 doi: http://dx.doi.org/10.15517/3am3kd25

A NEW SPECIES OF *CHLORAEA* (CHLORAEINAE)

Delsy Trujillo[1,3] & Luis Ocupa-Horna[2]

[1]Herbario San Marcos (USM), Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Av. Arenales 1256, Jesús María, Lima, Perú.

[2]Herbario Pedro Ruiz Gallo (PRG), Universidad Nacional Pedro Ruiz Gallo, Calle Juan XXIII 391, Lambayeque, Lambayeque, Perú.

[3]Author for correspondence: delsytrujillo@gmail.com

Abstract. In Peru, *Chloraea* previously included five species. However, recent field explorations and herbarium specimen revisions have led to the discovery of a new species from northern Peru. Here, we describe and illustrate *Chloraea aequatorialis*, the species with the most northern distribution recorded for the genus, ranging from 5º50’ to 7º56’ S. The new species closely resembles *C. septentrionalis*, with which it grows partly in sympatry in the departments of Cajamarca and La Libertad, but it can be easily distinguished by its larger sepals and petals, a lip disc covered by thin, narrow, and long appendages, a longer lip claw, column, and anther, and a shorter stigma. We provide information on the habitat, distribution, and conservation status of the new species, along with an updated description of *C. septentrionalis* and a key to the Peruvian species of *Chloraea*.

Resumen. En Perú, *Chloraea* estaba conformado por cinco especies. Sin embargo, recientes exploraciones de campo y la revisión de ejemplares de herbario han permitido descubrir una nueva especie del norte del Perú. Aquí describimos e ilustramos a *Chloraea aequatorialis,* la especie con la distribución más al norte registrada para el género, entre los 5º50’ y 7º56’ S. La nueva especie es más similar a *C. septentrionalis*, con la que crece parcialmente en simpatría en los departamentos de Cajamarca y La Libertad, pero se diferencia fácilmente de esta por tener sépalos y pétalos más grandes, disco del labelo cubierto por apéndices largos, delgados y angostos, la uña del labelo, columna y antera más largas, y el estigma más corto. Proporcionamos información sobre el hábitat, distribución y estado de conservación de la nueva especie, una descripción actualizada de *C. septentrionalis* y una clave para las especies peruanas de *Chloraea*.

Keywords / Palabras clave: Andes peruanos, *Chloraea aequatorialis*, *Chloraea septentrionalis*, Orchidaceae, Peruvian Andes, taxonomía, taxonomy

Introduction. The South American genus *Chloraea* Lindl., with 52 species, is the largest of the subtribe Chloraeinae (Trujillo *et al*., 2023). It is distributed in disjunct areas from northern Peru and southeastern Brazil to southern Chile and Argentina, including the Falkland Islands (Cisternas *et al*., 2012; Correa, 1969). The genus consists of terrestrial herbs with several leaves in a basal rosette or spirally arranged along the stem. The roots are fleshy and fasciculate. The inflorescence is terminal, the peduncle is covered with several bracts similar to the leaves, and the raceme consists of few to many resupinate, white, greenish, yellow or orange flowers often with longitudinal or reticulate contrastingly colored nerves, or warts. The sepals and petals are free. The lip is clawed, entire, 3-lobed or pandurate, recurved, commonly provided with crests, warts, keels, or appendages, margins entire or pinnately divided, toothed or wavy. The column is elongate, arcuate, with narrow wings. The anther is terminal, erect or slightly incumbent, with a reflexed apex and bilocular. The stigma is ventral, concave, entire, ovate or oblong (Cisternas *et al*., 2012; Correa & Sánchez, 2003).

In Peru, *Chloraea* previously included five species: *C. densipapillosa* C. Schweinf., *C. multilineolata* C. Schweinf., *C. pavonii* Lindl., *C. reticulata* Schltr., and *C. septentrionalis* M.N. Correa. Except for *C. reticulata*, which also occurs in Bolivia and Argentina, they are endemic to the country (Roque & León, 2006). The species inhabit forest relicts, shrublands on rocky slopes of the dry inter-Andean valleys, and the Lomas formation in the desertic, coastal lowlands (Trujillo & Paredes-Burneo, 2020; Trujillo *et al.*, 2023).

ORCID of the Author: DT, LOH
Received 19 May 2025; accepted for publication 15 July 2025. First published online: 18 August 2025.

Chloraea septentrionalis, has the northernmost distribution recorded for the genus. This species occurs in the northwestern Peruvian Andean valleys, between 7º and 8º S, in the departments of Cajamarca and La Libertad. However, a recent botanical survey conducted by one of the authors (LO-H) in the department of Piura, led to the discovery of a new species of *Chloraea* at 5º 50'S (Fig. 1), making it the species with the most northern distribution recorded. The revision of the specimens of *Chloraea* from herbaria and photographic records on iNaturalist (2025) revealed that the new species is also distributed in the departments of Cajamarca and La Libertad.

In this study, we present a detailed morphological description, a line drawing and color photographs of the new species, along with information on its habitat, a map of its known distribution, and an assessment of its extinction risk are also provided. Additionally, we present an updated description of *C. septentrionalis* based on our field observations, alcohol-preserved material, and herbarium specimens, to supplement the information provided in its protologue. The distinguishing floral features of both species are contrasted in a comparative line drawing.

