



## ***Paronychia ubinensis* (Caryophyllaceae: Paronychioideae) a new species from Moquegua, South Peru**

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### **Abstract**

As part of the botanical and phytosociological characterisation of the Moqueguan flora, several Caryophyllaceae were studied. A specimen that was collected from the Ubinas district is named *Paronychia ubinensis* (Caryophyllaceae: Paronychioideae) and described as a new species. This species is compared with its closest relatives *P. andina*, *P. mandoniana*, *P. muschleri*, *P. peruviana* and *P. weberbaueri* from Southern Peru.

**Key words:** *Paronychia ubinensis*, Caryophyllaceae, Paronychioideae, new species, Southern Peru

### **Introduction**

*Paronychia* Miller (Bittrich 1993) consists of approximately 110 species worldwide (Chaudhri 1968, Kool 2012), 11 species and 7 subspecies are recorded from Peru (Macbride 1937; Brako & Zarucchi 1993). During a study on the flora and vegetation of the Andean region of the department of Moquegua in southern Peru, more than 1000 botanical specimens were collected. While identifying these collections several novelties were discovered (Al-Shehbaz & Montesinos 2009, Montesinos 2012). One such species new to science is described here and named *Paronychia ubinensis*. This species is similar to *Paronychia andina* A.Gray, *P. mandoniana* Rohrb., *P. muschlerii* Chaudhri, *P. peruviana* Chaudhri and *P. weberbaueri* Chaudhri in habit and lifeform characters, but differs in leaf and flower morphology. In *P. ubinensis* the leaves are much shorter, the ciliate hairs on the leaf lamina and margins are absent, the ovary is shorter and the stigma is reduced to <0.1 mm in length.

***Paronychia ubinensis* Montesinos, spec. nov.**

TYPE:—PERU. Moquegua Department: General Sánchez Cerro Province, Ubinas District: Punku near Tassa locality, 16°10'30" S, 70°42'21" W. 4030 m, 6 April 2012, *Montesinos 3698* (holotype WAG!, isotype USM).

Additional specimens examined: PERU, Moquegua Department, General Sánchez Cerro Province, Ubinas District: Roadside, Querala-Patune, 4340 m, 1 June 2011, *Montesinos 3164* (USM). PERU, Moquegua Department, General Sánchez Cerro Province, Yunga District: Sura slopes, 4500 m, 28 March 2013, *Montesinos 4049* (USM, CUZ, HSP). *Herba perennis, 2–4 cm longa, folia relinquunt subterminale glomerulus; bractae oblongae ovatis; petalis obscure viridis colorem.*

Perennial herb with stem woody and branched at the base, decumbent, caespitose, densely congested and imbricate, forming pulvinate tufts, 2–4 cm long, with internodes <0.5 mm long. Leaves disposed in subterminal glomerules. Leaves brown red to lilac red, stiff, linear to narrowly elliptic, 1.8–2.4 mm x 0.6–0.9 mm, apex acute, with translucent, 0.1–0.2 mm stout mucro (brown at the base) with few minute bristle hairs at the tip; margin glabrous and slightly folded, the base of the leaves deep red or pale purple, always darker than the lamina; stipules oblong-lanceolate, 1.8–2.2 mm x 0.6–1.0 mm, mostly equalling the leaves, tip aristate to

acuminate, margin and tip with few minute bristle hairs, midrib with more bristle hairs than the lamina. Leaves subglabrous, with few minute hirtella on the mucro. Bracts oblong-ovate, 1.2–2.0 mm x 0.8–1.5 mm, slightly obtuse, with minute hirtella on margins and tip. Flowers few, 1.9–2.2 mm x 0.9–1.2 mm, glabrous and urceolate; receptacle ovoid, whitish, 0.8–1 mm x 0.6–0.8 mm; sepals ovate, white, scarious, 1.6–1.8 mm x 0.8–1.4 mm, margins with <0.1 mm long white bristle hairs; petals dark red to purple, concave, 0.2–0.4 mm x 0.1–0.2 mm, urceolate, glabrous, base pale green; filaments 0.1–0.3 mm long; anthers 0.1–0.2 mm x 0.05–0.1 mm and pale green; ovary oblong, pale white, 0.6–0.8 x 0.6–0.8 mm; style <0.1 mm long, stigma indistinctive. Fruit oblong-ovoid, 1–1.2 mm long, smooth, pale brown; seed c. 0.8–1 mm, subglobose to ovoid.

