

## Honoring Jeanne Baret: *Baretia lanata* Timaná, comb. nov. (Caryophyllaceae), a new endemic genus and species combination for the Flora of Chile

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# Honoring Jeanne Baret: *Baretia lanata* Timaná, comb. nov. (Caryophyllaceae), a new endemic genus and species combination for the Flora of Chile

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## ABSTRACT

*Baretia* Timaná, gen. nov., a new genus in the plant family Caryophyllaceae from central Chile, is proposed and described. The new monospecific genus differs from other members in the family by possessing a combination of characters that include dioecy, a densely albo-lanuginose indumentum cover, absence of stipules, strongly perigynous flower, a well-developed receptacular cup, style undivided with a slightly capitate stigma, and an indehiscent, one-seeded fruit. The genus includes a single species, *Baretia lanosa* (Phil.) Timaná, comb. nov. and honors French botanist and explorer Jeanne Baret, the first known woman to circumnavigate the globe as part of the Bougainville expedition around the world (1766-1769).

## RÉSUMÉ

*Hommage à Jeanne Baret*: *Baretia lanata* Timaná, comb. nov. (Caryophyllaceae), un nouveau genre endémique et une combinaison nouvelle pour la Flore du Chili.

*Baretia* Timaná, gen. nov., un nouveau genre de plante de la famille des Caryophyllaceae, du centre du Chili, est proposé et décrit. Le nouveau genre monospécifique diffère des autres genres de la famille par une combinaison de caractères incluant la dioécie, une couverture pubescente dense, blanche et lanugineuse, l'absence de stipules, une fleur fortement périgyne, une coupe florale bien développée, un style simple à stigmatte légèrement capité, ainsi qu'un fruit monosperme et indéhiscent. Le nouveau genre comprend une seule espèce, *Baretia lanosa* (Phil.) Timaná, comb. nov., et rend hommage à la botaniste et exploratrice française Jeanne Baret, la première femme connue à avoir fait le tour du monde comme membre de l'expédition de Bougainville autour du monde (1766-1769).

## KEY WORDS

Caryophyllaceae,  
*Pycnophyllum*,  
*Pycnophyllopsis*,  
Andes,  
Chile,  
Jeanne Baret,  
new combination,  
new genus.

## MOTS CLÉS

Caryophyllaceae,  
*Pycnophyllum*,  
*Pycnophyllopsis*,  
Andes,  
Chili,  
Jeanne Baret,  
combinaison nouvelle,  
genre nouveau.



## INTRODUCTION

The family Caryophyllaceae consists of almost 100 genera and nearly 3000 species, mainly distributed in the temperate regions of the northern hemisphere with a center of diversity in the Mediterranean and Irano-Turanian region (Hernández-Ledesma *et al.* 2015). The family is also well represented in the cold temperate regions and tropical highlands of the southern hemisphere – from the alpine tundra of Australia and New Zealand to the Andes and the Antarctic and peri-Antarctic regions. In addition to some of the widespread genera such as *Arenaria* L., *Stellaria* L., and *Cerastium* L. there are several endemic genera to those regions, including *Pycnophyllum* J. Remy, *Pycnophyllopsis* Skottsbo., and *Colobanthus* Bart., among others.

In 1892, the German naturalist and student of the Chilean flora Rudolfo Amando Philippi (1808-1904) described a new species, *Pycnophyllum lanatum* Phil., based on specimens collected near the Cordillera Illapel in the Region of Coquimbo, Chile (Philippi 1892b). Philippi missed the small, inconspicuous flowers concealed by the dense indumentum that characterizes this taxon (“*Recibí varios ejemplares, ninguno tiene traza de flor ni de fruto*”; *I received several specimens, none have traces of flower or fruit*) (Philippi 1892b: 775) and therefore, proposed the new species with some reservation, adding a question mark after the generic name, thus as *Pycnophyllum ? lanatum*, Phil. (Timaná 2017). The binomial was listed as such in Reiche’s *Flora de Chile* (1896: 207). It is worth mentioning that despite the question mark, the binomial should be considered as validly published in accordance with the Article 36 of the *International Code for Nomenclature* (see ex. 1; Turland *et al.* 2018). Johannes Mattfeld reviewed *Pycnophyllum* in 1922 but was unable to study any part of the original material and listed this taxon as *Species Dubia*, questioning its generic position due to its heavy white indumentum, a character entirely absent among *Pycnophyllum* species (Mattfeld 1922). It would be almost 100 years, in 1984, until new collections, this time by Otto Zöllner, also from the Coquimbo Region, were added to those studied by Philippi, providing new insights into this plant species.

