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SURVEY OF THE ALPINE FLORA OF TORRES DEL PAINE NATIONAL PARK, CHILE

Inventario de la flora alpina del Parque Nacional Torres del Paine, Chile

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ABSTRACT

A survey of the alpine (above-treeline) flora of Torres del Paine National Park, 50°-51°S, Chile is given, based on recent field explorations and existing published work. Field work conducted on the Sierra del Toro, Cordillera de Paine and Senos de Catherine revealed a total of 47 vascular plant species previously unrecorded for the alpine zone. The total alpine flora in Torres del Paine National Park now stands at 179 species in 94 genera, with two introduced species. None of the 177 native alpine species in Torres del Paine National Park is strictly endemic to Chile. However 3.9% are endemic to southern Patagonia, 6.2% are endemic to the region of southern Patagonia and Tierra del Fuego, and 4.5% are endemic to the latter region with extensions onto the Falkland Islands (Islas Malvinas). Consequently, 14.6% of the alpine species of Torres del Paine National Park are endemic to the general region of the far south of South America. The known distribution of each species in the alpine zone in the park is provided along with available data on life-form, flower colour, breeding system and habitat.

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RESUMEN

Se presenta un catálogo de la flora alpina (sobre la línea arbórea) del Parque Nacional Torres del Paine, 50°-51°S, Chile, basado en trabajo de terreno recientemente efectuado en el parque y antecedentes bibliográficos. De las exploraciones en terreno realizadas en Sierra del Toro, Cordillera de Paine y Senos de Catherine se obtuvo un total de 47 especies desconocidas hasta la fecha para la zona alpina del parque. El total de la flora alpina del Parque Nacional Torres del Paine abarca actualmente 179 taxa, distribuidos en 94 géneros, de las cuales dos corresponden a especies introducidas. De las 177 especies nativas, ninguna es endémica de Chile. Sin embargo, un 3,9% de ellas son endémicas de la Patagonia austral, 6,2% son endémicas de la región de la Patagonia austral y Tierra de Fuego y 4,5% son endémicas de la última región y extendiéndose hasta las islas Malvinas. En consecuencia, 14,6% de las especies alpinas en el Parque Nacional Torres del Paine son endémicas de la región del extremo sur de Sudamérica e islas Falkland (islas Malvinas). Se incluyen antecedentes del hábitat, forma de vida, color de la flor y sistema de reproducción en la medida que éstos se encuentren disponibles. Para todas las especies se da la distribución conocida en la zona alpina del parque.

KEYWORDS; Alpine flora, endemism, Chile, Torres del Paine National Park, International Biosphere Reserve.

INTRODUCTION

Chile has 28 national parks covering an area of approximately 83,000 km2. Botanical exploration of Chile's national parks varies in intensity and quality, there being published floras only for the Juan Fernández Archipelago National Park (Skottsberg, 1921b, 1951), Puyehue National Park (Muñoz Schick, 1980) and Rapa Nui (Easter Island) National Park (Skottsberg, 1921a, 1951; Zizka, 1991).

With the aim of increasing information on the flora of the national parks of Chile, and assessing the role of the latter in the protection of endemic taxa, in this paper we provide a survey of the alpine flora of Torres del Paine National Park (Parque Nacional Torres del Paine) as presently known. Torres del Paine National Park is situated in the province of Ultima Esperanza in the XII Region of Chile, 50°-51°S. Occupying an area of 1,814 km^2, it is the fifth largest national park in Chile. The park was declared an International Biosphere Reserve by the United Nations in 1978, in virtue of its wide representation of far southern South American ecosystems and unpolluted air.

The landscape of Torres del Paine National Park is heavily dissected and dominated by numerous high mountains, a number of which exceed 3000 m elevation. A notable feature of the park is the wide range of climates on account of the presence of an abrupt west-east regional gradient in precipitation, overlain by a milder north-south gradient in precipitation. Illustrating the more severe west-east gradient, the western areas of the park that border on the Southern Patagonian Icefield receive around 1000 mm precipitation, whereas recorded annual precipitation for Laguna Amarga situated in the east of the park at 33 km from the icefield is 438 mm (Pisano, 1974).

The wide range of climates in the relatively small area of Torres del Paine National Park can be expected to be associated with a taxonomically diverse and species-rich flora. Published information on the alpine flora of Torres del Paine National Park however, was non-existent except for isolated records in monographs and until Pisano (1974), in an excellent overview of the main vegetation types and plant associations in the park, mentioned a total of 54 [1] species occurring above treeline. Forty-five of these species had not been cited in monographs for the park previously. Arroyo *et al.* (1989) undertook extensive collecting above and just below the treeline on Cerro Diente, Cerro Agudo and Cerro Daudet, all located in the northern area of the park on the western extreme of the east-west trending Sierra de Los Baguales Range. The latter constituted part of a broader east-west transect across the mountains in southern Patagonia. One hundred and fifteen (115) species cited in Arroyo *et al.* (1989) were collected above treeline in Torres del Paine National Park of which 72 were new for the alpine. Additionally *Pernettya mucronata* occurs above treeline, but was not collected there. Seven additional species not cited in Pisano (1974) appeared in monographs before Arroyo *et al.* (1989).

In February, 1992, in relation to a general survey of endemism in the alpine flora of the temperate South America, we undertook further collecting in the alpine of Torres del Paine National Park. We chose collecting sites to increase the range of climates sampled in the park to date, and to include the more southerly mountains. Specifically, work was conducted on the Sierra del Toro, the eastern face of Cordillera de Paine and on Senos de Catherine. We also attempted to collect in the alpine zone on the western side of Cerro Ferrier, but were forced off the mountain because of difficult weather conditions. As far as we can determine, Senos de Catherine has not been previously collected by professional botanists.

The **Sierra del Toro** is a flat table-like mountain, located between Lago Sarmiento and Lago del Toro, that just penetrates into the south-eastern corner of the park (Fig. 1). It is found at 30 km from the Southern Patagonian Icefield. The maximum elevation on the Sierra del Toro within the park boundary is 1158 m. Alpine vegetation occurs above an altered treeline of deciduous *Nothofagus pumilio* forest. The natural treeline is situated at around 700-750 m elevation. Isohyets (Pisano, 1974) suggest that the alpine zone in the area of Sierra del Toro receives an estimated 600-700 mm annual precipitation. Collecting was effected above treeline in a traverse that began above Laguna Verde and ended on the western face of the highest point within the park boundary (51°10'S; 72°50'W). Within this general area, north, west and east-exposed slopes were covered. Collections were made in high elevation bogs and on the drier alpine slopes.

1 Includes four unidentified species.

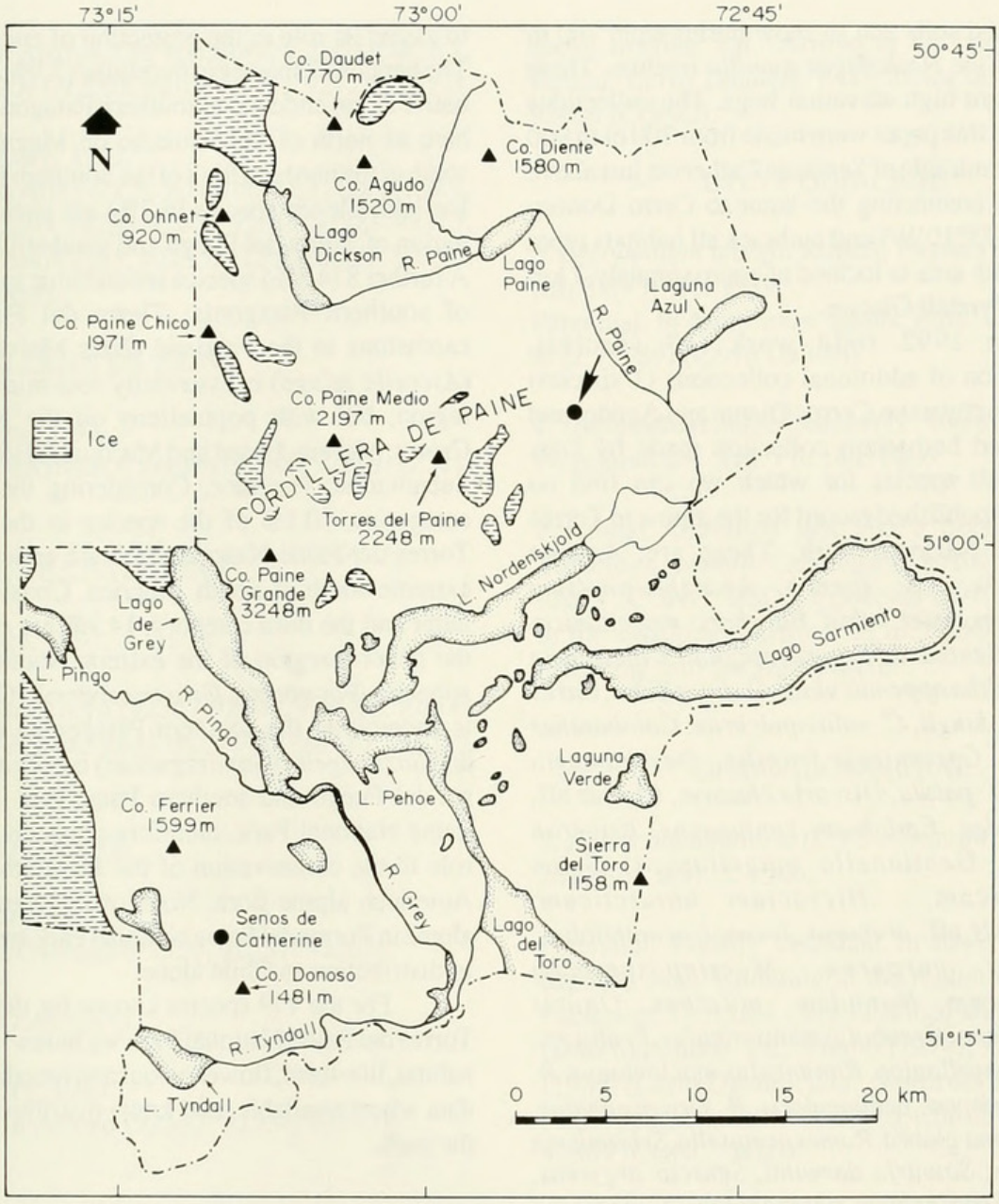

Figure 1. Torres del Paine National Park, showing localities mentioned in text. The large arrow indicates the exact collecting locality on the Cordillera de Paine.

Figura 1. Parque Nacional Torres del Paine, XII Región, Chile. Se señalan las localidades mencionadas en el texto. La flecha mayor indica la localidad exacta de colecta en Cordillera de Paine.

The **Cordillera del Paine**, an isolated massif, is located in the center of the park (Fig. 1). Alpine vegetation occurs around the rim of the massif. The new collections reported in this paper were made on steep slopes immediately below near-vertical moraines on the north-eastern face of the massif, between 750-1000 m elevation above an altered treeline of *Nothofagus pumilio*. High alpine bogs are absent in this area, thus collecting was restricted to the zonal flora on the drier alpine slopes. The exact locality was inmediately above the Río Paine, 9 km to the north-west of Laguna Amarga (50°56'S; 72°71'W), at some 23.5 km from the southern Patagonian Icefield. Based on Pisano (1974), the eastern face of the Cordillera de Paine receives an estimated 500-600 mm annual precipitation.

Senos de Catherine is located in the wet, south-western area of the park (ca. 900 mm annual precipitation) between Cerro Ferrier and Cerro Donoso (Fig. 1). The maximum elevation is 1083 m. Alpine vegetation occurs on glacially-polished rocks

with skeletal soils and in snow basins from 700 m upward of the *Nothofagus pumilio* treeline. There are abundant high elevation bogs. The collections reported in this paper were made from 700 m to 900 m on the south side of Senos de Catherine just above the saddle connecting the latter to Cerro Donoso (51°12'S; 73°10'W) and embrace all habitats types present. The area is located at approximately 7 km from the Tyndall Glacier.

