peroni, A. & Peroni, G. 2001: Contribution to the knowledge of the pteridological flora of El Hierro (Canary Islands). – Bot. Complutensis **25:** 289-297.

Borgen, L. 1987: *Lobularia (Cruciferae).* A biosystematic study with special reference to the Macaronesian region. – Opera Bot. **91.**

— & Elven, R. 1980: *Brassica bourgeaui (Cruciferae)* rediscovered in the Canary Islands. – Vieraea **9:** 149-152.
Bornmüller, J. 1903: *Senecio Murrayi*, eine unbeschriebene Art von Ferro, sowie einige floristische Notizen über diese Insel. – Bot. Jahrb. Syst. **33,** Beibl. **72:** 1-11.
— 1904: Ergebnisse zweier botanischer Reisen nach Madeira und den Canarischen Inseln. – Bot. Jahrb. Syst. **33:** 387-492.
Boulos, L. 1974: Révision systematique du genre *Sonchus* L. s. l. V. Sous-genre 2. *Dendrosonchus*. – Bot. Not. **127:** 7-37.
Bramwell, D. 1968: Notes on the taxonomy and nomenclature of the genus *Aichryson*. – Bol. Inst. Nac. Invest. Agronom. **59:** 203-213.
— 1969: The genus *Crambe (Cruciferae)* in the Canary Islands flora. – Cuad. Bot. Canar. **6:** 5-12.
— 1972: A revision of the genus *Echium* in Macaronesia. – Lagascalia **2:** 37-115.
— 1977: The subspecies of *Aichryson pachycaulon* Bolle *(Crassulaceae)* and their probable origin. – Bot. Macarones. **4:** 106-111.
— 2003: Observations on a proposal to conserve the name *Euphorbia obtusifolia* Poiret. – Bot. Macarones. **24:** 143-147.
— & Bramwell, Z. 1974: Wild flowers of the Canary Islands. – London.
— & — 2001: Wild flowers of the Canary Islands. – Madrid.
Brandes, D. 1998: *Parietaria judaica* L. – Zur Morphologie, Ökologie und Soziologie einer verkannten nitrophilen Saumpflanze. – Tuexenia **18:** 357-376.
— 2002: *Nicotiana glauca* als invasive Pflanze auf Fuerteventura. – Braunschweiger Geobot. Arbeiten **8:** 39-57.
— & Fritzsch, K. 2002: Alien plants of Fuerteventura, Canary Islands (version of Jan. 2002). – Published on the Internet http://opus.tu-bs.de/opus/volltexte/ 2000/79/.
Brullo, S., Scelsi, F. & Spampinato, G. 1997: Aristido caerulescentis-Hyparrhenion hirtae, alleanza nuova della classe Lygeo-Stipetea a distribuzione sud Mediterraneo-Macaronesica. – Fitosociologia **32:** 189-206.
— , Campo, G., Marcenb, C., Romano, S. & Siracusa, G. 1998: *Crassula campestris* (Eckl. & Zeyh.) Endl. *(Crassulaceae),* a new record for the Italian flora. – Willdenowia **28:** 53-58.
Brummitt, R. K. 2000: Proposals to conserve or reject. Report of the Committee for Spermatophyta 50. To conserve *Euphorbia obtusifolia* Poir. over *E. obtusifolia* Lam. – Taxon **49:** 800.
Bruyns, P. 1986: The genus *Ceropegia* on the Canary Islands *(Asclepiadaceae – Ceropegieae).* A morphological and taxonomic account. – Beitr. Biol. Pfl. **60:** 427-458.
Burchard, O. 1929: Beiträge zur Ökologie und Biologie der Kanarenpflanzen. – Bibl. Bot. **98.**
Cannon, M. J. 1994: *Umbelliferae* [*Apiaceae*]. – Pp. 238-248 in: Press, J. R. & Short, M. J. (ed.), Flora of Madeira. – London.
— & Turland, N. J. 1994: *Bituminaria*. – P. 161 in: Press, J. R. & Short, M. J. (ed.), Flora of Madeira. – London.
Cardona, A. & Sierra-Rèfols, E. 1981: Contribución al estudio del género *Rubia* 1. Táxones mediterráneo-occidentales y macaronésicos. – Annales Jard. Bot. Madrid **37:** 557-575.

Carqué Álamo, E., Marrero Gómez, M. V., Bañares Baudet, A., Ojeda Land, E. & Ernández López, Á. 2003: *Myrica rivas-martinezii*. – Pp. 406-407 in: Bañares, Á, Blanca, G., Güemes, J., Moreno, J. C., & Ortiz, S. (ed.). Atlas y Libro Rojo de la flora vascular amenazada de España. – Madrid.

Carracedo, J. C., Guillou, H., Badiola, E. R., Pérez Torrado, F. J. & Day, S. 2002: Geological map of El Hierro, Canary Islands. – Published on the Internet http://www.ipna.csic.es.

Ceballos [Fernández de Córdoba], L. & Ortuño [Medina], F. 1976: Estudio sobre la vegetación y flora forestal de las Canarias occidentales, ed. 2. – Santa Cruz de Tenerife.

Chaudhri, M. N. 1968: A revision of the *Paronychiinae*. – Meded. Bot. Mus. Herb. Rijksuniv. Utrecht **285.**

Chilton, L. 1994: Plant list for El Hierro. – Hunstanton.

Christ, D. H. 1888. Specilegium canariense. – Bot. Jahrb. Syst. **9:** 86-172.

Clayton, W. D & Renvoize, S. A. 1982: *Gramineae* (Part 3). – Pp. 722-726 in: Polhill, R. M. (ed.), Flora of tropical East Africa. – Rotterdam.

Conert, H. J. 1987: Über den Einfluß des Menschen auf die Flora der Kapverdischen Inseln. – Cour. Forsch.-Inst. Senckenberg **95:** 119-126.

— 1998: Gustav Hegi, Illustrierte Flora von Mitteleuropa, ed. 3, **1(3).** – Berlin.

— & Türpe, A. M 1974: Revision der Gattung *Schismus (Poceae: Arundinoideae: Danthonieae).* – Abh. Senckenb. Naturforsch. Ges. **532.**

Cope, T. A. 1994: *Gramineae* [*Poaceae*]. – Pp. 406-453 in: Press, J. R. & Short, M. J. (ed.), Flora of Madeira. – London.

Cronquist, A. 1976: *Conyza* Less. – P. 120 in: Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M., Webb, D. A. (ed.), Flora europaea **4.** – Cambridge.

Dalgaard, V. 1979: Biosystematics of the Macaronesian species of *Scrophularia*. – Opera Bot. **51.**

DeFilipps, R. A. 1976: *Hypochoeris* L. – Pp. 308-310 in: Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M., Webb, D. A. (ed.), Flora europaea **4.** – Cambridge.

Devesa, J. A. 1987: *Gamochaeta*. – Pp. 32-33 in: Valdés, B., Talavera, S., Fernández-Galiano, E. (ed.), Flora vascular de Andalucía occidental **3.** – Barcelona.

— 2002: *Pseudognaphalium*, *Phagnalon*. – Pp. 646-649 in: Valdés, B., Rejdali, M., Achhal El Kadmiri, A., Jury, S. L. & Montserrat, J. M. (ed.), Catalogue des plantes vasculaires du Nord du Maroc, incluant des clés d'identification. Checklist of vascular plants of N Morocco with identification keys. – Madrid.

Díaz de la Guardia, C. 2002: *Tolpis* Adans. – Pp. 688-689 in: Valdés, B., Rejdali, M., Achhal El Kadmiri, A., Jury, S. L. & Montserrat, J. M. (ed.), Catalogue des plantes vasculaires du Nord du Maroc, incluant des clés d'identification. Checklist of vascular plants of N Morocco with identification keys. – Madrid.

Díaz Lifante, Z. & Valdés, B. 1994: Lectotypification of *Asphodelus ramosus (Asphodelaceae),* a misunderstood Linnaean name. – Taxon **43:** 247-251.

— & Valdés, B. 1996: Revisión del género *Asphodelus* L. *(Asphodelaceae)* en el Mediterráneo occidental. – Boissiera **52.**

Dierschke, H. 1994: Pflanzensoziologie. Grundlagen und Methoden. – Stuttgart.

Díez-Garretas, B. & Asensi, A. 1999: Syntaxonomic analysis of the *Andropogon*-rich grasslands (Hyparrhenietalia hirtae) in the western Mediterranean region. – Folia Geobot. **34:** 307-320.

