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## TWO NEW SPECIES OF *ANDINIA* (PLEUROTHALLIDINAE) FROM THE CENTRAL CORDILLERA OF PERU

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**ABSTRACT.** Two new *Andinia* species are described, *A. barba-caprina* and *A. crassipetala*, both found during a botanical expedition to the montane forests of the Central Cordillera of the Peruvian Andes. They are compared with morphologically similar species, and Lankester Composite Dissection Plates (LCDP) are provided. *Andinia barba-caprina* is more similar to *A. tingomariana* but is distinguished by having obovate sepals with sparsely erose margins and the lip with narrowly obtuse, short basal lobes and a group of large hairs on the abaxial surface. *Andinia crassipetala* is distinguished from the two most similar species, *A. hernandoi* Est. Domínguez & S. Vieira-Uribe and *A. persimilis* (Luer & Sijm) Karremans & S. Vieira-Uribe for having thick, deltate and obtuse petals.

**KEY WORDS/PALABRAS CLAVE:** Andes Peruanos, *Andinia* subgénero *Andinia*, *Andinia* subgénero *Brachycladium*, *Andinia* subgenus *Andinia*, *Andinia* subgenus *Brachycladium*, Epidendroideae, Huánuco, Peruvian Andes

**Introduction.** The Pleurothallidinae subtribe, is the largest subtribe in the Orchidaceae family, with 5481 accepted species (Karremans & Vieira-Uribe 2020) distributed in the Neotropics. The genus *Andinia* (Luer) Luer (2000) is endemic to the tropical Andes. Its species are distributed from Colombia to Bolivia and can grow as epiphytes or terrestrial at mid to high elevations, from 1200 up to 3825 m of elevation (Wilson *et al.* 2017).

This genus has a complex taxonomic history, and its species have been placed in several different genera at different times. This was until Wilson *et al.* (2017) performed a molecular phylogenetic study and proposed five subgenera and two sections within the genus *Andinia*, including species that were previously treated as members of the genera *Masdevalliantha* Luer (1986), *Neooreophilus* Archila (2009), and *Xeno-*

*sia* Luer (2004). Currently, *Andinia* has 77 recognized species (Karremans & Vieira-Uribe 2020), nine of them in subgenus *Aenigma* (Luer) Karremans & Mark Wilson, five in subgenus *Andinia*, 56 in subgenus *Brachycladium* (Luer) Karremans & S. Vieira-Uribe, four in subgenus *Masdevalliantha* (Luer) Karremans & Mark Wilson and finally subgenus *Minuscula* Karremans & Mark Wilson with three species.

In South America, during the last decade, seven new *Andinia* species have been described from countries such as Colombia: *Andinia lueri* S. Vieira-Uribe & Karremans (Vieira-Uribe & Karremans 2016), *A. obesa* S. Vieira-Uribe & Karremans (Vieira-Uribe & Karremans 2017), *A. auriculipetala* S. Vieira-Uribe & N. Gutiérrez (Vieira-Uribe & Gutiérrez 2020) and *A. hernandoi* Est. Domínguez & S. Vieira-Uribe (Vieira-Uribe & Domínguez Vargas 2020); from Ecuador:

*Andinia barbata* J.Ponert, M.Portilla, Chumová & P.Trávn. (Ponert *et al.* 2020) and from Peru: *A. sunchubambensis* A.Doucette & Janovec (Doucette & Janovec 2016) and *A. tingomariana* A.G.Diaz & Mark Wilson (Díaz *et al.* 2018).

In Peru, a botanical expedition carried out by the authors in 2019 to the montane forests of the Mariano Dámaso Beraún and Chaglla districts in the Huánuco region, resulted in the discovery of two new *Andinia* species, one of them in the subgenus *Andinia* and the other in the subgenus *Brachycladium* sect. *Amplectentes*. Both species are described and illustrated here.

**Material and methods.** Specimens were recorded in situ using Canon® Rebel T3 and EOS 7D Mark II cameras equipped with a Canon EF 100mm f/2.8L Macro USM lens. Plants were dissected under an AY11230 Barska trinocular stereo microscope. Living floral and vegetative structures were photographed with an EOS 7D Mark II camera equipped with a Canon EF 100mm f/2.8L Macro USM and Raynox DCR-250 super macro snap-on lens. Obtained images were used to prepare Lankester composite dissection plates (LCDP) using Adobe Photoshop®.

