

# Taxonomic notes on *Cistanthe* and *Calandrinia* (Montiaceae) in Chile

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**ABSTRACT:** This work describes a new species of Chilean *Cistanthe*, *C. josetomasallendeana* Hershk., validates the combinations *Cistanthe subverticillata* (Phil.) Carolin ex Hershk. and *Cistanthe litoralis* (Phil.) Carolin ex Hershk., and validates the species name *Calandrinia jompomae* Hershk. (Montiaceae).

**KEY WORDS:** *Cistanthe*, *Calandrinia*, Montiaceae, Chile Montiaceae is an angiosperm family of on the order of 300 species distributed primarily in western North America, South America, and Australasia (Hershkovitz, 2019). About one third of the species occur among five genera incident to Chile, including *Cistanthe* Spach and *Calandrinia* Kunth. The present work describes a new species of *Cistanthe* and additionally provides two new combinations in this genus, and also validates a species name in *Calandrinia*.

## 1. A new species of *Cistanthe*, *C. josetomasallendeana*

The genus *Cistanthe* (Cistantheae Hershk.; Montiaceae) sensu Hershkovitz (2019) comprises ca. 40 species of succulent annual and perennial herbs or, in two cases, pachycaul shrubs (Hershkovitz, 2019, 2022a). Hershkovitz (2020; cf. 2019) divided the genus into three sections based on phylogenetic evidence: *C. sect. Cistanthe* (ca. 12 spp.), *C. sect. Rosulatae* (Reiche) Hershk. (ca. 21 spp.), and *C. sect. Thyrsoidae* (6 spp.).

All but six *Cistanthe* species occur in Chile ( $\pm$  Argentina or Peru), the remainder in Peru, Mexico, and California (USA). Within Chile, all but six species (ca. 28) are incident to the semi-desert and desert vegetations of the adjacent Coquimbo and Atacama Regions. These two regions comprise a more or less narrowly rhombic territory extending between ca. 25.5–32.1°S, or ca. 720 km latitudinally, and ranging from 100–250 km broad longitudinally from south to north. The total area is ca. 116,000 km<sup>2</sup>, about the size of the US state of Ohio and slightly smaller than North Korea.

Within the Coquimbo/Atacama zone, most of the diversity of *Cistanthe* and related Cistantheae genera is concentrated in the lower elevation western half (Atacama Region) to two-thirds (Coquimbo Region). This area comprises coastal plains (0–250 m elev.) and low mountains (< 1000 m elev.) under stronger marine climatic influence, and interior ranges (< 2000 m elev.) and valleys (300–500 m elev.) with a more continental climate. To the east, the Andes Mountains arise abruptly and attain elevations of 3000–5000 m. This region harbors only five of the 28 *Cistanthe* species incidental to the Coquimbo and Atacama Regions.

Among the species incident to the semi-desert Coquimbo region are three and probably four species that historically had been misidentified as *Cistanthe arenaria* (Cham.) Carolin ex Hershk.: *C. chamissoi*, (Barnéoud) Carolin ex Hershk., *C. subverticillata* (Phil.) Carolin ex Hershk.,<sup>1</sup> and *C. vicina* (Phil.) Carolin ex Hershk., and probably also *C. trigona* (Bertero ex Colla) Carolin ex Hershk. (Hershkovitz, 2022a). *Cistanthe chamissoi* and *C. vicina* often co-occur in the same populations, especially in western Choapa Province.

In early September, 2022, following a relatively but not extremely rainy Austral winter, I was exploring dense coastal semi-desert-slash-matorral scrub in a Choapa Province locality called Puerto Oscuro (Fig. 1). This vegetation extends for more than 100 km of latitude along the humid western slopes of the westernmost coast ranges of central and southern Coquimbo Region. But at this locality, in small clearings between the woody dominants (see below), in addition to abundant *C. chamissoi* and *C. vicina* plants, I was surprised to find thousands of vigorously growing individuals of a plant that I had never seen before (Fig. 2) in explorations of this and similar localities.

