

NOTES ON AMERICAN LOGANIACEAE IV REVISION OF DESFONTAINIA RUIZ ET PAV.

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HISTORY OF THE GENUS

Desfontainia was originally described by RUIZ and PAVÓN (1794) in the Linnaean group *Pentandria monogynia*. HUMBOLDT and BONPLAND (1808) left it in this group, but indicated that it should be placed in the *Solanaceae*. Many authors, e.g. ROEMER and SCHULTES (1819), REICHENBACH (1837), SPACH (1840), ENDLICHER (1839, 1841), GAY (1849, 1858), and DUNAL (1852), followed him in placing it in the last-named family but often with misgivings.

D. DON (1831) placed *Desfontainia* in the *Gentianaceae* where it was accommodated by G. DON (1838) in a separate tribe. MEISNER (1840) moved it to the *Aquifoliaceae*, but added a question mark.

At about the same time the family *Desfontainiaceae* appeared in ENDLICHER's *Genera Plantarum* (1839) without definite indication of rank. The author placed the "*Desfontaineae*" at the end of or after the *Solanaceae* and suggested to treat it as a separate family. This suggestion is only visible by the difference of the letter type and the arrangement of the paragraphs.

J. D. HOOKER (1846) reported relationship between *Desfontainia* and *Diapensia*.

BENTHAM (1856, 1876) moved *Desfontainia* to the tribe *Fagraeae* (= *Potalieae*) of the *Loganiaceae*. He was followed by HUTCHINSON (1959) who raised this tribe to the rank of family.

SOLEREDER (1895), however, placed it at the end of the family on the ground of absence of intraxylary phloem, being in doubt about its taxonomic position. HALLIER (1911) supposed relationship between *Desfontainia* and *Columellia*.

RELATIONSHIP TO OTHER GENERA

As is easily observed in the above history of the genus *Desfontainia* presented problems to various authors.

The corolla, the stamens, and the aestivation of *Desfontainia* agree in many respects with those of *Fagraea*. On the other hand the ciliate sepals resemble those of the *Gelsemieae*, and the narrow corolla tube and the slender style those of the *Retzieae*. The ovary is unilocular in the upper, quinquelocular in the lower part. In *Retzia* the ovary is unilocular in the upper, 2-celled in the lower part, in *Potalia* it is 2-celled in the upper and 4-celled in the lower part. The seeds of *Desfontainia* resemble strikingly those of the genera of the *Potalieae*, both outside and in their inner structure. On the basis of these characteristics

the present author prefers to place the genus in the *Loganiaceae* in a separate tribe near the *Potalieae* and *Retzieae*. For this purpose it is nomenclaturally sufficient to transfer the tribe *Desfontainieae* G. Don from the *Gentianaceae* to the *Loganiaceae*.

GEOGRAPHICAL DISTRIBUTION AND ECOLOGY

Desfontainia occurs from Costa Rica to Cape Horn. In the tropics it is restricted to high altitudes, whereas in extra-tropical regions it reaches down to sea level. It prefers a rather cool climate with a high degree of moisture. Therefore it is an excellent garden plant in e.g. western Scotland. A distribution map is presented on the basis of the ca. 200 specimens studied by the present author, although the area may still be incompletely known.

Tribe *Desfontainieae* G. Don, Gen. Syst. 4: 175, 213. 1838 (in *Gentianaceae*); Dunal in De Candolle, Prod. 13 (1): 675. 1852 (as *Desfontainieae* in *Solanaceae*).

Type genus: *Desfontainia* Ruiz et Pav.

Homotypic synonym: *Desfontainieae* Endl., Gen. Pl. 669. 1839 and Enchiridion 336. 1841 (as *Desfontaineae* after or in *Solanaceae* in *Tubiflorae*).

One monotypic genus.

Desfontainia Ruiz et Pav., Fl. Peruv. et Chil. Prod. 29, f. 5. 2nd fig. nos. 1–7. 1794; Schrader, Journ. Bot. 1: 174. 1799; von Humboldt & Bonpland, Pl. Aequin. 1: 157. 1808; Sprengel, Anleitung 2nd ed. 2 (1): 456. 1817 and Syst. 1: 700. 1825; von Humboldt, Bonpland & Kunth, Nov. Gen. 7: 295. 1825 (ed. folio; as *Desfontainea*); Kunth, Syn. 4: 266. 1825 (as *Desfontainea*); Sprengel, Gen. Pl. 1: 160. 1830; D. Don, Edinb. Phil. Journ. July-Sept. 1831: 274; Reichenbach, Handb. 201. 1837 and Der Deutsche Botaniker 1 (= Nomenclator): 122. 1841; G. Don, Gen. Syst. 4: 213. 1838; Meisner, Gen. Pl. 1: 252. 1839 and 2: 161. 1840; Endlicher, Gen. Pl. 669. 1839 and Enchiridion 336. 1841 (as *Desfontainea*); J. D. Hooker, Fl. Antarct. 1 (2): 332. 1846 (as *Desfontainea*); Lindley, Veg. Kingdom 614. 1847; Grisebach, Abh. Goett. Ges. 6: 112. 1856; Bentham, Journ. Linn. Soc. 1: 97. 1856; Bentham & J. D. Hooker, Gen. Pl. 2: 794. 1876 (as *Desfontainea*); Solereder in Engler & Prantl, Natürl. Pflanzenf. 4 (2): 50, f. 28. A-C. 1895; Fedde, Beiträge Anat. Solanac. (Thesis) 48. 1896 (as *Desfontainea*); Hallier, Meded. Rijksherb. Leiden 1911: 28 (as *Desfontainea*).

Type species: *D. spinosa* Ruiz et Pav.

Homotypic synonym: *Linkia* Pers., Syn. 1: 219. 1805; Roemer & Schultes, Syst. 4: LV, 682. 1819, not. Cav.

