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THE SOUTH AMERICAN GENUS *OZIROË* (HYACINTHACEAE-OZIROËOIDEAE)

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ABSTRACT: Guaglianone, E. R. & Arroyo-Leuenberger, S. 2002. The South American genus *Oziroë* (Hyacinthaceae-Oziroëoideae). *Darwiniana* 40(1-4): 61-76.

The genus *Oziroë* (Hyacinthaceae), better known under the later name *Fortunatia*, is the only representative of the family in South America and ranges from Peru and Chile to Bolivia, Paraguay and north to central Argentina. Some of the species were originally described in the genera: *Scilla*, *Allium*, *Ornithogalum*, *Nothoscordum* and *Fortunatia*; and some temporarily considered to belong to *Camassia*. This paper deals with the taxonomic history of the genus and presents the results of a taxonomic revision, recognizing five species: *Oziroë acaulis*, *O. argentinensis*, *O. arida*, *O. biflora* and *O. pomensis*. A key to recognize the species, descriptions of the genus and species, together with illustrations and distribution maps are provided. The study revealed *Oziroë argentinensis* as a new record for Paraguay, *O. acaulis* for Chile, and *O. pomensis* as new for Bolivia, Chile and Peru; *O. arida* is endemic to Chile, and *O. biflora* was confirmed only for Chile and Peru.

Key words: Taxonomy, Hyacinthaceae, *Oziroë*, *Fortunatia*, South America.

RESUMEN: Guaglianone, E. R. & Arroyo-Leuenberger, S. 2002. El género sudamericano *Oziroë* (Hyacinthaceae-Oziroëoideae). *Darwiniana* 40(1-4): 61-76.

El género *Oziroë* (Hyacinthaceae) mejor conocido por su anterior nombre *Fortunatia*, es el único representante de la familia en América del Sur. Su área se extiende desde Perú y Chile hasta Bolivia, Paraguay y norte y centro de la Argentina. Algunas de sus especies fueron consideradas en diferentes géneros: *Scilla*, *Allium*, *Ornithogalum*, *Nothoscordum*, *Fortunatia* y *Camassia*. En este trabajo se presenta la historia taxonómica del género, se lo describe así como también a sus especies, reconociéndose 5: *Oziroë acaulis*, *O. argentinensis*, *O. arida*, *O. biflora* y *O. pomensis*. Se provee una clave para el reconocimiento de las especies, ilustraciones y mapas de distribución geográfica. Este estudio reveló que *Oziroë acaulis* es una nueva cita para Chile, *O. argentinensis* es nueva cita para Paraguay y *O. pomensis* también es nueva para Bolivia, Chile y Perú. *O. arida* es endémica de Chile, mientras que *O. biflora* pudo ser confirmada solo para Chile y Perú.

Palabras clave: Taxonomía, Hyacinthaceae, *Oziroë*, *Fortunatia*, Sud América.

INTRODUCTION

Oziroë Raf. is a South American genus of Hyacinthaceae, for more than 60 years better known as *Fortunatia* J. F. Macbr., and included in the Liliaceae. Most of the species now referred to *Oziroë* were first described in other genera: *Scilla* L., *Ornithogalum* L., *Allium* L. and *Nothoscordum* Kunth. Some were temporarily placed in *Camassia* Lindl. by Cocucci (1969). The systematic position of *Oziroë*, as related to *Scilla* s. lat. and within Liliaceae s. lat., has recently been investigated and discussed by Speta (1998 a). Speta created the subfamily Oziroëoideae (Hyacinthaceae) and definitively segregated the South American genus *Oziroë* from the North American genus *Camassia*. The systematic placement including a key to the genera, is treated by Speta (1998 a, b). The greatest diversity of Hyacinthaceae is in South Africa, the Mediterranean area and thence to NW Europe, central and east Asia. It is represented in North America by the subfam. Chlorogaloideae Speta and in South America by the monotypic subfam. Oziroëoideae Speta (Speta, 1998 b).

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The present study was stimulated by an earlier revision of *Nothoscordum* and *Ipheion* Raf. for Argentina (Guaglianone, 1972) and during the preparation of the preliminary nomenclatural adjustments and listings for the flora of Argentina (Guaglianone & Arroyo-Leuenberger, 1995, 1996). The purpose of this contribution is an elucidation of the complex taxonomic history, and a critical taxonomic revision of the species including typification of all names, key to species, descriptions, illustrations, and distribution maps.

MATERIAL AND METHODS

Material from the following herbaria was consulted: AAU, B, BA, BAA, BM, BR, C, CONC, CORD, CTES, F, G, GB, HAL, HBG, K, LIL, LP, LPB, LZ, MA, MO, MPU, NY, P, S, SGO, SI, US, W, Z, ZSS. Herbarium acronyms follow Holmgren et al. (1990). Measurements of flowers and inflorescence, also colors of them, were taken from herbarium and living specimens. Independent field studies were made by both authors in Argentina and in Chile.

TAXONOMIC HISTORY

The first reports of plants belonging to the genus *Oziroë* date back to the early 19th century, when Ruiz & Pavón (1802), described the first species, *Scilla biflora* from Peru. Poeppig (1833) published *Ornithogalum aridum* from central Chile. Lindley (1836) described another species, *Ornithogalum chloroleucum*, from the coastal area of Chile in the vicinity of Valparaiso.

Rafinesque (1837) recognized *Ornithogalum chloroleucum* Lindl. as a different genus and, without citing material, proposed the generic name *Oziroë* with the only species *Oziroë leuchlora*, an illegitimate new name based on *Ornithogalum chloroleucum*. Subsequent authors ignored *Oziroë* and continued to place New World species in Old World genera (e.g., Kunth, 1843; Gay, 1850; Baker, 1873). Further species were described under various generic names: *Ornithogalum geminiflorum* from the vicinity of Lima, Peru, by Herbert (1838); *Ornithogalum chilense* and *Scilla triflora* from central and northern Chile by Philippi (1857, 1860), and *Scilla acaulis* from the highland of Peru by Baker (1874). Further names are: *Allium sessile* Fries (1905) from the Puna of Argentina, *Scilla argentinensis* Lillo & Hauman (Hauman, 1917) from northern Argentina, and *Nothoscordum fictile* Macbride (1931), from southern Peru.

In some instances related species were placed in different genera, e.g., by Kunth (1843), Beck & Valenzuela (1991), Brako & Jörgensen (1993), and Rahn (1998). Bentham (1883) proposed *Scilla* sect. Hesperoscilla for *S. biflora*. This was maintained by Krause (1930). Macbride (1931) proposed the new genus *Fortunatia*, based on *Scilla* sect. Hesperoscilla of Bentham (1883) with the only species *Scilla biflora*.