Descriptions were prepared from living specimens, which have been then dried and flowers preserved in alcohol and glycerin. Specimens were deposited in USM herbarium.

#### TAXONOMIC TREATMENT

*Andinia barba-caprina* Ocupa & S.Vieira-Uribe, *sp. nov.* (Fig. 1, 2B–C).

**TYPE:** Peru. Huánuco: Leoncio Prado Province, Mariano Dámaso Beraún district, Caserío Corazón de Jesús, 1,590 m, 21 October 2019, *Martel et al.* 95 (holotype: USM-Spirit!).

**DIAGNOSIS:** *Andinia barba-caprina* is morphologically similar to *A. tingomariana* A.G.Diaz & Mark Wilson, but is distinguished by having a sub-obovate dorsal sepal with slightly erose margins (*vs.* elliptical, entire), broadly obovate lateral sepals with slightly erose margin (*vs.* elliptical, ciliate) and the lip with narrowly obtuse, short basal lobes (*vs.* long basal lobes, oblong to

narrowly triangular) and abaxially with a group of long hairs (*vs.* briefly ciliate).

**Plant** epiphytic, ascending, up to 3.5 cm tall. **Rhizome** up to 2.3 mm between ramicauls. **Ramicaul** abbreviated, terete, 3.1–3.4 mm long, enclosed by 2 tubular, ribbed sheaths. **Leaf** erect, elliptic, up to 13.9 × 3.7 mm, the apex emarginate with an abaxial mucro, the base cuneate into a petiole *ca.* 1 mm long. **Inflorescence** a lax, successively few flowered raceme up to 12 mm long including the slender peduncle, floral bracts conical, acute, 0.9 mm long, pedicels 2.4 mm long. **Ovary** yellowish green, terete, costate, 1.9 mm long. **Flowers** with the sepals yellow with a scarlet basal, central blotch; the petals scarlet-orange and the lip amber with scarlet margins; the column scarlet with a white and burgundy apex, the anther cap white and burgundy. **Sepals** 3-veined, puberulous, sparsely erose, shortly caudate, abaxially carinate along the central vein; **dorsal sepal** sub-obovate, shallowly concave, 5.5 × 3.3 mm, almost free; **lateral sepals** broadly obovate to elliptical, 5.3 × 3.5 mm connate for *ca.* 1.2 mm. **Petals** reniform, puberulous, sparsely long ciliate, unguiculate, obtuse, 0.6 × 1.3 mm. **Lip** sub-reniform and laterally constricted when expanded, 3-veined, puberulous, long ciliate, rounded, 1.8 × 1.8 mm expanded, with short, erect, narrowly obtuse basal lobes embracing the column, abaxially with a group of long hairs along the mid vein up to 1.8 mm long, adnate to the apical third of the column. **Column** terete, slightly dilated apically, microscopically pubescent, 2.9 mm long including the rostellum, anther apical, stigma apical, rostellum antrorse. **Pollinia** two, yellow, pyriform, with a viscidium. **Anther cap** elliptic, cucullate, white at the base, and vinaceous towards the top.

**ETYMOLOGY:** The epithet *barba-caprina*, is the combination of the Latin words *barba* (beard) and *caprinus* (goat), in allusion to the tuft of long hairs hanging from the lower jaw of goats, commonly known as goat beard; in comparison to the long hairs near the base of the lip of this species.

**DISTRIBUTION, HABITAT AND ECOLOGY:** *Andinia barba-caprina* grows in secondary forests of the “yungas fluviales” ecoregion, distributed in the eastern side of the central cordillera of the Peruvian Andes, in caserío Corazón de Jesús, province of Leoncio Prado, Huánuco