**Ecology and distribution:** *Paronychia ubinensis* grows mostly on rocky slopes and plateaus with bare soils and is associated with chasmophyte vegetation. The plant was found at elevations of 4030–4500 m. This species is endemic to Peru and is known thus far only from two collections from Moquegua.

**Comparison:** *Paronychia ubinensis* is closely related to the Andean *Paronychia* complex (Chaudhri 1968, MacBride 1937, Alvarez 2010, Kool 2012). The geographical parameters and habitats of *Paronychia andina* A.Gray, *P. mandoniana* Rohrb., *P. muschlerii* Chaudhri, *P. peruviana* Chaudhri and *P. weberbaueri* Chaudhri are similar to the newly described species. However, these species differ in morphological characteristics, including leaves, flowers and ovary. Numerous herbarium specimens were examined from USM, HUSA, MO, F, WAG and L. None of the described Andean species of *Paronychia* has internodes shorter than 0.5 mm, the leaf shape linear to narrowly elliptic and size shorter than 2.2 mm, the sepals larger than 1.6 mm and the ovary not larger than 0.8 mm, all characters in *P. ubinensis*. Therefore, *P. ubinensis* has the shortest leaf size and larger ovary size of any known Andean *Paronychia* species. Another important parameter is the absence of pubescence and bristle hairs on the leaves of *P. ubinensis*. Trichomes are only present on the mucro; as opposed to the related *Paronychia* species, where pubescence in leaves and leaf indument is common.

**TABLE 1.** Morphological comparison of *Paronychia ubinensis*, *P. andina*, *P. mandoniana*, *P. muschleri*, *P. peruviana* and *P. weberbaueri*.

