Botanica Complutensis
2001, 25, 289-297

ISSN: 0214-4565

Contribution to the knowledge of the Pteridological Flora of El Hierro (Canary Islands)

Cleo BONALBERTI PERONI, Adalberto PERONI & Gabriele PERONI

Museo Insubrico di Scienze Naturali, Piazza Giovanni XXIII 4,
21056 Indumo Olona (VA), Italy

Abstract

BONALBERTI PERONI, C., PERONI, A. & PERONI, G. 2001. Contribution to the knowledge of the Pteridoligical Flora of El Hierro (Canary Islands). *Bot. Complutensis* 25: 289-297.

A study on the Pteridophyta of El Hierro, the western island of the Canary Archipelago, was realized. A census of 30 taxa subdivided in 12 families was made. Some notes have a greatest importance for the rareness of species or for ecological conditions where taxa vegetate.

Key words: Pteridophyta, distribution, Canary Islands, El Hierro.

Resumen

BONALBERTI PERONI, C., PERONI, A. & PERONI, G. 2001. Contribución al conocimiento de la flora pteridológica de El Hierro (Islas Canarias). *Bot. Complutensis* 25: 289-297.

Se ha llevado a cabo un estudio de los pteridófitos de El Hierro, la más occidental de las islas del archipiélago canario. En total se han censado 30 táxones pertenecientes a 12 familias. Las especies se acompañan de datos sobre su rareza y condiciones ecológicas en que se desarrollan.

Palabras clave: Pteridophyta, distribución, Islas Canarias, El Hierro.

INTRODUCTION

The Canary Islands are located between 27°37′ (Punta de la Restinga, El Hierro) and 29°25′ (Punta de los Mosegos, Alegranza) of north latitude and between 13°20′ (Roque del Este) and 18°10′ (Punta de Orchilla, El Hierro) of west longitude in conformity with the Greenwich meridian.

El Hierro is the smallest of the seven larger islands, with an area of 287 Km^2, it is also the westernmost in the archipelago, since it is situated ca. 145 Km WSW

away from Tenerife. Malpaso, with 1501 m in height is the upper most top in El Hierro. This small volcanic island is also the youngest of the Canary Islands, it appeared from the ocean between 7 and 9 million years ago, and the youngest areas are 2-4 million years old.

The vegetation of El Hierro can be summarized as follows: a «base-stratum» up to 400 m with halophytes and xerophytes (*Euphorbia canariensis* L., *E. balsamifera* Ait., *E. obtusifolia* Poir., *Astydamia latifolia* (L. fil.) Baill., etc.); a «transition formation» whose limit is caused by the exposure to trade winds and the sun, between 300 and 600 m in the northern coast and between 500 and 900 m in the southern coast (*Juniperus turbinata* Guss. subsp. *canariensis* (Guy.) Rivas-Mart et al., *Echium hierrense* Webb ex Bolle, *Maytenus canariensis* (Loes.) Kunkel et Sund., *Visnea mocanera* L. fil., etc.); and a «mountainous level», humid or arid in conformity with exposure, which reaches the top of the mountains (*Myrica faya* Ait., *Erica arborea* L., *Pinus canariensis* Chr. Smith ex DC, *Laurus azorica* (Seub.) Franco, *Picconia excelsa* (Ait.) DC, *Apollonias barbujana* (Cav.) Bornm., etc.).

The pteridological flora in the Canary Islands is well known with regard to some islands (Horn & Wells, 1996), while specific studies about El Hierro are insufficient and rather vague regarding informations of discovery stations (Page, 1965; Benl & Sventenius, 1970). Some notes about pteridophytes in El Hierro are included in articles relating to the whole archipelago (see Horn & Wells, 1996).

This study is the result of an expedition to El Hierro, during May 2000, and the revision of the data mentioned in literature.

The taxonomic arrangement follows Pichi Sermolli (1977) and Tutin et al. (1993), and name of Authors of taxa are abbreviated in accordance with Pichi Sermolli (1996).

Voucher specimens were deposited in the author's herbarium and in the herbarium of the Museo Insubrico di Storia Naturale di Induno Olona (VA), Italy.