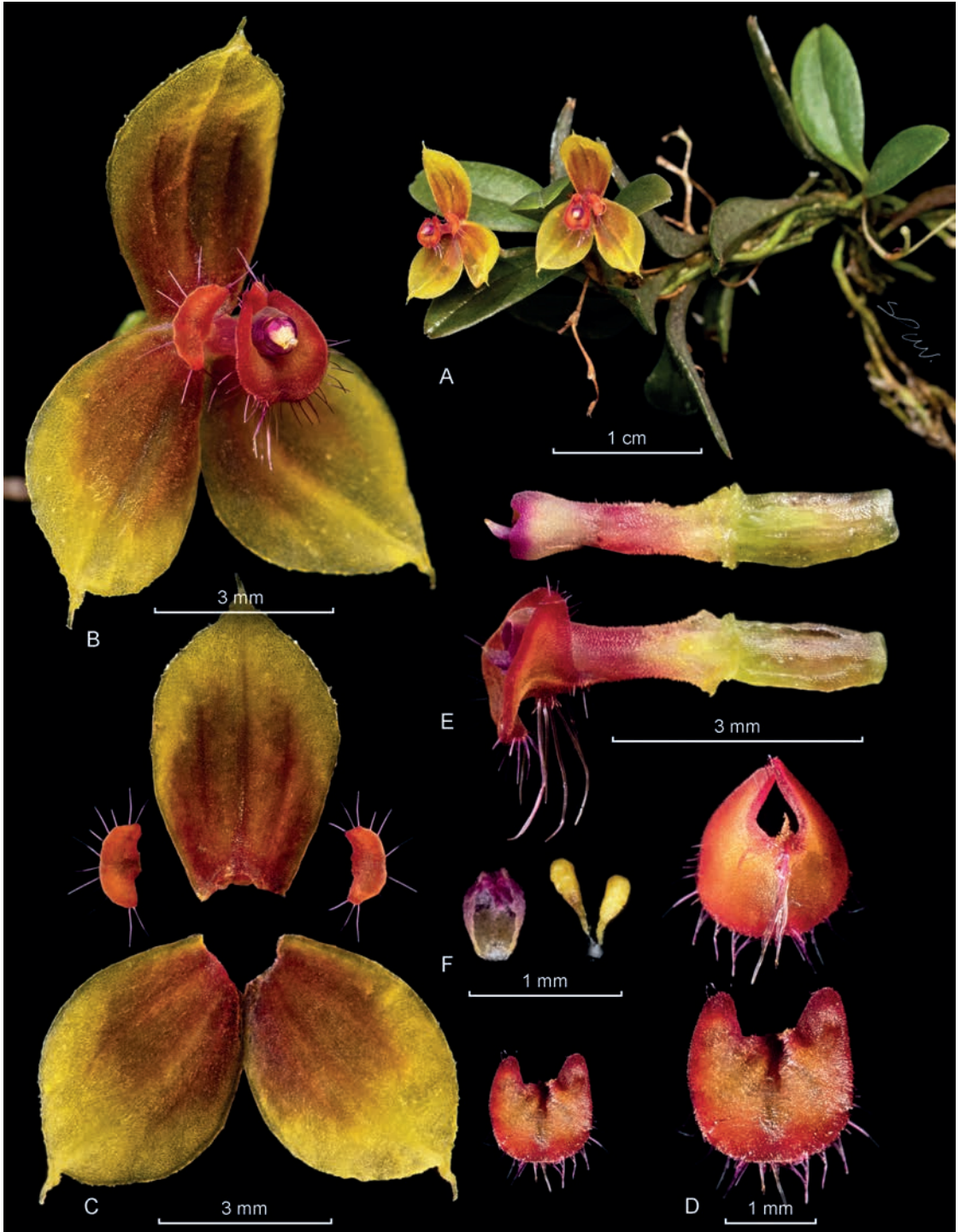


FIGURE 1. Lankester composite dissection plate of *Andinia barba-caprina* Ocupa & S.Vieira-Uribe. **A.** Habit. **B.** Flower. **C.** Dissected perianth. **D.** Lip, abaxial and adaxial view. **E.** Ovary and column with and without lip. **F.** Anther cap and pollinia. Photographed and prepared by S. Vieira-Uribe from the plant that served as type.