Domínguez Santana, M. D., La Serna Ramos, I. & Pérez de Paz, P. L. 1991: A palynological study of the genera *Tinguarra* Parl. and *Todaroa* Parl. *(Apiaceae)* from the Macaronesian region. – Palaeoecol. Africa **22:** 27-34.

Ebinger, J. E. 1963: A new subgenus in *Luzula (Juncaceae)*. – Brittonia **15:** 169-174.

Fairfield, K. N., Mort, M. E. & Santos Guerra, A. 2004: Phylogenetics and evolution of the Macaronesian members of the genus *Aichryson (Crassulaceae)* inferred from nuclear and chloroplast sequence data. – Pl. Syst. Evol. **248:** 71-83.

Feinbrun-Dothan, N. 1986: Flora palaestina (text and plates) **4.** – Jerusalem.

Fernandes, R. B. 1997: *Crassula* L. – Pp. 99-103 in: Castroviejo, S., Aedo, C., Laínz, M., Morales, R., Muñoz Garmendia, F., Nieto Feliner, G. & Paiva, J. (ed.), Flora ibérica **5.** – Madrid.

Fernández Galván, M. & Mendez, P. 1989: La vinagrera (*Rumex lunaria* L.), forraje para zonas calidas aridas y semiaridas. – Invest. Agr. Prod. Prot. Veg. **4:** 87-96.

— & Santos Guerra, A. 1991: A literature survey (1696-1991) on the fodder shrubs tagasaste and escobón (*Chamaecytisus proliferus* (L. fil.) Link sensu lato) *(Fabaceae: Genisteae)*. – New Zeal. J. Agricult. Res. **34:** 471-488.

Fernández-Palacios, J. M. & Dias, E. 2001: Marco biogeográfico macaronésico. – Pp. 45-52 in: Fernández-Palacios, J. M. & Martín Esquivel, J. L. (ed.), Naturaleza de las Islas Canarias, ecología y conservación. – Santa Cruz de Tenerife.

— & Santos, A. de los 1996: Ecología de las Islas Canarias, muestro y análisis de poblaciones y comunidades. – Santa Cruz de La Palma.

Fernández-Pello Martín, L. 1987: Configuración espacial del pinar de El Hierro. – Revista Geogr. Canaria **2:** 87-104.

— 1989: Los paisajes naturales de la Isla de El Hierro. – Santa Cruz de Tenerife.

Francini, E. & Messeri, A. 1955: L'isola di Marettimo nell'arcipelago delle Egadi e la sua vegetazione. – Webbia **11:** 607-846.

Francisco Ortega, J., Crawford, D. J., Santos Guerra, A. & Carvalho, J. A. 1996: Isozyme differentiation in the endemic genus *Argyranthemum (Asteraceae: Anthemideae)* in the Macaronesian Islands. – Pl. Syst. Evol. **202:** 137-152.

— , Jackson, M. T., Santos Guerra, A. & Fernández-Galván, M. 1991: Historical aspects of the origin and distribution of Tagasaste *Chamaecytisus proliferus* (L. fil.) Link ssp. *palmensis* (Christ) Kunkel, a fodder tree from the Canary Islands. – J. Adelaide Bot. Gard. **14:** 67-76.

— , —, — & — 1993a: Morphological variation in the *Chamaecytisus proliferus* (L. f.) Link complex *(Fabaceae: Genisteae)* in the Canary Islands. – Bot. J. Linn. Soc. **112:** 187-202.

— , —, Socorro-Monzon, A. R. & Ford-Lloyd, B. V 1992: Ecogeographical characterization of germplasm of Tagasaste and Escobon (*Chamaecytisus proliferus* (L. fil.) Link sensu lato) from the Canary Islands: Soil, climatological and geographical features. – Invest. Agr. Prod. Prot. Veg. **7:** 377-388.

— , Newbury, H. J., Ford-Lloyd, B. V. & Soriano, O. 1993b: Tagasaste in the Canary Islands in the 17th century. – J. Adelaide Bot. Gard. **15:** 87-92.

— , Jackson, M. T., Santos Guerra, A., Fernández-Galván, M. & Ford-Lloyd, B. V. 1994: The phytogeography of the *Chamaecytisus proliferus* (L. fil.) Link *(Fabaceae: Genisteae)* complex in the Canary Islands: a multivariate analysis. – Vegetatio **110:** 1-17.

Gaisberg, M. von 2000: A revision of *Teucrium heterophyllum* L'Hér. *(Lamiaceae)* with two new subspecies of the Canary Islands. – Willdenowia **30:** 263-271.

— 2002: Contribución al conocimiento de la taxonomía, la biología reproductiva y la distribución de *Carduus baeocephalus* Webb. – Rev. Acad. Canar. Ci. **14:** 253-261.

— 2003: Posibles causas de la distribución actual de los cardonales y tabaibales dulces en la isla de El Hierro. – Vieraea **31:** 51-63.

— 2005: Die Vegetation der Fußstufe von El Hierro (Kanarische Inseln). – Diss. Bot. **395.**

— & Wagenitz, G. 2002: *Carduus baeocephalus* subsp. *microstigma* Gaisberg & Wagenitz, a new subspecies from the Canary Islands *(Cardueae, Carduineae)* – a facultative autogamous descendant of *Carduus baeocephalus* Webb subsp. *baeocephalus*. – Candollea **57:** 271-282.

— & Stierstorfer, C. 2005: The significance of geological traits for the speciation of endemic angiosperms on El Hierro (Canary Islands). – Phytocoenologia **35:** 39-52.

Galán de Mera, A., Morales Alonso, R. & Vicente Orellana, J. A. 2000: Pasture communities linked to ovine stock. A synthesis of the Poetea bulbosae class in the western Mediterranean region. – Phytocoenologia **30:** 223-267.

Galbany Casals, M., Garcia Jacas, N., Susanna, A., Saez, L., Benedi, C. 2004: Phylogenetic relationships in the Mediterranean *Helichrysum (Asteraceae, Gnaphalieae)* based on nuclear rDNA ITS sequence data. – Austral. Syst. Bot. **17:** 241-253.

Gallego, M. J., Talavera, S. & Silvestre, S. 1980: Revision del género *Reichardia* Roth *(Compositae)*. – Lagascalia **9:** 159-217.

Gandullo, J. M. (ed.) 1991: Estudio ecológico de la laurisilva canaria. – Santa Cruz de Tenerife.

García Casanova, J. 2001: Flora del archipiélago incluida en el catálogo de especies amenazadas de Canarias. – Published on the Internet http:/www.gobcan.es/medioambiente/revista/2001/21/266/index.html.

García Gallo, A., Wildpret de la Torre, W., Rodríguez Delgado, O., Pérez de Paz, P. L., León Arencibia, M. C., Suárez Rodríguez, C. & Reyes Betancort, J. A. 1999: El xenófito *Pennisetum setaceum* en las islas Canarias *(Magnoliophyta, Poaceae)*. – Vieraea **27:** 133-158.

Gibbs, P. E. 1967: A revision of the genus *Adenocarpus*. – Bol. Soc. Brot., sér. 2, **41:** 67-121.

— & Dingwall, I. 1972: A revision of the genus *Teline*. – Bol. Soc. Brot., sér. 2, **45:** 269-316.

Gibby, M. & Paul, A. M. 1994: *Pteridophyta.* – Pp. 25-53 in: Press, J. R. & Short, M. J. (ed.), Flora of Madeira. – London.

— , Jermy, A. C., Rasbach, H., Rasbach, K., Reichstein, T. & Vida, G. 1977: The genus *Dryopteris* in the Canary Islands and Azores and the description of two new tetraploid species. – Bot. J. Linn. Soc. **74:** 251-277.

González Henríquez, M. N., Rodrigo Pérez, J. D. & Suárez Rodríguez, C. S. 1986: Flora y vegetación del archipiélago Canario. – Las Palmas de Gran Canaria.

