

TWO NEW SPECIES OF BOMAREA (ALSTROEMERIACEAE) FROM THE VENEZUELAN ANDES

Basil STERGIOS¹ y Laurence J. DORR²

¹BioCentro, UNELLEZ, Mesa de Cavacas, Estado Portuguesa, Venezuela 3323
basilven@cantv.net

²Dept. of Systematic Biology (Botany), MRC-166 National Museum of Natural History,
Smithsonian Institution P.O. Box 37012, Washington, DC 20013-7012, USA
dorr.laurence@nmnh.si.edu

ABSTRACT

Two new species of *Bomarea* (Alstroemeriaceae), *B. amilcariana* Stergios & Dorr and *B. truxillensis* Stergios & Dorr, from the Venezuelan Andes are described and illustrated. The relationships of these new species to other Andean species of *Bomarea* and to the widespread *B. edulis* (Tussac) Herb. are discussed.

Key words: Alstroemeriaceae, *Bomarea*, Andes, Venezuela.

DOS NUEVAS ESPECIES DE BOMAREA (ALSTROEMERIACEAE) EN LOS ANDES VENEZOLANOS

RESUMEN

Se describen y se ilustran dos nuevas especies, *Bomarea amilcariana* Stergios & Dorr y *B. truxillensis* Stergios & Dorr (Alstroemeriaceae) de los Andes de Venezuela. Se discuten las relaciones de las nuevas especies con otras especies de los Andes, también con respecto a una especie de las tierras bajas, *B. edulis* (Tussac) Herb.

Palabras clave: Alstroemeriaceae, *Bomarea*, Andes, Venezuela.

INTRODUCTION

The genus *Bomarea* Mirb. (Alstroemeriaceae) comprises about 100 species of eye-catching perennial vines and herbs distributed from Mexico and the Greater Antilles to southern South America. The genus is in need of a critical revision, the last comprehensive treatment was that of Baker (1888) who recognized 75 species. In Venezuela, 10-15 species are known (Anonymous 1998; Bono 1996; Garbiso & Estrada 2001; Killip 1936; Knuth 1928; Meerow 2001; Schnee 1945; Steyermark & Huber 1978) and all but one of them are found either in the Venezuelan Andes or the Cordillera de la Costa above 1000 m. The exception, *B. edulis* (Tussac) Herb., is known in Venezuela from scattered localities, mostly at lower elevations (Garbiso & Estrada 2001; Meerow 2001). Its distribution appears to be influenced by man as the root tubers are edible. No new taxa of *Bomarea* have been described from Venezuela since a review of the horticultural potential of the genus by Killip (1936). However, work related to the preparation of a manual of the flora of Guaramacal National Park (Portuguesa and

Trujillo states) (Dorr et al. 2000) has convinced us that the following species of *Bomarea* are new.

Bomarea amilcariana Stergios & Dorr, sp. nov.

TYPE: VENEZUELA. **TRUJILLO**, Municipio Boconó, Parque Nacional Guaramacal, road from Boconó to Guaramacal, SE of Boconó, ca. 15 km from the post of the park guards (9°13'N, 70°12'long W), S slope of mountain, 02/November/1998, L.J. Dorr, E. Briceño, G. Briceño & R. Caracas 8387 (holotype, PORT; isotypes, F, GB, K, MO, NY, US, VEN). ([Fig. 1](#) and [2](#)).