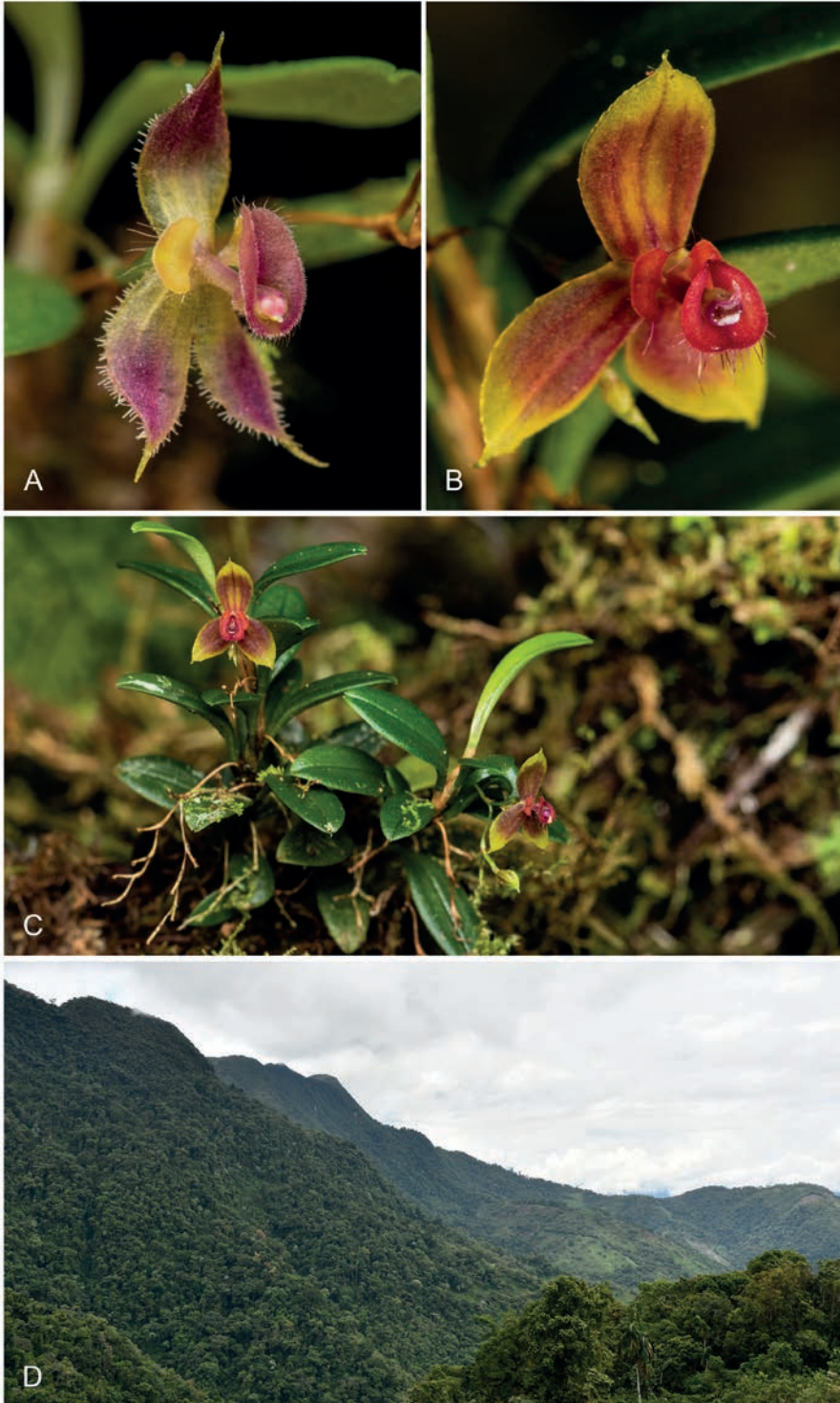


FIGURE 2. Comparison of species. **A.** *Andinia tingomariana*. **B.** *A. barba-caprina*. **C.** *A. barba-caprina* growing *in-situ*. **D.** Habitat of *A. barba-caprina*. Photographs by S. Vieira-Uribe (A–C) and Luis E. Yupanqui (D).