Goyder, D. A. 1994: *Lathyrus*, *Vicia*. – Pp. 162-171 in: Press, J. R. & Short, M. J. (ed.), Flora of Madeira. – London.
Grau, J. 1968: Cytotaxonomische Bearbeitung der Gattung *Myosotis* L. III. Die annuellen Sippen. – Mitt. Bot. Staatssamml. München **7:** 17-100.
Greuter, W., McNeill, J., Barrie, F. R., Burdet, H. M., Demoulin, V., Filgueiras, T. S., Nicolson, D. H., Silva, P. C., Skog, E., Trehane, P., Turland, N. J. & Hawksworth, D. L. 2000: International Code of Botanical Nomenclature (Saint Louis Code). – Regnum Veg. **138.**
Hadidi, M. N., el 1974: Weitere Beobachtungen an der Gattung *Fagonia* L. – Mitt. Bot. Staatssamml. München **11:** 379-404.
Haeupler, H. & Muer, T. 2000: Bildatlas der Farn- and Blütenpflanzen Deutschlands. – Stuttgart.
Halliday, P. 1986: The genus *Kleinia (Compositae)* in North Africa and the Canary Islands. – Kew Bull. **41:** 279-285.
Hansen, A. & Sunding, P. 1993: Flora of Macaronesia. Checklist of vascular plants, ed. 4. – Sommerfeltia **17.**
Hedge, I. C. 1974: A revision of *Salvia* in Africa including Madagascar and the Canary Islands. – Notes Roy. Bot. Gard. Edinburgh **33:** 1-121.
— & Miller, A. G. 1977: New and interesting taxa from NE tropical Africa. – Notes Roy. Bot. Gard. Edinburgh **35:** 179-193.
Hilliard, O. M. & Burtt, B. L. 1981: Some generic concept in *Compositae-Gnaphaliinae*. – Bot. J. Linn. Soc. **82:** 181-232.
Hobohm, C. 2000: Plant species diversity and endemism on islands and archipelagos, with special reference to the Macaronesian Islands. – Flora **195:** 9-24.
Hohenester, A. & Welß, W. 1993: Exkursionsflora für die Kanarischen Inseln. – Stuttgart.
Horn, K., Jäger, W., Philippi, G., Gaisberg, M. von & Stierstorfer, C. 2006 [in press]: New records of the Macaronesian endemic fern *Asplenium anceps* Lowe ex Hooker & Grev. *(Aspleniaceae, Pteridophyta)* on El Hierro, La Gomera and Tenerife (Canary Islands). – Nova Hedwigia.
Hügin, G. 1986: Einige Bemerkungen zu wenig bekannten *Amaranthus*-Sippen *(Amaranthaceae)* Mitteleuropas. – Willdenowia **16:** 453-478.
Humphries, C. J. 1976a: A revision of the Macaronesian genus *Argyranthemum* Webb ex Schultz Bip. *(Compositae-Anthemideae)*. – Bull. Brit. Mus. (Nat. Hist.) Bot. **5(4):** 145-240.
— 1976b: Evolution and endemism in *Argyranthemum* Webb ex Schultz Bip. *(Compositae: Anthemideae)*. – Bot. Macarones. **1:** 25-50.
Ibañez, M. & Alonso, M. R. 1990: La projección U.T.M.: Su aplicación al estudio de la fauna y flora Canaria. – Pp. 453-470 in: Serv. Public. Univ. La Laguna (ed.), Homenaje al Prof. Dr Telesforo Bravo I. – La Laguna de Tenerife.
Ietswaart, J. H. 1980: A taxonomic revision of the genus *Origanum (Labiatae)*. – Leiden Bot. Ser. **4.**
IPNI [International Plant Names Index] 1999-: The Plant Names Project. – Published on the Internet http://www.ipni.org.
Jaarsveld, E. van 2003: *Crassula*. – Pp. 29-86 in: Eggli, U. (ed.), Sukkulenten-Lexikon **4.** – Stuttgart.
Jahn, R. & Schönfelder, P. 1995: Exkursionsflora für Kreta. – Stuttgart.

Jalas, J. 1966: *Cerastium sventenii* Jalas, sp. nova, and the related Macaronesian taxa. – Ann. Bot. Fenn. **3:** 129-139.
Jorgensen, T. H. & Frydenberg, J. 1999: Diversification in insular plants: inferring the phylogenetic relationship in *Aeonium (Crassulaceae)* using ITS sequences of nuclear ribosomal DNA. – Nordic J. Bot. **19:** 613-621.
— & Olesen, J. M. 2000: Growth rules based on the modularity of the Canarian *Aeonium (Crassulaceae)* and their phylogenetic value. – Bot. J. Linn. Soc. **132:** 223-240.
Jury, S. L. 1987: A new species of the genus *Torilis (Apiaceae).* – Bot. J. Linn. Soc. **95:** 293-299.
Kadereit, J. W. 1984: The origin of *Senecio vulgaris (Asteraceae).* – Pl. Syst. Evol. **145:** 135-153.
Kämmer, F. 1972: Ergänzungen zu O. Eriksson: Checklist of vascular plants of the Canary Islands (1971). – Cuad. Bot. Canar. **16:** 47-49.
— 1976: The influence of man on the vegetation of the Island of Hierro (Canary Islands). – Pp. 327-346 in: Kunkel, G. (ed.), Biogeography and ecology in the Canary Islands. – Monogr. Biol. **30.**
Kerguélen, M. 1999: Index synonymique de la flore de France. – Published on the Internet http://www. inra.fr/Internet/Centres/Dijon/malherbo/fdf/index.htm.
Kim, S.-C., Crawford, D. J., Francisco Ortega, J. & Santos Guerra, A. 1999: Adaptive radiation and genetic differentiation in the woody *Sonchus* alliance *(Asteraceae: Sonchinae)* in the Canary Islands. – Pl. Syst. Evol. **215:** 101-118.
Knoche, H. 1923: Vagandi Mos. Reiseskizzen eines Botanikers. I. Die Kanarischen Inseln. – Strasbourg.
Kretzschmar, H., Kretzschmar, G. & Kreutz, K. 1993: Beitrag zur Orchideenflora von Teneriffa. – Ber. Arbeitskreises Heimischer Orchid. **10:** 26-44, 145.
— , — & — 1998: Orchideen vom Ende der Welt. – Ber. Arbeitskreises Heimischer Orchid. **15:** 4-10.
Kunkel, G. 1969a: Sobre *Notholaena marantae (Sinopteridaceae).* – Cuad. Bot. Canar. **5:** 46-47.
— 1969b: Nota taxonómica sobre *Messerschmidia (Boraginaceae).* – Cuad. Bot. Canar. **5:** 47-49.
— 1970: Novedades en la flora canaria. – Cuad. Bot. Canar. **8:** 10-14.
— 1971: Lista revisada de los pteridófitos de las Islas Canarias. – Cuad. Bot. Canar. **13:** 21-46.
— 1972: Novedades en la flora canaria. VI. Adiciones y nuevas descripciones. – Cuad. Bot. Canar. **16:** 39-45.
— 1973: The role of adventitious plants in the vegetation of the Canary Islands. – Monogr. Biol. Canar. **4:** 103-106.
— 1976: Notes on the introduced elements in the Canary Islands' flora. – Pp. 249-266 in: Kunkel, G. (ed.), Biogeography and ecology in the Canary Islands. – Monogr. Biol. **30.**
— 1977: The *Ilex*-complex in the Canary Islands and Madeira. – Cuad. Bot. Canar. **28:** 17-29.
— 1980: An excursion through my herbarium II. – Vieraea **8:** 337-364.
— 1991: Flora y vegetación del archipiélago Canario 3. Tratado Florístico **2.** – Las Palmas de Gran Canaria.