The novel form does not correspond to any species that has been described or perhaps even collected. Moreover, the combination of characteristics of the plants is unusual. The traits seemed to be a mix of those of *C. chamissoi* (Hershkovitz, 2022a: 15–17; Fig. 2) and *C. vicina* (Hershkovitz, 2022a: 17–19; Fig. 3). Indeed, both of these species grow intimately intermingled with the novel form (Fig. 2B). The present work describes the novel form as *Cistanthe josetomasallendeana* and discusses evidence that it is a nothospecies, a fully fertile and vigorous lineage apparently derived from a cross between *C. chamissoi* and *C. vicina*. *Cistanthe josetomasallendeana* was referred to in Hershkovitz (2022a) as “*Cistanthe* n. sp.”

## TAXONOMY

*Cistanthe josetomasallendeana* Hershk. sp. nov. TYPE: Chile: Coquimbo Region, Choapa Province, Comuna de Canela, hills on the north side of Caleta Puerto Oscuro, 31.4210S, 71.6000W, elevation ca. 100 m, 7 September 2022, Hershkovitz 22-04 (Fig. 2; HOLOTYPE, SGO).

<sup>1</sup> *Cistanthe subverticillata* (Phil.) Carolin ex Hershk., comb. nov. Basionym: *Calandrinia subverticillata* Phil., Anales Univ. Chile 85: 302. 1894. HOLOTYPE: *F. Philippi s. n.*, without date, Cerro San Cristóbal, Santiago (SGO [image! [https://plants.jstor.org/stable/10.5555/al.ap.specimen.sgo000001841?searchUri=filter%3Dname%26so%3Dps\\_group\\_by\\_genus\\_species%2Basc%26Query%3DCalandrinia%2Bsubverticillata](https://plants.jstor.org/stable/10.5555/al.ap.specimen.sgo000001841?searchUri=filter%3Dname%26so%3Dps_group_by_genus_species%2Basc%26Query%3DCalandrinia%2Bsubverticillata)]).

**Diagnosis.** Plants similar to those of *Cistanthe* sect. *Rosulatae* but differing in possessing the unique combination of: linear to linear-oblongate apetiolate non-bullate/rugose leaves > 3 cm in length; flowering stems commonly > 20 cm long; sepals markedly glossy and remaining so up until fruit dehiscence, and densely marked/streaked with black lines; petals 1.5X the sepal length; stamens up to 20–30; style distinct but much shorter than the ovary and with a branched magenta stigma; and seeds pustulate-tomentose.

**Annuals**, glabrous, rosetiform. **Taproot** up to 5–10 cm long X 2–3 mm broad at the crown. **Basal leaves** up to ca. 14 cm long X 1 cm broad, succulent, rather glaucous, grayish-green, more or less erect, linear to narrowly oblanceolate, apex acute, reddish-colored hydathode at the apex, surface smooth (not bullate/rugose). **Flowering stems** terminal in small plants and/or in larger plants emerging from rosette leaf axils, swollen at the base and at all nodes, terete, smooth, green, prostrate, ascending, or erect, up to ca. 35 cm long X 5 mm broad, stiff, morphology highly variable within and among individuals, from essentially naked, terminating in a cyme, to bearing 1–few reduced leaves and/or bracts, axillary stems sometimes with a secondary rosette of leaves up to 6 cm from the base and terminating in another naked and/or leafy and/or bracteate stem that terminates in a cyme. **Flowering stem bracts** semi-amplexicaul, ovate, apiculate, somewhat keeled abaxially, reticulately marked/streaked with black lines, yellow-green and herbaceous when young, becoming scarious by anthesis, solitary along the elongate portion of the flowering stem, paired at the base of the cyme and its internal nodes, the outer bract somewhat to markedly larger than the inner, 3–8 mm long. **Cymes** terminal and sometimes also lateral at nodes bearing single bracts, becoming lax at anthesis, 3–11-flowered when terminal, 1–3-flowered when lateral, the central flower the largest, successive flowers smaller, opening/expanding further and becoming more rigid in fruit. **Pedicels** green, up to 10 mm long at anthesis, expanding to as much as 20 mm in fruit. **Flowers** hermaphroditic. **Sepals** two, broadly ovate-deltoid, the abaxial larger than the adaxial, the margins of both rolled inward, the rolled margin of the abaxial sepal clasping the adaxial sepal in bud, up to 10 mm long X 10 mm broad, yellow-green, very lustrous at anthesis, reticulately marked/streaked with black lines and spots, remaining lustrous during fruit maturation, enveloping the capsule, shriveled but persistent at dehiscence. **Petals** 5, free, somewhat flabellate, up to 15 mm long X 10 mm broad, rose in the apical two-thirds, more magenta towards the base, evanescent after anthesis, the apices twisting about the gynoecium and falling off the fruit as a unit. **Stamens** up to 30 in two whorls, ca. 9 mm long, filaments ca. 8 mm long, magenta, anthers yellow. **Gynoecium** hypogynous, syncarpellate, carpels 3, ca. 4.5 mm long, ovary green, broadly ovate, ca. 2.5 mm long X 2 mm broad, style very pale green, ca. 1 mm long X 0.4 mm broad, stigma magenta, 3-branched, pubescent, ca. 1 mm long and broad. **Fruit** a septical capsule, the pedicel reorienting the apex vertically upwards at dehiscence, 10 mm long at dehiscence, green until nearly the moment of dehiscence, becoming gold-green and later more tan and somewhat woody at dehiscence, valves splitting from the apex, the apical portion of the valves recurving, exposing the seeds, placentation free-central. **Seeds** up to ca. 250, somewhat snail-shaped, strophiolate, surface with brownish pustulate tomentum, ca. 0.8 mm in maximum diameter.