During a taxonomic revision of the Andean genus *Pycnophyllum* (Timaná 2005, 2017) it became evident that *Pycnophyllum lanatum* was highly unusual morphologically. A detailed evaluation of the type material and Zöllner’s collections showed that it barely resembles other species in the genus. Several morphological features however, pointed to a possible relationship with the genus *Pycnophyllopsis* (*sensu* Timaná 2017, but see Sharples & Tripp 2019), and therefore, it was provisionally treated as *Pycnophyllopsis lanatum* in Timaná (2005). This binomial, although not validly published until 2017, was used by local botanists (e.g. Muñoz-Schick & Morales 2013; Macaya-Berti *et al.* 2017). However, because the divergences found are in fundamental features (reproductive and vegetative characters) that would significantly alter the generic circumscription

of either *Pycnophyllum* or *Pycnophyllopsis* as currently established to accommodate the inclusion of *P. lanatum*, I consider it is necessary to describe a new monospecific genus, *Baretia* Timaná, gen. nov., to accommodate what Philippi described as *Pycnophyllum ? lanatum*.

## MATERIAL AND METHODS

As part of a taxonomic revision of the high Andean genera *Pycnophyllum*, *Plettkea* Mattf., and *Pycnophyllopsis* (Timaná 2005) herbarium specimens corresponding to the new taxon described here were borrowed from the Missouri Botanical Garden Herbarium (MO), the Herbarium of the Museo Nacional de Historia Natural, Santiago (SGO) and, the US National Arboretum Herbarium (NA). These specimens were studied using standard methods of taxonomic research (Radford *et al.* 1974; Stuessy 1990). Morphological terminology follows Radford *et al.* (1974), Stearn (1983) and Timaná (2005, 2017). Further information was obtained from high resolution photographs of herbarium specimens provided by the curators of CONC, MO and NA, the JSTOR Plants website, and the photos published by Macaya-Berti *et al.* (2017). Herbaria abbreviations follows Thiers (updated continuously).

## RESULTS

## MORPHOLOGY

*Habit*

*Baretia lanata* (Phil.) Timaná, comb. nov. is a perennial shrub, forming either a densely pulvinate hemispherical cushion plant, from *c.* 25 to 100 cm across (*sensu* Macaya *et al.* 373 [CONC185842]), and up 60 cm high, growing in small patches. Cushions are characterized by their reduced internodes and lack of apical dominance. Branching is pseudo-dichotomous, with adpressed, crowded branches. Deceased leaves from previous seasons are visible, forming a structural part of the whole plant as is the case of other peat-accumulating cushion plants.

*Leaves*

Leaves are always opposite, sessile, and exstipulate. Although lacking a petiole, the leaf blade rarely fuses into a sheath surrounding the stem as is the case among other pulvinate species of *Pycnophyllum* or *Pycnophyllopsis*. Only among rapidly growing shoots can such a structure be detected. Newly formed leaves tend to show a characteristic light-green coloration that fades into a dull light yellow in herbarium specimens.

Perhaps the most distinctive feature of *Baretia lanata* (Phil.) Timaná, comb. nov. is the dense indumentum. It consists of single-celled, filiform, simple, albo-lanuginose trichomes that extend across almost all plant parts, from leaves to flowers, and branches. Some of the parts that may, sometimes, be free of the dense indumentum are the sepals’

