

THE VASCULAR PLANT FLORA OF THE BELLOTOS DEL MELADO
NATIONAL RESERVE, VII REGION, CHILE: A DOCUMENTED
CHECKLIST

LA FLORA VASCULAR DE LA RESERVA NACIONAL BELLOTOS
DEL MELADO, VII REGION, CHILE: UN CATALOGO
DOCUMENTADO

Mary T. K. Arroyo¹, Oscar Matthei², Clodomiro Marticorena², Mélica Muñoz³,
Fernanda Pérez¹ and Ana María Humaña¹

ABSTRACT

The vascular plant flora of the vegetationally diverse, scenically endowed Bellotos del Melado National Reserve contained in the Chilean National Protected Area System (SNASPE) and located in the Andes of Region VII (35°S) in the mediterranean-type climate area of Chile is documented, based on intensive field exploration, and the herborization and identification of > 800 plant collections. The small reserve, covering 417 hectares, contains species and their subtaxa totaling 297, in 295 species, representing 79 families and 190 genera. 84.5% of the flora (251 species including subtaxa) is native, and 29.5% of the native flora is endemic to continental Chile. Comparison with similar or smaller-sized protected areas in the mediterranean-type climate area of Chile, for which published floristic lists are available, suggests that the Bellotos del Melado reserve is rich in relation to its size. The reserve protects the following woody species recognized to have conservation problems in the Red Book on the Chilean Native Flora: *Beilschmiedia berteriana*, *Orites myrtoidea*, *Nothofagus glauca*, *Austrocedrus chilensis*, *Maytenus chubutensis* and *Citronella mucronata*. Five of the world's most invasive exotic species (*Conium maculatum*, *Cirsium vulgare*, *Hordeum murinum*, *Leucanthemum vulgare*, *Rumex*

¹Center for Advanced Studies in Ecology and Research on Biodiversity, Departamento de Biología, Facultad de Ciencias, Universidad de Chile, Casilla 653, Santiago, Chile. E-mail: southern@abello.dic.uchile.cl.

²Departamento de Botánica, Facultad de Ciencias Naturales y Oceanográficas, Universidad de Concepción, Casilla 160-C, Concepción, Chile

³Sección Botánica, Museo Nacional de Historia Natural, Casilla 787, Santiago, Chile.

acetosella) are found among the 46 exotic species documented for the reserve. Herbarium specimens have been deposited in CONC and SGO.

KEYWORDS: Bellotos del Melado National Reserve, protected area, endemism, exotic species, floristic checklist, biodiversity conservation.

RESUMEN

Se documenta la flora vascular de la Reserva Nacional Bellotos del Melado del SNASPE chileno, ubicada en los Andes de la VII Región (35°S), en base a un programa de exploración intensiva en terreno y la herborización e identificación de > 800 colecciones. La pequeña área protegida, con una superficie de 417 hectáreas, alberga 297 especies y subtaxas, en 295 especies, las que representan 79 familias y 190 géneros. Un 84,5% de la flora (251 especies y subtaxa) es nativa, y un 29,5% de la flora nativa es endémica a Chile continental. Una comparación de las floras de otras áreas protegidas en la zona mediterránea de Chile, para las cuales existen listas florísticas publicadas, permite sugerir que la flora de Bellotos del Melado es rica en relación a su pequeña superficie. La reserva protege las siguientes especies leñosas, reconocidas por presentar problemas de conservación en el Libro Rojo de la Flora Terrestre de Chile: *Beilschmiedia berteriana*, *Orites myrtoidea*, *Nothofagus glauca*, *Austrocedrus chilensis*, *Maytenus chubutensis* y *Citronella mucronata*. Cinco de las especies más invasoras del mundo (*Conium maculatum*, *Cirsium vulgare*, *Hordeum murinum*, *Leucanthemum vulgare*, *Rumex acetosella*) se encuentran entre las 46 especies exóticas documentadas para la reserva. Se ha depositado material de herbario en CONC y SGO.

PALABRAS CLAVES: Reserva Nacional Bellotos del Melado, área protegida, especies endémicas, especies adventicias, catálogo florístico, conservación de biodiversidad.

INTRODUCTION

The Bellotos del Melado National Reserve, contained in the Chilean National Protected Area System (SNASPE), is located in the VII Region of Chile, toward the southern extreme of the mediterranean-type climate area (Fig. 1). The reserve derives its name from the vernacular name "belloto" of *Beilschmiedia berteriana* (Gay) Kosterm. (Lauraceae), a rare endemic tree restricted to a limited number of populations in the Coast Range and the Andes. The Bellotos del Melado protected area was established in 1995 by the Corporación Nacional Forestal (CONAF) (Muñoz *et al.* 1996). Covering an area of 417 hectares, it is located north and north-east of the confluence of Quebrada Hornillos with the Río Ancoa, on the steep southern slopes of Cerro El Melado, with near vertical rock faces from 1200-1500 m upward, and spanning an elevational gradient of 900-2010 m. Quebrada Hornillos is the main and only permanent large water course. There are several ephemeral water courses coming off Cerro Melado, which are dry during the summer months. Annual precipitation at Linares (157 m), site of the closest long-functioning weather station, is 1007 mm; mean annual temperature is 13.9°C (di Castri & Hayek 1976).

Consistent vascular plant vegetation in the reserve is found to around 1500 m, and thereafter in scattered crevices and terraces in rock faces to around 1800 m. The main vegetation types are: a) semi-open deciduous forest, dominated by *Nothofagus obliqua* (Mirb.) Oerst. (Fagaceae) (29 ha) and *Nothofagus glauca* (Phil.) Krasser (55 ha) (according to official vegetation map supplied by CONAF, VII Region) which, at lower elevations, contains many typical sclerophyllous species such as *Azara petiolaris* (D. Don) I.M. Johnst. (Flacourtiaceae), *Lithrea caustica* (Molina) Hook. et Arn. (Anacardiaceae), *Lomatia dentata* (Ruiz et Pav.) R.Br. and *L. hirsuta* (Lam.) Diels ex J.F. Macbr. (Proteaceae), with annual and perennial herbs in the understory; and at higher elevations, patches of the evergreen gymnosperm, *Austrocedrus chilensis* (D. Don) Pic. Serm. et Bizzarri (Cupressaceae); b) open matorral (56 ha), dominated by the bamboo grass, *Chusquea culeou* E. Desv. and bunch-grass like *Carex aphylla* Kunth, accompanied by species such as succulent *Puya* sp. (Bromeliaceae), and the small shrubs, *H. paucidentatus* Phil. (Compositae); c) closed evergreen forest, found

along the main permanent water course, composed of a mixture of typical mediterranean sclerophyllous trees (e.g. *Beilschmiedia berteriana* (Lauraceae), *Luma apiculata* (DC.) Burret (Myrtaceae), *Quillaja saponaria* Molina (Rosaceae)) mixed with more typical seasonal rainforest species (*Laurelia sempervirens* (Ruiz et Pav.) Tul. (Monimiaceae) and *Hydrangea serratifolia* (Hook. et Arn.) F. Phil. (Hydrangeaceae)); d) subalpine scrub, containing typical high elevation small shrubs and perennial herbs, such as *Nassauvia aculeata* (Less.) Poepp. et Endl., *Ourisia microphylla* Poepp. et Endl. (Scrophulariaceae), *Tropaeolum leptophyllum* G. Don (Tropaeolaceae) and *Viviania ovata* Phil. (Vivianiaceae). Although the major vegetation types are fully intact, evidence of sporadic selective logging in the past can be found. During the summer months, the reserve is the main conduit to summer pastures in the Linares Andes east of Cerro Melado. Large herds of cattle are passed through the southern and western sides of the reserve along wide traditional access routes to high elevation herbfields. A number of sites in deciduous *Nothofagus* forest are used annually as rest stops for the herds.

Judging by a lack of material herbarium in the two main Chilean herbaria (CONC, SGO), little, if any previous botanical work has been effected in the Bellotos del Melado reserve. As part of an ongoing effort to establish the conservation value of a number of existing state protected areas, and determine additional preservation needs of the mediterranean flora of Chile, we here provide a documented checklist of the vascular plant flora of the Bellotos del Melado Reserve, along with information on the life-forms represented in the flora and endemism status of taxa in relation to continental Chile.