Macbride's generic concept was accepted by most subsequent workers, e.g., Weberbauer (1945), Navas (1973), Dahlgren & Clifford (1982), Ravenna (1982), Guaglianone (1984), Hoffmann (1989), Marticorena (1990), Brako & Jørgensen (1993), and Guaglianone & Arroyo-Leuenberger (1995, 1996). The major exception was Cocucci (1969) who sank most of the species now included in *Oziroë* in one species of *Camassia*, a North American genus.

Fernández & Daviña (1991) made a comparative cytological study of *Camassia* and *Fortunatia*. Based on chromosome data, they upheld *Fortunatia* as distinct from *Camassia*. Using DNA-data, Fay & Chase (1996), confirmed the segregation of *Fortunatia* (attributed to Hyacinthaceae) from *Camassia* (supposed near Agavaceae).

Following the resurrection of *Oziroë* by Speta (1998a), Ravenna (1998) described *Oziroë pomensis*, a new species from NW Argentina, and one year later *O. correntina* from NE Argentina, and *O. totorensis* from Cochabamba, Bolivia (Ravenna, 1999). With these recently described novelties, the number of species accepted by Ravenna amounts to eight.

In the more general treatment of Hyacinthaceae, Speta (1998b) treated *Oziroë* as a genus with about ten species, without listing them. Pfosser & Speta (1999) presented molecular data showing a basal position of *Oziroë* within Hyacinthaceae.

Ravenna (2000) proposed an infrageneric classification of *Oziroë* with two sections: sect. Oziroë, with *O. arida, O. biflora, O. argentinensis, O. correntina, O. pomensis, and O. totorensis*, and sect. Nidia Ravenna, with *O. acaulis* and *O. sessilis.* Pfosser & Speta (2001) confirmed the basal position of the Oziroëoideae, indicating a very early separation within the family.

Distribution

Predominantly *Oziroë* is in W South America, from ca. 10° S latitude in Peru to ca. 36° S in Chile, extending to Bolivia, Paraguay, and NW, central, and NE Argentina, from sea level to 4000 m s.m. Rundel et al. (1990) mentioned the widely distributed *Oziroë biflora* (as *Fortunatia biflora*) as an example of species successfully established over the entire length of the Atacama and Peruvian deserts.

Oziroë comprises five species and is represented in Argentina and Bolivia by three species: *O. argentinensis*, *O. acaulis*, and *O. pomensis*; in Chile by *O. acaulis*, *O. arida* (endemic), *O. pomensis* and *O. biflora*, in Peru by *O. biflora*, *O. acaulis*, and *O. pomensis*, and in Paraguay by *O. argentinensis*.

GENERIC DESCRIPTION

Oziroë[1] Raf., Fl. tellur. 3: 53. 1837 (1836).

Scilla L. sect. Hesperoscilla Benth. in Benth. & Hooker f., Gen. 3: 815. 1883.
Fortunatia J. F. Macbr., Field Mus. Nat. Hist., Bot. Ser. 11 (1): 9. 1931.

Type species: *Oziroë leuchlora* Raf., nom. illeg. [=*Oziroë chloroleuca* (Lindl.) Speta = *Oziroë arida* (Poepp.) Speta].

Bulbous geophytes, perennial; roots few, white, branched, a few thickened contractile roots present. Bulbs tunicate, without conspicuous odour, variously deep-seated, narrowly drop-shaped to globose; outer bulb cataphylls papery, pale dirty whitish to dark brown, inner fleshy, mucilaginous, with starch and raphides. Leaves few, all basal, synanthous, imbricate; leaf base sheathing, eligulate, membranous, forming a subterranean neck; leaf blade linear to lanceolate or strap-shaped, fleshy, somewhat succulent, glabrous, channelled or flat, green or glaucous, basally flushed brown-red, suberect or spreading on the ground; apex terete or acute; margin entire. Inflorescence a few to many flowered raceme, simple or double, 3-45 flowers, or corymbiform raceme, rarely umbellate, then with an involucre of several bracts and without aerial scape. Scapes 1-2(-4) per bulb at a time, lateral, solid, stiff, terete, glabrous, green to purplish-red, becoming pale towards the tip, leafless; sometimes with scapes not developed, sterile, ribbon-shaped, membranous. Rachis absent (*O. acaulis*) to more or less elongated. Flowers 1 or 2(-4) per node on extremely reduced shoots, in the axils of bracts, with prophylls; bracts 2(-4) per node, the outer longer than the inner bracts, 1-nerved, subulate, margin hyaline; pedicels straight, pointing obliquely upwards, not articulate. Flowers bisexual, hypogynous, trimerous, actinomorphic. Perigone rotaceous, stellate; tepals 3 plus 3, one-nerved, spreading, ovate, elliptic to lanceolate, the outer ones slightly larger, outside with broad olive-green to greenish-brown-red midvein area, inside white to yellow-white; nearly free, apex papillose adaxially, sometimes the outer cucullate. Stamens 6, filaments patent, scarcely connate and adnate to the tepals at their base; subulate to ovate-lanceolate, white; anthers linear, dorsifixed, viridescent, pale-yellow or white, dehiscing longitudinally; pollen pale yellow. Ovary 3-carpellate, 3-lobed, conical to subglobose, olive-green or pale brown; ovules 2-6 per locule, anatropous, arranged in 2 rows; septal nectaries present; style not exceeding the stamens, stylar channel present; stigma inconspicuous, papillose, white. Capsule globose or ovate, loculicidal, with persisting perianth. Seeds pear shaped to ellipsoid, black, opaque or shiny, rugose, surface striolate, striae transverse or radiating; embryo central, straight, almost as long as the endosperm. Seedling with epigeal, unifacial cotyledonary hyperphyll.

Chromosome number: 2n=30, 34.

Key to the species of Oziröe

1. Scape totally included in the subterranean neck. Flowers in an umbel at soil level, involucre of several bracts ..... 1. *O. acaulis*
1. Scape evident. Flowers in a raceme 2
2 (1). Scape (2-)3-6(-7) cm long, much shorter than the leaves; flowers on a rachis of (1,5-) 2-4 (-5) cm long ..... 5. *O. pomensis*
2. Scape (4-)6-30(-42) cm long, as long as or longer than the leaves; flowers on a rachis of (2,3-)4-30 cm long 3
3 (2). Inflorescence a short raceme, flowers 3-15; rachis 2,3-6(-12) cm long; 1(-2) flowers per node. Stamens with ovate-lanceolate filaments ..... 3. *O. arida*

[1] *Oziroë*, from Greek *okys*: swift.