D. spinosa Ruiz et Pav., Fl. Peruv. et Chil. 2: 47, t. 186. 1799; W. J. Hooker,

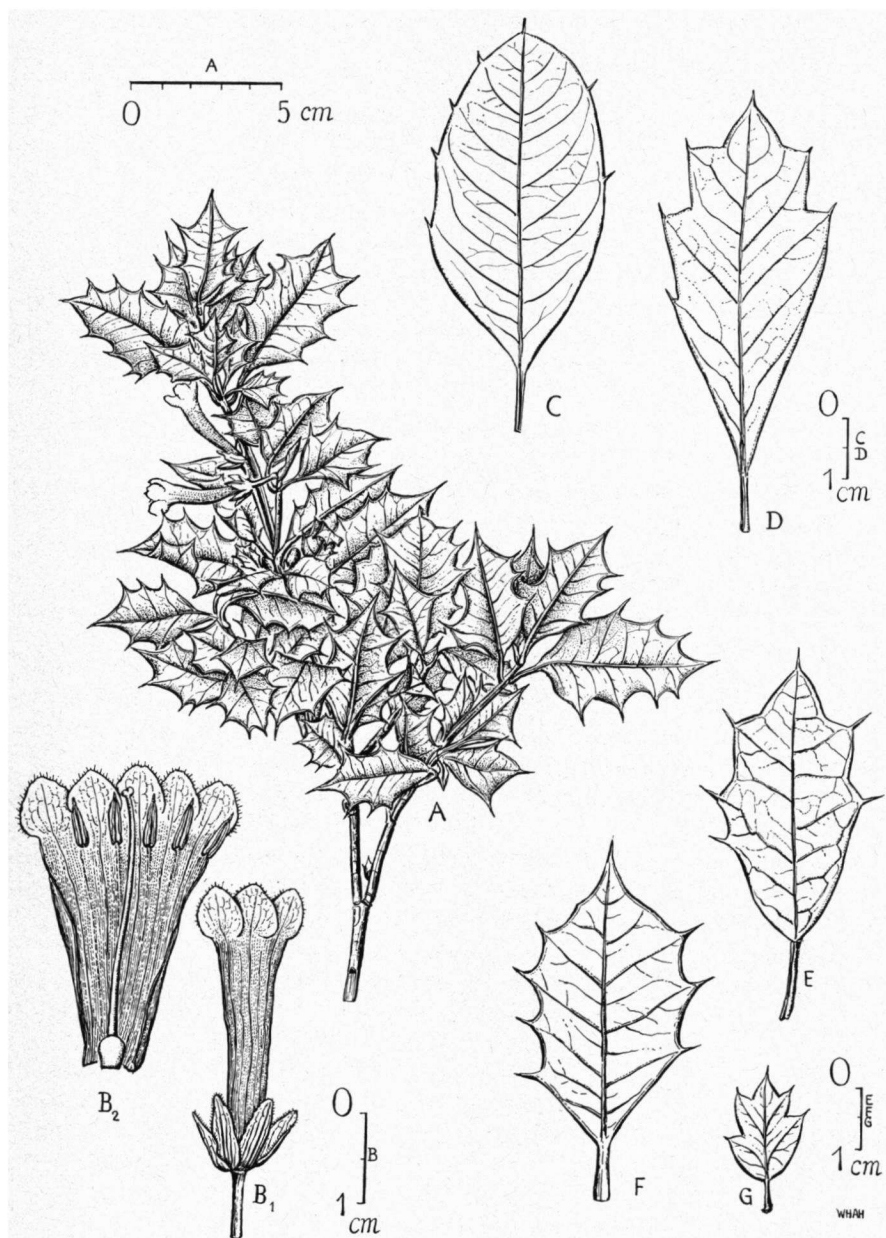


Fig. 5. *Desfontainia spinosa*: A. habit; B₁. flower; B₂. opened corolla with stamens and pistil; C-G. leaves. (A, B, F: De Barba 994; C: Wurdack 982; D: Gay s.n., type of *D. chilensis*; E: Ljungner 1262; G: Uribe 5923).

Icon. 1: t. 33. 1837; G. Don, Gen. Syst. 4: 213. 1838; J. D. Hooker, l.c.; Remy in Cl. Gay, Fl. Chilena 5: 99. 1849 and Hist. Chil. Atlas t. 56. 1858 (as *Desfontainea*); Dunal in De Candolle, Prod. 13 (1): 675. 1852; W. J. Hooker, Bot. Mag. 80: t. 4781. 1854; J. J. (?), Cottage Garden 12: 369, with fig. 1854; Lemaire, Illustr. Hort. 1: pl. 27. 1854; Herincq, Horticulteur Franç. 1855: 97, pl. 9. f. 1. 1855; Rutger, Floricult. Cab. 1855: 273, with col. pl. 1855; Bentham, Journ. Linn. Soc. 1: 97. 1856; Le Maout & Decaisne, Traité Gén. Bot. 163, with fig. 1868; Nicholson, Illustr. Dict. Gard. 1: 459. 1885; Goldring, Garden 33: 514, with fig. 1888 (as *Desfontainea*); Baillon, Hist. Pl. 10: 123, f. 107–109. 1889 (as *Desfontainea*); Schneider, Illustr. Handb. Laubh. 2: 842, f. 529. 1912 (as *Desfontainea*). **Fig. 5; Map 1**

Type: Peru: near Churupallana, Tarma or between Muña and Pozuzo, Ruiz & Pavón s.n. (MA, lectotype, not seen, photograph in WAG; isotypes seen: BM, F).

Homotypic synonyms: *Linkia peruviana* Pers., Syn. 1: 219. 1805; Roemer & Schultes, Syst. 4: 682. 1819.

L. spinosa (Ruiz et Pav.) Poir., Enc. Suppl. 3: 449. 1813.

Heterotypic synonyms: *D. splendens* v. Humb. et Bonpl., Pl. Aequin. 1: 157, t. 45. 1808; von Humboldt, Bonpland & Kunth, Nov. Gen. 7: 295. 1825 (ed. folio; as *Desfontainea*); Dunal, l.c. p. 676. Type: Colombia: Cundinamarca, Mt. Quindio, Bonpland 2060 (P, isotype; F, fragment). Homotypic synonym: *Linkia splendens* (v. Humb. et Bonpl.) Poir., l.c.; Roemer & Schultes, l.c.

