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The genus *Cladonia* in Garajonay National Park, La Gomera, Canary Islands

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Abstract – Twenty-four taxa of the genus *Cladonia* were found in the Garajonay National Park (La Gomera Island, Spain). *C. chlorophaea, C. decorticata, C. hammeri*, *C. humilis, C. phyllophora, C. portentosa* and *C. subcervicornis* are new records for La Gomera Island. *C. macilenta* is new for the Canary Islands. *C. glauca* and *C. prolifica* are new for Macaronesia. An identification key is published.

***Cladonia* / lichens / Garajonay National Park / Canary Islands / Spain**

Resumen – Se comentan 24 taxones pertenecientes al género *Cladonia*, para los que se aporta una clave sistemática. Las muestras se recolectaron en el Parque Nacional de Garajonay en la isla de La Gomera. Constituyen novedades corológicas para la isla: *C. chlorophaea, C. decorticata, C. hammeri*, *C. humilis, C. phyllophora, C. portentosa* y *C. subcervicornis.* Se cita por primera vez para las Islas Canarias *C. macilenta*, y para el conjunto de la Macaronesia *C. prolifica* y *C. glauca.*

***Cladonia* / líquenes / Parque Nacional Garajonay / Islas Canarias / España**

INTRODUCTION

The National Park of Garajonay, is located in La Gomera Island which belongs to the Canary Islands archipelago. It was declared National Park 25th March 1981, and in 1986 nominated UNESCO World Heritage as an area of great importance for conservation of natural resources and recognition of cultural Gomerans heritage.

The territory has a surface of 3.986 Ha which represents 10% of the island. It is located in the middle of the island, and protects the remains of the ancestral Tertiary subtropical laurel forest, namely "monteverde canario", largely disappeared from southern Europe and northern Africa. The National Park has a great diversity of ecosystems housing numerous endemic species (25% of vascular plants and 55% of the fauna). It has a rugged topography shaped by volcanism

and extreme weather. Altitudes vary from 750 m to 1487 m in the peak Alto de Garajonay.

Two reports suggest that the knowledge of lichen species in the islands is high (Hernández-Padrón, 2004; Sicilia, 2007) and listed 437 taxa. The genus *Cladonia* has the highest number of cited species (33). This work is part of the *Cryptogamic Biodiversity of Garajonay Project* (Spain´s National Parks and La Laguna University Tenerife).

MATERIALS AND METHODS

This work is based on 178 freshly-collected specimens in all the environmental unities defined in the Park and deposited in TFC herbarium (La Laguna University), and some duplicates are in the MACB (Madrid Complutense University). The species were performed by their morphological and chemical characters. TLC analysis was performed from acetona extracts according to standarized procedures (White & James, 1985). The symbols are: * new for La Gomera, □ new for Canary Islands.