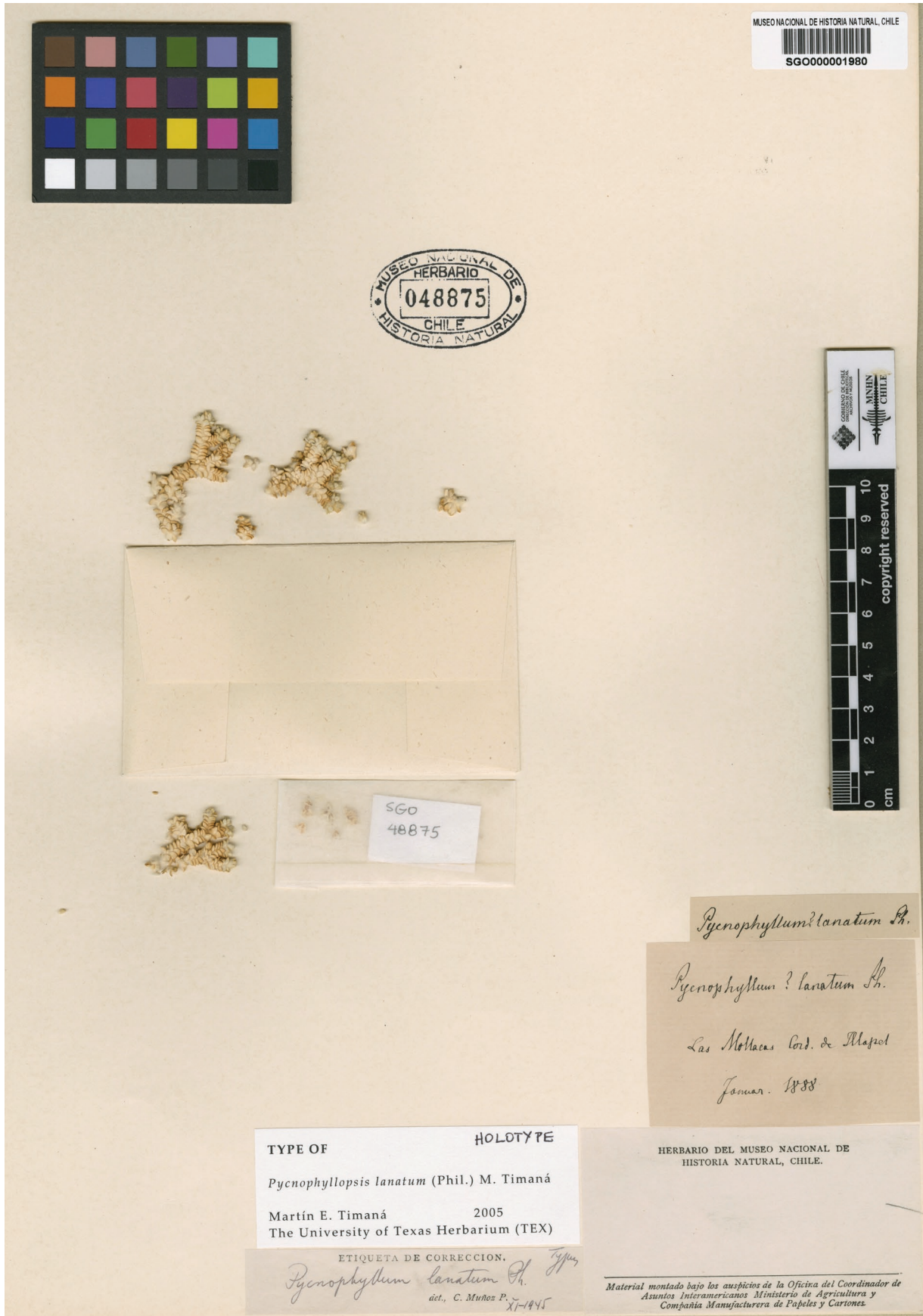


FIG. 1. — *Baretia lanata* (Phil.) Timaná, comb. nov. Lectotype: *R. Philippi* s.n. (SGO 048875). Source: SGO (JSTOR Plants).

adaxial surface – although their infolded margins may give the impression of indumentum on that side – as well as petals, ovary, and fruits. This dense cover can be easily removed from surface of the leaves (and sepals) as “patches” or tufts exposing a leathery, irregularly striated, pale ochraceous blade (or sepal). Whether or not this degree of pubescence is an adaptive response to local environmental conditions remains to be studied. The semi-rigid nature of the leaves may also contribute to their brittle nature; they can be easily broken off at the base with little effort.

#### *Inflorescence*

Flowers are terminal, sessile or minutely pedicellate, usually solitary, rarely, in pairs. Bracts are always absent. While newly borne flowers are found slightly above the surrounding leaves (but by no more than half their total length), eventually they are overtopped by a pair of lateral prophylls that enclose the flower. A similar feature has been observed among the perigynous members of *Pycnophyllopsis*, but never among *Pycnophyllum* species. By the time flowers have turned into fruits, they can be found up to 1 cm below the prophylls' apices. In rare occasions, one of the prophylls is suppressed, thus leading to a flower in a pseudo-lateral position.