METHODS

Field exploration was carried out in December and January of the austral summer of 1999-2000. That particular summer, which came after a year of the worst drought in the century, was a very good year in central Chile for precipitation and the native flora. Direct field work involved a total of 40 man (woman)/days. Herbarium collections, totalling 824, were made at 35 localities within the reserve, and at one locality close to the CONAF headquarters

which lies outside the limits of reserve. The floristic data published here is based on 805 identifiable collections (785 within the reserve and 20 made in the vicinity of CONAF headquarters). The 35 localities spanned the entire gamut of vegetation types and altitudinal range of consistent vascular vegetation. All localities were GPS-ed (Garmin Model 12 XL) and recorded for elevation with a standard altimeter. Species were categorized according to geographic origin (endemic to the flora of continental Chile, native, but non-endemic to the flora of continental Chile, exotic) and life form according to four categories: annual to facultatively annual or biennial herbs; perennial herbs and suffrutices; shrubs; trees. Nomenclature of the identified material follows the continuously updated checklist of the Chilean flora maintained by Profesor Clodomiro Marticorena at the Universidad de Concepción, Chile. In the absence of a modern floristic treatment for Chile, endemism and life form data was compiled from standard monographic and floristic treatments, and through reference to the recently published comprehensive checklists of the flora of Argentina (Zuloaga *et al.* 1994, Zuloaga & Morrone 1996, 1999a,b). Species limited in distribution to Chilean territory as including the Juan Fernández Islands and other island territories of Chile where not considered endemic (to continental Chile) for the present purposes. In two instances (*Baccharis poeppigiana* DC. subsp. *ocellata* (Phil.) H.W. Hellwig and *Acrisione denticulata* (Hook. et Arn.) B.Nord.) where different taxonomic concepts are currently used in Chile and Argentina, we have followed biological principles with regard to endemism status. Herbarium specimens have been deposited in CONC and SGO.

RESULTS AND DISCUSSION

A total of 297 taxa (species and subtaxa) in 295 species, representing 79 families and 190 genera were collected within the confines of the reserve (Tables 4, 5 and 6). The native flora comprises species and their subtaxa (2) totalling 251, in 249 species. The latter are contained in 77 families and 157 genera. An additional 8 species (other than those collected in the reserve) are reported as occurring around the CONAF headquarters (Table 7).

Several new records at the level of Region VII are contained in the botanical material. The taxonomic composition of the reserve flora (Table 1) reveals a strongly angiosperm-dominated flora, the only gymnosperms being *Austrocedrus chilensis* (D.Don) Pic.Serm. et Bizarri and *Ephedra chilensis* K.Presl. As in the mediterranean flora of Chile in general (Arroyo *et al.* 1995) the life-form composition of the flora is broad (Table 2), with a strong concentration of herbaceous species (71.7% of native taxa; 75.4% of native and exotic taxa combined).

Considering only the native flora, 29.5% of taxa in the reserve are endemic to continental Chile (Table 2). This percentage is fairly high, considering that the reserve contains a sizable high mountain floristic component shared with adjacent Argentina. The endemic taxa are concentrated in the deciduous and evergreen forest zones, and along the ecotone from forest to subalpine. The perennial herb category contains the highest number of Chilean endemics (> 50% of taxa). However, for a reserve that is located in the Andes, where species often cross the Andes into Argentina, levels of endemism in the woody categories are also appreciable (Table 2). Endemism in the native annual component of the reserve is relatively low. The native annual species found in the reserve, which will be recalled, is located toward the southern end of the mediterranean-type climate area, tend to be widely distributed species.

A consideration of distributions at the regional level showed that endemic *Senecio linarensis* Soldano is restricted to Region VII. One species, endemic at the varietal level (*Mimulus luteus* L. var. *variegatus* (Lodd.) Hook.) is restricted to Regions VI and VII. The Chilean endemics, *Adesmia denticulata* Clos and *Gnaphalium landbeckii* Phil. are restricted to Regions VII and VIII. A few other species (e.g. *Rhodophiala bakeri* (Phil.) Traub, *Trisetum lechleri* (Steud.) Nicora, *Calceolaria exigua* Witasek, *Xanthium argenteum* Widder) are presently known from two geographically non-contiguous regions, but possibly will be eventually found in intervening regions upon further exploration.

Table 3 compares species richness for native species in the Bellotos del Melado reserve with other protected areas (in one case (Contulmo), including a significant area surrounding the park) in the mediterranean-type area, for which published floristic checklists are available. The Bellotos del Melado reserve appears to be floristically rich for

its area in relation to the Contulmo area and El Morado National Park. Nevertheless, given that species richness and area are not linearly correlated, a more sophisticated analysis is needed to determine whether the Bellotos del Melado reserve shows exaggerated floristic richness in relation to the mediterranean-type climate area in general.

Our work reveals that the Bellotos del Melado reserve protects a number of species formally recognized as having conservation problems in the Red Book on the Chilean Native Flora (Benoit 1989). In addition to *Beilschmiedia berteroaana* (Gay) Kosterm. (Lauraceae), which is classified as ENDANGERED at the national level, especially important from a conservation perspective are the presence of *Orites myrtoidea* (Poepp. et. Endl.) Benth. et Hook.f. ex B.D.Jacks., *Nothofagus glauca*, *Austrocedrus chilensis*, *Maytenus chubutensis* (Speg.) Lourteig, O'Donell et Sleumer and *Citronella mucronata* (Ruiz et Pav.) D.Don, all of which are included in the list of woody species in Region VII with conservation problems. *Austrocedrus chilensis* is also classified as VULNERABLE at the national level, while *Orites myrtoidea*, *Citronella mucronata*, *Maytenus chubutensis* are considered in the RARE category at the national level. The reserve also contains *Laurelia sempervirens* (Ruiz et Pav.) Tul., considered to present conservation problems (Benoit 1989) in Region VII, but not currently included in the national list. We found a large, well conserved population of *Orites myrtoidea* between 1300-1450 m on the north-eastern side of the reserve, while *Maytenus chubutensis* was found in several locations in evergreen forest along Quebrada Hornillos at 1350-1450 m, in the forest understorey with *Austrocedrus chilensis* at 1300 m, and in subandean matorral at 1520 m. *Citronella mucronata* is locally abundant in evergreen forest along Quebrada Hornillos. *Nothofagus glauca* is the dominant tree species in 13% of the area of the reserve. Little is known about the conservation status of the vast majority of perennial herbs and annuals in Chile (Benoit 1989), comprising an outstanding 79% of the mediterranean flora (Arroyo *et al.* 1995). Exceptions are the geophytes and ferns. Some geophytes considered to have conservation problems were documented for the reserve (e.g. *Rhodophiala bakeri*). This last species, as can be stated for most showy-flowered monocotyledons in the reserve, tends to be locally distributed. For ferns, the reserve contains *Dennstaedtia glauca* (Cav.) C.Ch. ex Looser, con-

sidered in the RARE category at the national level in the Chilean Red Data Book.

Finally, we draw attention to the 46 exotic species comprising 15.5% of the vascular plant flora of the reserve (Table 1). Not unexpectedly, the majority of exotic species are annuals, and annuals are more common in the exotic flora in comparison with the native flora. Only two spontaneously establishing exotic shrubs (*Rosa canina* L. and *Rubus ulmifolius* Schott) were recorded in the reserve. *Rosa canina* is not common at present; however *Rubus ulmifolius* has taken hold of the borders of an old, still functional, water canal leading away from Quebrada Hornillos. There seem to be no naturally established exotic trees in the reserve. However, one individual of the exotic fruit tree, *Pyrus communis* L. was found in a non-disturbed natural habitat. We have excluded this species from the floristic list in Table 6, on account of it not being clear as to whether the individual observed was planted. The presence of *Pyrus communis* in the reserve possibly dates back to an earlier period when the reserve was in private hands. Although there seems to be little evidence for invasiveness in *Pyrus communis* (Holm *et al.* 1997), and *Pyrus communis* is not included in Matthei's (1995) treatise on weedy species for Chile, it would be as well to monitor any future appearances of this species in the reserve. The exotic grasses found in the reserve mostly occur in low density throughout (e.g. *Bromus hordeaceus* L., *Vulpia myuros* (L.) C.C.Gmel. var. *myuros*). Most exotic species in the reserve seem to be strongly dependent on disturbance and well lit, open habitats for establishment (e.g. *Cirsium vulgare* (Savi) Ten., *Echium vulgare* L., *Anthemis cotula* L., *Lactuca virosa* L., *Leucanthemum vulgare* Lam., *Marrubium vulgare* L., *Trifolium* spp., *Rosa canina*, *Verbascum thapsus* L., *V. virgatum* Stokes, *Rumex acetosella* L.).

Among the exotic species occurring in the reserve, the following are listed in Holm *et al.* (1997) list of the world's 200 most serious weeds:

- *Conium maculatum* L.
- *Cirsium vulgare* (Savi) Ten.
- *Hordeum murinum* L.
- *Leucanthemum vulgare* Lam.
- *Rumex acetosella* L.

The large herds of cattle passed through the southern and western sides of the reserve along the

wide traditional access routes to high elevation herbfields constitute a potential vehicle of diaspores of new exotic species, and of replacement diaspores of passing-by species already in the reserve. However, it must also be borne in mind that cattle have been passed through this area for many decades, and perhaps over a century. Thus an alternative hypothesis is that an equilibrium has already been established in terms of exotic species. The answer to this problem will only become evident with serious monitoring of the native and exotic components of the reserve. In the meantime, it is advisable that the more heavily invasive species already present in the reserve are kept under scrutiny, and records of any newly establishing exotic species reported and documented. Special care needs to be taken when opening new nature trails for the public, given the demonstrated proneness of Chile's mediterranean ecosystems to invasion, and the strong correlation between the frequency of exotic species and the density of penetration routes in Chile (Arroyo *et al.* 2000). It is widely appreciated that strongly invasive exotic species may pose a risk to native biodiversity (Simberloff 1997). Many exotic species may not constitute a real risk to native biodiversity; however, exotics do have the effect of homogenizing floras, thereby lowering the uniqueness, and sustainable development value of a country's national parks and reserves.