List of localities: **L3:** Cerca del Mirador de Vallehermoso, 15-IV-2000, 1100 m, E 279700-N 3116540, *C. Hernández & D. Sicilia*. **L4:** Cabezo de Pajarito, 15-IV-2000, 1400 m, E 280020-N 3111010, *C. Hernández & D. Sicilia.* **L5:** Hoya del Vaquero, 15-IV-2000, 1400 m, E 279450-N 3110270, *C. Hernández & D. Sicilia.* **L7:** Pinar de Igualero, 15-IV-2000, 1350 m, E 278740-N 3110620, *C. Hernández & D. Sicilia.* **L8:** Sendero desde Contadero a Laguna Grande, 15-IV-2000, 1100 m, E 280500-N 3112700, *C. Hernández*, *D. Sicilia & J. Etayo.* **L12:** Alto de Cherelepín, 17-X-1999, 1310 m, E 279110-N 3112610, *C. Hernández & P. Pérez.* **L17:** Cruce de las Hayas-Jardín de las Creces, 13-10-2000, 1000 m, E 275500-N 3114500, *D. Sicilia.* **L20:** Inmediaciones de Laguna Grande, I-2001, 1240 m, E 278670-N 3113020, *C. Hernández & P. Pérez.* **L21:** En dirección a El Cercado (inmediaciones de Laguna Grande), I-2001, 1220 m, E 278550-N 3112850, *C. Hernández & P. Pérez.* **L22:** Epina (Lomo del Carretón), I-2001, 950 m, E 274960-N 3117310, *C. Hernández & P. Pérez.* **L26:** Cumbres de Tajaqué, I-2001, 1270 m, E 282040-N 3111080, *C. Hernández & P. Pérez.* **L28:** Pista al Alto de Garajonay, I-2001, 1440-1430 m, E 279370-N 3111370, *C. Hernández & P. Pérez.* **L29:** Apartacaminos, I-2001, 1020 m, E 274210-N 3116080, *C. Hernández & P. Pérez.* **L32:** Inmediaciones de Degollada Fría, III-2001, 1150 m, E 276770-N 3113440, *C. Hernández & P. Pérez.* **L36:** Cumbres de Arure (Cabecera del Barranco), V-2001, 1000 m, E 273600-N 3115860, *C. Hernández & P. Pérez.* **L57:** Cerca del raso del Quebradón, 19-II-2002, 1038 m, E 281960-N 3114910, *D. Sicilia*. **L58:** Sendero hacia el Tión, 19-II-2002, 1040 m, E 279500-N 3116500, *D. Sicilia*. **L62:** Entre Fuensanta y el Mirador de Vallehermoso, 19-II-2002, 1025 m, E 278960-N 3116180, *D. Sicilia*. **L65:** Las Cancelas, 19-II-2002, 1300 m, E 278910-N 3112100, *D. Sicilia*. **L69:** Próxima al cruce de La Zarcita, 19-II-2002, 1230 m, E 282290-N 3111920, *D. Sicilia.* **L70:** Degollada del Tanque, III-2002, 1015 m, E 282822-N 3110893, *C. Hernández & P. Pérez.* **L73:** Roque de La Zarcita (Cima), III-2002, 1230 m, E 282394-N 3111593, *C. Hernández & P. Pérez.* **L74:** Roque de La Zarcita (Base), III-2002, 1180 m, E 282259-N 3111563, *C. Hernández & P. Pérez.* **L77:** Sobre Los Loros. Vallehermoso, 19-III-2002, 900 m, E 278543-N 3115970, *C. Hernández & P. Pérez.* **L80:** Entre Tajaqué y Pajarito, 19-III-2002,

1320 m, E 280456-N 3110980, *C. Hernández*, *P. Pérez*, *D. Sicilia* & *I. Pérez*. **L81:** Montaña de Las Negrinas, 19-III-2002, 1200 m, E 280352-N 3110285, *C. Hernández*, *P. Pérez*, *D. Sicilia* & *I. Pérez*. **L83:** Espigón de Ibos (Ibosa), 19-III-2002, 1000 m, E 283738-N 3113112, *C. Hernández*, *P. Pérez*, *D. Sicilia* & *I. Pérez*. **L85:** Ladera izquierda del Barranco de La Laja, 19-III-2002, 900 m, E 284344-N 3112556, *C. Hernández*, *P. Pérez*, *D. Sicilia* & *I. Pérez*. **L87:** Cumbre del Carbonero (2), 19-III-2002, 900-1000 m, E 284616-N 3113549, *C. Hernández*, *P. Pérez*, *D. Sicilia* & *I. Pérez*. **L90:** Pista de Los Aceviños, sobre el caserío de El Cedro, IX-2002, 1000 m, E 282171-N 3114651, *C. Hernández* & *P. Pérez*. **L93:** Sobre Benchijigua e Imada, IX-2002, 1225 m, E 280419-N 3109864, *C. Hernández* & *P. Pérez*. **L97:** Lomo de Costal, IX-2002, 1000 m, E 280950-N 3115200, *L. Sánchez-Pinto*. **L98:** Cerca de la Montaña de Las Cuevas, IX-2002, 1050 m, E 280930-N 3114500, *L. Sánchez-Pinto*. **L99:** Cañada de Jorge (3), IX-2002, 950 m, E 274300-N 3115500, *L. Sánchez-Pinto*. **L105:** Inmediaciones de Degollada Fría, XII-2002, 1150-1175 m, E 276500-N 3113500, *C. Hernández* & *P. Pérez*. **L107:** Los Acebiños, XII-2002, 950 m, E 281900-N 3114663, *C. Hernández* & *P. Pérez*. **L110:** Lomo del Carretón (1), XII-2002, 1000 m, E 273837-N 3117045, *C. Hernández* & *P. Pérez*. **L111:** Lomo del Carretón sobre Alojera (2), XII-2002, 950 m, E 273964-N 3117040, *C. Hernández* & *P. Pérez*. **L112:** Degollada Blanca entre Igualero y casa forestal de Las Tajoras, XII-2002, 1225 m, E 278117-N 3110980, *C. Hernández* & *P. Pérez*. **L115:** Tajaqué, XII-2005, 1200-1250 m, E 281217-N 3111305, *D. Sicilia*.