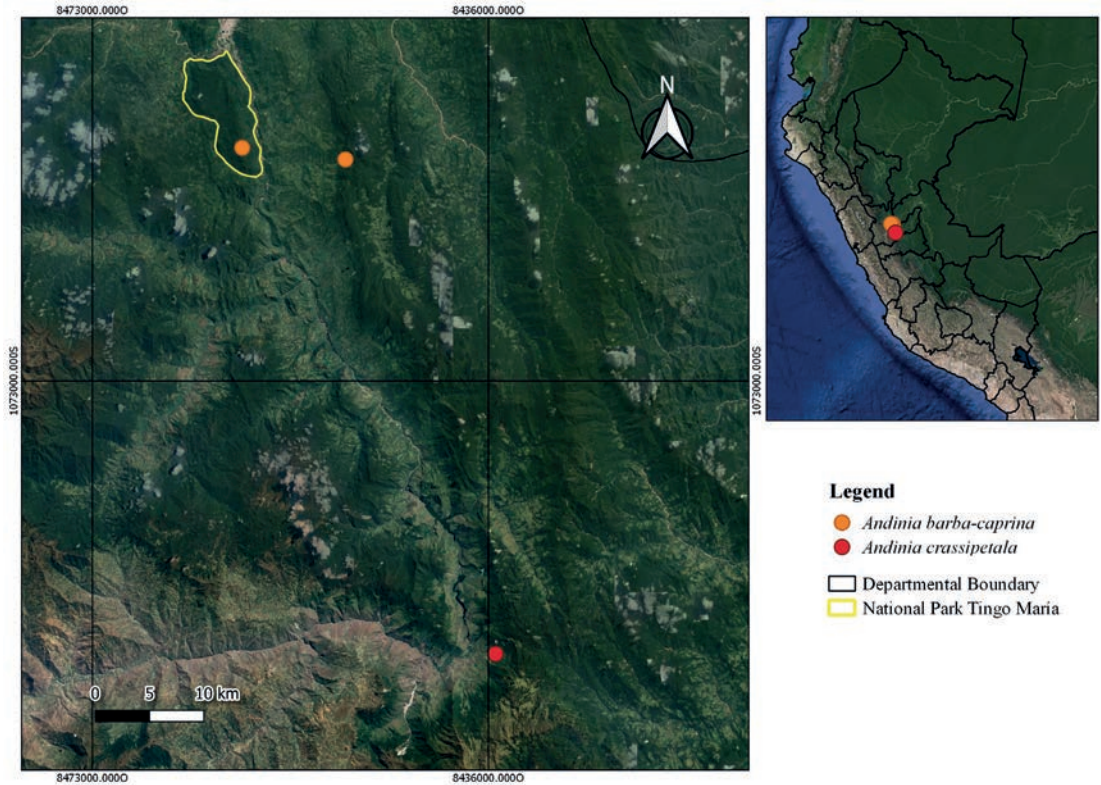


FIGURE 3. Map showing the localities of *Andinia barba-caprina* Ocupa & S.Vieira-Uribe and *A. crassipetala* S.Vieira-Uribe & Ocupa. Map prepared by L. Ocupa Horna.

co (Fig. 3), at an elevation of 1590 m. It has been found growing as an epiphyte in the bark of *Cyathea andina* Domin, in a very humid montane forest (Fig. 2D). It has also been reported in the Tingo María National Park, which is located within a steep area in the chain of mountains known as Bella Durmiente, 10 km from the locality of the type, where it grows as epiphyte on branches of bushes, in sympatry with *Andinia tingomariana*. It was observed that the flowering of this species occurs between September and October.

*Andinia barba-caprina* belongs to the *Andinia* subgenus and is most similar to the recently described *A. tingomariana*, both from a vegetative and floral point of view, sharing traits such as abbreviated ramicauls, erect leaves, reniform and puberulous petals with long ciliated margins and a column terete, microscopically pubescent and slightly dilated at the apex. However, *Andinia barba-caprina* is clearly distinguished from *A. tingomariana* by presenting yel-

low flowers with a central scarlet basal spot (*vs.* light yellow and apricot flowers), sub-obovate dorsal sepal with slightly erose margins (*vs.* elliptic, entire), broadly obovate lateral sepals with slightly erose margin (*vs.* elliptical, ciliate) and the lip with narrowly obtuse, short basal lobes (*vs.* long basal lobes, oblong to narrowly triangular) and abaxially with a group of long hairs (*vs.* briefly ciliate). (Fig. 2).