D. parvifolia D. Don., Edinb. Phil. Journ. July–Sept. 1831: 275. Type: Peru: Muña Mts., Ruiz & Pavón s.n. (BM, holotype; isotypes: F, MA, the MA sheet which is paratype of *D. spinosa* var. *parvifolia* not seen, photograph of it in WAG). Homotypic synonym: *D. spinosa* var. *parvifolia* (D. Don) W. J. Hook., l.c.

D. fulgens D. Don, Trans. Linn. Soc. 17: 505. 1837. Type: Chile: near Valdivia, Bridges 776 (K, lectotype; isotype: BM). Homotypic synonyms: *D. hookeri* Dun., l.c. p. 676; Planchon, Fl. des Serres 9: 207, t. 938. 1854; Dippel, Handb. Laubholz. 1: 156, with fig. 1889 (as *Desfontainea*). *D. spinosa* var. *hookeri* (Dun.) Reiche, Fl. Chile 6: 100. 1911; Skottsberg, Kungl. Svenska Vet. Akad. Handl. 56 (5): 287, t. 3. f. 1. 1916 (as *Desfontainea*).

D. chilensis Cl. Gay, Fl. Chilena 5: 100. 1849 (as *Desfontainea*). Type: Chile: sin. loc., Gay s.n. (P, holotype; isotype: F). Homotypic synonym: *D. spinosa* var. *chilensis* (Gay) Reiche, Fl. Chile 6: 100. 1911.

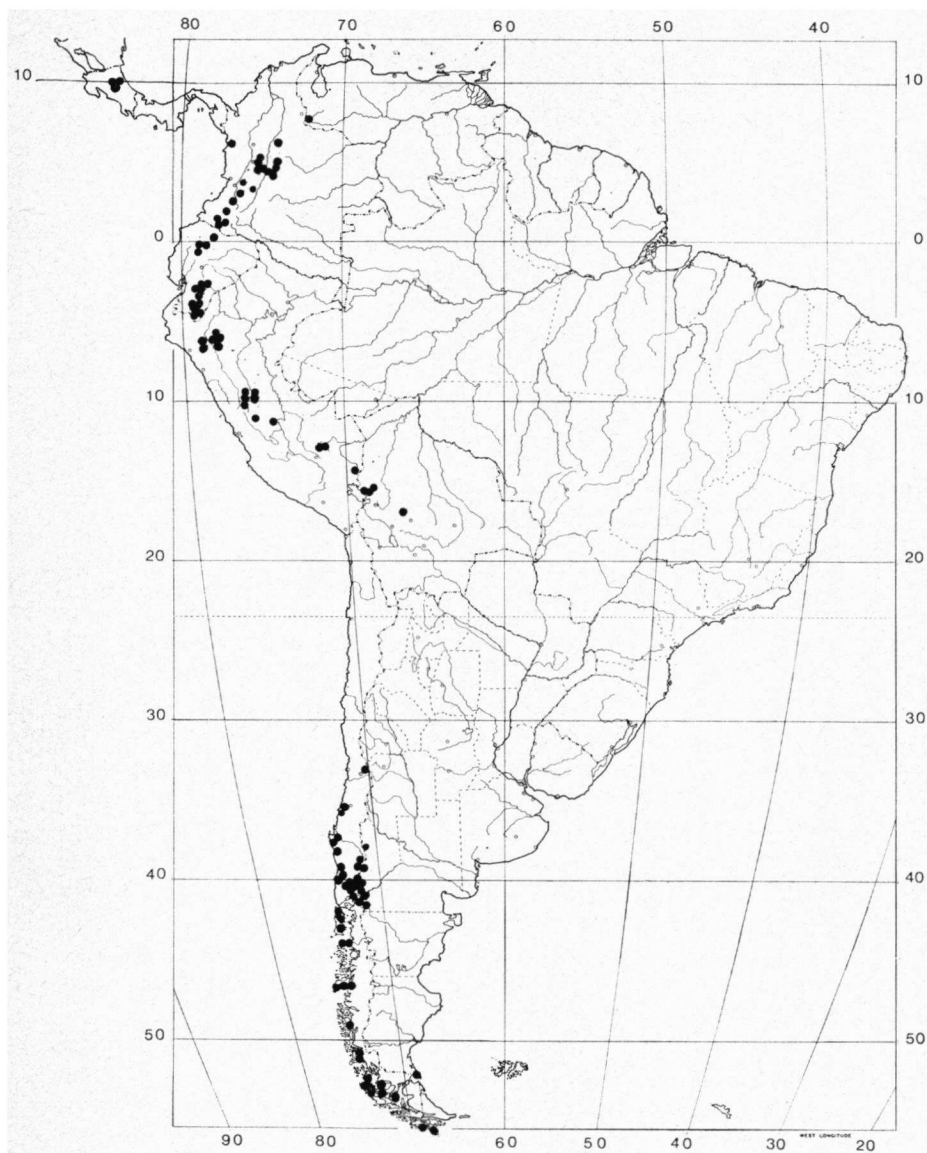
D. acutangula Dun., l.c. p. 676. Type: Colombia: Caldas, Tolima, Province Mariquita, Linden 944 (G-DC, holotype, not seen, microphot. in WAG; isotypes seen: BM, BR, FI, GH, K, LE, OXF, P, photograph of G sheet in MO and NY).

D. ilicifolia Phil., Linnaea 29: 25. 1857. Type: Chile: sin. loc., Gay 208 (P, lectotype; isotypes: BR, F, GH, K, LE, NY, WU).