#### *Flowers*

Flowers of *Baretia lanata* (Phil.) Timaná, comb. nov. are unisexual, pentamerous, with an oligomerous gynoecium, strongly perigynous and with a well-developed receptacular cup (*sensu* Bittrich 1993), with a distinctive pale greenish-yellow color in living specimens. The sepals are free above the rim of the receptacle cup, contiguous, barely reaching each other along the margin (thus in a valvate configuration). As mentioned before, the lanuginose indumentum fully covers the outer surface. The corolla is always pentamerous with the petals membranous, translucent, and glabrous, always shorter than the sepals and with a consistent “semi-oblong” outline (that is, with two parallel sides, a straight base perpendicular to the sides, and a rounded to obtuse apex). Similar to the leaves, the petals tend to be notably fragile at the base, easily rupturing under mechanical pressure. The pistillate flowers always bear five episepalous, sterile stamens, which are attached to the receptacle cup. They are always shorter than the adjacent petals. The filament is uniform in width, without the enlargement (i.e., nectary glands) that characterizes other members of this family. While sterile anthers are 0.4 mm long and 0.2 mm wide, pale cream in color, fertile ones are 0.6 mm long and 0.35 mm wide, and light brown colored. The deep receptacular cup is formed by the adnation of sepals, petals and staminodes. Internally the structure is visibly marked by the vascular traces of the stamens (or staminodes). In addition, there is a thin tissue outgrowth, here termed ‘floral disk’ produced on the receptacle cup wall, almost perpendicular to the flower’s transverse axis, well below the attachment point of petals and stamens (or staminodes), and at about the same level as the style base, thus hiding the sunken ovary in a small nest-like chamber (inset Fig. 2; Timaná

2005: fig. 3.1.c). A preliminary survey of Caryophyllaceae flower morphology has failed to detect a similar structure elsewhere. Instead, what we observe in other genera is an enlargement of the receptacular cup rim, later enclosing the fertilized ovary (e.g., *Scleranthus* L.) or, without the ovary enclosure (e.g., *Herniaria* L.). Whether this structure represents a functional nectary remains to be determined. The gynoecium consists of a unilocular, 3-carpellate ovary, with the styles completely fused lengthwise and a single, slightly capitate stigma. The ovary is glabrous, ellipsoid, yet slightly diverging from its transverse axis, thus showing an oblique position; within it are three ovules attached to the base of the central placental column; in staminate flowers, the pistillode is much more reduced in size and shows a “shriveled” appearance.

#### *Fruits and seeds*

The fruits of *Baretia lanata* (Phil.) Timaná, comb. nov. are indehiscent and one-seeded, i.e., an utricle, surrounded by the papery ovary wall. The fruiting ovary is accompanied by a persistent perianth. As in other Caryophyllaceae species bearing indehiscent fruits (e.g., *Pycnophyllum*, *pro parte*), the effective unit of dispersal may be the perianth-seed carrying ovary complex. Seeds are usually light brown in color laterally and dark brown dorsally, with a curve embryo.

#### *Breeding system*

There is strong evidence that flowers of *Baretia lanata* (Phil.) Timaná, comb. nov. are unisexual and that plants are dioecious. Of the nearly 30 flowers examined from the Zöllner specimens (MO, NA), all of them show a functional pistil (with nearly a third of them already carrying seeds) and what I consider as staminodes or sterile stamens. They have an apparently well-developed anther with two pollen sacs but none of the almost 30 samples carried any trace of pollen. According to the collection label, these two specimens were collected within a month of each other (but see under “Additional Collections”) yet, even though flowers show various degrees of maturation, their pollen sacs show no evidence of ever having been fertile. We can safely conclude then that at least these specimens are pistillate. The fragmentary type specimen however, shows some contradictory evidence. Of the three flowers available for study (all of which were attached to the same branch), one of them shows a clearly staminate flower – that is, with well-developed pollen-bearing anthers and, a reduced, malformed pistillode. The two remaining flowers carry pistils that cannot be conclusively considered as pistillodes; in addition, the stamens, although with well-developed anthers, show no evidence of carrying pollen. However, both flowers also show pollen grains dispersed within the surface of the receptacle cup. Whether these pollen remains originated from the corresponding flower remains unclear. Thus then, while there is strong evidence that this species is in fact, dioecious, we cannot rule out the possibility of a more complex breeding system. Evidently, more collections and a meticulous population sampling will be needed in the future to clarify this point.





