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BACCHARIS GRISEBACHII AND *B. POLYGAMA* (ASTERACEAE: ASTEREAE), TWO NEW RECORDS FOR CHILE

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Abstract. Medina López, P.; P. C. Guerrero & A. Oporto. 2024. *Baccharis grisebachii* and *B. polygama* (Asteraceae: Astereae), two new records for Chile. *Darwiniana*, nueva serie 12(1): 122-134.

Baccharis grisebachii and *B. polygama* are reported from the Antofagasta Region, Chile. Both species are known to occur in Argentina and Bolivia. A few small populations were reported in the surroundings of quebrada Barrera, quebrada Pacopaco and quebrada Cherejara, commune of Calama, Antofagasta Region. In addition, an artificial taxonomic key with all known species present in the region, is provided. The distribution map in South America and some comments on the conservation status of the two registered species are provided here.

Keywords. Andean mountain range; *Baccharis*, new records, northern Chilean flora.

Resumen. Medina López, P.; P. C. Guerrero & A. Oporto. 2024. *Baccharis grisebachii* y *B. polygama* (Asteraceae: Astereae), dos nuevos registros para Chile. *Darwiniana*, nueva serie 12(1): 122-134.

Se reporta la presencia de *Baccharis grisebachii* y *B. polygama* para la Región de Antofagasta, Chile. Ambas especies poseen distribución conocida en Bolivia y Argentina. Se registraron pequeñas poblaciones de las especies en los alrededores de las quebradas Barrera, Pacopaco y Cherejara, comuna de Calama, Región de Antofagasta. Se proporciona una clave artificial para su segregación respecto de otras especies del género descritas en la región. Se presenta un mapa de distribución en Sudamérica de las especies citadas y algunos comentarios acerca de su estado de conservación.

Palabras clave. *Baccharis*; Cordillera de los Andes; flora del norte de Chile; nuevos registros.

INTRODUCTION

Baccharis L. is a monophyletic genus of the family Asteraceae (Heiden, 2014, 2021; Heiden et al., 2019). Strictly American taxon, composed of 360 up to 442 species (Giuliano, 2000, 2001, 2003, 2013; Nesom & Robinson, 2007; Brouillet et al., 2009; Müller, 2013; Heiden, 2014; Giuliano & Plos, 2014; Heiden et al., 2019; Heiden & Bonifacino, 2021; Heiden, 2021). It consists of the third most diverse genus of the vascular flora of the Southern Cone of South America with up to 210 species (Zuloaga et al., 2019). *Baccharis,* has been classified within the tribe Astereae Cass., subtribe Baccharidinae Less. (Bentham, 1873; Nesom, 1993, 1994; Nesom & Robinson, 2007). The Baccharidinae subtribe is a monogeneric group, whose hypothesis of molecular phylogeny allowed the previously segregated genera to be reunited, supporting a wide circumscription of *Baccharis s.l.* [incl. *Archibaccharis* Heering, *Arrhenachne* Cass., *Baccharidastrum* Cabrera, *Baccharidiopsis* Barroso, *Baccharis, Hemibaccharis* Blake, *Heterothamulopsis* Deble, A.S. Oliveira &

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Marchiori, *Heterothalamus* Less., *Lanugothamnus* Deble, *Molina* Ruiz & Pav., *Neomolina* Hellwig, *Pingraea* Cass., *Pseudobaccharis* Cabrera, *Psila* Phil., *Stephananthus* Lehm., among others, more details in Heiden et al. (2019) and Nesom (2020)]. The studies by Heiden (2014), Heiden and Pirani (2016), and Heiden et al. (2019), resulted in the proposal of seven subgenres and 47 sections. The genus has a wide geographical distribution in South America, together with a high morphological variation in terms of habit, leaves, insertion and grouping of the florets inside the capitulum (Hellwig, 1990; Giuliano, 2000, 2003; Nesom & Robinson, 2007; Giuliano & Plos, 2014; Heiden et al., 2019; Heiden & Bonifacino, 2021).

Baccharis is distributed from the southern tip of Patagonia (Giuliano & Ariza, 1999; Giuliano, 2000, 2001, 2003, 2008, 2013; Giuliano & Plos, 2014; Heiden & Bonifacino, 2021), extending towards the central and coastal part of United States (Nesom & Robinson, 2007; Giuliano, 2013; Giuliano & Plos, 2014; Heiden & Bonifacino, 2021; Heiden, 2021), reaching from the northeast to Nova Scotia, Canada with the species *Baccharis halimifolia* L. (Fielding, 2001; Giuliano, 2003; Heiden & Bonifacino, 2021; Heiden, 2021; CWG, 2024). In Chile, the genus is represented by 46 taxa and about 38-40 species (Giuliano, 2008; Moreira-Muñoz, 2012; Müller, 2013; Moreira-Muñoz et al., 2016; Rodríguez et al., 2018; Rodríguez & Marticorena, 2019). Heiden (2021) recognizes 48 species of which 15 are endemic. Specifically, *Baccharis* species richness in Antofagasta Region reaches 12 taxa [*B. acaulis* (Wedd. ex R. E. Fr.) Cabrera, syn= *Pseudobaccharis acaulis* (Wedd. ex R. E. Fr.) Cabrera; *B. alnifolia* Meyen & Walp.; *B. boliviensis* (Wedd.) Cabrera, *B. caespitosa* Pers.; *B. scandens* Pers.; *B. juncea* (Cass.) Desf.; *B. sagittalis* (Less.) DC.; *B. salicifolia* (Ruiz & Pav.) Pers.; *B. taltalensis* I. M. Johnst.; *B. santelicis* Phil. (incl. *B. tola* var. *incarum*); *B. tola* Phil.; *B. viscosissima* (Kuntze) G. Heiden] (Marticorena et al., 1998; Giuliano, 2008; García, 2013; Müller, 2013; Rodríguez et al., 2018; Rodríguez & Marticorena, 2019).

