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Autor: Smith, D.N. / Gereau, R.E.

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Bomarea albimontana (Alstroemeriaceae), a new species from high Andean Peru

D. N. SMITH †
&
R. E. GEREAU

ABSTRACT

† SMITH, D. N. & R. E. GEREAU (1991). *Bomarea albimontana* (Alstroemeriaceae), a new species from high Andean Peru. *Candollea* 46: 503-508. In English, English and Spanish abstracts.

Bomarea albimontana (Alstroemeriaceae), a new species endemic to the Cordillera Blanca, Ancash Department, Peru, is described, illustrated, and its distribution mapped.

RESUMEN

† SMITH, D. N. & R. E. GEREAU (1991). *Bomarea albimontana* (Alstroemeriaceae), nueva especie del Perú altiandino. *Candollea* 46: 503-508. En inglés, resúmenes en inglés y español.

Bomarea albimontana (Alstroemeriaceae), especie nueva endémica a la Cordillera Blanca, Departamento de Ancash, Perú, está descrita e ilustrada, y su distribución geográfica está indicada en un mapa.

The new species was discovered during field studies for the preparation of a flora of the Huascarán National Park and International Biosphere Reserve (SMITH, 1988). The Park includes the bulk of the Cordillera Blanca: it extends from 8°50' to 10°00'S latitude, a distance of nearly 160 km; and has an area of 340.000 ha. The elevations within the Park range from 3240 m to the summit of Nevado Huascarán Sur at 6770 m.

The Cordillera Blanca is the highest tropical mountain range in the world, and is part of the Andean system. The geologic structure of the Park is complex: the northern half is a mixture of granitic and sedimentary rocks; and the southern half is sedimentary. The sedimentary series are often metamorphosed. During several periods of the Pleistocene, the Cordillera was extensively glaciated, and still has many glaciers and icefields. The nature of the local geologic structure and the effects of glaciation have resulted in a steep and dissected topography.

The climate of the Park is of a summer rainy type, dominated by air masses coming from the east. The mean annual temperature at 4000 m is 6-7.5°C, and the average annual precipitation is between 700 and 1100 mm. At 4000 m and above, freezing temperatures can occur in all months, and the average minimum temperatures are below 0°C from July to December (based on data in ONERN, 1972, and unpublished records from ElectroPerú, Huaraz). This general picture is modified by the many microclimates created by the complex topography and geology of the Cordillera Blanca.

The vegetation types within the Park form a complex mosaic that includes dwarf woodlands, shrublands, grasslands, and aquatic, semi-aquatic, and extremely high Andean vegetation. Of these basic types, grasslands are the most widespread. Each vegetation type includes several different plant communities.

Characters of the new species common to all Alstroemeriaceae (DAHLGREN & al., 1985; GEREAU, 1989) are: leaves simple, alternate; inflorescence terminal, bracteate; flowers perfect; sepals 3; petals 3; stamens 6 with anthers pseudobasifixed (the tip of the filament inserted in a deep pit) and introrsely dehiscent; style 1 with 3 stigmatic branches. Characters common to all species of *Bomarea* are: flowers actinomorphic; ovary trilocular; ovules several per locule on axile placentas; seeds surrounded by a fleshy sarcotesta.

Bomarea albimontana D. N. Smith & Gereau, *spec. nov.* (Fig. 1). **Type:** Perú, Ancash Dept., Huari Prov., Huascarán National Park, Quebrada Pucaraju, a lateral valley of Quebrada Rurichinchay, 3900-4200 m, 15 June 1986, *Smith, Gonzales & Maldonado 12701* (Holotype USM; isotypes CPUN, G, HUT, ISC, MO; reference collection at Huascarán National Park).

