




HIERONYMIELLA PERUVIANA (AMARYLLIDACEAE, AMARYLLIDOIDEAE, EUSTEPHIEAE): A NEW SPECIES AND FIRST RECORD OF THE GENUS FOR THE FLORA OF PERU

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Abstract. Huaylla, H.; A. C. Slanis & O. Llalla-Cordova. 2024. *Hieronymiella peruviana* (Amaryllidaceae, Amaryllidoideae, Eustephieae): A new species and first record of the genus for the flora of Peru. *Darwiniana*, nueva serie 12(1): 149-155.

Hieronymiella peruviana (Amaryllidaceae, Amaryllidoideae, Eustephieae), a new species from the Department of Moquegua in southern Peru, is described and illustrated. This species is distinguished by having winged staminal filaments with crisscrossed sickle-shaped appendages, grows on dry slopes in semi-arid areas with pumice soils near the Huaynaputina volcano. This is the first record of *Hieronymiella* for the Flora of Peru. Its conservation status is assessed.

Keywords. Biodiversity; conservation; Moquegua; South Peru; taxonomy.

Resumen. Huaylla, H.; A. C. Slanis & O. Llalla-Cordova. 2024. *Hieronymiella peruviana* (Amaryllidaceae, Amaryllidoideae, Eustephieae): Una nueva especie y primer registro del género para la flora del Perú. *Darwiniana*, nueva serie 12(1): 149-155.

Se describe e ilustra *Hieronymiella peruviana* (Amaryllidaceae, Amaryllidoideae, Eustephieae), una nueva especie del departamento de Moquegua al sur del Perú. Esta especie se caracteriza por presentar filamentos estaminales alados con apéndices en forma de hoz entrecruzados, habita en laderas secas con suelos de piedra pómez en zonas semiáridas cercanas al volcán Huaynaputina. Este es el primer registro de *Hieronymiella* para la flora del Perú. Se evalúa su estado de conservación.

Palabras clave. Biodiversidad; conservación; Moquegua; Sur de Perú; taxonomía.

INTRODUCTION

The tribe Eustephieae (Amaryllidaceae, Amaryllidoideae) includes four genera: *Eustephia* Cav., *Chlidanthus* Herb., *Pyrolirion* Herb. and *Hieronymiella* Pax. (Meerow et al, 2000, Meerow, 2023). Only the first three genera have been recorded for Peru to date. The genus *Hieronymiella*

is distinguished from the other genera of the tribe Eustephieae by its stamens with filaments apically winged and connate, and the wing forming tooth or horn like prolongations at or below the point of attachment of the anther (Arroyo-Leuenberger & Leuenberger, 2004). The genus *Hieronymiella* is endemic to the Andes and comprises nine species that extended hitherto from south-central Bolivia

to north-western and central Argentina.

In Bolivia *Hieronymiella* is distributed in the Subandina and Prepuna regions of the Boliviano-Tucumana biogeographic province (Navarro & Ferreira, 2009), in the northwest of Potosí and southwest of Santa Cruz de la Sierra where five species are present: *Hieronymiella bedelarii* R. Lara & Huaylla, *H. cardenasii* (Traub) R. Lara, *H. clidanthoides* Pax, *H. marginata* (Pax) Hunz. and *H. tarijensis* (Fern. Casas) Fern. Casas & R. Lara (Lara Rico & Huaylla Limachi, 2015; Lara Rico, 2018, 2021). In Argentina, all *Hieronymiella* species are found in semi-arid to arid habitats within the phytogeographical Monte, Prepuna and Puna provinces defined by Cabrera (1994) (Arroyo-Leuenberger & Leuenberger, 2004; Flora Argentina, 2024). The taxa reported for Argentina are *Hieronymiella aurea* Ravenna, *H. cachiensis* Ravenna, *H. caletensis* Ravenna, *H. clidanthoides* Pax, *H. marginata* (Pax) Hunz. and *H. speciosa* (R.E.Fr.) Hunz. that are distributed from northern Mendoza to Jujuy (Flora Argentina, 2024).

Arroyo-Leuenberger & Hunziker (1995) synonymized *Hieronymiella tarijensis* with *H. argentina* (Pax) Hunz. & S.C. Arroyo, a name later subordinated under *H. marginata* (Arroyo-Leuenberger & Dutihl, 2008). However, in this article, following Lara Rico & Huaylla Limachi (2015), *H. marginata* and *H. tarijensis* are treated as different species.