**Morphological variability.** As noted in the description, the flowering stems vary considerably in the number and position of their leaves and bracts, the same as in *C. vicina* (Hershkovitz, 2022a). In addition, like many annual species of *Cistanthe* (pers. obs.) and perhaps annual plants in general, plants of *C. josetomasallendeana* vary in size at flowering, from the maximal proportions described above to plants with leaves and flowering stems on the order of 2 cm long and with proportionally reduced floral organ dimensions and < 10 stamens. This perhaps is a consequence of signal-induced phase change, i.e., some environmental parameter induces a young plant to switch precociously and irreversibly from vegetative to reproductive growth, yielding a dwarfed adult (Hershkovitz, 2022a).

**Distribution, habitat, and ecology.** At Puerto Oscuro the plants were found in sandy soil in adjacent natural clearings, each 10–30 m<sup>2</sup>, over a total area of ca. 1000 m<sup>2</sup> of scrub vegetation dominated by *Puya chilensis* Molina, *Puya venusta* Phil., *Oxalis gigantea* Barnéoud, and *Leucostele chiloensis* (Colla) Schlumpb.

However, I have seen a photo on a Facebook post (October, 2022) of the same species in a population of apparently the same species in sandy soil in Canela Baja, a coast range community ca. 15 km east of Puerto Oscuro. The photo does not document surrounding vegetation. Vegetation in Canela Baja, as in Puerto Oscuro, varies locally from more woody to more herbaceous, and to more disturbed because of urbanization and agriculture.

**Etymology.** *Cistanthe josetomasallendeana* honors Chilean professional racehorse owner/trainer, Don José Tomás Allende, who generously financed the fieldwork that made possible the discovery of this species, as well as the work in Hershkovitz (2022a, b, c).

**Evolution.** I suggest (but do not prove) here that *C. josetomasallendeana* originated as a hybrid between *C. chamissoi* and *C. vicina*. An alternative hypothesis is that *C. josetomasallendeana* originated via a purely divergence process, viz. cladogenesis/anagenesis. A third possibility is that the species is indeed a hybrid, but sterile and recurring. I stress, however, that these alternatives have no consequence on the recognition of *C. josetomasallendeana* as a taxonomic species, moreover without nomenclatural designation as a hybrid. *Cistanthe josetomasallendeana* is recognized here on the basis of its striking (in this case morphological) differences from other species.