D. obovata Kränzlin in Engler, Bot. Jahrb. 40: 312. 1908 (as *Desfontainea*). Type: Peru: between Tambo Ichubamba and Tambo Yuneacoyu, Sandia-Chunchumayo road, Weberbauer 1079 (holotype not seen, destroyed in B; isotype seen: F).

D. novemdentata Gandoger, Bull. Soc. Bot. France 60: 25. 1913. Type:

REVISION OF DESFONTAINIA



Map. 1. *Desfontainia spinosa*.

Chile: sin. loc., Philippi anno 1901 (LY, holotype).

D. pulchra Moldenke, Phytologia 2: 216. 1947. Type: Venezuela: Tachira, base of Páramo de Tamá, 4–10 kms above Betania, Steyermark 57344 (F, holotype; photograph in NY).

Acta Bot. Neerl. 18(6), Dec. 1969

D. steyermarkii Moldenke, l.c. p. 217. Type: Ecuador: Province Santiago-Zamora, along Río Valladolid, between Quebrada Honda and Tambo Valladolid, Steyermark 54597 (F, holotype; isotypes: K, NY).

D. costaricensis Woodson, Ann. Miss. Bot. Gard. 47: 73. 1960. Type: Costa Rica: vicinity of Millsville, Pan American Highway, about 3 kms above Nivel, Holm & Ittis 534 (MO, holotype; isotype: P).

Erect or sprawling shrub or rarely small tree, 0.50–4 (5) m high. Branches unarmed, pale grey-brown, not lenticellate; branchlets glabrous. *Leaves* opposite or decussate, those of a pair equal or subequal, petiolate; petioles glabrous, 2–15 mm long, those of a pair joined at the very base by a stipular line; blade like that of *Ilex aquifolium* L., more or less shining and dark green above, paler beneath, coriaceous, obovate or elliptic, very variable in shape and size, 1.2–2.5 (3) $\times$ as long as wide, 15–90 $\times$ 8–55 mm or smaller, acute at the apex, decurrent into the petiole or cuneate or sometimes rounded at the base, with 1–10 entire lobes on each side which vary much in size, glabrous on both sides or occasionally with a few hairs on the costa beneath; apex and lobes sharply pointed; costa and veins prominent beneath. *Flowers* 5-merous, actinomorphic, solitary or occasionally several together in the axils of the leaves near the apices of the branchlets. Peduncle glabrous or pubescent, 9–12 mm long, with 2 very narrowly oblong to linear bracteoles at the base which are about twice as long as the sepals and like them or intermediate between them and the leaves. *Sepals* pale green, occasionally purplish-green, connate at the very base only, equal or subequal, narrowly ovate or oblong, 1.8–4 $\times$ as long as wide, (1.5) 3–11 $\times$ 1–5 mm (size varies independently from that of the corolla), obtuse or less often acute at the apex, partially sinuate, ciliate or not, glabrous on both sides or occasionally with some hairs outside, with distinct longitudinal slightly branched veins. *Corolla* in the mature bud (2) 3–8 $\times$ as long as the calyx, (14) 22–45 (63) mm long, elongate at anthesis, fleshy, orange-red outside, with a pale yellow limb and inner side, glabrous on both sides; tube nearly cylindrical, much longer than the calyx and the lobes; lobes imbricate or contorted but not twisted, suborbicular, 5 $\times$ 5–10 $\times$ 10 mm, rounded or less often retuse, entire, ciliate, slightly spreading. *Stamens* slightly exserted; filaments very short, 0.1–0.5 $\times$ as long as the anthers, glabrous, inserted just below the mouth; anthers narrowly triangular to nearly oblong, 3–4 $\times$ as long as wide, 4–6 $\times$ 1.2–1.8 mm, basifixed, glabrous, deeply cordate at the base, often apiculate at the apex, introrse; cells 2, parallel, discrete, dehiscent throughout by a longitudinal split. *Pistil* glabrous or occasionally with a minutely pubescent style; ovary cylindrical, 1–1.7 $\times$ as long as wide, 3–5 $\times$ 2–3 mm, abruptly narrowed into the style, at the base 5- and at the apex 1-celled; style slender, not or slightly exserted, persistent; stigma capitate, minutely pubescent with glandular hairs. Placentae 5, parietal, mushroom-shaped on section, ovuliferous outside, united inside in the basal half of the ovary. *Fruit* a berry, yellow or white, globose or nearly so, about 10–15 mm in diam., many-seeded; wall about 3 mm thick; bases of placentae thin. *Seeds* dark brown, shining, obliquely ellipsoid or ovoid, 2.2–

$2.4 \times 1.2\text{--}1.5 \times 0.8\text{--}1.2$ mm, smooth, slightly angular (only seen in a few specimens). Embryo very small, straight, surrounded by much mealy endosperm.

Distribution: Andes, from Costa Rica to Cabo de Hornos.

Ecology: Open hillsides partly covered with *Sphagnum* with much fog and rain or montane rain forests. Alt. in tropical regions 2000–4000 m, outside the tropics 0–1200 m.

COSTA RICA: next to Pan American Highway between kms 18 and 20 from El Empalme to Villa Mills, Province San Jose (fl., fr. July), *Marcela Cruz* 85 (F, GH); Vicinity of Millsville, Pan American Highway, about 3 km above Nivel, Cartago (fl., fr. July), *Holm & Iltis* 534 (MO, P, type of *D. costaricensis*); on Pan American Highway, S. of Cartago, Talamanca range, Cartago (March), *Carlson* 3589 (F); Cerro de las Vueltas, Cordillera de Talamanca, Cartago, *L. O. Williams* 16109 (GH); Cerro de la Muerte, Cordillera de la Talamanca (May), *L. O. Williams* 20136 (F, WAG).