During trips to different localities of the Department of Moquegua in southwestern Peru, while working on the project to create the Herbarium Moqueguensis at the “Universidad Nacional de Moquegua”, a specimen of Amaryllidaceae was collected in fruit in March 2020. A second collection from the same population was made at the beginning of February in 2021 when flowering material was found enabling a better understanding of the taxonomy of the species. Upon closer examination, we confirmed that the specimens represented a new species which is described and illustrated here as *Hieronymiella peruviana*. With this discovery, the presence of the genus *Hieronymiella* is reported for the first time in Peru. A key to differentiate the genera of the Eustephieae present in Peru is provided as well as the main differences with *H. bedelarii*, the most closely related Bolivian species. Finally, we make a preliminary assessment of the conservation status of the new species.

MATERIALS AND METHODS

The morphological analysis and description of the species treated here were carried out using conventional techniques of botanical systematics. The descriptions were based on fresh material

from Moquegua (Prov. Mariscal Nieto, Dist. Torata, Peru), which was later dried and deposited in the MOQ Herbarium (Thiers, 2024). The vegetative and floral characteristics were analyzed during field and laboratory work. To rule out the possibility that it had been previously described, the bibliography concerning Bolivian (Lara Rico & Huaylla Limachi, 2015; Lara Rico, 2018, 2021) and Argentinian species (Arroyo-Leuenberger & Leuenberger, 2004; Flora Argentina, 2024) was reviewed.

We examined herbarium material and field photos of *Hieronymiella* species present in Argentina and Bolivia, including the nomenclatural types.

Photographs of the plant and its flowers were taken using a Panasonic DMC-FZ200 camera and a binocular microscope (Micros Ladybird MZ1240, Austria). The conservation status of the new species was assessed using the IUCN guidelines (IUCN, 2024). The distribution map was prepared in QGIS (QGIS 2021), using coordinates collected in the field.

Hieronymiella bedelarii, a Bolivian species related to *H. peruviana* and hitherto the most northern species of the genus in its distribution, was analyzed in the field and monitored under cultivation for three years.

In the citations of the analyzed specimens, the numbers after MOQ, acronym of the Moqueguensis Herbarium according to Thiers (2024), correspond to the registration number of the Institution's collection.

RESULTS

Taxonomic treatment

Hieronymiella peruviana Huaylla, Slanis & Llalla **sp. nov.** TYPE: PERU. Moquegua, Prov. Mariscal Nieto, Dist. Torata, the roadside in the Jaguay Chico sector, 2822 m, 8-II-2021, *O. Llalla & A. Manchego 68* (holotype, MOQ-1168; isotypes: USM, LPB). Figs. 1, 2.

Diagnosis. *Hieronymiella peruviana* is similar to *H. bedelarii*, differing by having weakly spatulate external tepals and flat appendages on the winged staminal filaments which take the form of crossed sickles (*vs.* lanceolate external tepals and broad appendages on the winged staminal filaments which take the form of lobes with a thick edge).

Perennial, terrestrial geophyte 53-67 cm high at anthesis. Bulb ovoid to globose, 5.2-6 × 3.8-4.7 cm with numerous pale or dark coffee-colored tunics. Leaves 2-6, sheathing at the base forming a neck 7.2-13.5 × 1.1-2 cm; blade dark leaden