LIST OF SPECIES

Selaginellaceae

Selaginella denticulata (L.) Spring

Rather frequent in humid places.

We find it in the following places: Frontera, towards Nuestra Señora de la Candelaria, ca. 375 m, not very copious on walls; Between Valverde and Frontera, from 400 to 1100 m, common along the road, on the rocks and at the border of the laurisilva; San Andrés, ca. 920 m, very frequent on the walls; Between Valverde and San Andrés, ca. 1130 m, very frequent at the border of laurisilva forest; Hoya de El Pino, ca. 1000 m, some plants on the rocks at the border of laurisilva forest; Between Jinama and Las Montañetas, ca. 900 m, on dry-walls, many big tufts; Between Valverde and Tiñor, ca. 770 m, some specimens; San Andrés, El Garoé, ca.

1100 m, some specimens on the rocks; Sabinosa, towards Pozo de la Salud, on the rocks, some tufts.

Selaginella kraussiana (Kunze) A. Br.

Is mentioned for El Hierro by Hansen & Sunding (1993). We have not found it.

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

Only a locality of this species is known at El Hierro mentioned by Page (1971). This plant is considered rare (R) by Ormonde (1990).

Ophioglossaceae
Ophioglossum lusitanicum L.

Hansen & Sunding (1993) mentioned this species for El Hierro. We have not found it.

Ophioglossum polyphyllum A. Br.

Mentioned also by Hansen & Sunding (1993) for El Hierro, but we have not found it during our expedition.

Davalliaceae
Davallia canariensis (L.) Sm.

It is very frequent in this island up to 1350 m on the rocks and walls, in the laurisilva sometimes grows epiphytic on *Erica arborea* and *Laurus azoricum*. As a curiosity, we found *D. canariensis* on one roof near the most important square of Valverde.

Polypodiaceae
Polypodium macaronesicum A. E. Bobrov
(*Polypodium cambricum* L. subsp. *macaronesicum* (A. E. Bobrov) Fraser-Jenk.)

This species is very copious on the island too, especially on the rocks and low walls up to 1350 m, in the laurisilva it is easy to find it as an epiphyte, especially on *Erica arborea*.

Sinopteridaceae
Cheilanthes guanchica Bolle

Ormonde (1990) found this species in small populations in the Canary Islands, and considered them as not well known and probably in danger.

We found *C. guanchica* in several stations in El Hierro: on the road between Valverde and Tiñor, ca. 760 m, about a hundred of tufts on walls and rocks; not far from Frontera in direction to Valverde, ca. 500 m, some big tufts on the rocks; bet-

ween El Pinar and La Restinga, ca. 515 m, about ten tufts; in lava flows in the «Malpais» of La Restinga, ca. 330 m, several small patches; Binto, going to Santuario de la Virgen de los Reyes, four tufts on the wall, between 1150 and 1265 m; between Binto and Malpaso, near Cruz de los Rey, ca. 1350 m, a lot of patches; between Jinama and Las Montañetas, ca. 900 m, several tufts on the walls, in arid zones. Growing with *C. pulchella*; Frontera, in Guinea place, on walls, several specimens.

Cheilanthes pulchella Bory ex Willd.

We found this taxon only in two places: between Jinama and Las Montañetas, ca. 900 m, some little tufts on low-walls in an arid zone; between El Pinar and La Restinga, on the rocks and walls at 515 m, two very big tufts. Not far away from where we found several tufts of *C. guanchica*.

Cheilanthes maderensis Lowe

We have not found this species on El Hierro, but Hansen & Sunding (1993) mentioned it for this island.

Notholaena marantae (L.) Desv. subsp. *subcordata* (Cav.) G. Kunkel

Very frequent on the rocks, the walls and in the laurisilva, with some large populations, to ca. 1320 m, in a station at Cruz de los Reyes.

Adiantaceae

Adiantum reniforme L.

We found this taxon in Frontera, on the road to Valverde, ca. 375 m. In this place, few tufts on the walls were growing with a lot of *Davallia canariensis*, *Notholaena marantae* subsp. *subcordata* and *Selaginella denticulata*.

Adiantum capillus-veneris L.