COLOMBIA: El Valle: Alto del Buey (fl., fr. Oct.), *Cuatrecasas* 18097 (F). Santander: Horta Naque (Nov.), *Espinosa* 950 (NY). Caldas: Cordillera Central, SW. of Ruiz (May), *Cuatrecasas* 9216 (US); Mt. Quindio, *Goudot s.n.* (K, P); *ibid.*, *Pennell & Hazen* 10045 (GH, NY, US); *ibid.*, *Bonpland* 2060 (F, P, type of *D. splendens*); *ibid.*, ex herb. *Desfontaines s.n.* (FI); Mt Tolima (Jan.), *Linden* 944 (BM, BR, FI, GH, K, LE, OXF, P, type of *D. acutangula*); *ibid.*, *Goudot s.n.* (FI, K, OXF, P); *ibid.* (July), *Tracey* 200 (K); *ibid.*, *Purdie s.n.* (GH, K). Cundinamarca: near Sibaté (Sept.), *Wilson Popenoe* 1113 (US); Fusugasuga (fl., fr. Oct.), *Humbert c.s.* 26941 (P, US); *ibid.*, *Purdie s.n.* (GH, K); *ibid.* (fl., fr. Sept.), *Triana* 3875.2 (BM); near Bogota (Dec.), *Linden* 829 (FI, P); Páramo de San Fortunado, *Triana* 2320 (P); Carupa, Peña de Sumangá (Aug.), *Uribe* 5923 (WAG). Valle del Cauca: near Abelina (Nov.), *Core* 1652 (US). Cauca: Cordillera Central, Alto del Duende (Dec.), *Cuatrecasas* 18847 (F); Río López, Tierra Adentro (Jan.), *Pittier* 1082 (BM, NY, US); Páramo de Amalguer, *Triana* 2319 (BM, BR, NY, P, US), 3875.1 (BM). Narino: Casapamba (fr. June), *André* 995 (K); Casapamba and Pasto, *André* 2959 (K); Vulcan of Pasto (June), *André* 1152 (K); *ibid.*, *Jameson* 412 (BM, FI, K, LE, MO); near Pasto, *Jameson* 472 (BM, FI, K, LE, US); Páramo de San Antonio, road from Pasto to Sibundoy (March), *Schultes & Cabrera* 18898 (US); Laguna de la Cocha, Quebrada de Santa Lucía (Jan.), *Cuatrecasas* 11814 (US). Sin. loc., *Lobb* 79 (K); *Mutis* 71 (F, K).

VENEZUELA: Tachira: base of Páramo de Tamá, 4–10 kms above Betania (July), *Steyermark* 57344 (F, type of *D. pulchra*).

ECUADOR: Napo-Pastaza: ENE. of Cayambe Mt. (fl., fr. Dec.), *Cazalet & Pennington* 5548 (K), 5594 (K). Imbabura: between Toldadas and Naranjito (fl., fr. Aug.), *Drew* E 244 (US); Quito, *Jameson s.n.* (K); Tungurahua (fr. May), *Spruce* 5400 (BM, K). Cuenca: Cerra Yanahuanca (fl.), *Lehmann* Oct. 1889 (K); Azuay: Páramo de Tinajillas, 30–50 km S. of Cuenca (Mar.), *Camp E* 2089 (G, NY); between Oña and Cuenca (Sept.), *Hitchcock* 21618 (NY, US); between El Pan and Guachapala (Sept.), *Camp E* 5221 (F, NY, US); between Cumbe and Nabon (July), *Penland & Summers* 1098 (F). Canar: Ayapamba, about 15 km ENE. of Azogues (Sept.), *Prieto P* 152 (GH, K, NY, P). vicinity of Saraguro (Sept.), *Rose c.s.* 23157 (NY, US); vicinity of Las Juntas (Sept.), *Rose c.s.* 23203 (US); Saraguro Mts. (Aug.), *Hartweg* 811 (BM, FI, K, LE, P); Chuquiribamba Quebrada de St. Bárbara (Nov.), *André* 4462 (F, K, NY). Loja: between Tam Cachiyacu, La Entrada, and Nudo de Sabanillas (Oct.), *Steyermark* 54431 (F, NY, US). Santiago-Zamora: along Río Valladolid, between Quebrada Honda and Tambo Valladolid (fl., fr. Oct.), *Steyermark* 54597 (F, K, NY, type of *D. steyermarkii*). Sin. loc., *Hartweg* 1542 (K).

PERU: Amazonas: E. of Shipasbamba (fl., fr. June), *Wurdack* 982 (K, U, US); W. of Molinopampa (July), *Wurdack* 1357 (US); Taulia, *Mathews* 1546 (K, L, OXF); Middle eastern Calla-Calla slopes near kms 411–416 of Leimebamba-Balsas road (July), *Wurdack* 1313 (US).

Cajamarca: Cutervo (July), *Sandeman* 4137 (K); 10 km NW. of Socota (Dec.), *Stork & Horton* 10139 (F, K). Huánuco: Sariapampa (May), *Woytkowski* 34299 (F, MO); Carpish (Mar.), *Ferreira* 1855 (US); *ibid.*, above Acomayo, *P. C. Hutchinson* c.s. 5933 (MO); 24 km NE. of Huanuco (June), *Macbride & Featherstone* 2197 (F, US, WAG); Tambo de Vaca (June), *Macbride* 4452 (F, US); Muña Mts., Pozuzo, *Ruiz et Pavón* s.n. (BM, F, type of *D. parvifolia*). Junin: Churupallana, Tarma Province, *Dombey* 989 (P); *ibid.*, *Ruiz et Pavón* s.n. (BM, F, type). Huancavelica: 1 km E. of Surcubamba (Jan.), *Stork & Horton* 10353 (F, K). Cuzco: Urubamba Province, near Wenner Gren ruins (Aug.), *Metcalf* 30750 (A, MO, US); Puyupata (Mar.), *Vargas* C 2764 (US); Paucartambo (July), *Vargas* 2107 (F). Puno: between Tambo Ichubamba and Tambo Yuneacoyu, Sandia-Chunchumayo road, *Weberbauer* 1079 (F, type of *D. obovata*). Sin. loc., herb. *Dombey* 1818 (BM); *Liman* s.n. (P); herb. *Richard* s.n. (P).