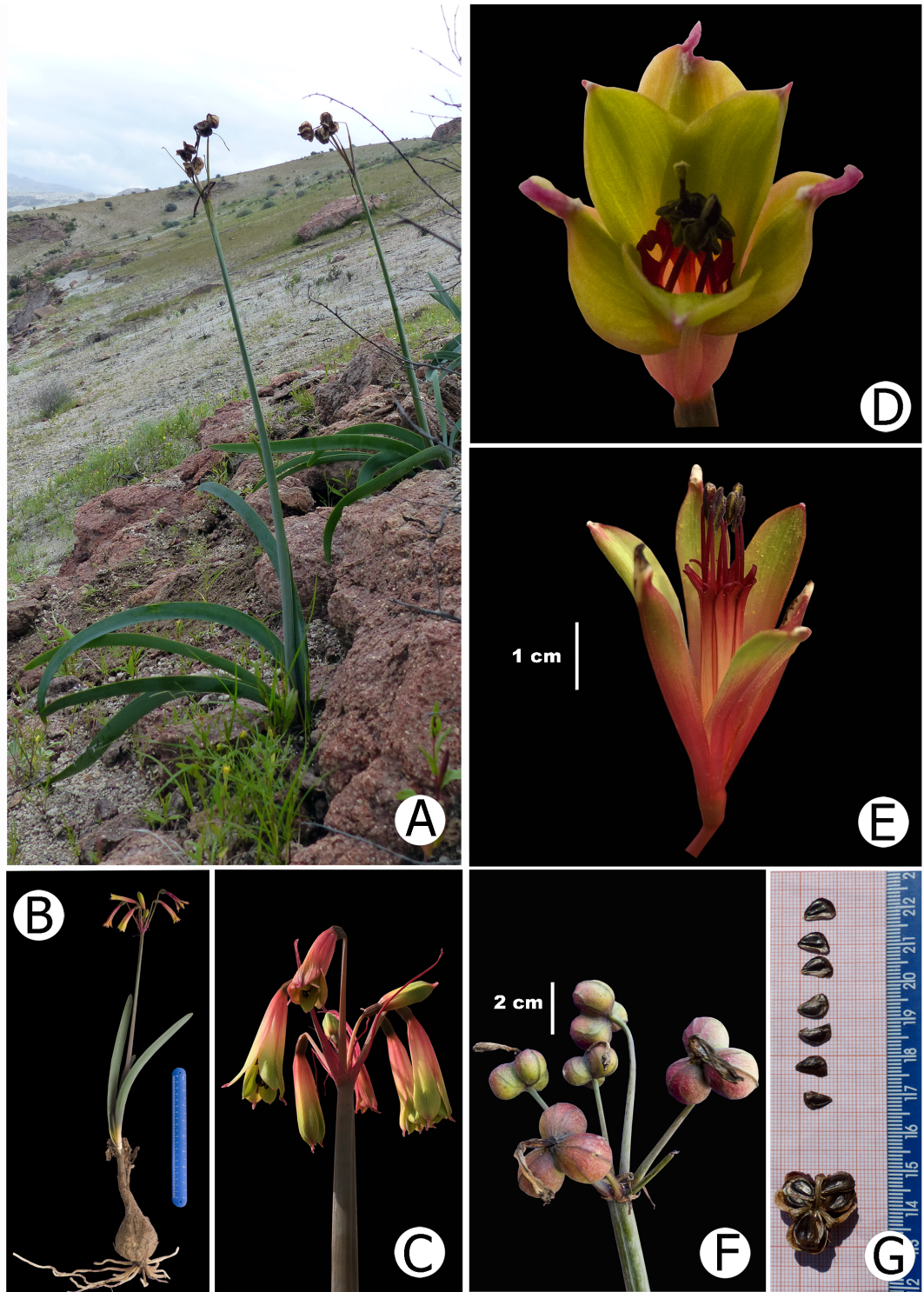


Fig. 1. *Hieronymiella peruviana*. **A**, Habitat with rocky soil and pumice stone. **B**, Habit. **C**, Inflorescence. **D**, Flower, frontal view. **E**, Flower, lateral view. **F**, Fruits. **G**, Mature capsule and seeds. (Photos A, F, G: H. Huaylla et al. 4813, MOQ; B, C, D, E: O. Llalla & A. Manchego 68, MOQ).

