

# *On the Pteridophytes of La Gomera (Canary Islands)*

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During a one-man collecting tour on La Gomera (Western group of the Canary Islands), 56 specimens of ferns were collected. The resulting 26 species, of which 4 species are new to the flora of that island, includes *Dryopteris* cf. *dilatata*, a new species to the Canaries altogether. 5 other species, mentioned by previous collectors but not found during my few days on La Gomera, are also enumerated in the list which follows below.

## *Previous records:*

WEBB et BERTHELOT (1836-50) cite 4 species of pteridophytes from La Gomera. C. BOLLE (1863-66) gives 7 species whereas J. BORNMUPELLER (1904) mentioned only (?) one single species. PITARD et PROUST (1908) recorded 15 species, a number enlarged by LINDINGER (1926) to 23. K. LEMS (1960) summarizes a total of 25 species. A report of Newcastle-upon-Tyne University (PAGE 1965) mentioned 12 species collected on that island.

## *Excursions:*

- 8.8.1967 -- coastal cliffs near San Sebastian:  
idem -- Barranco de la Villa, La Laja.
- 9.8.1967 -- Bosque El Cedro.
- 10.8.1967 -- Agulo, Vallehermoso - Palmita.
- 11.8.1967 -- Cumbre de Juan Tomé - La Carbonera; Carretera Central, Kms. 13 - 10.

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## ENUMERATION OF SPECIES

### SELAGINELLACEAE

- 1 *Selaginella denticulata* (L.) Link, Fil. Sp. 159 (1841)  
(*Lycopodium denticulatum* L.)  
El Cedro, Dco. la Barrera, 750 m, on moist banks, common (Ku 11490); La Carbonera, 720 m, on banks below trees, frequent (Ku 11562). Noted also from La Laja, 550 m.  
Other localities: Los Loros; above Hermigua (LINDINGER).  
Lind. 1926: 327; Lems 1960: 9; Page 1965: 54.

### EQUISETACEAE

- 2 *Equisetum ramosissimum* Desf., Fl. Atl. 2: 398 (1799)  
Barranco La Laja, 550 m, edge of streambed and among wet rocks (Ku 11479a); seems to be rare.  
Other localities: near Hermigua (LINDINGER); Vallehermoso and Agulo (PITARD).  
Pit. & Pr. 1908: 413; Lind. 1926: 317; Lems 1960: 9.

### SINOPTERIDACEAE

- 3 *Cheilanthes fragrans* (L.f.) Swartz ssp. *maderensis* (Lowe) Benl, Mitt. Bot. Staatssamml. München 6: 33 (1966).  
(*Cheilanthes maderensis* Lowe)  
(*Cheilanthes pteridioides* [Reichb.] C. Chr.)

Mentioned by BOLLE 1863: 316 (Bourgeau) from Bco. La Laja. WEBB & BERTH. cite Realejos (Bourgeau), a locality which is situated on Tenerife. The records still remain doubtful.

W & B 1836: 453 (as *C. fragrans* Nob.); Bolle 1863: 316; Lind. 1926: 322 (as *C. fragrans* var. *maderensis* Lowe).

- 4 *Cheilanthes pulchella* Bory ex Willd., Sp. Pl. 5: 456 (1810)

(*Cheilanthes maderensis* of Lems)

(*C. fragrans* [L.] Hook var. *pulchella* [Bory] Kze.)

Barranco La Laja, 500 - 600 m, on dry cliffs, common (Ku 11483), with fronds up to 23 cm long; Rocks above Carretera Central, Km 10 (Ku 11539), with *Notholaena marantae*.

Lems 1960: 11 (as *C. maderensis* Lowe)

- 5 *Notholaena marantae* (L.) R.Br., Journ. Bot. appl. 1: 92 (1813)

(*Acrostichum marantae* L.)

(*Gymnogramma marantae* [L.] Mett.)