The objective of this note is to report the finding of *Baccharis grisebachii* Hieron. and *Baccharis polygama* Ariza, as new citations for the vascular flora of the Antofagasta Region (Chile), together with a distribution map within South America and a key for the identification of *Baccharis* species in the Antofagasta Region.

MATERIALS AND METHODS

The new appointments were recorded during successive botanical explorations in Loa´s river upper-middle basin between february 2018–december 2019. Specifically, around quebrada Barrera (21°54'16.21" S–68°52'09.55" W, 3800 m a.s.l.), quebrada Pacopaco (21°56'09.21" S–68° 51'20.27" W, between 3600–3900 m a.s.l.) and quebrada Cherejara (21°53'41.23" S–68°55'11.85" W, 3660 m a.s.l.). The three localities are located in the commune of Calama, Antofagasta Region. The collected material was deposited in CONC, EIF, MURAY and SGO herbaria. The taxonomic determination of the species was based on the consultation of protologues and literature according to each taxon: *Baccharis grisebachii* (Hieronymus 1881; Cabrera, 1978; Giuliano, 2000, 2001, 2013; Müller, 2006; Giuliano & Plos, 2014) *and B. polygama* (Ariza, 1976; Giuliano, 2000, 2001; Giuliano & Plos, 2014). In addition, type specimens and additional digitized material for both species were reviewed (BAF, CORD, E, F, FR, G, GH, LIL, LP, P, SI and UPS herbaria) through the JSTOR platform "Global Plant Initiative, GPI" (JSTOR 2024 http://plants.jstor.org). The taxonomic-nomenclatural ordering mainly follows Giuliano (2001, 2008), Giuliano & Freire (2011), Giuliano & Plos (2014), Flora del Conosur Catalog (Zuloaga et al., 2008), Catalog of the vascular flora of Chile (Rodríguez et al., 2018; Rodríguez & Marticorena, 2019; Herbariodigital.cl, 2024), International Plant Names Index (IPNI, 2024), Global Compositae Database (CWG, 2024), Plants of The World online (POWO, 2024) and World Plant database (Hassler, 2024). The nomenclature of the acronyms of the Herbariums consulted follows Thiers (2024, constantly updated). The key was based on field observations, literature review and detailed observation of macro-morphological characters, using a Leitz Dialux 20 stereoscopic microscope with 4.5x adjustable magnification and 10x ocular magnification. Distribution maps were based on spatially referenced herbarium specimens, using free access software QGIS, version 3.18 Zürich (QGIS, 2024).

RESULTS

1. **Baccharis grisebachii Hieron.**, Boletín de la Academia Nacional de Ciencias 4: 36 (1881). TYPE. ARGENTINA. La Rioja. La Incrucijada, Sierra Famatina, 1879, *G. Hieronymus & G. Niederlein s/n* (Lectotype, photo in BR00008233424!, designated by J. Müller, Syst. Bot. Monogr. 76: 222. 2006; isolectotypes, FR00007150, photo in G00222635!, photo in P00218133!). Fig. 2

Baccharis abietina Kuntze, Revisio generum plantarum 3(3): 131 (1898). Type: CHILE? [probably ARGENTINA, Mendoza]: Paso Cruz,

1600 m, january 1892, O. *Kuntze s/n* (Lectotype, photo in NY00162203!, designated by Giuliano & Plos, Flora Argentina 7(1): 77. 2014; isolectotype, photo in NY00162202!).

Baccharis rosmarinifolia Hook. & Arn. var. *andicola* Hauman, Anales de la Sociedad Científica Argentina 86: 316 (1918). Sintypes: ARGENTINA. Mendoza. Punta de Vacas, november 1913, *L. Hauman 332* (photo in BA!); Prov. San Juan. «Cordilleres de l' Espinacito». *Bodenbender s.n.* (not localized).

Vernacular names and uses. Not clearly known in Chile. Villagrán & Castro (2004: 181) point out a specimen "*Baccharis* sp1", whose foliar structures are related and could be attributed to *B. grisebachii*, which was registered for the locality of Quebrada de Caspana in Alto Loa and whose vernacular names consists of "quinchamale", "tolilla" or "chillka", but there is no more information. In Argentina it is known mainly as "quinchamal" o "quinchamalí" (Hieronymus, 1881; Cabrera, 1978; Zardini, 1984; Freire et al., 2007; Hind, 2011; Giuliano, 2013; Giuliano & Plos, 2014). It is also known by the common names of "romerillo" and "tancha" (Zardini, 1984; Giuliano, 2000, 2013), and "chilca mamil" (Freire et al., 2007). Zardini (1984) indicates that the decoction of leaf segments and poultices are used to heal wounds. Local knowledge attributes to this plant a medicinal "vulneraria" type of use (Giuliano, 2000; Giuliano & Plos, 2014). Verdi et al. (2005) point out antimicrobial, cytotoxic and protein synthesis properties for this species.