3. Inflorescence an elongate raceme, flowers 14-40(-60), rachis (8-)10-25(-30) cm long, 1-2(-4) flowers per node. Stamens with subulate filaments 4

4 (3). Tepals (6-)7-8,5(-10) mm long; seeds ca. 3,5 mm long ..... 4. *O. biflora*

4. Tepals (3,5-)4-5,5(-7) mm long; seeds 5-7 mm long ..... 2. *O. argentinensis*

DESCRIPTION OF SPECIES

1. **Oziroë acaulis** (Baker) Speta, Phyton (Horn) 38: 56. (August) 1998. *Scilla acaulis* Baker, J. Bot. 12: 364. 1874. *Fortunatia acaulis* (Baker) Guagl. & Arroyo-L., Hickenia 2(31): 137. 1995. *Oziroë acaulis* (Baker) Ravenna, Onira 3: 41. (November) 1998. Comb. superfl. TYPE: Peruvia, Rio Cosnipulta, leg. *Whiteley* s. n. (1869) (holotype, BM). Figs. 1, 7

Allium sessile R. E. Fries, Nova Acta Regiae Soc. Sc. Upsal., ser. 4, l (l): 165. 1905. *Nothoscordum sessile* (R. E. Fries) Beauverd, Bull. Herb. Boissier, ser. 2, 8: 996. 1908. *Fortunatia sessilis* (R. E. Fries) Ravenna, Wrightia 7: 51. 1982. *Oziroë sessilis* (R. E. Fries) Ravenna, Onira 3: 41. 1998. TYPE: Argentina. Prov. Jujuy: Cuesta de Sta. Catalina ad Rio San Juan in petrosis, ca. 4000 m s.m., 1 Febr. 1901, leg. *F. Claren s. n.*, Herb. *Kurtz 11546* (holotype, S not seen; isotype, CORD).

Nothoscordum fictile J. F. Macbr., Field Mus. Nat. Hist., Bot. Ser. 11 (1): 12. 1931. TYPE: Peru: Prov. Moquegua, Carumas, Febr. 21-Mar. 6-1925, *A. Weberbauer 7262* (holotype, F, photo Ser. Field Mus. 45092; isotypes, BM, K, S).

Bulb subglobose, 1,5-3,5 cm diam.; subterranean neck (1-)2-6(-10) cm long. Leaves fleshy, decumbent, 7-14(-20) cm long x 3(-10) mm wide. Inflorescence at the soil level, 1-4 scapes enclosed within the leaf sheaths which form the subterranean neck, sometimes together with some sterile scapes which are ribbon like, white, more or less twisted at the apex. Umbel with 2-7(-12) flowers; pedicels 8-14(-27) mm long; involucre of hyaline bracts, the outer as much as pedicels, 7-10(-18) mm long, the inner bracts at the base of the pedicels, shorter. Rarely, a second superposed but reduced umbel on a short axis present, up to 1,5 mm long. Flowers white, tepals lanceolate, 4,5-5 mm long x 1,5-2 mm wide, apex papillose adaxially, the outer cucullate, the hoods conspicuous in bud, white, with green, purple or coerulean midvein. Filaments subulate, 3,3-3,4 mm long x 0,7 mm wide; anthers brown, ca. 1,6 mm long. Ovary subglobose 2-2,4 mm diam., ovules ca. 4 per locule; style 1-1,5 mm long. Capsule globose, shortly apiculate, 6 mm diam. Seeds ellipsoid, opaque, with transverse striae, 2,9-3,5 mm long x 1,5-2 mm wide.

Distribution and ecology

SW Peru, W Bolivia, N Chile, and NW Argentina, from 3000 to 4000 m s.m., in rocky soil.

Common name: "Psike Psike", "Sike Sike", edible (Chile).

Specimens examined

ARGENTINA. **Jujuy**. *Dpto. Yavi*: alrededores de Yavi, Siete Hermanos Norte, 3600 m s.m., 30-I-1953 (fl), *Sleumer 3605* (LIL, S, SI).

BOLIVIA. **La Paz**. Región andina, 3700 m s.m., III-1913 (fl, fr), *Buchtien 825* (HBG, NY, SI, US). Murillo: La Paz, Cota-Cota, 1 km hacia el Cerro Muela del Diablo, 3600 m s.m., 21-I-1981 (fl) *Beck 4331* (SI); La Paz hacia el S cerca del pueblo por debajo de la Muela del Diablo, 3800 m s.m., 18-III-1989 (fl), *Beck 16848* (SI); La Paz-Calacoto, 29 km hacia el SE por Collana, 3750 m s.m. 11-I-1981 (fl), *Beck 4266* (LPB); La Paz, hills directly south of Los Pinos suburb, 3300-3700 m s.m., 10-III-1982 (fr), *Solomon 7159* (LPB); idem, 12,5 km al SE del camino entre La Paz y Palca por el camino a Santiago de Collana, 6-II-1988 (fl), *Solomon 17775* (MO). *Prov. Ingavi*: Huacullani cerca cumbre de Lomas de Rosapata, 4000 m s.m., 7-II-1979 (fl), *Beck 299* (LPB). **Potosí.** *Prov. Saavedra*: Cerro Tomillque near Betanzos, 3500 m s.m. 3-II-1994 (fr), *Wood 7902* (LPB).

CHILE. **Región I**. (de Tarapaca) *Prov. Parinacota*: Tignamar, en las lomas próximas a la antena repetidora, 3455 m s.m., 18º24´S 69º39´W, 30-III-2002 (fl), Rosello & Belmonte 763/02 (CONC 156112, SI).

PERU. Without locality, 1839-1840 (fl), *Gay 2230* (P). **Cuzco**. Sicuani, 145 km al S del Cuzco, en praderas, muy abundante, 3551 m s.m., II-1903 (fl, fr), *Hicken s. n.* (SI 10504).

Observations: Oziroë acaulis can be confused with *Nothoscordum*, but the umbel in the latter genus has only 2 bracts, the pedicels lack prophylls at their base, and a stylar channel is lacking.