The 1992 field work (47 species), identification of additional collections (1 species) made earlier by us on Cerros Diente and Agudo, and one isolated herbarium collection made by Díaz provided 49 species for which we can find no previously published record for the alpine in Torres del Paine National Park. These are: *Acaena pinnatifida, A. tenera, Anarthrophyllum desideratum, Aster vahlii, Baccharis magellanica, B. nivalis, Benthamiella nordenskjoldii, Calceolaria tenella, Caltha appendiculata, C. dioneifolia, Carex caduca, C. kingii, C. vallis-pulchrae, Colobanthus quitensis, Cystopteris fragilis, Deschampsia flexuosa, D. patula, Discaria chacaye, Elymus* aff. *agropyroides, Epilobium conjungens, Erigeron myosotis, Gentianella magellanica, Geum magellanicum, Hieracium antarcticum, Hypochaeris* aff. *arenaria, Iocenes acanthifolius, Leucheria purpurea, Marsippospermum grandiflorum, Nanodea muscosa, Onuris spegazziniana, Oreobolus obtusangulus, Pratia* sp., *Primula magellanica, Ranunculus maclovianus, R. peduncularis* var. *peduncularis, R. sericocephalus, Rytidosperma glabra, Rumex acetosella, Schizeilema ranunculus, Satuurja darwinii, Senecio argyreus, S. miser, Sisyrinchium patagonicum, S. pearcei , Tetrachondra patagonica* ssp. *fuegiana, Trisetum* aff. *lasiolepis, T. cumingii* var. *cumingii, Valeriana carnosa* and *Viola commersonii*. A very high proportion of these species were collected on Senos de Catherine in the wettest part of the park.

The present alpine flora of Torres del Paine National Park, considering the new records given here and those published earlier, stands at 179 species and 181 taxa in 94 genera. Included are two introduced species (*Rumex acetosella* and *Poa pratensis*), one (R. acetosella) in an exclusively introduced genus. A minor increase in this number could be expected with further exploration of the wettest mountains in the park, such as Cerro Ferrier.

Given that Torres del Paine National Park is an International Biosphere Reserve, it is of interest to assess its role in the protection of endemic taxa. The park has 7 species in the alpine (3.9% of the total native flora) endemic to southern Patagonia, defined here as north of the Estrecho de Magallanes and south of the northern limit of the Southern Patagonian Icefield. Eleven species (6.2%) are endemic to the region of Tierra del Fuego and southern Patagonia. A further 8 (4.5%) species are endemic to the region of southern Patagonia, Tierra del Fuego with extensions to the Falkland (Islas Malvinas). One (*Azorella selago*) is essentially endemic to the last region, but with populations on the Kerguelen, Crozet, Marion, Heard and Macquarie Islands of the Subantarctic Province. Considering the first two categories, 10.1% of the species in the alpine in Torres del Paine National Park are endemic to the extreme south of South America. Considering the latter and the third category, 14.9% are endemic to the general region of the extreme south of South America. For genera, *Grammosperma* (Cruciferae) is endemic to the southern Patagonian mountains and *Saxifragella* (Saxifragaceae) is endemic to Tierra del Fuego and southern Patagonia. Torres del Paine National Park, therefore plays an important role in the conservation of the far southern South American alpine flora. None of the species in the alpine in Torres del Paine National Park are restricted in distribution to Chile alone.

For the 179 species known for the alpine in Torres del Paine National Park we herewith provide habitat, life-form, flower colour and breeding system data where available, and know distribution within the park.

DATA FOR NEW COLLECTIONS CITED

Collection dates, collectors and collection numbers are given below for the three localities studied in 1992 and for additional previously unreported collections made on Cerro Diente and Cerro Agudo. Herbarium material has been deposited in CONC and SGO.

1. SIERRA DEL TORO

a) 9 February, 1992.
M.T. Kalin Arroyo, Ch. von Bohlen, J. García, & J. Gigoux (92002, 90024, 92026, 92032, 92039-92044, 92046-92090).
b) 10 February, 1992.

M.T. Kalin Arroyo, Ch. von Bohlen, J. García, & J. Gigoux (92091-92097, 92100-92171, 92173-92197).

c) 11 February, 1992.
M.T. Kalin Arroyo, Ch. von Bohlen, J. García, & J. Gigoux (92205, 92208-92209, 92219, 92221, 92223, 92234, 92244-92245, 92255, 92290-92297, 92299, 92556, 92559).

2. CORDILLERA DE PAINE

14 February, 1992.
Ch. von Bohlen & L. Cavieres (92300-92319, 92321-92362).

3. SENOS DE CATHERINE

14 February, 1992.

M.T. Kalin Arroyo (92367-92404, 92405a, 92406-92409, 92411a, 92411b, 92412-92423, 92557, 92558).

4. CERRO DIENTE

25 February, 1987.
M.T. Kalin Arroyo (92550, 92551, 92553).

5. CERRO AGUDO

18 February, 1987.
M.T. Kalin Arroyo (92552, 92554, 92555).

PTERIDOPHYTA

DRYOPTERIDACEAE

1. *Cystopteris fragilis* (L.) Bernh. var. *apiiformis* (Gand.) C. Chr., Index Filic. Suppl. Prelim. 11. 1917.

Shortly rhizomatous perennial. Very rare in alpine. Seen only once at 1100 m on Cordillera de Paine. Exs.: 92341 (CONC, SGO).

2. *Polystichum andinum* Phil., Linnaea 29: 108. 1858.

Rhizomatous perennial. Occasional on the western mountains in cushion bogs and on wet rock faces just above treeline. Lit.: Arroyo *et al.* (1989) (Cerro Agudo, Cerro Daudet); Exs.: Senos de Catherine 92406 (CONC).

LYCOPODIACEAE

3. *Lycopodium alboffii* Rolleri, Physis (Buenos Aires) 38(95): 56. 1979.
Perennial. In damp snow basins. Rare. Lit.: Arroyo *et al.* (1989) (Cerro Daudet).

4. *Lycopodium magellanicum* (P. Beauv.) Sw. var. *magellanicum*. Syn. Fil. 180. 1806.

Perennial. Common just above treeline and in *Nothofagus pumilio* clearings. Exs.: Sierra del Toro 92079 (CONC, SGO). Collected on Cerro Diente in the subalpine (Arroyo *et al.*, 1989), but also extending into the alpine there.

OPHIOGLOSSACEAE

5. *Botrychium lunaria* (L.) Sw. var. *dusenii* Christ, Ark. Bot. 6(3): 5. 1906.

Perennial. Locally abundant in lower alpine on exposed sites. **Endemic** to the region of southern Patagonia, Tierra del Fuego and the Falkland Islands (Islas Malvinas). Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro, 92059 (CONC, SGO), 92093 (CONC); Cordillera de Paine 92309 (CONC, SGO).

ANGIOSPERMAE: DICOTYLEDONEAE

BERBERIDACEAE

6. *Berberis buxifolia* Lam., Tabl. Encycl. 2: tab. 253, Fig. 3. 1792.

Decumbent shrub; flowers yellow. Self-incompatible (Arroyo & Squeo, 1990a,). Occasional in the lower alpine. Lit.: Arroyo *et al.* (1989) (Cerro Agudo). Exs.: Sierra del Toro, 92191 (CONC). Collected in the subalpine on Cerro Diente (Arroyo *et al.* 1989) and recorded in frequency cuadrats above the treeline.

7. *Berberis empetrifolia* Lam., Tabl. Encycl. 2: tab. 253, Fig. 4. 1792.

Sprawling shrub, rooting at nodes; flowers yellow. Partially self-compatible (Arroyo & Squeo, 1990a). Locally common mostly in lower alpine just above treeline. Lit.: Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro, 92053 (CONC), 92234 (CONC); Cordillera de Paine, 92346 (CONC, SGO).

CALYCERACEAE

8. *Moschopsis rosulata* (N.E. Br.) Dusén, Ark. Bot. 7(2): 42. 1907.

Rosette perennial herb, with well developed underground rhizomes; flowers green. Partially self-compatible (Arroyo & Squeo, 1990a). Common species on high alpine tallus slopes. **Endemic** to the region of southern Patagonia and Tierra del Fuego. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo). Exs.: Sierra del Toro, 92091 (CONC, SGO).

CAMPANULACEAE

9. *Pratia* sp.

Creeping perennial herb in lower alpine bog. Seen only once on Senos de Catherine. Exs.: Senos de Catherine, 92411b. *Pratia longiflora* Hook. f. with pinkish flowers and *P. repens* Gaudich, with blue-violet flowers are know for the south of Chile with *P. longiflora* having been collected from the eastern Baguales Range (Arroyo *et al.*, 1989). Our material is sterile and cannot be identified to species.

CARYOPHYLLACEAE

10. *Cerastium arvense* L., Sp. Pl. 438. 1753.

Perennial herb with loosely matted stems; flowers white. Partially self-compatible (Arroyo & Squeo, 1990a). Common species throughout in the subalpine and alpine reaching the upper limit of vegetation. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Agudo, Cerro Diente, Cerro Daudet). Exs.: Sierra del Toro, 92067 (CONC, SGO), 92178 (CONC); Cordillera de Paine, 92317 (CONC, SGO); Senos de Catherine, 92403 (CONC).

11. *Colobanthus lycopodioides* Griseb., Syst. Bemerk. 28. 1854.

Perennial herb forming small, compact cushions; flowers green. Self-compatible (Arroyo & Squeo, 1990a). Scattered in upper alpine. Lit. Arroyo *et al.* (1989) (Cerro Agudo, Cerro Diente, Cerro Daudet) under *C. subulatus* (D'Urv.) Hook., f. Exs.: Sierra del Toro, 92170 (CONC, SGO).

12. *Colobanthus quitensis* (Kunth) Bartling in K. Presl, Reliq. Haenk. 2: 13, tab. 49. 1831.

Rhizomatous perennial herb found occasionally in lower alpine bogs. Self-compatible (Arroyo & Squeo, 1990a). Exs.: Sierra del Toro, 92095 (CONC), 92148 (CONC), 92156 (CONC).

13. *Colobanthus subulatus* (D'Urv.) Hook. f., Fl. Antarct. 13. 1844.

Deep rooted perennial forming small, compact cushions; flowers green. Self-compatible (Arroyo & Squeo, 1990a). Locally common in snow depressions mostly in high alpine. **Endemic** to the region of southern Patagonia, Tierra del Fuego and the Falkland Islands (Islas Malvinas). Exs.: Senos de Catherine, 92372 (CONC). Seen also on Cerro Diente at 1000 m in a snow depression.

COMPOSITAE

14. *Abrotanella emarginata* (Cass. ex Gaudich.) Cass., Dict. Sci. Nat. 36: 27. 1825.

Perennial herb forming large, hard, compact cushions; florets brownish-red. Partially self-compatible (Arroyo & Squeo, 1990a). Common in upper alpine bogs on wetter western mountains. **Endemic** to the region of southern Patagonia, Tierra del Fuego and the Falkland Islands (Islas Malvinas). Lit.: Arroyo *et. al.* (1989) (Cerro Agudo, Cerro Diente, Cerro Daudet), Exs.: Senos de Catherine, 92379 (CONC).

15. *Abrotanella linearifolia* A. Gray, Proc. Amer., Acad. Arts 5: 137. 1862.

Perennial herb with slender rhizomes; florets inconspicuously coloured. Locally common in alpine and subalpine bogs on western summits. Lit.: Arroyo *et al.* (1989) (Cerro Agudo, Cerro Daudet). The record on Cerro Daudet constitutes a northern limit for this species.

16. *Abrotanella trichoachaenia* Cabr., Revista Chilena Hist. Nat. 38: 85. 1934.

