A new species of Andinia (Orchidaceae, Pleurothallidinae) from Huánuco, Peru, and the first Peruvian locality for Andinia schizopogon

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Abstract

A new species of Andinia in subgenus Andinia from Tingo María National Park is described, illustrated and compared to the most similar species pair. Andinia tingomariana is distinguished by unguiculate, reniform, ciliate petals, a longer column without the terminal dilation and a trilobed, ciliate lip in which the narrow, semi-auriculate lateral lobes project upward around the column, adnate in the middle, creating a furrowed surface. The floral morphology of the new species is compared to that of the phylogenetically unrelated Salpistele group of Stelis and possible convergent evolution of pollination syndromes is discussed. Finally, the first confirmed locality of A. schizopogon is reported and a preliminary list of Andinia species in Peru is provided.

Keywords: Andinia, Peruvian orchid flora, Salpistele, Stelis, pleurothallid taxonomy

Introduction


Andinia (Luer) Luer (2000: 5) was recently re-circumscribed based on phylogenetic analysis to contain 72 species in five subgenera: Aenigma, Andinia, Brachycladium, Masdevalliantha and Minuscula (Wilson et al. 2017). Species of this genus are confined to the Andes and distributed from northern Colombia to northern Bolivia. Of relevance

Recently, during exploration of Tingo María National Park, Department of Huánuco, Peru, a plant was collected that belongs to *Andinia* subgenus *Andinia*, but which bore even more resemblance to the species of *Salpistele* than does either *A. dielsii* or *A. pensilis*. The species is here described and compared morphologically to other members of the subgenus. We speculate on the remarkable convergence to similar floral morphology between the new species and species of *Salpistele*, now part of *Stelis* (Karremans et al. 2013). Additionally we report the first confirmed occurrence of *Andinia schizopogon* (Luer 1979: 179) Pridgeon & Chase (2001: 251) in Peru and provide a preliminary list of Peruvian *Andinia* species.

**Materials and Methods**

The plant material was collected in Tingo María National Park, Huánuco, Peru (Fig. 5). Photographs *in situ* were taken with a Nikon D5000 with a 105 mm Nikkor Macro lens. A flower was dissected to allow measurement and was examined and photographed using an Alpha Optics stereomicroscope with an 8 MP camera on a Motorola Moto G cellphone. The specimen was drawn using a Rotring Rapidograph and 0.1 mm bond paper 75 g. The sample was deposited at HUT. The plant was compared to all species of *Andinia* in subgenera *Aenigma*, *Andinia*, *Masdevalliantha* and *Minuscula* to determine its novelty and with species of the former genus *Salpistele* for the discussion of convergent evolution. In particular, the new species was compared in detail to the most similar species *Andinia dielsii* and *Andinia pensilis* (Table 1).

<table>
<thead>
<tr>
<th>TABLE 1. Comparison (all in mm) of <em>Andinia tingomariana</em> with <em>A. pensilis</em> and <em>A. dielsii</em>.</th>
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</thead>
<tbody>
<tr>
<td><strong>Andinia tingomariana</strong></td>
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<tr>
<td>Whole flower</td>
</tr>
<tr>
<td>Dorsal sepal</td>
</tr>
<tr>
<td>Synsepal</td>
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<tr>
<td>Petals</td>
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<tr>
<td>Column length</td>
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<td>Labellum</td>
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</table>

**Taxonomy**

*Andinia tingomariana* A.Diaz & MarkWilson, *sp. nov.* (Figs. 1–5)

Type:—PERU. Huánuco: Tingo María National Park, districts of Mariano Dámaso Beraun and Rupa Rupa of the Province of Leoncio Prado of the Huánuco Region, Peru, S9.34238° W76.00451°, 1285 m, 12 March 2017, Diaz, Ocupa & Yupanqui (holotype: HUT!).

*Andinia tingomariana* is distinguished from the most closely related species, *A. dielsii*, by a number of attributes, including a smooth ovary versus echinate in *A. dielsii*, unguiculate, reniform, ciliate petals versus narrowly linear, non-ciliate in *A. dielsii*; a longer column ~2.5 mm versus ~2 mm in *A. dielsii*, an undilated column apex versus dilated into a flattened, ovate extension in *A. dielsii* and attachment to the lip on terminal third of the column versus half-way in *A. dielsii*.