RESULTS

Species Key

1. Primary thallus absent, podetia without cortex, surface aracnoid 2
1. Primary thallus always present, podetia with outer cortex, surface no arachnoid 3

2. Young apices dichotomostly branched, not curved, algal layer uniform, surface flat no roughned ..... *C. gr. mediterranea*
2. Young apices tri- or tetrachotoumous branched, curved or not, algal layer discontinous, surface roughened or not, UV+ white ..... *C. portentosa*

3. Apothecia and pycnidia red, K+ purple 4
3. Apothecia brown dark to pale, K–, or without apothecia 5

4. Podetia with farinose soredia, without squamules ..... *C. macilenta*
4. Podetia corticate, not farinose, sometimes with bullate granules ..... *C. coccifera*

5. Squamules of the primary thallus longer than podetia (up to 1 cm height), or without podetia 6
5. Squamules of the primary thallus shorter than podetia (up to 0.5 cm height) . 9

6. Thallus KC+ yellow to brown 7
6. Thallus KC–, K+ yellow, Pd+ red ..... *C. firma*

7. Thallus Pd–, K+ yellow ..... *C. iberica*
7. Thallus Pd+ red 8

8. Thallus KC+ yellow ..... *C. foliacea*
8. Thallus KC+ brown ..... *C. subcervicornis*

9. Podetia goblet shape 10
9. Podetia subulate, not goblet shape 17

10. Podetia sorediate 11
10. Podetia not sorediate 13

11. Podetia with soredia farinose 12
11. Podetia with soredia granulose not farinose ..... *C. chlorophaea*

12. Podetia completly sorediate ..... *C. fimbriata*
12. Podetia with upper part sorediate, corticate in lower part ..... *C. humilis*

13. Podetia with continuous cortex, with proliferations or not 14
13. Podetia with discontinuous cortex, upper part with granules, plaques or squamules 16

14. Podetia rarely with proliferations, primary thallus always present .....
..... *C. cervicornis* subsp. *cervicornis*
14. Podetia with proliferations, primary thallus always absent 15

15. Proliferations from centre, goblet shape, usually in several lines.....
..... *C. cervicornis* subsp. *verticillata*
15. Proliferations marginally arranged, dichotoumostly branched .... *C. dimorpha*

16. Podetia short and granulose upper part, primary thallus big ..... *C. hammeri*
16. Podetia long and with plaques upper part, primary thallus small ...*C. pyxidata*

17. Podetia spread from the base, podetia corticate, primary thallus rarely present
..... 18
17. Podetia not spread from the base, primary thallus usually present 19

18. Podetia morphologically variables, algal layer continuous, cortex craked or continuous, sometimes with squamules, without rangiformic acid ..... *C. furcata*
18. Podetia with algal layer discontinuous, usually without squamules, cortex not craked, algal layer discontinuous, with rangiformic acid ..... *C. rangiformis*

19. Podetia Pd–, K–..... 20
19. Podetia Pd+ red, K–..... 22

20. Podetia with several longitudinal cracks, with perlatolic acid ... *C. decorticata*
20. Podetia without or with only one crack, with squamatic acid 21

21. Podetia subulate, sorediate in upper part and base squamuloses .... *C. glauca*
21. Podetia subulate with open apices, completely squamulose .....
..... *C. squamosa* v. *squamosa*

22. Podetia scyphose with proliferations marginally arranged 23
22. Podetia subulate, rarely with narrow sciphy ..... *C. coniocraea*

23. Podetia with blackish stereome in the base ..... *C. phyllophora*
23. Podetia without blackish stereome in the base .....*C. prolifica*

Cladonia cervicornis (Ach.) Flot. **subsp. *cervicornis***
Jahrb. schles. Ges. vaterl. Kultur, 27: 31, 1849.