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TABLE 1. Taxonomic composition of the vascular plant flora of Bellotos del Melado National Reserve, VII Region, Chile. Numbers refer to species and subtaxa combined. Total subtaxa = 2. PTERI = Pteridophyta; PINOP = Pinophyta; DICOT = Dicotyledoneae; MONOC = Monocotyledoneae.

TABLA 1. Composición taxonómica de la flora vascular de la Reserva Nacional Bellotos del Melado, VII Región, Chile. Los números se refieren al número total de especies y subtaxa incluidos. Total de subtaxa = 2. PTERI = Pteridophyta; PINOP = Pinophyta; DICOT = Dicotyledoneae; MONOC = Monocotyledoneae.

	PTERI	PINOP	DICOT	MONOC	TOTAL
<i>Total native taxa</i>	15 (6.0 %)	2 (0.8 %)	184 (73.3 %)	50 (19.9 %)	251 (84.5 %)
Native, non endemic	15 (8.5 %)	2 (1.1 %)	120 (67.8 %)	40 (22.6 %)	177 (70.5 %)
Endemic to continental Chile	0 (0.0 %)	0 (0.0 %)	64 (86.5 %)	10 (13.5 %)	74 (29.5 %)
<i>Exotic taxa</i>	0 (0.0 %)	0 (0.0 %)	35 (76.1 %)	11 (23.9 %)	46 (15.5 %)
Total flora	15 (5.1 %)	2 (0.7 %)	219 (73.7 %)	61 (20.5 %)	297

TABLE 2. Life forms in the native and exotic flora of the Bellotos del Melado National Reserve, Region VII, Chile.

TABLA 2. Formas de vida en la flora nativa y adventicia de la Reserva Nacional Bellotos del Melado, VII Región, Chile.

	Annual* herbs	Perennial** herbs	Shrubs	Trees	Total
<i>Total native taxa</i>	23 (9.2 %)	157 (62.5 %)	48 (19.1 %)	23 (9.2 %)	251 (84.5 %)
Native, non endemic	13 (7.3 %)	118 (66.7 %)	34 (19.2 %)	12 (6.8 %)	177 (70.5 %)
Endemic to continental Chile	10 (13.5 %)	39 (52.7 %)	14 (18.9 %)	11 (14.9 %)	74 (29.5 %)
<i>Exotic taxa</i>	27 (58.7 %)	17 (37.0 %)	2 (4.3 %)	0 (0.0 %)	46 (15.5 %)
Total flora	50 (16.8 %)	174 (58.6 %)	50 (16.8 %)	23 (7.7 %)	297

* Includes biennials and some facultative annuals.

** Includes suffrutices.

TABLE 3. Species and generic richness (native) for protected areas in central Chile with published species lists.

TABLA 3. Riqueza específica y genérica (nativa) para unidades del SNASPE en la zona mediterránea de Chile donde existen listas florísticas publicadas.

Protected Area (Latitude)	Source	Area (ha)	Species richness	Generic richness
Bellotos del Melado (35°S)	Present publication	417	249	157
Contulmo area ^a (38°S)	Baeza <i>et al.</i> (1999)	Ca. 6540	248	171
El Morado ^b (34°S)	Teillier <i>et al.</i> (1994)	3000	246	140
Fray Jorge and Talinay ^c (30°S)	Muñoz & Pisano (1947)	959	368	219

^a: The area studied includes the Contulmo National Monument and additional surrounding land. ^b: Nomenclatura follows Chilean flora data base. ^c: Numbers are approximate due to uncertain origins of some species.

TABLE 4. Endemic flora (restricted to the area of continental Chile) of the Bellotos del Melado National Reserve, Region VII, Chile. A: Annual; B: Biennial herb; H: Perennial herb; S: Suffrutice; F: Shrub; T: Tree. All cited collection numbers are those of Arroyo *et al.*

TABLA 4. Taxa endémicos (restringidos al área de Chile continental) de la Flora de la Reserva Nacional Bellotos del Melado, VII Región, Chile. A: Hierba anual; B: Hierba bienal; H: Hierba perenne; S: Sufrútice; F: Arbusto; T: Arbol. Las muestras de herbario citadas son de Arroyo *et al.*

DICOTYLEDONEAE

ANACARDIACEAE

1. T *Lithrea caustica* (Molina) Hook. et Arn.
994857 (CONC); 994916 (CONC); 994950 (CONC); 996130 (CONC).

ASCLEPIADACEAE

2. F *Diplolepis menziesii* J.H.Schult.
994866 (CONC); 996141 (CONC).

BERBERIDACEAE

3. F *Berberis actinacantha* Mart.
20105 (CONC, SGO); 20141 (CONC); 994862 (CONC, SGO); 994900 (CONC, SGO); 996235 (CONC, SGO); 996275 (CONC).
4. F *Berberis rotundifolia* Poepp. et Endl.
20127 (CONC).

BORAGINACEAE

5. F *Cynoglossum paniculatum* Hook. et Arn.
20147 (CONC, SGO).

COMPOSITAE

6. A *Chaetanthera tenella* Less. var. *tenella*
994903 (CONC, SGO).
7. H *Gnaphalium landbeckii* Phil.
20102 (CONC).
8. F *Gochmatia foliolosa* (D. Don) D. Don ex Hook. et Arn. var. *foliolosa*
994869 (CONC, SGO); 996139 (CONC, SGO).
9. H *Haplopappus macrocephalus* (Poepp. ex Less.) DC.
20179 (CONC); 996030 (CONC); 996193 (CONC, SGO).

10. H *Hypochaeris apargioides* Hook. et Arn.
20058 (CONC, SGO).
11. H *Hypochaeris thrincioides* (J.Remy) Reiche
996251 (CONC, SGO).
12. H *Leucheria hieracioides* Cass.
20089 (CONC, SGO); 994808 (CONC, SGO); 994901 (CONC); 994973 (CONC, SGO); 994988
(CONC); 996150 (CONC, SGO); 996185 (CONC, SGO).
13. F *Mutisia subulata* Ruiz et Pav. f. *rosmarinifolia* (Poepp. et Endl.) Cabrera
996358 (CONC, SGO).
14. F *Mutisia ilicifolia* Cav. var. *ilicifolia*
996137 (CONC, SGO); 996211 (CONC); 996221 (CONC); 996231 (CONC).
15. S *Mutisia brachyantha* Phil.
20142 (CONC); 996199 (CONC, SGO); 996247 (CONC, SGO); 996272 (CONC, SGO); 996376
(CONC, SGO).
16. F *Proustia pyrifolia* DC.
994848 (CONC, SGO); 994951 (CONC, SGO); 994984 (CONC); 996229 (CONC, SGO).
17. S *Senecio lastarrianus* J.Remy
20153 (CONC, SGO).
18. S *Senecio linarensis* Soldano
20133 (CONC, SGO); 996250 (CONC, SGO); 996308 (CONC, SGO); 996419 (CONC).
19. A *Xanthium argenteum* Widder
994891 (CONC).
- ESCALLONIACEAE**
20. F *Escallonia illinita* K.Presl
20042 (CONC, SGO); 996195 (CONC); 996201 (CONC, SGO); 996378 (CONC, SGO).
- EUPHORBIACEAE**
21. F *Colliguaja dombeyana* A.Juss.
994822 (CONC, SGO); 994909 (CONC, SGO); 996179 (CONC).
- FAGACEAE**
22. T *Nothofagus glauca* (Phil.) Krasser
994830 (CONC, SGO); 994883 (CONC); 996165 (CONC, SGO).
- FLACOURTIACEAE**
23. T *Azara petiolaris* (D.Don) I.M.Johnst.
994824 (CONC); 994906 (CONC); 996096 (CONC); 996125 (CONC).
- FRANCOACEAE**
24. H *Francoa appendiculata* Cav.
20022 (CONC); 20086 (CONC); 994801 (CONC); 994998 (CONC); 996181 (CONC); 996328 (CONC).
- GERANIACEAE**
25. H *Geranium commutatum* Steud.
996074 (CONC, SGO); 996124 (CONC); 996081-A (CONC).
- ICACINACEAE**
26. T *Citronella mucronata* (Ruiz et Pav.) D.Don
994939 (CONC, SGO); 996167 (CONC); 996215 (CONC).
- LABIATAE**
27. F *Satureja gilliesii* (Graham) Briq.
994811 (CONC); 994885 (CONC, SGO); 996186 (CONC, SGO); 996322 (CONC, SGO).
28. F *Teucrium bicolor* Sm.
996119 (CONC, SGO); 996223 (CONC, SGO); 996224 (CONC, SGO); 996258 (CONC, SGO).
- LAURACEAE**
29. T *Beilschmiedia berteriana* (Gay) Kosterm.
996006 (CONC, SGO).