Herba perennis volubilis. *Caulis* plurimetralis rigido-volubilis rufo-velutinus apice pendens. *Folia* sessilia non resupinata subtus albedo-pubescentia subdimorpha, inferiora lanceolata rigida arcuata adpressiuscula, summa elliptica complanata horizontaliter patentia. *Inflorescentia* cymosa multiflora pendula umbelliformis involucre bractearum foliiformium prominentium subtenta; ramis furcatis in quaque furca bracteolatis; bracteis floralibus parvis papyraceis persistentibus. *Flores* 17-25 mm longi; sepalis roseis; petalis flavis adaxialiter violaceo-maculatis; ovario semiinfero. *Capsula* globosa dehiscens.

Herbaceous vine: rootstock not seen. *Stem* several meters long, 2-4.7 mm diameter, stiff, twining, rufous-velutinous, often densely so, pendent at apex. *Leaves:* somewhat dimorphic, the lower ones (36-)55-66 × 5-10(-13.5) mm, lanceolate, stiff, arcuate, somewhat appressed to stem, the uppermost 44-76 × (8-)12-19 mm, elliptic, flattened, widely spreading horizontally in live material; both leaf types sessile, short-attenuate, rufous-velutinous at base, glabrous above with many prominent nerves, blue-green, white-pubescent beneath with nerves pilose, internerves velutinous, hairs multicellular and flattened, the margins revolute, apex acute-revolute. *Inflorescence:* compound, hemispherical, cymose-umbellate, (6-)17-29-flowered, subtended by involucre of 6-11 leaflike bracts, these (40-)59-73 × 9-18 mm, elliptic, widely spreading horizontally in live material; inflorescence branches to 35 mm long, puberulent, 1-2(-3) forked, with a bracteole at each node; peduncles (basal portion of inflorescence branches below first fork) 2-4(-6.2) mm long; floral bracts 8.-5-13 × 2.7-6 mm, ovate-attenuate to lanceolate, papyraceous, many-nerved, persistent, rarely larger and subfoliaceous; pedicels (distal portion of inflorescence branches) (3-)10-27 mm long, filiform, puberulent. *Flowers:* perianth campanulate, the segments connivent, appearing equal in length due to higher insertion of petals, decurrent on ovary; *sepals* 17-25 × 10-13 mm, thickened, oblanceolate, acute-revolute at apex, pink; *petals* 19-24 × (4.5-)6.5-7.5 mm, spatulate, acute at apex, abaxially papillose on claw and adaxially with papillose *nectary* at base, abaxially yellow with pink costa plicate between 3 central nerves, adaxially yellow with purple spots; *stamens* with filaments (10-)17.5-19 mm long, acicular, terete, thickened at base, 1-1.5 mm diameter, puberulent; anthers 5.5-8.2 × 1.5-2.7 mm, cordate at base, acute-apiculate at apex, mammilose on surface; *ovary* half-inferior, the upper surface papillose, style 12-18.5 mm long, puberulent, stigmas papillose. *Fruit:* a subspherical loculicidal capsule, ca. 11-23 × 11-15 mm, blue-green; *seeds* ca. 1 mm diameter, globose; sarcotesta bright orange.

Distribution. — This species inhabits the middle and northern Cordillera Blanca, from 8°50' to 9°41'S latitude, on both its western and eastern flanks (Fig. 2). *Bomarea albimontana* can be expected in all the major drainages of the Huascarán National Park from Huaraz northward. It is found in tall shrublands dominated by *Gynoxys caracensis* Muschler (Asteraceae) or *Miconia salicifolia* (Bonpl.) Naudin (Melastomataceae) and *Polylepis weberbaueri* Pilger (Rosaceae) woodlands at altitudes of 3700-4600 m, with adequate moisture throughout the year and mesothermal temperatures. The soils are poorly developed, varying from small pockets of organic matter in the understory of the woodlands to deeper soils of morainal parent material under the shrublands.