Podetia corticate, generally small, scyphose and margin regular, rarely bearing proliferations from center of scyphi. Basal squamules well developed and permanents, up to 12 mm long. Thallus Pd+ red, K–, KC–, UV–, contains fumarprotocetraric, protocetraric and quaesicitic acids. Similar to *C. cervicornis* subsp. *verticillata*; but in this case the absence of basal squamules is characteristic. Marginal proliferations in the scyphi are used to diferenciate of *C. gracilis*. It grows on soil and has been collected with bryophytes. Early reported from Garajonay (Sicilia 2002). Widespread in the Macaronesian Region. It is known from El Hierro, La Palma, La Gomera, Tenerife, Gran Canaria, Azores and Madeira Islands. Specimens studied: L85 (TFC Lich 4666).

Cladonia cervicornis **subsp. *verticillata*** (Hoffm.) Ahti
Lichenologist, 12: 126, 1980.

Podetia longer and narrower than in subsp. *cervicornis* which bear 5 to 6 central proliferations. Primary thallus is absent. Thallus K–, KC–, Pd+ red, UV–, contains fumarprotocetraric acid, rarely atranorin. It grows on soil and has been collected with bryophytes. First record for Garajonay. It is known from El Hierro, La Palma, La Gomera, Tenerife, Gran Canaria and Azores Islands. Specimens studied: L85 (TFC Lich 4661).

Cladonia coccifera (L.) Willd.
Fl. Berolin.: 361, 1787.

Podetia corticate, small, similar to *C. pyxidata* in size but bearing red hymenial discs. Thallus K–, KC+ yellowish, Pd–, contains usnic acid and zeorine. Early reported to Garajonay (Mester 1986, Hernández-Padrón *et al.* 1990, Etayo & Burgaz 1997) from well stablished laurel forest. It was collected on stump of *Erica arborea*. It is known from El Hierro, La Gomera, Gran Canaria and Azores Islands. Specimens studied: L80 (TFC Lich 5348).

* ***Cladonia chlorophaea*** (Flörke ex Sommerf.) Spreng.
Syst. Veg. Edn 4(1): 273, 1827.

Regular podetia with coarse and rounded soredia. Primary thallus up to 1-4 mm broad. K–, C–, KC–, Pd+ red, contains fumarprotocetraric, protocetraric acids, rarely atranorin in traces. It can be confused with *C. pyxidata* but the morphology of granulose soredia is characteristic. It grows on soil and has been collected with bryophytes. New to La Gomera Island. It is known from El Hierro, La Palma, Tenerife and Gran Canaria Islands. Specimens studied: L26 (TFC Lich 3127). L28 (TFC Lich 3296, MACB 94686). L112 (TFC Lich 6139).

Cladonia coniocraea (Flörke) Spreng.
Syst. Veg., 4, 1: 272, 1827.

Podetia subulate, rarely with narrow scyphi, sorediate and base thinly corticate. Primary thallus squamulose, with margin lobates and sometimes sorediates. Thallus K–, Pd+ orange to red, UV–, contains fumarprotocetraric,

protocetraric acids, and sometimes quaesicitic acid, too. A common species in many vascular formations but, rarely in sustitutional shrubs of "fayal-brezal". It grows on several base trees and soil mixed with bryophytes. Early reported from Garajonay (Hernández-Padrón *et al.* 1990, Sicilia 2002). It is known from La Palma, Tenerife, Azores and Cabo Verde Islands. Specimens studied: L65 (TFC Lich 4360, MACB 93479). L90 (TFC Lich 4953). L101 (TFC Lich 5182). L69 (TFC Lich 6120).