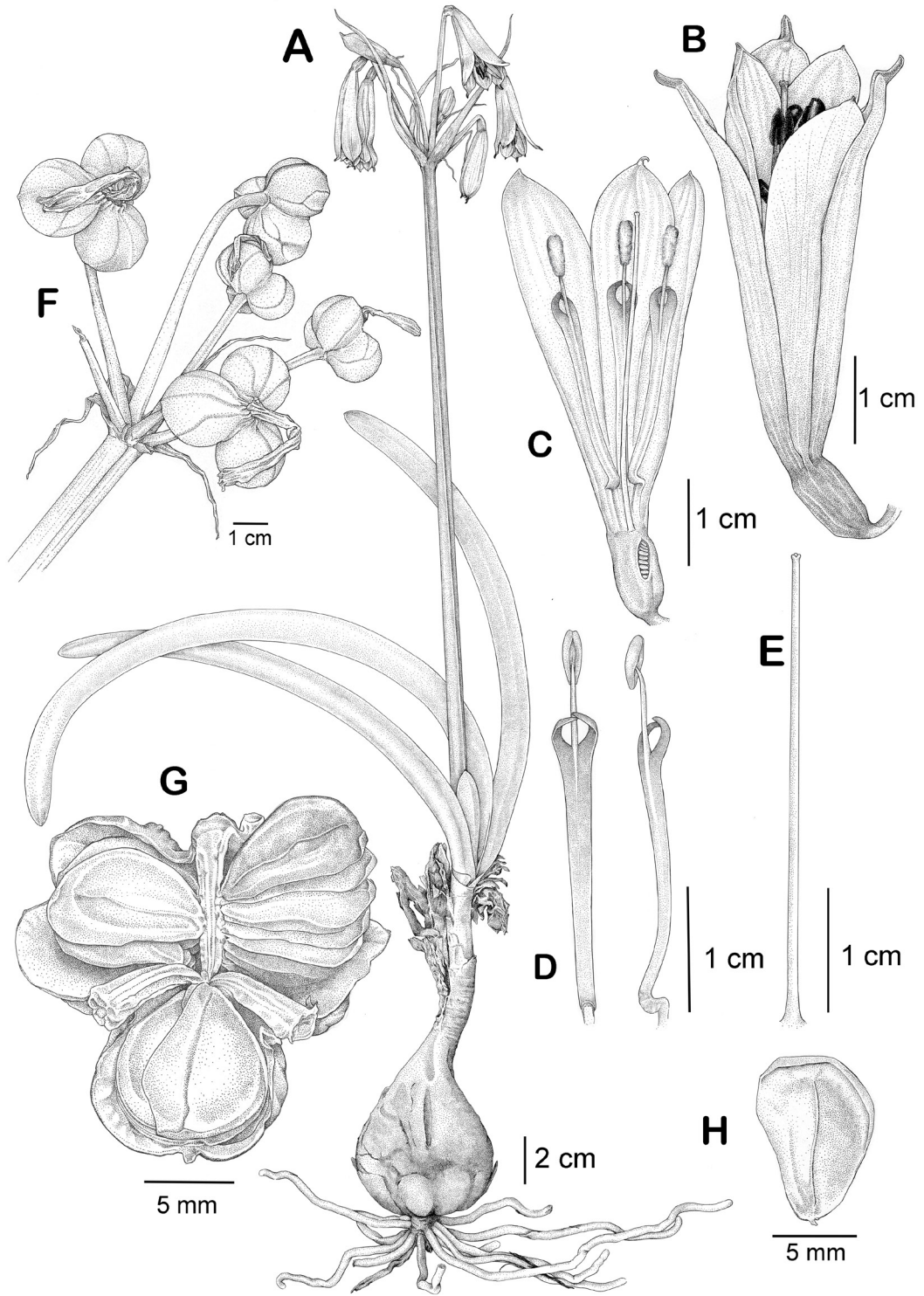


Fig. 2. *Hieronymiella peruviana*. **A**, Habit. **B**, Flower, lateral view. **C**, Longitudinal section of flower showing inner and outer tepals, stamens and gynoecium. **D**, Dorsal and lateral view of stamens. **E**, Style. **F**, Fruits. **G**, Front view of dehiscent fruit. **H**, Seed. Drawn by N. Sánchez.

green, sessile, lorate, falcate, apex acute, 16-26 × 1.5-2 cm. Scape solid, terete, purplish basally, glaucous, 38-39.5 × 1-1.5 cm. at the base; 0.4-0.7 cm diam. apically; bracts red, apex acute, outer bracts lanceolate, shorter than the flowers, 6.6-7.5 × 0.45-0.5 cm; inner bracts 3.7-4.8 × 0.2-0.3 cm. Umbels 4-8 flowered, pendulous; pedicel trigonous, 2.1-7.8 cm, shiny salmon-colored. Flowers 4-5 cm (including the ovary), 0.8-1 cm diam.; perigone tubular at the base, nectary glands present; tepals fused forming a short tube, 0.5 cm, the interior pale yellow, the exterior salmon-colored at base, pale yellow in the central part and yellow-green apically, whitish in the central part and yellow-green apically; outer tepals lanceolate, weakly spatulate, 3.2-4.2 × 0.5-0.7 cm, apex obtuse, mucronate, 1 mm, salmon-colored; inner tepals spatulate, 3.2-4.2 × 0.5-0.6 cm, apex rounded. Stamens 6, filaments 2.8-3.8 × 0.1 cm, pale yellow, fused 0.5 mm and folded at the base, then straightened and flattened,