Materials and methods. Fieldwork was conducted in November 2017 and April 2024 in the district of Huarmaca, province of Huancabamba, Piura Department. Live plants were photographed, and notes on their habitat and phenology were recorded *in situ*. Three specimens were pressed and deposited at herbaria HUT, PRG, and USM. Line drawings, measurements, and descriptions were prepared from herbarium specimens, liquid-preserved flowers, and flowers from herbarium specimens softened by immersion in boiling water. The original descriptions and other relevant literature on the taxonomy of the genus *Chloraea* were consulted (e.g., Correa, 1969; Schweinfurth, 1941; Trujillo & Paredes-Burneo, 2020). Additionally, *Chloraea* specimens were physically reviewed at the herbaria CPUN, HAO, HUT, M, NY, and USM. High-resolution digital images of specimens housed at F, HUH, MO, P, and W were examined through the online platforms Field Museum's online Botanical Collections Database (F, 2025) Harvard University Herbaria (HUH, 2025), Missouri Botanical Garden (Tropicos.org, 2025), Muséum National d'Histoire Naturelle, Vascular Plants Database (P, 2025), and JACQ Consortium Virtual Herbarium (JACQ, 2025). Photographs were taken with a Canon® Rebel T3 digital camera equipped with a Canon EF-S 18-55 mm f/3.5-5.6 lens. Images were processed using Adobe Photoshop 24.0.1 (Adobe Inc., 2022). The conservation status was assessed following the categories and criteria of the International Union for Conservation of Nature Red List (IUCN, 2024), based on estimates of the Extent of Occurrence (EOO) and Area of Occupancy (AOO), both calculated using the online GeoCat Geospatial Conservation Assessment Tool (Bachman *et al*., 2011). The map was created with QGIS Desktop 3.40.5 (QGIS.org, 2024) and edited in Adobe Photoshop. Botanical terminology followed Beentje (2016) and Stearn (2004).

Taxonomic treatment

Chloraea aequatorialis D.Trujillo & Ocupa, ***sp. nov.*** (Fig. 1B, 2–3, 4A).

TYPE: PERU. Piura: Provincia de Huancabamba, distrito de Huarmaca, Cerro Porcuya, carretera hacia Tallacas, 2738 m, 08 June 2024, *L. Ocupa 348* (holotype: PRG-19952!; isotype: USM-357331!).

Diagnosis: *Chloraea aequatorialis* is most similar to *C. septentrionalis* M.N.Correa but differs in the longer sepals and petals (sepals 3.0–3.4 cm *vs*. 1.8–3.1 cm; petals 2.8–3.1 cm *vs*. 2.05–2.75 cm), the lip covered with warts, laterally flattened, long appendages at base, and thin, narrow, long appendages on the disc (*vs*. lip covered by fleshy long, non-laterally flattened appendages at base and disc), the claw of the lip 7–9 mm long (*vs*. claw 2 mm long), the column 2.3–2.6 cm long, strongly arcuate and apex with narrow wings (*vs*. column 1.60–2.05 cm long, slightly arcuate and wingless), the obtriangular stigma 5.0–5.5 mm long (*vs*. oblong stigma 6–8 mm long), and the anther 6–7 mm long (*vs*. 4.5–5.0 mm long).

Plant terrestrial about 32–52 cm high. *Roots* fasciculate, cylindrical and fleshy. *Stem* stout, leafy on its lower one half. *Leaves* spirally arranged along the stem, amplexicaul, blade ovate to elliptic, obtuse or acute, slightly carinate along the central vein, 5.0–9.5 × 2.2–4.2 cm, gradually decreasing in size and turning into bracts of the peduncle of the inflorescence from about the middle of the stem. *Raceme* erect, lax,

Figure 1. **A**. *Chloraea septentrionalis*. **B**. *Chloraea aequatorialis*. Photographs by D. Trujillo (A, from *D. Trujillo 210*) and S. Garrido (B, from *S. Garrido s.n*).

3–11-flowered, the flowers decreasing in size towards the apex, rachis 7.5–12.5 cm long. *Floral bracts* green, broadly elliptic to ovate, obtuse to acute, shorter to longer than the ovary, 2.5–4.0 × 1.3–3.0 cm (decreasing in size towards the apex of the raceme). *Flowers* resupinate, sepals and petals light greenish yellow with dark green, reticulate veins, lip light yellow near the base and bright yellow otherwise, with green, reticulate veins on the margins of the lateral lobes, column white to cream white with dark red spots at the base, anther yellow and greenish white. *Ovary* green, subclavate, slightly twisted and longitudinally sulcate, with a short pedicel, 2.4–3.0 cm long. *Dorsal sepal* elliptic, obtuse, with 5 main nerves, lateral nerves branched, 3.2–3.4 × 1.2–1.6 cm. *Lateral sepals* obliquely ovate-elliptic, obtuse to subacute, with 5–6 main nerves, lateral nerves branched, 3.0–3.3 × 1.2–1.6 cm. *Petals* broadly elliptic, obtuse to acute, with 7–9 main nerves, lateral nerves branched, 2.8–3.1 × 1.5–2.1 cm. *Lip* 3-lobed, recurved, clawed, 9 main longitudinal nerves, lateral nerves branched, claw 7–9 mm long, lip base densely covered by laterally flattened long appendages turning into warts near the claw; disc with numerous thin, narrow, long appendages along the main nerves of the lip which become shorter towards the apex, 2.0–2.4 × 1.6–2.0 cm; lateral lobes elliptic, incurved, entire, 1.15–1.25 × 0.5–0.6 cm; mid-lobe oblong to square, recurved, margin somewhat undulate, 0.95–1.0 × 0.9–1.2 cm. *Column* slender, strongly arcuate, nearly flat ventrally, base bearing a fovea and a small, rounded projection at each side, 2.3–2.6 cm long, apex with narrow wings 1 mm wide. *Stigma* obtriangular, basal part with prominent margins, 5.0–5.5 × 4–5 mm (about 1/5 column length). *Anther* terminal, partially incumbent, apex reflexed, 6–7 × 5 mm. *Fruit* not seen.