Rhizomatous perennial forming loose cushions; florets inconspicuously coloured. Common in alpine bogs on the wetter western mountains. Exs.: Senos de Catherine, 92376 (CONC), 92415 (CONC). Collected just below treeline on Cerro Agudo (Arroyo *et al.*, 1989), where it also occurs above treeline.

17. *Aster vahlii* (Gaudich.) Hook. et Arn., Companion Bot. Mag. 2: 49. 1836.

Glabrous rhizomatous perennial herb; ray florets white. Self-compatible (Moore, 1983). Collected in the alpine only once on Cordillera de Paine. This species is common at lower elevations in the park in boggy situations. Exs.: Cordillera de Paine, 1000 m, Díaz s.n. (CONC).

18. *Baccharis magellanica* (Lam.) Pers., Syn,. Pl. 2: 424. 1807.

Prostrate shrub forming extensive mats; heads inconspicuously coloured. Dioecious (Arroyo & Squeo, 1990a). Rare in the alpine on the drier eastern mountains. Exs.: Cordillera de Paine, 92359 (CONC).

19. *Baccharis nivalis* (Wedd.) Schultz-Bip. ex Phil., Anales Univ. Chile 87: 705. 1894.

Low perennial herb with slender rhizomes forming large loose mats. Dioecious. Apparently rare in Torres del Paine National Park. Seen only once in a low alpine bog on a steep south-eastern slope with late snow accumulation along with *Ranunculus sericocephalus* Hook. f., *Viola tridentata* Menzies ex Gingins and *Cardamine glacialis* (G. Forster) DC. Exs.: Sierra del Toro, 92143 (CONC, SGO).

20. *Chiliotrichum diffusum* (G. Forster) Kuntze, Revisio Gen. Pl. 3(3): 141. 1898.

Low growing shrub; rays white. Self-incompatible (Arroyo & Squeo, 1990a). Occasional in low alpine bogs on the wetter western mountains. Collected on Cerro Diente below treeline (Arroyo *et al.* 1989) where it also was seen to occur above treeline. Exs.: Senos de Catherine, 92367 (CONC).

21. *Erigeron leptopetalus* Phil., Linnaea 33: 136. 1864.

A common rhizomatous perennial herb in alpine bogs throughout; rays pinkish-white. Self-incompatible (Arroyo & Squeo, 1990a). Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro, 92072 (CONC, SGO), 92103 (CONC, SGO); Cordillera de Paine, 92349 (CONC, SGO).

22 *Erigeron myosotis* Pers., Syn. Pl. 2: 431. 1807.

A rhizomatous perennial herb with white to blue-tinged rays only just reaching into the alpine on the drier eastern mountains. Exs.: Sierra del Toro, 92167 (CONC), 92209 (CONC, SGO).

23. *Gamochaeta nivalis* Cabr., Bol. Soc. Argent. Bot. 9: 374. 1961.

Compact perennial herb sometimes forming small cushions with whitish rays. Scattered to common in the lower to upper alpine. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente). Exs.: Cordillera de Paine, 92348 (CONC, SGO); Senos de Catherine, 92394 (CONC).

24. *Gamochaeta spiciformis* (Schultz-Bip.) Cabr., Bol. Soc. Argent. Bot.: 9: 381. 1961.

Lax perennial herb with whitish rays. Partially self-compatible (Arroyo & Squeo, 1990a). Locally common, mostly in alpine bogs. Lit.: Arroyo *et al.* (1989) (Cerro Agudo, Cerro Daudet). Exs. : Sierra del Toro, 92073 (CONC, SGO), 92118 (CONC); Cordillera de Paine, 92361 (CONC); Senos de Catherine, 92388 (CONC).

25. *Hieracium antarcticum* D'Urv., Fl. Iles Malouin. 39. 1825.

Pubescent rosette perennial with yellow heads. Partially self-compatible (Arroyo & Squeo 1990a). Mostly restricted to alpine bogs just above treeline. Exs.: Sierra del Toro, 92064 (CONC); Senos de Catherine, 92402 (CONC, SGO).

26. *Hypochaeris* aff. *arenaria* Gaudich., Ann. Sci. Nat. (Paris) 5: 103. 1825.

Rhizomatous perennial with underground rhizomes; heads yellow. Partially self-compatible (Arroyo & Squeo, 1990a). Depauperate plants found only in a low alpine bog on Senos de Catherine are tentatively referred to here. Exs.: Senos de Catherine, 92375 (CONC).

27. *Hypochaeris incana* (Hook. et Arn.) Macloskie, Rep. Princeton Univ. Exped. Patagonia 8, Bot. 899. 1906.

Perennial with stout rhizomes and white heads. Self-incompatible (Arroyo & Squeo, 1990a). Abundant on dry alpine slopes and occasionally in bogs. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro, 92129 (CONC), 92186 (CONC), 92194 (CONC, SGO); Cordillera de Paine, 92306 (CONC, SGO.), 92322 (CONC, SGO).

28. *Hypochaeris tenerifolia* (Remy) O. Hoffm. in Dusén, Wiss. Ergebn. Schwed. Exped. Magellansländern 3(5): 121. 1900.

Slender perennial herb with yellow heads. Just reaching the alpine. Lit.: Arroyo *et al.* (1989) (Cerro Agudo).

29. *Hypochaeris tenuifolia* (Hook. et Arn.) Griseb, Abh. Königl. Ges. Wiss. Göttingen 24(1): 218. 1879.

Reported for the alpine by Pisano (1974).

30. *Iocenes acanthifolius* (Hombron et Jacquinot) B. Nordenstam, Opera Bot. 45: 59. 1978.

Succulent perennial herb with short, stout rhizomes; heads greenish-white. Locally abundant in bog and flush areas above treeline, extending into *Nothofagus pumilio* forest when damp. Exs.: Senos de Catherine 92399 (CONC).

31. *Leucheria hahnii* Franchet, Miss. Sci. Cap Horn 5, Bot. 349, tab. 3. 1889.

Rhizomatous perennial herb; heads white to pinkish, occasionally deep pink. Self-incompatible (Arroyo & Squeo, 1990a). Found in moist sites on the more eastern mountains. Exs.: Sierra del Toro, 92063 (CONC), 92133 (CONC). Collected in the subalpine on Cerros Diente and Agudo (Arroyo *et al.*, 1989), but also occurring into the alpine on both mountains.

32. *Leucheria leontopodioides* (Kuntze) Schumann, Just's Bot. Jahresb, 26(1): 378. 1900.

Rhizomatous perennial forming small, compact cushions. Self-incompatible (Arroyo & Squeo, 1990a) Dominant species throughout on high alpine tallus slopes. **Endemic** to southern Patagonia. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Agudo, Cerro Diente, Cerro Daudet). Exs.: Sierra del Toro, 92110, (CONC, SGO), 92132 (CONC, SGO), 92179 (CONC, SGO), Cordillera de Paine, 92357 (CONC).

33. *Leucheria purpurea* (M. Vahl) Hook, et Arn., Companion Bot. Mag. 2: 43. 1836.

Rhizomatous perennial herb; heads wine-red. Locally abundant on drier eastern sites in lower alpine where it occurs mostly in grassy situations. **Endemic** to the region of southern Patagonia and Tierra del Fuego. Ex.: Sierra del Toro, 92043 (CONC, SGO), 92054 (CONC, SGO); Cordillera de Paine, 92325 (CONC).

34. *Nardophyllum bryoides* (Lam.) Cabr., Notas Mus. La Plata, Bot. 17: 61. 1954.

Prostrate shrub forming hard compact cushions; heads deep yellow. Self-incompatible (Arroyo & Squeo, 1990a). A common species at lower elevations throughout the eastern Patagonian mountains, reaching the alpine in the park only occasionally as on Sierra del Toro. **Endemic** to the region of southern Patagonia and Tierra del Fuego. Lit.: Pisano (1974). Exs.: Sierra del Toro, 92039 (CONC).

35. *Nassauvia aculeata* (Less.) Poepp. et Endl. var. *azorelloides* (Speg.) Cabr., Darwiniana 24: 356. 1982.

Common multistemmed, low-growing, rhizomatous suffruticose perennial herb in the lower alpine, except on the wetter mountains; heads white. Self-incompatible (Arroyo & Squeo, 1990a). Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente). Ex.: Cerro La Victorina, Díaz s.n. (CONC); Sierra del Toro, 92032 (CONC), 92080 (CONC, SGO), 92195 (CONC); Cordillera de Paine, 93210 (CONC, SGO), 92353a (CONC), Tsujii 778 (CONC).

35a. *Nassauvia lagascae* (D. Don) F. Meigen var. *globosa* Skottsb., Kongl. Svensk. Vet. Akad. Handl. 56(5): 329. 1916.

Rhizomatous perennial herb with white heads. Self-incompatible (Arroyo & Squeo, 1990a). Common in the middle to upper alpine on some mountains. Variety **endemic** to southern Patagonia. Lit.: Pisano (1974). Exs.: Sierra del Toro, 92139 (CONC); Cordillera de Paine, 92307 (CONC).

35b. *Nassauvia lagascae* (D. Don) F. Meigen var. *lanata* (Phil.) Skottsb., Kongl. Svensk. Vet. Akad. Handl. 56(5): 329. 1916.

Rhizomatous perennial herb with white heads widely distributed in middle to upper alpine on the northern mountains in the park. Lit.: Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo).

36. *Nassauvia magellanica* J. Gmelin, Syst. Nat. 2: 1281. 1792.

Rhizomatous perennial herb; florets white. Partially self-compatible (Arroyo & Squeo, 1990a). Common in moist alpine locations throughout, especially in areas of late snow accumulation. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Cerro La Victorina, Díaz s.n. (CONC); Sierra del Toro, 92057 (CONC, SGO), 92190 (CONC, SGO); Cordillera de Paine, 92332 (CONC); Senos de Catherine, 92422 (CONC).

37. *Nassauvia pygmaea* (Cass.) Hook. f., Fl. Antarct. 319.1846.

Rhizomatous, multistemmed perennial herb; heads creamish-white. Self-incompatible (Arroyo & Squeo, 1990a). Dominant species throughout in high alpine, extending also into low alpine. A very common species in the park. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro, 92113 (CONC, SGO); Cordillera de Paine, 92339 (CONC, SGO); Pisano, 4125 (CONC); Senos de Catherine, 92369 (CONC).

38. *Nassauvia revoluta* D. Don, Philos. Mag. Ann. Chem. 11: 390. 1832.

Rhizomatous perennial herb with white to brownish-white heads. Self-incompatible (Arroyo & Squeo, 1990a). Common species in the high alpine. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet) . Exs.: Cerro La Victorina, Díaz s.n. (CONC). Sierra del Toro, 92175 (CONC), Pisano, 4119 (CONC).

39. *Perezia lactucoides* (M. Vahl) Less. var. *lactucoides*, Linnaea 5: 22. 1830.

Fleshy perennial herb with slender rhizomes. In high alpine cushion bogs. Variety **endemic** to the region of southern Patagonia and Tierra del Fuego. Lit.: Arroyo *et al.* (1989) (Cerro Agudo).

40. *Perezia magellanica* (L. f.) Less., Linnaea 5: 23. 1830.

Slender perennial herb with thick oblique rhizomes and white heads found occasionally in bogs above timberline on the wetter mountains close to icefield. Lit.: Vuilleumier (1970) (Lago Dickson, 1400 m.); Arroyo *et. al.* (1989) (Cerro Agudo). Exs.: Senos de Catherine 92398 (CONC).

41. *Perezia megalantha* Speg., Revista Fac. Agron. Veterin. La Plata 3(30-31): 540. 1897.

Stout perennial herb producing rosettes from thick rhizomes; heads white to pinkish-brown. Self-incompatible (Arroyo & Squeo, 1990a). Found on the more northern and easterly mountains. Locally common species throughout in high alpine. **Endemic** to southern Patagonia. Vuilleumier (1970) (Cordillera de Paine); Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente).