FIG. 2. — *Baretia lanata* (Phil.) Timaná, comb. nov., O. Zöllner 11772 (NA 0001301). Courtesy of the U.S. National Arboretum Herbarium (NA), USDA-ARS. Inset: Flower close-up, O. Zöllner 11772 (MO346208). Scale bar: 1 mm.





FIG. 3. — *Baretia lanata* (Phil.) Timaná, comb. nov. Close up of terminal branches, Teillier & Torres-Mura 8034 (CONC 182760). Courtesy of the herbarium of Universidad de Concepción. Scale bar: 1 cm.

## TAXONOMIC TREATMENT

Family CARYOPHYLLACEAE Juss.

Genus *Baretia* Timaná, gen. nov.

Densely lanuginose, suffruticose, perennial, hemispheric, dioecious shrub; leaves opposite, exstipulate; blade sessile. Inflorescence terminal, single-flowered; flowers dioecious, haplostemonous, tetracyclic, dichlamydeous, strongly perigynous; receptacle infundibuliform, floral disk present; calyx valvate, sepals 5, coriaceous, free above the receptacle cup; petals 5; style single; stigma capitate; ovary unilocular, 3-carpellate, 3-ovulate, placentation central basal; fruit dry, indehiscent, one-seeded; embryo curved. Chromosome number unknown.

TYPE AND ONLY SPECIES. — *Baretia lanata* (Phil.) Timaná, comb. nov.

ETYMOLOGY. — It is an immense pleasure to name this genus in honor of the French botanist and explorer Jeanne Baret (also spelled Barret) (1740-1807), the first known woman to circumnavigate the globe. She traveled, disguised as a young man, as a field assistant of botanist and explorer, Philibert Commerson (1727-1773). They were members of the French expedition around the world led by Louis Antoine de Bougainville during the years 1766 to 1769 on board the ships *Boudeuse* and *Étoile* (Godley 1965; Bougainville & Freijomil 2005). Baret's life, achievements, scientific work, but also struggles during the expedition have been depicted in detail by Ridley (2011), Clode (2020), and Telleria (2021). A more botanical approach to her life and work is given by Thiers (2020). According to Thiers, Commerson and Baret collected nearly 30 000 specimens representing nearly 5 000 species, including the type specimen of *Bougainvillea spectabilis* supposedly collected by Baret in Brazil, although this suggestion, put forward by Ridley (2011), has been dismissed as highly speculative by professional botanists such as Knapp (2011) and

Lack (2012). However, based on the specimens now preserved in the Paris herbarium (a total of 4 022 according to a search of its online database of digitalized specimens), only Commerson was credited with those collections. Baret collected in the Strait of Magellan, in Chilean territory, between December and January 1767-1768 (Godley 1965). To this date, her contribution to botany has only been recognized with a species in the Solanaceae family, namely *Solanum baretiae* Tepe, from northern Peru (Tepe *et al.* 2012). According to Thiers, Commerson had planned to name a new genus for her, as *Baretia* (now *Turraea* L., Meliaceae), as evidenced in the label on the specimen annotated by Commerson as "*Baretia bonafidia*" (Paris herbarium, specimen P00391569). Although the name *Baretia* is mentioned (yet not fully described) in many 19<sup>th</sup> century botanical reference books (based on a search of the Biodiversity Heritage Library database), the binomial was never published, because, as stated by Knapp (2011) when the specimen finally arrived in Paris that genus already had a name. This publication aims to fulfill Commerson's intention to honor his loyal scientific partner and travel companion.

*Baretia lanata* (Phil.) Timaná, comb. nov.  
(Figs 1; 2; 3)

*Pycnophyllum ? lanatum* Phil., *Anales de la Universidad. I. Memorias Científicas i Literarias* 81 (6a): 774 (Philippi 1892b) . — Type: Chile. Las Mollacas, Cord. de Illapel, I.1888, R. Philippi s.n. (lecto-, SGO[SGO048875]! [fragment], here designated) (Fig. 1).

*Pycnophyllopsis lanatum* (Phil.) Macaya-Berti, Novoa-Quezada & Teillier, *Chloris Chilensis* 20 (2): 1-5 (Macaya-Berti *et al.* 2017).

ETYMOLOGY. — The specific epithet "*lanata*" refers to the dense cottony indumentum that covers most parts of this plant.