We did not found it, although it is generically recorded in the whole archipelago, and in El Hierro.

Hemionitidaceae

Anogramma leptophylla (L.) Link

This species is frequent in El Hierro.

We found it in the following places: on the road between Valverde and Frontera, in several places up to 900 m; between El Pinar and La Restinga, near El Fayal, ca. 1300 m; Binto, on the road going to Santuario de los Reyes, ca. 1150 m, very frequent; Binto, on the walls between 1215 and 1265 m, few rare tufts; Cruz de los Reyes, ca. 1320 m, several specimens; Mirador de Jinama, ca. 1230 m, on the rocks, some tufts; San Andres, in the laurisilva, ca. 1300 m, on the rocks;

Between Jinama and Las Montañetas, in arid zones, ca. 910 m, few rare individuals in the lava flows; San Andrés, El Garoé, between 1000 and 1100 m, several specimens on rocks and walls.

Cosentinia vellea (Aiton) Tod. subsp. *bivalens* (Reichst.) Rivas Mart. et Salvo

We found this taxon in two places only: between El Pinar and La Restinga, ca. 515 m, several sparse tufts; La Restinga, in the crevices of lava streams of the «Malpais», ca. 340 m, only one tuft.

Following Ormonde (1990) this species is in extinction danger.

Hymenophyllaceae

Vandenboschia speciosa (Willd.) G. Kunkel
(Sin. *Trichomanes speciosum* Willd.)

We saw this species in one place: San Andrès, El Garoé, ca. 1100 m, in a small cave, very humid, about 30 specimens.

Vandenboschia speciosa is listed as rare (R) in the red-book of the Pteridophyta of the Canary Islands (Ormonde, 1990).

Dennstaedtiaceae

Pteridium aquilinum (L.) Kuhn

Very common everywhere, especially in *Pinus canariensis* Sweet ex Spreng forest, between 350 and 1100 m.

Aspleniaceae

Asplenium aethiopicum (Burm. f.) Bech. subsp. *braithwaitii* Ormonde

It is recorded by some authors as existent even if localized, in the «subbasale» region of El Hierro, but we did not find it.

Ormonde (1990) considers this fern as a plant of conservation interest.

Asplenium onopteris L.

Not rare on the island, we found it in: between Valverde and Frontera, from 1100 to 1300 m, in *Pinus canariensis*, *Erica arborea* and *Laurus azorica* zone, many individuals on the rocks; between Valverde and Frontera, near El Castaño, ca. 400 m, some large specimens; San Andrés, in the laurisilva, between 1130 and 1300 m, copious on the rocks; Binto, going to Santuario de la Virgen de los Reyes, ca. 1150 m; Cruz de los Reyes, ca. 1320 m, on rocks, many beautiful tufts; Mirador de Jinama, ca. 1230 m, several specimens; Hoya de el Pino, ca. 1000 m, on the border of the forest, very common; between Valverde and San Andrés, in the laurisilva, ca. 1300 m, epiphytic on *Erica arborea*; between Jinama and Las Montañetas, ca. 900 m, in crevices of the rocks, copious; San Andrés, going to El Garoé, between 1000 and 1100 m, on the rocks, several tufts.

Asplenium anceps Lowe ex Hook. et Grev.

Page (1971) said that one specimen of this species appeared in the El Golfo area, ca. 1275 m, in the crevices of lava rocks.

This taxon is considered rare (R) by Ormonde (1990) and Hansen & Sunding (1993) do not include it in the flora of Canary Islands.

Asplenium obovatum Viv. subsp. *lanceolatum* (Fiori) P. Silva
(Sin. *Asplenium billotii* F.W. Schultz)

This plant is rare in El Hierro. We found it in these places: between Valverde and Tiñor, ca. 830 m, a tuft on a rock; between Jinama and Las Montañetas, ca. 900 m, copious in the most protected and humid zone.

This taxon is also catalogued by Ormonde (1990) as a rare plant (R) in the red-list of the Canary Islands pteridophytes.

Asplenium obovatum Viv. subsp. *obovatum* was once cited in this island (Hansen & Sunding, 1993), but with reserve.

Asplenium trichomanes L. subsp. *quadrivalens* D.E. Mey.