42. *Perezia pilifera* (D. Don) Hook. et Arn., Companion Bot. Mag. 1: 34. 1835.

Rhizomatous perennial herb often forming extensive interconnected mats; florets pale blue. Probably self-incompatible (Arroyo & Squeo, 1990a). Common species in alpine bogs, extending onto dry slopes. Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92084 (CONC, SGO); Cordillera de Paine 92343 (CONC).

43. *Perezia recurvata* (M. Vahl) Less., Linnaea 5: 21. 1830.

Perennial herb forming compact cushions; florets blue. Self-incompatible (Arroyo & Squeo 1990a). In the lower alpine on some of the drier mountains. Lit.; Pisano (1974). Exs.: Sierra del Toro 92081 (CONC, SGO), 92162 (CONC, SGO); Cordillera de Paine 92360 (CONC). Seen also in the alpine on Cerro Diente.

44. *Senecio alloeophyllus* O. Hoffm. in Dusén, Wiss. Ergebn. Schwed. Exped. Magellansländern 3(5): 105. 1900.

Suffruticose; heads yellow. Self-incompatible (Arroyo & Squeo, 1990a). A rare species in the park, found close to the limit o f the vegetation. **Endemic** to the region of southern Patagonia and Tierra del Fuego. Lit.: Cabrera (1949) (Cordillera de Paine).

45. *Senecio argyreus* Phil., Anales Univ. Chile 88: 261. 1894.

Suffruticose; florets yellow. Self-incompatible (Arroyo & Squeo, 1990a). Locally common in the low alpine on the drier mountains. Lit.: Pisano (1974). Exs.: Sierra del Toro 92002 (CONC, SGO); Cordillera de Paine 92326 (CONC, SGO).

46. *Senecio darwinii* Hook. et Arn., J. Bot. (Hooker) 3: 333. 1841.

Low suffrutice with large yellow heads and cobwebby pubescence on the backs of the leaves. Sporadically distributed in the park. Lit.: Cabrera (1949) (Cordillera de Paine, Ventisquero Dickson). Exs.: Senos de Catherine 92423 (CONC, SGO).

47. *Senecio laseguei* Hombron et Jacquinot in D'Urv., Voy. Pôle Sud, Atlas, tab. 13 d. 1846.

Perennial herb with decumbent stems; heads yellow. Self-incompatible (Arroyo & Squeo, 1990a). A low alpine species, found more commonly on the drier mountains in the park. **Endemic** to the region of southern Patagonia and Tierra del Fuego. Lit.: Arroyo *et al.* (1989) (Cerro Agudo). Exs.: Sierra del Toro 92042 (CONC), 92130 (CONC, SGO), 92135 (CONC), 92154 (CONC, SGO).

48. *Senecio magellanicus* Hook. et Arn., J. Bot. (Hooker) 3: 343. 1841.

Rhizomatous perennial with oblique rhizomes; heads dirty yellow. Self-incompatible (Arroyo & Squeo, 1990a). Fairly common throughout in the low alpine, extending into high alpine. **Endemic** to the region of southern Patagonia and Tierra del Fuego. Lit.: Cabrera (1949) (Cordillera de Paine); Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente. Cerro Agudo). Exs.: Sierra del Toro 92136 (CONC), 92145 (CONC, SGO).

49. *Senecio miser* Hook. f., Fl. Antarct. 314. 1846. Erect subshrub; heads yellow. Self-incompatible (Arroyo & Squeo, 1990a). Abundant in the subalpine on the Sierra del Toro, not seen elsewhere to date. Exs.: Sierra del Toro 92056 (CONC, SGO), 92158 (SGO), 92185 (CONC).

50. *Senecio skottsbergii* Cabr., Bol.Soc. Argent. Bot. 2: 271. 1948.

Low suffrutice. The only record for the park is in Pisano (1974).

51. *Senecio subpubescens* Cabr., Lilloa 15: 194. 1949.

Low subshrub, branched at base; heads yellow. Occasional at treeline. Seen only once on Cerro Diente. Lit.: Arroyo *et al.* (1989) (Cerro Diente).

52. *Senecio tricuspidatus* Hook. et Arn. , J. Bot. (Hooker) 3: 346. 1841.

Small shrub; heads yellow. Partially self-compatible (Arroyo & Squeo, 1990a). Locally common species above treeline on the Sierra del Toro. Lit.: Pisano (1974). Exs.: Sierra del Toro 92295 (CONC).

53. *Senecio vaginaefolius* Schultz-Bip., Flora 38: 117. 1855.

Stout, rhizomatous perennial herb, seen only to date on the Sierra del Toro. Lit.: Pisano (1974). Exs.: Sierra del Toro 92123 (CONC), 92142 (CONC, SGO), 92174 (CONC, SGO).

54. *Taraxacum gilliesii* Hook. et. Arn., Companion Bot. Mag. 1: 31. 1835.

Rhizomatous perennial; florets yellow. Locally common in the alpine. Lit.: Pisano (1974). Exs.: Sierra del Toro 92122 (CONC, SGO).

CRUCIFERAE

55. *Cardamine glacialis* (G. Forster) DC., Syst. Nat. 2: 264. 1821.

Rhizomatous perennial herb; flowers white. Self-compatible (Arroyo & Squeo, 1990a). In alpine bogs on the drier eastern mountains and on wet rock faces

on the wetter western mountains. Lit.: Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92047 (CONC, SGO), 92149 (CONC, SGO); Senos de Catherine 92412 (CONC).

56. *Draba funiculosa* Hook. f., Fl. Antarct. 238, tab. 89. 1845.

Caespitose perennial herb; flowers white to tinged lilac. Self-compatible (Arroyo & Squeo, 1990a). Local species on wet slopes. **Endemic** to the region of southern Patagonia, Tierra del Fuego and the Falkland Islands (Islas Malvinas). Lit.: Arroyo *et al.* (1989) (Cerro Agudo). Exs.: Sierra del Toro 92294 (CONC); Cerro Diente 92550 (CONC).

57. *Draba magellanica* Lam., Encycl. 2: 328. 1786.

Caespitose perennial herb; flowers white. Self-compatible to partially agamospermous (Arroyo & Squeo, 1990a). Widespread throughout, but never very common. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92140a (CONC), 92171 (CONC); Cordillera de Paine 92328 (CONC), 92336 (CONC, SGO); Senos de Catherine 92417 (CONC).

58. *Eudema hauthalii* Gilg et Muschler, Bot. Jahrb. Syst. 42: 471. 1909.

Perennial herb forming extensive loose cushions; flowers white to cream. Self-incompatible (Arroyo & Squeo, 1990a). Common in bogs in the low and high alpine. **Endemic** to southern Patagonia. Lit.: Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92115 (CONC, SGO), 92191a (CONC), 92293 (CONC, SGO).

59. *Grammosperma dusenii* O.E. Schulz, Notizbl. Bot. Gart. Berlin-Dahlem 10: 562. 1929.

Perennial herb; flowers white, with a purple hue. Mostly in areas of sand accumulation. A rare species, seen by us only on Cerro Diente. **Species and genus endemic** to southern Patagonia, know from very few localities. Lit.: Arroyo *et al.* (1989) (Cerro Diente). The species was collected by Ansorge (Nº 3, 1899) (Boelcke y Romanczuk, 1984) above tree-line on the Sierra del Toro, however we do not know whether the collection was made within the park boundary.

60. *Menonvillea nordenskjoeldii* (Dusén) Rollins, Contr. Gray Herb. 177. 21. 1955.

Perennial herb with stout underground stems; flowers white. Self-incompatible (Arroyo & Squeo, 1990a) Locally common in the high alpine on rock crevices and steep tallus slopes. **Endemic** to the region of southern Patagonia. Lit.: Boelcke y Romanczuk (1984) (Cordillera, Estancia Cerro Paine, 1.000 m); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Senos de Catherine 92418 (CONC).

61. *Onuris spegazziniana* Gilg et Muschler, Bot. Jahrb. Syst. 42: 468. 1909.

Perennial herb forming loose aggregations. A rare species in the park, seen only on Cerro Diente at around 1100 m in the high alpine on a horizontal terrace with heavy snow accumulation. Exs.: Cerro Diente 92553 (CONC).

62. *Thlaspi magellanicum* Comm. ex Poiret in Lam., Encycl. 7: 541. 1806.

Caespitose perennial herb; flowers white. Self-compatible (Arroyo & Squeo, 1990a). Locally common in the low alpine on wet slopes and in bogs. Lit.: Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo). Exs.: Sierra del Toro 92046 (CONC), 92140 (CONC, SGO), 92219 (CONC); Cordillera de Paine 92330 (CONC).

63. *Weberbauera colchaguensis* (Barnéoud) Al-Shehbaz, J. Arnold Arbor. 71: 241. 1990.

Perennial herb forming small cushions. A rare species seen in moist sites on the wetter western mountains. Lit.: Arroyo *et al.* (1989) (Cerro Agudo, Cerro Daudet under *Stenodraba pusilla* (Gillies ex Hook. et Arn.) Boelcke var. *patagonica* (Phil.) Boelcke, now considered a synonym of W. *colchaguensis* (Al-Shehbaz, 1990)). Exs.: Senos de Catherine 92368 (CONC). The park localities constitute the extreme southern record for the species.

EMPETRACEAE

64. *Empetrum rubrum* M. Vahl ex Willd., Sp. Pl. 4(2): 713. 1806.

Shrub forming extensive low open mats; flowers brownish- red. Dioecious to polygamous (Arroyo & Squeo, 1990a). Dominant species throughout in the alpine. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92097 (CONC); Cordillera de Paine 92353 (CONC); Senos de Catherine 92408 (CONC).

ERICACEAE

65. *Pernettya mucronata* (L. f.) Gaudich. ex Spreng., Syst. Veg. 4(2), Cur. Post. 158. 1827.

Shrub forming extensive low thickets; flowers white. Dioecious (Arroyo & Squeo, 1990a). A mostly subalpine species, collected on Cerro Diente and Cerro Agudo below treeline, where it also extends into the alpine.

66. *Pernettya pumila* (L. f.) Hook. var. *pumila*, Icon. Pl. 1: tab. 9. 1837.

Prostrate shrub, forming extensive mats in bogs and on wetter alpine slopes. Very common. Dioecious (Arroyo & Squeo, 1990a). Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92119 (CONC, SGO) 92153 (CONC); Senos de Catherine 92374 (CONC).

FAGACEAE

67. *Nothofagus antarctica* (G. Forster) Oersted, Bidrag. Egefam. 24. 1871.

Small monoecious deciduous tree. Collected at treeline on Cerro Daudet by Arroyo *et al.* (1989) but also occurring occasionally as krummholz above treeline.

68. *Nothofagus pumilio* (Poepp. et Endl.) Krasser, Ann. K.K. Naturhist. Hofmus. 11: 163. 1896.

Deciduous, monoecious tree. Throughout the park in the forest belt and also forming forest islands in the alpine. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente). Collected at treeline on Cerros Agudo and Daudet where it also occurs above treeline as krummholz. Seen as krummholz on Cordillera de Paine. Exs.: Sierra del Toro 92205 (CONC, SGO).

GENTIANACEAE

69. *Gentianella magellanica* (Gaudich.) Fabris ex D.M. Moore, Brit. Antarct. Surv. Sci. Rep. 60: 103. 1968.

Facultative annual; flowers deep blue to white. Self-compatible to perhaps agamospermous (Arroyo & Squeo. 1990a). Occasional at the level of the alpine. Seen above treeline only on the Sierra del Toro in bogs. Exs.: Sierra del Toro 92085 (CONC), 92208 (CONC, SGO).

GERANIACEAE

70. *Geranium sessiliflorum* Cav., Diss. 198, tab. 77, Fig. 2. 1787.