Additional specimens examined. — Perú, Ancash Dept., Huascarán National Park: Carhuaz Prov., trail between Vinoyapampa and Portachuelo Honda, 4400-4600 m, 3 Oct. 1985, *Smith*,

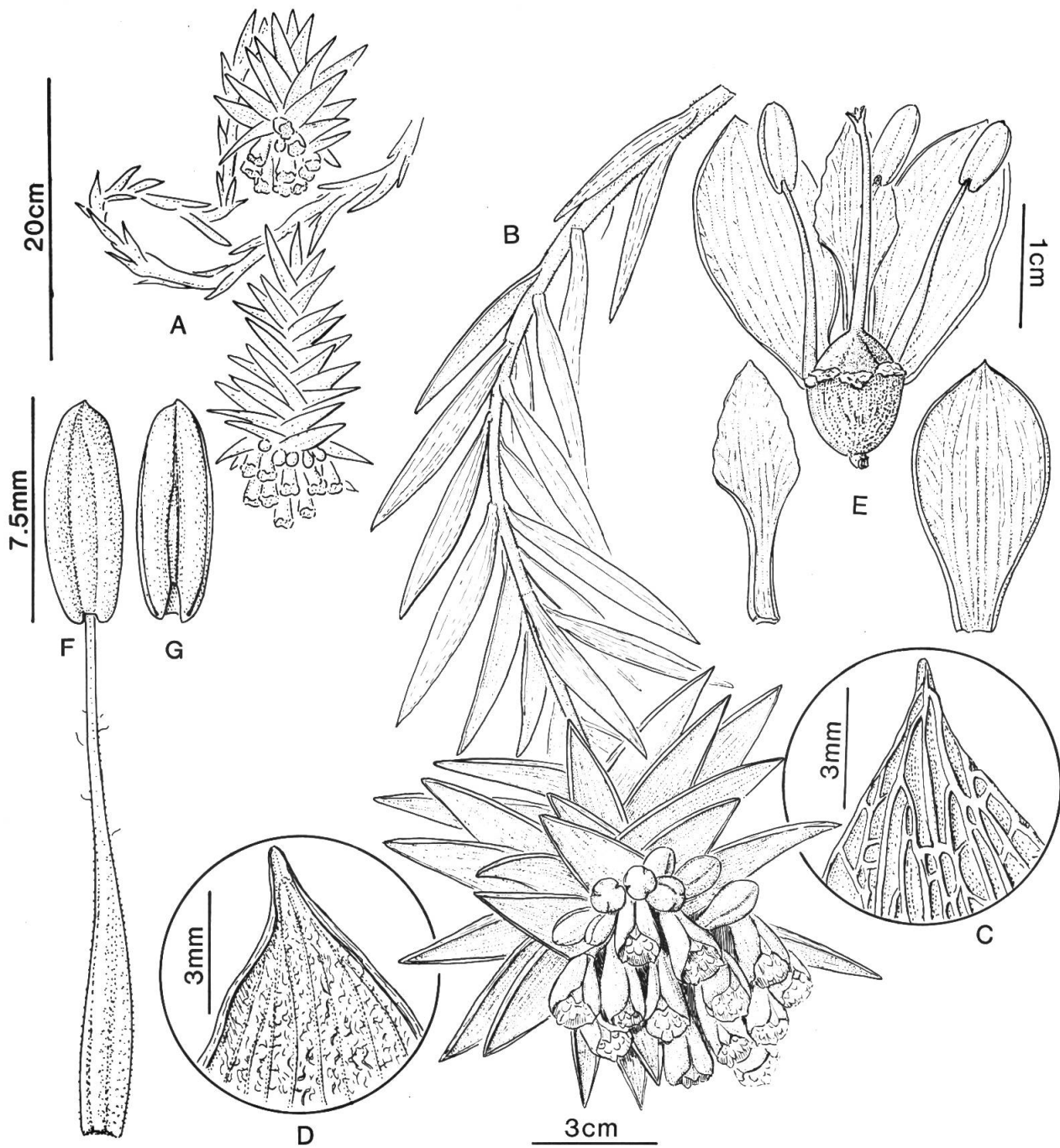


Fig. 1. — A, habit; B, apical section of plant; C, adaxial surface of leaf; D, abaxial surface of leaf; E, flower, 1 sepal and 2 petals removed; F, stamen, abaxial view; G, anther, adaxial view..