30. T *Cryptocarya alba* (Molina) Looser
994819 (CONC); 996142 (CONC); 996164 (CONC).

LOASACEAE

31. AH *Loasa artemisiifolia* Poepp. ex Urb. et Gilg
20074 (CONC, SGO); 994874 (CONC, SGO); 996044 (CONC, SGO); 996182 (CONC); 996225 (CONC, SGO); 996333 (CONC); 996374 (CONC); 996417 (CONC).
32. A *Loasa micrantha* Poepp.
994995 (CONC, SGO); 996218 (CONC, SGO); 996278 (CONC, SGO).

MONIMIACEAE

33. T *Laurelia sempervirens* (Ruiz et Pav.) Tul.
994888 (CONC, SGO); 996117 (CONC).
34. T *Peumus boldus* Molina
994881-A (CONC); 996101 (CONC).

OXALIDACEAE

35. AB *Oxalis clandestina* Phil.
996076 (CONC, SGO).
36. A *Oxalis rosea* Jacq.
994798 (CONC); 996056 (CONC); 996134 (CONC); 996219 (CONC).

PAPILIONACEAE

37. H *Adesmia araucana* Phil.
20011 (CONC); 994818 (CONC); 994985 (CONC); 996040 (CONC); 996248 (CONC); 996298 (CONC); 996315 (CONC); 996393 (CONC).
38. S *Adesmia denticulata* Clos
20132 (CONC); 994884 (CONC); 994924 (CONC); 996152 (CONC).
39. H *Adesmia prostrata* Clos var. *eglandulosa* Burkart
20097 (CONC, SGO).
40. H *Lathyrus subandinus* Phil.
20120 (CONC); 996151 (CONC); 996261 (CONC).
41. T *Sophora macrocarpa* Sm.
994886 (CONC); 996145 (CONC); 996363 (CONC).

POLEMONIACEAE

42. A *Collomia cavanillesii* Hook. et Arn.
20090 (CONC); 994872 (CONC); 996011 (CONC); 996356 (CONC, SGO).

PORTULACACEAE

43. H *Cistanthe grandiflora* (Lindl.) Schltld.
996238 (CONC).

RHAMNACEAE

44. F *Retanilla stricta* Hook. et Arn.
994876 (CONC); 996160 (CONC); 996214 (CONC, SGO).

ROSACEAE

45. T *Kageneckia oblonga* Ruiz et Pav.
994993 (CONC); 996166 (CONC); 996190 (CONC); 996230 (CONC).
46. T *Quillaja saponaria* Molina
994823 (CONC); 996116 (CONC).

RUBIACEAE

47. H *Galium araucanum* Phil.
20108 (CONC).
48. AH *Galium diffusoramosum* Dempster et Ehrend.
994967 (CONC, SGO); 996410 (CONC)
49. H *Galium trichocarpum* DC.
994817 (CONC); 996163 (CONC); 996192 (CONC).

SCROPHULARIACEAE

50. S *Calceolaria andina* Benth.
994965 (CONC).
51. H *Calceolaria cana* Cav.
20125 (CONC); 994815 (CONC); 996257 (CONC); 996282 (CONC).
52. HS *Calceolaria corymbosa* Ruiz et Pav.
996043 (CONC); 996157 (CONC); 996400 (CONC, SGO).
53. F *Calceolaria exigua* Witasek
996175 (CONC, SGO); 996303-A (CONC).
54. S *Calceolaria glabrata* Phil.
20046 (CONC); 994812 (CONC); 994831 (CONC); 996303 (CONC, SGO).
55. H *Calceolaria paralia* Cav.
996345 (CONC, SGO).
56. S *Calceolaria pseudoglandulosa* Clos
20026 (CONC); 994921 (CONC); 996005 (CONC, SGO).
57. AH *Mimulus luteus* L. var. *variegatus* (Lodd.) Hook.
20024 (CONC); 20053 (CONC, SGO); 994994 (CONC).

SOLANACEAE

58. H *Solanum etuberosum* Lindl.
20181 (CONC, SGO); 994955 (CONC).

TROPAEOLACEAE

59. H *Tropaeolum ciliatum* Ruiz et Pav. subsp. *septentrionale* Sparre
20078 (CONC, SGO); 20159 (CONC, SGO); 996000 (CONC, SGO).
60. H *Tropaeolum tricolor* Sweet
996227 (CONC); 996279 (CONC); 996353 (CONC); 996394 (CONC).

UMBELLIFERAE

61. H *Azorella spinosa* (Ruiz et Pav.) Pers.
20067 (CONC, SGO); 20098 (CONC, SGO); 994959 (CONC, SGO); 996183 (CONC, SGO); 996426 (CONC, SGO).

VALERIANACEAE

62. A *Valeriana crispa* Ruiz et Pav.
994946 (CONC, SGO); 996197 (CONC, SGO); 996416 (CONC).
63. H *Valeriana verticillata* Clos
20096 (CONC); 996054 (CONC); 996404 (CONC, SGO).

VIVIANIACEAE

64. HF *Cissarobryon elegans* Kunze ex Poepp.
20009 (CONC); 20082 (CONC, SGO); 996032 (CONC); 996274 (CONC); 996405 (CONC).

MONOCOTYLEDONEAE

ALSTROEMERIACEAE

1. H *Alstroemeria ligtu* L. subsp. *ligtu*
20094 (CONC, SGO); 994797 (CONC, SGO); 994844 (CONC, SGO); 996024 (CONC, SGO); 996178 (CONC), 996321 (CONC, SGO).
2. H *Alstroemeria presliana* Herb. subsp. *australis* Ehr.Bayer
20023 (CONC); 996014 (CONC); 996320 (CONC); 996401 (CONC).
3. H *Bomarea salsilla* (L.) Herb.
994813 (CONC); 994847 (CONC); 994911 (CONC).

AMARYLLIDACEAE

4. H *Rhodophiala bakeri* (Phil.) Traub
20169 (CONC).

- BROMELIACEAE**
5. H *Ochagavia carnea* (Beer) L.B.Sm. et Looser
994943 (CONC, SGO); 996234 (CONC, SGO).
- DIOSCOREACEAE**
6. H *Dioscorea andina* Phil.
20070 (CONC); 20164 (CONC, SGO).
7. H *Dioscorea nervosa* Phil.
20039 (CONC); 994845 (CONC); 994937 (CONC); 994961 (CONC, SGO); 996158 (CONC, SGO).
- IRIDACEAE**
8. H *Libertia sessiliflora* (Poepp.) Skottsb.
994802 (CONC, SGO); 994854 (CONC); 994948 (CONC).
- ORCHIDACEAE**
9. H *Chloraea galeata* Lindl.
994810 (CONC); 996254 (CONC, SGO).
10. H *Chloraea nudilabia* Poepp.
20137 (CONC); 996035 (CONC); 996249 (CONC); 996330 (CONC); 996402 (CONC).

TABLE 5. Non-endemic native flora of the Bellotos del Melado National Reserve, Region VII, Chile. A: Annual herb; B: Biennial herb; H: Perennial herb; S: Suffrutice; F: Shrub; T: Tree. All cited collection numbers are those of Arroyo *et al.*

TABLE 5. Taxas nativos no endémicos de la flora de la Reserva Nacional Bellotos del Melado, VII Región, Chile. A: Hierba anual; B: Hierba bienial; H: Hierba perenne; S: Sufrutice; F: Arbusto; T: Arbol. Las muestras de herbario citadas son de Arroyo *et al.*

PTERIDOPHYTA

- ADIANTACEAE**
1. H *Adiantum chilense* Kaulf. var. *chilense*
20019 (CONC, SGO); 994871 (CONC); 994908 (CONC); 996220 (CONC, SGO).
2. H *Adiantum scabrum* Kaulf.
996162 (CONC).
3. H *Adiantum sulphureum* Kaulf.
994846 (CONC, SGO); 994851 (CONC, SGO); 994962 (CONC, SGO).
4. H *Cheilanthes glauca* (Cav.) Mett.
20130 (CONC, SGO); 994975 (CONC, SGO); 996305 (CONC); 996397 (CONC).
5. H *Cheilanthes hypoleuca* (Kunze) Mett.
994927 (CONC); 996189 (CONC); 996236 (CONC).
6. H *Cryptogramma fumariifolia* (Phil. ex Baker) H.Christ
20062 (CONC, SGO); 994912
- ASPLENIACEAE**
7. H *Pleurosorus papaverifolius* (Kunze) Fée
996058 (CONC).
- BLECHNACEAE**
8. S *Blechnum cordatum* (Desv.) Hieron.
20003 (CONC, SGO); 994964 (CONC, SGO).
9. H *Blechnum hastatum* Kaulf.
994842 (CONC, SGO); 996039 (CONC); 996135 (CONC, SGO); 996140 (CONC).
10. H *Blechnum microphyllum* (Goldm.) C.V.Morton
20114 (CONC, SGO).
- DENNSTAEDTIACEAE**
11. H *Dennstaedtia glauca* (Cav.) C.Chr. ex Looser
20006 (CONC, SGO); 994936 (CONC, SGO).