Distribution. Andean puna of southern Bolivia, central-northwest Andes of Argentina in the provinces of Jujuy, Tucumán, Catamarca, La Rioja, Salta, until San Juan and Mendoza, between 2000-3800 m a.s.l. (Hieronymus, 1881; Cabrera, 1978; Giuliano, 2000; Müller, 2006; Zuloaga et al., 2008; Giuliano, 2013; Giuliano & Plos, 2014; Hassler, 2024; POWO, 2024). In Bolivia, it grows in the dry puna and mountainous region to the southeast of the altiplano (Tarija), towards the north it has been recorded as far as Potosí, Uyuni and Cotagaita, inhabiting grasslands, scrublands and along permanent and intermittent streams, between 3000-4100 m a.s.l. (Müller, 2006; Hind, 2011; Jørgensen et al., 2014, 2015; Hassler, 2024). The finding for Chile was recorded in the surroundings

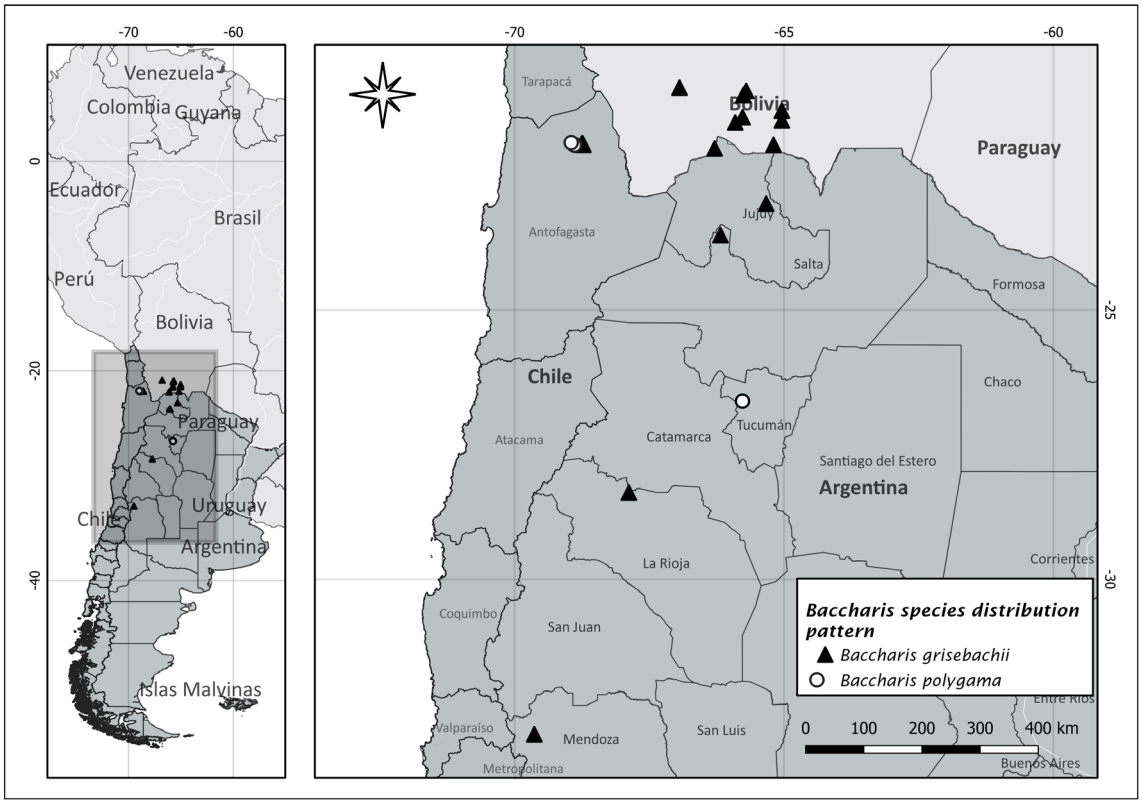

Fig. 1. Distribution map of *Baccharis grisebachii* and *B. polygama*.

of quebrada Barrera, between 3600-3800 m a.s.l., Calama commune, Antofagasta Region (Fig. 1). *Baccharis grisebachii* coexists in a community of riparian vegetation located at the creek bottom with gentle slopes, circumscribed in a mountainous sector with numerous narrow ravines with steep slopes. The hydrological regime of the creek bottom is characterized by being intermittent (avenues or waterways) and has certain isolated sectors where water flows from the sub-surface course generating favorable edaphic conditions for the development of small and fragmented plant communities. These communities, characteristic of intrazonal conditions or "vegas", are composed of *Festuca hypsophila* Phil., *Phylloscirpus acaulis* (Phil.) Goetgh. & D.A Simpson and *Lobelia oligophylla* (Wedd.) Lammers. The substrate is sandy–stony mixed with rocks (Fig. 2). The community is mainly composed of low shrubs, which make up 25–50% of the ground cover. *Baccharis grisebachii* is a companion species of the plant community dominated by *Atriplex imbricata* (Moq.) D. Dietr. and *Ephedra americana* Humb. & Bonpl. ex Willd. Other associated species are: *Artemisia copa* Phil., *Baccharis santelicis* Phil., *Cistanthe celosioides* (Phil.) Carolin ex Hershk., *C. densiflora* (Barnéoud) Hershk., *Fabiana denudata* Miers, *F. ramulosa* (Wedd.) Hunz. & Barboza, *Haplopappus rigidus* Phil., *Maihueniopsis glomerata* (Haw.) R. Kiesling and *Phacelia pinnatifida* Griseb. ex Wedd.

Conservation status. The literature available does not provide data on the conservation status in Argentina and Bolivia, nor does it estimate its frequency or abundance in situ, much less population sizes. In Chile, there are some collections from a single locality, with an isolated distribution pattern and few individuals limited to a very restricted area along the bottom of a small tributary in the Barrera creek. The record consists of a single population with numerous individuals (>80) distributed along the creek bottom and confined to an extremely small area (<2.0 ha). The small population is in close proximity to a mining project owned by El Abra Mining Company. Additional potential threats to the populations and/or their habitat cannot be excluded. According to IUCN (2012, 2022) criteria, the area of occupation (AO) and extent of occurrence (EO) were estimated as 0.017 km^2 and 3.28 km^2, respectively. The information available on its distribution in Chile is very scarce and makes it impossible to determine its threats and does not allow us to propose a conservation category with consistent data. We propose to maintain its status as Data Deficient (DD), while further studies fill the information gap. The foregoing opens a great opportunity for making it possible to carry out additional studies and short-term population conservation initiatives, either by private companies and/or government institutions, to add more data.