— (ed.) 1992: Flora y vegetación del archipiélago Canario 2. Tratado florístico **1.** – Las Palmas de Gran Canaria.
— & Sunding, P. 1967: Enumeration of species of *Limonium* Mill. *(Plumbaginaceae)* in the Canary Islands, with nomenclatural notes. – Cuad. Bot. Canar. **2:** 9-18.
La Serna Ramos, I. E 1976: Iconographía selecta canaria: *Cedronella canariensis* (L.) Webb & Berth., *Calamintha sylvatica* Bromf. ssp. *ascendens* (Jord.) P. W. Ball. – Vieraea **6:** 167-174.
— 1980: *Bystropogon origanifolius* L'Hér. var. *canariae* y *Bystropogon origanifolius* L'Hér. var. *ferrensis*, una nueva variedad y una nueva combinación de *B. origanifolius* L'Hér. – Vieraea **10:** 95-108.
— 1984: Revisión del género *Bystropogon* L'Her. nom. cons. *(Lamiaceae-Stachyoideae).* Endemismo de la región Macaronésica. – Phanerog. Monogr. **18.**
— , León Arencibia, M. C. & Wildpret de la Torre, W. 1982: Contribución a la tipificación de algunas especies del género *Limonium* Mill., endémicas de la región Macaronésica. – Vieraea **11:** 57-68.
Lems, K. 1958: Botanical notes on the Canary Islands. I. Introgression among the species of *Adenocarpus*, and their role in the vegetation of the islands. – Bol. Inst. Nac. Invest. Agron. **18(39):** 351-370.
— 1960a: Floristic botany of the Canary Islands. – Sarracenia **5:** 1-94.
— 1960b: Botanical notes on the Canary Islands. II. The evolution of plant forms in the islands: *Aeonium*. – Ecology **41:** 1-17.
León Arencibia, M. C. & Wildpret de la Torre, W. 1983: El género *Lavandula* L. en el Archipiélago Canario. – Comunic. II Congr. Internac. Flora Macaronésica, Funchal **1977:** 95-112.
— , La Serna Ramos, I. & Wildpret de la Torre, W. 1982: Tipificación de *Chenopodium coronopus* Moq. y de *Phagnalon umbelliforme* DC., especies descritos en el Prodromus de De Candolle. – Vieraea **11:** 69-75.
Lid, D. T. 1967: Contributions to the flora of the Canary Islands. – Skr. Norske Vidensk.-Akad. Oslo I. Mat.-Naturv. Kl., ser. 2, **23:** 1-212.
Lidén, M. 1986: Synopsis of *Fumarioideae (Papaveraceae)* with a monograph of the tribe *Fumarieae*. – Opera Bot. **88.**
Lindinger, L. 1926: Beiträge zur Kenntnis von Vegetation und Flora der Kanarischen Inseln. – Abh. Gebiet Auslandskunde **21.**
Liu, H.-Y. 1989: Systematics of *Aeonium (Crassulaceae)*. – Nat. Mus. Nat. Sci. (Taichung, Taiwan), Spec. Publ. **3.**
Lobin, W. 1982: Untersuchungen über Flora, Vegetation und biogeographische Beziehungen der Kapverdischen Inseln. – Cour. Forsch.-Inst. Senckenberg **53.**
— 1986: *Ophioglossum* Linnaeus 1753 in the Azores, Madeira, Canary and Cape Verde Islands. – Senckenbergiana Biol. **66:** 399-404.
— & Roessler, H. 1985: Die Gattung *Forsskaolea* Linnaeus 1764 auf den Kanarischen und Kapverdischen Inseln *(Phanerogamae: Urticaceae)*. – Senckenbergiana Biol. **65:** 373-390.
— & Zizka, G. 1987: Einteilung der Flora *(Phanerogamae)* der Kapverdischen Inseln nach ihrer Einwanderungsgeschichte. – Cour. Forsch.-Inst. Senckenberg **95:** 127-153.
López González, G. 1982: *Ophioglossum polyphyllum* A. Braun, un helecho nuevo para las Islas Canarias. – Anales Jard. Bot. Madrid **38:** 523-524.

— 1994: Nota sobre el género *Hyparrhenia* Andersson ex E. Fourn. *(Gramineae)*. – Anales Jard. Bot. Madrid **51:** 312-313.

Losada Lima, A., Wildpret de la Torre, W. & León Arencibia, M. C. 1990: Contribución al estudio del género *Cedronella* Moench en el Archipiélago Canario. – Pp. 493-507 in: Serv. Publ. Univ. la Laguna (ed.), Homenaje al Prof. Dr Telesforo Bravo I. – La Laguna de Tenerife.

Lösch, R. 1990: Funktionelle Voraussetzungen der adaptiven Nischenbesetzung in der Evolution der makaronesischen Semperviven. – Diss. Bot. **146.**

Lowe, R. T. 1857: On *Ranunculus creticus*, *cortusaefolius* and *grandifolius* of authors. – J. Bot. & Kew Gard. Misc. **9:** 65-75.

Lucía-Sauquillo, V., Arco Aguilar, M. J. del, Acebes-Ginovés, J. R., Pérez de Paz, P. L. & Wildpret de la Torre, W. 1996: Contribución al estudio de plantas canarias con interés ornamental. III. – Vieraea **25:** 57-87.

Lüpnitz, D. 1995: Beitrag zur phytogeographischen Stellung der Kanarischen Inseln. – Mainzer Naturwiss. Archiv **33:** 83-98.

Mabberley, D. J. 2002: A note on the Macaronesian *Sideroxylon (Sapotaceae)*. – Taxon **51:** 179-180.

Machado, A. 2004: An index of naturalness. – J. Nature Conserv. **12:** 95-110.

Machado Yanes, M. C. del 1999: Aproximación a la vegetación de Daute (Tenerife) durante el periodo pre-Europeo, a partir del análisis antracológico. – Pp. 301-306 in: Pallí Buxó, L. & Roqué Pau, C. (ed.), Avances en el estudio del Cuaternario español. – Girona.

— & Martín Rodríguez, E. 2000: Resultados del antraco-análisis del Caboco de la Zarza (Garafía, La Palma). – Anuario Inst. Estud. Canar. **44:** 407-423.

Marrero Gómez, M., Rodríguez Delgado, O. & Wildpret de la Torre, W. 2000a: Contribución al estudio descriptivo y etnobotánico del balo *(Plocama pendula)*. – Estud. Canar. **44:** 47-30.

— , Carqué Álamo, E., Bañares Baudet, Á & Mesa Coello, R. 2003: *Cistus chinamadensis* subsp. *gomerae*. – Pp. 186-187 in: Bañares, Á, Blanca, G., Güemes, J., Moreno, J. C., & Ortiz, S. (ed.), Atlas y Libro Rojo de la flora vascular amenazada de España. – Madrid.

Marrero Rodríguez, A. 1989: Dos citas de interés en la flora canaria. – Bot. Macarones. **18:** 89-91.

— 1992: Comentarios corológicos de la flora canaria. – Bot. Macarones. **19/20:** 151-155.

— & Montelongo, V. 2000: Datos sobre *Trisetaria lapalmae (Gramineae)* en las Islas Canarias. – Anales Jard. Bot. Madrid **57:** 428-429.

Martín Cáceres, K., Mesa Coello, R. & Santos Guerra, A. 2003: *Androcymbium hierrense*, *Argyranthemum adauctum* subsp. *erythrocarpon*. – Pp. 114-115, 574-577 in: Bañares, Á., Blanca, G., Güemes, J., Moreno, J. C., & Ortiz, S. (ed.), Atlas y Libro Rojo de la flora vascular amenazada de España. – Madrid.

Martín Osorio, V. E., Wildpret de la Torre, W. & Hernández Bolaños 2003: *Bencomia sphaerocarpa*. – Pp. 142-143 in: Bañares, Á., Blanca, G., Güemes, J., Moreno, J. C., & Ortiz, S. (ed.), Atlas y Libro Rojo de la flora vascular amenazada de España. – Madrid.

Mathias, M. E. & Constance, L. 1965: A revision of the genus *Bowlesia* Ruiz & Pav. *(Umbelliferae-Hydrocotyloideae)* and its relatives. – Univ. Calif. Publ. Bot. **38:** 1-73.