BOLIVIA: Mapiro (Sept.), *Bang* 1580 (A, BM, E, F, GH, K, LE, MO, NY, US, WU); *ibid.* (Apr.), *Rusby* 1951 (BM, K, LE, NY, US); Copapuncu (Aug.), *Cardenas* 1119 (NY); *ibid.*, *Tate* 324 (NY), 352 (NY); 40 km N. of Sorata (June), *Brooke* 6470 (BM, NY); Yungas, Unduavi (Feb.), *Buchtien* 778 (353) (F, US); *ibid.* (fl.) *Pearce* Dec. 1865 (BM, K); *ibid.*, *Rusby* 1950 (LE, NY); sin. loc., *Bridges* s.n. (BM).

CHILE: Cordillera (Mar.), *Philippi* 44 (BM, GOET, LE, P, UPS); Villavicencio, *Neger* anno 1897 (C); Coronel, *Ochsenius* anno 1865 (BR, BREM, GOET); Araucana, *Philippi* anno 1888 (K, US, WU); Arauco, *Reed* s.n. (BM, K); Angol (Feb.), *Pennell* 12832 (F, GH, NY, US); Vulcan Llama (Feb.), *Wedermann* 1247 (A, BM, F, GH, K, MO, NY, U, US); *ibid.* (Apr.), *Frödin* 793 (UPS); *ibid.* (Jan.), *Joseph* 3143 (US); Cautin to Valdivia, *Calvert* s.n. (BM); Valdivia, *Bridges* 776 (BM, K, lectotype of *D. fulgens* and *D. hookeri*); *ibid.* (Mar.), herb. *Gerte* 3655 (JE); *ibid.*, *Philippi* anno 1888 (US); *ibid.*, *Philippi* (?) s.n. (HAL, US); *ibid.* (fl.), *Sanminiatielli* Mar. 1890 (FI); *ibid.* (fl.), *Sargent* 24 Jan. 1906 (A); *ibid.*, Corral (Mar.), *Gunckel* 53 (BM); *ibid.*, *H. Krause* s.n. (US); *ibid.* (Dec.), *West* 4871 (GH, MO); Panguipulli, *Joseph* 2350 (US); Cordillera de Ranco, *Lechler* 839 (UPS), 839a (LE, P, UPS); W. of la Unión, Cordillera de la Alerce (Feb.), *Eyerdam* 10678 (F, K, US); Cordillera Pelada, ca. 30 km from San Juan de la Costa (Mar.), *Morrison* 17626 (GH, K, MO); Cordillera de la Carpa, Osorno Province (Feb.), *Eyerdam* 10572 (F, US); Lago de Llanquihue (fl.), *Philippi & Borchers* 1 Feb. 1885 (BM, F); Puerto Varas, Calbuco Mt. (fl.), *Rehn* (?) 24 Apr. 1917 (F, MO, WAG). Chiloé Island: *Anderson* 130 (BM); *Capt. King* annis 1826–1830 (FI, K); *Lobb* s.n. (K); *Reed* 1811 (K); Chepu, *Godley* 209a (BM); Cordillera de Piuchué (Feb.), *Wedermann* 289 (BM, F, GH, K, MO, NY, U, US); Cordillera San Pedro, *Godley* 520b (BM); Tilmiquen (Feb.), *Junge* 112 (MO). Melinka (Jan.), *Andreas* 470 (U); Guaitecas Islands (fl.), *Dusén* Apr. 1897 (UPS); Istmo de Ofqui (Feb.), *Hicken* 14464 (FI); Keley Bay, *Skottsberg* annis 1920–1921 (GB); Otway Harbour, Gulf of Penas (fl.), *Mosely* Jan. 1876 (BM, K); Peninsula Tres Montes (fl.), *Roivainen* 2 Apr. 1929 (H); *ibid.* (fl.), *Skottsberg* 10 Feb. 1921 (GB); Puerto Edén (fl.), *J. Ball* June 1882 (K, US); *ibid.* (fl.), *Cunningham* 21 Mar. 1868 (K); *ibid.*, *Godley* 554b (BM); *ibid.*, *T. Hill* anno 1872 (GH); Puerto Bueno, herb. *Le Jolis* Oct. 1865 (LE); Puerto Mayne (fl., fr.), *L. A. Lee* 5 Feb. 1888 (F, US); Straits of Magellan, *Routledge* anno 1913 (K); Smyth Canal (fl.), *Bens* (?) 9–10 Mar. 1879 (LE); *ibid.*, *Borchers* acc. 1880 (GOET); *ibid.* (Feb.), *C. Elliot* 314 (K); *ibid.* (fl.), *W. E. Safford* 7 Dec. 1834 (NY, US); *ibid.* (Jan.), *Skottsberg* 105 (BR, GB, LE); Skyring (Apr.), *Skottsberg* 279 (UPS); Tuesday, herb. *Naumann* 2 Feb. 1876 (JE); Isla Desolación (Mar.), *Dusén* 670 (H, UPS); Isthme-Bay, Terr. Desolación (Feb.), *Savatie* 184 (K, P), 1778 (K); Puerto Churruca, *L. A. Lee* 2 Feb. 1888 (US); *ibid.* (fl., fr. Jan.), *Savatie* 1894 (LY, P), Jan. 1877 (P); Playa Parda Cove (fl.), *H. M. S. Albert* Feb. 1880, comm. Coppinger (K); *ibid.* (fl.), *Cunningham* 18 Mar. 1867 (C, GH, K, LE, NY); Glacier Bay, *J. H. Blake* Mar. 1872 (GH); Hassler Glacier, *T. Hill* anno 1872 (GH); Puerto Famine, *Marivault* anno (?) 1850 (P); Otter Island (Dec.), *Tilman* 4 (BM); Barba Canal, Cabo de Hornos (fr.), *Capt. King* May 1828 (K). Sin. loc. (fr. Dec.), *Funk* 131 (P); *Gay* 143 (P), 208 (BR, F, GH, K, LE, NY, P, WU, lectotype of *D. ilicifolia*), s.n. (F, P, type of *D. chilensis*); *Hartweg* 262 (P); *Hunemann*, herb. Ledebour s.n. (LE); comm. *Philippi* anno 1904 (BM); *Philippi* anno 1901 (LY, type of *D. novemdentata*).