Taxonomic note. *Baccharis grisebachii* was classified by Giuliano (2001) within *Baccharis* sect. *Pseudobaccharis*, for presenting staminate flowers with elongated and separate branches of the style, pistillate flowers with briefly ligulate apex, 5-ribed achenes, uniseriate pappus bristles, persistent and not accrescent. Giuliano (2003), based on a cladistic-morphological analysis, segregated the genera *Dioicothamnus* Giuliano, which encompasses the species of *Baccharis* sect. *Pseudobaccharis*, proposing the species *D. grisebachii* (Hieron.) Giuliano. Later, Giuliano & Freire (2011) carried out an infrageneric complement and ordering of some sections of *Baccharis*, regrouping it within *Baccharis* sect. *Subliguliflorae* Giuliano, in agreement with what was stated by Müller (2006). However, from the study of Heiden (2014) and Heiden et al. (2019), based on a DNA molecular phylogenetic analysis, they recently rearranged *Baccharis* infrageneric classification, positioning *B. grisebachii* within *Baccharis* subgen. *Molina* (Pers.) Heering, and *Baccharis* sect. *Thymifoliae* Giuliano. This position has been recently maintained by Heiden (2021).

EXAMINED MATERIAL

ARGENTINA. **Catamarca.** Dept. Tinogasta, *A. Hunziker et al. 14244 ½* (photo in CORD!). **Jujuy.** Dept. Humahuaca, 23 km N of Humahuaca, *S. Renvoize 3511* (photo in B!, NY!). **La Rioja.** Dept. Famatina, La Incrucijada, sierra Famatina, 1879, *G. Hieronymus & G. Niederlein s/n* (photo in BR8233424!). **Mendoza.** Punta de Vacas, XI-1913, *L. Hauman 332* (BA). **Salta.** Mountains W of salta, 5 km N of Cobres, *B. Hammel 5963* (photo in MO!). **San Juan.** Dept. Calingasta, reserva natural estricta El Leoncito, ciénaga de Las Cabeceras, *Apochian et al. 156* (photo in SI!); quebrada del Leoncito, XII-1875, *S. Echegaray s/n* (photo in CORD05249!). **Tucumán.** Dept. Tafí del Valle, *Venturi 4129* (photo in SI!). BOLIVIA. **Tarija.** Prov. Avilez, quebrada Honda, *S. Beck et al. 23734* (photo in JE!, LPB!); Prov. Méndez, Iscayachi, *Ehrich 50* (photo in LPB!); Escayachi, *K. Fiebrig 3020* (photo in GH!). **Potosi.** Prov. Nor Chichas, Quechisla, *M. Cárdenas 26* (photo in GH!). Prov. Quijarro, Uyuni, 25-III-1921, *E. Asplund 3167* (photo in UPS!). Prov. Sud Chichas, Quebrada Chiriyoj Wayko W Tupiza, *J. Müller 9005* (photo in GH!, P!); Sillar Loma W Tupiza, *J. Müller 9024* (photo in UPS!). Prov. Sud Lípez, San Antonio debut route vers Villazón, *J. de Sloover 414* (photo in BR!). **New records**. CHILE. **Antofagasta Region**. Prov. El Loa,

Calama, quebrada de Barrera, 21°54’37.9” S, 68°52’55.6” W, 3693 m, 18-II-2018, *P. Medina 3922, 3927* (EIF!, CONC!); ibid., 21°54’16.2” S, 68°52’07.0” W, 3698 m, 22-VIII-2018, *P. Medina 3926* (EIF!, CONC!); ibid., 21°54’37.9” S, 68°52’55.6” W, 3693 m, 24-VIII-2018, *P.*