(*Cheilanthes marantae* [L.] Domin)

(*Gymnopteris marantae* [L.] Ching)

including ssp. *subcordata* (Cav.: *Acrostichum subcordatum*)

Along old road Vallehermoso to Palmita, 520 m, on rocks (Ku 11525), rare; Rocks above Carretera Central, Km 10 (Ku 11538), with *Cheilanthes pulchella*. This species was found to be very common on dry cliffs above the tunnel (Km 12) towards the Cumbre de Juan Tomé.

Other localities: Barranco del Agua, and Hermigua (BOLLE, LINDINGER); Agulo (LINDINGER); Cumbre de Carbonera (PITARD).

W. & B. 1836: 455 (as *Nothochlaena marantae*); Bolle 1863: 317; Pit. & Pr. 1908: 403; Lind. 1926: 324 (as *N. marantai*); Lems 1960: 12.

- 6 *Notholaena velleu* (Ait.) Desv., Journ. Bot. appl. 1: 93 (1813)

(*Acrostichum velleum* Ait.)

(*Notholaena lanuginosa* [Desf.] Desv.)

(*Cheilanthes catanensis* [Cosent.] Fuchs).

PITARD mentioned "Barranco de la Concepción, prés San Sebastián".

Pit. & Pr. 1908: 404 (as *Nothochlaena vellea* Desv.); Lems 1960: 12.

#### ADIANTACEAE

- 7 *Adiantum capillus - veneris* L., Sp. Pl. 1096 (1753)  
Barranco La Laja, 550 m, wet walls and channcls (Ku 11479). Seen along Central Road (wet patches, Km 10); in tunnel (Km 13); in Vallehermoso, Agulo, and even in San Sebastian (irrigation channels); never noticed in high forest.  
Lind. 1926: 318; Lems 1960: 11.
- 8 *Adiantum reniforme* L., Sp. Pl. 1094 (1753).  
On cliffs at Km 10, Central Road (Ku 11540); isolated colonies.  
Other localities: Wall near waterfall above Hermigua (LINDINGER); Fuente Blanca (PITARD), BORN-MUELLER); Bco. de la Concepción (PITARD).  
Bornm. 1904: 390; Pit. & Pr. 1908: 410; Lind. 1926: 319; Lems 1960: 11.

#### PTERIDACEAE

- 9 *Pteris arguta* Ait., Hort. Kew. 3: 458 (1789)  
(*Pteris serrulata* Auct.)  
El Cedro, common in wet ravines from 700 to above 1000 m, fronds up to 2 m long (Ku 11485); La Carbonera, 700 - 800 m, quite common in dense woods, with fronds longer stalked and more triangular (Ku 11547); Ku 11513 from El Cedro, 900 m (in drier woods) shows extreme irregular morphological development.  
Other localities: Above Hermigua, Arramaqué (LINDINGER); Fuente Santa (PITARD).  
Pit. & Pr. 1908: 410; Lind. 1926: 326; Lems 1960: 12; Page 1965: 54 (as *P. serrulata*).  
Note: According to *Flora Europaea* 1: 11 (1964) the correct name for our species is *P. serrulata* Forsk., Fl. Aegypt. 187 (1775).
- 10 *Pteris vittata* L., Sp. Pl. 1074 (1753)  
(*Pteris longifolia* auct. can. non L.)  
Occasionally on sunny but wet walls along Carretera Central, Km 10 - 12, 450 - 500 m (Ku 11522), with

*Adiantum capillus-veneris*.

Other localities: Bco. La Laja (BOLLE); Bco. Aguajilva towards Cumbre, above Hermigua, woods of Arramaqué (LINDINGER); Lomo de Fragoso, Agulo (PI-TARD).

Bolle 1863: 311; Pit & Pr. 1908: 410; Lind. 1926: 327; Lems 1960: 12, all as *P. longifolia* L.

#### GYMNOGRAMMACEAE (Hemionitidaceae)

- 11 *Anogramma leptophylla* (L.) Link, Fil. Sp. 137 (1841)  
(*Polypodium leptophyllum* L.)  
(*Gymnogramme leptophylla* [L.] Desv.)