Table 1 provides a list of 24 traits of *C. josetomasallendeana*, *C. chamissoi*, and *C. vicina*. The traits of *C. josetomasallendeana* appear to be a mosaic of the other two. Nineteen of 24 traits of *C. josetomasallendeana* are shared with one or the other but not both species: twelve with *C. vicina* and seven with *C. chamissoi*. Five trait states are unique to *C. josetomasallendeana*, but only one of these, the ratio of ovary height to style length, is intermediate between the other species. Three listed traits might be considered “transgressive” in that their values exceed the minimum or maximum of the putative parents. This characterization, of course, presumes hybridity.

At the same time, it must be emphasized that *C. josetomasallendeana* is strikingly distinct from both of the other species. The sepals are especially distinctive for their combination of size and brilliant luster. They resemble hand-painted works of heavily

glazed fine ceramic. The flowers themselves are among the largest of any species of *C. sect. Rosulatae*, rivaling those of *C. litoralis* (Phil.) Carolin ex Hershk., one of the most conspicuous and emblematic species of Chile's famed "desierto florido."<sup>2</sup>

The morphological evidence could support a hybridization or cladogenesis/anagenesis hypothesis, though not necessarily equally well. For example, the gynoeceum proportions, stigma form and color, and capsule size and texture strongly resemble *C. vicina* and, certainly collectively, no other species of *C. sect. Rosulatae*. The plant size and inflorescence length and architecture seem to corroborate a relation with *C. vicina*. But then the combination of leaf shape and seed surface morphology suggest especially *C. chamissoi*. It might seem unexpected to find a mix of the traits in a single plant, hence the evidence might be interpreted in terms of hybridization.

But as noted in Hershkovitz (2022a), the pustulate-tomentose seed surface and the glossy sepals may be a synapomorphy that defines a clade within *C. sect. Rosulatae* that excludes a basal grade that includes *C. vicina*, *C. coquimbensis* (Barnéoud) Carolin ex Hershk., and possibly also *C. floresiorum* J.M. Watson. Thus, *C. josetomasallendeana* might be interpreted as the sister species of the clade that includes *C. chamissoi*, and its similarities with *C. vicina* would be expected symplesiomorphies. In this interpretation, *C. josetomasallendeana* necessarily would be a rare relictual species (but see below).

Given that the morphology by itself does not provide convincing support for either hypothesis, additional evidence must be considered. Here, I suggest that geographic and historical botanical evidence support the hybridization hypothesis. In particular, the vegetation and ecological conditions in the vicinity of the Type locality at Puerto Oscuro are fairly "uniform." There is species turnover at the 50–100 m scale, and this involves mostly the larger perennial taxa. But at the large scale, there is no turnover. The same mix of perennial taxa extend for many kilometers. And, in any case, there seems to be little meaningful turnover of more "opportunistic" annuals and smaller herbaceous perennials. The same herbaceous species are shared in essentially all microhabitats, viz. with or without woody dominants and otherwise different degrees of moisture, slope, and disturbance.

As an example, *C. vicina* and, perhaps to a lesser extent, *C. chamissoi* are abundant and ubiquitous at the Puerto Oscuro locality, not only on the western slopes that support native xerophytic matorral, but also the drier eastern slope, which is essentially herbaceous meadow used for grazing a small number of horses. And these two species remain abundant up to at least 50 km inland into semi-desert vegetation. In contrast, I found *C. josetomasallendeana* in only one of at least 150 hectares of matorral that I transited and explored to various degrees. Yet, it was extremely abundant ("weedy") in that hectare. While that hectare possibly was richer than average in woody taxa, I noticed nothing about the hectare that distinguished it from other such hectares.

The apparent "weediness" of *C. josetomasallendeana* in its location and its expected "weediness" given that of annual *C. sect. Rosulatae* species generally thus beg the question of its exceptionally restricted distribution. In particular, its ecology is inconsistent with the expectation that it is rare relict. Here emerges recent hybrid origin as a possible explanation. Possibly there has not passed sufficient time for the species to achieve (passively) its potential distribution. In this context, it is notable that the only other record of *C. josetomasallendeana* is from Canela Baja, ca. 20 km east of Puerto Oscuro (see above).