This taxon is scarce in Canary Islands and has been cited mainly at low altitudes.

We found it in: Binto, before the turn-off to Malpaso, ca. 1350 m, ten tufts on walls; Cruz de los Reyes, ca. 1320 m, rare, tufts on crevices of rocks; between Valverde and Frontera, ca. 1150 m, many scattered tufts on the rocks; between Jinama and Las Montañetas, ca. 900 m, some tufts on very humid rocks.

Asplenium marinum L.

We found only one locality of this very interesting taxon, it stands out due to the unusual altitude where it was growing: between Jinama and Las Montañetas, ca. 910 m, one station of ca. 1.50 m long in a zone wetted by NW ocean breeze.

Asplenium marinum is included in the red-list of the canarian pteridophytes as rare (R) by Ormonde (1990).

Asplenium hemionitis L.

Another taxon considered rare (R) in the red-list of the canarian pteridophytes (Ormonde, 1990).

We found it only in one place: San Andrés, El Garoé, ca. 1100 m, about 15 specimens in two little and very humid caves.

Ceterach aureum (Cav.) Buch subsp. *parvifolium* (Benl et G. Kunkel) Ormonde

Well distributed in El Hierro, sometimes forming very large populations: On the road between Valverde and Frontera, between 400 and 1150 m, on the rocks

and on the border of the laurisilva; Fuente de la Llania, ca. 750 m, some individuals on the walls and rocks; Frontera, after the village, ca. 500 m, one tuft on the rock; Between Frontera and San Andrés, at the border of laurisilva, ca. 1130 m, many specimens, some of them about 60 cm tall; Hoya de el Pino, at the border of the laurisilva, ca. 1100 m, few individuals on the rocks.

According to Ormonde (1990a) we found only the subsp. *parvifolium*, easily recognizable for its large spore size, in our specimens the spore size was (39)-47,56-(54) (m, obtained after measuring 100 spores.

Hansen & Sunding (1993) recorded for El Hierro *C. aureum* var. *aureum* only.

This taxon is considered by Ormonde (1990) as rare (R) in the red-list of the canarian pteridophytes too.

Athyriaceae

Athyrium filix-femina (L.) Roth

Recorded as rare in El Hierro (Benl, 1967; Hansen and Sunding, 1993), but we did not found it.

Cystopteris viridula (Desv.) Desv.

This plant is common only in humid areas (caves, laurisilva, etc.).

We found it in the following places: between Frontera and San Andrés, ca. 920 m, on the walls, several tufts; between Frontera and San Andrés, at the border of laurisilva, ca. 1130 m, several individuals on rocks; between El Pinar and La Restinga, near El Fayal,ca. 1300 m, at the border of laurisilva, several tufts; between Valverde and Frontera, ca. 1300 m, in laurisilva, very common on rocks; between Jinama and Las Montañetas, 910 m, several specimens on rocks in humid and cool zones; San Andrés, going to El Garoé, from 1000 to 1100 m, some tufts on walls; San Andrés, El Garoé, 1100 m, several specimens in the caves.

Dryopteridaceae

Dryopteris oligodonta (Desv.) Pic. Serm.

This wonderful fern is very common in the forests, with large populations.

We found *D. oligodonta* in these places: between Valverde and Frontera, from 400 to 1300 m, very common; Binto, going to Santuario de la Virgen de los Reyes, ca. 1150 m, some specimens in the meadows; Pedras de las Hermanas, ca. 1300 m, many specimens; Mirador de Jinama, ca. 1230 m, some plants in the woods; Hoya de El Pino, from 1000 to 1100 m, very abundant at the border of the laurisilva.

Polystichum setiferum (Forssk.) T. Moore ex Woyn.

Is also indicated in El Hierro, but we did not found it.

DISCUSSION

The present work, in our opinion, give an enough indicative idea about the pteridological flora of El Hierro, although further studies are needed. The isle is remarkable by itself because of the number of taxa that have been found and the interest of some of them. A census of 30 taxa (out of 54 existing in the whole archipelago), subdivided into 17 genera and 12 families, was made.