Not found as summer was too far advanced. LINDINGER cites localities above Hermigua and woods of Arramaqué.

Lindinger 1926: 324 (as *Gymnogramme*); Lems 1960: 11.

#### DENNSTAEDTIACEAE (Hypolepidaceae)

- 12 *Pteridium aquilinum* (L.) Kuhn in Decken, Reis. Ost Afr., Bot. 3 (3): 11 (1879)  
(*Pteris aquilina* L.)

Common species of Gomera, in woods and on more open slopes. As on other Canary Islands, plants of moist woodlands are tripinnate, herbaceous, and may attain a height of 2 m whereas communities on open slopes rarely exceed 40 or 50 cm in height, with coriaceous, triangular-shaped fronds which are bipinnate only (bipinnatifid).-El Cedro, 950 m, plants 1,5 m tall (Ku 11508); La Carbonera, 720 m (Ku 11564); La Laja, 550 m, rocky slopes (Ku 11482).

Bolle 1863: 305 (as *Pteris aquilina*); Pit & Pr. 1908: 409 (idem); Lind. 1926: 326 (as var. *lanuginosum* [Bory] Luer. of *Pteridium*); Lems 1960: 12; Page 1965: 54.

#### DAVALLIACEAE

- 13 *Davallia canariensis* (L.) J.E.Sm., Mém. Acad. Sci. Turin 5: 414 (1793).  
(*Trichomanes canariensis* L.)

On rocks and roots, old road Vallehermoso to Palmita, 520 m; with new fronds here (Ku 11527), in other locali-

ties still dormant (La Laja, Km 10 Central Road, Agulo). La Carbonera, 750 m. epiphytic (Ku 11552). Other localities: above Hermigua, betw. Chipude and Granrey, Garajonai, Agulo (LINDINGER); Fuente Santa (PITARD).

Pit. & Pr. 1908: 408; Lind. 1926: 323; Lems 1960: 10; Page 1965: 54.

#### HYMENOPHYLLACEAE

- 14 *Hymenophyllum tunbrigense* (L.) J.E.Sm. in Sowerby, Engl. Bot 3, t.162 (1794)  
(*Trichomanes tunbrigense* L.)

Mentioned by PAGE 1965: 54 ("epiphytically").

#### TRICHOMANACEAE (Hymenophyllaceae)

- 15 *Vandenboschia speciosa* (Willd.) Kunkel, Ber. Schweiz. Bot. Ges. 76: 48 (1966)  
(*Trichomanes speciosum* Willd)  
(*T. radicans* Auct.)

El Cedro, Barranco de Matarnos, about 1000 m, on dark moist banks in narrow ravine; fronds up to 30 cm long. New record for Gomera!

#### THELYPTERIDACEAE

- 16 *Cyclosorus dentatus* (Forsk.) Ching, Bull. Fan Mem. Inst. Biol. (Peking), Bot. 8: 206 (1938)  
(*Polypodium dentatum* Forsk.)  
(*Dryopteris dentata* [Forsk.] C. Chr.)  
(*Lastrea dentata* Romariz)  
(*Thelypteris dentata* [Fork.] St. John)  
(*Dryopteris mollis* Auct.)

Barranco near Agulo, 160 m, on wet cliffs and between moist or drier rocks; locally abundant; fronds up to 70 cm long (Ku 11524).

Other localities: Bco. La Laja, Valle de San Sebastian (BOLLE); Woods of Arramaqu , Hermigua (LINDINGER, PITARD).

W & B 1836: 437; Bolle 1864: 224; Pit & Pr. 1908: 405; Lind. 1926: 320 (all as *Aspidium molle* Sw.); Lems 1960: 9 (as *Dryopteris dentata*).