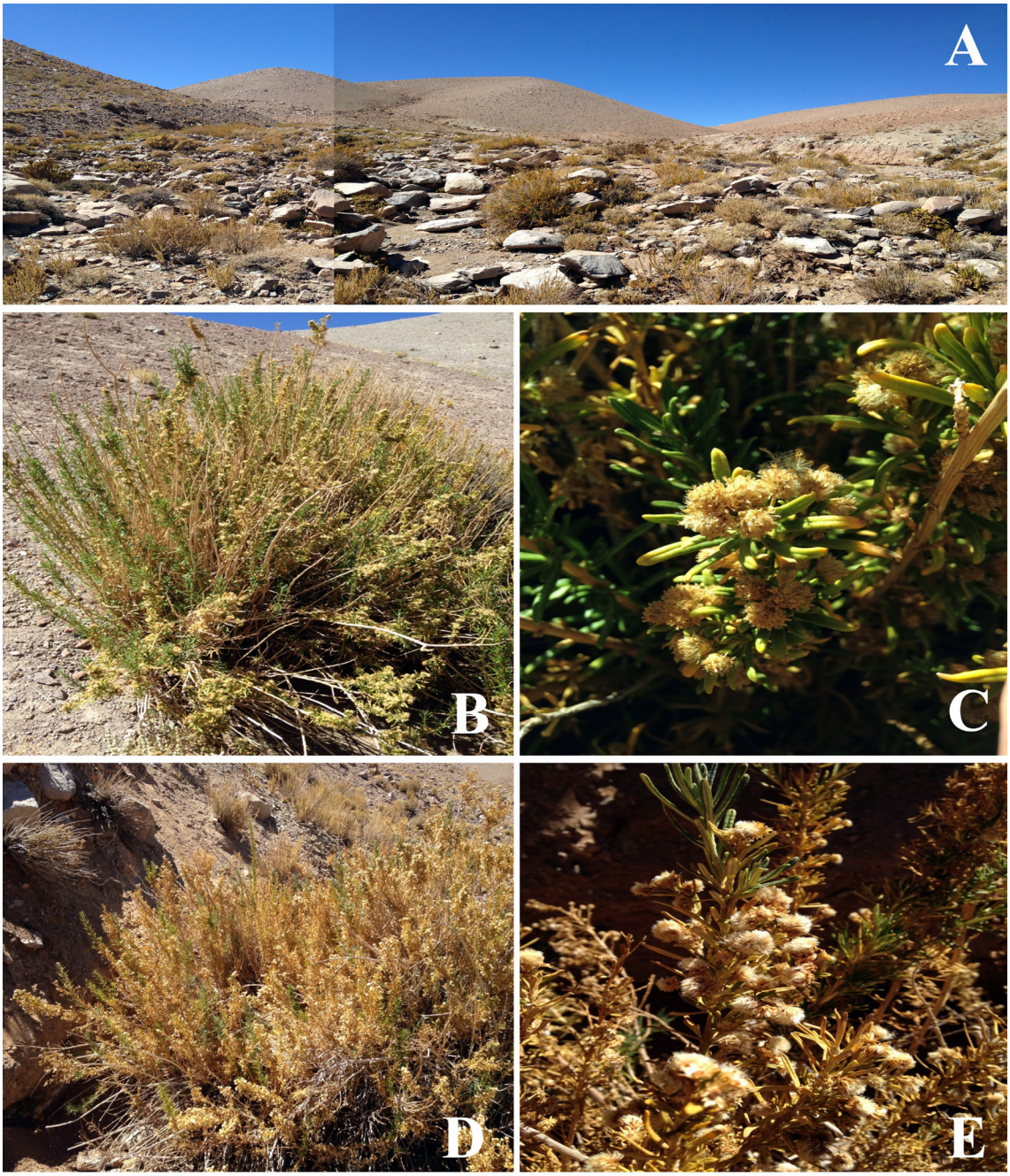

Fig. 2. *Baccharis grisebachii* Hieron. **A,** new record habitat in Quebrada Barrera. **B,** habit of an individual with staminate capitula. **C,** detail of capitulescences of an individual with staminate capitula. **D,** habit of an individual with pistillate capitula. **E,** detail of capitulescences of an individual with pistillate capitula. B-C from *P. Medina 3922* (EIF, CONC); A, D-E from *P. Medina 3928* (EIF, CONC). Photos by P. Medina.

Guerrero s/n (EIF!, CONC!); ibid., 21°54'16.4" S, 68°52'03.3" W, 3736 m, 22-VIII-2018, *P. Medina 3928* (EIF!, CONC!); quebrada Pacopaco, el Abra, 21°56'01.6" S, 68°51'11.2" W, 3670 m, VI-2009, *L. Faúndez s/n* (photo in CONC169396!).

Fig. 3. *Baccharis polygama* Ariza. **A,** new record habitat in Quebrada Barrera. **B,** new record habitat in Quebrada Cherejara. **C,** individual habit. **D,** twig with fasciculate leaves. **E,** detail of twig with corymbiform paucicapitulated capitulescences. **F,** detail of capitulescence with heterogamous capitula. A-C from *P. Medina 3923* (EIF, CONC); D-E from *Gamboa s/n* (EIF, CONC). Photos by: A-D, P. Medina, E–F, J. H. Márquez.

2. Baccharis polygama Ariza, Kurtziana 9: 83 (1976). TYPE. ARGENTINA**.** Tucumán, without registered location, *F. M. Rodríguez 1232* (Holotype photo in LIL001577!; Isotypes photo in BAF00000015!, photo in BAF0000089!, photo in LP000828!, photo in LP000831!, photo in SI000828!, photo in SI000829!)**.** Observation: the Isotype consign "cumbres Calchaquíes, La Cienaguita". Fig. 3

Vernacular name: not known by science.

Distribution & habitat. Argentina, endemic species from the "la cienaguita" and "cumbres Calchaquíes", in Tucumán province, where it grows between 2200-3400 m a.s.l. (Ariza, 1976; Giuliano & Plos, 2014; Hassler, 2024; POWO, 2024). In Chile, the species was recorded in two sectors: the first site consists of quebrada Pacopaco, a tributary of quebrada Barrera (3600-3900 m a.s.l.). The second population was recorded in a sector of quebrada Cherejara, located at an elevation of 3650 m a.s.l. (Fig. 3). Both sites are located in commune of Calama, Antofagasta Region (Fig. 1). *Baccharis polygama* is a rare species with scarce collections and information, it coexists in a community of riparian vegetation located at the creek bottom with gentle slopes. In its surroundings there are outcrops of water that allow the development of wet vegetation plant communities or "vegas". The geoform is characterized by consisting of a series of small and narrow mountain foothills, whose ravine bottom has soils generated by alluvial material with a sandy texture mixed with fine gravel, stones and rocks. The community is mostly dominated by low shrubs *Atriplex imbricata* and *Ephedra americana*, with ground coverage ranging from 10-25%. Other associated species that cohabits within the community are: *Artemisia copa*, *Baccharis alnifolia*, *B. santelicis*, *Caiophora chuquitensis* (Meyen) Urb. & Gilg, *Cistanthe celosioides*, *C. densiflora*, *Fabiana ramulosa*, *Haplopappus rigidus*, *Polyachyrus carduoides* Phil., *Pseudognaphalium psilophillum* (Meyen & Walp.) Anderb., *Mutisia hamata* Reiche, *M. ledifolia* Decne. ex Wedd., *Neuontobotrys tarapacana* (Phil.) Al-Shehbaz, *Senecio ctenophyllus* Phil. and *Tetragonia microcarpa* Phil.