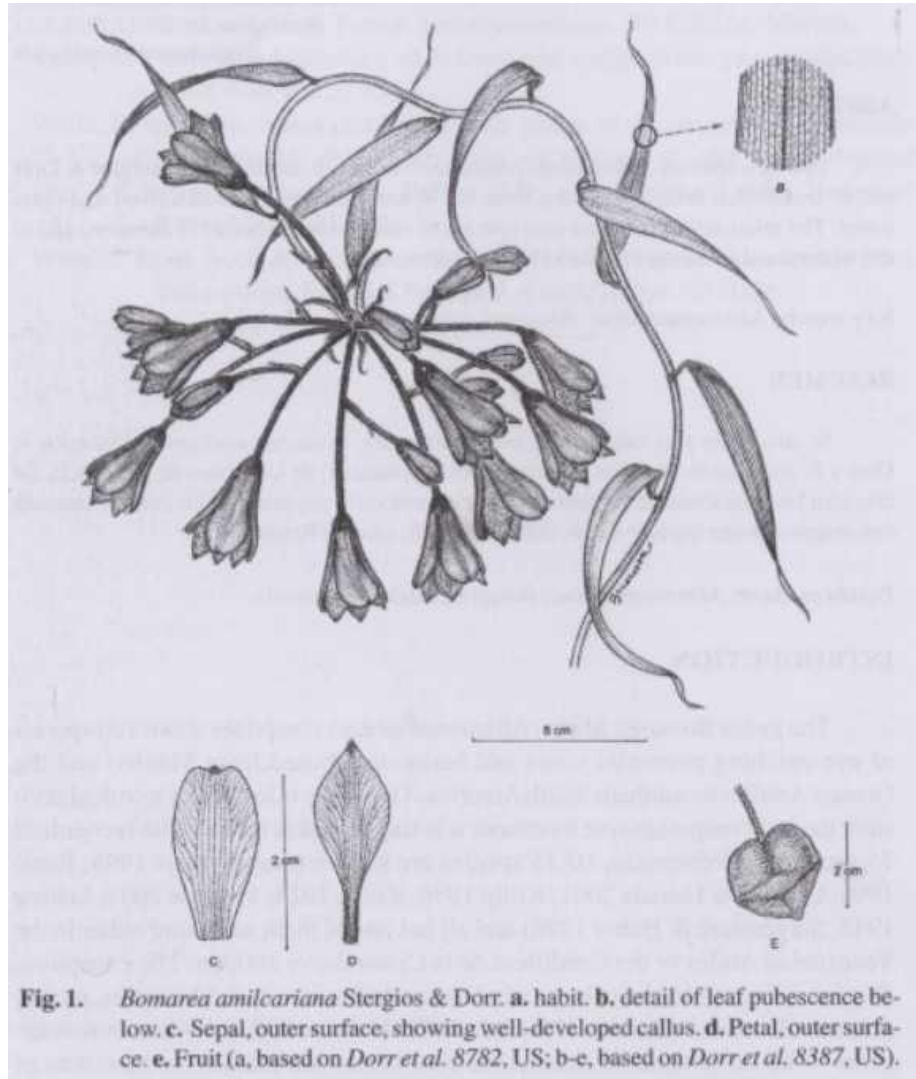


Fig. 1. *Bomarea amilcariana* Stergios & Dorr. **a.** habit. **b.** detail of leaf pubescence below. **c.** Sepal, outer surface, showing well-developed callus. **d.** Petal, outer surface. **e.** Fruit (a, based on Dorr et al. 8782, US; b-e, based on Dorr et al. 8387, US).

***Bomarea* sp. B**, Dorr et al., Contr. U.S. Natl. Herb. 40: 36. 2000 [2001].

Herba procumbens, volubilis, breviter scandens, caule tereti, apicem versus fusciscenti. Folia caulina, lineari-lanceolata vel anguste ovata-lanceolata, acuminata, 9-11 cm longa, 0.8-1.6 cm lata, resupinata, repanda, supra glabra, subtus uniformiter dense tomentoso-pubescentia, uni- (pluri-) cellata, pilis squamiformibus pellucidis, cellulis epidermicis tessellatis. Bractee foliosae, foliis dimidio minores. Umbellae radii 6-12 (-14), breves, laxe diffusi, (3) 5-8.5 cm longi, fusciscentes, dense hirsuteque pubescentes, subaequaliter furcati; pedicellus brevior flore abortivo submaturecenti

donatus. Sepala interdum petalis subaequalia, 2-2.3 cm longa, rubra; petala unguiculato-spathulata, 2.3-2.6 cm longa, viridia, distaliter castaneo-maculata, luteaque ungue donata, ad basin crasse carnosae. Fructus capsula semiglobosa, carnosae, viridi suffusa.



Fig. 2. *Bomarea amilcariana* Stergios & Dorr (photograph of Dorr & Stergios 8782).