TYPE LOCALITY. — The type locality, described by R. Philippi as "Las Mollacas, Cord. Illapel" may lead to some confusion because the current locality known as Las Mollacas (c. 30°45'8"S, 70°39'23"W) is nearly 100 km from the city of Illapel (c. 31°37'45"S, 71°10'13"W); however, the type locality most probably refers to the "Cerro Las Mollacas" (c. 31°30'0"S, 71°4'0"W), which is near the indigenous diaguita community of "Las Mollacas" (c. 31°28'28"S, 71°4'42"W). In the protologue Philippi states that he had received the specimens from somebody else ("*Recibi varios ejemplares, ninguno tiene traza de flor ni de fruto*", Philippi 1892b: 775). Although he did not mention the source, nor is it shown on label of the type specimen, it is very plausible that it was collected by Mr Zacarias Vergara, one of the main taxidermist and specimen preparator of the Museo Nacional de Chile (Philippi 1908), who was sent to the Cordillera Illapel in 1888 and 1892 (Urizar Olate 2016: 196) and who, according to the German botanist, collected in the surroundings and sent him specimens (Philippi 1892a: 69; Philippi 1908: 19).

DISTRIBUTION. — Endemic to central Chile (Fig 4), restricted to the Regions of Coquimbo and Valparaíso. In the Coquimbo Region the species was reported by Philippi at Las Mollacas, in the Cordillera Illapel. Otto Zöllner collected another specimen in the Coquimbo Region, in the Cordillera de Quelén, near the town of Salamanca; more recently Macaya-Berti *et al.* (2017) reported the species in Quebrada El Durazno in the Valparaíso Region. *Baretia lanata* (Phil.) Timaná, comb. nov. has been collected at elevations from 1500 to 3250 meters. According to Macaya-Berti *et al.* (2017), the species was observed in semi-arid, sunny sites, in red, granitic soils, with a sandy loam texture (Fig. 4).

PHENOLOGY. — Flowering between November and February; fruiting February.



TABLE 1. — Comparative morphology of *Pycnophyllum* J. Remy, *Baretia* Timaná, gen. nov. and *Pycnophyllopsis* Skottsbo. s.l.

|                       | <i>Pycnophyllum</i> J. Remy | <i>Baretia</i> Timaná, gen. nov. | <i>Pycnophyllopsis</i> Skottsbo.                   |
|-----------------------|-----------------------------|----------------------------------|--|
| Plant indumentum      | completely glabrous         | densely albo-lanuginose          | completely glabrous                                |
| Leaf sheath           | strongly sheathed           | weak; mostly on young shoots     | strongly sheathed                                  |
| Blade texture         | scarios                     | chartaceous                      | scarios  |
| Blade margin          | entire                      | densely lanuginose               | ciliate to denticulate                             |
| Breeding system       | dioecious                   | dioecious                        | bisexual or dioecious                              |
| Flower position       | hypogynous                  | perigynous                       | perygynous to sub-perygynous;<br>rarely hypogynous |
| Bracts                | 4-10 (12)                   | 0                                | 0  |
| Sepal number          | 5                           | 5                                | 4 or 5   |
| Petal number          | 0 or 5; rarely 1 or 3       | 5                                | 4 or 5; rarely 3                                   |
| Petal apex            | bifid to truncated          | rounded to truncated             | usually deeply bifid                               |
| Petal size            | less than 0.2 mm long       | 0.8-1 mm long                    | 0.2-1.5 mm long                                    |
| Stamen nectary glands | absent                      | absent                           | usually present                                    |
| Style                 | single                      | single                           | 2 or 3, free to the base                           |
| Stigma                | terete                      | capitate                         | terete   |
| Receptacular cup      | absent                      | present; flat, prominent         | present or poorly developed                        |
| Seed number           | 1 to 6                      | 1                                | 1  |

LOCAL NAME. — Unknown.

ADDITIONAL COLLECTIONS. — Chile. Coquimbo Region, Las Mol-lacas, Cordillera Illapel, s.d., *Philippi s.n.* (SGO[SGO090982]); Cordillera de Quelén, near Salamanca, 2500 m, 9.I.1984, *Zöllner 11772* (NA); Cordillera de Quelén, near Salamanca, 2600 m, 9.II.1984, *Zöllner 11772* (MO) [it is certainly plausible that these two specimens are exact duplicates and that one of them is erroneously dated]. — Valparaíso Region, Prov. Petorca, “En la cima de la quebrada El Durazno”, 32°12'2.00”S, 71°0'51.08”W, 1555 m, 7.XI.2017, *J. Macaya, S. Teillier, P. Novoa & O. Fernández 373* (CONC[CONC185842]); Prov. Petorca-Alicahue, quebrada Piu-queues, 32°14'4.86”S, 70°27.8'22.0”W, 3250 m, III.2016, *S. Teil-lier & J. Torres-Mora 8034* (CONC[CONC182760]).