2. **Oziroë argentinensis** (Lillo & Hauman) Speta, Phyton (Horn) 38: 56. (August) 1998. *Scilla argentinensis* Lillo & Hauman in Hauman, Notes Floristiques, *Anales Mus. Nac. Hist. Nat. Buenos Aires* 29: 423. 1917. *Fortunatia argentinensis* (Lillo & Hauman) Ravenna,

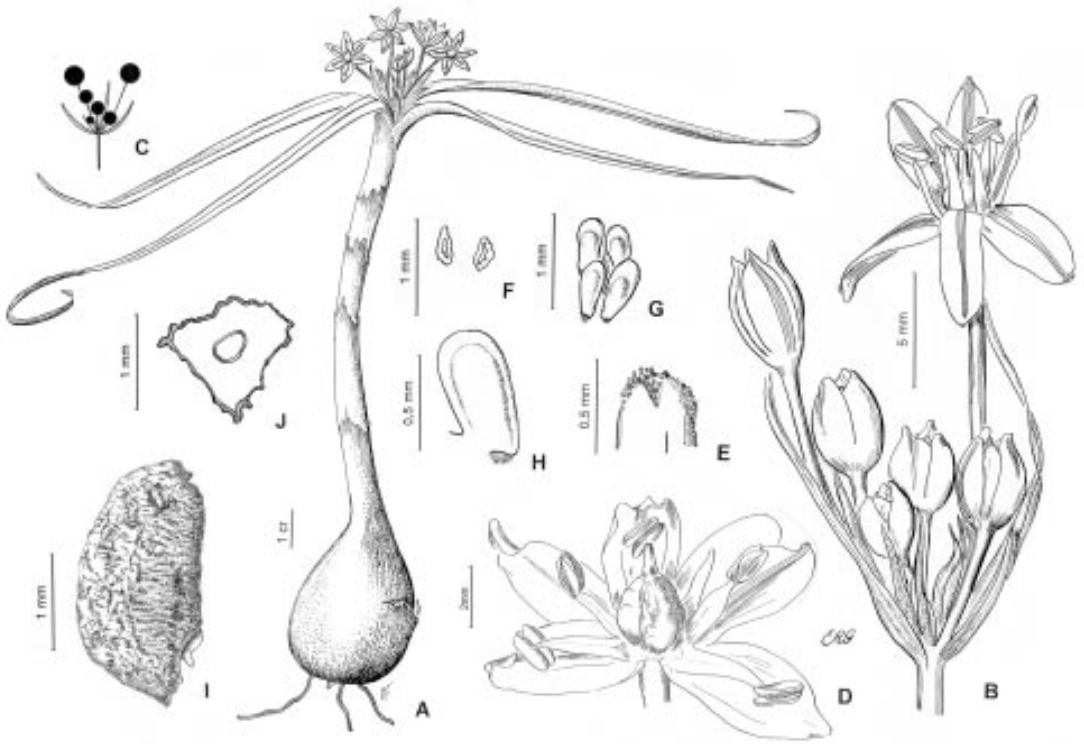

Fig. 1.- *Oziroë acaulis*. A: habit. B: inflorescence. C: diagram of the inflorescence. D: flower opened. E: stigma. F: transections of two styles, showing the stylar channel. G: ovules of one locule. H: ovule. I: seed. J: transection of seed. A, D: from *Claren s. n*., (herb. *Kurtz 11546*, CORD); B, E: from *Weberbauer 7262* (F). F, G, H: from *Whiteley s. n.* (BM). I-J: from *Hicken s. n*. (SI 10504).

Wrightia 7: 51. 1982. *Oziroë argentinensis* (Lillo & Hauman) Ravenna, Onira 3: 40. (November) 1998. Comb. superfl. TYPE: Argentina. Tucumán. Dpto. Burruyacú: Las Cuchillas. Alt. 1100 m s.m., 6-XII-1906, *Lillo 5330* (holotype, LIL). Figs. 3, 8

Oziroë correntina Ravenna, Onira 3: 68-69. 1999. TYPE: "Culta in Bonaria Argentinae ex bulbis prope Chavarría, Prov. Corrientes Argentinae a domine A. Schulz collectis, *Ravenna 2132*, Dec. 1969 (Herb. Rav. type, isotypi institutionibus patet)" (holotype, herb. Ravenna, not seen).

Illustration: Cocucci, Kurtziana 5: 184. fig. 3. 1969 (as *Camassia biflora*).

Plant 20-65 cm high. Bulb subglobose to globose, 3-6 cm long x 3-5 cm wide; subterranean neck 4,5-16 cm long. Leaves glaucous, 25-40 cm long x 5-14 mm wide. Inflorescence a raceme; scape 11-42 cm long, rachis (9-)14-30 cm long, with 14-45(-60) flowers, 1-2(-4) per node; pedicels 1,5-5 cm long; outer bract 3-12 mm long. Flowers white, tepals (3,5-)4-5,5(-7) mm long x 1,1-2,6 mm wide. Filaments subulate; anthers viridescent or pale yellow, 1-1,6 mm long. Ovary globose to conical, 2,5-3 mm diam.; ovules 2-6 per locule; style 2,5 mm long. Capsule erect, globose to ovate, apiculate, 7-12 mm long x 7 mm diam. Seeds narrowly obovoid, 5-7 mm long x 1,5-3 mm wide, surface with radiating striae.

Chromosome number: 2n=30: Fernández & Daviña, 1991, (as *Fortunatia biflora*) and Cocucci, 1969 (as *Camassia biflora*).

Distribution and ecology

Eastern Paraguay, central Bolivia, and northern to central Argentina. From the lowlands to 3200 m s.m. In Corrientes common in "quebrachales" of *Schinopsis balansae* Engl., among Bromeliaceae sp. Flowering in summer and after the rains, from September to March, exceptionally in June.