Epiphytic herbs, 4.0–7.5 cm tall. Rhizome 2–3 mm between ramicauls. Ramicaul abbreviated, 12–21 × 2–4 mm, enclosed by 1 or 2 tubular, ribbed sheaths. Leaf conduplicate, erect, oblong to subacute, smooth, the base cuneate, trinervate, and apex minutely tridentate, petiole 2–3 mm long. Inflorescence successively several 1–6-flowered, arching, raceme to 3 cm long, floral bracts oblique, acuminate, 1 mm long; pedicels 2 mm long. Ovary smooth, furred, 1.20 × 0.65 mm; sepals yellow to orange, intensifying towards apices becoming violet, margins irregularly ciliate, carinate, triveined, dorsal sepal elliptic, concave, slightly acuminate, 5.0 × 1.5 mm, lateral sepals free, oblique,
flat, 5.0 × 1.4 mm, apices acute, acuminate; petals yellow to orange, bilobed, reniform, unguiculate, obtuse, long cilia, 1.2 × 1.0 mm; lip violaceous reddish, trilobed, reniform, triveined, 4.0 × 1.5 mm, finely ciliate, slightly expanded in the centre, geniculate, apex rounded, surrounding the column, to which it joins adaxially in the outer third with a thin ciliate claw. Column orange-purple, terete, minutely ciliate, 2.5 mm long, slightly dilated apically, anther subapical, stigma subapical, bilobed; capsule not observed.

**FIGURE 1.** *Andinia tingomariana*. A. Ovary, column and labellum. B. Whole flower (partial side view). C. Whole plant. D. Corolla. E. Labellum. Drawn from material used to prepare the holotype by Alex Diaz.

FIGURE 3. *Andinia tingomariana* in situ on a liana. Photograph by Alex Diaz.
FIGURE 4. *Andinia tingomariana* in situ with mosses and *Selaginella*. Photographs by Alex Diaz.

FIGURE 5. Type locality of *Andinia tingomariana* (red star) in Tingo María National Park (hatched), Huánuco, Peru.
**Etymology:**—Named for the type locality in Parque Nacional Tingo María, Huánuco, Peru (Fig. 5).

**Distribution and habitat:**—To date, *A. tingomariana* has only been observed in this one location, a mountain range running longitudinally north-south through Tingo Maria National Park. *Andinia tingomariana* was observed growing epiphytically among mosses and *Selaginella* on tree trunks and vines (Figs. 3–4), in a humid forest exposed to moisture-laden winds at an elevation of 1285 m in the same habitat as *Cranichis muscosa* Swartz (1788: 120) and *Masdevallia concinna* König (1982: 101).

**Conservation status:**—Although the type locality of *Andinia tingomariana* is in a protected area, Tingo Maria National Park, the limited number of plants observed and distribution suggest that it may be vulnerable. However, until further information on distribution and abundance can be collected it should be listed as Data Deficient according to IUCN criteria.


**PERU:**—Cajamarca: Province of Chota, District of Querecoto, Bosque de Protección Pagaibamba (BPP) *Diaz* (HUT!).

**Taxonomic notes:**—*Andinia tingomariana* described here (Figs. 1–4) is remarkable for the resemblance of the flowers to those of members of the former genus *Salpistele* (Fig. 6), now part of *Stelis* (Karremans et al. 2013). The *Salpistele* group currently contains five species: *Stelis deutoadrianae* Shaw (2014: 77; syn. *Salpistele adrianae* Luer & Sijm in Luer, 2009: 18; Fig. 6a), *Stelis brunnea* (Dressler) Pridgeon & Chase (2001: 261) (syn. *Salpistele brunnea*; Fig. 6b), *Stelis maculata* Pridgeon & Chase (2002: 99; syn. *Salpistele lutea*; Figs. 6c) and *Stelis gnoma* Pridgeon & Chase (2002: 99; syn. *Salpistele parvula*; Fig. 6d). The floral morphology of the group is unique in *Stelis*, the flowers exhibiting a longer than usual column, modified with a flattened extension at the apex with a clasping lip in which the lateral lobes project above the column on both sides. Presumably the unique morphology in this group reflects a different pollination syndrome from the other clades of *Stelis*. Comparing *Andinia dielsii* (Figs. 7a, 8b) and *A. pensilis* (Figs. 7b, 8c) to these *Salpistele* species, it is not difficult to see why Luer initially placed these two *Andinia* species in *Salpistele*. However, *A. dielsii* and *A. pensilis* are not phylogenetically closely related to the *Salpistele* clade of *Stelis* (Wilson et al. 2017).