ARGENTINA: upper Renaico Valley, crossing of Diablo R., Chilan boundary (fl.), *Elwes*

25 Jan. 1902 (K); Río Puesto, Lanin (Jan.), *Comber* 964 (E, K); Lago Lacar, Neunquén, *J. J. Neumeyer* Nov. 1937 (H); Río Negro Province (Mar.), *Fazies* 1112 (C); Lago Nahuel Huapi (fl., fr.), *Elwes* 13 Feb. 1902 (A, K); Puerto Blest (Mar.), *Cardini herb. Inst. Miguel Lillo* 36093 (F, GH, NY); *ibid.* (Mar.), *De Barba* 994 (U); *ibid.* (fl., fr.), *Elwes* 13 Feb. 1901 (K); *ibid.* (fr. Dec.), *Hunnewell* 10100 (GH); Puerto Blest – Puerto Alegre (Jan.), *Sleumer* 1505 (US); Laguna Fria, Río Negro (fr. Dec.), *West* 4834 (GH); *ibid.* (Dec.), *Andreas* 339 (U); *ibid.* (Feb.), *Cabrera* 6024 (GH, NY); *ibid.* (Mar.), *De Barba* 1029 (BR, P); Isla Victoria, Río Negro (fr. Jan.), *Cabrera & Job* 245 (NY); Lago Espejo (Feb.), *Cabrera* 6010 (F, NY, US); *ibid.* (fl.), *Kalela* Nov. 1937 (H); Puerto Nuevo, Lago Nahuel Huapi, *Ljungner* 1262 (GB); Viento Arroz Negro (Jan.), *Ljungner* 216 (GB); W. of Bandera (Aug.), *Ljungner* 78 (NY); Lago Correntoso (Mar.), *Maldonado* 62 (NY); *ibid.* (Feb.), *Burkart* 6422 (F); *ibid.* (Mar.), *Cabrera* 5053 (F, GH, NY, WAG); *ibid.*, *Kalela* Nov. 1937 (H); *ibid.* (Mar.), *Scolnik* 260 (US); Brazo Rincón (Feb.), *Pedersen* 1569 (BR, C, US); Cabo Virgenes, herb. *Schatteburg* anno 1900 (BREM).

CULT.: London, Great Britain (fl.), *Ellis* 22 Dec. 1960 (K); Kew (fl.), *Boom* 5–14 Sept. 1935 (L); Glenborrodale, Argyllshire (fl.), comm. *Trent* 22 July 1938 (BM); Benmore Bot. Gard., near Dunoon, W. Scotland (fr. June), *Leeuwenberg* 3488 (WAG); *Hort. Amsterdam*, Netherlands (Sept.), *Leeuwenberg* 3507 (WAG); (fl.), *Hort. Leiden* 18 July 1911 (L); Austria (?) (fl.), *Hort. Prugg* 13 Oct. 1902 (WU); cult. (?) *ex hort. bot. Petropolitano* 70.10 (LE).

Notes. The only species of *Desfontainia* maintained here is the very variable *D. spinosa*, as concluded from study of a large number of herbarium specimens. It is a mountain plant, growing often at high altitude on open or forested slopes. It stands to reason that its habit is influenced by the habitat. In open places the plants are more compact than in the shade. Furthermore the exposition and the altitude are very important.

This variability has led to the description of many species, especially at the time when there was only little material available. The following consideration may explain why the present author maintains only one species. Except for the last three species described in *Desfontainia*, all were reduced to synonymy by previous authors. The variation in the shape and the size of the leaves and their teeth is most striking. As in many other plants the leaves are larger and thinner in the shade. The variation in the number, the shape, and the size of the teeth is practically independent from the size of the leaves. In order to arrive at some order in this wealth of forms an enumeration is given with some examples, followed by a list of some intermediates. Among these examples are all type specimens mentioned, all “species” cited in the literature being accounted for. There is no correlation between size and shape of the leaves and the size of the calyx and the corolla. As proof the length of calyx and corolla is indicated with every specimen, where known.

The forms are:

A. Small leaves with few, small, not very sharp teeth: *Steiermark* 57344 (calyx 6–7 mm long, corolla 30 mm, type of *D. pulchra*), *André* 1152 (cal. 3 mm, cor. 20 mm).

B. Small leaves with more and larger teeth: *Cuatrecasas* 9216 (cal. 8 mm, cor. 55 mm), *Uribe* 5923 (cal. 7–9 mm, cor. 27–30 mm), *Macbride & Featherstone* 2197 (cal. 3–4 mm, cor. 28–33 mm), *Mathews* 1546 (cal. 2 mm, cor. 22 mm), *Ruiz & Pavón* (type of *D. parvifolia*), *Linden* 944 (cal. 9 mm, cor. 35–55 mm,

type of *D. acutangula*), Tracey 200 (cal. 4–9 mm, cor. 24–40 mm), and Pennell & Hazen 10045 (cal. 8 mm, cor. 63 mm). The three last-named specimens have a slight tendency towards F.

C. Large leaves with few large, not very sharp teeth: Gay s.n. (cal. 4–6 mm, cor. 35–40 mm, type of *D. chilensis*), Philippi anno 1888, Araucana (cal. 7 mm, cor. 37 mm).

D. Often rather large and narrow leaves with few, very small teeth: Cuatrecasas 18097 (cal. 7 mm, fr.), Penland & Summers 1098 (cal. 3–7 mm, cor. 25–32 mm), Steyermark 54331 (cal. 1.5–2 mm, cor. 18–20 mm), Wurdack 982 (cal. 2–3 mm, cor. 25–30 mm), 1357 (cal. 1.5–2 mm, cor. 22–25 mm).