Procumbent, low-climbing, scandent, or twining vines; stems to 1 m or more in length, terete, 2.5-3 mm in diameter, nitid, glabrous to sparingly pubescent below the terminal inflorescence. Leaf blades resupinate, subcoriaceous, linear-lanceolate (rarely narrowly ovate-lanceolate), 9-11(-15) x 0.8-1.6 (-2.5) cm, base narrowly cuneate to briefly attenuate, margin slightly revolute, especially near base, repand, apex acuminate, glabrous above, glaucous below and with a dense, uniform, whitish- (or brownish-) translucent, scale-like pubescence covering the entire surface, the scales 1- (several-) celled, flattened, blunt to acute, and weakly erect, epidermal cells tessellate; veins narrowly arcuateparallel, ca. 20-27 in number, raised below and slightly raised above, the midrib and principal veins alternating with thinner veins, transverse veinlets visible (with magnification) above, but not below; petioles canaliculate, with scale-like pubescence in the channel, otherwise glabrous, to 7 mm long (if straightened). Leaf internodes 1.5-3 cm long. Involucral bracts ca. 12, resembling the leaves in form, but smaller, 2-5 cm long, usually reflexed, densely short-pubescent above, glabrous below. Inflorescence umbellate, somewhat loosely spreading, 10-11 cm wide; umbel rays 6-12 (-14), once-forked, (3) 5-8.5 cm long, rarely twice-forked but then flowers not maturing, densely hirsute-pubescent with multicellular hairs, diverging pedicel shorter than, or occasionally equal in length to, the main pedicel; flowers on diverging pedicels always maturing after the flowers on main pedicel; umbel rays and pedicels filiform, somewhat

angled (an artifact of drying?) or terete, very dark red-purple, rather densely, hirsute pubescent, the hairs multicellular, tan-castanate; pedicel bracts at point of forking similar to ray bracts but 1-1.5 cm long; only pedicel of diverging branch bracteolate; bracteoles 5-7 mm long, inserted 4-8 mm below base of ovary. Flowers bisexual, actinomorphic, epigynous; sepals 3, obovate to broadly spatulate, retuse apically, free, equal or subequal, 2-2.3 x 1 cm, dark red, the 7 nerves centered about the axis converging to an obtuse-rounded, somewhat flatly-thickened green callus without, minutely puberulent especially basally and along lower margins, sometimes glabrous; petals 3, unguiculate-spathulate, free, regular, 2.3-2.6 x 0.7-0.8 cm, green with maroon spots distally and yellow claw, somewhat thickened, especially along the center and toward the base, the basal portion notably canaliculate, minutely puberulent throughout; petals usually exceeding the sepals by 0.5-2.5 mm; stamens 6, free, subequal, sometimes one or several 2-4 mm longer than the others, filaments densely puberulent near the base, glabrescent toward the apex, dark-red; anthers pseudo-basifixed, broadly and obtusely fusiform, thickened down the center, 4 x 2.5 mm; receptacle globose to ovoid, 4 x 3 mm, minutely puberulent; ovary inferior, 3-loculed; ovules numerous; style 3-angled basally, ca. 10-12 mm long, puberulent, 3-branched apically, the stigmatic branches erect, loosely appressed. Fruit a verrucoserugose, somewhat triangular-turbinate, leathery, loculicidal capsule, with a greenish bloom, 1-2 cm in diameter. Seeds 6-8 per locule, pyriform, darkmaroon, 3-4 mm in diameter.

Distribution and ecology

Found in openings in upper-montane and cloud forest, and on shrubby, subparamo embankments on the upper slopes of Cerro Guaramacal and the Fila de Agua Fría in Guaramacal National Park, Trujillo state, Venezuela; (1600-) 1900-3000 m. Most frequently collected on the moister, southern slopes and subparamos of the Park. Flowering from November through March (dry season) and fruiting from April through July (rainy season). Possibly locally endemic.