Perennial herb with stout stock; flowers pale pink to white. Partially self-compatible (Arroyo & Squeo, 1990a). Scattered in alpine bogs and in moister sites outside bogs. Lit.: Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92082 (CONC, SGO), 92151 (CONC).

GUNNERACEAE

71. *Gunnera magellanica* Lam., Encycl. 3: 61. 1789.

Succulent perennial forming extensive mats. Dioecious (Arroyo & Squeo, 1990a). Widespread in the park in low alpine bogs. Lit.: Arroyo *et al.* (1989) (Cerro Diente, Cerro Daudet). Exs.: Sierra del Toro 92108 (CONC, SGO); Senos de Catherine 92371 (CONC).

HYDROPHYLLACEAE

72. *Phacelia secunda* J. Gmelin, Syst. Nat. 2: 330. 1791.

Perennial herb with strong stock, tending to form small mats; flowers white. Partially self-compatible (Arroyo & Squeo 1990a). In the low alpine on the drier mountains. Lit.: Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92087 (CONC); Cordillera de Paine 92321 (CONC, SGO).

LABIATAE

73. *Satureja darwinii* (Benth.) Briq. in Engler et

Prantl, Natürl. Pflanzenfam. 4 (3a),: 300. 1896.

Procumbent shrub with bluish flowers, forming loose mats. Uncommon, found mostly in the low alpine, on the drier eastern mountains. Exs.: Sierra del Toro, 92128 (CONC), Pisano 4109 (CONC); Cordillera de Paine 92304 (CONC, SGO).

ONAGRACEAE

74. *Epilobium australe* Poepp. et Hausskn. ex Hausskn., Monogr. *Epilobium* 269. 1884.

Rhizomatous perennial with pink flowers. Self-compatible (Arroyo & Squeo, 1990a.). Grows in bogs and on wet alpine slopes. Lit.: Solomon (1982) (Sierra del Toro); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92152 (CONC, SGO); Senos de Catherine, 92407 (CONC).

75. *Epilobium conjungens* Skottsb., Wiss. Ergebn. Schwed. Südpolar Exped. 4(4): 24, tab. 1, Fig. 3a-d. 1906.

Creeping perennial herb. A very rare species in the park, seen thus far only in one very wet locality. Self-compatible (Solomon, 1982). Exs.: Senos de Catherine 92383 (CONC).

76. *Epilobium nivale* Meyen, Reise 1: 315. 1834.

Low caespitose perennial herb with reddish-purple flowers, occurring in alpine bogs. Self-compatible (Solomon, 1982). Reported for the park by Solomon (1982) (Sierra del Toro).

OXALIDACEAE

77a. *Oxalis enneaphylla* Cav. ssp. *enneaphylla.* Icon. 5: 7, tab. 411. 1799.

Perennial herb, with stout rhizomes, forming small cushions; flowers pink. Tristylous and self-incompatible (Moore, 1983). Reported for the park by Pisano (1974).

77b. *Oxalis enneaphylla* Cav. ssp. *ibari* (Phil.) Lourt. in Correa, Fl. Patag. 5: 9, Fig. 7. 1988.

Perennial herb with stout rhizomes and pink flowers, forming small cushions. Tristylous and self-incompatible (Arroyo & Squeo, 1990a). Common high alpine species. **Endemic** to southern Patagonia. Lit.: Arroyo *et al.* (1989), as *O. patagonica* Speg. (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Cordillera de Paine 92329 (CONC, SGO).

78. *Oxalis loricata* Dusén, Öfvers. Förh. Kongl. Svenska Vetensk. Akad. 58: 247. 1901.

Strongly rhizomatous perennial herb; flowers pink. On tallus slopes. Tristylous and self-incompatible (Arroyo & Squeo, 1990a). Abundant in the upper alpine on some mountains. Lit.: Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92102 (CONC, SGO). 92299 (CONC, SGO). The type specimen (Dusén s.n. - Knuth, 1930) was collected on the Sierra del Toro, however it is unknown whether within the park boundary.

79. *Oxalis magellanica* G. Forster, Commentat. Soc. Regiae Sci. Gott. 9: 33. 1787.

Slender perennial, strongly rhizomatous; flowers white. Rare at the level of the alpine, and only on the wettest mountains. Lit.: Arroyo *et al.* (1989) (Cerro Daudet).

PAPILIONACEAE

80. *Adesmia corymbosa* Clos in C. Gay, Fl. Chil. 2: 165. 1846.

Prostrate perennial with deep root and yellow flowers. Rare in the park at the level of alpine. Lit.: Pisano (1974). Exs.: Cordillera de Paine 92342 (CONC, SGO).

81. *Adesmia lotoides* Hook. f., Fl. Antarct. 255. 1845.

Rhizomatous perennial herb with yellow flowers. Partially self-compatible (Arroyo & Squeo, 1990a). Common in the lower alpine on most of the drier mountains. Lit. Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92048 (CONC), 92245 (CONC).

82. *Adesmia parvifolia* Phil., Linnaea 28: 683. 1858.

Caespitose perennial herb with lilac flowers. Self-compatible (Arroyo & Squeo, 1990a). Common in

the low to high alpine on the drier mountains. Lit.: Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92187 (CONC, SGO).

83. *Adesmia pumila* Hook. f., Fl. Antarct. 255. 1845.

Rhizomatous perennial herb with yellow flowers. Self-compatible (Arroyo & Squeo, 1990a). Locally common species in moist habitats and bogs in the low alpine, where it forms extensive mats. Lit.: Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92075 (CONC, SGO), 92196 (CONC, SGO).

84. *Adesmia salicornioides* Speg., Anales Soc. Ci. Argent. 47: 274. 1899.

Suffruticose cushion species with yellow flowers growing in very exposed habitats. Partially self-compatible (Arroyo & Squeo, 1990a). Seen only on Cerro Diente, where it is very abundant.Lit.: Arroyo *et al.* (1989) (Cerro Diente).

85. *Adesmia villosa* Hook. f. Fl. Antarct. 256. 1845.

Rhizomatous perennial herb with dark yellow flowers.Partially self-compatible (Arroyo & Squeo, 1990a). Locally common on alpine slopes on some mountains. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente). Exs.: Cordillera de Paine 92340 (CONC, SGO).

86. *Anarthrophyllum desideratum* (DC.) Benth., Gen Pl. 1(2): 478. 1865.

Shrub forming hard, elevated cushions. Just reaching the alpine and seen there only at one locality in the east or the park. Exs.: Sierra del Toro 92255 (CONC, SGO).

87. *Astragalus nivicola* Gómez-Sosa, Hickenia 1(7): 93, Fig. 1. 1977.

Caespitose perennial herb; flowers bluish-purple. Common on the drier mountains in the park. Self-compatible (Arroyo & Squeo, 1990a). Lit.: Gómez-Sosa (1984) (Cerro Diente); Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92168 (CONC), 92291 (CONC); Cordillera de Paine 92335 (CONC, SGO).

88. *Vicia bijuga* Gillies ex Hook. et Arn., Bot. Misc. 3: 197. 1833.

Prostrate, rhizomatous perennial herb with bluish-purple flowers, common in the low to high alpine on the drier mountains. Partially self-compatible (Arroyo & Squeo, 1990a). Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92055 (CONC, SGO), 92111 (CONC), 92177 (CONC, SGO), 92189 (CONC); Cordillera de Paine 92300 (CONC, SGO).

89. *Vicia magellanica* Hook. f., Fl. Antarct. 257. 1846.

Scandent, rhizomatous perennial herb with pink to light blue flowers. Partially self-compatible (Arroyo & Squeo, 1990a). Only occasional at the level of the alpine. Exs.: Sierra del Toro 92066 (SGO), 92092 (CONC, SGO); Cordillera de Paine 92301 (CONC). Collected on Cerro Diente in the subalpine (Arroyo *et al.*, 1989), where it also occurs above treeline.

PLANTAGINACEAE

90. *Plantago barbata* G. Forster ssp. *austroandina* Rahn, Nord J. Bot. 4(5): 615, 1984.

Perennial herb forming dense cushions; flowers inconspicuously coloured. Common in alpine bogs in the park. Species is cited as self-compatible (Moore, 1983). Lit.: Arroyo *et al.* (1989) (Cerro Agudo, Cerro Daudet). Exs.: Cerro del Toro, 92155 (CONC, SGO), 92197, (CONC, SGO); Senos de Catherine 92400 (CONC).

91. *Plantago uniglumis* Wallr. ex Walp., Nov. Actorum Acad. Caes. Leop.-Carol. Nat. Cur. 19, Suppl. 1 : 402. 1843.

Perennial herb forming hard cushions. On dry slopes in alpine; locally common. Lit.: Arroyo *et al.* (1989) (Cerro Diente).

PLUMBAGINACEAE

92. *Armeria maritima* (Miller) Willd. ssp. *andina* (Poepp. ex Boiss.) D.M. Moore et B. Yates, Bot. Not. 127: 191. 1974.

Perennial herb, woody at base, forming small, compact cushions. Flowers pale pink. Self-compatible (Arroyo & Squeo, 1990a). On moist slopes and

occasionally in bogs. Lit.: Arroyo *et al.* (1989) (Cerro Diente, Cerro Daudet). Exs.: Sierra del Toro 92074 (CONC). Collected in a cushion bog at treeline on Cerro Agudo (Arroyo *et al.* 1989), where it also extends into the alpine.

POLYGONACEAE

93. *Rumex acetosella* L., Sp. Pl. 338. 1753.

Dioecious perennial herb. An **introduced** species found sometimes in abundance in the low alpine on the drier mountains. Exs.: Sierra del Toro 92244 (CONC, SGO); Cordillera de Paine 92354 (CONC).

PRIMULACEAE

94. *Primula magellanica* Lehm., Monogr. Primul. 62, tab. 6. 1817.

Stoloniferous perennial herb; flowers white to pink. In bogs in the lower alpine. Self-compatible (Arroyo & Squeo, 1990a). Seen only above treeline at one locality. Exs.: Senos de Catherine 92397 (CONC).

95. *Samolus repens* (J.R. et G. Forster) Pers., Syn. Pl. 1: 171. 1805.

Perennial herb with white to cream flowers. Seen only once along streamside on Cerro Daudet. Lit.: Arroyo *et al.* (1989) (Cerro Daudet).

RANUNCULACEAE

96. *Anemone multifida* Poiret, Encycl., Suppl. 1: 364. 1810.

Rhizomatous perennial herb; flowers pale cream. Self-compatible (Arroyo & Squeo, 1990a). Locally common in the alpine where it occurs in bogs and on slopes with heavy snow accumulation. Collected on Cerro Diente in the subalpine (Arroyo *et al.*, 1989), where it also occurs above treeline to around 900 m. Exs.: Sierra del Toro 92070 (CONC, SGO).

97. *Caltha appendiculata* Pers., Syn. 2: 107. 1807.

A rhizomatous perennial herb. Self-compatible (Moore, 1983). Rare above treeline in the park and restricted to bogs in very wet localities. Exs.: Senos de Catherine 92405a (CONC).

98. *Caltha dioneifolia* Hook. f., London J. Bot. 2: 307. 1843.

A cushion-forming species. Rare in alpine bogs, and apparently restricted to the wettest mountains. Exs.: Senos de Catherine 92404 (CONC).

99. *Caltha sagittata* Cav., Icon. 5: 8, tab. 414. 1799.

Perennial herb forming large extensive interconnected mats; flowers pale-greenish cream. Self-compatible (Moore, 1983). Found exclusively in bogs. Lit.: Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo). Exs.: Sierra del Toro 92141 (CONC, SGO), 92161 (CONC).

100. *Hamadryas delfinii* Phil. ex Reiche, Anales Univ. Chile 88: 77. 1894.