## ASPLENIACEAE

- 17 *Asplenium hemionitis* L., Sp. Pl. 1078 (1753)  
(*Asplenium palmatum* Auct.)  
El Cedro, on cliffs in laurel wood (rare) or on ground in forest, 950 m (Ku 11509).  
Other localities: Wood above Hermigua (LINDINGER).  
f. *pinnatipartitum* Kunkel, El Museo Canario 93-96: 10 (1966) with irregularly divided or crested segments; more common than typical form (Ku 11509a).  
Lind. 1926: 321; Lems 1960: 10; Page 1965: 54.
- 18 *Asplenium onopteris* L., Sp. Pl. 1081 (1753)  
(*A. acutum* Bory; *A. productum* Lowe)  
(*A. adiantum-nigrum* L. ssp. *onopteris* [L.] C. Chr.)  
Referring to the two main forms of this species, *A. onopteris* is divided here as follows:  
var. *onopteris*.  
typical form, very long stipes, pinnae and segments long and narrow, pinnae usually curved towards the apex.  
Barranco La Laja, 550 m, on dry walls (40 cm. tall: Ku 11475); El Cedro, 1000 m, in laurel wood, 75 cm tall (Ku 11503).  
Other localities: Near to Hermigua (LINDINGER, PITTARD).  
var. *triangularis* Kunkel var. nov.  
*Varietas ex affinitate var. onopteris sed differt pinnae et pinnulae caudatae. Lamina deltoideo - triangulare: pinnae ovaliformes vel oblonges non incurvates.*  
*Typus*: Ku 11555, Canary Islands, La Gomera: La Carbonera 750 m, in Laurel woodland; El Museo Canario.  
The differences between the two varieties are established here to point out two main forms of the vast complex which *Asplenium onopteris* presents on Macaronesian islands. Furthermore, as the presence of the true *Asplenium adiantum-nigrum* has not been confirmed (cytologically) for the Canaries, and as var *triangularis* comes very near to *A. Adiantum-nigrum*, such differentiation was necessary. Although no plants have been collected by the author on La Gomera which might be suspected as being *A. adiantum-nigrum* L., this species seems to be present on the eastern islands of the archipelago.  
El Cedro, la Barrera 750 m, 35 cm tall (Ku 11488); El Cedro, in laurel woodland, 1000 m, 65 cm tall (Ku

11504); Vallehermoso - Palmital, 600 m, in open *Erica*-bushland, plants only 12 to 20 cm tall (Ku 11535); same locality but 720 m, in open bush (Ku 11565).

Literature referring to the species (generally as *A. adiantum-nigrum*): Pit & Pr. 1908: 407; Lind. 1926: 320; Lems 1960: 9; Page 1965: 54.

- 19 *Asplenium trichomanes* L., Sp. Pl. 1080 (1753).  
(*Asplenium anceps* v. Buch)  
s/n. Barranco de Barrera (El Cedro), 750 - 800 m.; rare.  
Other locality: Woods of Arramaqué (LINDINGER).  
Lind. 1926: 322; Lems 1960: 10; Page 1965: 54.
- 20 *Ceterach aureum* (Cav.) v. Buch, Abh. Akad. Wiss. Berlin 1816-17: 361 (1819).  
(*Acrostichum aureum* Cav. non L.)  
(*Asplenium aureum* Cav.)  
(*Ceterach officinarum* var. *aureum* Menezes)  
Cumbre de Juan Tomé, on cliffs, 800 m, rare (Ku 11546); fronds up to 25 cm long.  
Other localities: Above Hermigua (BOLLE); Cumbre de Carbonera (PITARD).  
Bolle 1864: 25; Pit. & Pr. 1908: 403; Lind. 1926: 320 (as *Asplenium aureum* Cav.); Lems 1960: 10.