DRYOPTERIDACEAE

12. H *Polystichum chilense* (H.Christ) Diels
994849 (CONC, SGO); 994960 (CONC); 994969 (CONC); 996002 (CONC); 996004 (CONC, SGO);
996138 (CONC, SGO); 996213 (CONC).
13. H *Polystichum plicatum* (Poepp. ex Kunze) Hicken
20001 (CONC, SGO); 20050 (CONC, SGO).

EQUISETACEAE

14. H *Equisetum bogotense* Kunth
20155 (CONC, SGO); 994932 (CONC).

WOODSIACEAE

15. H *Cystopteris fragilis* (L.) Bernh. var. *apiiformis* (Gand.) C.Chr.
20049 (CONC).

PINOPHYTA

CUPRESSACEAE

1. T *Austrocedrus chilensis* (D.Don) Pic.Serm. et Bizzarri
994941 (CONC); 994991 (CONC); 996169 (CONC); 996240 (CONC); 996295 (CONC).

EPHEDRACEAE

2. F *Ephedra chilensis* K.Presl
20134 (CONC, SGO); 996281 (CONC, SGO); 996347 (CONC); 996352 (CONC, SGO); 996423 (CONC, SGO).

DICOTYLEDONEAE

AEXTOXICACEAE

1. T *Aextoxicon punctatum* Ruiz et Pav.
994944 (CONC).

ANACARDIACEAE

2. F *Schinus patagonica* (Phil.) I.M.Johnst. ex Cabrera
20000 (CONC, SGO); 994999 (CONC); 996149 (CONC, SGO); 996364 (CONC, SGO); 996390 (CONC).
3. FT *Schinus polygama* (Cav.) Cabrera
996120 (CONC).

ASCLEPIADACEAE

4. S *Cynanchum nummulariifolium* Hook. et Arn.
20007 (CONC); 996300 (CONC); 996334 (CONC); 996415 (CONC); 996429 (CONC).

BERBERIDACEAE

5. F *Berberis trigona* Kunze ex Poepp. et Endl.
20178 (CONC).

BUDDLEJACEAE

6. T *Buddleja globosa* Hope
20004 (CONC); 994910 (CONC); 996365 (CONC).

CAESALPINIACEAE

7. F *Senna arnottiana* (Gillies ex Hook. et Arn.) H.S.Irwin et Barneby
20116 (CONC).

CARYOPHYLLACEAE

8. H *Paronychia chilensis* DC.
996110 (CONC).

CELASTRACEAE

9. T *Maytenus boaria* Molina

- 20036 (CONC, SGO); 994929 (CONC).
 10. F *Maytenus chubutensis* (Speg.) Lourteig, O'Donell et Sleumer
 20136 (CONC); 994996 (CONC); 996293 (CONC); 996370 (CONC); 996380 (CONC).

CHENOPODIACEAE

11. H *Chenopodium ambrosioides* L.
 994879 (CONC); 996264 (CONC).

COMPOSITAE

12. FT *Acrisione denticulata* (Hook. et Arn.) B.Nord.
 994832 (CONC, SGO); 994983 (CONC, SGO); 996228 (CONC).
 13. H *Aster glabrifolius* (DC.) Reiche
 20017 (CONC); 20099 (CONC).
 14. F *Baccharis magellanica* (Lam.) Pers.
 996348 (CONC, SGO).
 15. F *Baccharis poeppigiana* DC. subsp. *ocellata* (Phil.) F.H.Hellwig
 20061 (CONC, SGO); 20072 (CONC, SGO); 20103 (CONC, SGO); 20138 (CONC, SGO); 996131
 (CONC, SGO); 996203 (CONC); 996217 (CONC); 996387 (CONC, SGO); 996389 (CONC, SGO).
 16. F *Baccharis rhomboidalis* J.Remy
 994828 (CONC, SGO); 996202 (CONC); 996311 (CONC, SGO).
 17. F *Baccharis salicifolia* (Ruiz et Pav.) Pers.
 994930 (CONC, SGO).
 18. H *Chaetanthera chilensis* (Willd.) DC.
 20126 (CONC, SGO); 20139 (CONC, SGO); 994809 (CONC, SGO); 994820 (CONC, SGO); 996256
 (CONC, SGO); 996290 (CONC, SGO); 996372 (CONC); 996425 (CONC, SGO).
 19. H *Gamochaeta chamissonis* (DC) Cabrera
 994838 (CONC); 996188 (CONC, SGO).
 20. H *Gamochaeta spiciformis* (Sch.Bip.) Cabrera
 20014 (CONC, SGO); 20092 (CONC, SGO).
 21. S *Haplopappus paucidentatus* Phil.
 20008 (CONC); 994804 (CONC); 994807 (CONC); 996168 (CONC, SGO); 996204 (CONC); 996284
 (CONC, SGO); 996428 (CONC, SGO).
 22. H *Hieracium glaucifolium* Poepp. ex Froel.
 20045 (CONC); 20140 (CONC); 994805 (CONC, SGO); 994865 (CONC, SGO); 994971 (CONC);
 996243 (CONC); 996398 (CONC).
 23. H *Leucheria glacialis* (Poepp. ex Less.) Reiche
 20163 (CONC).
 24. H *Leucheria lithospermifolia* (Less.) Reiche
 20088 (CONC, SGO); 996207 (CONC); 996242 (CONC, SGO); 996259 (CONC, SGO).
 25. A *Madia sativa* Molina
 996113 (CONC); 996184 (CONC).
 26. F *Mutisia decurrens* Cav. var. *decurrens*
 996159 (CONC); 996306 (CONC); 996386 (CONC, SGO).
 27. F *Mutisia subulata* Ruiz et Pav. f. *subulata*
 20174 (CONC).
 28. H *Nassauvia aculeata* (Less.) Poepp. et Endl. var. *aculeata*
 20171 (CONC, SGO); 996341 (CONC, SGO).
 29. H *Perezia linearis* Less.
 20165 (CONC); 996291 (CONC).
 30. H *Perezia lyrata* (J.Remy) Wedd.
 20167 (CONC); 996318 (CONC, SGO); 996414 (CONC, SGO).
 31. H *Perezia nutans* Less.
 994986 (CONC); 996412 (CONC).
 32. S *Senecio angustissimus* Phil.
 20119 (CONC, SGO); 20172 (CONC, SGO); 996028 (CONC); 996115 (CONC, SGO); 996392 (CONC,
 SGO); 996420 (CONC).
 33. S *Senecio chilensis* Less.
 20048 (CONC, SGO); 20166 (CONC, SGO); 994833 (CONC); 994972 (CONC); 996020 (CONC);
 996222 (CONC); 996307 (CONC).
 34. H *Viguiera revoluta* (Meyen) S.F.Blake
 20030 (CONC); 994834 (CONC); 994966 (CONC); 996351 (CONC, SGO).

CONVOLVULACEAE

35. H *Dichondra sericea* Sw. var. *sericea*
994904 (CONC); 996010 (CONC, SGO); 996129 (CONC).

CRUCIFERAE

36. H *Cardamine glacialis* (G.Forst.) DC.
994978 (CONC, SGO); 996369 (CONC).
37. H *Cardamine tenuirostris* Hook. et Arn.
994979 (CONC); 996373 (CONC); 996411 (CONC, SGO).
38. H *Draba gilliesii* Hook. et Arn.
20044 (CONC); 996241 (CONC, SGO); 996313 (CONC).

CUSCUTACEAE

39. A *Cuscuta chilensis* Ker-Gawl.
20081 (CONC); 994907 (CONC); 996099 (CONC); 996357 (CONC, SGO).

ELAEOCARPACEAE

40. T *Aristolelia chilensis* (Molina) Stuntz
20018 (CONC); 994859 (CONC); 996128 (CONC); 996133 (CONC).

ERICACEAE

41. F *Gaultheria phillyreifolia* (Pers.) Sleumer
996019 (CONC); 996381 (CONC, SGO).
42. F *Gaultheria tenuifolia* (Phil.) Sleumer
20029 (CONC, SGO); 20135 (CONC).

ESCALLONIACEAE

43. F *Escallonia alpina* Poepp. ex DC.
994799 (CONC, SGO); 996349 (CONC, SGO).
44. FT *Escallonia myrtoidea* Bertero ex DC.
994954 (CONC); 996266 (CONC, SGO).
45. F *Escallonia rubra* (Ruiz et Pav.) Pers. var. *rubra*
994953 (CONC, SGO).

EUPHORBIACEAE

46. A *Euphorbia klotzschii* Oudejans
996114 (CONC, SGO).
47. H *Euphorbia portulacoides* L. var. *portulacoides*
20100 (CONC, SGO); 996359 (CONC, SGO).

FAGACEAE

48. T *Nothofagus obliqua* (Mirb.) Oerst. var. *obliqua*^a
996100 (CONC, SGO); 996132 (CONC, SGO); 996226 (CONC); 996232 (CONC, SGO); 996262
(CONC, SGO); 996377 (CONC).