The origin of the two different populations 20 km apart cannot be determined here. Either population could have originated via dispersal from the other or, alternatively, both from yet undiscovered populations. And if the hybridization hypothesis is correct, the two populations might be derived from single or separate hybridization events. *Cistanthe chamissoi* and *C. vicina* are abundant in both localities.

Further circumstantial support for the nonrelictual rarity of *C. josetomasallendeana* emerges from social network plant records, including iNaturalist ([www.iNaturalist.org](http://www.iNaturalist.org)) and assorted general social network and photo-sharing sites. Over the past decade or so, the number of new plant records/photos posted on such social networks has ballooned to the point where often there are more such records posted within the past ten years than there were plants physically collected and preserved during the previous two centuries. But despite such data and my own extensive botanical exploration of the Coquimbo Region, there seem to be no records of *C. josetomasallendeana* besides these two from 2022. Still, it remains possible that, because of historically poor geographic collection coverage in the Coquimbo Region (Hershkovitz, 2022b), the distribution of *C. josetomasallendeana* is broader than the present two records would suggest.

The rarity of *C. josetomasallendeana* might be predicted in the case that this species was a sterile recurring hybrid. This cannot be evaluated without additional experimental evidence. At the same time, there is no positive evidence that the plants are sterile, e.g., male or female sterility or poorly developed seeds. The seeds are abundant and as plump as in any species of *Cistanthe*. And the seeds were derived from manual self pollination of flowers that opened on my windowsill. But, again, eventual evidence for sterility of *C. josetomasallendeana* has no bearing on its recognition here as a taxonomic species.

Additional and intriguing circumstantial evidence for a hybrid origin of *C. josetomasallendeana* emerges from peculiar individuals of *C. vicina* that I found at Puerto Oscuro a few hundred meters from plants of the former. In these individuals, the basal half to two-thirds of the sepals were not merely reticulately black streaked, but essentially solidly black (Hershkovitz, 2022a: 18–

<sup>2</sup> I previously considered *Calandrinia litoralis* Phil. to be a taxonomic synonym of *Cistanthe longiscapa* (Barnéoud) Carolin ex Hershk. (Hershkovitz, 1991). Cumulative observations since then lead me to consider the species as distinct. *Calandrinia litoralis*, from sea-level in coastal Copiapó Province (Atacama Region), has glabrous seeds (Philippi, 1860). The Type of *Cistanthe longiscapa* (*C. Gay 314* [P!]), from the Andean precordillera in the Coquimbo Region, elevation ca. 1933 m., has pustulate-tomentose seeds. The species might intergrade, but my field notes suggest consistency of the morphological, geographical, and ecological differences. Thus, I recombine here the former name in *Cistanthe*:

*Cistanthe litoralis* (Phil.) Carolin ex Hershk., **comb. nov.** Basionym: *Calandrinia litoralis* Phil., Fl. Atacam. 20. 1860.  
HOLOTYPE: *R. Philippi* s. n., December 1853 (SGO [image! [https://plants.jstor.org/stable/10.5555/al.ap.specimen.sgo000001826?searchUri=filter%3Dname%26so%3Dps\\_group\\_by\\_genus\\_species%2Basc%26Query%3Dcalandrinia%2Blitoralis](https://plants.jstor.org/stable/10.5555/al.ap.specimen.sgo000001826?searchUri=filter%3Dname%26so%3Dps_group_by_genus_species%2Basc%26Query%3Dcalandrinia%2Blitoralis)]).

19, Figs. 3N–O). Otherwise, these individuals were identical to “normal” *C. vicina* plants at this locality. This is peculiar, because the sepals in most individuals of *C. vicina* at Puerto Oscuro (and many other) localities are hardly streaked at all. They are nearly completely green.

There are only two possible explanations for the black sepals: genetic mutation or backcrossing between *C. vicina* and *C. josetomasallendeana*, assuming that the latter already derived from the former. I cannot resolve this question with the data at hand. Hybridization might be evidenced better if the black-sepal form had additional traits of *C. josetomasallendeana*. But it seems notable that the black-sepal form seems to occur only here, in the presence of *C. josetomasallendeana*.