#### ATHYRIACEAE

- 21 *Cystopteris diaphana* (Bory) Blasdell, Mem. Torrey Bot. Club 21 (4): 47 (1963).  
(*Polypodium diaphanum* Bory)  
(*Cystopteris fragilis* Auct.)  
(*C. canariensis* Presl)
- El Cedro, Barranco de Matarnos, 1000 m, in dark and damp ravine, quite common (Ku 11499); fronds over 50 cm long. Noted also from Agulo, 160 m; and La Carbonera, 730 m.  
Other localities: Near Hermigua, woods of Arramaqué (LINDINGER). Ku 11514 from El Cedro, 950 m, common on rocks in stream, seems to be an intermediate form between the two species mentioned.  
Lind. 1926: 323 (as *C. fragilis* var. *canariensis* Willd.); Lems 1960: 9, and Page 1965: 54 give *C. fragilis*.
- 22 *Cystopteris fragilis* (L.) Bernh. in Schrad. N. Journ. Bot. 1 (2): 27 (1806).  
(*Polypodium fragile* L.)



El Cedro, Barranco la Barrera, 750 m, in moist ravine, common but perhaps often mixed with *C. diaphana*; Ku 11489.

Although the borderline drawn by BLASDELL (1963) between *Cystopteris fragilis* s. str. and the preceding species generally is rather unsatisfactory, our 11489 seems to be a *C. fragilis*. Regarding previous records as referring to *C. diaphana*, this record is therefore a new species for Gomera.

- 23 *Athyrium filix-femina* (L.) Roth, Tent. Fl. Germ. 3 (1): 65 (1799)

*Polypodium filix-femina* L.  
(*Asplenium filix-femina* Bernh.)

El Cedro, Bco. La Barrera, 750 m. in moist ravine (Ku 11491); plants 1 m tall. La Carbonera, 720 m, in moist but more open woods (Ku 11561). Noted also from above Palmita, 400 m, and from Agulo, 160 m.

Other localities: Woods of Arramaqué, above Hermigua (LINDINGER).

Lind. 1926: 322; Lems 1960: 9; Page 1965: 54.

- 24 *Athyrium umbrosum* (Ait.) Presl, Tent. 98 (1836).

(*Polypodium umbrosum* Ait.)  
(*Allantodia umbrosa* Kaulf.)  
(*Aspidium umbrosum* Swartz)  
(*Asplenium umbrosum* J. Sm.)  
(*Diplazium caudatum* [Cav.] Jermy)

El Cedro, Bco. de Matarnos, 950 m, dark and moist ravine (Ku 11493); locally abundant. La Carbonera, 720 m, in climax wood, quite common (Ku 11560); plants up to 1,8 m tall with very large sori.

Other localities: Above Hermigua, woods of Arramaqué (LINDINGER).

Pit & Pr. 1908: 406; Lind. 1926: 322; Lems 1960: 9; Page 1965: 54.

#### ASPIDIACEAE

- 25 *Dryopteris maderensis* (Milde) Alston, Bol. Soc. Broter., sér. 2, 30: 14 (1956).

(*Dryopteris spinulosum* f. *maderense* Milde)

El Cedro, Barranco de Matarnos, 950 m, in deep ravine,

rare; plants 1 m tall (Ku 11495). 11496 presents a young plant from the same locality.  
New record for Gomera!

- 26 *Dryopteris oligodonta* (Desv.) Pic.-Serm., Webbia 8: 150 (1951)

(*Aspidium oligodonton* Desv.)  
(*Aspidium elongatum* sensu Willd.)  
(*Aspidium canariense* A. Br.)  
(*Dryopteris filix-mas* Auct.)

Common woodland fern, up to 1,5 m tall. El Cedro, La Barrera, 750 m (Ku 11484); idem (11487, pinnae only); La Carbonera, 780 m, in laurel wood (Ku 11550). Noted also from Agulo, 160 m.

Lind. 1926: 319 (? as *Aspidium canariense* ?) Lems 1960: 9 (as *Dryopteris filix-mas* ssp. *oligodonta*); Page 1965: 54 (mentioned "three or four species of *Dryopteris*").

- 27 *Dryopteris* cf. *dilatata* (Hoffm.) A. Gray, Man. Bot. North. U.S. 631 (1848)

(*Dryopteris autriaca* Auct.)

The material has been classified by Mr. J. CRABBE (BM), and spores have been sent to C.N. PAGE (Newcastle University) for cytological investigations.