Additional material examined

VENEZUELA: **TRUJILLO:** Parque Nacional Guaramacal, vertiente sur, parcela de estudio fitosociológico No. 6 (9°13'32"N, 70°10'01"W), 13-15/December/1995, Cuello et al. 1264 (GB, MO, PORT, US); road from Boconó to Guaramacal, SE of Boconó, below the television antennas (9°13' Lat. N, 70°12'W), 14/July/1995, Dorr & Barnett 8093 (PORT, US); on road from Boconó to Guaramacal, SE of Boconó, S slope of mountain (9°13' Lat. N, 70°12' Long. W), 22/July/1995, Dorr & Barnett 8242 (PORT); S slopes of Páramo de Guaramacal on the Boconó-caserío de Guaramacal road, 02/January/2001, Dorr & Stergios 8782 (PORT, US); Páramo de Guaramacal, Wof road summit (ca. 9°14'N, 70°11'W), 28/April/1988, Dorr et al. 5007 (NY, PORT); slope forests of El Pumar, SE of Boconó on old mule trail to caserío de Guaramacal (UTM: 19-364614E; 1021651N), 27/December/2000, Dorr et al. 8677 (CTES, K, PORT, US); vertiente sur, parcela de estudio fitosociológico No. 9 (ca. 9°13'N, 70°07'W), 20-22/January/1996, Licata et al. 660 (PORT-unicate); 12 km ESE of Boconó, 1 km N to 4 km NNE of Guaramacal [sic] (9°12'13" Lat. N, 70°09' Long. W), 15/March/1982, Liesner et al. 12994 (VEN-unicate); 20-22 km along rd. to Guaramacal from jct. with hwy. to Boconó (ca. 9°13'N, 70°13'W), 15/March/1984, Luteyn & Cotton 9741 (NY, PORT); Parque Nacional Guaramacal, 2700 m, 11/February/1999, Manara y Fco. Oliva-Es/n (VEN); Fila de Agua Fría (9°16.7' Lat. N, 70°8.65' Long. W), January-

February/1996, Stergios & Zambrano 17657 (GB, PORT, US); Cerro Guaramacal, Boconó, bajando hacia el caserío de Guaramacal, 25-26/November/1982, Stergios et al. 4704 (PORT), Stergios et al. 4754 (PORT); sector cumbre del páramo, alrededores de las antenas, June/2001, Stergios et al. 19263 (PORT); Páramo de Guaramacal, entre Boconó y Guaramacal, 24/February/1971, Steyermark 104840 (VEN).

We are pleased to name this species for Amílcar Bencomo, superintendent of Guaramacal National Park since its creation in 1988. He has been not only an important defender of the Park, but also an enthusiastic supporter of biological research focused on understanding this island of natural vegetation in the Venezuelan Andes.

Bomarea amilcariana can be readily distinguished from all other species of *Bomarea* by its unequal, once-forked umbel rays that are densely hirsute-pubescent, with multicellular hairs; diverging pedicels shorter than, or occasionally equal in length to, main pedicels; and the fact that the diverging pedicel alone of a pair of pedicels is bracteolate. In *B. amilcariana* the diverging pedicel always bears a flower that is less vigorous than that on the main pedicel, sometimes even a flower that aborts. Also distinctive in this new species are the narrow, linearlanceolate (rarely narrowly ovate-lanceolate), notably repand and resupinate, subcoriaceous leaves that are revolute especially near the base. The leaf blades below are glaucous with a distinctive whitish- (or brownish-) translucent, scalelike pubescence that is uniformly distributed over the leaf surface below, and not restricted to the ribs.

Bomarea amilcariana belongs in *B.* subgenus *Bomarea*, which is characterized by elongate, sarmentous stems, and resupinate, elongate leaves (Baker 1888). Within this subgenus it can be assigned to the "Edules group", characterized by forked umbel rays, and sepals and petals that are subequal in length (Baker 1888; Killip 1935, 1936). Within the "Edules group", *B. amilcariana* can be distinguished from *B. edulis* by leaf texture (subcoriaceous versus membranous) and pubescence (densely pubescent versus glabrous), and by umbel ray length (ca. 5-8.5 versus 7.5-24 cm long) and pubescence (densely pubescent versus glabrous). In *B. cornuta* Herb., another member of the "Edules group" known from Venezuela (Táchira state), the sepals have conspicuous corniculate appendages as opposed to the subapical calluses of *B. amilcariana*.

Although the once-forked umbel rays and bracteoles easily separate *Bomarea amilcariana* from *B. multiflora* (L.f.) Mirb. and *B. bredemeyerana* Herb. (both with simple umbel rays and without bracteoles), the leaf pubescence below of all three species is remarkably similar. The stems of *B. bredemeyerana* are rather densely pubescent. Those of the other two species are glabrous (albeit occasionally sparingly pubescent toward the inflorescence).