Paratypes: PERU. **Departamento de Cajamarca**, provincia de Contumazá, Chiñac (cerca a Guzmango), 2200 m, 28 Mar. 1985, *A. Sagástegui & S. Leiva 12539* (HUT-20194!). **Departamento de La Libertad**: provincia de Otuzco, entre Otuzco y Usquil, 3000 m, 26 Jun. 1962, *A. López, A. Sagástegui & A. Aldave s.n.* (HUT-3965!); Provincia de Otuzco, abajo San Miguel, 3100 m, 5 Jun. 1993, S. *Leiva & P. Leiva 526* (GH [HUH01940927, photo!], HAO-2838! [destroyed, photo record], HUT-21875!). **Departamento de Piura**: provincia de Huancabamba, carretera cuello de Porcuya – Tallacas, 2450 m, 8 Jun. 2017, *L. Ocupa 243* (HUT-65427!).

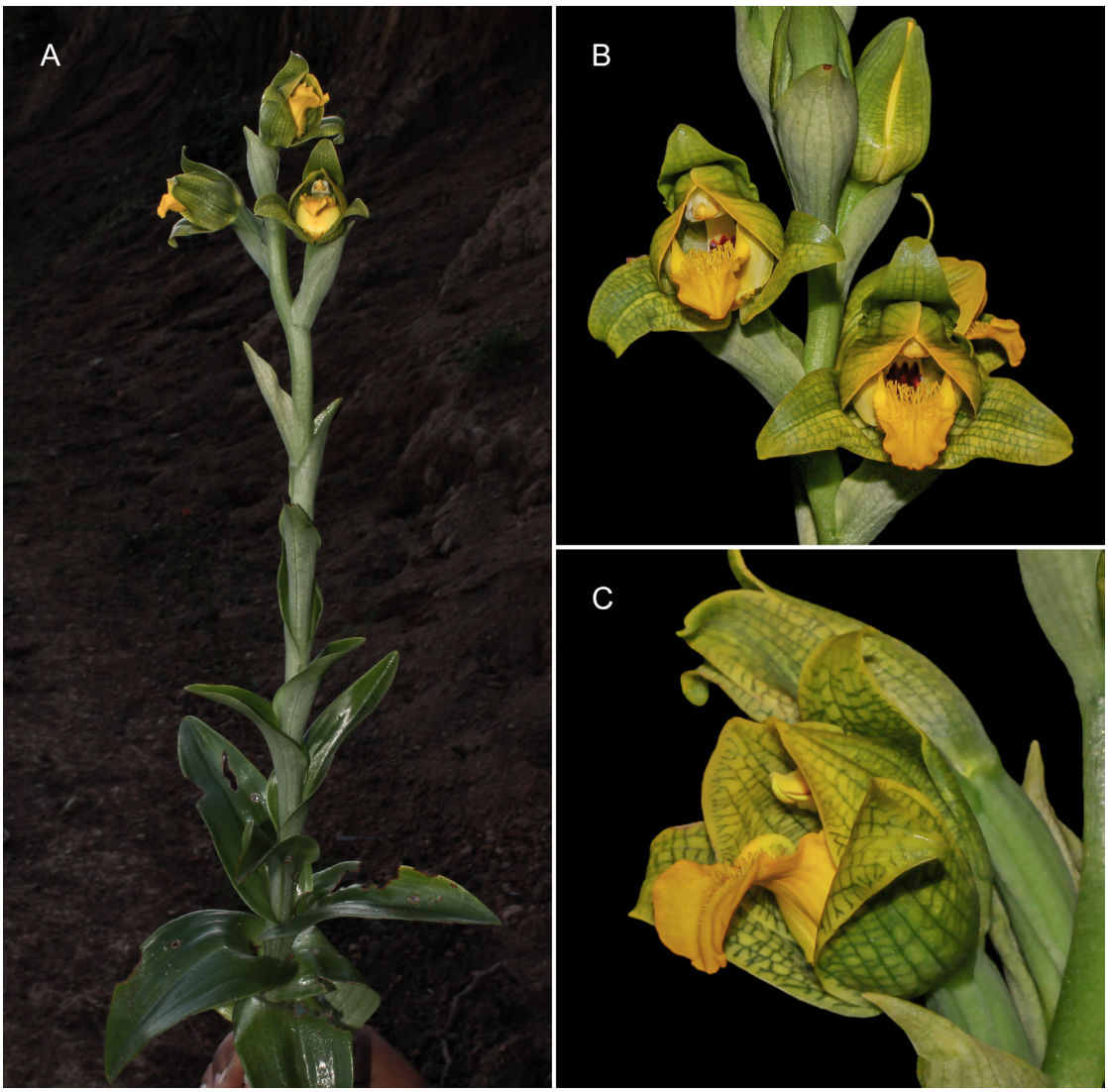

Figure 2. *Chloraea aequatorialis* **A**. Plant. **B**. Close-up of an inflorescence. **C**. Flower, side view. Photographs by L. Ocupa-Horna from *L. Ocupa 243* (A) and *L. Ocupa 348* (B, C).

Other records: PERU. **Departamento de Cajamarca**: provincia de San Pablo, 7°02'55.3"S 78°38'52.1"W, 4 Jun. 2024, *E. Gastolomendo s.n.* (Gastolomendo, 2024). Departamento de La Libertad, provincia de Pataz, 3027 m, 30 Mar. 2024. *S. Garrido s.n.* (photo record!).

Etymology: From Latin *aequatorialis*, referring to the distribution of the new species, in the equatorial region.