* ***Cladonia decorticata*** (Flörke) Spreng.
Sys. Veg. 4(1): 271, 1827.

Primary thallus squamulose, inconspicuous. Podetia greyish, subulate, surface sorediate and longitudinally fisurate, bearing crenate microesquamules. Thallus K–, Pd–, contains perlatolic and squamatic acids, and atranorin. A very rare species growing on soil. Early reported from Tenerife island (Klement, 1965) in similar habitats of the "monteverde" forest. New to La Gomera Island. It is known from Tenerife and Madeira Islands. Specimens studied: L4 (TFC Lich 3022).

Cladonia dimorpha Hammer
Mycotaxon 37: 339, 1990.

Primary thallus squamulose, persistent, slightly lobulate. Podetia scyphose, sometimes with base squamulose, surface continuous or verrucose, bears laterally proliferations with dichotomous, longitudinally fissured ramifications and brown hymenial discs. Thallus K– or + brownish, KC–, Pd+ red, contains fumarprotocetraric and protocetraric acids. A common species collected on soil slopes. Difficult to recognized and usually confused with *C. pyxidata* or another scyphose species. Early reported from Garajonay (Etayo & Burgaz, 1997). It has a disyunct distribution from western North America and the southwestern Europe. It is known from La Palma Island. Specimens studied: L28 (TFC Lich 6497, MACB 94684). L107 (TFC Lich 6124).

Cladonia fimbriata (L.) Fr.
Lichenogr. Eur. Ref.: 222, 1831.

Primary thallus squamulose, evanescent. Podetia up to 1,5 cm high, surface farinose to granular sorediate but with the base corticate. Thallus K–, KC–, Pd+ red, UV–, contains fumarprotocetraric and protocetraric acids. A common species collected on soil slopes and tree bases. Early reported from Garajonay (Pitard & Harmand, 1911). It is known La Palma, La Gomera and Tenerife Islands. Specimens studied: L3 (TFC Lich 2989). L20 (TFC Lich 3200). L65 (TFC Lich 4358). L69 (TFC Lich 4454). L77 (TFC Lich 4888). L111 (TFC Lich 5204). L112 (TFC Lich 5387).

Cladonia firma (Nyl.) Nyl.
Bot. Z.: 352, 1861.

Primary thallus persistent, upper surface glaucous green and whitish underside. Podetia not observed. Thallus K+ yellowish, KC–, Pd+ red, contains

fumarprotocetraric acid and atranorin. A common species growing on soil on exposed open areas usually mixed with mosses. Early reported from Garajonay (Etayo & Burgaz (1997). It is known from El Hierro, La Palma, La Gomera, Tenerife, Gran Canaria and Lanzarote Islands. Specimens studied: L8 (TFC Lich 3091). L73 (TFC Lich 4248, 4243, 4234, 4248, 4277). L77 (TFC Lich 4868). L81 (TFC Lich 4584). L83 (TFC Lich 4698). L97 (TFC Lich 5131). L98 (TFC Lich 5131). L110 (TFC Lich 5219).

Cladonia foliacea (Huds.) Willd.

Fl. Berol.: 363, 1787.

Primary thallus persistent, 15-30 mm high, marginally lobate, upper surface green yellowish and white yellowish underside. Podetia not observed. Thallus K+ and KC+ yellow, Pd+ red, contains fumarprotocetraric and usnic acids. A common species growing on tree bases and exposed open areas. It can be confused with *C. firma* but it has a characteristic yellowish colour. Early reported from Garajonay (Etayo & Burgaz, 1997; Sicilia, 2002). It is known from all the Canary Islands. Specimens studied: L5 (TFC Lich 3059). L7 (TFC Lich 3071). L8 (TFC Lich 3091). L12 (TFC Lich 3195). L22 (TFC Lich 3195). L73 (TFC Lich 4280). L83 (TFC Lich 4698).

Cladonia furcata (Huds.) Schrad.

Spicil. Fl. Germ.: 107, 1794.