Rhizomatous perennial; flowers brownish-red. Only on the easternmost summits, where it is common in the low alpine. Dioecious (Arroyo & Squeo, 1990a). Lit.: Lourteig (1951) (Cerro Diente); Pisano (1974); Exs.: Sierra del Toro 92050 (CONC, SGO), 92062 (CONC), 92081 (CONC); Cordillera de Paine 92347 (CONC).

101. *Hamadryas kingii* Hook. f., Fl. Antarct. 228. 1845.

Rhizomatous perennial, with scattered connected rosettes; flowers dark blue with yellow. Dioecious (Arroyo & Squeo, 1990a). Common species in the alpine reaching the upper vegetation limit and extending into the lower alpine on the westernmost summits. Lit.: Lourteig (1951) (Cerro Diente); Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92060 (CONC, SGO); Cordillera de Paine 92308 (CONC).

102. *Hamadryas sempervivoides* Sprague, Hooker's Icon. Pl. 28: tab. 2748. 1905.

Perennial herb forming extensive hard cushions; flowers bright yellow. Dioecious (Arroyo & Squeo, 1990a). Restricted to bogs. Seen in the park only on the northern mountains. **Endemic** to southern Patagonia. *Hamadryas sempervivoides* is highly variable morphologically on Cerro Agudo and Cerro Daudet, possibly due to hybridization with other species. Lit.: Lourteig (1951) (Cerro Diente), Arro-

yo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet).

103. *Hamadryas* sp.

Perennial herb with connecting rhizomes between rosettes; flowers similar to those of *H. kingii*. Dioecious (Arroyo & Squeo, 1990a). Plants found on several mountains in the park, possibly representing F_1 hybrids between *H. kingii* and *H. sempervivoides*, or alternatively an undescribed species are placed here until further study. If new, **endemic** to southern Patagonia. Lit.: Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet).

104. *Ranunculus maclovianus* D'Urv, Fl., Iles Malouin. 48. 1825.

Slender perennial herb with small yellow flowers. Self-compatible (Moore, 1983). Restricted to very wet sites in the park. Senos de Catherine 92414, (CONC, SGO).

105. *Ranunculus peduncularis* J.E. Smith. var. *peduncularis*, in Rees, Cycl. 29(2): Ranunculus 49. 1815.

Perennial herb, rooting at nodes; flowers yellow. Just reaching the alpine on Sierra del Toro. Self-compatible with some agamospermy (Arroyo & Squeo, 1990a). Locally common in bogs with late snow melt. Exs.: Sierra del Toro 92071 (CONC).

106. *Ranunculus sericocephalus* Hook. f., Fl. Antarct. 225, tab 83. 1845.

Perennial herb rooting at nodes; flowers yellow. Restricted to bog habitats. Self-compatible (Moore, 1983). Seen above treeline only on the Sierra del Toro. Exs.: Sierra del Toro 92144 (CONC).

RHAMNACEAE

107. *Discaria chacaye* (Don) Tort., Parodiana 2(1): 80. 1983.

Spiny, low growing shrub; flowers white. Just reaching the alpine on some of the drier mountains. Exs.: Cordillera de Paine 92362 (CONC).

ROSACEAE

108. *Acaena antarctica* Hook. f., Fl. Antarct. 269. 1846.

Prostrate subshrub forming large mats; flowers inconspicuously coloured. Self-compatible (Arroyo & Squeo, 1990a). Common in alpine bogs. Lit.: Arroyo *et al.* (1989) (Cerro Diente, Cerro Daudet). Exs.: Sierra del Toro 92104 (CONC), 92146 (CONC, SGO), 92165 (CONC, SGO); Cordillera de Paine 92352 (CONC, SGO).

109. *Acaena lucida* (Lam.) M. Vahl, Enum. Pl. 1: 296. 1804.

Low subshrub, flowers reddish. Self-compatible (Arroyo & Squeo, 1990a). Locally common in the lower alpine. Lit.: Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92120 (CONC, SGO); Senos de Catherine 92393 (CONC).

110. *Acaena magellanica* (Lam.) M. Vahl, Enum. Pl. 1: 297. 1804.

Rhizomatous suffrutice; flowers with conspicuous red stigmas. Gynodioecious (Arroyo & Squeo, 1990a). Fairly common throughout in damp situations, and especially towards the edges of bogs. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92556 (CONC); Cordillera de Paine 92338 (CONC, SGO); Senos de Catherine 92389 (CONC).

111. *Acaena pinnatifida* Ruiz et Pavón, Fl. Peruv. Chil. 1: 68, tab. 104, Fig. b. 1798.

Perennial herb with elongate inflorescences and greenish flowers. Self-compatible (Arroyo & Squeo, 1990a). Seen only in the alpine zone on Cordillera de Paine. Exs.: Cordillera de Paine 92337 (CONC, SGO).

112. *Acaena platyacantha* Speg., Rev. Fac. Agron. Veterin. La Plata 3(30-31): 515. 1897.

Perennial herb; heads globose with greenish flowers. A common species in the mid alpine on Cerro Diente, but not seen elsewhere. Self-compatible

(Arroyo & Squeo, 1990a). Lit.: Arroyo *et al.* (1989) (Cerro Diente).

113. *Acaena tenera* Alboff, Rev. Mus. La Plata 7: 367. 1896.

Delicate perennial herb with bright green foliage, the leaflets with purplish marginal teeth. Seen only in bogs on the wetter western mountains. **Endemic** to the region of southern Patagonia and Tierra del Fuego. Our material constitutes very northerly records for the species. Exs.: Senos de Catherine 92420 (CON, SGO); Cerro Agudo 92555 (CONC).

114. *Geum magellanicum* Pers., Syn. Pl. 2: 57. 1806.

Stout perennial herb with large rootstock and conspicuous yelow flowers. Self-compatible with perhaps some agamospermy (Arroyo & Squeo, 1990a). Just reaching alpine in humid situations. Exs.: Sierra del Toro 92114 (CONC, SGO).

RUBIACEAE

115. *Oreopolus glacialis* (Poepp.) Ricardi var. *glacialis*, Gayana, Bot. 6: 7. 1963.

Perennial herb forming consistent cushions; flowers bright yellow. Distylous and self-incompatible (Arroyo & Squeo, 1990a). Dominant in lower and middle alpine on the drier mountains. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92040 (CONC, SGO); Cordillera de Paine 92351 (CONC).

SANTALACEAE

116. *Arjona patagonica* Hombron et Jacquinot in D'Urv., Voy. Pôle Sud, Atlas, tab. 15, Fig. a. 1845.

Stoloniferous perennial herb; flowers pale to dark pink with age. Distylous and self-incompatible (Arroyo & Squeo, 1990a). Common species in lower alpine on drier mountains. Lit.: Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92089 (CONC, SGO).

117. *Nanodea muscosa* Banks ex C.F. Gaertner, Suppl. Carp. 251, tab. 225, Fig. 9. 1807.

Creeping perennial herb with red herbage and dark red flowers. Very rare in the alpine where it is restricted to bogs in the lower alpine. Exs.: Senos de Catherine 92385 (CONC).

SAXIFRAGACEAE

118. *Escallonia alpina* Poepp. ex DC., Prodr. 4: 665. 1830.

Erect to spreading shrub with white to dark pink flowers. Self-incompatible (Arroyo & Squeo, 1990a). Just extending into the alpine where it forms low, windswept mats. Exs.: Sierra del Toro 92094 (CONC); Senos de Catherine 92401 (CONC). Collected on Cerro Diente (Arroyo *et al.* 1989), where it also occurs sporadically to around 850 m above treeline.

119. *Escallonia rubra* (Ruiz et Pavón) Pers., Syn. Pl. 1: 235. 1805.

Cited for the alpine zone by Pisano (1974).

120. *Ribes cucullatum* Hook. et Arn., Bot. Misc. 3: 340. 1833.

Forming low thickets above treeline; flowers wine red. Dioecious (Arroyo & Squeo, 1990a). Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente). Exs.: Cordillera de Paine 92334 (CONC, SGO). Collected at treeline on Cerro Agudo (Arroyo, 1989), where is also penetrates into the alpine.

121. *Saxifraga magellanica* Poiret, Encycl. 6: 686. 1805.

Caespitose perennial herb; flowers white. Self-compatible to possibly agamospermous (Arroyo & Squeo, 1990a). Common on moist sites in lower to upper alpine throughout. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92026 (CONC, SGO), 92109 (CONC, SGO); Cordillera de Paine 92305 (CONC); Senos de Catherine 92382 (CONC).

122. *Saxifragella bicuspidata* (Hook. f.) Engler in Engler et Prantl, Natürl. Pflanzenfam. 3(2a): 61. 1891.

Perennial herb forming small, compact cushions; flowers geenish. Partially self-compatible (Arroyo & Squeo, 1990a). A rare species found only to date in the park on Cerro Agudo and Cerro Daudet. **Genus and species endemic** to region of southern Patagonia and Tierra del Fuego. Lit.: Arroyo *et al.* (1989) (Cerro Agudo, Cerro Daudet). The park populations constitute very northerly records for this species.

SCROPHULARIACEAE

123. *Calceolaria biflora* Lam., Encycl., 1: 556. 1785.

Perennial herb with short rhizomes and pale yellow flowers, just reaching alpine on the drier mountains. Self-compatible (Arroyo & Squeo, 1990a). Exs.: Sierra del Toro 92061; (CONC, SGO). Collected in the subalpine on Cerro Diente (Arroyo et al.,1989) where its also occurs in the alpine.

124. *Calceolaria tenella* Poepp., Nov. Gen. Sp. Pl. 3: 76, tab. 287. 1845.

Shortly rhizomatous perennial herb forming small mats; flowers pale yellow. Self-compatible (Arroyo & Squeo, 1990a). Seen only in the high alpine at 1100 m at the shaded base of a rock crevice. Exs.: Cordillera de Paine 92318 (CONC, SGO).

125. *Calceolaria uniflora* Lam., Encycl. 1: 556. 1785.

Perennial herb forming individual rosettes to extensive lose cushions; flowers orange-yellow, the lower lip with a large wine-red spot with white border. Partially self-compatible (Arroyo & Squeo, 1990a). A very beautiful plant, common on many mountains in the park. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo). Exs.: Sierra del Toro 92131 (CONC), 92176 (CONC, SGO); Cordillera de Paine 92356 (CONC).

126. *Ourisia breviflora* Benth. in DC. Prodr. 10: 493. 1846.

Delicate species growing occasionally in bogs or on rock crevices in the low alpine on the wetter mountains. Lit.: Arroyo *et al.* (1989) (Cerro Daudet). Exs. Senos de Catherine 92386 (CONC). Collected on Cerro Agudo just below treeline (Arroyo *et al.*, 1989), where it also occurs higher into the alpine.

127. *Ourisia poeppigii* Benth. in DC. Prodr. 10: 492. 1846.

Erect perennial herb with stout rhizomes and scarlet-red flowers. Self-compatible (Arroyo & Peñaloza, 1990). Reaching the high alpine in abundance along vertical stream banks on Cerro Diente. Lit.: Arroyo *et al.* (1989) (Cerro Diente).

SOLANACEAE

128. *Benthamiella nordenskjoldii* Dusén ex N.E. Br., Hooker's Icon. Pl. 27, tab. 2636a. 1900.

Perennial herb with some woodiness forming large soft cushions; flowers white. Self-incompatible (Arroyo & Squeo, 1990b). Rare in the park, seen to date only on the Sierra del Toro in the high alpine. Our material constitutes a very westerly record for the species. **Endemic** to the region of southern Patagonia and Tierra del Fuego. Exs.: Sierra del Toro 92193 (CONC, SGO).

TETRACHONDRACEAE

129. *Tetrachondra patagonica* Skottsb. ssp. *fuegiana* D.M. Moore, Bol. Soc. Argent. Bot. 13: 6. 1970.