Conservation status. Two small populations in quebrada Pacopaco and only one reduced patch in quebrada Cherejara, were recorded. There are limited collection sites, with a few living individuals, an isolated distribution pattern and the fragments are limited to a reduced surface within the area. Although the information is scarce, IUCN (2012, 2022) standards were applied and the area of occupation and extent of occurrence were estimated for all the known population fragments as 0.022 km^2 and 7.11 km^2, respectively. The limited information available about its distribution in Chile it is very scarce and makes it impossible to determine all of its threats and does not allow us to suggest any conservation category with consistent data. We propose to keep its status as Data Deficient (DD), while further studies complementing the information gap. In this study, it was not possible to cover the entire extension of the creek bottoms. Only a few individuals were registered in the explored area (20 individuals in quebrada Pacopaco and 15 in quebrada Cherejara). Both populations are concentrated within an area of occupation less than 2.5 ha. The literature does not indicate population data, their conservation status in Argentina or any ecological data such as abundance and population sizes. The population from Pacopaco are in the vicinity to a mining project that belongs to El Abra Mining Company. Indeed, the proximity to the waste dump area, is the main threat to the fragments. Other potential threats to populations and/or their habitat have not been clearly studied, but contamination of subsurface waters in creek bottom by mining productive processes, desertification and aridification due to climate change are considered potential threats.

Taxonomic note. *Baccharis polygama* was classified by Giuliano (2001) and Giuliano & Nesom (2003) within *Baccharis* sect. *Aristidentes* G.L. Nesom. *Baccharis* sect. *Aristidentes* is a heterogeneous and poorly clarified section, that comprises species with epaleate receptacles, staminate flowers with elongated and separate style branches, pistillate flowers with truncated apex corollas, pappus 2-3 seriate, persistent, accrescent and 5-ribed papillose (or not) achenes. Nesom (1990) indicates that this section has affinity with species of *Baccharis* sect. *Molinae*. *Baccharis* sect. *Aristidentes* presents leaves with serrated-awned margins, punctate, each punctation generally with a minute extruded papilla or puberulent trichomes and pappus 2-3 seriate. Giuliano (2003), in his systematic-morphological proposal, argues its inclusion within *Baccharis* subgen. *Pteronioides* Heering, *Baccharis* sect. *Bogotenses* Cuatrec., and *Baccharis* series *Bogotenses* (Cuatrec.). Later, Giuliano & Freire (2011) carried out a complement and infrageneric order, regrouping it within *Baccharis* subgen. *Molina* due to the presence of 5-ribed achenes and slightly accrescent uniseriate pappus. Similarly, Giuliano & Freire (2011) tentatively propose to include the species in *Baccharis* sect. *Molinae* (Ruiz & Pav.) Pers. emend. Cuatrec., due to the erect shruby habit, capitula gathered in terminal corymbiform capitulescences, although *B. polygama* presents some differences with most

of the species in the section: notorious middle vein and inconspicuous secondary veins (vs. 3-5 veined leaves of most species in *Baccharis* sect. *Molinae*), heterogamous staminate capitula (vs. homogamous), short capitulescences (vs. lax and open) and pappus bristles of staminate flowers with slightly denticulate and not thickened apex (vs. pappus bristles with thickened apex). Exceptionally heterogamous capitula can occur in *B. salicifolia*. On the other hand, within the world *Baccharis* checklist (Müller, 2013), *B. polygama* is considered as a synonym of *B. salicifolia*. In the same way, *B. polygama* was not addressed within the systematic-molecular proposal of Heiden (2014), neither in the DNA molecular infrageneric phylogeny presented by Heiden et al. (2019), probably because it is treated as part of the synonymy of *B. salicifolia*, in accordance with what was presented by Müller (2013). Currently, a proposal from Heiden (2021, pp. 52) accepted *B. polygama* as a valid species and classified it into *Baccharis* subgen. *Molina*, placed within *Baccharis* sect. *Corymbosae* Heering, as the same as *B. salicifolia* (Heiden et al*.,* 2019; Heiden, 2021). This section is roughly characterized by shrubs with large, generally 3-nerved leaves, broad, corymbiform capitulescences, pistillate capitula that are always epaleate, and by pistillate flowers bearing apically truncate corollas with a subapical wreath of trichomes (Heiden et al*.,* 2019; Heiden, 2021). We considerate, *B. polygama* as a valid species, according to the original proposal of Ariza (1976), maintained by Giuliano & Plos (2014) and reevaluated by Heiden (2021), until further molecular studies demonstrate another hypothesis.

EXAMINED MATERIAL

ARGENTINA. **Tucumán**. XII-1913, *F. M. Rodríguez 1231* (photo in LIL1578!). Dept. Tafí del Valle, El Chorro, cumbres Calchaquíes, 2600 m, 05-I-1914, *F. M. Rodríguez 1231* (photo in BAF88!); ibid., 2600 m, 05-I-1914, *F. M. Rodríguez 1231* (photo in BAF14!); ibid., 05-I-1914, 2600 m, *D. Rodríguez 1231* (photo in SI12031!); La Cienaguita, cumbre Calchaquí, 03-I-1913, *D. Rodríguez 1231* (photo in LP833!). **New records**. CHILE. **Antofagasta Region**. Prov. El Loa, Calama, quebrada Pacopaco, afluente quebrada de Barrera, 21°56’28.3” S, 68°51’43.8” W, 3601 m, 13-VI-2018*, P. Medina 3923* (EIF!, CONC!); ibid., 21°55’51.6” S, 68°51’04.3” W, 3746 m, 18-II-2018, *P. Guerrero s/n a* (EIF!, CONC!); ibid., 21°56’30.0” S, 68°51’42.9” W, 3612 m, 27-II-2018, *P. Guerrero s/n b* (EIF!, CONC!); quebrada Cherejara, 21°53’39.9” S, 68°55’12.4” W, 3682 m, 14-XII-2019, F. Gamboa s/n (EIF!, CONC!).