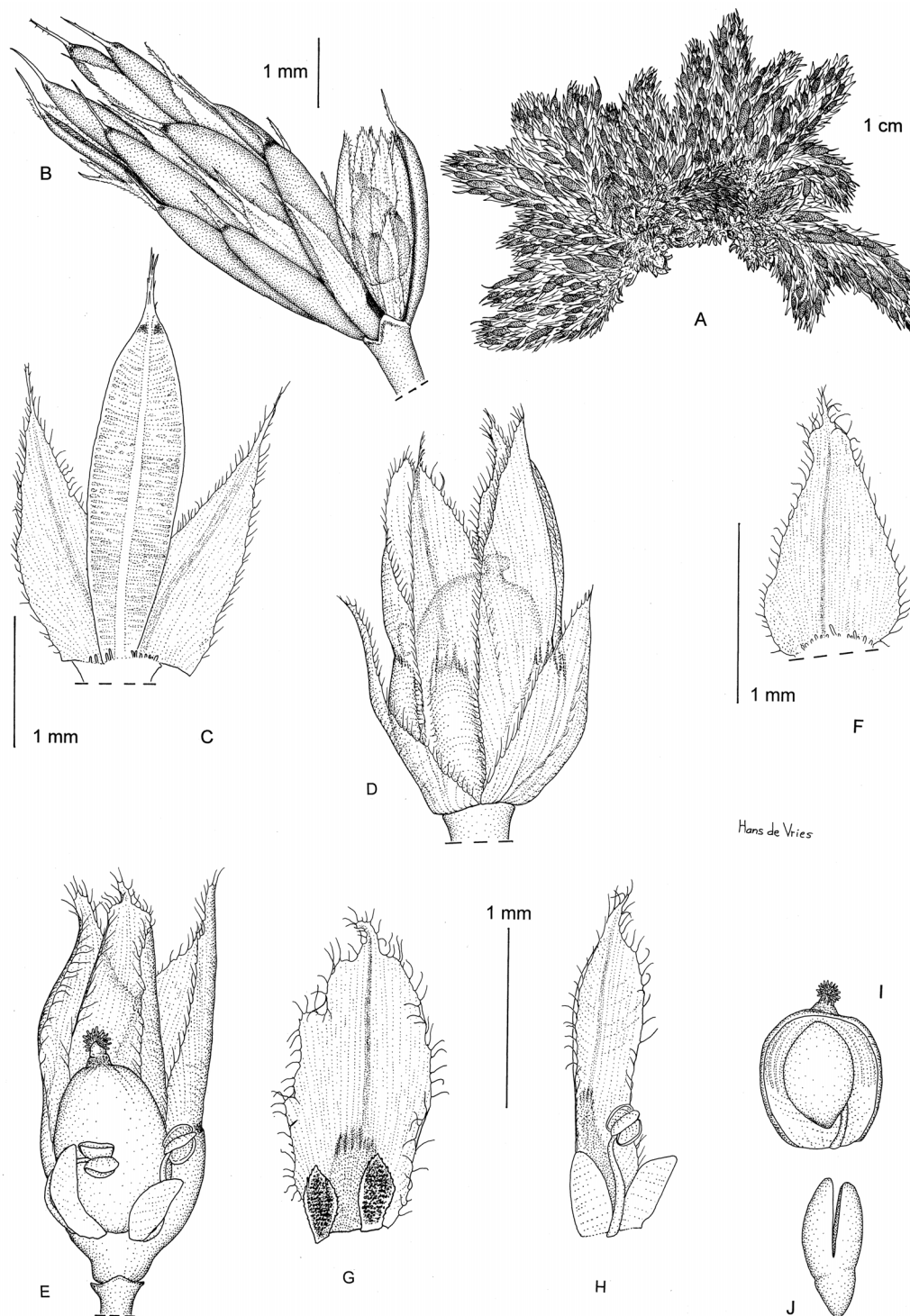
Characters	<i>P. andina</i>	<i>P. mandoniana</i>	<i>P. muschleri</i>	<i>P. peruviana</i>	<i>P. ubinensis</i>	<i>P. weberbaueri</i>
Habit	pulvinate perennial herb	perennial herb, prostrate to suberect	perennial herb	perennial herb, small and compact	perennial herb, branched at base	perennial herb, ascending or suberect
Glomerules	terminal, subterminal	dense, terminal-subterminal, 4–7 mm	stems prostrate, congested	suberect, 3.5–7.0 cm, ramified	dense, congested, imbricate	terminal
Internodes	glabrous, 1–2 mm	short, 1–5 mm	5–9 mm, pubescent to glabrescent with age	6 mm, oblong to ovate-lanceolate	<0.5 mm	1–3 mm, puberulous, reddish with age
Leaf shape	elliptic-oblong to ovate	lanceolate	obovate-oblong to narrow elliptic-oblong	elliptic, oblong to ovate-lanceolate	linear to narrowly elliptic	elliptic oblong to ovate, concave
Leaf size (mm)	2.5–4 x 1.2–2	3–6 x 0.7–1.2	5–9 x 1.5–2.2	4–6 x 1.2–2.2	1.8–2.2 x 0.6–1.0	2.7–3.5 x 2–2.5
Leaf indument	glabrous or puberulous in the under side	scabrous-pubescent to puberulous	glabrous or sparsely pubescent (adaxial)	spare or subglabrous, ciliata on margins	glabrous, only with minute hirtella in mucro	hirtellous on both sides, margin slightly hirsute
Stipules	ovate to oblong, 2–3(–4) x 1.5–2(–2.5) mm	narrow, ovate-lanceolate, 4 mm	ovate-lanceolate	ovate or suboblong, 3.5 mm	oblong-lanceolate, 1–8–2.2 x 0.6–1.0 mm	broadly oval-oblong 3.8 x 2.7 mm
Flower size (mm)	(2–)2.2–2.5(–3.2)	1.7–2	4–5	(2.2–) 2.4–3.0	1.9–2.2 x 0.9–1.2	2.2–2.3
Sepals	oblong, 1.3–1.5(–2) x 0.5–0.7 mm	oblong to lanceolate oblong 1–1.2 mm	oblong to ovate-oblong, 0.6–0.7 x 0.5 mm	pubescent, oblong, (1.2–) 1.4 mm	ovate, scarious, 1.6–1.8 x 0.8–1.4	oblong, obtuse, 1.2–1.4 mm
Ovary	conical, 0.5–0.6 x 0.4–0.5 mm	subsessile, 0.5 x 0.3 mm, ellipsoid	conical-ovoid, 0.5 x 0.4 mm	conicum, 0.7–0.5 mm	oblong, 0.6–0.8 x 0.6–0.8 mm	subquadrangular 0.5 mm in diam.