Particulary interesting is *Cheilanthes guanchica*, which is a species in danger about which Ormonde (1990) wrote: « Populações muito pouco conhecidas». Other remarkable species for their intrinsic rareness are *Vandenboschia speciosa* and *Asplenium hemionitis*.

Asplenium trichomanes subsp. *quadrivalens* has been always recorded at low altitudes in the Canary Islands, while, according to our observations, in El Hierro it is found up to 1350 m. *Asplenium marinum* is usually found at a low altitude (in continental Europe rarely over 100 m) and close to the sea, with the exception of only one French population, reported by Prelli & Boudrie (1992) from Mayenne, in which *A. marinum* is more than 60 Km far from the sea. The only locality we found in El Hierro is some kilometers far from the coast and about 910 m above sea level.

It is interesting to note that nine (26%) of the taxa living in El Hierro are in the red-list of canarian pteridophytes published by Ormonde (1990).

ACKNOWLEDGEMENTS

The authors thanks Mrs. Diana Lo Prete (Sumirago-Varese) for English translation.

REFERENCES

BENL, G. & SVENTENIUS, E. R. (1970). Beiträge zür Kenntnis der Pteridophyten-Vegetation und Flora der kanarischen Westprovinz (Teneriffe, La Palma, Gomera, Hierro). *Nova Hedwigia*, 20(3/4): 413-462.

FERRARINI, E., CIAMPOLINI, F., PICHI SERMOLLI, R. E. G. & MARCHETTI, D. (1986). Iconographia Palynologica Pteridophytorum Italiae. *Webbia*, 40(1): 1-202.

HANSEN, A. & SUNDING, P. (1993). Flora of Macaronesia. Checklist of vascular plants. 4. Revised Edition. *Sommerfeltia*, 17: 1-295.

HORN, K. & WELLS, W. (1996). Bibliography for the pteridophyte flora of Macaronesia. *Vieraea*, 25:89-101.

ORMONDE, J. (1990). Pteridofitos endemicos, raros ou amenaçados das Ilhas Macaronesicas. *Fontqueria*, 28:5-12.

ORMONDE, J. (1990a). O genero *Ceterach* Willd. nas Ilhas Macaronésicas. In RITA J. (Ed.), Taxonomia, Biogeografia y Conservaciòn de Pteridofitos, *Soc. Hist. Nat. Bal. IME*, pp. 157-170.

ØLLGAARD, B. & TIND, K. (1993). Scandinavian ferns. *Rhodos*, 317 pp.

PAGE, C. N. (1965). Studies on the pteridophyte flora of Canary Islands. In *Expedition to Gomera and Hierro (Canary Islands)*: 52-57.

PAGE, C. N. (1971). Three pteridophytes new to Canary Islands. *Brit. Fern Gaz.*, 10(4): 205-208.

PAGE, C. N. (1977). An ecological survey of the fern of the Canary Islands. *Fern Gaz.*, 11(5): 297-312.

PAGE, C. N. (1997). The ferns of Britain and Ireland. Second Edition. *Cambridge University Press*, Cambridge, 540 pp.

PICHI SERMOLLI, R. E. G. (1977). Tentamen Pteridophytorum genera in Taxonomicum ordinem redigendi. *Webbia*, 31: 313-512.

PICHI SERMOLLI, R. E. G. (1996). Authors of scientific names in Pteridophyta. *Royal Botanic Gardens*, Kew, 78 pp.

PIGNATTI, S. (1982). Flora d'Italia. Vol. 1. *Edagricole*, Bologna, 790 pp.

PRELLI, R. & BOUDRIE, M. (1992). Atlas écologique des fougères et plantes alliées. *Lechevalier*, Paris, 272 pp.

TUTIN, T. G., BURGES, N. A., CHATER, A. O., EDMONDSON, J. R., HEYWOOD, V. H., MOORE, D. M., VALENTINE, D. H., WALTERS S. M. & WEBB, D. A. (Eds.) (1993). Flora Europaea. Vol. 1: Psilotaceae to Platanaceae. Second edition. *Cambridge University Press*, Cambridge, 581 pp.

Original recibido: 9 de Agosto de 2000
Versión final recibida: 6 de Junio de 2001