Key to *Baccharis* L. species of Antofagasta Region

1. Rhizomatous herbs or creeping subshrubs up to 0.25 m tall……2
1. Tall plants, herbs, subshrubs or shrubs, larger than 0.25 m high……..3
2(1). Rhizomatous tiny perennial herbs, leaves sessile, rosulate, linear, margins entire, leaves slightly fleshy or fleshy ……...……..……...*Baccharis acaulis*
2. Dwarf creeping subshrub, grows into small flat cushions, leaves sessile to shortly petiolate, narrowly obovate, margins entire or with a couple of inconspicuous small teeth, leaves membranous to leathery, not fleshy ……. ……...……..……*Baccharis caespitosa*
3(1). Perennial herbs or suffruticose plants……..…....4
3. Shrubs……..……...5
4(3). Rhizomatous perennial herbs, stems terete, not winged; leaves linear, margin sometimes with small teeth; capitulum pedicellate, solitary at the end of branches or forming corymbiform capitulescences ……..……...… *Baccharis juncea*
4. Subshrubs or suffruticose plants, 2-3 longitudinal winged stems; leaves oblong-elliptic, margin entire; capitulum sessile, capitula gathered into a dense glomerule (sometimes a lax spike) in the apex of twigs….……*Baccharis sagittalis*
5(3). Shrubs taller than 1.5 m……....6
5. Shrubs shorter than 1.5 m tall, rarely taller……..……9
6(5). Plants polygamo-dioecious; foliage densely arranged, distributed on twigs in both ways, alternate or fascicled, leaves lanceolate-oblanceolate, leaf margins entire or smoothly toothed, leaves 1-veined, easily observed on adaxial surface (lateral veins conspicuous in abaxial surface); capitulum heterogamous, capitula gathered on compound, terminal, corymbiform paucicapitulated capitulescences (<20 heads-capitula) ……..…....*Baccharis polygama*
6. Plants dioecious; foliage sparsely to slightly densely arranged, leaves distributed on twig in one way, alternate (rare

fascicled), leaves ovate-oblong to ovate-elliptical or lanceolate, leaf margins with a few to numerous well defined teeth, leaves 3-veined, easily observed on adaxial surface (rare 1-veined); capitulum homogamous, capitula gathered on terminal congested or open, corymbiform pluricapitulated capitulescences (>20 heads-capitula) …….....7
7(6). Capitulescences tightly crowded, corymbiform, capitula densely set, barely or slightly exceeding from the branch apex; leaves ovate-elliptical (length/width ratio = 2-3) ..……..…*Baccharis alnifolia*
7. Capitulescences loosely crowded, with double-compounded or more, open corymbiform capitulescences, capitula open and laxly set, slightly to conspicuously exceeding from the branch apex; leaves ovate-oblong or linear-lanceolate (length/width ratio different, <=2 or >=3)……..……...8
8(7). Shrubs 2-4 m tall, with broad-globose crown, foliage dense, branches recurved to procumbent; leaves ovate-oblong (length/width ratio <= 2), 3-veined (conspicuous), margins clearly dentate; capitulescences notoriously exceeding from the branches apex, arranged into compound crowded corymbs at the end of branches ……...…*Baccharis scandens*[1]
8. Shrubs up to 2 m tall, underdeveloped crown, foliage sparse, branches erect to decumbent; leaves linear to widely lanceolate (length/width ratio >=3), 3-veined (inconspicuous, sometimes 1-veined aspect), margins entire or with obscure to lax teeth (sparse and smooth); capitulescences slightly exceeding from branches apex, arranged in compound corymbs that are grouped together again into a corymboid synflorescence at the end of branches……..……...……*Baccharis salicifolia*
9(5). Shrubs <0.7 m tall; leaves linear to narrowly obovate, margins entire, rare 1 tooth per side; receptacle of pistillate capitula paleate.……..……*Baccharis boliviensis*
9. Shrubs 0.7-1.5 m tall; leaves with different shape, linear-oblanceolate to obtriangular-obtrullate or obovate, margin generally with 1 or more teeth; receptacle of pistillate capitula epaleate……10
10(9). Leaves linear to linear-oblanceolate, leaf margins entire or with 1 tooth per side……....11
10. Leaves with other shape, not linear, generally obtriangular-obtrullate to obovate, or oblanceolate to oblong, leaf margins with 1-3 teeth per side……....12
11(10). Leaves discolor, linear to narrowly obovate, apex straight, sub-acute to obtuse, abaxial surface gray-tomentose, adaxial surface glabrous to glabrescent, margins slightly revolute, not v-shaped; capitulum homogamous, capitulescences not terminal, cylindrical, paniculiform, densely leafy, capitula crowded but distributed throughout the upper twigs……..…….....……..…..…*Baccharis grisebachii*
11. Leaves concolor, linear to linear-oblanceolate, with slightly recurvated apex, acute to short mucronate, both surfaces glandular-resiniferous, margin slightly conduplicated or slightly “v”-shaped; capitulum heterogamous, terminal capitulescences, triangular, corymbiform, capitula scarcely crowded into distal part of twigs (sometimes appears to be solitary in leaf axil) …..……..……..……..... *Baccharis taltalensis*
12(10). Capitula axillary, sessile or with peduncles up to 7 mm long, sometimes in terminal small racemes; plant slightly sticky resinous; leaves obtriangular-obtrullate to obovate, margins with 1-2 mostly obtuse and plane teeth per side…….....……..…..*Baccharis santelicis*[2]
12. Capitula terminal (in distal part of branches or small twigs), sessile to short pedicellated, mainly solitary; plants very resinous, sticky to the touch; leaf blades obtriangular-obovate or oblanceolate-oblong, margins with 1-3 acute and twisted or recurved teeth per side (like 5 tip star appearence), terminal teeth obtuse or acute ……13
13(12). Shrubs generally more than 0.5 m up to 1.20 m high; leaves thicky-coriaceous, oblanceolate to oblong, margins with 2-3 acute, twisted or recurved teeth per side, terminal tooth obtuse to acute, giving to leaves a star appearance; capitulum sessile, rarely pedunculated ……... *Baccharis tola* subsp. *tola* and *B. tola* var. *tola*[3]
13. Shrubs up to 0.5 m high; leaves not thicky-coriaceous, obtriangular, obtrullate to obovate, with 1-2 obtuse plane teeth per side, terminal tooth generally obtuse, leaf without a star appearence; capitulum subsessile to slightly pedunculated……..... *Baccharis viscosissima*[4]