E. Large leaves with many small teeth: Bonpland 2060 (cal. 7–9 mm, type of *D. splendens*), Brooke 6470 (cal. 7 mm, cor. 27 mm), Pittier 1082 (cal. 7–8 mm, cor. 20–30 mm), Popenoe 1113 (cal. 7 mm, cor. 22 mm), Purdie s.n., Fusagasuga (cal. 6–8 mm, cor. 20–30 mm), Rusby 1950 (cal. 9–10 mm, cor. 40–42 mm), Stork & Horton 10353 (cal. 5–8 mm, cor. 28 mm), Wurdack 1313 (cal. 10 mm, cor. 22–25 mm), and the lectotype of *D. spinosa* (cal. 5–8 mm, cor. 20 mm).

F. Large leaves with many large, distinctly sharp teeth: Cabrera 6010 (cal. 9–10 mm, cor. 30–43 mm), Elwes 25 Jan. 1902 (cal. 8–9 mm, cor. 38–43 mm), Gay 208 (cal. 7–8 mm, cor. 35–55 mm, lectotype of *D. ilicifolia*), Lechler 839, 839a and L. O. Williams 20136 (cal. 10 mm, cor. 30 mm), and Lobb 79 (cal. 5–7 mm, cor. 22–25 mm).

Intermediates between these forms are:

Between A and B: Jameson 412 (cal. 5–6 mm, cor. 22–23 mm).

Between A and E: André 4462 (cal. 4–10 mm, cor. 22–27 mm), Bang 1580 (cal. 3–7 mm, cor. 22–35 mm), Rose c.s. 23203 (cal. 3–5 mm, cor. 23–25 mm).

Between B and C: Cuatrecasas 18847 (cal. 6–7 mm, cor. 27–37 mm).

Between B and D: Weberbauer 1079 (type of *D. obovata*).

Between B and E: Buchtien 778 (cal. 6–7 mm, cor. 20–32 mm), Rose c.s. 23157 (cal. 4 mm, cor. 25 mm).

Between B and F: Bridges 776 (cal. 7 mm, cor. 22–32 mm, lectotype of *D. fulgens* and *D. hookeri*), Burkart 6422 (cal. 8–10 mm), Cardini herb. Inst. Miguel Lillo 36093 (cal. 7–10 mm, cor. 28–37 mm), De Barba 994 (cal. 8–9 mm, cor. 31–35 mm), 1029 (cal. 8 mm, cor. 30–37 mm), Dusén 670 (cal. 6–9 mm, cor. 30–48 mm), Frödin 793 (cal. 8 mm, cor. 40–45 mm), Ljungner 216 (cal. 5–8 mm, cor. 34–37 mm), Morrison 17626 (cal. 7–8 mm, cor. 35–40 mm), Skottsberg 279 (cal. 8–10 mm, cor. 32–45 mm), Wedermann 289 (cal. 9–10 mm, cor. 35–44 mm), 1247 (cal. 7–8 mm, cor. 37–43 mm).

Between C and D: Pennell 12832 (cal. 5–7 mm, cor. 28–45 mm), Steyermark 54597 (cal. 1.5 mm, cor. 15–22 mm, type of *D. steyermarkii*).

Between C and E: Funck 131 (bud and fruit), Stork & Horton 10139 (cal. 5–8 mm, cor. 23–27 mm), Triana 2319 (cal. 5–7 mm, cor. 24–26 mm).

Between C and F: Ljungner 216 (cal. 8 mm, cor. 37 mm), Philippi 44 (cal. 8 mm, cor. 27 mm).

Between D and E: Camp 2089 (cal. 5–6 mm, cor. 21 mm), Cardenas 1119 (cal. 7 mm, cor. 28 mm), Hitchcock 21618 (cal. 6 mm, cor. 27–30 mm),

REVISION OF DESFONTAINIA

Sandeman 4137 (cal. 4–6 mm, cor. 18–25 mm), *Holm & Iltis* 534 (cal. 5–6 mm, cor. 30 mm, type of *D. costaricensis*).

Between E and F: *Cabrera* 6024 (cal. 6–8 mm, cor. 33–42 mm), *Camp* 5221 (cal. 5–10 mm, cor. 35 mm), *Philippi* anno 1901 (cal. 11 mm, type of *D. novemdentata*), *Woytkowski* 34299 (cal. 11 mm, cor. 26 mm).

The complexity of the variation is not yet completely described by the above enumeration; e.g. *Lechler* 839 (UPS) has on the same specimen leaves of F, B-F, and D-E. The largest teeth are found on the leaves of *Cabrera* 5033 (GH, NY, and one branch of F sheet) (cal. 7–10 mm, cor. 30–35 mm) and *H. Krause* s.n. (US) (in bud).

The Madrid herbarium contains some sheets of *Desfontainia* collected by Ruiz and Pavón. Some specimens on these sheets have large leaves with relatively small teeth like those of the type of *D. splendens* and the other small leaves with relatively large teeth, as in the type of *D. parvifolia*. D. Don studied the duplicates of this collection which are at present in the British Museum, and described *D. parvifolia* on the basis of the small-leaved specimen. The present author therefore considers the small-leaved specimens of *Desfontainia* in the Madrid herbarium as isotypes of *D. parvifolia*. Consequently one of the remaining large-leaved specimens in the latter collection should be considered as the lectotype of *D. spinosa*.

D. fulgens is based on the plate of *D. spinosa* in HOOKER's *Icones*. Hooker cited among collections from other localities one collection from Valdivia, Bridges 776, which agrees completely with the plate. Moreover, he indicates that the plate is based on a collection from Valdivia. Therefore this specimen is chosen as lectotype here.

D. ilicifolia is based on the plate of *D. spinosa* in GAY's *Flora Chilena*. Gay's collection no. 208 is the best specimen of his collection which agrees with his conception of the species. Therefore it is designated lectotype here.

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