Specimens examined

ARGENTINA. **Catamarca**. *Dpto. El Alto*: El Alto, 6-XI-1948 (fl), *Argañarás* s. n. (LIL 586604). **Córdoba.**

Dpto. *Tulumba*: Cerro Colorado, 450 m s.m., 12-XI-1950, *Hunziker A. T. & Cocucci 8497* (CORD); Cerro Colorado, cult. Universidad Nac. Córdoba, 29-XII-1955 (fl, fr), *Hunziker, A. T. 20117, 20118* (CORD). **Corrientes.** *Dpto. Capital*: El Perichón, 50 m s.m., 4-XI-1986 (fl), *Charpin & Eskuche 20099* (SI); ruta 5, ca. 19 km al oeste de Corrientes, 8-X-1982 (fl), *Schinini & Martinez Crovetto 22775* (CTES, SI); ca. 10 km de Corrientes (fr), *Schinini & Pire 8676* (CTES, LIL); camino a San Luis del Palmar (fl), *Cristóbal et al. 1421* (CTES); Molina Punta, 15-VII-1988 (fl), *Daviña & Vanni 72* (CTES). *Dpto*. *Empedrado*: 7-XI-1949, *Pedersen 466* (C, P); 27-III-1986, *Pedersen 14544* (C); Manuel Derqui, 15-III-1950 (fl), *Schwarz 10221* (LIL). *Dpto. Itatí*: Ramada Paso, 1-III-1972, *Krapovickas & Quarin 20896* (CTES, LIL, LP, P); Toro Jhú, 8 km S ruta 12, a 40 km E del desvío a Itatí, 16-II-1983 (fl), *Schinini & Carnevali 23248* (CTES). *Dpto. Mburucuyá*: Estancia Sta. Teresa, 28-XII-1954 (fl), *Pedersen 3076* (B, C, CORD, LP, P, S); idem, 16-XII-1974 (fl, fr), *Burkart et al. 30789* (SI). *Dpto. Saladas*: Río San Lorenzo, 28-I-1950 (fl, fr), *Schwarz 9407* (LIL). *Dpto. San Cosme*: Paso de La Patria, en quebrachal a orillas del río Pehuahó, 26-I-1977 (fl), *Irigoyen 404* (C, CTES, SI); Paso de La Patria a ruta 12, 15-I-1961, *Nicora & Cámara Hernández 276* (BAA). *Dpto. San Roque*: Ea. Coaguazú, near Batelito, 28-II-1961 (fl), *Pedersen 5338* (C). **Chaco**. *Dpto. 1º de Mayo*: Colonia Benítez, cult. ex Corrientes, III-1970 (fl), *Schulz 17240* (CTES). *Dpto*. *San Roque*: Chavarría, zona rural, 7-XI-1969 (fl), *Schulz 17168* (CTES). **Jujuy**. *Dpto. Capital*: ruta 9, a 11 km San Salvador de Jujuy, ca. arroyo Huaico Hondo, (fl), *Ahumada 4547* (CTES, SI); Pampa Blanca, 29-I-1937 (fl), *Castellanos s. n*. (BA 20027). **Salta**. *Dpto. Cafayate*: Cafayate, ruta 40, 7 km S de Cafayate, 1600 m s.m. (fl), *Krapovickas & Cristóbal 20575* (CTES); Sacucluya, 7-I-1943, *Castellanos s. n*. (BA 46663). *Dpto. La Poma*: ruta 40, al S del Rodeo, 24-II-1999 (fl, fr), *Guaglianone et al. 3188* (B, SI). *Dpto. Santa Victoria*: Santa Victoria, 2550 m s.m., 8-II-1956 (fl, fr), *Hjerting et al. 161* (C, S); Valle Calchaquí, Churcal, 6-II-1943, *Castellanos s. n*. (BA 46666). **Tucumán**. *Dpto*. *Burruyaco*: Las Cuchillas. 1100 m s.m., 6-XII-1906 (fl), *Lillo 7847* (CORD, LIL). *Dpto*. *Trancas*: Vipos, 799 m s.m., 1-XII-1960 (fl), *Burkart 22028* (SI).

BOLIVIA. **Chuquisaca**. *Prov*. *Nor Cinti*: Puca Khasa, prope Tacaquira, 21-27-III-1934 (fl, fr), *Hammarlund 316* (S). **Cochabamba**. *Prov*. *Chapare*: Cerro San Pedro, 2560 m s.m., II-1947 (fl), *Cárdenas 3939* (S); Temporal, 2570 m s.m., III-1931 (fl), *Cárdenas 710* (LIL); Cordillera Tunari, 2600 m s.m., 3-III-1939, *Eyerdam 24653* (BM); Totora, Chilispe, 1800 m s.m., 18-XII-1921 (fl), *Steinbach 6005* p. p., mixed with *O*. *pomensis* (LIL). **Potosí**. *Prov*. *Saavedra*: entre Betanzos y Retiro, 3200 m s.m., II-1979 (fl), *Ceballos et al. 303* (SI). **Santa Cruz.** *Prov. Chiquitos*: "Chiquitos" (fl, fr), *D´Orbigny 1063* (W). *Prov. Cordillera*: Transchaco, entre Fortín Ravelo et Fortín Suárez Arana (Route vers Roboré) 50 km avant Fortín Suárez Arana, 9-II-1975 (fl) *De Sloover 150* (BR). *Prov. Ñuflo de Chavez/Prov. Velazco:* San Ignacio-Concepción, km 5, 28-X-1977 (fl) *Evrard 8401* (BR). **Tarija**. *Prov. Cercado*: área del Ceramitar, 1850 m s. m., 23-XII-1985 (fl), *Bastián 230* (LPB). *Prov. E. Méndez*: Cantón Paycho, 3200 m s.m. 27-II-1991 (fl), *E. García 2397* (LPB). *Prov. Gran Chaco*: Villamontes (fl), *Pflanz 4026* (B). "Chiquitos" (fl, fr), *D´Orbigny 1063* (W).

PARAGUAY. **Concepción**. Zwischen Río Apa und Río Aquidaban, 1908-1909, Centurion, Okt., *Fiebrig 4153* (K); Pto Risso, 17-I-1955 (fr), *Schulz 8809* (CTES).

Observations: the illustrations and description of *Camassia biflora* (Ruiz et Pav.) Cocucci (1969) correspond to *Oziroë argentinensis*. The specimens cited there belong to *Oziroë biflora* (*Werdermann 457* & *768*); *O. arida* [Valparaíso: without date and collector (CORD), *Behn s. n.*, and *Grandjot s. n.* (SI)] and *O. argentinensis* (*Lillo 5330* and *7847*; *Hunziker, A. T. & Cocucci 8497*).

Guaglianone & Arroyo-Leuenberger (1996) erroneously cited the specimen *Ahumada 4547* as *Fortunatia biflora* (=*O. argentinensis*).

O. argentinensis is a highly variable species; its delimitation from *O. biflora* is difficult and more experimental studies need to be carried out in order to distinguish the two species. *O. argentinensis* has smaller flowers than *O. biflora*.