Primary thallus rarely persistent. Podetia grey-greenish, subulate and dichotomously branched. Thallus Pd+ red, K– or K+ yellowish, contains fumarprotocetraric and protocetraric acids, rarely physodalic acid. Very variable species in morphology, frequent on soil and tree bases usually growing with mosses. Early reported from Garajonay (Pitard & Harmand, 1911; Follmann, 1981 and Etayo & Burgaz, 1997). It is known from El Hierro, La Palma, La Gomera, Tenerife and Gran Canaria Islands. Specimens studied: L3 (TFC Lich 2990). L17 (TFC Lich 3144). L21 (TFC Lich 6047). L29 (TFC Lich 3303, MACB 93483). L32 (TFC Lich 3453). L62 (TFC Lich 4332, MACB 93485). L65 (TFC Lich 4375, MACB 94675). L69 (TFC Lich 6050, 4450, MACB). L70 (TFC Lich 4203). L74 (TFC Lich 5430, MACB 94689). L87 (TFC Lich 4590, 4586, MACB 93488). L99 (TFC Lich 5161). L107 (TFC Lich 5318). L110 (TFC Lich 5222). L112 (TFC Lich 5384, 5385, MACB 94688).

□ ***Cladonia glauca*** Flörke

De Cladon.: 140, 1828.

Primary thallus inconspicuous with small squamules. Podetia subulate, simple or dichotomously ramified, farinose soredia in upper parts and bearing small basal squamules. Thallus K-, Pd-, medulla UV+ white-bluish, contains squamatic acid. A rare species growing on bases of *Erica arborea.* New to Canary Island and to the Macaronesian Region. Specimens studied: L99 (TFC Lich 6115, MACB 93477).

□ ***Cladonia hammeri*** Ahti

Lichen Flora of the Greater Sonoran Desert Region 1: 144, 2002.

Primary thallus squamulose, persistent, up to 2-4 mm broad, ascendent. Podetia grey-whitish, scyphose, margin without proliferations, surface granulose nor sorediate, base corticated. Thallus K–, C–, KC–, Pd+ red. Contains fumarprotocetraric and protocetraric acids. Difficult to recognized and usually confused with *C. pyxidata* or another scyphose species but the granulose soredia are characteristic. It grows on soil mixed with mosses. New to La Gomera Island. Recently reported from La Palma Island (Pérez-Vargas *et al*., 2008). This is another species such as *C. dimorpha* distributed in California and southwestern Europe. Specimens studied: L58 (TFC Lich 4320, MACB 94685).

* ***Cladonia humilis*** (With.) J.R. Laundon

Lichenologist 16: 220, 1984.

Primary thallus squamulose, persistent, with rounded squamules, white below. Podetia short, scyphose, pale greyish, soredia farinose, only sorediate in upper part of young podetia and base corticate. Thallus K+ yellow, C– KC–, Pd+ red, contains fumarprotocetraric, protocetraric, hypoprotocetraric acids and atranorin. A common species growing on soil slopes mixed with mosses. New to La Gomera Island. It is known from Tenerife and Azores Islands. Specimens studied: L4 (TFC Lich 3019). L62 (TFC Lich 4333, MACB 93491). L112 (TFC Lich 6499).

Cladonia iberica Burgaz & Ahti

Nova Hedwigia 59(3-4): 430, 1994.

Primary thallus squamulose, persistent, lobate, glaucous green above, whitish to pale violet below. Podetia rare, corticate, glaucous green, no scyphose, with apical brown hymenial discs. Thallus K+ yellow, Pd–, contains atranorin and protolichesterinic acid. A common species growing on slope soil, and exposed open areas usually mixed with mosses. Early reported from Garajonay (Etayo & Burgaz, 1997). Only known from La Gomera. Specimens studied: L36 (TFC Lich 3447, MACB 93475). L93 (TFC Lich 5005, MACB 93474). L98 (TFC Lich 5140).

□ ***Cladonia macilenta*** Hoffm.

Deutschl. Flora, 2: 126, 1796.