In their synopsis of the Venezuelan species of *Bomarea* subgenus *Bomarea*, Garbiso and Estrada (2001) treated several collections (e.g., Liesner et al. 12994, Steyermark 104840) from Guaramacal as *B. pauciflora* (Kunth) Herb. We cannot agree with their determinations since these specimens do not have the alternating thick and thin vein pattern (Garbiso & Estrada 2001, Fig. 2A) that is so distinctive in *B. pauciflora* and because the cited material agrees in all other particulars with *B. amilcariana*.

***Bomarea truxillensis* Stergios & Dorr, sp. nov.**

TYPE: VENEZUELA, **TRUJILLO**, Municipio Boconó, Parque Nacional Guaramacal, Sector Las Cruces, camino real La Aguadita-Batatal (9°20,11' Lat. N, 70°5,57' Long. W), 1900-1950 m, 17/March/1999, N. Cuello, C. Orúa & A. Milla 1487 (holotype, PORT; isotype, US).

Herba scandens, volubilis, flexuosa, glabra. Folia lineari-lanceolata vel lanceolata, pellucido-membranacea, subfalcata, 11-12 cm longa, 2-2.5 cm lata. Bracteae umbellares foliosae, sed foliis duplo minores, concolores. Umbella compacta subglobosa, radiis brevibus, glabris, semel furcatis, raro simplicibus, constituta. Sepala spathulata, late emarginata, appendice deltoideo, ligulaeformi, subapicali, roseo-lilacino donata. Petala unguiculata, alba, ad basin breviter obscureque villosa, ad apicem crasse obscureque apiculata, apiculo viridi ornata.