Matzke-Hajek, G. 2001: A revision of Macaronesian *Rubus* taxa *(Rosaceae).* – Edinburgh J. Bot. **58:** 371-382.
— & Weber, H. 1999: A survey of the *Rubus* species *(Rosaceae)* described from the Canary Islands. – Anales Jard. Bot. Madrid **57:** 25-35.
McVaugh, R. 1993: *Euphorbiae* Novo-Galicianae revisae. – Contr. Univ. Michigan Herb. **19:** 207-239.
Médail, F. & Quézel, P. 1999: The phytogeographical significance of SW Morocco compared to the Canary Islands. – Pl. Ecol. **140:** 221-244.
Mendoza-Heuer, I. 1971: Aportación al conocimiento del género *Convolvulus* en la zona macaronésica. – Cuad. Bot. Canar. **12:** 22-34.
— 1972a: Datos para la determinación de especies en el género *Phyllis (Rubiaceae).* – Cuad. Bot. Canar. **14/15:** 5-9.
— 1972b: Acerca del género *Erysimum (Cruciferae)* en la zona macaronésica. – Cuad. Bot. Canar. **14/15:** 17-26.
Mes, T. H. M. 1995: Phylogenetic and systematic implications of chloroplast and nuclear spacer sequence variation in the Macaronesian *Sempervivoideae* and related *Sedoideae.* – Pp. 30-44 in: 't Hart, H. & Eggli, U. (ed.), Evolution and systematics of the *Crassulaceae.* – Leiden.
— & 't Hart, H. 1996: The evolution of growth-forms in the Macaronesian genus *Aeonium (Crassulaceae)* inferred from chloroplast DNA RFLPs and morphology. – Molec. Ecol. **5:** 351-363.
— , Brederode, J. van & 't Hart, H. 1996: Origin and the woody Macaronesian *Sempervivoideae* and the phylogenetic position of the East African species of *Aeonium.* – Bot. Acta **109:** 477-491.
Mesa Coello, R. & Marrero Gómez, M. C. 2003: *Adenocarpus ombriosus.* – Pp. 568-569 in: Bañares, Á., Blanca, G., Güemes, J., Moreno, J. C., & Ortiz, S. (ed.), Atlas y Libro Rojo de la flora vascular amenazada de España. – Madrid.
— , Oval de la Rosa, J. P., Martín Cáceres, K., Santos Guerra, A. & Marrero Gómez, M. V. 2003c: *Sonchus gandogeri.* Pp. 510-511 in: Bañares, Á., Blanca, G., Güemes, J., Moreno, J. C., & Ortiz, S. (ed.), Atlas y Libro Rojo de la flora vascular amenazada de España. – Madrid.
— , Santos Guerra, A., Martín Cáceres, K., Oval de la Rosa, J. P. & Acevedo Rodríguez, A. 2003d: *Limonium brassicifolium* subsp. *brassicifolium.* – Pp. 742-743 in: Bañares, Á., Blanca, G., Güemes, J., Moreno, J. C., & Ortiz, S. (ed.), Atlas y Libro Rojo de la flora vascular amenazada de España. – Madrid.
— , —, —, — & Marrero Gómez, M. V. 2003e: *Limonium* brassicifolium subsp. *macropterum.* – Pp. 744-745 in: Bañares, Á., Blanca, G., Güemes, J., Moreno, J. C., & Ortiz, S. (ed.), Atlas y Libro Rojo de la flora vascular amenazada de España. – Madrid.
— , Acevedo Rodríguez, A., Oval de la Rosa, J. P., Hernández Luis, A., Marrero Gómez, M. & Carqué Álamo, E. 2003a: *Cerastium sventenii.* – Pp. 634-635 in: Bañares, Á., Blanca, G., Güemes, J., Moreno, J. C., & Ortiz, S. (ed.), Atlas y Libro Rojo de la flora vascular amenazada de España. – Madrid.
— , Marrero Gómez, M., Carqué, E., Oval, J. P., Afonso, L., Hernández, A., Rodríguez, B., Acevedo, A., Naranjo, J. & Santana, J. 2003b: *Anagyris latifolia.* – Pp. 90-91 in: Bañares, Á., Blanca, G., Güemes, J., Moreno, J. C., & Ortiz, S. 2003, Atlas y Libro Rojo de la flora vascular amenazada de España. – Madrid.

Meusel, H. & Kästner, A. 1994: Lebensgeschichte der Gold- und Silberdisteln. Monographie der mediterran-mitteleuropäischen Compositen-Gattung *Carlina* 2. – Österr. Akad. Wissensch., Math.-Naturw. Kl., Denkschr. **128.**

Mitchell-Thomé, R. 1976: Geology of the Middle Atlantic Islands. – Beitr. Region. Geol. Erde **12.**

Molero, J. & Rovira, A. M. 1998a: A note on the taxonomy of the Macaronesian *Euphorbia obtusifolia* complex *(Euphorbiaceae).* – Taxon **47:** 321-332.

— & — 1998b: Proposal to conserve the name *Euphorbia obtusifolia* Poir. *(Euphorbiaceae)* against an earlier homonym. – Taxon **47:** 469-470.

— , — 2004: *Euphorbia lamarckii* Sweet, correct name for *E. obtusifolia* Poir. non Lam. – Vieraea **32:** 117-122.

— , Garnatje, T., Rovira, A., Garcia-Jacas, N. & Susanna, A. 2002: Karyological evolution and molecular phylogeny in Macaronesian dendroid spurges *(Euphorbia* subsect. *Pachycladae).* – Pl. Syst. Evol. **231:** 109-132.

Monasterio-Huelin, E. & Weber, H. E. 1996: Taxonomy and nomenclature of *Rubus ulmifolius* and *Rubus sanctus (Rosaceae).* – Edinburgh J. Bot. **53:** 311-322.

Mort, M. E., Soltis, D. E., Soltis, P. S., Francisco Ortega, J. & Santos Guerra, A. 2001: Phylogenetic relationships and evolution of *Crassulaceae* inferred from matK sequence data. – Amer. J. Bot. **88:** 76-91.

Muñoz Garmendia, F. & Navarro, C. 1998: Notas acerca del género *Sanguisorba* L. *(Rosaceae)* en la Península Ibérica y Baleares. – Anales Jard. Bot. Madrid **56:** 174-176.

Naranjo Morales, M. 2000: El Proyecto Life flora amenazada del Monteverde ha mejorada la situación de los cinco endemismos afectados. – Published on the Internet http://www.gobcan.es/ medioambiente/revista/2000/19/254/.

Nezadal, W., Lindacher, R. & Welß, W. 1999: Lokalendemiten und Phytodiversität der westkanarischen Inseln La Palma and La Gomera. – Feddes Repert. **110:** 19-30.

Nicolás, J. P., Fernández-Palacios, J. M., Ferrer, F. J. & Nieto, E. 1989: Inter-island floristic similarities in the Macaronesian region. – Vegetatio **84:** 117-125.

Nogales, M., Hernández, E., Delgado, G. & Quintero, A. 1990: Breve nota sobre el Roque Grande de Salmor (El Hierro, Islas Canarias) y su población de *Gallotia galloti caesaris* (Lehrs 1914) (F. Lacertidae). – Vieraea **19:** 161-163.

Nyffeler, R. 1992: A taxonomic revision of the genus *Monanthes* Haworth *(Crassulaceae).* – Bradleya **10:** 49-82.

— 2003: *Aeonium* (incl. *Greenovia*), *Aichryson, Monanthes.* – Pp. 11-25, 190-193 in: Eggli, U. (ed.), Sukkulenten-Lexikon **4.** – Stuttgart.

Oberdorfer, E. 1965: Pflanzensoziologische Studien auf Teneriffa und Gomera (Kanarische Inseln). – Beitr. Naturk. Forsch. SW Deutschl. **24:** 47-104.

Ormonde, J. 1990: O genero *Ceterach* Willd. nas Ilhas Macaronésicas. – Pp. 157-170 in: Rita, J. (ed.), Taxonomia, biogeografia y conservacion de pteridofitos. Simposio an Máo (Menorca), del 27 al 30 Septiembre de 1988. – Palma de Mallorca.

— 1991a: O complexo *Asplenium aethiopicum (Aspleniaceae, Pteridophyta)* nas Ilhas Macaronésicas. – Acta Bot. Malacitana **16:** 293-315.

— 1991b: The Macaronesian representatives of the *Asplenium aethiopicum* complex *(Aspleniaceae, Pteridophyta): A. aethiopicum* subsp. *braithwaitii,* subsp. nov., and *A. filare* subsp. *canariense,* comb. et stat. nov. – Bol. Mus. Mun. Funchal **43(233):** 177-189.

Otto, R., Fernández-Palacios, J. M. & Krüsi, B. O. 2001: Variation in species composition and vegetation structure of succulent scrub on Tenerife in relation to environmental variation. – J. Veg. Sci. **12:** 237-248.

Page, C. N. 1965: Studies on the pteridophyte flora of the Canary Islands. – Pp. 52-57 in: Explor. Soc. Univ. Newcastle (ed.), 1964 expedition to Gomera and Hierro (Canary Islands). – Newcastle.

— 1971: Three pteridophytes new to Canary Islands. – Brit. Fern Gaz. **10:** 205-208.

Paiva, J. 1993: *Parietaria* L. – Pp. 268-270 in: Castroviejo, S., Aedo, C., Cirujano, S., Laínz M., Montserrat, P., Morales, R., Muñoz Garmendia, F., Navarro, C., Paiva, J. & Soriano, C. (ed.), Flora Ibérica **3.** – Madrid.

Pastor, J. 1987 : *Allium* L. – Pp. 448-457 in: Valdés, B., Talavera, S., Fernández-Galiano, E. (ed.), Flora vascular de Andalucía occidental **3.** – Barcelona.

Pedrola-Monfort, J. & Caujapé-Castells, J. 1998: The *Androcymbium* species of the Canary Islands. – Curtis's Bot. Mag. ser. **15:** 67-77.

Pérez de Paz, P. L. 1975: El género *Anagyris* L. *(Leguminosae)* en las Islas Canarias. – Vieraea **4:** 164-172.