Primary thallus squamulose, persistent, margins crenate and sorediate. Podetia subulate and sorediate, up 1-3 cm high. Small hymenial discs, red. Thallus C–, K–, KC+ yellowish, Pd–, UV+, contains barbatic acid. In the Mediterranean region this chemotype is only known from Portugal (Burgaz *et al.*, 1999). It is a rare species growing on bases of *Pinus radiata* and *Myrica faya*. New to Canary Islands. It is known from Azores and Madeira Islands. Specimens studied: L4 (TFC Lich 3020, MACB 93481). L25 (TFC Lich 3166).

Cladonia gr. mediterranea
(incl. *C. macaronesica* Ahti and *C. mediterranea* P. A. Duvign. & Abbayes).

Podetia without cortex and continuous algal layer, green greyish to grey yellowish, up to 10-12 cm high, usually dichotomuous branched although some specimens are anisotomuous (TFC Lich 4585, 3181, 5143, 6922, duplic in H) while others are isotomuous (TFC Lich 4528, 4549, 5223). Thallus K–, KC–, Pd–, contains perlatolic and usnic acids. It is a frequent species on soil and tree bases mixed with mosses. It will be necessary molecular studies to clarify the morphological variability showed in Garajonay and its possible relationship with taxonomy. It is known from El Hierro, La Palma, La Gomera, Tenerife and Gran Canaria islands. Specimens studied: L22 (TFC Lich 3181, MACB 94682). L74 (TFC Lich 4528, 94679). L12 (TFC Lich 6922, H). L87 (TFC Lich 5143, 4549, MACB 94680). L98 (TFC Lich 4585, MACB 94678). L110 (TFC Lich 5223).

* ***Cladonia phyllophora*** Hoffm.
Deutschl. Fl. 2: 123, 1796.

Primary thallus inconspicuous with small squamules. Podetia glaucous green with irregular scyphous, algal layer usually discontinuous, and blackish bases. Thallus K–, Pd+ red, contains fumarprotocetraric and protocetrric acids. Sometimes difficult to differenciate from *C. prolifica* which podetia bases are not blackish. It is a frequent species on soil mixed with mosses. New to La Gomera Island. It is known from La Palma and Tenerife Islands. Specimens studied: L26 (TFC Lich 3127). L28 (TFC Lich 6498, MACB 94683). L112 (TFC Lich 5388, MACB 93473).

* ***Cladonia portentosa*** (Dufour) Coem.
Bull. Acad. R. Belg., sér. 2, 19: 43, 49, 1885.

Podetia without cortex, continuous or discontinuous algal layer, green greyish, usually trichotomuous branched. It can be confused with the gr. *C. mediterranea* but the colour, the podetia branch and stiff are characteristic. Thallus K–, KC–, Pd–, contains perlatolic and usnic acids. It is a frequent species on soil mixed with mosses in heathlands of *Erica platycodon* and *E. arborea*. It was found more often f. *impexa* than f. *portentosa*. Usually grows mixed with *C.* gr. *mediterranea* and sometimes difficult to identify. New to La Gomera Island, f. *impexa* is new to Canary Islands. It is known from El Hierro, La Palma and Tenerife Islands. Specimens studied: f. *impexa*: L110 (TFC Lich 5838, 5224, MACB 94677). f. *portentosa*: L74 (TFC Lich 4529).

□ ***Cladonia prolifica*** Ahti & Hammer
Mycotaxon 37: 342, 1990.

Primary thallus squamulose, evanescent. Podetia corticate, green greyish, with irregular scyphi and microesquamules. Thallus K–, Pd+ red, contains fumarprotocetraric, protocetraric acids, and physodalic in traces. It can be confused with *C. phyllophora* by the irregular podetia bearing squamules marginally but this has the podetia bases not blackish. It was collected on *Myrica faya* base. New to Canary Islands. It is another disyunct species from western North America and southwestern Europe. Specimens studied: L58 (TFC Lich 4307, MACB 93478).

Cladonia pyxidata (L.) Hoffm.

Deutschl. Flora, 2: 121, 1796.

Primary thallus squamulose, persistent and ascendent, green brownish to green greyish above, white below. Podetia scyphose, corticate and with many peltate squamules specially into the scyphus. Thallus K–, KC–, Pd+ red, UV–, contains fumarprotocetraric acid, rarely also atranorin in traces. It is a frequent species on soil mixed with mosses, tree bases and stumps. Early reported from Garajonay (Pitard & Harmand, 1911; Steiner, 1912; Mester, 1986 and Sicilia, 2002. It is known from El Hierro, La Palma, La Gomera, Tenerife and Gran Canaria Islands. Specimens studied: L4 (TFC Lich 3022).