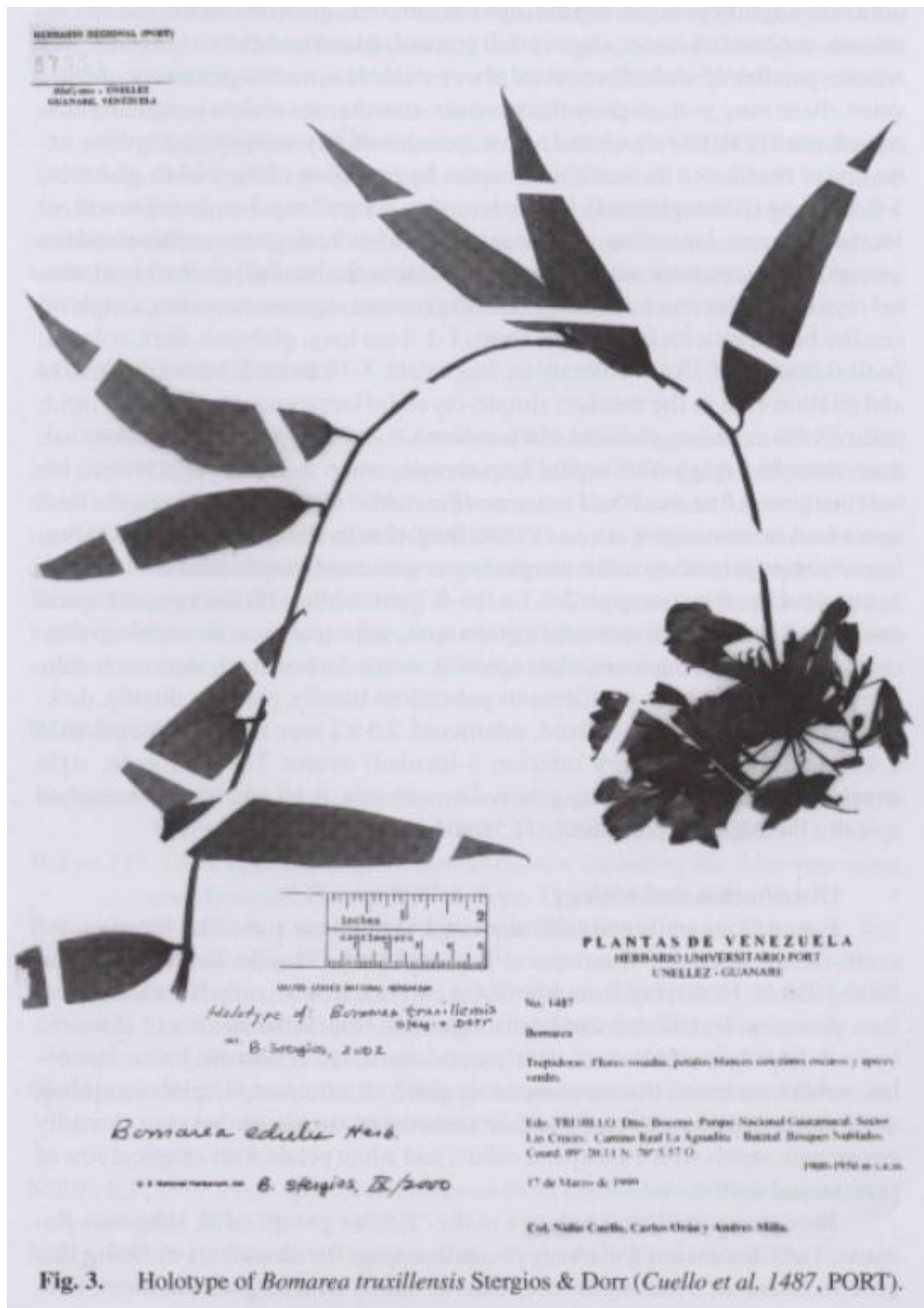


Fig. 3. Holotype of *Bomarea truxillensis* Stergios & Dorr (Cuello et al. 1487, PORT).

Spindly, flexuose, herbaceous, scandent vines; stems thin, delicate, terete, 1-2 mm in diameter, glabrous. Leaf blades resupinate, thinly membranous, almost translucent, linear-lanceolate to lanceolate, slightly falcate, 11-12 x 2-2.5 cm, base obtuse to slightly oblique, repand, apex acuminate, glabrous above and below, smooth, sublustrous above, slightly dull greenish-glaucous below; veins narrowly arcuate-parallel, 15 in number, raised above and below, midrib prominent, thinner veins alternating with slightly thicker ones, transverse veinlets irregularly dispersed, readily visible above and below; petioles shortly-winged by a hyaline extension of the base of the leaf blade, costate by extension of the midrib, glabrous, 5-8 mm long (if straightened). Leaf internodes 2-8 cm long. Involucral bracts ca. 16, membranous, lanceolate, acuminate, 2-4 x 0.3-0.5 cm, glabrous above and below, nitid. Inflorescence a rather compact, subspherical umbel, ca. 9 x 11 cm, umbel rays 16 or more, once-forked on seemingly more vigorous branches, simple on smaller branches with fewer rays, short, 1-1.8 cm long, glabrous, dark-colored; pedicel bracts leaf-like, membranous, lanceolate, 8-10 mm x 2-3 mm (diminutive and enation-like in the weaker, simple-rayed inflorescences), glabrous, nitid; pedicels filamentous, glabrous, dark-colored, 1-1.5 cm long. Flowers bisexual, actinomorphic, epigynous; sepals 3, spatulate, onion skin-like papyraceous, often emarginate, free, ca. 2.5 x 1 cm, rose-lilac, with 7 longitudinal nerves, the midnerve thicker, converging at a ca. 0.5 mm long, obtuse, triangular subapical callus, lateral nerves ascending to the margin from outer-most longitudinal nerve; petals 3, unguiculate, free, unequal, 2-2.7 x 0.5-0.7 cm, white with a single, subapical row of pronounced dark spots and a green apex, same texture as the sepals, pubescent within basally, thick-apiculate apically, with a darkened tip; stamens 6, free, subequal, 1.8-2 cm long, the filaments puberulous basally, glabrous distally, dark-colored; anthers pseudo-basifixed, subdiscoid, 2.5 x 2 mm; receptacle cupulate, 4 x 4.5 mm, glabrous; ovary inferior, 3-loculed; ovules 2-3 per locule; style cuneiform, sometimes slightly grooved on one side, 8-10 mm long, 3-branched apically, the stigmatic branches ca. 1.5 mm long. Fruit unknown.

Distribution and ecology

Found along trails and other openings in montane and cloud forest on the south-facing slopes of Guaramacal National Park, Trujillo state, Venezuela; 1900-1950 m. Flowering from March (or earlier). Known only from the type.