I have seen numerous populations of *C. vicina* from throughout the Coquimbo Region, and there are available on the internet numerous photos of this species (misidentified) from numerous localities (Hershkovitz, 2022a). While plants with varying degrees of reticulate sepal markings occur, I have found no record of black sepals like those of the peculiar Puerto Oscuro plants. This is significant, because the black sepals render the plants especially conspicuous, even when the flowers are closed. This ought to have increased the probability of collection/photographing if indeed this form occurred elsewhere.

Hershkovitz (2022a) suggested that more extensive reticulate sepal markings in some populations of *C. vicina* elsewhere also may reflect past hybridization/introgression. Hershkovitz (2022a) reported such forms from Chincolco (Petorca Province, Valparaíso Region). These plants also had short styles, whereas stigmas were sessile in Puerto Oscuro and Illapel populations. Thus, perhaps both the sepal markings and short style are consequent to introgression. Two other *Cistanthe* species, *C. subverticillata* and *C. trigona*, comingle with *C. vicina* in the Chincolco vicinity. Both of the first two species have styles, but the style of *C. trigona* is especially long.

## 2. Validation of *Calandrinia jompomae* Hershk.

Hershkovitz (2020b) described but did not validly publish a new species, *Calandrinia jompomae* Hershk. Hershkovitz (2022d) predicated to validate the name but did not, because the diagnosis was published in Spanish and not Latin or English. The name is validated here.

***Calandrinia jompomae* Hershk., sp. nov.** TYPE: CHILE: Los Ríos Region, Valdivia Province, Valdivia, January 1835, *C. Gay* 104 (HOLOTYPE, P! [P05276741]).

**Diagnosis.** Plants similar to species of *Calandrinia* sect. *Calandrinia* (sensu Hershkovitz, 2019a), differing from *C. bonariensis* in distribution and associated ecology in humid forest vegetation of south-central coastal Chile rather than the shrubby steppe-like vegetation of Buenos Aires Province, Argentina; differing from *C. ciliata* (Ruiz & Pav.) DC, *C. menziesii* (Hook.) Torrey & A. Gray, *C. pilosiuscula* DC, and *C. breweri* S. Watson in having longer pedicels and shorter leaves (or merely bracts) in the apical portion of the inflorescence, lacking distinct cilia along the sepal keel and margins, and having pale purple rather than pink to deep rose flowers; differing also from *C. pilosiuscula* in having more ovate rather than deltoid sepals that are basally nearly free rather than connate; differing also from *C. breweri* in having mature capsules ca. 1.5X rather than ca. 2X the length of the sepals and also being intercontinentally disjunct; differing from *C. alba* (Ruiz & Pav.) DC and *C. nitida* (Ruiz & Pav.) DC in having only bracteate nodes in the apical portion of the inflorescence rather than leafy sterile and fertile nodes throughout, and relatively smooth rather than deeply sculptured seeds; differing also from *C. nitida* in having ovate sepals and capsules rather than nearly orbicular, and pedicels deflexed rather than reflexed in fruit; differing from *C. monandra* (Ruiz and Pav.) DC in having a (superficially) racemose rather than a highly and irregularly branched inflorescence and also much larger flowers with greater numbers of petals, stamens, carpels, and ovules.