Distribution and ecology: The species is endemic to the northwestern slopes of the Peruvian Andes, between 5º50' and 7º56'S, in the departments of Cajamarca, La Libertad and Piura (Fig. 5), at elevations of 2200–3100 m. Individuals were found growing in shrublands, among rocks on stony hillsides. In some locations in the Provinces of Contumaza and San Pablo (Cajamarca), and Otuzco (La Libertad), *C. equatorialis* lives sympatrically with *C. septentrionalis*. The population located near the Abra de Porcuya grows scattered on soils and slopes formed by sedimentary layers of clays, silts, sands and stony gravels, among dispersed shrubs of *Brachyotum* sp. (Melastomatace-

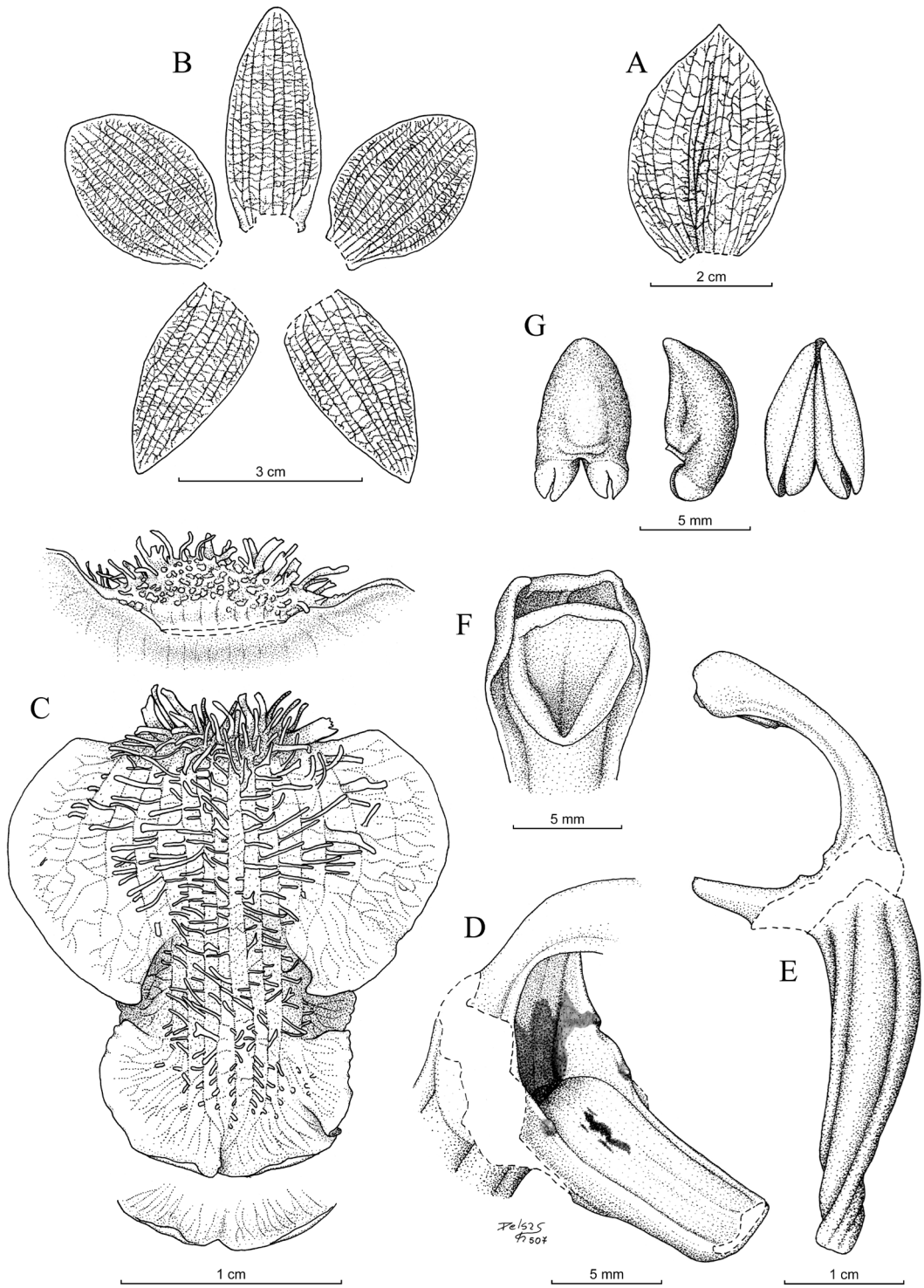

Figure 3. *Chloraea aequatorialis* **A**. Floral bract. **B**. Dissected perianth. **C**. Lip. **D**. Base of column and claw. **E** Column and ovary. **F**. Stigma. **G**. Anther, dorsal, side and ventral view. Drawing by D. Trujillo based on *L. Ocupa 348*.