Rare, diminutive, creeping herb rooting at the nodes, found in damp rock crevices in lower alpine. Seen only on Senos de Catherine to date. The populations in the park apparently belong to ssp. *fuegiana*, which is distinguished from ssp. *patagonica* by its entire to essentially glabrous leaves. Our material constitutes an extreme northerly record for the subspecies, previously only known from mountains of Tierra del Fuego. **Endemic** to the region of southern Patagonia and Tierra del Fuego. Exs.: Senos de Catherine 92419 (CONC).

THYMELAEACEAE

130. *Drapetes muscosus* Banks ex Lam., J. Hist. Nat. 1: 189, tab. 10, fig. 1. 1792.

Perennial herb forming lax cushions. Rare in cushions bogs above treeline. Lit.: Arroyo *et al.* (1989) (Cerro Agudo, Cerro Daudet). Exs.: Senos de Catherine 92409 (CONC).

UMBELLIFERAE

131. *Azorella filamentosa* Lam., Encycl. 1: 344. 1783.

Perennial herb forming extensive soft mats in lower alpine in humid areas, only rarely reaching the alpine. According to Martínez (1989), basically gynodioecious but with infrequent male plants. **Endemic** to the region of southern Patagonia, Tierra del Fuego and the Falkland Islands (Islas Malvinas). Exs.: Sierra del Toro 92049 (CONC, SGO). Collected at 650 m on Cerro Diente (Arroyo *et al.*, 1989) where it also occurs above treeline.

132. *Azorella fuegiana* Speg., Anales Mus. Nac. Hist. Nat. Buenos Aires 5: 58. 1896.

Rhizomatous perennial herb; flowers pale yellow-green. Possibly agamospermous (Arroyo & Squeo, 1990a). According to Martínez (1989), female, male and hermaphrodite plants can be found in this species. Fairly common on most mountains in the park, predominantly in the lower alpine. Lit.: Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo). Exs.; Sierra del Toro 92078 (CONC, SGO); 92221 (CONC, SGO); Senos de Catherine 92421 (CONC).

133. *Azorella lycopodioides* Gaudich., Ann. Sci. Nat. (Paris) 5: 105. 1825.

Perennial herb, stems woody at base, forming large, dense cushions; flowers green. Partially self-compatible (Arroyo & Squeo, 1990a). Common throughout and occurring principally in the lower alpine. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92127 (CONC, SGO); Cordillera de Paine 92323 (CONC, SGO); Senos de Catherine 92395 (CONC).

134. *Azorella monantha* Clos in C. Gay, Fl. Chil. 3: 79. 1848

Perennial herb, stems woody at base, forming hard, often elevated cushions; flowers pale yellow. A locally common species in the park found in the lower to the upper alpine on the drier mountains. Lit.: Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92041 (CONC, SGO); Cordillera de Paine 92344 (CONC, SGO).

135. *Azorella selago* Hook. f., Fl. Antarct. 284, tab. 99. 1846.

Perennial herb, stems woody at base, forming cushions; flowers greenish. A circumantarctic species now known from three mountains in the wetter areas of the park. **Endemic** to the region of southern Patagonia, Tierra del Fuego, Falkland Islands (Islas Malvinas) and the subantartic islands. Lit.: Arroyo *et al.* (1989) (Cerro Agudo, Cerro Daudet). Exs.: Senos de Catherine 92370 (CONC).

136. *Bolax gummifera* (Lam.) Sprengel, Syst. Veg. 1: 879. 1824.

Perennial herb, stems woody at base, forming compact elevated cushions; flowers green. Dioecious (Arroyo & Squeo, 1990a). Dominant species in the lower alpine throughout, extending into the upper alpine. Lit.: Pisano (1974): Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92024 (CONC, SGO); Cordillera de Paine (92345); Senos de Catherine 92373 (CONC).

137. *Osmorhiza depauperata* Phil., Anales Univ. Chile 85: 726. 1894.

Delicate perennial herb with small white flowers, occasionally extending into the alpine in damp situations. Self-compatible (Arroyo & Squeo, 1990a.) Exs.: Sierra del Toro 92086 (CONC), 92125 (CONC, SGO). Reported below treeline on Cerro Diente (Arroyo *et al.* 1989) where it was also seen to occur rarely in the lower alpine.

138. *Schizeilema ranunculus* (D'Urv.) Domin, Bot. Jahrb. Syst. 40: 576. 1908.

Delicate perennial herb with greenish flowers, found very occasionally in the alpine. Seen only in one bog on Sierra del Toro. Exs.: Sierra del Toro 92096 (CONC).

139. *Valeriana carnosa* J. E. Smith, Pl. Icon. Ined. 3: 52, tab. 52. 1791.

Erect perennial herb with thick glaucous leaves and white flowers, found to date in the alpine only on Sierra del Toro. Gynodioecious (Arroyo & Squeo, 1990a). Exs.: Sierra del Toro 92044 (CONC), 92069 (CONC, SGO), 92090 (CONC).

VIOLACEAE

140. *Viola commersonii* DC. ex Gingins in DC., Prodr. 1: 297. 1824.

Slender perennial herb, of rare occurrence in lower alpine bogs. Seen only to date on Senos de Catherine where it was found sterile. Exs.: Senos de Catherine 92411a (CONC).

141. *Viola maculata* Cav., Icon. 6: 20, tab. 530. 1800.

Perennial herb with short rhizomes, the flowers yellow. Self-compatible (Arroyo & Squeo, 1990a). Extending into the lower alpine on the drier mountains. Lit.: Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92058 (CONC, SGO), 92290 (CONC, SGO), 92292 (CONC); Cordillera de Paine 92333 (CONC, SGO).

142. *Viola tridentata* Menzies ex Gingins in DC., Prodr. 1: 300. 1824.

Rhizomatous perennial herb forming extensive bright green mats; flowers pale purplish-blue. Partially self-compatible (Arroyo & Squeo, 1990a). Found in alpine bogs or growing on cushion-plants. Lit.: Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo). Exs.: Sierra del Toro 92147 (CONC, SGO), 92297 (CONC); Senos de Catherine 92377 (CONC).

ANGIOSPERMAE: MONOCOTYLEDONEAE

CYPERACEAE

143. *Carex caduca* Boott, Ill. Carex 4: 157, tab. 508, Fig. 1. 1867.

Rhizomatous perennial. In low alpine bogs. Exs.: Sierra del Toro 92052 (CONC, SGO) , 92077 (CONC, SGO); Senos de Catherine 92416 (CONC).

144. *Carex kingii* (Boott ex Hook. f.) Reznicek, Canad. J. Bot. 68(7): 1419. 1990.

Rhizomatous and stoloniferous perennial herb, found in bogs only on the weter mountains. **Endemic** to the region of southern Patagonia and Tierra del Fuego, reaching its northern limit in the area of the park. Exs.: Senos de Catherine 92390 (CONC).

145. *Carex vallis-pulchrae* Phil., Anales Univ. Chile 93: 487. 1896.

Perennial with slender rhizomes forming tufts in bogs and on the larger cushion species outside bogs. Exs.: Sierra del Toro 92559 (CONC); Cerro Agudo 92552 (CONC); Senos de Catherine 92558 (CONC).

146. *Oreobolus obtusangulus* Gaudich., Ann. Sc. Nat. 1: 99, tab. 2, Fig. 1. 1825.

Cushion-forming species in alpine bogs. Rare in the park. Seen only to date at one locality. Exs.: Senos de Catherine 92392 (CONC).

147. *Schoenus andinus* (Phil.) H. Pfeiffer, Repert. Spec. Nov. Regni Veg. 23: 348. 1927.

Rhizomatous perennial. In alpine cushion bogs. Lit.: Arroyo *et al.* (1989) (Cerro Diente).

GRAMINEAE

148. *Agrostis flavidula* Steud., Syn. Pl. Glumac. 1: 421. 1854.

Cited for the park by Pisano (1974).

149. *Agrotis inconspicua* Kunze ex E. Desv. in C. Gay, Fl. Chil. 6: 315. 1854.

Caespitose perennial grass. Occasional in alpine bogs and on moist slopes. Exs.: Cordillera de Paine 92302 (CONC, SGO); Cerro Diente 92551 (CONC).

150. *Agrotis meyenii* Trin., Mem. Acad. Imp. Sci. Saint-Petersbourg, Ser. 6, Sci. Math., Seconde Pt. Sci. Nat. 4: 312. 1841.

Caespitose perennial herb. Common in cushion bogs and on moist slopes in alpine. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Agudo). Exs.: Sierra del Toro 92124 (CONC).

151. *Deschampsia flexuosa* (L.) Trin., Bull. Sci. Acad. Imp. Sci. Saint-Petersbourg 1: 66. 1836.

Caespitose perennial. On dry slopes in low alpine. Occasional in park. Exs.: Cordillera de Paine 92316 (CONC, SGO).

152. *Deschampsia parvula* (Hook. f.) E. Desv. in C. Gay, Fl. Chil. 6: 339. 1854.

Perennial forming small cushions. In bogs and in wet alpine slopes on the more westerly mountains. **Endemic** to the region of southern Patagonia, Tierra del Fuego and the Falkland Islands (Islas Malvinas). Lit.: Arroyo *et al.* (1989) (Cerro Agudo, Cerro Daudet). Exs.: Senos de Catherine 92413 (CONC, SGO).

153. *Deschampsia patula* (Phil.) Pilger ex Skottsb., Kongl. Svenska Vetenskapsakad. Handl. n.s. 56(5): 175. 1916.

Erect perennial. Occasional in the alpine. Seen only at one locality. **Endemic** to the region of southern Patagonia and Tierra del Fuego. Exs.: Senos de Catherine 92378 (CONC).

154. *Deyeuxia erythrostachya* E. Desv. in C. Gay, Fl. Chil. 6: 324, tab. 78, fig. 1. 1854.

Caespitose perennial. In high alpine bogs, or on very moist slopes. Lit.: Arroyo *et al.* (1989) (Cerro Daudet). Exs.: Sierra del Toro 92138 (CONC, SGO).

155. *Elymus* aff. *agropyroides* J. Presl, Rel. Haenk. 1: 265. 1830.

Laxly caespitose perennial grass. Exs.: Sierra del Toro 92107 (CONC, SGO), 92188 (CONC).

156. *Elymus glaucescens* Seberg, Pl. Syst. Evol. 166(1-2): 99. 1989.

Prostrate to erect, caespitose perennial grass. Common in the high alpine, reaching the upper limits of the vegetation. Lit.: Arroyo *et al.* (1989), as *E. patagonicus* Speg. (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92183 (CONC, SGO); Cordillera de Paine 92331 (CONC, SGO).

157. *Festuca gracillima* Hook. f., Fl. Antarct. 383. 1847.

Caespitose perennial grass. Above treeline, mostly on the drier eastern mountains. Lit.: Arroyo *et al.* (1989) (Cerro Agudo). Exs.: Sierra del Toro 92101 (CONC, SGO); Cordillera de Paine 92319(CONC, SGO).

158. *Festuca magellanica* Lam., Encycl. 2: 461. 1788.

Caespitose perennial. Common species throughout in low and high andean belts. Frequently grows on *Bolax gummifera* and other cushion species. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92106 (CONC, SGO); Cordillera de Paine 92314 (CONC, SGO); Senos de Catherine 92396 (CONC).

159. *Festuca pyrogea* Speg., Anales Mus. Nac. Hist. Nat. Buenos Aires 5: 97. 1896.

Caespitose perennial herb. Common in bogs, extending into areas of heavy snow accumulation outside bogs. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92121 (CONC), 92134 (CONC, SGO), 92160 (CONC, SGO); Cordillera de Paine 92350 (CONC).

160. *Phleum alpinum* L., Sp. Pl. 59. 1753.

Caespitose perennial. Common grass on drier alpine slopes and in grassy bogs. Moore (1983) considers the Fuegian material to belong to the cosmopolitan ssp. *alpinum*. Lit.: Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92126 (CONC, SGO); Cordillera de Paine 92324 (CONC).