— 1978: Revisión del género *Micromeria* Bentham *(Lamiaceae-Stachyoideae)* en la Región Macaronésica. – Inst. Estud. Canar. Monogr. **16.**

— 1981: Flora canaria: Notas taxonómico-corológicas 1. – Bol. Soc. Brot., ser. 2, **53:** 855-872.

— 1990: *Todaroa aurea* (Solander) Parl. subsp. *suaveolens* P. Pérez, nov., *(Apiaceae)* de La Palma (Islas Canarias). – Vieraea **19:** 319-325.

— 1994: Re the genus *Micromeria* Benth. *(Labiatae)* and nomenclatural inconsistency. – Taxon **43:** 241-242.

— & Hernández Padrón, C. E. 1999: Plantas medicinales o útiles en la flora Canaria, aplicaciones populares. – La Laguna.

— & Negrín Sosa, M. L. 1992: Revisión taxonómica de *Sideritis* L. subgénero *Marrubiastrum* (Moench) Mend.-Heuer (endemismo macaronésico). – Phanerog. Monogr. **20.**

— , Arco Aguilar, M. J. del & Wildpret de la Torre, W. 1981: Contribución al conocimiento de la flora y vegetación de El Hierro (Islas Canarias). I. – Lagascalia **10:** 25-57.

— , —, — 1987: Contribución al conocimiento de la vegetación hidrofítica de Canarias. – V Jornadas Fitosociología. Vegetación de Riberas de Agua Dulce. – 2. Univ. La Laguna, Series Informes **22:** 11-33.

— , García Gallo, A. & Heene, A. (ed.) 1999: Control y erradicación del "Rabo-Gato" [*Pennisetum setaceum*] en la isla de La Palma. – La Palma.

— , La Serna Ramos, I. E., & Hernández Padrón, C. E. 1992: El género *Rhamnus* L. en las Islas Canarias. – Stud. Bot. (Salamanca) **10:** 91-107.

— , Barquín, E., Santos Guerra, A. & Wildpret de la Torre, W. 1976: Citas nuevas, notas corológicas y comentarios sobre la flora del Hierro, Islas Canarias. – Vieraea **6:** 219-226.

Pitard, J. & Proust, L. 1908: Les Iles Canaries, flore de l'archipel. Paris [reprint 1973, Königstein].

Pichi Sermolli, R. E. G. 1985: The fern genus *Cosentinia* Todaro. – Webbia **39:** 179-189.

Podlech, D. 1994: Revision der altweltlichen anuellen Arten der Gattung *Astragalus* L. *(Leguminosae).* – Sendtnera **2:** 39-170.

Polatschek, A. 1976: Die Gattung *Erysimum* auf den Kapverden, Kanaren und Madeira. – Ann. Naturhist. Mus. Wien **80:** 93-103.

Pott, R., Hüppe, J. & Wildpret de la Torre, W. 2003: Die Kanarischen Inseln, Natur- und Kulturlandschaften. – Stuttgart.

Praeger, R. L. 1932: An account of the *Sempervivum* group. – London.

Press, J. R. 1988: Intraspecific variation in *Rumex bucephalophorus* L. – Bot. J. Linn. Soc. **97:** 344-355.

— 1994: *Chenopodiaceae, Compositae [Asteraceae], Cupressaceae, Iridaceae, Plantaginaceae, Polygonaceae, Ranunculaceae, Urticaceae.* – Pp. 54f, 58-74, 95-100, 320-324, 333-382, 394-399 in: Press, J. R. & Short, M. J. (ed.), Flora of Madeira. – London.

Pyšek, P., Richardson, M. R., Rejmánek, M., Webster, G. L., Williamson, M. & Kirschner, J. 2004: Alien plants in checklists and floras: towards better communication between taxonomists and ecologists. – Taxon **53:** 131-143.

Quintero Reboso, C. 1997: El Hierro – una isla singular: historia, costumbres, leyendas, geografía, flora, fauna. – Santa Cruz de Tenerife.

Rahn, K. 1996: A phylogenetic study of the *Plantaginaceae.* – Bot. J. Linn. Soc. **120:** 145-198.

Rasbach, H., Reichstein, T. & Schneller, J. 1983: Five further natural hybrids in the genus "*Cheilanthes*" Sw. *(Sinopteridaceae, Pteridophyta).* – Webbia **37:** 43-62.

Reifenberger, U. 1990: *Androcymbium hierrense* Santos ssp. *macrospermum* Reifenberger ssp. nov. *(Liliaceae),* ein neuer Endemit der Insel La Gomera. – Vieraea **18:** 251-259.

— & Reifenberger, A. 1990: Ergänzungen zum Katalog der Gefäßpflanzenflora der Inseln La Gomera und El Hierro. Chorologische und ökologische Diskussion. – Vieraea **18:** 235-249.

Rich, T. C. G. & Rich, M. D. B 1988: Plant crib. – London.

Rivas-Martínez, S. & Gaisberg, M. von 2006 [in press]: *Euphorbia lamarckii* Sweet subsp. *wildpretii* (Molero Rovira) Rivas-Mart. & Gaisberg comb. et stat. nova. – In: Rivas-Martínez, S. & al., Mapa de series, geoseries y geopermaseries de vegetacíon de España. Memoria del mapa de la vegetación potencial de España. – Itin. Geobot. **16.**

— , Penas, A. & Díaz, T. E. 2001b: Biogeographic Map of Europe; 1:16 000 000, Cartographic Service, University of León. – León.

— , Wildpret de la Torre, W., Diaz, T. E., Pérez de Paz, P. L., Arco Aguilar, M. J. del & Rodríguez, O. 1993a: Excursion guide. Outline vegetation of Tenerife Island (Canary Islands). – Geobotanica **7:** 5-168.

— , —, Arco Aguilar, M. J. del, Rodríguez, O., Pérez de Paz, P. L., García-Gallo, A., Acebes Ginovés, J. R., Díaz González, T. E. & Fernández-González, F. 1993b: Las comunidades vegetales de la Isla de Tenerife (Islas Canarias). – Itin. Geob. **7:** 169-374.

— , Díaz, T. E., Fernández-González, F., Izco, J., Loidi, J., Lousn, M. & Penas, A. 2002: Vascular plant communities of Spain and Portugal. Addenda to the syntaxonomical checklist of 2001, part I+II. – Itin. Geobot. **15:** 5-922.

Robson, N. K. B. 1996: Studies in the genus *Hypericum* L. *(Guttiferae)* 6. Sections 20. *Myriandra* to 28. *Elodes.* – Bull. Brit. Mus. Nat. Hist. **26(2):** 75-217.

Rodríguez Delgado, O., García Gallo, A. & Cruz Trujillo, G. M. 2003: *Cheirolophus duranii.* – Pp. 176-177 in: Bañares, Á., Blanca, G., Güemes, J., Moreno, J. C., & Ortiz, S. (ed.), Atlas y Libro Rojo de la flora vascular amenazada de España. – Madrid.

Rodríguez Oubiña, J., Reinoso Franco, J. & Gómez Valverde, M. 2001: Pleuridio acuminati-Ophioglossetum lusitanici una nueva asociación del afloramiento de rocas ultrabásicas del centro de Galicia (N. O. de España). – Nova Acta Ci. Compostelana (Bioloxía) **11:** 167-175.

Rodríguez Piñero, J. C., Wildpret de la Torre, W. & Arco Aguilar, M. J. del 1987: Contribución al estudio biosistemático de *Salix canariensis (Salicaceae).* – Vieraea **17:** 121-142.

Romero Zarco, C. 1987: *Hordeum, Trisetaria.* – Pp. 318-320, 811-812 in: Valdés, B., Talavera, S. & Galiano, E. F. (ed.), Flora vascular de Andalucía occidental **3.** – Barcelona.

Rutherford, R. W. & Jury S. L. 2002: *Amaranthaceae.* – Pp. 122-124 in: Valdés, B., Rejdali, M., Achhal El Kadmiri, A., Jury, S. L. & Montserrat, J. M. (ed.), Catalogue des plantes vasculaires du Nord du Maroc, incluant des clés d'identification. Checklist of vascular plants of N Morocco with identification keys. – Madrid.

Sáenz de Rivas, C. & Rivas-Martínez, S. 1979: Revision del género *Cheilanthes (Sinopteridaceae)* en España. – Lagascalia **8:** 215-241.

Sales, F. 1993: Taxonomy and nomenclature of *Bromus* sect. *Genea.* – Edinburgh J. Bot. **50:** 1-31.