appendages deep red, linear, acute, sickle-shaped, 0.5-0.7 cm; anthers dorsifixed, oblong, yellow, 4 × 1 mm. Ovary dark red, subtrigonus, 0.6-0.7 × 0.3-0.4 cm, ovules 9 per loculus. Style cylindrical, similar in size to the tepals, pale yellow with a red apex, 3.4-4 cm; stigma capitate 0.1 cm diam., 3-lobed, pubescent, reddish. Capsule trilocular, pale yellow to brown, 1-2 × 1.5-2.5 cm. Seeds flat, shiny-black, shortly winged, 0.7-0.9 × 0.4-0.5 cm.

Etymology. It is named after the country of Peru.

Distribution and habitat. *Hieronymiella peruviana* is endemic to the Department of Moquegua, on the western Andean slopes of southern Peru. It is recorded along the route that connect Quinistaquillas and Jaguay Chico. It grows in semi-desert between 2307 and 2838 m of elevation, on rocky west-facing slopes composed of whitish pumice originating from Huaynaputina volcano.

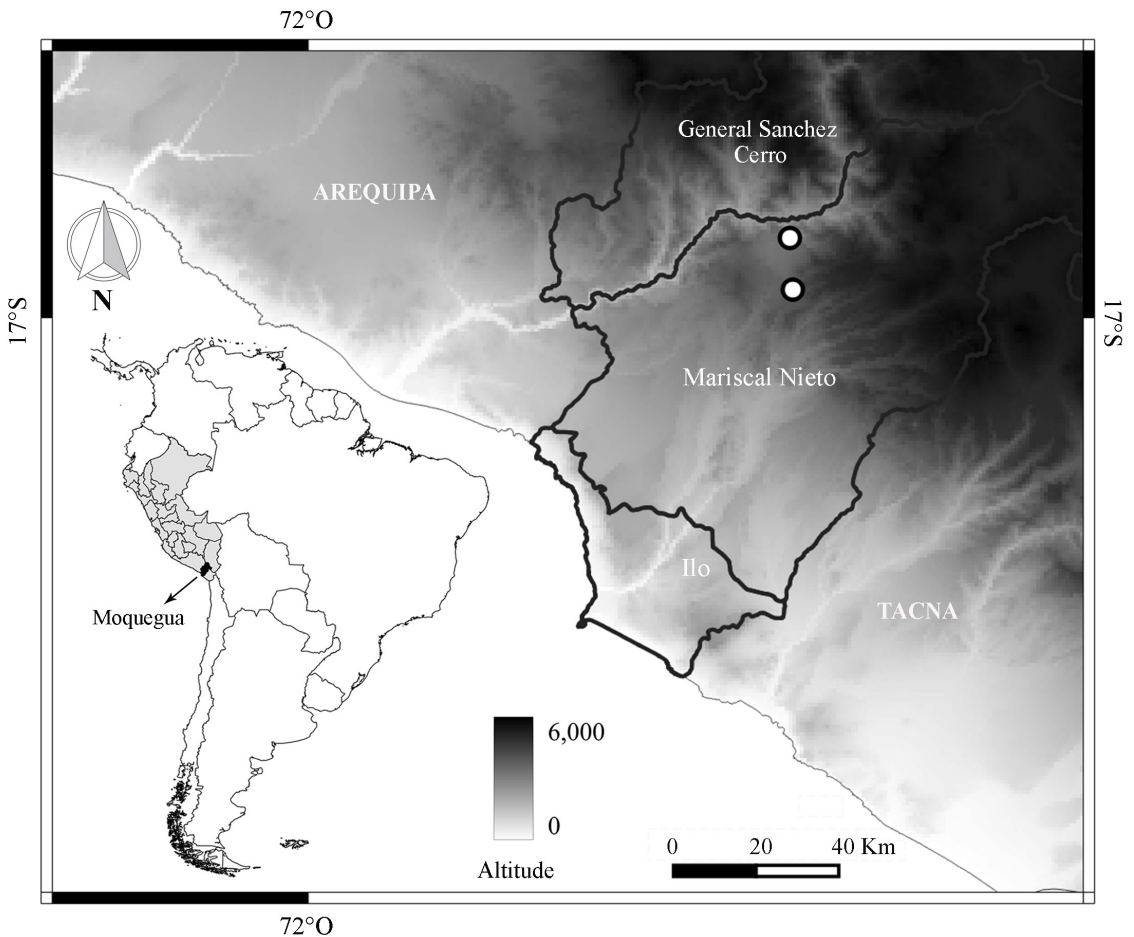


Fig. 3. Collection sites of *Hieronymiella peruviana* (circles).

The sparse xerophytic vegetation corresponds to the ecoregion of Desierto Costero Subtropical (Britto, 2017) (Fig. 3). It is associated with *Tagetes minuta* L. (Asteraceae), *Hoffmannseggia prostrata* Lagerh. ex DC. (Fabaceae), *Chenopodium album* L. (Amaranthaceae), *Cistanthe* sp. (Portulacaceae), *Mirabilis* sp. (Nyctaginaceae) and *Puya* sp. (Bromeliaceae).

In the field, different habits can be observed in individuals from the same population. Plants that grow on stony soil have sickle-shaped leaves while those that grow on sandy soil have erect, ribbed leaves. In 2022 at the type locality a few plants were seen with flowers but without leaves, some with a short scape arising at ground level.

Phenology. Flowers are found between January and February and fruits in March, depending on the rains, humidity, and temperature.

Conservation status. The species has only been found in two isolated localities, each with an extent of occurrence of approximately 0.5 km². It inhabits slopes close to the highway. Both known localities are outside protected natural areas. Road maintenance, agricultural expansion, changes in annual precipitation and landslides are factors that could lead to the gradual disappearance of the species. A preliminary conservation status of Vulnerable (VU-D2) is assigned according to the Guidelines for the application of the IUCN Red List Categories and Criteria (IUCN 2024).