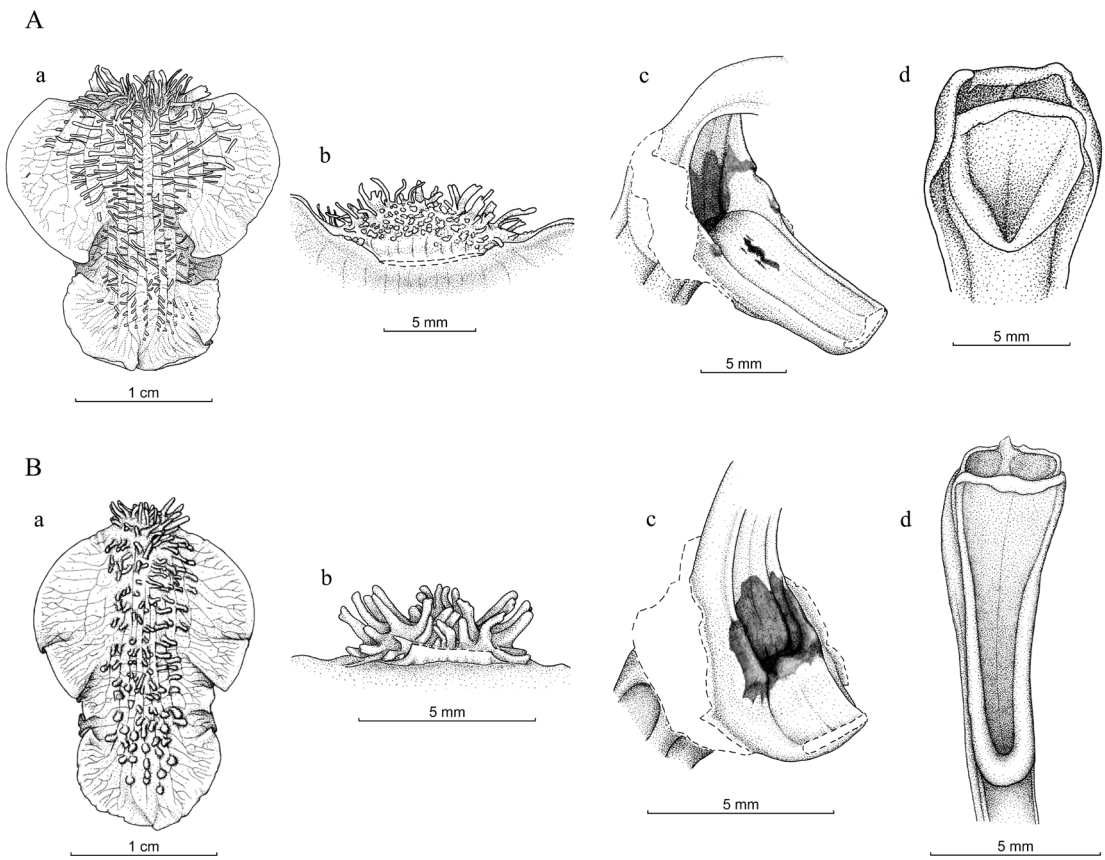

FIGURE 4. Morphological differences between *Chloraea aequatorialis* (A) and *Chloraea septentrionalis* (B). **a**. Lip. **b**. Base of the lip, back view. **c**. Base of column with the lip claw. **d**. Stigma. Drawing by D. Trujillo based on *L. Ocupa 348* (A) and *D. Trujillo 213* (B).

ae), *Clethra* sp. (Clethraceae), *Dodonaea viscosa* Jacq. (Sapindaceae), *Monnina* sp. (Polygalaceae), *Oreocallis grandiflora* (Lam.) R.Br. (Proteaceae), and other orchid species such as *Epidendrum rauhii* Hágsater, *Oncidium cajamarcae* Schltr. and *Sobralia aryaelizabethiana* Ocupa.

PHENOLOGY: Flowering occurs between March and June, at the beginning of the dry season.

CONSERVATION STATUS: *Chloraea aequatorialis* is endemic to the Peruvian Andes. It is known from six locations in the northwestern departments of Cajamarca, La Libertad, and Piura. Currently, the primary threats to *C. aequatorialis* are habitat loss and degradation caused by land conversion for agriculture, overgrazing, reforestation with exotic species of genera *Eucalyptus* L'Hér. (Myrtaceae) and *Pinus* L. (Pinaceae), and the traditional practice of burning of grasses on hillsides by farmers. For the population found in Cerro Porcuya (Piura), along the slopes of the road to Tallacas, maintenance work on the road that crosses this ecosystem, and ongoing landslides caused by erosion and heavy rains pose additional threats. Currently, no population of the new species has been recorded in a protected area that would adequately safeguard its habitat. Based on the six known locations, the estimated Extent of Occurrence is 14647.86 km^2, and the Area of Occupancy is 24 km^2. Therefore, *C. aequatorialis* is assessed as Vulnerable based on IUCN criteria B1 and B2 (VU, B1ab(i.iii) + B2ab(ii, iii)) (IUCN, 2024).

Discussion. The new species shows a similar distribution and overall morphology to *C. septentrionalis*

(Fig. 1). Their ranges partially overlap (Fig. 5), and both species have lax racemes of yellow flowers, with sepals and petals that have green reticulate veins and a 3-lobed lip. However, *C. aequatorialis* can be easily distinguished from *C. septentrionalis* by having larger sepals and petals, a lip covered with warts, laterally flattened, long appendages at base, and thin, narrow, and long appendages on the disc, a longer lip claw, column, and anther, and a shorter, differently shaped stigma (Fig. 3, 4).

Correa (1969) described *C. septentrionalis* based on the collection *A. López 651* (holotype: HUT-1515! (Fig. 6), isotypes: BAB000611 [photo!], LIL000242 [photo!], USM000595!), and cited *A. López et al. s.n.* (HUT-3965!) as additional material examined (Fig. 7). However, Correa overlooked some floral features of *A. López et al. s.n.* that conflict with *C. septentrionalis* but instead match *C. aequatorialis* (Fig. 7B). These include an obtriangular and a short stigma (about 1/5 column length), 7 mm long lip claw, and larger sepals and petals. Hence, here we assign *A. López et al. s.n.* to *C. aequatorialis*.

A close examination of herbarium specimens of *Chloraea* from northern Peru revealed that the specimens: *A. Sagástegui & S. Leiva 12539* (HUT-20194) and *S. Leiva & P. Leiva 526* (HAO-2838 (destroyed), HUT-28175), identified as *C. septentrionalis* by Trujillo & Paredes-Burneo (2020) and Trujillo *et al.* (2023), also belong to the new species described here.