Floral morphology of the new species, *Andinia tingomariana* (Figs. 1–4, 8a) resembles that of the *Salpistele* group of *Stelis* (Fig. 6), particularly that of *Stelis maculata* (Figs. 6c, 8d), even more than do those of *A. dielsii* (Figs. 7a, 8b) and *A. pensilis* (Figs. 7b, 8c). Although *A. tingomariana* does not exhibit the columnar apical dilation seen in *A. dielsii*, *A. pensilis* and the *Salpistele* species, it is possible that the furrowed surface created by the adnate lateral lobes of the lip serves a similar purpose during pollination. Presumably, the similar floral morphologies between the *Salpistele* group of *Stelis* and these three *Andinia* species represent convergent evolution due to similar pollination syndromes. Such convergent evolution has been observed also between *Andinia* subgenus *Brachycladium* and *Lepanthes*, in which pollination through sexual deceit (pseudocopulation by male dipterans) has resulted in similar floral morphology in phylogenetically distant clades (Wilson et al. 2017). However, to date, no pollination data have been reported for either *Salpistele* group of *Stelis* or *Andinia* subgenus *Andinia*, so we can do no more than speculate.

The species described here, *Andinia tingomariana*, has been illustrated previously as *Andinia* sp. in a regional field guide for Tingo Maria National Park (Ocupa Horna et al. 2017) but to our knowledge has not been observed, recorded or illustrated elsewhere. This brings the number of *Andinia* species recorded for Peru to nine (Table 2). Among these species *Andinia schizopogon* is tentatively recorded for Peru by Luer (1994) “Without collection data, flowered in cultivation at Heidelberg Botanical Garden, Senghas 799 (HEID).”, however, no record of this collection can be found at HEID (Sack, pers. comm.). Here we report the first confirmed location of *A. schizopogon* in Peru, in the regions of Cajamarca (Fig. 9) and San Martín. To date, only two species from subgenus *Aenigma* have been recorded for Peru, the aforementioned *A. schizopogon* and the recently described *A. sunchambensis* Doucette & Janovec (2016: figs. 1–3; homotypic synonym *A. wayzechensis* Martell, Collantes, Maire & Thoerle 2016: 291). However, it would be surprising if the species *Andinia dalstroemii* (Luer 1984: 52) Pridgeon & Chase (2001: 251), *Andinia pentamytera* (Luer 1994: 58) Pridgeon & Chase (2001: 251) and *Andinia pogonion* (Luer 1994: 61; Pridgeon & Chase 2001: 251), which occur in the neighboring Ecuadorian provinces of Loja and Zamora Chinchipe, do not also occur in Amazonas and Cajamarca.

**FIGURE 9.** *Andinia schizopogon* in situ, region of Cajamarca, Peru. Photographs by Alex Diaz.

**TABLE 2.** A preliminary list of records for the genus *Andinia* in Peru.

<table>
<thead>
<tr>
<th>Species</th>
<th>Subgenus</th>
<th>Localities</th>
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<tbody>
<tr>
<td><em>Andinia caveroi</em> (Bennet &amp; Christenson 2001: 670)</td>
<td>Brachycladium</td>
<td>Condorcanqui, Amazonas</td>
</tr>
<tr>
<td>Karremans &amp; Uribe in Wilson et al. (2017: 124)</td>
<td></td>
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<tr>
<td><em>Andinia erepsis</em> (Luer &amp; Hirtz 1986: 215)</td>
<td>Brachycladium</td>
<td>San Ignacio, Cajamarca</td>
</tr>
<tr>
<td>Karremans &amp; Uribe in Wilson et al. (2017: 124)</td>
<td></td>
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<tr>
<td><em>Andinia longiserpens</em> (Schweinfurth 1942: 183)</td>
<td>Masdevalliantha</td>
<td>Huanta, Ayacucho; Huancavelica</td>
</tr>
<tr>
<td>Karremans &amp; Wilson in Wilson et al. (2017: 126)</td>
<td></td>
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<tr>
<td><em>Andinia pholeter</em> (Luer 1994: 33)</td>
<td>Brachycladium</td>
<td>La Peca, El Parco, Amazonas</td>
</tr>
<tr>
<td>Karremans &amp; Uribe in Wilson et al. (2017: 125)</td>
<td></td>
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<tr>
<td><em>Andinia spiralis</em> (Ruiz &amp; Pavon 1798: 237)</td>
<td>Andinia</td>
<td>Amazonas; Ancash; Ayacucho; Cajamarca; Huancavelica; Lambayeque, Incahuasi; Piura, Huarmaca, Huancabamba</td>
</tr>
<tr>
<td>Karremans &amp; Wilson in Wilson et al. (2017: 126)</td>
<td></td>
<td></td>
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<tr>
<td><em>Andinia sunchubambensis</em> Doucette &amp; Janovec (2016: 1)</td>
<td>Aenigma</td>
<td>Wayqecha, Paucartambo, Cusco</td>
</tr>
<tr>
<td><em>Andinia tingomariana</em> Diaz &amp; Wilson (this publication)</td>
<td>Andinia</td>
<td>Tingo Maria, Leoncio Prado, Huánuco</td>
</tr>
</tbody>
</table>
Acknowledgements

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References


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