La Carbonera, 720 m, in laurel wood; locally abundant, plants up to 1 m tall (Ku 11557-58-59).

New record for Macaronesia!

- 28 *Polystichum setiferum* (Forsk.) Moore ex Woyнар, Mitt. Naturw. Ver. Steierm. 49: 181 (1913).

(*Aspidium aculeatum* Auct.)  
(*Polystichum angulare* [Kit. ex Willd.] Presl)

Common in parts of the laurel woodland, highly variable.

El Cedro, Bco. de Matarnos, 1000 m (Ku 11494), plants 1 m tall; La Carbonera, 800 m (Ku 11549), likewise typical material. Ku 11498 from El Cedro, 1000 m, young fronds only; La Carbonera, 720 m (Ku 11553), fronds 50 cm long but sterile.

As in almost every part where the genus occurs, the species presents a complex of different but taxonomically difficult forms. My numbers 11498 and 11553 are rather similar to *Polystichum aculeatum* (L.) Roth but as the material is not fertile, no sure decision can be made.

Ku 11554 from La Carbonera, 700 m, shows transition to 11502 (see variety); fronds 105 cm long.

Other localities: Between Agulo and Vallehermoso, near to Hermigua, woods of Arramaqué (LINDINGER). Lind. 1926: 319 (as *Aspidium aculeatum* [L.] Döll var. *angulare* (Sw.) G. & G); Lems 1960: 9; Page 1965: 54.

cf. var. *hastulatum* (Ten.) Hayek, Prodr. Fl. Penins. Balc. 1: 29 (1927).

Frond 80-100 cm tall, 30 cm wide; tripinnatisect. El Cedro, Barranco de Matarnos, 1000 m, in dark ravine (Ku 11502).

### BLECHNACEAE

- 29 *Blechnum spicant* (L.) Roth, Ann. Bot. (Usteri) 10: 56 (1794).

(*Osmunda spicant* L.)  
(*Lomaria spicant* Desv.)

Barranco la Madera (towards El Cedro), 800 m, on banks; rare but may be common on higher slopes (Ku 11515). La Carbonera, 720 m (Ku 11563); large colonies on mossy slopes and banks; fertile fronds up to 50 cm long.

Other localities: Fuente Santa (BOLLE, PITARD); Cumbre de Laguna Grande (PITARD).

W & B 1836: 448; Bolle 1863: 325 (both as *Lomaria spicant*); Pit & Pr. 1908: 409; Lems 1960: 10.

- 30 *Woodwardia radicans* (L.) J. E. Sm., Mem. Acad. Sci. Turin 5: 412 (1793).

(*Blechnum radicans* L.)

Common in moist ravines. El Cedro, 700 - 1100 m (Ku 11486); fronds may attain a length of up to 3 m. La Carbonera, 750 m, very large fronds (Ku 11548), with pinnae up to 50 cm long.

Other localities: Wood above Vallehermoso (LINDINGER); Agulo (PITARD).

Bolle 1863: 326; Pit. & Pr. 1908: 402 (as *W. radicans* Cav. f. *erosa* Kaulf.); Lind. 1926: 327; Lems 1960: 10; Page 1965: 54 ("fronds attaining twelve to fourteen feet...").

## POLYPODIACEAE

- 31 *Polypodium macaronesicum* A. Bobr., Bot. Journ. (USSR) 49 (4): 540 (1964).

(*Polypodium vulgare* ssp. *serratum* [Willd.] Christ)

(*P. vulgare* var. *teneriffae* Milde)

(*P. australe* Fée, pro parte)

Critical species of still uncertain taxonomic position. If *Polypodium macaronesicum* and *P. australe* are found to be clearly separable, both species are to be expected in our area.

La Carbonera, 800 m, on mossy roots; fronds up to 50 cm long (Ku 11551). Seen, with smaller fronds, on rocks in the Bco. La Laja; old road Vallehermoso - Palmita; El Cedro.

Other localities: Southern slopes of Garajonai, above Hermigua (LINDINGER); Bco. de Aguajilva (PI-TARD).