3. **Oziroë arida** (Poepp.) Speta, Phyton (Horn) 38: 56. (August) 1998. *Ornithogalum aridum* Poepp., Fragm. Syn. Pl.: 9. 1833. *Fortunatia arida* (Poepp.) Ravenna, Wrightia 7: 51. 1982. *Oziroë arida* (Poepp.) Ravenna, Onira 3: 40. (November) 1998. Comb. superfl. TYPE: "(Poeppig Coll. pl. Chil. I. 104). Diar. 123. In montib. aridiss. prope Concon. Aug. flor". (Lectotype here designated, HAL; isotype P; photo Ser. Field Mus. Nat. Hist. 10032 from B+ at LIL, SI). Figs. 2, 3, 4, 7

Ornithogalum chloroleucum Lindl. Bot. Reg. 22: tab. 1853. 1836. *Oziroë leuchlora* Raf., Fl. tellur. 3: 54. 1837 (1836), nom. illeg. based on *Ornithogalum chloroleucum* Lindl. *Scilla chloroleuca* (Lindl.) Kunth, Enum. pl. 4: 325. 1843. *Oziroë chloroleuca* (Lindl.) Speta, Phyton (Horn) 38: 56. 1998. *Ornithogalum biflorum* (Ruiz & Pav.) D. Don var. *chloroleucum* (Lindl.) Baker, J. Linn. Soc. 13: 273. 1873. TYPE: Chili. Prope Valparaíso, 1831, *H. Cuming 692*, (lectotype here designated, K, not seen, photo at

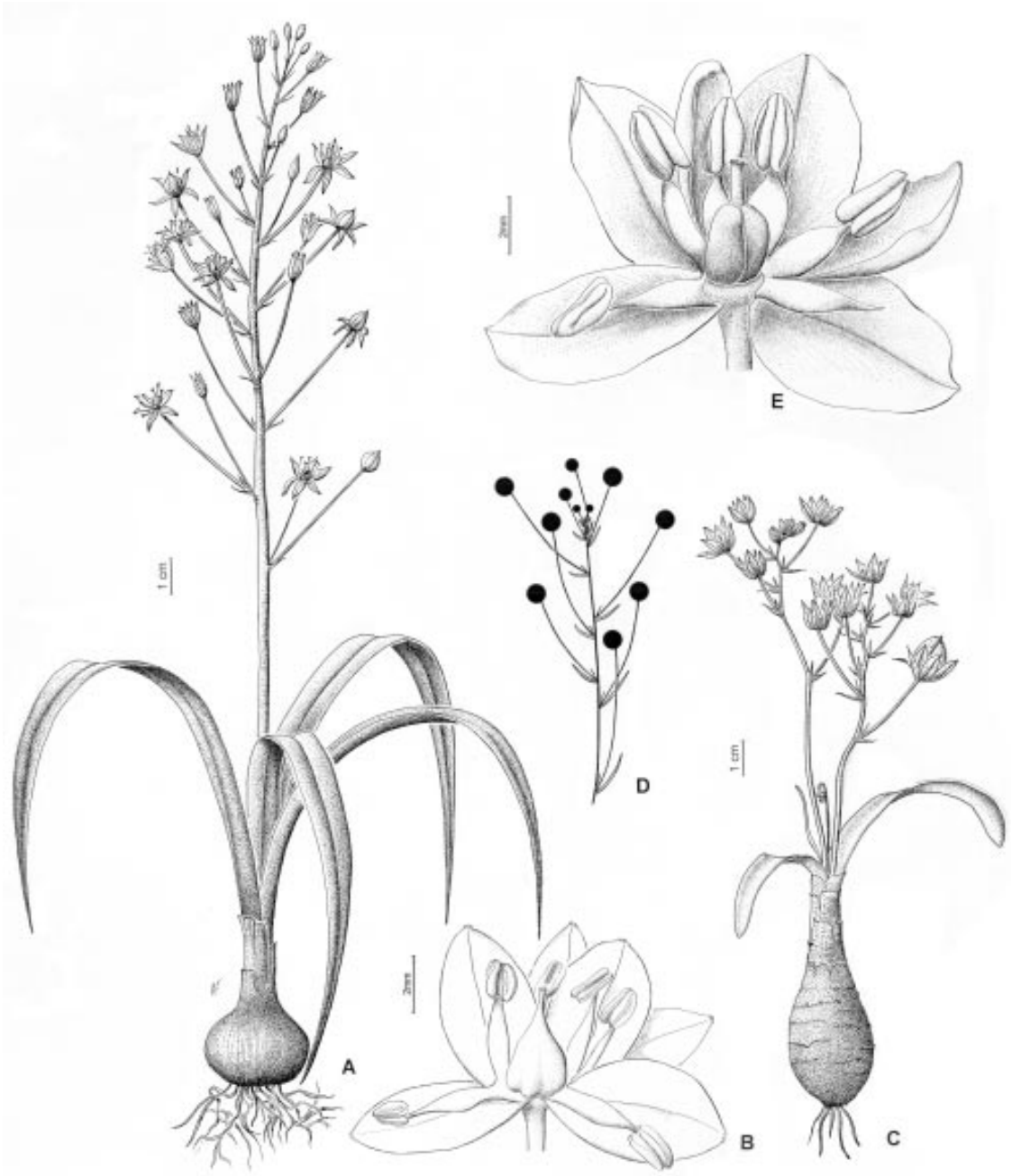

Fig. 2.- *Oziroë biflora*. A: habit. B: flower opened. *O. arida*. C: habit. D: diagram of inflorescence. E: flower opened. A-B: from *Jiles 304* (SI). C: from *Eggli et al. 3115* (SI). E: from *Eggli et al. 3108* (B).

B; isolectotype, K). Note: mounted together with specimens of other species.

Ornithogalum chilense Phil., Linnaea 29: 73. 1857. TYPE: Chile. "Cuesta Zapata. Sept. 1854", *Volckmann s n.* (holotype, SGO 46641). Note: mounted together with specimens of other species.