GUNNERACEAE

49. H *Gunnera tinctoria* (Molina) Mirb.
20028 (CONC); 996047 (CONC).

HYDRANGEACEAE

50. F *Hydrangea serratifolia* (Hook. et Arn.) F.Phil.
994829 (CONC); 994963 (CONC); 996007 (CONC); 996350 (CONC).

HYDROPHYLLACEAE

51. H *Phacelia secunda* J.F.Gmel. var. *secunda*
20080 (CONC); 20106 (CONC); 996237 (CONC); 996342 (CONC).

LABIATAE

52. AH *Stachys gilliesii* Benth.
20031 (CONC); 20109 (CONC); 996016 (CONC); 996095 (CONC); 996143 (CONC); 996323 (CONC).

LARDIZABALACEAE

53. F *Lardizabala biternata* Ruiz et Pav.
994949 (CONC); 996121 (CONC).

LEDOCARPACEAE

54. S *Wendtia gracilis* Meyen
20032 (CONC); 20145 (CONC); 994835 (CONC); 994917 (CONC); 996180 (CONC).

LOASACEAE

55. A *Loasa tricolor* Ker-Gawl.
994997 (CONC, SGO).

LORANTHACEAE

56. F *Tristerix corymbosus* (L.) Kuijt
994825 (CONC, SGO); 996148 (CONC, SGO).

MALVACEAE

57. H *Malacothamnus chilensis* (Gay) Krapov.
20063 (CONC, SGO).

MISODENDRACEAE

58. S *Misodendrum linearifolium* DC.
994826 (CONC, SGO); 994880 (CONC, SGO).

MYRTACEAE

59. T *Amomyrtus luma* (Molina) D.Legrand et Kausel
994957 (CONC).
60. T *Luma apiculata* (DC.) Burret
20002 (CONC, SGO); 994918 (CONC); 994938 (CONC, SGO).
61. T *Myrceugenia ovata* (Hook. et Arn.) O.Berg var. *nannophylla* (Burret) Landrum
20079 (CONC, SGO); 996379 (CONC).

ONAGRACEAE

62. H *Epilobium australe* Poepp. et Hausskn. ex Hausskn.
20038 (CONC).
63. H *Epilobium glaucum* Phil.
20110 (CONC, SGO); 20168 (CONC).
64. F *Fuchsia magellanica* Lam.
20043 (CONC, SGO); 994806 (CONC); 994942 (CONC).

OXALIDACEAE

65. A *Oxalis micrantha* Bertero ex Colla
996061 (CONC, SGO).
66. H *Oxalis squamata* Zucc.
20064 (CONC); 20161 (CONC); 994915 (CONC, SGO).

PAPILIONACEAE

67. H *Adesmia exilis* Clos
996396 (CONC).
68. H *Lathyrus multiceps* Clos
994843 (CONC); 996332 (CONC); 996406 (CONC).
69. H *Vicia nigricans* Hook. et Arn.
20041 (CONC); 994841 (CONC); 994864 (CONC); 996260 (CONC); 996388 (CONC).

PLANTAGINACEAE

70. H *Plantago grandiflora* Meyen
996310 (CONC, SGO).

PLUMBAGINACEAE

71. H *Armeria maritima* (Mill.) Willd.
20124 (CONC); 996309 (CONC); 996421 (CONC).

POLEMONIACEAE

72. A *Microsteris gracilis* (Hook.) Greene
994968 (CONC).

POLYGONACEAE

73. F *Muehlenbeckia hastulata* (Sm.) I.M.Johnst. var. *fascicularis* (Meisn.) Brandbyge
994882 (CONC); 994952 (CONC, SGO); 996105 (CONC); 996354 (CONC, SGO).
74. F *Muehlenbeckia hastulata* (Sm.) I.M.Johnst. var. *hastulata*
20152 (CONC).

PORTULACACEAE

75. H *Montiopsis andicola* (Gillies ex Hook. et Arn.) D.I.Ford
20123 (CONC).
76. H *Montiopsis gayana* (Barnéoud) D.I.Ford
20122 (CONC); 994896 (CONC); 996017 (CONC); 996427 (CONC).
77. H *Montiopsis umbellata* (Ruiz et Pav.) D.I.Ford
996029 (CONC).

PROTEACEAE

78. T *Lomatia dentata* (Ruiz et Pav.) R.Br.
994856 (CONC); 994868 (CONC); 996161 (CONC); 996283 (CONC); 996383 (CONC).
79. T *Lomatia hirsuta* (Lam.) Diels ex J.F.Macbr.
20071 (CONC); 994821 (CONC); 996385 (CONC).
80. F *Orites myrtoidea* (Poepp. et Endl.) Benth. et Hook.f. ex B.D.Jacks.
996424 (CONC, SGO).

RHAMNACEAE

81. F *Colletia hystrix* Clos
994877 (CONC, SGO); 994947 (CONC, SGO); 996329 (CONC).

ROSACEAE

82. H *Acaena ovalifolia* Ruiz et Pav.
20034 (CONC, SGO).
83. H *Acaena pinnatifida* Ruiz et Pav.
994873 (CONC).
84. H *Geum quellyon* Sweet
20112 (CONC).
85. S *Margyricarpus pinnatus* (Lam.) Kuntze
996191 (CONC); 996362 (CONC).
86. F *Tetraglochin alatum* (Gillies ex Hook. et Arn.) Kuntze
996346 (CONC).

RUBIACEAE

87. H *Galium eriocarpum* Bartl. ex DC.
20146 (CONC); 20149 (CONC); 20157 (CONC); 996314 (CONC, SGO); 996338 (CONC); 996347 (CONC).
88. H *Galium hypocarpium* (L.) Endl. ex Griseb. subsp. *hypocarpium*
994894 (CONC); 994928 (CONC); 996097 (CONC); 996147 (CONC).
89. S *Galium suffruticosum* Hook. et Arn.
994989 (CONC, SGO); 996289 (CONC, SGO); 996418 (CONC); 996422 (CONC).
90. H *Hedyotis salzmännii* (DC.) Steud.
996059 (CONC).

SANTALACEAE

91. F *Myoschilos oblongum* Ruiz et Pav.
994982 (CONC); 996102 (CONC, SGO); 996122 (CONC, SGO); 996205 (CONC, SGO); 996216 (CONC, SGO).
92. H *Quinchamalium chilense* Molina
20056 (CONC); 20093 (CONC, SGO); 994800 (CONC); 996176 (CONC, SGO); 996288 (CONC, SGO).

SAXIFRAGACEAE

93. F *Ribes punctatum* Ruiz et Pav.
20085 (CONC, SGO); 994814 (CONC); 994850 (CONC); 996003 (CONC, SGO); 996136 (CONC); 996384 (CONC).

94. H *Saxifraga magellanica* Poir.
20076 (CONC, SGO); 20150 (CONC); 20177 (CONC, SGO); 996196 (CONC); 996324 (CONC, SGO).

SCROPHULARIACEAE

95. SF *Calceolaria dentata* Ruiz et Pav.
20113 (CONC, SGO); 20180 (CONC, SGO).
96. H *Calceolaria foliosa* Phil.
20084 (CONC).
97. H *Calceolaria williamsii* Phil.
996026 (CONC); 996206 (CONC).
98. A *Mimulus glaberrimus* Kunth
996046 (CONC).
99. H *Ourisia alpina* Poepp. et Endl.
20151 (CONC); 20156 (CONC).
100. S *Ourisia microphylla* Poepp. et Endl.
20144 (CONC, SGO); 20162 (CONC, SGO); 996344 (CONC, SGO).
101. H *Ourisia poeppigii* Benth.
20069 (CONC, SGO); 20077 (CONC).

SOLANACEAE

102. F *Fabiana imbricata* Ruiz et Pav.
996021 (CONC); 996304 (CONC).
103. H *Salpiglossis sinuata* Ruiz et Pav.
20055 (CONC); 994913 (CONC); 996339 (CONC); 996360 (CONC).
104. AB *Schizanthus hookeri* Gillies ex Graham
20054 (CONC); 996012 (CONC); 996027 (CONC); 996366 (CONC).
105. F *Solanum ligustrinum* Lodd.
20060 (CONC, SGO).

TROPAEOLACEAE

106. H *Tropaeolum leptophyllum* G. Don
996337 (CONC, SGO).

UMBELLIFERAE

107. H *Apium chilense* Hook. et Arn.
20020 (CONC).
108. A *Bowlesia incana* Ruiz et Pav.
996052 (CONC).
109. H *Bowlesia tropaeolifolia* Gillies et Hook.
20057 (CONC); 20173 (CONC); 996277 (CONC).
110. AH *Chaucus montanus* Humb. et Bonpl. ex Spreng.
996268 (CONC).
111. H *Eryngium paniculatum* Cav. et Dombey ex F. Delaroché
994852 (CONC); 996212 (CONC, SGO); 996267 (CONC, SGO).
112. H *Osmorhiza berteroi* DC.
20083 (CONC, SGO); 994887 (CONC); 994940 (CONC); 996001 (CONC, SGO); 996153 (CONC).
113. H *Sanicula graveolens* Poepp. ex DC.
996276 (CONC); 996296 (CONC).