[1] separated from *B. calliprinos* Griseb*., sensu* Heiden, 2023, *pers. comm.*
[2] Syn = *B. tola* subsp. *santelicis,* incl. *B. tola* subsp. *santelicis* var. *incarum,* sensu Müller, 2006; Giuliano & Plos, 2014
[3] sensu Müller, 2006; Giuliano & Plos, 2014; Heiden, 2021
[4] Syn = *Baccharis tola* var. *viscosissima* sensu Müller, 2006; Heiden, 2020; Heiden, 2023, pers. comm.

DISCUSSION

This study documents two new records for the Asteraceae family in Chile. The findings proposed here, enhance the richness of *Baccharis* from Antofagasta Region to 14 species and the account of the genus for Chile increased up to 50 species. This situation reinforces the shared and complementary distribution pattern of species that live in border areas of countries located along the Andes Mountains foothills. The same situation occurs after reviewing other floristic studies and compilations made for the area and nearby regions (Marticorena et al., 1998; García, 2013; Faúndez et al., 2014; Gatica–Castro et al., 2015; Moreira et al., 2016). The new findings allow to extend and complement information about the distribution of the species mentioned here for Bolivia, Argentina, and Chile. Both species, lack of information and have not been subjected to the species evaluation and classification process by Chilean RCE ("*Reglamento de Clasificación de Especies*"), or any evaluation process responsibility of the Ministry of the Environment evaluation committee. Indeed, the species listed above, do not have a category of threat status within the national territory of Argentina and Bolivia either. A single population of *B. grisebachii* was found (registered only in a small sector of quebrada Barrera, area of occupation less than 0.02 km^2). In the same way, in the case of *B. polygama*, only two population fragments were detected (quebrada Pacopaco and quebrada Cherejara, both with an area of occupation less than 0.02 km^2), with few individuals, isolated and bounded to a small geographic area. Both records are scarce and unique within the study area, which makes it important to generate additional research for a better understanding of its extension of occurrence in neighboring sectors and other border areas from the national territory. Neither of the three localities, where *B. grisebachii* and *B. polygama* were registered, are represented within protected areas (public and private conservation areas). It is a priority to carry out additional exploratory surveys in the indicated creek bottoms, neighboring sectors and within nearby conservation units (private and public, e.g.: Alto El Loa National Reserve from SNASPE units), in order to corroborate their distribution pattern, especially to improve data to define their conservation categories, threats and the sensitivity and uniqueness of the fragments of the populations here described.

Baccharis polygama, has little collection material in Argentina, as well as only two small Chilean known localities, in fact, the material cited in the literature indicates that it is endemic to the "cumbres Calchaquíes", Province of Tucumán, Argentina (Ariza, 1976; Giuliano & Plos, 2014; Heiden, 2021). On the other hand, Müller (2013) consider this taxon as a synonym of *B. salicifolia,* and consequently, Heiden (2014) and Heiden et al. (2019), did not include *B. polygama* as a separate valid species from *B. salicifolia* in its molecular studies. Heiden et al. (2019) did not have the opportunity to investigate this taxon and accept the hypothesis of synonymy proposed by Müller in 2013 (Heiden, 2023, pers. comm.). This dubious situation allows us to ask the following questions: is the distribution of *B. polygama* really strictly endemic? or is the scarce knowledge of the species allowing the misidentification of the collected material, which makes possible these specimens to be confused with other taxonomic identities and entered into herbaria with a wrong name? Another question to ask concern if *B. polygama* consists a different taxonomic entity from *B. salicifolia* or it would correspond to an infraspecific taxon of the latter?

When comparing both species from a morphological point of view, specifically, their reproductive (capitulum) and foliar structures, habits and their habitats (environments and vegetation types), we agree with hypothesis proposed by Ariza (1976) and Giuliano & Plos, (2014), to consider that *B. polygama* as a valid species which noticeably differs from *B. salicifolia*, in fact, as a result of recent data additions and review of new specimens, Heiden (2021), accepts neglected names missing from previous list provided by Heiden et al. (2019) and reincorporates *B. polygama* as a valid species in the same way as we consider it. However, future molecular based studies will contribute to elucidate this enigma with certainty.

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