Cladonia rangiformis Hoffm.

Deutschl. Flora, 2: 114, 1796.

Primary thallus squamulose, persistent or inconspicuous. Podetia dichotomuously branched, up 4-5 cm high, algal layer discontinuous, rarely with small basal squamules. Thallus K+ yellow, KC–, Pd– ó + red, contains rangiformic acid and atranorin, rarely also fumarprotocetraric acid. Morfologically similar with *C. furcata* but it has a continuous algal layer and the thallus is K–. It is the most frequent species growing on soil mixed with mosses and tree bases. Early reported from Garajonay (Pitard & Harmand, 1911; Steiner, 1912; Hernández-Padrón *et al.*, 1990; Etayo & Burgaz, 1997 and Sicilia, 2002. It is distributed in all the Canary Islands. Specimens studied: L3 (TFC Lich 2989). L5 (TFC Lich 3059). L6 (TFC Lich 3043). L10 (obs. campo). L15 (TFC Lich 3104). L18 (MACB 93476). L20 (TFC Lich 3205). L22 (TFC Lich 6140). L28 (TFC Lich 3295). L31 (TFC Lich 3221). L32 (TFC Lich 3456). L58 (TFC Lich 4310). L62 (TFC Lich 4331). L64 (TFC Lich 4402). L70 (TFC Lich 4200). L70 (TFC Lich 4205). L71 (TFC Lich 4179). L72 (TFC Lich 4899). L73 (TFC Lich 4156). L75 (TFC Lich 4504). L77 (TFC Lich 4865). L83 (no material). L85 (TFC Lich 4710). L87 (TFC Lich 4589). L95 (TFC Lich 5547). L96 (TFC Lich 5123). L98 (TFC Lich 5140). L99 (TFC Lich 6114, MACB 94687). L99 (TFC Lich 5161). L107 (TFC Lich 5317). L111 (TFC Lich 5203). L112 (TFC Lich 5382, 6118, 5383). L114 (TFC Lich 7655).

Cladonia squamosa Hoffm. ***var. squamosa***

Deutschl. Flora, 2: 125, 1796.

Primary thallus squamulose, persistent or evanescent. Podetia green greyish to grey brownish, simples or slightly branched, covered with many small squamules, open apices. Hymenial discs brown and frequent. Thallus K–, KC–, Pd–, UV+ white, contains squamatic and barbatic acids. It is a frequent species growing in well established areas of the Park, on soil mixed with mosses, stumps and tree bases. Early reported from Garajonay (Pitard & Harmand, 1911; Mester, 1986; Hernández-Padrón *et al.*, 1990 and Etayo & Burgaz, 1997. It is known from El Hierro, La Palma, La Gomera and Tenerife Islands. Specimens studied: L17 (TFC Lich 3140). L22 (TFC Lich 6123). L26 (TFC Lich 3159). L36 (TFC Lich 6055). L69 (TFC Lich 6121). L77 (TFC Lich 4878). L83 (TFC Lich 4730). L99 (TFC Lich 5152, 5163, MACB 94681). L105 (TFC Lich 5302). L115 (TFC Lich 5988, 5986).

* ***Cladonia subcervicornis*** (Vain.) Kernst.

Jahresber. Staats-Oberrealschule Klagenfurt 43: 15, 32, 1900.

Primary thallus squamulose, persistent, glaucous green to green brownish above, withish below, bases blackish. Podetia rare, corticate, scyphose. Thallus K+ yellow, Pd+ red, contains fumarprotocetraric, protocetraric acids, atranorin and cloratranorin. It is a frequent species growing on slope soil mixed with *Riccia* sp. and *Fossombronia* sp. New to La Gomera Island. It is known from La Palma, Tenerife, Gran Canaria, Azores and Madeira Islands. Specimens studied: L57 (TFC Lich 4442).

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