#### DESCRIPTION

Perennial, caespitose, dioecious shrub, forming pulvinate cushions up to 0.6 m high and almost 1 m in diameter. Primary branches 10-15 mm long, 2-3 mm thick, herbaceous. Leaves opposite, decussate or imbricate, adpressed, 2.6-2.8 mm long, sessile, exstipulate, sheathing mainly on young shoots; blade flat, elliptic to slightly obovate, 1.2-1.5 (1.8) mm long, 1.2-1.4 mm wide, chartaceous, fracturing easily at the base, abaxial and adaxial surfaces densely albo-lanuginose, trichomes filiform, unbranched, flexuous, 0.5-0.75 mm long, pale yellow to light green when dry, indumentum easily detachable from the blade surface; margin lanuginose; mid-vein lacking; apex obtuse, erect; basal sheath barely formed, less than 0.7 mm long. Inflorescence single flowered, terminal, concealed by two lateral prophylls; pedicel 0.3 mm long; bracts absent. Flowers unisexual. **Pistillate flower** usually concealed by the surrounding leaves, strongly perigynous, valvate, 2.5-3.5 mm long, 1-1.5 mm wide, receptacle cup well developed, crateriform to infundibular, approximately 1 mm long, sepals and staminodes inserted on the edge of the receptacle cup forming a protruding, flat disk; calyx ovoid, sepals 5, slightly canaliculated or flat, ovate to triangular, chartaceous, 1.3-1.7 mm long, 0.5-0.7 mm wide at the base, pale greenish-yellow to stramineous, densely lanuginose abaxially, margin lanuginose, midvein raised on the adaxial surface, apex acute to obtuse;

petals 5, free, alternisepalous, cream-colored to yellowish, semi-translucent, oblong, 0.8-1 mm long, 0.5-0.6 mm wide at the base, membranaceous, apex rounded to truncate, margin entire, glabrous; staminodes 5, episepalous, 0.75 mm long, filaments uniformly linear, 0.4 mm long; sterile anthers introrse, dorsifixed, oblique, 0.4 mm long, 0.2 mm wide, pollen absent; pistil 1.5-1.8 mm long, sessile, ovary 3-carpellate, unilocular, ovoid, laterally flattened, sometimes irregularly outlined, 0.7 mm long, 0.5 mm wide, glabrous; style single, 0.5-0.6 mm long; stigmatic lobes 1, slightly capitate, ovules 3, arranged at the base of a central placental column. **Staminate flowers** with perianth similar in morphology and size as the pistillate flowers; stamens 5, episepalous, approximately 1 mm long, filaments uniformly linear, 0.4 mm long, anthers introrse, dorsifixed, versatile, 0.6 mm long, 0.4 mm wide, dehiscing by longitudinal slits; pistillode irregularly shaped, reduced, 0.3 mm long, without distinctive style and stigma. Fruit an utricle, 1.2-1.3 mm long, 1-1.3 mm wide, enclosed by the persistent calyx. Seed 1, reniform, laterally compressed, yellowish brown and opaque laterally, dark brown and nitid dorsally, 1 mm long, 0.6-0.75 mm wide, glabrous, minutely sculptured; embryo curved.

#### DISCUSSION

Based on the morphological evidence, *Baretia* Timaná, gen. nov. is a very distinctive member of the Caryophyllaceae. As circumscribed here, this new taxon presents a set of multiple morphological characters that justify separating it as a taxonomic unit, including the combination of dioecy, a single style, a capitate stigma and an indehiscent fruit. While some of these characteristics are shared with some species of *Pycnophyllum*, there are, however, key differences; Table 1 lists the main distinctive features between *Pycnophyllum*, *Pycnophyllopsis s. l.* and the newly established genus. *Baretia* Timaná, gen. nov., such as the flower position – hypogynous in *Pycnophyllum* versus perigynous in *Baretia* Timaná, gen. nov., the lack of a