Taxonomic observations

The presence of stamens with filaments apically winged and connate in *Hieronymiella peruviana* allowed us to identify our specimens irrefutably as belonging to *Hieronymiella* and distinguish it from other genera of Eustephieae.

Due to its floral characteristics (perigone tube much shorter than the free part of the tepal segments) and vegetative characteristics (ovoid bulb, elongated neck; leaves strongly falcate, lorate, appearing before the inflorescence), *Hieronymiella peruviana* appears to be related to *H. bedelarii*, a stenochore species that is a very local endemic of Torotoro (Departament Potosí, Bolivia) from which it differs by its perigone tube 0.5 cm, spatulate external tepals, staminal filaments with sickle-shaped appendages (*vs.* perigone tube 0.9 cm, lanceolate external tepals, staminal filaments with broad appendages with a thick edge).

Specimens examined

Hieronymiella peruviana. PERU. **Moquegua**. Prov. Mariscal Nieto, between Quinistaquillas and Jaguay Chico, 18-III-2020 (fr.), *H. Huaylla, O. Llalla & A. Manchego 4813* (MOQ-946); Jaguay Chico, 18-III-2020 (fr.), *H. Huaylla, O. Llalla & A. Manchego 4818* (MOQ-952).

Hieronymiella bedelarii. BOLIVIA. **Potosí**. Prov. Charcas, Torotoro: cerro Llamachaki, 09-IV-2007, *H. Huaylla Limachi 2521 & R. F. Lara Rico* (holotypus HSB); *ibid.*, 14-IV-1997, *R. F. Lara Rico 1928*, (BOLV).

Key to the genera of Eustephieae in Peru

1. Perigone funnellform, the tube longer than the free part of the tepals. Flowers sessile2
1. Perigone tubular, the tube much shorter than the free part of the tepals. Flowers pedicellate.....3
- 2(1). Leaves appearing after flowering. Staminal filaments connate into a funnel < 6 cm.....*Pyrolirion*
2. Leaves appearing before flowering. Staminal filaments connate into a funnel > 6 cm.....*Chlidanthus*
- 3(1). Perigone tube 1-5 cm. Staminal filaments free at the base, apically winged and connate*Hieronymiella*
3. Perigone tube less than 1 cm. Staminal filaments free or connate at the base, the winged part free*Eustephia*

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