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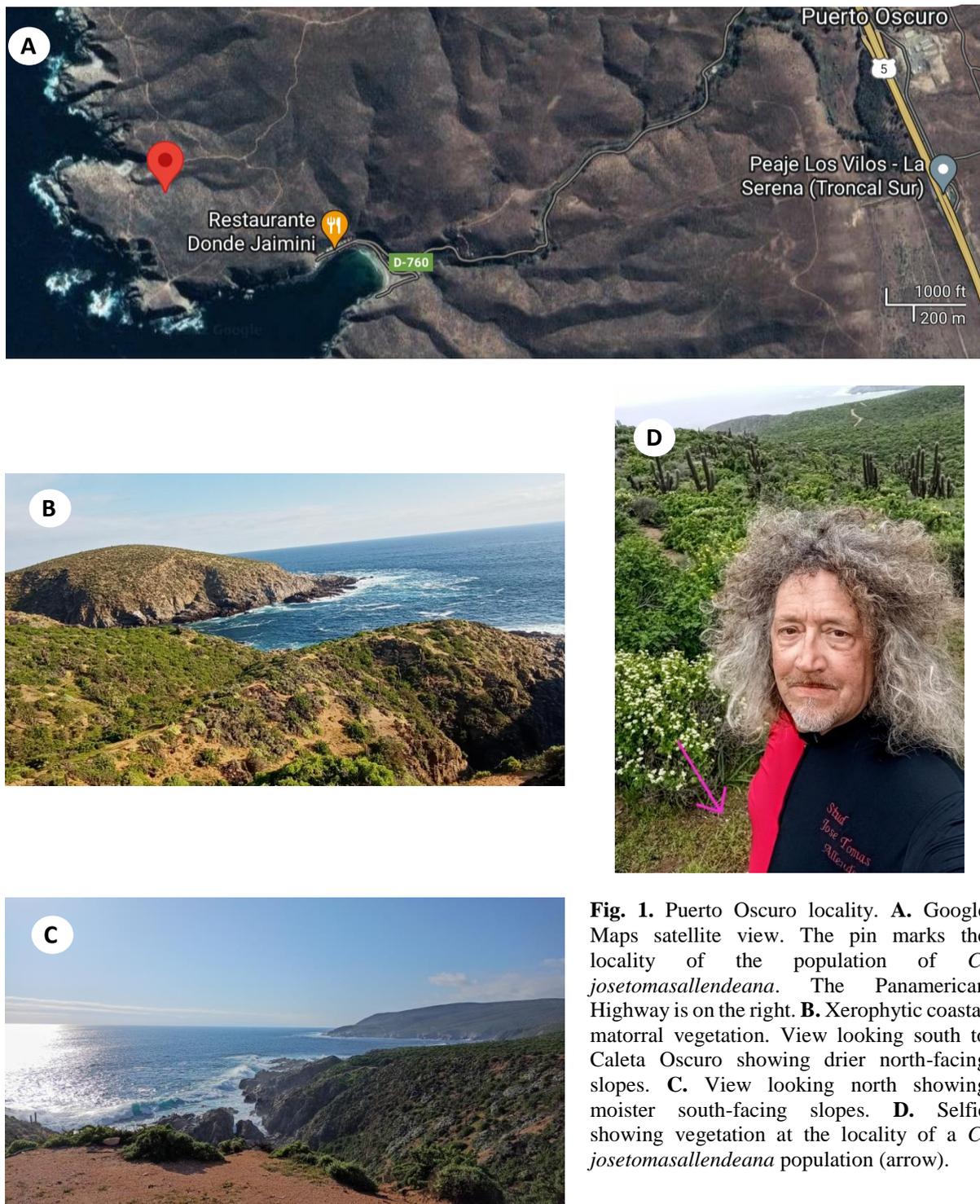
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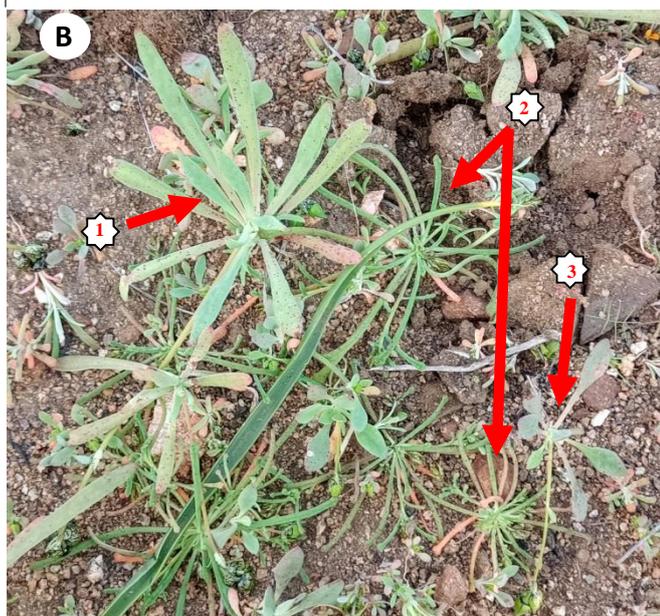
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**Table 1.** Comparison of traits of *Cistanthe vicina*, *C. josetomasallendeana*, and *C. chamissoi*. Traits of *C. josetomasallendeana* and shared traits of *C. vicina* or *C. chamissoi* are shown in bold. Sharing is indicated with arrows. Trait states unique to *C. josetomasallendeana* are indicated in brackets.