The discovery of *Chloraea aequatorialis* emphasizes the limited understanding of certain orchid genera in Peru. To improve this, more extensive field explorations and a comprehensive review of herbarium materials are crucial to better identify and understand the diversity of this genus in the country.

Chloraea septentrionalis M.N.Correa, Darwiniana 15(3–4): 489. 1969.

TYPE: PERU. Departamento de La Libertad: Provincia de Otuzco, Shilte, hacienda Llaguén, [3100 m, 2 Junio 1951], *A. López 651* (holotype: HUT-1515! (Fig. 6); isotypes: BAB000611 [photo!], LIL000242 [photo!], USM000595!).

Plant terrestrial about 28–98 cm high. *Roots* fasciculate, cylindrical and fleshy. *Stem* stout, leafy. *Leaves* spirally arranged along the stem or compressed like a basal rosette, amplexicaul, blade ovate, ovate-lanceolate or oblong-lanceolate, acute to obtuse, 2.5–13.5 × 1.6–5.0 cm, gradually decreasing in size and becoming in bracts of the peduncle of the inflorescence. *Raceme* erect, lax, 3–20-flowered, flowers decreasing in size towards the apex, rachis 3–23 cm. *Floral bracts* green, broadly elliptic to ovate, acute to acuminate, 8–11 nerves, shorter to slightly longer than the ovary, 1.4–3.5 × 1.0–2.05 cm. *Flowers* resupinate, sepals and petals white near the base and yellow otherwise, with green reticulate veins, lip base and lateral lobes white with green reticulate veins, midlobe yellow, column white with red spots at the base, anther yellow and greenish white. *Ovary* green, subclavate, with a short pedicel, 1.6–3.8 × 0.20–0.45 cm. *Dorsal sepal* oblong to elliptic, obtuse to subacute, 5–7 main nerves, lateral nerves branched or not, 1.8–3.1 × 0.7–1.1 cm. *Lateral sepals* ovate-lanceolate to oblong-lanceolate, oblique, acute to sub-obtuse, 3–5 main nerves, lateral nerves branched, 2.4–2.8 × 0.7–1.2 cm. *Petals* elliptic to sub-rhombic, rounded to obtuse, 5–7 main nerves, lateral nerves branched, 2.05–2.75 × 0.95–1.60 cm.

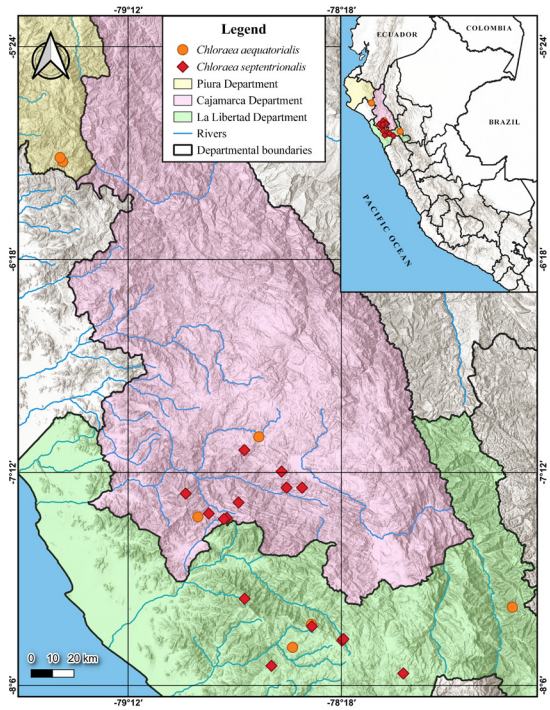

Figure 5. Distribution map of *Chloraea aequatorialis* and *C. septentrionalis* in Peru. Prepared by L. Ocupa-Horna.

FIGURE 6. Holotype of *Chloraea septentrionalis* (*A. López 651*). Reproduced with the kind permission of the Herbarium Truxillense, Universidad Nacional de Trujillo.

Figure 7. *Chloraea aequatorialis* (*A. López et al. s.n.*). **A**. Herbarium sheet. **B**. Close-up of the dissected flower. Reproduced with the kind permission of the Herbarium Truxillense, Universidad Nacional de Trujillo.

Lip 3-lobed, recurved, shortly clawed, 7–9 main longitudinal nerves, laterals nerves branched, claw 2 mm long; lip base densely covered by fleshy long appendages, disc with numerous fleshy long appendages along the main nerves of the lip getting shorter towards the apex turning into warts, 1.6–2.2 × 1.2–1.8 cm; lateral lobes elliptic, incurved, 1.0–1.3 × 0.4–0.6 cm; mid-lobe oblong to widely elliptic, recurved, margin somewhat undulate, 0.75–1.00 × 0.70–0.95 cm. *Column* slender, slightly arcuate, base bearing a shallow fovea and a small projection or transversal ridge, 1.60–2.05 cm long. *Stigma* oblong, basal part with prominent margin, 6–8 mm long (2/5 column length). *Anther* terminal, partially incumbent, 4.5–5.0 × 2.0–2.5 mm. *Fruit* ellipsoid, 2.5–3.5 × 0.6–1.1 cm.