161a. *Poa alopecurus* (Gaudich.) Kunth ssp. *alopecurus*, Revis.Gramin. 1: 116. 1829.

Densely caespitose perennial. Often the dominant grass species in the lower and high alpine, reaching the upper vegetation limit. Dioecious (Arroyo & Squeo, 1990a). **Endemic** to the region of southern Patagonia, Tierra del Fuego and the Falkland Islands (Islas Malvinas). Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92117 (CONC, SGO). 92163 (CONC, SGO); Cordillera del Paine 92311 (CONC, SGO), 92315 (CONC, SGO).

161b. *Poa alopecurus* (Gaudich.) Kunth ssp. *fuegiana* (Hook. f.) D.M. Moore et Dogg., Brit. Antarct. Surv. Bull. 43: 105. 1976.

Caespitose perennial herb. On wet alpine slopes. Pseudoviviparous (Moore & Doggett, 1976). Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92164 (CONC), 92184 (CONC, SGO); Cordillera de Paine 92313 (CONC), 92327 (CONC); Senos de Catherine 92384 (CONC, SGO), 92396a (CONC).

162. *Poa pratensis* L., Sp. Pl. 67. 1753.

Stoloniferous perennial. Locally common on moist slopes in the alpine. **Introduced.** Lit.: Arroyo *et al.* (1989) (Cerro Diente).

163. *Rytidosperma glabra* (Phil.) Nicora, Darwiniana 18(1-2): 87. 1973.

Caespitose perennial grass. Rare in the alpine, growing on dry slopes. Exs.: Cordillera de Paine 92303 (CONC).

164. *Trisetum* aff. *lasiolepis* E. Desv. in C. Gay, Fl. Chil. 6: 346. 1854.

Caespitose perennial grass growing in bogs. Exs.: Sierra del Toro 92076 (CONC, SGO).

165. *Trisetum cumingii* (Nees) Nicora var. *cumingii*, in Correa, Fl. Patag. 3: 250. 1978.

Caespitose perennial grass. Grows on the drier alpine slopes. Exs.: Sierra del Toro 92112 (CONC, SGO), 92137 (CONC), 92169 (CONC), 92173 (SGO), 92192 (CONC, SGO); Cordillera de Paine 92312 (CONC, SGO).

166. *Trisetum phleoides* (D'Urv.) Kunth, Revis. Gramin. 1: 101. 1829.

Caespitose perennial. In exposed slopes in lower and upper alpine. **Endemic** to the region of southern Patagonia, Tierra del Fuego and the Falkland Islands (Islas Malvinas). Lit.: Arroyo *et al.* (1989) (Cerro Diente). Exs.: Cerro Agudo 92554 (CONC).

IRIDACEAE

167a. *Phaiophleps biflora* (Thunb.) R.C. Foster ssp. *biflora*, Contr. Gray Herb. 127: 43. 1939.

Perennial herb with oblique rhizomes and showy cream-white flowers. Self-incompatible (Arroyo & Squeo, 1990a). Locally abundant in lower alpine on the drier mountains. Lit.: Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92088 (CONC, SGO), 92116 (CONC, SGO), 92223 (CONC).

167b. *Phaiophleps biflora* (Thunb.) R.C. Foster ssp. *lyckholmii* (Dusén) D.M. Moore, Bot. J. Linn. Soc. 84: 112. 1982.

Perennial herb with oblique rhizomes; flowers brick-red. Self-incompatible (Arroyo & Squeo, 1990a). Seen in abundance on Cerro Diente at around 900 m. **Endemic** to the region of southern Patagonia and Tierra del Fuego. Lit.: Arroyo *et al.* (1989) (Cerro Diente).

168. *Sisyrinchium patagonicum* Phil. ex Baker, Handb. Irideae 126. 1892.

Perennial herb with a short, oblique rhizome and yellow flowers. Self-compatible (Moore, 1983). Seen in the alpine only on Sierra del Toro, where it occurs just above treeline in snow hollows. Exs.: Sierra del Toro 92068 (CONC, SGO).

169. *Sisyrinchium pearcei* Phil., Linnaea 33: 251. 1864.

Perennial herb with oblique rhizome and pale yellow flowers. Self-compatible (Arroyo & Squeo, 1990a). Only seen above treeline on the Sierra del Toro. Exs.: Sierra del Toro 92051 (CONC, SGO).

JUNCACEAE

170. *Juncus scheuchzerioides* Gaudich., Ann. Sci. Nat. Bot. 5: 100. 1825.

Rhizomatous perennial. Self-compatible (Moore, 1983). Common in alpine bogs and also frequently growing on cushion plants outside bogs. Exs.: Sierra del Toro 92157 (CONC); Senos de Catherine 92381 (SGO). Collected below treeline on Cerros Diente and Agudo (Arroyo *et al.* 1989), where it also occurs in the alpine.

171. *Luzula alopecurus* Desv., J. Bot. (Desvaux) 1: 159. 1808.

Caespitose perennial. Self-compatible (Arroyo & Squeo, 1990a). Common in lower alpine on the drier slopes. **Endemic** to the region of southern Patagonia, Tierra del Fuego and the Falkland Islands (Islas Malvinas). Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo). Exs.: Sierra del Toro 92083 (CONC, SGO), 92100 (CONC, SGO), 92105 (CONC), 92166 (CONC), 92296 (SGO); Cordillera de Paine 92355 (CONC); Senos de Catherine 92387 (CONC), 92391 (CONC, SGO).

172. *Luzula chilensis* Nees et Meyen ex Kunth, Enum. Pl. 3: 312. 1841.

Caespitose perennial. Rare in lower alpine. Lit.: Pisano (1974); Arroyo *et al.* (1989) (Cerro Diente).

173. *Luzula correae* Barros in Correa, Fl. Patag. 2: 118. 1969.

Caespitose perennial forming small cushions. Typically grows in alpine bogs. **Endemic** to southern Patagonia. Lit.: Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92150 (CONC), 92159 (SGO).

174. *Luzula* sp.

Perennial herb forming small cushions, the flowers with three stamens. Self-compatible (Arroyo & Squeo, 1990a). Possibly a new species. Grows on large cushions or freely in alpine bogs. If new, probably **endemic** to southern Patagonia. Lit.: Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo).

175. *Marsippospermum grandiflorum* (L. f.) Hook., Icon. Pl. 6: tab. 533. 1843.

Rhizomatous perennial, locally common in lower alpine bogs. Exs.: Sierra del Toro 92065 (CONC, SGO); Cordillera de Paine, Tsujii 798 (CONC).

176. *Marsippospermum reichei* Buch., Ber. Deutsch. Bot. Ges. 19: 160. 1901.

Caespitose perennial. A bog species, commonly growing also on *Bolax gummifera* cushions in the lower to upper alpine. Lit.: Arroyo *et al.* (1989) (Cerro Diente, Cerro Agudo, Cerro Daudet). Exs.: Sierra del Toro 92182 (CONC); Senos de Catherine 92380 (CONC).

LILIACEAE

177. *Tristagma nivale* Poepp. fma. *australe* (Neger ex Dusén) Ravenna, Bol. Soc. Argent. Bot. 11(2-3): 151. 1967.

Geophyte with prostrate leaves and brownish-green flowers. Occasional in lower alpine on the drier mountains. Lit.: Arroyo *et al.* (1989) (Cerro Diente). Exs.: Sierra del Toro 92180 (CONC, SGO); Cordillera de Paine 92358 (CONC).

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LITERATURE CITED

AL-SHEHBAZ I.A. 1990. A revision of *Weberbauera* (Brassicaceae). J. Arnold Arbor. 71(2): 221-250.

ARROYO, M.T.K., MARTICORENA, C., MIRANDA, P., MATTHEI, O., LANDERO, A. & SQUEO, F. 1989. Contribution to the high elevation flora of the Chilean Patagonia: A checklist of species on mountains on an east-west transect in the Sierra de Los Baguales, latitude 50° S. Gayana, Bot. 46(1-2): 121-151.

ARROYO, M.T.K. & PEÑALOZA, A. 1990. Genetic self-compatibility in a South American species of *Ourisia* (Scrophulariaceae). New Zealand J. Bot. 28: 467-470.

ARROYO, M.T.K. & SQUEO, F. 1990a. Relationships between plant breeding systems and pollination. In S. Kawano (ed.), Biological Approaches and Evolutionary Trends in Plants. Academic Press, London, pp. 205-227.

ARROYO, M.T.K. & SQUEO, F. 1990b. Genetic self-incompatibility in the endemic Patagonian genus *Benthamiella* (Solanaceae). Gayana, Bot. 47(1-2): 51-55.

BOELCKE, O. & ROMANCZUK, M.C. 1984. Cruciferae.

In M. N. Correa (ed.), Flora Patagónica 4a: 373-544. INTA, Bs. Aires.

CABRERA, A.L. 1949. El género *Senecio* en Chile. Lilloa 15: 27-501.

GÓMEZ-SOSA, E. 1984. *Astragalus*. In M.N. Correa (ed.), Flora Patagónica 4b: 175-206. INTA, Bs. Aires.

KNUTH, R. 1930. Oxalidaceae. In A. Engler (ed.), Das Pflanzenreich 4(130) Heft 95: 1-481. H.R. Engelmann, Wien.

LOURTEIG, A. 1951. Ranunculáceas de Sudamérica templada. Darwiniana 9(3-4): 397-608.

MARTÍNEZ, S. 1989. El género *Azorella* (Apiaceae-Hydrocotyloideae) en la Argentina. Darwiniana 29(1-4): 139-178.

MOORE, D.M. 1983. Flora of Tierra del Fuego. Anthony Nelson, Oswestry.

MOORE, D.M. & DOGGETT, M.C. 1976. Pseudo-vivipary in Fuegian and Falkland Islands grasses. Brit. Antarct. Surv. Bull. 43: 103-110.

MUÑOZ SCHICK, M. 1980. Flora del Parque Nacional Puyehue. Editorial Universitaria, Santiago.

PISANO, E. 1974. Estudio ecológico de la región continental sur del área andino-patagónica. II. Contribución a la fitogeografía de la zona del "Parque Nacional Torres del Paine". Anales Inst. Patagonia. 5(1-2): 59-104.

SKOTTSBERG, C. 1921a. The Phanerogams of Easter Island. In C. Skottsberg (ed.), The Natural History of Juan Fernandez and Easter Island 2: 61-84. Almqvist & Wiksells Boktryckeri A.B., Uppsala.

SKOTTSBERG, C. 1921b. The Phanerogams of the Juan Fernandez Islands. In C. Skottsberg (ed.) The Natural History of Juan Fernandez and Easter Island 2: 95-240. Almqvist & Wiksells Boktryckeri A.B., Uppsala.

SKOTTSBERG, C. 1951. A supplement of the Pteridophytes and Phanerogams of Juan Fernandez and Easter Island. In C. Skottsberg (ed.), The Natural History of Juan Fernandez and Easter Island 2: 763-792. Almqvist & Wiksells Boktryckeri A.B., Uppsala.

SOLOMON, J.C. 1982. The systematics and evolution of *Epilobium* (Onagraceae) in South America. Ann. Missouri Bot. Gard. 69: 239-335.

VUILLEUMIER, B.S. 1970. The systematics and evolution of *Perezia* sect. *Perezia* (Compositae). Contr. Gray Herb. 199: 1-163.

ZIZKA, G. 1991. Flowering plants of Easter Island. Palmarum Hortus Francofurt. 3: 1-108.

RAMÍREZ, A. 1989. Malezas de Chile. Instituto de Investigastación Experimenal La Platina. Boletín Técnico Nº 15. Santiago. 80 pp.

ROSSOW, R.P. 1987. Revisión del género *Mecardonia* (Scrophulariaceae) Candollea 42 (2): 431-474.

SUBILS, R. 1977. Las especies de *Euphorbia* de la República Argentina. Kurtziana 10: 83-248

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