VALERIANACEAE

114. H *Valeriana hebecarpa* DC.
20013 (CONC, SGO); 996187 (CONC, SGO); 996312 (CONC, SGO).
115. H *Valeriana leucocarpa* DC.
20073 (CONC).

VERBENACEAE

116. F *Diostea juncea* (Gillies et Hook.) Miers
994889 (CONC); 996280 (CONC, SGO); 996340 (CONC, SGO).
117. S *Verbena ribifolia* Walp.
20154 (CONC, SGO).

VIOLACEAE

118. H *Viola reichei* Skottsbo.
994870 (CONC, SGO); 996253 (CONC, SGO); 996273 (CONC, SGO).

VIVIANIACEAE

119. F *Viviania ovata* Phil.
20040 (CONC, SGO); 994803 (CONC); 996244 (CONC, SGO); 996316 (CONC, SGO).

WINTERACEAE

120. T *Drimys winteri* J.R.Forst. et G.Forst.
994919 (CONC); 996013 (CONC).

MONOCOTYLEDONEAE

ALSTROEMERIACEAE

1. H *Alstroemeria aurea* Graham
20025 (CONC, SGO); 20095 (CONC); 996399 (CONC).

AMARYLLIDACEAE

2. H *Rhodophiala araucana* (Phil.) Traub
20160 (CONC); 996025 (CONC, SGO); 996210 (CONC); 996325 (CONC, SGO).

BROMELIACEAE

3. H *Puya alpestris* (Poepp.) Gay^b
996022 (CONC, SGO)

CYPERACEAE

4. H *Carex aphylla* Kunth
20128 (CONC, SGO); 994836 (CONC, SGO); 994976 (CONC, SGO); 996170 (CONC, SGO); 996327 (CONC, SGO); 996408 (CONC).
5. H *Carex banksii* Boott
20012 (CONC, SGO); 20101 (CONC); 20104 (CONC, SGO).
6. H *Carex lateriflora* Phil.
994992 (CONC, SGO).
7. H *Carex setifolia* Kunze ex Kunth
20051 (CONC, SGO); 20158 (CONC).
8. H *Uncinia phleoides* (Cav.) Pers.
20148 (CONC, SGO).

DIOSCOREACEAE

9. H *Dioscorea* sp.
996177 (CONC).
10. H *Dioscorea reticulata* Gay
994867 (CONC, SGO); 996144 (CONC, SGO); 996382 (CONC, SGO).

GRAMINEAE

11. H *Agrostis inconspicua* Kunze ex E.Desv.
996041 (CONC); 996154 (CONC, SGO).
12. A *Bromus berterianus* Colla
996069 (CONC, SGO).
13. H *Bromus tunicatus* Phil.
20066 (CONC).
14. H *Chascolytrum subaristatum* (Lam.) Desv.
994990 (CONC).
15. F *Chusquea culeou* E.Desv.
20005 (CONC, SGO); 20131 (CONC, SGO); 994827 (CONC, SGO); 996317 (CONC, SGO).
16. H *Elymus angulatus* J.Presl
996361 (CONC, SGO).

17. H *Festuca acanthophylla* E.Desv.
996173 (CONC, SGO); 996198 (CONC); 996285 (CONC, SGO); 996287-A (CONC, SGO); 996319 (CONC, SGO); 996336 (CONC).
18. H *Festuca thermarum* Phil.
20016 (CONC); 994858 (CONC); 994974 (CONC, SGO); 996286 (CONC); 996287-B (CONC, SGO); 996407 (CONC); 996409 (CONC, SGO).
19. H *Koeleria* sp.
996023 (CONC); 996171 (CONC); 996297 (CONC, SGO); 996302 (CONC, SGO); 996326 (CONC); 996395 (CONC).
20. H *Nassella chilensis* (Trin.) E.Desv.
996172 (CONC).
21. H *Nassella gigantea* (Steud.) M.Muñoz
994893 (CONC, SGO).
22. H *Piptochaetium montevidense* (Spreng.) Parodi
994895 (CONC).
23. H *Piptochaetium panicoides* (Lam.) E.Desv.
994933 (CONC); 994934 (CONC).
24. H *Poa* sp.
20027 (CONC)
25. H *Polypogon australis* Brongn.
996048 (CONC); 996067 (CONC, SGO).
26. H *Relchela panicoides* Steud.
994860 (CONC); 994863 (CONC); 994881 (CONC, SGO); 994987 (CONC, SGO); 996156 (CONC).
27. H *Rytidosperma violaceum* (E.Desv.) Nicora
20117 (CONC, SGO); 20033 (CONC, SGO).
28. H *Trisetum cumingii* (Nees ex Steud.) Parodi ex Nicora var. *cumingii*
20015 (CONC, SGO); 20037 (CONC); 20121 (CONC, SGO); 996015 (CONC); 996034 (CONC, SGO); 996155 (CONC).
29. H *Trisetum lechleri* (Steud.) Nicora
996367 (CONC).

IRIDACEAE

30. H *Olsynium junceum* (E.Mey. ex K.Presl) Goldblatt
20176 (CONC); 994980 (CONC); 996233 (CONC); 996413 (CONC, SGO).
31. H *Olsynium scirpoideum* (Poepp.) Goldblatt
994855 (CONC).
32. H *Sisyrinchium arenarium* Poepp.
20111 (CONC, SGO); 20143 (CONC, SGO); 20170 (CONC); 996208 (CONC, SGO); 996252 (CONC); 996299 (CONC); 996335 (CONC, SGO).
33. H *Solenomelus segethii* (Phil.) Kuntze
996331 (CONC); 996403 (CONC, SGO).

JUNCACEAE

34. A *Juncus bufonius* L.
996066 (CONC).
35. H *Juncus cyperoides* Laharpe
996050 (CONC, SGO); 996055 (CONC).
36. H *Juncus stipulatus* Nees et Meyen
20118 (CONC, SGO).
37. H *Juncus tenuis* Willd.
996063 (CONC).
38. H *Luzula racemosa* Desv.
20107 (CONC); 996033 (CONC); 996200 (CONC, SGO); 996255 (CONC); 996301 (CONC, SGO); 996371 (CONC).

ORCHIDACEAE

39. H *Gavilea araucana* (Phil.) M.N.Correa
994945 (CONC, SGO).
40. H *Gavilea glandulifera* (Poepp.) M.N.Correa
20175 (CONC, SGO); 994981 (CONC); 996246 (CONC).

^aThe following collections are possibly hybrids between *Nothofagus obliqua* and *N. glauca*: 20010 (CONC, SGO); 996126 (CONC, SGO). Further study might warrant placing these specimens in *Nothofagus leonii* Espinosa, considered by Donoso & Landrum (1976) to be a hybrid between the two species mentioned.

^b Taxonomy for *Puya* follows Trumpler (1998).

TABLE 6. Exotic flora of the Bellotos del Melado National Reserve, Region VII, Chile. A: Annual; B: Biennial herb; H: Perennial herb; F: Shrub. All cited collection numbers are those of Arroyo *et al.*

TABLA 6. Flora adventicia de la Reserva Nacional Bellotos del Melado, VII Región, Chile. A: Hierba anual; B: Hierba bienal; H: Hierba perenne; F: Arbusto. Las muestras de herbario citadas son de Arroyo *et al.*

DICOTYLEDONEAE

BORAGINACEAE

1. B *Cynoglossum creticum* Mill.
20068 (CONC).
2. B *Echium vulgare* L.
996127 (CONC); 996080 (CONC, SGO); 996239 (CONC).

CARYOPHYLLACEAE

3. H *Cerastium arvense* L.
20021 (CONC); 994816 (CONC); 994970 (CONC); 996294 (CONC); 996391 (CONC).
4. A *Petrorhagia dubia* (Raf.) G.López et Romo
996270 (CONC).
5. H *Saponaria officinalis* L.
994922 (CONC); 996265 (CONC, SGO).
6. A *Scleranthus annuus* L.
996008 (CONC); 996104 (CONC, SGO).
7. A *Stellaria media* (L.) Cirillo
994956 (CONC); 996368 (CONC).

COMPOSITAE

8. A *Anthemis cotula* L.
996103 (CONC).
9. A *Cirsium vulgare* (Savi) Ten.
20115 (CONC); 996108 (CONC).
10. A *Crepis capillaris* (L.) Wallr.
996086 (CONC, SGO); 996111 (CONC).
11. H *Hypochaeris radicata* L.
996042 (CONC); 996045 (CONC); 996111-A (CONC).
12. AB *Lactuca virosa* L.
20059 (CONC, SGO); 994875 (CONC).
13. H *Leucanthemum vulgare* Lam.
994892 (CONC); 996094 (CONC, SGO).
14. H *Tanacetum parthenium* (L.) Sch.Bip.
994914 (CONC, SGO).