Sanchez-Yelamo, M. D., Espejo Ibañez, Francisco Ortega, J. & Santos Guerra, A. 1995: Electrophoretical evidence of variation in populations of the fodder legume *Chamaecytisus proliferus* from the Canary Islands. – Biochem. Syst. Ecol. **23:** 53-63.

Santana, I. & Naranjo, J. 2003: *Schizogyne glaberrima.* – Pp. 840f in: Bañares, Á., Blanca, G., Güemes, J., Moreno, J. C., & Ortiz, S. (ed.), Atlas y Libro Rojo de la flora vascular amenazada de España. – Madrid.

Santos Guerra, A. 1976: Notas sobre la vegetación potencial de la Isla de El Hierro (1). – Anales Inst. Bot. Cavanilles **33:** 249-261.

— 1980: Contribución al conocimiento de la flora y vegetación de la Isla de Hierro (Islas Canarias). – Publ. Fund. Juan March, Ser. Univ. **114:** 1-50.

— 1983a: Vegetación y flora de La Palma. – Santa Cruz de Tenerife.

— 1983b: *Euphorbia scordifolia* Jacqu., nueva cita para Canarias. – Anales Jard. Bot. Madrid **40:** 283.

— 1983d: *Androcymbium hierrensis* spec. nov. para la flora canaria. – Comunic. II. Congr. Inter. Flora Macaronésica **1977:** 53-59.

— 1996a: Notas corológicas III: Adiciones florísticas y nuevas localidades para la flora Canaria. – Anales Jard. Bot. Madrid **54:** 445-448.

— 1996b: *Arbutus canariensis, Adenocarpus ombriosus, Aeonium valverdense, Androcymbium hierrense, Argyranthemum sventenii, Bencomia sphaerocarpa, Cheirolophus duranii, Dorycnium eriophthalmum, Echium hierrense, Gonospermum canariense, Limonium macropterum, Myrica rivas-martinezii, Polycarpaea smithii, Silene sabinosae, Sonchus gandogeri.* – Pp. 42f, 74f, 92f, 118f, 138f, 176f, 252f, 272f, 310f, 386f, 460f, 502f, 574f, 588f in: Gómez Campo, C. (ed.), Libro Rojo de especies vegetales amenazadas de las Islas Canarias. – Santa Cruz de Tenerife.

— & Fernández Galván, M. 1988: *Ophioglossum (Pteridophyta)* en las Islas Canarias. – Bot. Macarones. **16:** 61-66.

— & Francisco Ortega, J. 1994: On the nomenclature and types of *Chamaecytisus proliferus* (L. f.) Link *(Fabaceae: Genisteae),* a fodder shrub from the Canary Islands. – Bot. J. Linn. Soc. **115:** 235-245.
— & Gil Rodríguez, M. C. 1975: Notas sobre la distribución de *Ophioglossum lusitanicum* L. y *Asplenium marinum* L. en las Islas Canarias *(Pteridophyta).* – Vieraea **4:** 224-230.
Scott, A. J., Ford-Lloyd, B. V. & Williams, J. T. 1977: *Patellifolia*, nomen novum *(Chenopodiaceae).* – Taxon **26:** 284.
Schippmann, U. 1991: Revision der europäischen Arten der Gattung *Brachypodium* Palisot de Beauvais *(Poaceae).* – Boissiera **45.**
Schmid, E. 1976: The laurisilva of El Hierro. – Pp. 241-248 in: Kunkel, G. (ed.), Biogeography and ecology in the Canary Islands. – Monogr. Biol. **30.**
Schäfer, H. 2003: Chorology and diversity of the Azorean flora. – Diss. Bot. **374.**
Scholz, H. 1977: Beitrag zur Kenntnis der Kanaren-Flora *(Gramineae).* – Cuad. Bot. Canar. **28:** 3-9.
— 1981: Bemerkungen über *Bromus madritensis* und *B. rubens (Gramineae).* – Willdenowia **11:** 249-258.
— 1983: *Poa pitardiana (Gramineae),* ein neuer Endemit der Kanarenflora. – Willdenowia **13:** 129-132.
— 1986a: *Poa* studies 5. – The genus *Poa (Gramineae)* in Greece: Annotated check-list and key to the species. – Willdenowia **15:** 393-400.
— 1986b: Bemerkungen zur Flora Griechenlands: *Gastridium phleoides* und *G. ventricosum (Poaceae).* – Willdenowia **16:** 65-68.
— 1987: *Poa*-Studien 6. – Die ökologische und taxonomische Wertigkeit der Zwiebelform bei den altweltlichen *Poa*-Taxa der subsect. *Bulbosae (Gramineae).* – Willdenowia **16:** 403-407.
— 1991: Die Systematik der *Avena sterilis* und *A. fatua (Gramineae).* Eine kritische Studie. – Willdenowia **20:** 103-112.
— 1998a: *Bromus molliformis.* – Soc. Ech. Pl. Vasc. Eur. Bass. Médit., Bull. **27:** 19-20.
— 1998b: Notes on *Bromus danthoniae* and relatives *(Gramineae).* – Willdenowia **28:** 143-150.
— & Böcker, R. 1996: Ergänzungen und Anmerkungen zur Grasflora *(Poaceae)* der Kanaren. – Willdenowia **25:** 571-582.
— & Raus, T. 2001: New distribution and morphological data of *Vulpia membranacea.* – Willdenowia **31:** 309-313.
— , Stierstorfer, C. & Gaisberg, M. von 2000: *Lolium edwardii* sp. nova *(Gramineae)* and its relationship with *Schedonorus* sect. *Planthynia* Dumort. – Feddes Repert. **111:** 561-565.
Schönfelder, I. & Schönfelder, P. 2002: Kosmos-Atlas Mittelmeer- und Kanarenflora. – Stuttgart.
— & Schönfelder, P. 1997: Die Kosmos-Kanarenflora. – Stuttgart.
Schroeder, F. G. 1969: Zur Klassifizierung der Anthropochoren. – Vegetatio **16:** 225-238.
— 1974: Zu den Statusangaben bei der floristischen Kartierung Mitteleuropas. – Göttinger Florist. Rundbr. **8:** 69-92.
Seidel, D. & Gottschlich, G. 1981: Die Gefährdung authochthoner Inselfloren am Beispiel Madeiras. – Biologie Unserer Zeit **11(2):** 33-41.

Setshogo, M. P. 2002: *Dichanthium*. – Pp. 38-42 in: Pope, G. V. & Martins, E. S. (ed.), Flora zambesiaca **10.** – London.
Servicio Geográfico del Ejército 1997: Cartografía Militar de España, Isla de El Hierro 1:50.000, Serie L Hoja 34/35-43/44 Edición 1-SGE. – Madrid.
Short, M. J. 1988: A note on *Pelletiera* St Hil. *(Primulaceae)* in Macaronesia. – Bocagiana **22:** 1-3.
— 1994: *Boraginaceae, Caryophyllaceae, Cruciferae [Brassicaceae], Geraniaceae, Primulaceae, Scrophulariaceae, Violaceae.* – Pp. 83-95, 109-128, 193-200, 223-225, 251f, 271-277, 303-316 in: Press, J. R. & Short, M. J. (ed.), Flora of Madeira. – London.
Silvestre, S. 1987: *Plantaginaceae.* – Pp. 475-481 in: Valdés, B., Talavera, S., Fernández-Galiano, E. (ed.), Flora vascular de Andalucía occidental **2.** – Barcelona.
Small, E. 1989: A synopsis of the genus *Medicago (Leguminosae).* – Canad. J. Bot. **67:** 3260-3294.
Smith, G. F., Van Wyk, A. E., Steyn, E. M. A. & Retief, E. 2004: A first record of *Echium simplex* in South Africa. – Bothalia **34:** 44-47.
Snogerup, S., Gustafsson, M. & Bothmer, R. von 1990: *Brassica* sect. *Brassica (Brassicaceae).* I. Taxonomy and variation. – Willdenowia 1**9:** 271-365.
Stace, C. 1991: New flora of the British Isles. – Cambridge.
Stearn, W. T. 1980: *Allium* L. – Pp. 49-69 in: Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M., Webb, D. A. (ed.): Flora europaea **5.** – Cambridge.
— 2000: Botanical Latin, ed. 4. – Newton Abbot.
Stierstorfer, C. 2001: *Holcus mollis* L. subsp. *hierrensis (Poaceae),* a new subspecies of El Hierro (Canary Islands), and some notes on the species. – Feddes Repert. **112:** 47-57.
— 2005: The vascular plant vegetation in the forest belt of El Hierro (Canary Islands). – Diss. Bot. **393.**
— , Gaisberg, M. von & Otto, R. 2005: Distribution patterns of vascular plants on El Hierro (Canary Islands). – Hoppea **66:** 285-299.
Stirton, C. H. 1981: Studies in the *Leguminosae-Papilionoideae* of southern Africa. – Bothalia **13:** 317-325.
Subal, W. 1997: FLOREIN: Interaktives Programm zur Bearbeitung floristischer Daten, Version 5.0. – Bochum.
Sunding, P. 1968: Notes on the genus *Umbilicus* DC. *(Crassulaceae)* in the Canary Islands. – Cuad. Bot. Canar. **3:** 11-18.
— 1972: The vegetation of Gran Canaria. – Vid. Akad. Skr. I, Math.-Nat. Kl., ser. 2, **29.**
— 1979: Origins of the Macaronesian flora. – Pp. 13-40 in: Bramwell, D. (ed.), Plants and islands. – London.
Sutton, D. A. 1988: A revision of the tribe *Antirrhineae*. – London.
Sventenius, E. R. S. 1960a: Additamentum ad floram canariensem I. – Madrid.
— 1960b: Las Centaureas de la sección *Cheirolophus* en las Islas Macaronésicas. – An. Estud. Atlánt. **6:** 219-236.
— 1969: Plantae macaronesienses novae vel minus cognitae. – Ind. Sem. Hort. Acclim. Plant. Arautapae (Orotava) **1968/1969:** 43-60.
Swenson, U. & Manns, U. 2003: Phylogeny of *Pericallis (Asteraceae):* A total evidence approach reappraising the double origin of woodiness. – Taxon **52:** 533-546.