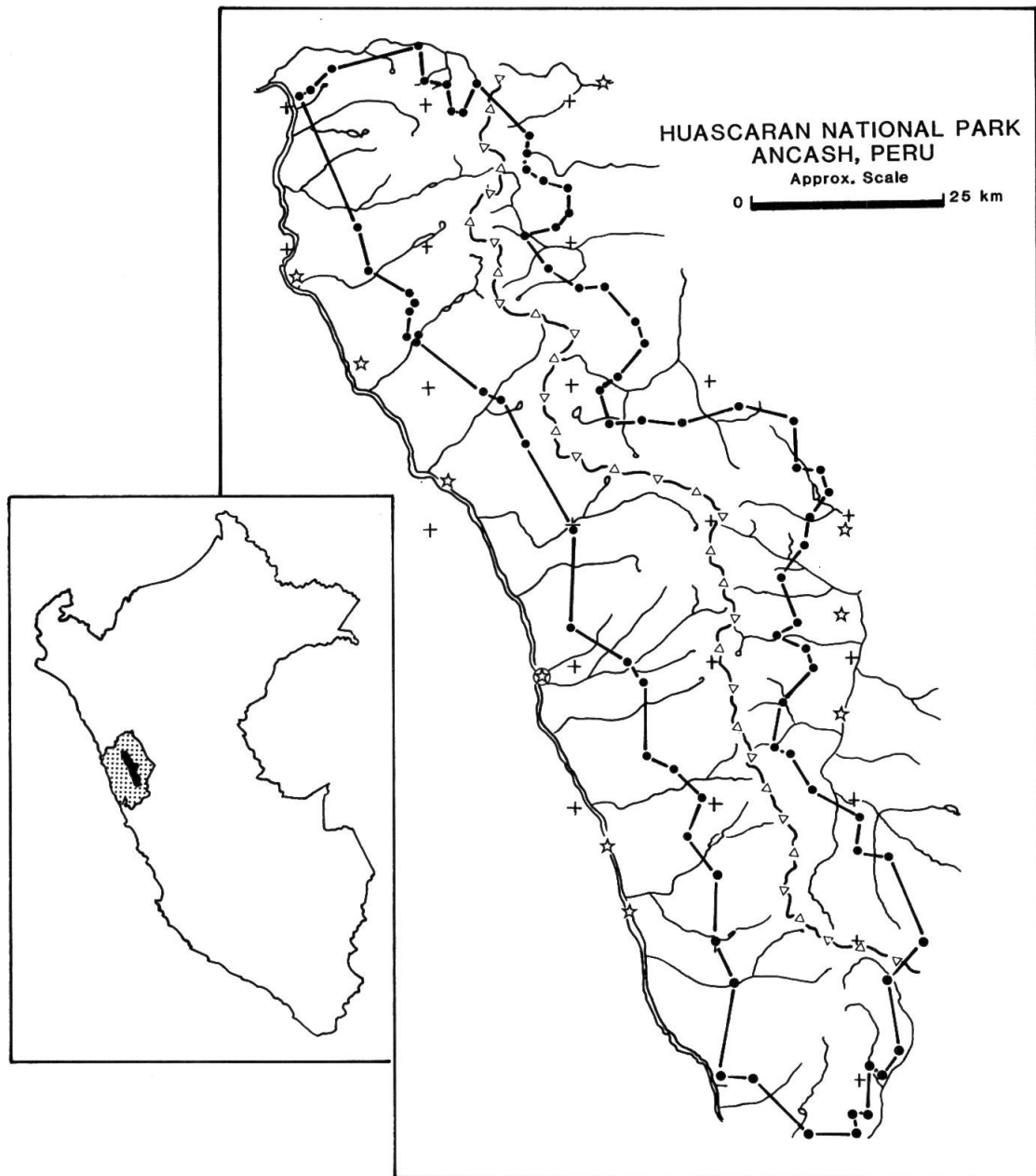


Fig. 2. — Huascarán National Park and distribution of *Bomarea albimontana*. Insert showing location of Park in Peru.