Plant 9-25(-40) cm high. Bulb globose, 2,2-3(-4,2) cm diam.; subterranean neck 3-5 cm long. Leaves bright green, 8-30 cm long x 5-12 mm wide. Inflorescence a short raceme; scape 4-23(-25) cm long, base reddish; rachis 2,3-6(-12) cm long; with 3-15 flowers, 1(-2) per node; pedicels erect, stout, 2-3,5(-6,2) cm long, the inferior pedicels larger than the

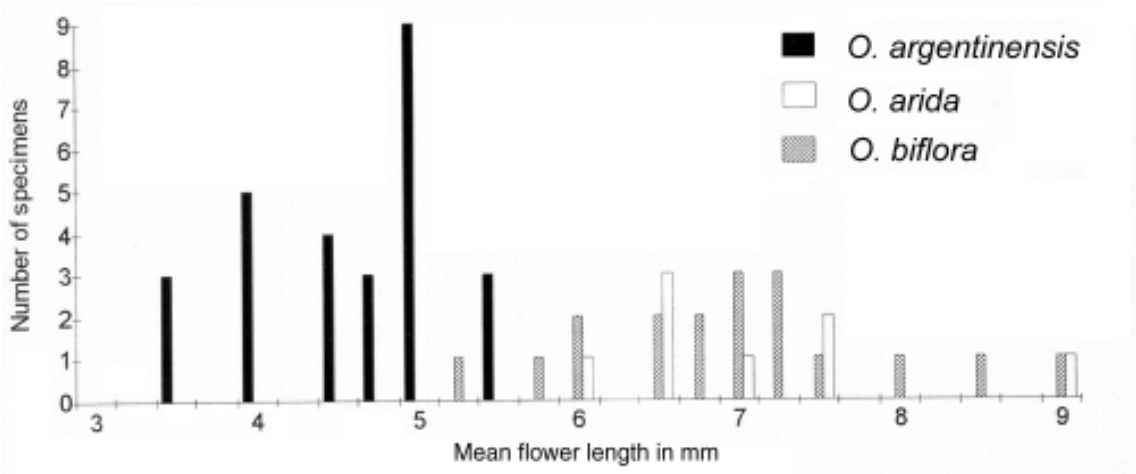

Fig. 3.- Mean flower length in specimens of *Oziroë argentinensis*, *O. arida* and *O. biflora*. The position of the bars on the horizontal axis represents a mean flower length for all flowers of a single specimens.

following; outer bract 5,5-17 mm long, inner bract 2 mm long. Flowers white, tepals ovate, 6-9(-10) mm long x 2,5-4,3 mm wide, outside with brownish midvein, inside with greenish midvein. Filaments ovate-lanceolate, white, becoming green towards the base, ca. 3,7 mm long x ca. 1,2 mm wide; anthers viridescent or pale yellow, 1,5-2,3 mm long. Ovary pale green, ca. 2,6 mm long x ca. 2,1 mm diam.; ovules 5-8 per locule; style 1,5 mm long, style and stigma white. Capsule 7-8 mm long x 4,5 mm wide. Seeds oblong, 3,5-4,5(-6) mm long.

Chromosome number: 2n=34 (Fernández & Daviña, 1991).

Distribution and ecology

Endemic in Chile, from Coquimbo (Región IV) to Bio Bío (Región VIII), from 20 to 140 m s.m. (recorded altitudes). Sandy, gritty (granitic), gravelly, or rocky terrain, coastal terraces to inland hills, also found in plantations of *Pinus* and *Eucalyptus.*

Common name: "Cebolleta" in scheda (*Behn s. n.*, *Bertero 480*, *Stock s. n.*); "Coifün" in Mapuche language: "cebolleta", with diaphoretic effects, cited by Mösbach (1992: 68 under *Camassia biflora*).

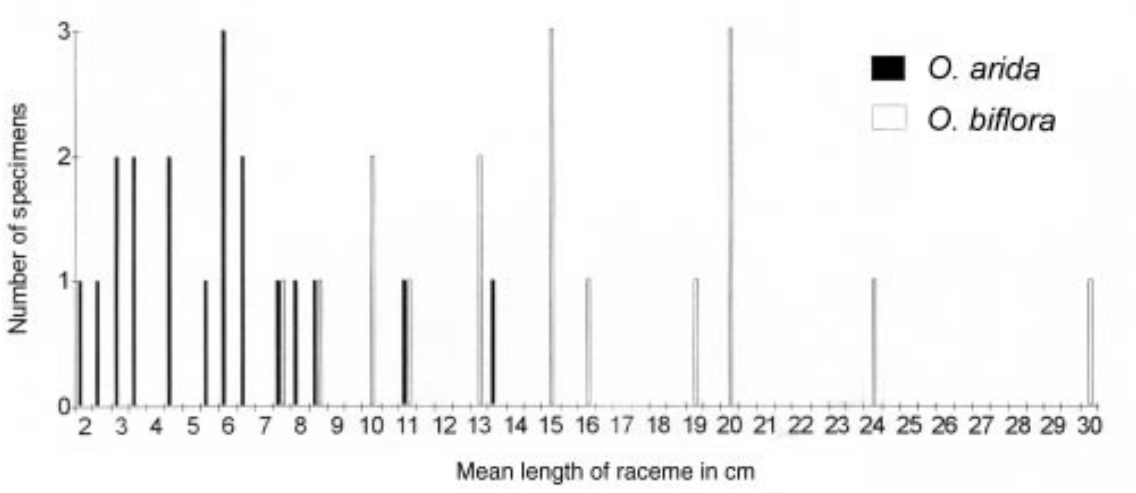

Fig. 4.- Mean raceme length (excluding scape) in specimens of *Oziroë arida* and *O. biflora*. The position of the bars on the horizontal axis represents the mean length in cm of mature racemes within a collection.