Talavera, S. 1987: *Silene.* – Pp. 244-267 in: Valdés, B., Talavera, S., Fernández-Galiano, E. (ed.), Flora vascular de Andalucía occidental **1.** – Barcelona.

— 1987: *Tolpis* – Pp. 107-108 in: Valdés, B., Talavera, S., Fernández-Galiano, E. (ed.), Flora vascular de Andalucía occidental **3.** – Barcelona.

Taylor, N. P. 1981: *Limonium pectinatum (Plumbaginaceae).* – Bot. Mag. **183:** 139-143, pl. 828.

Tebbs, B. R. 1994: *Campanulaceae.* – Pp. 329-333 in: Press, J. R. & Short, M. J. (ed.), Flora of Madeira. – London.

Terrell, E. E. 1968: A taxonomic revision of the Genus *Lolium.* – U.S. Dept. Agric. Techn Bull. **1392:** 1-65.

Trapero, M. 1999: Pervivencia de la lengua Guanche en el habla común de El Hierro. – Madrid.

Turland, N. J. 1994: *Amaranthaceae, Cactaceae, Convolvulaceae.* – Pp. 74-77, 229-230, 266-271 in: Press, J. R. & Short, M. J. (ed.), Flora of Madeira. – London.

Uhlich, H. 1994: Ein Beitrag zur Kenntnis von *Orobanche berthelotii* Webb et Berthelot. – Gleditschia **22:** 23-24.

Urtusáustegui, J. A. de 1779: Diario de viaje a la Isla de El Hierro en 1779. Ed. Lorenzo Perera, M. J. 1983, Centro de Estudios Africanos. – La Laguna de Tenerife.

Usher, M. B. 2000: The nativeness and non-nativeness of species. – Watsonia **23:** 323-326.

Valdés, B. 1979: Revisión del género *Asparagus (Liliaceae)* en Macaronesia. – Lagascalia **9:** 65-107.

— 1980: A new species of *Pelletiera (Primulaceae)* from Macaronesia. – Candollea **35:** 641-648.

Van Den Heede, C. J, Pajaron, S., Pangua, E. & Viane, R. L. L. 2004: *Asplenium ceterach* and *A. octoploideum* on the Canary Islands *(Aspleniaceae, Pteridophyta).* – Amer. Fern J. **94:** 81-111.

Vargas, P., Hess, J., Muñoz Garmendia, F. & Kadereit, J. 2001: *Olea europaea* subsp. *guanchica* and subsp. *maroccana (Oleaceae),* two new names for olive tree relatives. – Anales Jard. Bot. Madrid **58:** 360-361.

Vázquez, F. M. & Devesa, J. A. 1996: Revisión del género *Stipa* L. y *Nassella* Desv. *(Poaceae)* en la Peninsula Ibérica e Islas Baleares. – Acta Bot. Malacitana **21:** 125-189.

Ventura, M. R., Flores, M. P. & Castañón, J. I. R. 1999: Nutritive value of forage shrubs: *Bituminaria bituminosa*, *Acacia salicina* and *Medicago arborea.* – Pp. 171-173 in: Etienne, M. (ed.), Dynamics and sustainability of Mediterranean pastoral systems. – Badajoz.

Viceconsejería de Medio Ambiente (Gobierno de Canarias) 2000: Proyectos de conservación canarios, apoyados por los fondos Life. Conservación de 5 especies prioridades del monteverde de Canarias. – Published on the Internet http://www.gobcan.es/medioambiente/biodiversidad/ceplam/vidasilvestre/life9.html.

— 2001: Plan especial de protección paisajística – Paisaje Protegido de Ventejís. – Published on the Internet http://www.gobcan.es/medioambiente/biodiversidad/ceplam/areasprotegidas/areadescarga/Ventejis.pdf.

Voggenreiter, V. 1974a: Geobotanische Untersuchungen an der natürlichen Vegetation der Kanareninsel Tenerife (Anhang: Vergleiche mit La Palma und Gran Canaria) als Grundlage für den Naturschutz. – Diss. Bot. **26.**

— 1994: Zur Interpretation von UTM-Gitterpunkt-Arealformen westkanarischer Pflanzenarten als Grundlage für den Naturschutz. – Hoppea **55:** 817-843.
Wagenitz, G. 1970: Die Gattung *Filago* L. s.l. *(Compositae-Inuleae)* in der Agäis. – Willdenowia **6:** 115-138.
— 1991: New taxa and new names in the genus *Volutaria* Cass. *(Compositae).* – Candollea **46:** 407-410.
Walker, C. C. 2003: *Umbilicus.* – Pp. 381-384 in: Eggli, U. (ed.), Sukkulenten-Lexikon **4.** – Stuttgart.
Webster, G. L. 1994: Synopsis of the genera and suprageneric taxa of *Euphorbiaceae.* – Ann. Missouri Bot. Gard. **81:** 33-144.
Welß, W. & Lindacher, R. 1994: Beiträge zur Florenstatistik der Kanarischen Inseln. – Hoppea **55:** 845-857.
Wildpret de la Torre, W. 1970: Nota sobre la presencia de "*Pancratium canariense* Ker-Gawl." en la Isla de Tenerife. – An. Fac. Cienc. Univ. La Laguna **7:** 3-8.
Willemse, R. H. 1991: New combinations and names for Macaronesion *Satureja* taxa *(Labiatae).* – Willdenowia **21:** 81-85.
Williams, J. T., Scott, A. J. & Ford-Lloyd, B. V. 1976: *Patellaria:* a new genus in the *Chenopodiaceae.* – Feddes Repert. **87:** 289-292.
Wisskirchen, R. 1998: *Chamaesyce* Gray; *Plantago* L., *Polygonum* L. s.str. *(Polygonaceae).* – Pp. 142, 366f, 375-380 in: Wisskirchen, R. & Haeupler, H. (ed.), Standardliste der Farn- und Blütenpflanzen Deutschlands. – Stuttgart.
— & Haeupler, H. 1998: Standardliste der Farn- und Blütenpflanzen Deutschlands. – Stuttgart.
Wolff, P. & Rosinski, M. 1999a: Nuevas e interesantes plantas vasculares en las Islas Canarias. – Vieraea **27:** 11-21.
— 1999b: *Echium* × *taibiquense,* híbrido nuevo para la ciencia *(Magnoliophyta, Boraginaceae).* – Vieraea **27:** 7-10.
Zohary, M. 1959: A revision of the genus *Retama* Boiss. – Bull. Res. Counc. Israel, Sect. D (Botany) **7:** 1-12.

Index of genera

The misty forests of El Hierro are well established in the northern parts of the El Golfo embayment and along the uppermost crests of the island, which are strongly influenced by the trade winds (Stierstorfer, June 2006, near "Hoya de Fileba" at c. 1300 m); *Aeonium valverdense* is an endemic of El Hierro, growing in the lower parts in the south and east of the island (Stierstorfer, June 2006, near "Montaña de Julán" north of "La Restinga" at c. 300 m).