***Andinia crassipetala*** S.Vieira-Uribe & Ocupa, *sp. nov.* (Fig. 4).

**TYPE:** Peru. Huánuco: Pachitea province, Chaglla district, Muña to Monopampa road, 2150 m, 19 October 2019, *Martel et al. 96* (holotype, USM-Spirit!).

**DIAGNOSIS:** *Andinia crassipetala* is most similar to *A. hernandoi* Est.Domínguez & S.Vieira-Uribe and *A. persimilis* (Luer & Sijm) Karremans & S.Vieira-Uribe, but is easily distinguished by having thick, deltate, ob-

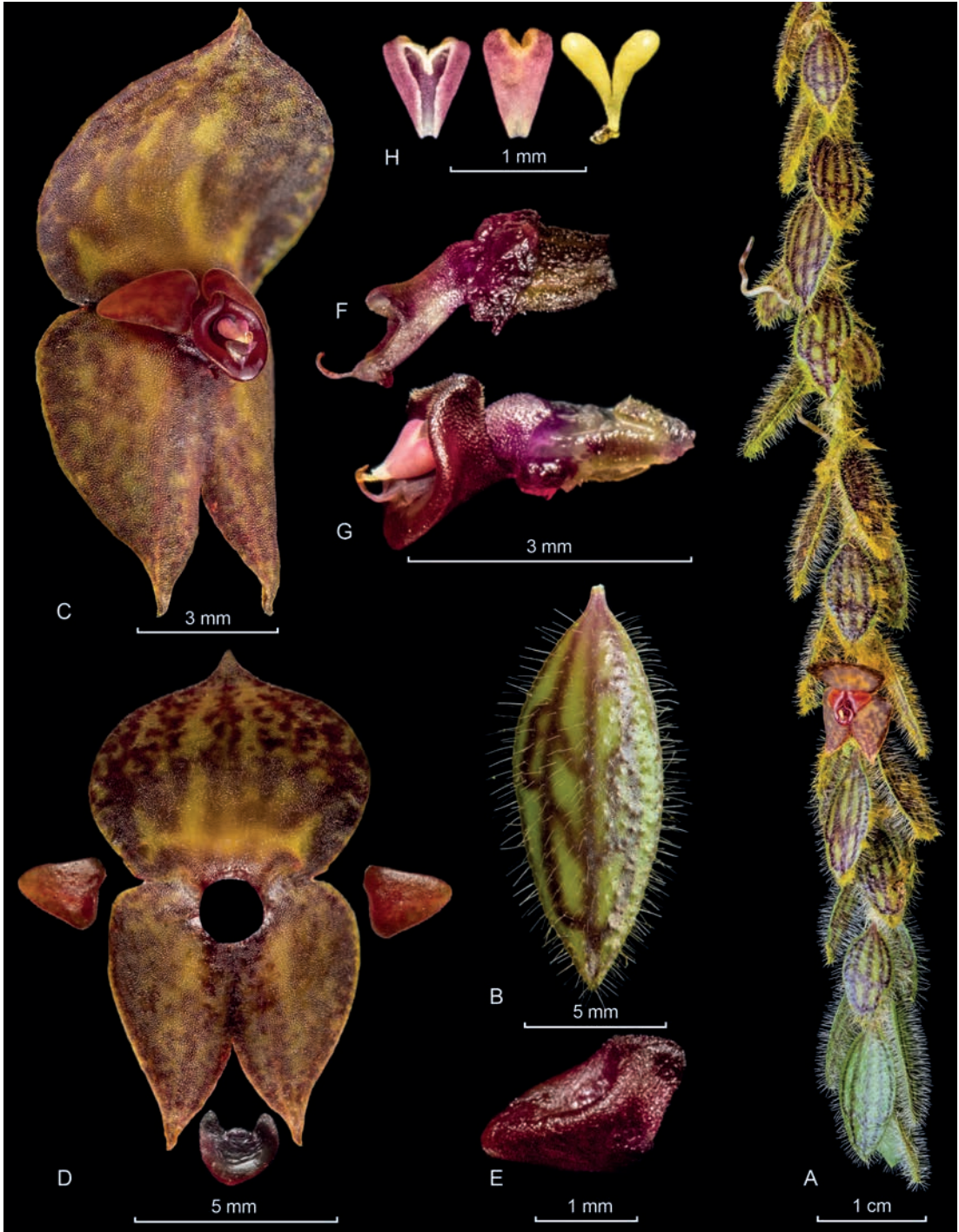


FIGURE 4. Lankester composite dissection plate of *Andinia crassipetala* S.Vieira-Uribe & Ocupa. **A.** Habit. **B.** Leaf. **C.** Flower, oblique view. **D.