*Paronychia ubinensis* was also compared with the *Paronychia* species occurring in the Bolivian and Chilean Andes, with which significant morphological and geographical differences were found. For instance, *P. communis* Cambess. (Cabessèdes 1829), *P. chilensis* DC. (Candolle 1828), *P. johnstonii* Chaudhri (Chaudhri 1968) and *P. setigera* (Gillies) F. Herm (Hermann 1937) have larger leaf size (>5 mm) and longitudinal separation of the glomerules (>1 cm), and form more prostrate plants inhabiting disturbed areas in lower elevation regions. *P. hieronymi* Pax (Pax 1894) forms dense woody stems, its leaf size is larger and has a pubescent surface, and it is restricted to Bolivia and Argentina. *P. microphylla* Phil. (Philippi 1891) is characterized by a shrubby habit with larger leaf size and forms dense green glomerules, with a flower size

larger than 4 mm. Therefore, *Paronychia ubinensis* can be classified as one of the smallest species from the Andean group.

According to Alvarez (2010), the genus *Paronychia* is polyphyletic and *Paronychia andina* and *Paronychia weberbaueri* form a clade. It is unlikely that the Andean *Paronychia* species form a monophyletic group (pers. comm. Anneleen Kool).

**Etymology:** The specific epithet of the new species refers to the endemism in the Ubinas district, in the Moquegua department, southern Peru.



**FIGURE 1.** A. Habitus: whole plant; B. Branch with infructescence; C. Leaf with stipules; D. Flowers, with bracts; E. Opened flower (bracts and 2 sepals removed); F. Bract, inside; G. Sepal, inside, with 2 petals; H. Sepal, inside, with 2 petals and 1 anther; I. Ovary, lengthwise section; J. Embryo.





**FIGURE 2.** *P. ubinensis*; habit at Punku, Tassa, Ubinas district, General Sánchez Cerro province, 4030 m.

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## References

- Al-Shehbaz, I. & Montesinos, D.B. (2009) *Weberbaueria arequipa* (Brassicaceae), a new species from Peru, *Novon* 19 (3): 281–283.  
<http://dx.doi.org/10.3417/2008075>
- Alvarez, S. (2010) Evolution and systematics of locally endemic *Paronychia* (Caryophyllaceae) in South America. Degree project in biology, Master of science. Uppsala Universitet, 20 pp.
- Bittrich, V. (1993) Caryophyllaceae. *In*: Kubitzki, K. (ed.) *The Families and Genera of Vascular Plants 2*, Springer-Verlag, Berlin, pp. 206–236.
- Brako, L. & Zarucchi, J. (1993) Catalogue of the Flowering Plants and Gymnosperms of Peru. *Monographs in Systematic Botany, Missouri Botanical Garden* 45: 337–338.
- Cambessèdes, J. (1829) *Flora Brasiliae Meridionalis* (quarto ed.). *Parisii: Apud A. Belin* 2: 186.
- Candolle, A.P. (1828) *Prodromus Systematis Naturalis Regni Vegetabilis. Parisii: Sumptibus Sociorum Treuttel et Wu*rtz

3: 570.

- Chaudhri, M.N. (1968) A revision of the Paronychiinae. PhD Thesis, Utrecht University. Drukkerij H. Gianotten N. V.-Tilburg. 440 pp.
- Gray, A. (1854) United States Exploring Expedition. During the years 1838, 1839, 1840, 1841, 1842. Under the Command of Charles Wilkes, U.S.N. vol. XV. *Botany*. Phanerogamia by Asa Gray with a Folia Atlas of 100 Plates. Part 1. Philadelphia. 128 pp.
- Hermann, F. (1937) Feddes Repertorium. *Berlin: Selbstverlag des Herausgebers* 42: 224.
- Kool, A. (2012) Desert Plants and Deserted Islands: Systematics and Ethnobotany in Caryophyllaceae. Acta Universitatis Upsaliensis. Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Science and Technology 972. Uppsala. 52 pp.
- Macbride, J.F. (1937) Caryophyllaceae, Flora of Peru. *Publications of Field Museum of Natural History, Botanical Series*. 13(2/2): 113–116.
- Montesinos, D. (2012) Lista anotada de nuevas adiciones para la flora andina de Moquegua, Perú. *Revista Peruana de Biología* 19(3): 303–312
- Pax, F.A. (1894) Botanische Jahrbücher für Systematik. *Pflanzengeschichte und Pflanzengeographie* 18: 34.
- Philippi, R.A. (1891) Anales del Museo Nacional de Chile. Segunda Sección – *Botánica* 8: 26.
- Rohrbach, P. (1872) *Paronychia mandoniana*. *Linnaea* 37: 208.