Specimens examined: PERU. **Departamento de Cajamarca**: provincia de Cajamarca, distrito de Cajamarca, entre Cajamarca y Cumbe Mayo, km. 14, en el Arboretum cumbe Mayo de CICAFOR, ladera, suelo turboso, 3400 m, 18 Abr. 1981, *I. Sánchez, V. Torrel & E. Medina 2480* (CPUN-1008!); provincia de Cajamarca, distrito de Cajamarca, Tamiacocha, elevación al S. de Cerro Negro, a 5 km del Abra El Gavilán, jalca graminosa, 3569 m, 4 Jun. 2001, *I. Sánchez 10660* (CPUN-14772!); provincia de Cajamarca, distrito de San Juan, Yumagual, ladera que converge a la quebrada Yunagual, vegetación arbustiva y arbórea, 2600 m, 26 Jun. 1966, *I. Sánchez & A. Iparraguirre 251* (CPUN-1007!, HAO-1892! [destroyed, photo record]); provincia de Contumazá, entre La Travesía y el Bosque de Cachil, bosque de arbustos y arboles más o menos denso, 2700 m, 2 Jul. 1983, *I. Sánchez, J. Sánchez & A. León 3163* (CPUN-1009!); provincia de Contumazá, entrada al Bosque de Cachil, ladera, 2440 m, 28 Jul. 1993, *A. Sagástegui, S. Leiva & P. Lezama 14949* (F-2128307 [photo!], HAO-2438! [destroyed, photo record]); province of Contumazá, road Contumazá to Cascas, area above Bosque de Cachil, Lomo Limpio, 2800-3500 m, 19 Jun. 1998, *M. Weigend, T. Franke, J. Skrabal & M.*

Gonzales 1998/562 (CPUN-20224!, F-2209931 [photo!], M!, USM-174201!); province of Contumazá, road Contumazá to Guzmango, 5–10 km west of Contumazá, 2600 m, 20 Jun. 1998, *M. Weigend, T. Franke, J. Skrabal & M. Gonzales 1998/563* (CPUN-20248!, M!, USM-174199!); provincia de Contumazá, Amanchaloc, Guzmango-Contumazá, ladera abierta, 2600 m, 7 May 1965, *A. Sagástegui & M. Fukushima 5145* (AMES-113595 [HUH01941028, photo!]); provincia de Contumazá, Tantarica, ladera rocosa, 1 May 1982, *A. Sagástegui, E. Alvites, S. López & J. Mostacero 10394* (HUT-17019!, NY04027063!); provincia de Contumazá, arriba de Lledén, ladera rocosa, 2500–3000 m, 28 Jun. 1983, *A. Sagástegui, J. Mostacero & E. Alvitez 10829* (GH [HUH-1940920, photo!], HUT-17787!, MO-3122800 [photo!], SEL-26765 [photo!]); provincia de Contumazá, Cruz del Hueco, ladera, 2880 m, 6 Jun. 1994, *A. Sagástegui, S. Leiva & P. Lezama 15327* (F-2145077 [photo!], HAO-3270! [destroyed, photo record]). **Departamento de La Libertad**: provincia de Otuzco, Shilte, Hda. Llaguén, en ladera, 3100 m, 2 Jun. 1951, *A. López 1515* (AMES-88199 [HUH01940928], photo!); provinca de Otuzco, Cerro Ragache (Salpo), ladera rocosa, 3400 m, 23 May 1984, *A. Sagástegui, M. Diestra & S. Leiva 11612* (HUT-18877!, MO-3226558 [photo!]); province of Otuzco, road from Otuzco to Usquil, 3200 m, 30 May 2001, *T. Henning & C. Schneider 309* (HUT-41128!, NY04027050!, M!, USM-187355!); provincia de Otuzco, districto de Usquil, Canibamba Alto, en pequeños roquedales y en las márgenes del río Perejil, 3512 m, 26 May 2005, *D. Trujillo 213* (URP!, SEL); provincia de Santiago de Chuco, cerro Ingacorral, arriba de Cachicadan, jalca sobre rocas, 4100 m, 10 Jun. 2001, *A. Sagástegui, S. Leiva & M. Zapata 16671* (F-2240253 [photo!],, HAO-3104! [destroyed, photo record]); provincia de Santiago de Chuco, distrito de Quiruvilca, La Victoria, al costado de la carretera, cerca de una mina de carbón, 3392 m, 25 May 2005, *D. Trujillo 210* (USM-357398!).

Another record: **Departamento de Cajamarca**: provincia de San Pablo, 7°06’18.14”S 78°42’32.83”W, 27 Apr. 2024, *C. Diaz s.n.* (Diaz, 2024).

Key to the Peruvian species of *Chloraea*

1. Flowers yellow, without or with tenuous longitudinal green nerves on sepals and petals; lip disc covered by short warts or ridges 2
    2. Sepals about 2.7 cm or less long, petals about 2.1 cm or less long; lip disc covered by dense mass of yellow warts and ridges ..... ***C. densipapillosa***
    2a. Sepals 2.8 cm or more long, petals 2.3 cm or more long; lip disc covered by yellow or green warts along the main nerves of the lip ..... ***C. multilineolata***
1a. Flowers yellow, light yellow or creamy white, with reticulate green nerves on sepals and petals; lip disc covered by long warts, appendages, or laterally flattened keels 3
    3. Lip white or creamy white with dark green margin; column about 1.5 cm or less long ..... ***C. reticulata***
    3a. Lip yellow with green nerves along the disc or in the margins of the lateral lobes; column 1.6 cm or more long 4
        4. Petals elliptic-ovate, asymmetric, with 4 main nerves; lip entire to obscurely 3-lobed ..... ***C. pavonii***
        4a. Petals elliptic to sub-rhombic or broadly elliptic with 5 to 9 nerves; lip clearly 3-lobed 5
            5. Lip claw 2 mm long, disc with fleshy long appendages, stigma oblong, 6–8 mm long (about 2/5 column length) ..... ***C. septentrionalis***
            5a. Lip claw 7.0–9.0 mm long, disc with thin, narrow, long appendages, stigma obtriangular, 5.0–5.5 mm long (about 1/5 column length) ..... ***C. aequatorialis***