** Dissected perianth. **E.** Lip, side view. **F.** Ovary and column (anther cap absent), side view. **G.** Ovary, column and lip (anther cap present), side view. **H.** Anther cap and pollinia. Photographed and prepared by S. Vieira-Uribe from the plant that served as type.

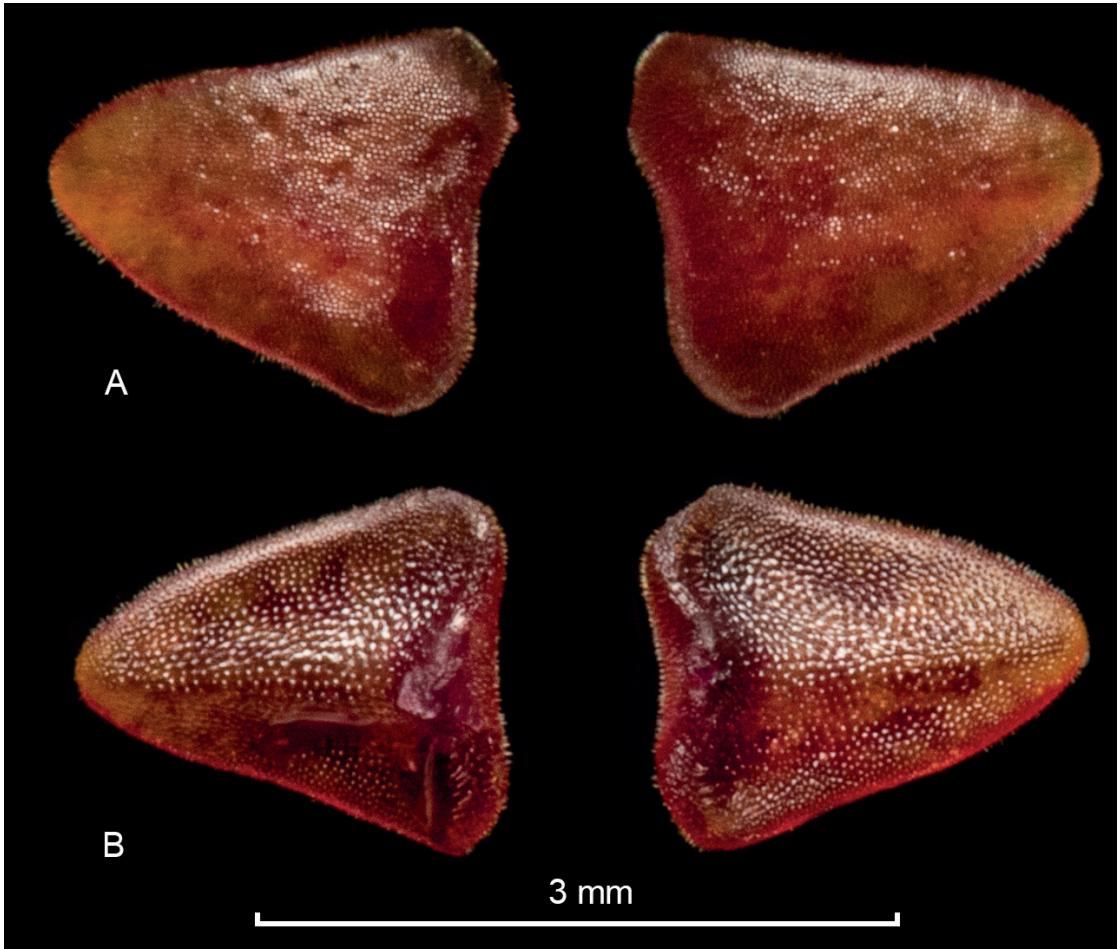


FIGURE 5. Detailed view of the petals of *Andinia crassipetala* S. Vieira-Uribe & Ocupa. **A.** Adaxial view. **B.** Abaxial view. Photographed and prepared by S. Vieira-Uribe from the plant that served as type.

tuse petals (*vs.* trifurcate in *A. hernandoi* and oblong-triangular, subacute in *A. persimilis*).