Pit. & Pr. 1908: 405 (as *P. vulgare* L. et vars.); Lind. 1926: 325 (as *P. vulgare* var. *serratum* [Willd.] Webb); Lems 1960: 11 (as *P. serratum* Milde); Page 1965: 54 ("... and a variety of forms of *Polypodium*...").

### Species to be expected on La Gomera

The following 4 taxa have not actually been found on La Gomera. But as the mentioned species are growing on the neighboring islands where ecological conditions are similar, they may very well occur.

*Asplenium aethiopicum* (Burm.) Becherer ssp. *canariense*.

*Culcita macrocarpa* Presl

*Dryopteris aitoniana* Pic. - Serm.

*Ophioglossum lusitanicum* L.

### Summary

The present enumeration of the pteridophytes of La Gomera (Canary Islands) records a total of 31 species. A list of 4 species to be expected is also given.

*Vandenboschia speciosa*, *Cystopteris fragilis* s. str., and *Dryopteris maderensis* are new for the flora of La Gomera;

*Dryopteris* cf. *dilatata* is a new record for the Canary flora in general. *Asplenium onopteris* L. has been divided into two varieties: var. *triangularis* is described as a new subtaxum.

#### Resumen

*Sobre los pteridofitos de La Gomera, Islas Canarias:*

La enumeración presente, resultado de una excursión de 4 días (8 días con el viaje), suma un total de 31 especies de helechos y helecho-aliados. De éstas, 4 especies no han sido encontradas por el autor, pero se menciona la literatura respectiva.

*Vandenboschia speciosa*, *Cystopteris fragilis* s. str. y *Dryopteris maderensis* resultaron nuevas para la flora de dicha isla; *Dryopteris* cf. *dilatata* es una especie nueva para la flora del archipiélago en general. De *Asplenium onopteris* L. se describe una nueva variedad: var. *triangularis*.

#### Literature

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*La vegetación de América del Norte y Central, incluyendo las islas de Hawaii,*  
por el Prof. Dr. R. Knapp del Instituto Botánico de Giessen, Alemania. Es el volu-  
men I de las *Monografías*, editadas (y con introducción) por el Prof. Dr. H. Walter.  
Una obra bien presentada por el editorialista científico G. Fischer, tratando los com-  
plejos múltiples de la vegetación de América del Norte de Panamá.—Aunque acom-  
pañado por un índice de obras citadas de 42 páginas, con más de 1.200 publicaciones,  
se nota la experiencia personal del autor en cada página: Resultado de estudios rea-  
lizados durante más de diez años.

En la construcción de la obra el autor trata la estructura de la vegetación:  
bajo las condiciones macro-climáticas y del suelo, las regiones florísticas particula-  
res, y una reconstrucción del posible desarrollo de la vegetación actual desde la  
época terciaria. Considerando la variedad de los paisajes del área tratado (—selvas  
tropicales, estepas, desiertos, bosques templados y tundras árticas—), esta obra ofre-  
ce un resumen extraordinario. Cada formación superior se presenta por un "esque-  
leto" de su estructura y se divide de acuerdo con sus subformaciones florísticas. Lis-  
tas de las especies más importantes y citas bibliográficas completan estos capí-  
tulos, cuyo estudio muchas veces, es facilitado, gracias a mapas y diagramas.  
Cada capítulo, además, trata de las influencias antropógenas en cuanto a cambios  
estructurales causados; se considera también las nuevas tendencias de trabajos fores-  
tales.

En resumen es fácil decir que esta obra es de suma importancia para el cono-  
cimiento geográfico, botánico, ecológico y para los forestales en general, naturalmen-  
te en especial para los técnicos americanos. Sería deseable que una segunda edición  
posible esté más ampliamente ilustrada (la edición presente contiene sólo 8 láminas  
con 20 fotografías). Considerando el amplio índice de literatura se recomienda citar  
sólo obras publicadas o en impresión. los manuscritos no publicados permanecerán  
mejor en la memoria del autor.

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