Bomarea truxillensis can be distinguished from other species of *Bomarea* by its delicately membranous, nearly translucent, rather narrow, linear-lanceolate, subfalcate leaves that are completely glabrous; compact, subglobose umbels with short, glabrous, once-forked or sometimes simple umbel rays; broadly emarginate sepals with a subapical callus; and white petals with an apical row of pronounced dark spots.

Bomarea truxillensis belongs in the "Edules group" of *B.* subgenus *Bomarea* (see discussion following *B. amilcariana* for characters defining this group). *Bomarea truxillensis* resembles *B. edulis* with its glabrous stem; thin, membranous, glabrous leaves; umbel bracts similar to, but about one-half or less the size of the leaves; forked, glabrous umbel rays; and flowers with pinkishlavender sepals. However, the leaves of *B. edulis* are generally broader, more lanceolate, and less acuminate; the umbel rays are notably longer, arranged in an open, nodding umbel, and usually multi- (versus once-) forked; the sepals are obtuse-mucronulate with a thickened callus at the apex; and the petals are usually yellowish-green with scattered, rather faded, maroon spots.

A fruiting specimen of *Bomarea* (Licata & Niño 825, PORT) collected at 2450 m in more arid scrub forest and subparamo near Arbol Redondo (north of the Boconó river valley), Trujillo state, may represent *B. truxillensis*, but there are subtle differences in leaf venation and texture. In addition, since most of the umbel rays have fallen or broken off the specimen, the inflorescence structure is difficult to interpret and associate with flowering material of *B. truxillensis*.

ACKNOWLEDGMENTS

Research was supported by the Andrew W. Mellon Foundation, UNELLEZ and CONICIT-Portuguesa research grants (SEI-23197106 and S1-96-004), and the Biological Survey and Inventories program of the National Museum of Natural History. We are indebted to INPARQUES and the Ministerio del Ambiente (MARNR-Venezuela) for granting us permits to collect botanical specimens; Bruno Manara (VEN) for illustrating *Bomarea amilcariana* and for providing the Latin descriptions; and Angel Fernández (IVIC) for checking several herbarium collections at the Fundación Instituto Botánico de Venezuela.

BIBLIOGRAPHY

1. Anonymous. 1998. Lista de trabajo para el nuevo catálogo de la flora de Venezuela. PNUD [GEF], FIBV, MARNR, and ENDIBIO.
2. Baker, J.G. 1888. Handbook of the Amaryllideæ, including the Alstroemerieæ and Agaveæ. George Bell & Sons, Covent Garden. London.
3. Bono, G. 1996. Flora y vegetación del estado Táchira. Monogr. Mus. Reg. Sci. Nat. (Torino) 20: 1- 951.
4. Dorr, L.J., B. Stergios, N.L. Cuello A. & A.R. Smith. 2000 [2001]. Catalogue of the vascular plants of Guaramacal National Park, Portuguesa and Trujillo states, Venezuela. Contr. U.S. Natl. Herb. 40: 1-155.
5. Garbiso, C. & J. Estrada. 2001. Sinopsis taxonómica de *Bomarea* Mirb. Subgénero *Bomarea* (Alstroemeriaceae) para Venezuela. PlantULA 3(1): 11-39.
6. Killip, E.P. 1935. New species of *Bomarea* from the Andes. J. Wash. Acad. Sci. 25: 370-377.
7. Killip, E.P. 1936. *Bomarea*, a genus of showy Andean plants. Natl. Hort. Mag. 15: 115-129.
8. Knuth, R. [1926-] 1928. *Initia Florae venezuelensis*. Repert. Spec. Nov. Regni Veg., Beih. 43: 1-768.
9. Meerow, A.W. 2001. *Bomarea* (Liliaceae). In: J.A. Steyermark et al., Flora of the Venezuelan Guayana 6: 4-5.
10. Schnee, L. 1945. *Bomarea* (Amaryllidaceae). In: H. Pittier et al., Catálogo de la flora venezolana 1: 178-179.

11. Steyermark, J.A. & O. Huber. 1978. Flora del Avila. Publicación Especial de la Sociedad Venezolana de Ciencias Naturales. Caracas.