Valencia & Buddensiek 11662 (HUT, ISC, MO, USM; hnp¹); Carhuaz Prov., Quebrada Ishinca, S side of valley, 4200-4260 m, 17 July 1985, *Smith & Buddensiek 11245* (MO, USM; hnp); Carhuaz Prov., Quebrada Ulta, on road to Ulta Pass, 4000-4400 m, 29 July 1985, *Smith 11409* (CPUN, HUT, ISC, MO, USM; hnp); Huaraz Prov., W slopes on road to Quebrada Llaca, 4100 m, *Smith & Buddensiek 11148* (MO, USM); Huaraz Prov., Quebrada Rajucolta, 4000-4150 m, 17-18 April 1986, *Smith, Valencia & Buddensiek 12171* (MO, USM); Huari Prov., 5 km below Cahuish Tunnel, 4250-4350 m, 10 July 1985, *Smith & Buddensiek 11085* (USM); Huari Prov., Quebrada Rima Rima, a lateral valley of Quebrada Carhuazcancha, 4440-4490 m, 7 May 1986, *Smith, Valencia, Buddensiek & Gonzales 12338* (USM); Huari Prov., Quebrada Carhuazcancha, valley of Laguna Ichicpotrero, 4100 m, 8 May 1986, *Smith, Valencia, Buddensiek & Gonzales 12405* (MO, USM); Huaylas Prov., Quebrada Alpamayo, at foot of snow-free peak above Lago Jancarurish, 4350-4500 m, 9 March 1985, *Smith, Valencia, Minaya & Gonzales 9771* (CPUN, ISC, MO, USM; hnp); Huaylas Prov., between Huiscash and Mirador, on trail to Alpamayo, 4350 m, 12 March 1985, *Smith & Valencia 10000* (MO, USM); Huaylas Prov., Parón valley, E of lake, 4250 m, 27 Sept. 1985, *Smith, Buddensiek & Maldonado 11468* (MO, USM); Yungay Prov., Quebrada Llanganuco, between lake and Portachuelo Llanganuco, 4200-4320 m, 16 Aug. 1984, *Smith 8240* (MO, USM; hnp); Yungay Prov., Quebrada Ranincuray, 4100-4150 m, 18 April 1985, *Smith, Valencia & Gonzales 10440* (CPUN, ISC, MO, USM; hnp).

Bomarea has three subgenera (BAKER, 1878, 1882, 1888; KILLIP, 1936a; PAX & HOFFMANN, 1930). Subgenus *Bomarea* is distinguished by flowers with completely inferior ovaries, dehiscent fruits, resupinate leaves, and an elongate, vining or herbaceous habit. The species included in this subgenus are found in a wide variety of habitats from tropical lowlands to high-montane forests. The subgenera *Wichuraea* (M. Roemer) Baker and *Sphaerine* (Herbert) Baker are of high Andean habitats. The former has half-inferior ovaries, stiff, non-resupinate linear leaves with revolute margins, stiffly erect stems, decurved stem apices, and dehiscent fruits. The latter is characterized by a wholly inferior ovary, indehiscent fruits, erect to decumbent (never climbing) stems, and usually resupinate leaves often crowded on the distal portion of the stem. *Bomarea albimontana* is intermediate between Subgenus *Wichuraea* and Subgenus *Bomarea*, being an elongate, twining vine as in Subgenus *Bomarea* with the leaf and floral characters typical of Subgenus *Wichuraea*.

In the treatment of *Bomarea* for Flora of Peru, KILLIP (1936b) lists 58 species. Our material keys immediately to the group of plants assigned to Subgenus *Wichuraea*, but cannot be keyed or matched to any of the included species.

Phenology. — Flowering occurs from March until October, and mature fruit is found in October.

Breeding system. — All specimens examined were protandrous: the style begins to elongate after the stamens are well developed, and the stigmas develop and become receptive after pollen is shed and the anthers are ready to fall. No pollinator has been observed for this species, but is presumably one of the several species of hummingbirds that occur in the Park.

¹All specimens cited as hnp are deposited in the reference collection at the Huascarán National Park headquarters in the Ministry of Agriculture, Huaraz.

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