Trait	<i>C. vicina</i>	<i>C. josetomasallendeana</i>	<i>C. chamissoi</i>
Stem, leaf color	deep green	gray-yellow green =>	=> gray-yellow green
Stem length	up to ca. 30 cm <=	<= up to ca. 30 cm	up to ca. 15 cm
Leaf length	up to ca. 10 cm <=	<= up to ca. 10 cm	up to ca. 5 cm
Leaf shape	broadly petiolate, laminar portion rhombic to elliptical	linear to narrowly => linear-oblongate	=> linear to narrowly linear oblongate
Leaf texture	usually bullate	[not bullate]	bullate
Cyme branching	internodes expanding <= at anthesis and further at dehiscence	<= internodes expanding at anthesis and further at dehiscence	cyme remaining congested through flowering and fruiting
Sepal length	ca. 10 mm <=	<= ca. 10 mm	ca. 5 mm
Sepal margin	inrolled <=	<= inrolled	not inrolled
Sepal texture	opaque	lustrous =>	=> lustrous
Sepal markings	none to few lines/spots,	reticulately lined/spotted	=> densely reticulately lined/spotted
Sepal marking color	black <=	<= black	dark red
Sepal/petal length ratio	1:1	[1:1.5]	1:1
Petal length	ca. 10 mm	[ca. 15 mm]	ca. 5 mm
Stamen number	ca. 20–30 <=	<= ca. 20–30	ca. 5
Ovary length	ca. 5 mm <=	<= ca. 5 mm	ca. 1.5 mm
Ovary/style length ratio	> 10:1	[ca. 5:1]	ca. 1:1
Style length	< 1 mm	ca. 1.5 mm =>	=> ca. 1.5 mm
Stigma shape	branched <=	<= branched	Lobed
Stigma color	magenta <=	<= magenta	yellow-green
Pedicels reorienting vertically in fruit	yes <=	<= yes	no
Capsule exsertion	exserted	not exserted =>	=> not exserted
Capsule valve texture	somewhat woody at dehiscence	<= somewhat woody at dehiscence	membranous at dehiscence
Seed diameter	1 mm	[0.8 mm]	0.9 mm
Seed surface	hairy	pusticulate-tomentose =>	=> pusticulate-tomentose



**Fig. 1.** Puerto Oscuro locality. **A.** Google Maps satellite view. The pin marks the locality of the population of *C. josetomasallendeana*. The Panamerican Highway is on the right. **B.** Xerophytic coastal matorral vegetation. View looking south to Caleta Oscuro showing drier north-facing slopes. **C.** View looking north showing moister south-facing slopes. **D.** Selfie showing vegetation at the locality of a *C. josetomasallendeana* population (arrow).



**Figs. 2A–C.** *Cistanthe josetomasallendeana*. **A.** Several plants in the natural state. The apparent petal color owes to flash washout. They actually are rose. **B.** Three species growing together at the type locality: *C. josetomasallendeana* (1), *C. chamissoi* (2), and *C. vicina* (3). **C.** A small plant with a single terminal cyme.



**Figs. 2D–G.** *Cistanthe josetomasallendeana*. **D.** Cymule. Note how the abaxial sepal clasps the adaxial. Hashmarks are 1 mm. **E.** Open flowers. The background is blackened for clarity. The sepals are ca. 10 mm long and the open flower ca. 30 mm broad. Note the short style. **F.** Mature cymule. After anthesis, the pedicels reorient the young fruit laterally. During the 24 hours prior to dehiscence, the pedicel reorients the fruit vertically upwards. **G.** Open capsule showing brownish pustulate-tomentose seeds.