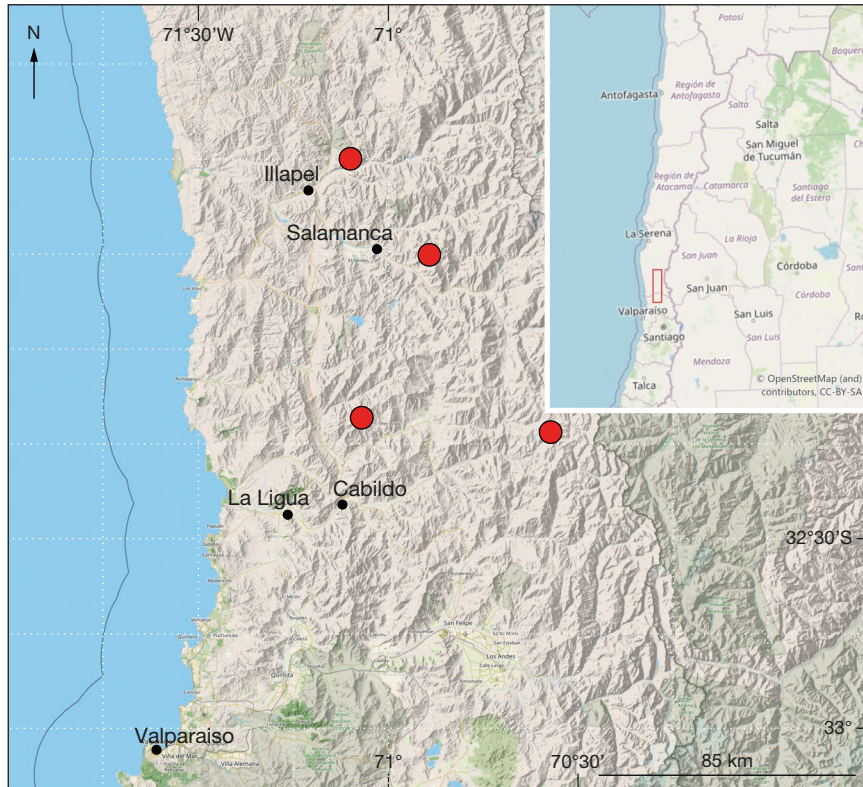


FIG. 4. — Map of known distribution of *Baretia lanata* (Phil.) Timaná, comb. nov.

receptacular cup in the former, and in particular, the presence of dense albo-lanuginose pubescence in the proposed genus, while all members of *Pycnophyllum* are completely glabrous.

In the last couple of decades DNA-based phylogenetic analyses have revealed that the traditional division of the Caryophyllaceae into three subfamilies, as circumscribed by Bittrich (1993) is no longer supported (Harbaugh *et al.* 2010; Greenberg & Donoghue 2011; Hernández-Ledesma *et al.* 2015), as none of these are monophyletic. In recent years some large genera, such as *Stellaria* and *Arenaria* L. have been subject to taxonomic rearrangement (Greenberg & Donoghue 2011; Sadeghian *et al.* 2015; Sharples & Tripp 2019). Based on phylogenetic relationships inferred from Restriction site-associated DNA sequencing (RADseq) Sharples & Tripp (2019) support the hypothesis that the cosmopolitan genus *Stellaria* not only is not monophyletic, but the core group includes members of *Pycnophyllopsis* (*sensu* Timaná 2017). The close relationship between *Pycnophyllopsis* and *Stellaria* was considered but rejected by Mattfeld (1934), who judged their difference in fruit type (an utricle in the former, a capsule in the latter) to be relevant enough to maintain them separate. A preliminary assessment based only on nuclear ribosomal ITS sequences (Timaná 2005) suggested a possible relationship between *Baretia lanata* (Phil.) Timaná, comb. nov., *Pycnophyllopsis*, and *Stellaria*, but due to lower bootstrap support values these results are to be considered preliminary. Further sampling is required to better elucidate the position of this new genus within the family. Harbaugh *et al.* (2010) proposed

abandoning the classification of Caryophyllaceae based on subfamilies and instead, proposed a tribal classification. In their phylogenetic analysis *Pycnophyllum* is nested within the Polycarpaeae, sister to *Drymaria* Willdenow ex Schultes, a placement later confirmed by Greenberg & Donoghue (2011); this position within the Polycarpaeae is also supported by some floral characters, such as the connate style. Considering the shared floral features between *Pycnophyllum* and *Baretia* Timaná, gen. nov., it is plausible to propose the placement of the new described genus in the tribe Polycarpaeae.

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