Acknowledgements. We thank the staff and curators of CPUN, NY, HAO, HUT, M, PRG, and USM for granting access to their collections; special thanks to the curator at HUT for their kind permission to reproduce images of specimens. We also thank Alex Díaz and Sandra Garrido for providing photographs and critical information on *C. aequatorialis*. We thank Mark Wilson for his comments and review of the English language used in this manuscript. Permission for scientific collection was granted by the Servicio Nacional Forestal y de Fauna Silvestre (SERFOR), through RD N° D000149-2023-MIDAGRI-SERFOR-DGGSPFFS-DGSPF. Finally, the authors thank the anonymous reviewers for their helpful comments and suggestions, and Editor-in-Chief for the improvements to the manuscript.

Author contribution. DT: Conceptualization, Investigation, Writing - Original Draft, Writing – Review & Editing, Visualization. LO-H: Conceptualization, Investigation, Writing - Original Draft, Writing – Review & Editing, Visualization.

Funding. The field explorations were financed by own resources (LO-H).

Conflict of interest. The authors declare no conflict of interest.

Literature cited

Adobe Inc. (2022). Adobe Photoshop, v. 24.0.1. Retrieved from https://www.adobe.com/products/photoshop.html [Accessed: February 2025].

Bachman, S., Moat, J., Hill, A. W., de la Torre, J. & Scott, B. (2011). Supporting Red List threat assessments with GeoCAT: geospatial conservation assessment tool. In: V. Smit & L. Penev (Eds.), *e-Infrastructures for data publishing in biodiversity science. ZooKeys*, 150, 117–126. (Version BETA).

Beentje, H. (2016). *The Kew plant glossary: an illustrated dictionary of plant terms* (2nd ed.). Richmond, Surrey, UK: Royal Botanic Gardens, Kew.

Cisternas, M. A., Salazar, G. A., Verdugo, G., Novoa, P., Calderón, X. & Negritto, M. A. (2012). Phylogenetic analysis of Chloraeinae (Orchidaceae) based on plastid and nuclear DNA sequences. *Botanical Journal of the Linnean Society*, 168(3), 258–277. doi: 10.1111/j.1095-8339.2011.01200.x

Correa, M. N. (1969). *Chloraea*, género sudamericano de Orchidaceae. *Darwiniana*, 15(3/4), 374–500.

Correa, M. N. & Sánchez, M. (2003). Chloraeeae. In: A. M. Pridgeon, P. J. Cribb, M. W. Chase & F. N. Rasmussen (Eds.), *Genera orchidacearum, 3: Orchidoideae (part two), Vanilloideae* (pp. 5–16). Oxford: Oxford University Press.

Diaz, C. (2024). Photo 373629932, iNaturalist. Retrieved from https://www.inaturalist.org/photos/373629932 [Accessed 26 March 2025]

Field Museum of Natural History [F]. (2025). Botanical collections. Retrieved from https://collections-botany.fieldmuseum.org/list [Accessed 10 February 2025]

Gastolomendo, E. (2024). Photo 390440213, iNaturalist. Retrieved from https://www.inaturalist.org/photos/390440213 [Accessed 26 March 2025]

Harvard University Herbaria [HUH]. (2025). Digital Collections. Retrieved from https://kiki.huh.harvard.edu/databases/specimen_index.html [Accessed 10 February 2025]

iNaturalist. (2025). iNaturalist registers. Available from https://www.inaturalist.org. Accessed [Accessed: 26 March 2025].

IUCN. (2024). *Guidelines for using the IUCN Red List categories and criteria.* Version 16. Prepared by the Standards and Petitions Committee. Retrieved from https://www.iucnredlist.org/documents/RedListGuidelines.pdf

JACQ Consortium [JACQ]. (2025). Virtual Herbarium Website. Retrieved from https:/www.jacq.org [Accessed 10 February 2025]

Muséum National d'Histoire Naturelle [P]. (2025). Vascular Plants Database. Retrieved from https://science.mnhn.fr/institution/mnhn/collection/p/item/search [Accessed 10 February 2025]

QGIS.org. (2024). QGIS Geographic Information System. Open Source Geospatial Foundation Project. Retrieved from http://qgis.org [Accessed: April 2025].

Roque, J. & León, B. (2006). Orchidaceae endémicas del Perú. *Revista Peruana de Biología,* 13(2), 759–878. doi: 10.15381/rpb.v13i2.1953

Schweinfurth, C. (1941). Orchidaceae Peruvianae I. *Botanical Museum Leaflets*, 9(3), 45–63. doi: 10.5962/p.295152

Stearn, W. T. (2004). *Botanical latin.* Portland, USA: Timber Press.

Tropicos.org. (2025). Missouri Botanical Garden. Retrieved from https://tropicos.org/collection/Search [Accessed 10 February 2025]

Trujillo, D., Edquén, J. D., Rizo-Patrón, F., Calatayud, G., Gutiérrez Dipaz A. & Salazar, G. A. (2023). Redescubrimiento de *Chloraea multilineolata* (Orchidaceae, Chloraeinae), una especie peruana en peligro de extinción. *Acta Botanica Mexicana,* 130, e2182. doi: 10.21829/abm130.2023.2182

Trujillo, D. & Paredes-Burneo, D. (2020). The *Chloraea* from Lima, a little-known species but described several times. *Lankesteriana,* 20(1), 91–106. doi: 10.15517/lank.v20i1.41443