*Plant* epiphytic, pendent, long repent, up to 43 cm. *Stem* occasionally branching, 2.4–2.5 mm long between ramicauls, each segment enclosed by two infundibular, imbricating, membranaceous, pilose sheaths with pilose dilated ostia. *Roots* slender, *ca.* 0.5 mm in diameter. *Ramicauls* *ca.* 1 mm long, enclosed by a single, infundibular, membranaceous, pilose sheath with pilose dilated ostia. *Leaves* suffused with purple along the reticulate veins, lanceolate, thickly coriaceous, pilose, acute, 13.9–14.8 × 5.7–6.3 mm, the base narrowing into a petiole *ca.* 0.5 mm long. *Inflorescence* a congested, successive raceme of up to 2 flowers, placed above the leaf, *ca.* 4.3 mm long including the

1.8 mm long pedicel. *Floral bract* infundibular, membranaceous, pilose along the margins, *ca.* 1 mm long. *Ovary* costate, *ca.* 1 mm long. *Flowers* with saffron sepals irregularly spotted with maroon, orange-red petals and claret lip, the column vinaceous with a vinaceous anther cap suffused with amber and white. *Dorsal sepal* sub-orbicular, shallowly concave, marginate, acuminate, 5-veined, 5.7 × 7.0 mm, connate to the lateral sepals for about 1.5 mm. *Lateral sepals* ovate, slightly convex, marginate, acuminate, 3-veined, connate for about 2.4 mm into a bifid synsepal 6.6 × 6.2 mm when expanded. *Petals* deltate, thick, puberulous, the apex and basal lobes obtuse, 2.0 × 1.8 mm. *Lip* reniform, 3-veined, marginally and abaxially puberulous, rounded, 1.5 × 2.0 mm expanded, with short, erect,





FIGURE 6. Comparison of *Andinia crassipetala* S.Vieira-Uribe & Ocupa with its most similar species. **A.** *A. crassipetala*. **B.** *A. hernandoi*. **C.** *A. persimilis*. **D.** *A. pilosella*. Photographs by S. Vieira-Uribe (A–B, D) and Ron Parsons (C).

obtuse basal lobes, embracing the column, adnate to the base of the column. *Column* terete, the anther and stigma apical, *ca.* 2.1 mm long including the antrorse, conspicuous rostellum. *Pollinia* two, yellow, obovoid, brought together by a drop-like viscidium. *Anther cap* cordate, cucullate.

ETYMOLOGY: From the Latin *crassus* (thick) and *petalum* (petals), in reference to the distinctively thick petals (Fig. 5).

DISTRIBUTION, HABITAT, AND ECOLOGY: *Andinia crassipetala* has only been seen at the type locality (Fig. 3), where it was first seen and photographed by Stig Dalström and Steve Beckendorf in 2014, and in 2019, when the authors visited the same place and were able to find a few plants growing as epiphyte, together with *Dracula saulii* Luer & Sijm on the branches of a small tree, about 50 cm above the ground, in the edge of the secondary forest bordering the road to Monopampa village at an elevation of 2150 m.

*Andinia crassipetala* is most similar to *A. hernandoi* and *A. persimilis*, sharing with them pilose leaves, an orbicular or sub-orbicular and concave dorsal sepal, and a bifid synsepal, but is differentiated by having thick, deltate petals. The only other species with lanceolate, pilose leaves supposedly found in Peru is *Andinia pilosella* (Rchb.f.) Karremans & S.Vieira-Uribe (Luer 1994) but it is easily distinguished from *A. crassipetala* because it has an orbicular, deeply concave dorsal sepal that is considerably larger than the synsepal (*vs.* sub-orbicular, shallowly concave, acuminate dorsal sepal, similar in size to the synsepal) and glabrous, narrowly triangular to linear-oblong petals (*vs.* thick, puberulous, deltate petals) (Fig. 6).

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