GERANIACEAE

15. A *Geranium molle* L.
20087 (CONC, SGO); 994837 (CONC); 994925 (CONC, SGO); 996051 (CONC).

GUTTIFERAE

16. H *Hypericum perforatum* L.
20035 (CONC); 996271 (CONC, SGO).

LABIATAE

17. H *Marrubium vulgare* L.
996107 (CONC).

18. H *Prunella vulgaris* L.
996053 (CONC, SGO); 996057 (CONC); 996075 (CONC, SGO).

LYTHRACEAE

19. A *Lythrum hyssopifolium* L.
994890 (CONC).

PAPILIONACEAE

20. H *Lotus uliginosus* Schkuhr
994920 (CONC, SGO).
21. A *Trifolium dubium* Sibth.
996071 (CONC); 996091-A (CONC).
22. A *Trifolium glomeratum* L.
996072 (CONC, SGO); 996085 (CONC); 996091-B (CONC).
23. H *Trifolium repens* L.
996263 (CONC).

PLANTAGINACEAE

24. H *Plantago lanceolata* L.
20129 (CONC, SGO); 994878 (CONC, SGO).

POLYGONACEAE

25. H *Rumex acetosella* L.
20091 (CONC); 994840 (CONC).

ROSACEAE

26. F *Rosa canina* L.
994839 (CONC).
27. F *Rubus ulmifolius* Schott
994931 (CONC, SGO).

RUBIACEAE

28. A *Galium aparine* L.
996146 (CONC).
29. A *Sherardia arvensis* L.
996073 (CONC, SGO); 996090 (CONC).

SCROPHULARIACEAE

30. B *Verbascum thapsus* L.
20065 (CONC); 996082 (CONC); 996123 (CONC).
31. B *Verbascum virgatum* Stokes
996245 (CONC).
32. AH *Veronica anagallis-aquatica* L.
994926 (CONC).
33. H *Veronica serpyllifolia* L.
996060 (CONC); 996077-A (CONC).

SOLANACEAE

34. A *Solanum nigrum* L.
994923 (CONC, SGO); 996118 (CONC).

UMBELLIFERAE

35. AB *Conium maculatum* L.
996106 (CONC).

MONOCOTYLEDONEAE

GRAMINEAE

1. H *Agrostis capillaris* L.
20047 (CONC, SGO).

2.	A	<i>Aira caryophyllea</i> L. 994861 (CONC); 994898-A (CONC); 996174 (CONC); 996375 (CONC).
3.	A	<i>Avena sativa</i> L. 996009 (CONC).
4.	A	<i>Briza minor</i> L. 996077 (CONC, SGO).
5.	A	<i>Bromus hordeaceus</i> L. 994898 (CONC); 994899 (CONC); 996068 (CONC); 996087 (CONC, SGO); 996109 (CONC).
6.	A	<i>Cynosurus echinatus</i> L. 20075 (CONC); 994935 (CONC, SGO); 996078 (CONC, SGO); 996194 (CONC, SGO).
7.	H	<i>Dactylis glomerata</i> L. 996037 (CONC).
8.	H	<i>Hordeum murinum</i> L. 996112 (CONC).
9.	H	<i>Lolium perenne</i> L. 996065 (CONC).
10.	A	<i>Vulpia bromoides</i> (L.) Gray 996062 (CONC).
11.	A	<i>Vulpia myuros</i> (L.) C.C.Gmel. var. <i>myuros</i> 994853 (CONC); 996018 (CONC, SGO); 996031 (CONC, SGO); 996036 (CONC).

TABLE 7. Additional species not found in the reserve, collected close to CONAF headquarters, Bellotos del Melado National Reserve, Region VII, Chile. A: Annual; H: Perennial herb. All cited collection numbers are those of Arroyo *et al.* N = Native, non-endemic; A = Adventive (exotic); O = Origin; FV = Life form.

TABLA 7. Taxas adicionales no encontrados en la reserva, coleccionados en la vecindad de las dependencias de CONAF, Reserva Nacional Bellotos del Melado, VII Región, Chile. A: Hierba anual; H: Hierba perenne. Las muestras de herbario citadas son de Arroyo *et al.* N = Nativo, no-endémico; A = Adventicia (exótico); O = Origen; FV = Forma de vida.

	O	FV	
1.	N	H	<i>Agrostis meyenii</i> Trin. (GRAMINEAE) 996084 (CONC).
2.	A	A	<i>Arenaria serpyllifolia</i> L. (CARYOPHYLLACEAE) 996093 (CONC).
3.	N	A	<i>Bromus cebadilla</i> Steud. (GRAMINEAE) 996089 (CONC).
4.	N	A	<i>Hydrocotyle indecora</i> DC. (UMBELLIFERAE) 996079 (CONC).
5.	A	H	<i>Modiola caroliniana</i> (L.) G.Don (MALVACEAE) 996088 (CONC).
6.	N	A	<i>Oenothera stricta</i> Ledeb. ex Link subsp. <i>stricta</i> (ONAGRACEAE) 996083 (CONC).
7.	N	A	<i>Oxalis valdiviensis</i> Barnéoud (OXALIDACEAE) 996098 (CONC).
8.	N	H	<i>Nierembergia repens</i> Ruiz et Pav. (SOLANACEAE) 996099-A (CONC).

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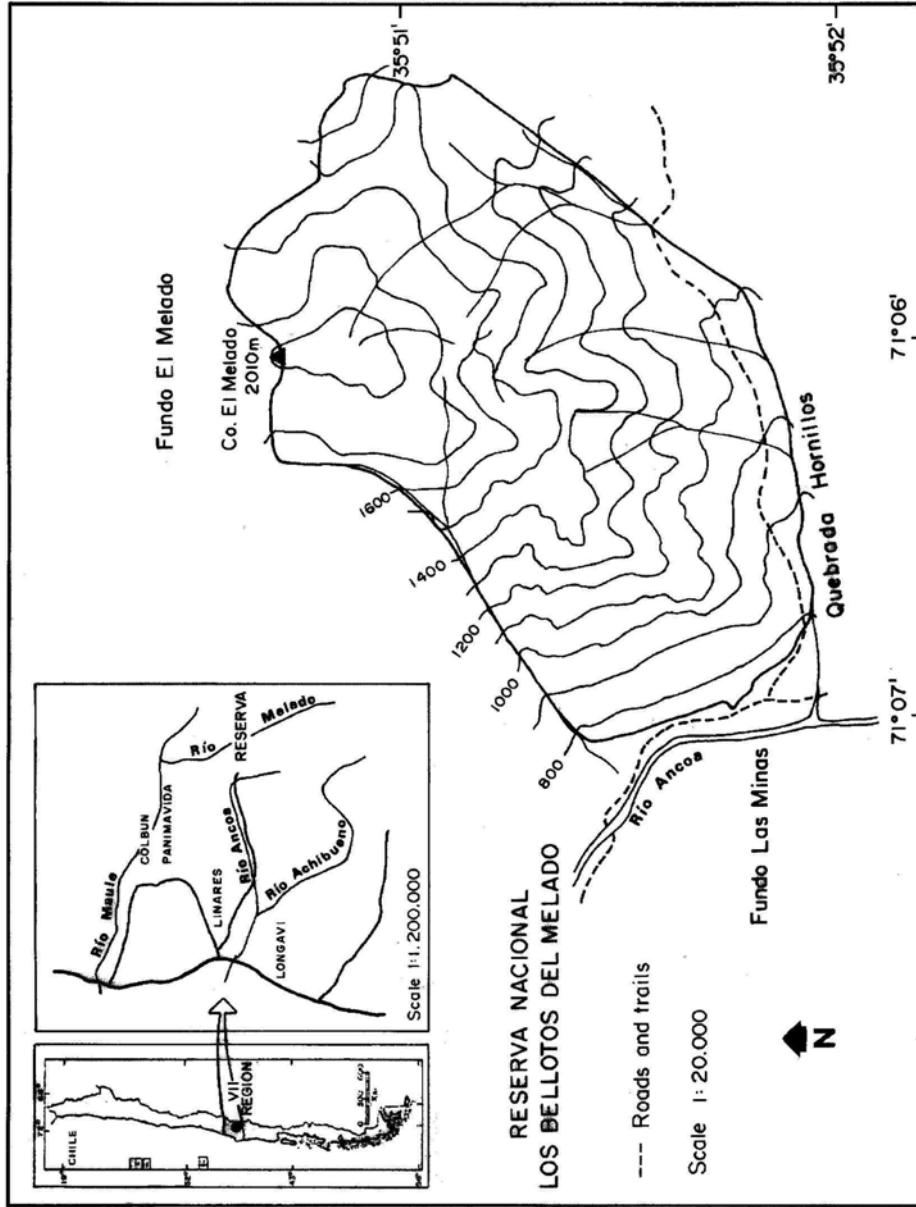


FIGURE 1. Location of the Bellotos del Melado National Reserve, Region VII, Chile.

FIGURA 1. Ubicación de la Reserva Bellotos del Melado, VII Región, Chile.