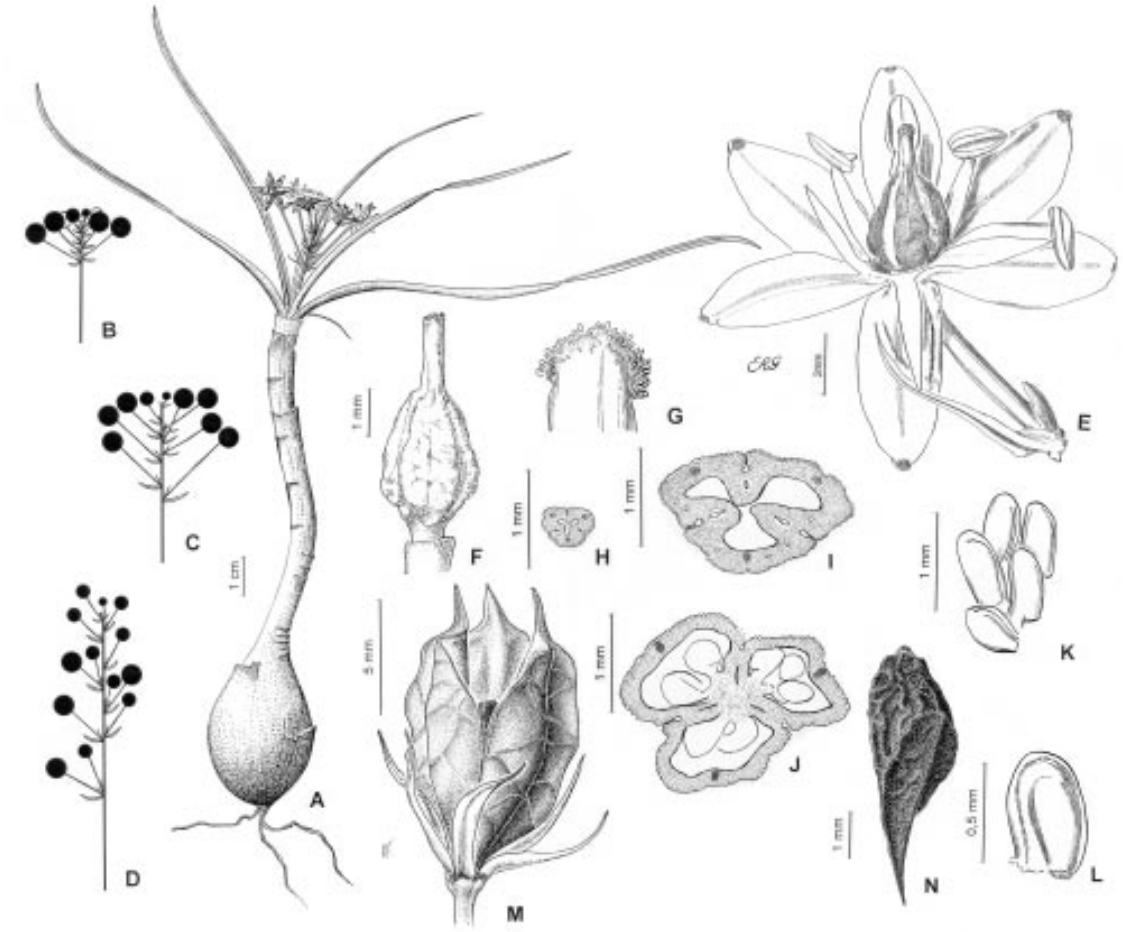

Fig. 5.- *Oziroë pomensis*. A: habit. B-D: diagrams of different development of the inflorescences. E: flower opened. F: gynoecium. G: stigma. H: transection of the style, showing the stylar channel. I: transection of the apical part of the ovary. J: transection of the ovary with ovules. K: ovules in one locule. L: ovule. M: capsule. N: seed. A: from *Guaglianone et al. 3120* (SI). E: from *Ruthsatz 31* (SI). F-L: from *Ruthsatz 325* (SI). M-N: from *Nicora 9171* (SI).

Specimens examined

CHILE. Without Region: Chili misit, 1834 (fl), *A. de Jussieu 399* (S); 1835 (fl) Cuming s.n. (BR); (Araucania) "Aucaria" (?), *Reynolds 1* (K, photo at B). **Región IV** (de Coquimbo). *Prov. Limarí*: Mun. Ovalle: IX-1934, *C. & C. Grandjot s. n.* (SI); idem, first hill N of the mouth of the Quebrada San Pedro, i.e. W of the culmination of the Panamericana N of Puente Teniente, 80-140 m s.m., 30°59.20´S 71°38.32´W, 18-X-1997 (fl, fr), *Eggli & Leuenberger 2953* (B, CONC, SGO, ZSS). *Prov. Choapa*: Mun. Los Vilos, 4 km Pichidangui, along Panamericana, 32°11.08´S 71°31.26´W, 17-X-1997 (fl), *Eggli & Leuenberger 2939 b* (B); Illapel, II-1916 (fl), *Geisse, s. n*. (Z). **Región V** (de Valparaiso). *Prov. Quillota*: Granizo, 20-IX-1994 (fl), *Zöllner s. n.* (HBG); *Prov. San Antonio*: Mun. Algarrobo, 16 km SW of Las Dichas towards Mirasol (3 km E of Algarrobo), 80 m s.m., 33°20.41´S 71°38.17´W, 5-XI-1997 (fl, fr), *Eggli et al. 3108* (B, CONC, SGO, ZSS); Algarrobo, 31-X-1969 (fl), *Schwabe s. n.* (B). *Prov. San Felipe de Aconcagua*: Catemu (fl), *Philippi s. n.* (B); Concón, 15-VIII-1930 (fl), *Behn s. n.* (SI); Llay-Llay, 13-IX-1957, *Cabrera 12501* (LP). *Prov. Valparaiso*: Valparaiso, without date, without collector, (CORD); Valparaiso, El Salto, 26-VIII-1917 (fl), *C. & I. Skottsberg 925* (GB, S); Valparaiso, 30 m s.m., X-1933 (fl), *Grandjot et al. s. n.* (S, Z); Valparaiso, 1832 (fl), *Bridges 343* (K, photo at B). Valparaiso, in graminosis, IX-1854 (fl), *Lechler 2825* (K, photo at B); idem, April-July, 1856 (fl), *W. H. Harvey s. n*. (K, photo at B); Valparaiso, 2-XI-1999 (fl), *Kubitzki & Feuerer 99-84* (HBG); 1831-1833 (fl), *Gaudichaud* 69 (P); Gaudichaud 299 (BR); Viña del Mar, 6-X-1929 (fl), *Behn s. n.* (SI); Vergara, 29-VIII-1934 (fl), *Stock s. n.* (HBG). **Región Metropolitana**. Santiago de Chile, sine coll. Cultivado, Corrientes (ex cult. hort. Kewensis 216-77-06068), (fl), *Fernández 387* (CTES). **Región VI** (Li-

bertador O'Higgins). *Prov. Cachapoal*: "Chili Rancagua in pascuis arenosis collium exp. planitiei" 1829 (fl), *Bertero 480* (MPU, P). *Prov. Cardenal Caro*: Mun. Pichilemu, Punta de Lobos 6 km S of Pichilemu, 20-80 m s.m., 34°25.64´S 72°02.53´W, 6-XI-1997 (fl), *Eggli et al. 3115* (B, CONC, SGO, SI, ZSS); Mun. Paredones, 13 km E of Bucalemu (bridge) towards Paredones (2 km W of Paredones), 40 m s.m., 34°39.20´S 71°55.77´W, 7-XI-1997 (fl), *Eggli et al. 3127* (B, CONC, SI); in Callibus. **Región VIII** (Bio Bío). "Fahrt von Prov. Aconcagua-Valparaiso nach Prov. Bio Bío: Concepción", 2/3-XI-1969 (fl), *Schwabe s. n.* (B); Environs de Concepción, Ann. 1855. *Rec. Ph. Germain s. n*. (K, photo at B).

Observations: *Ornithogalum aequipetalum* Bertero, Mercurio Chileno 16: 738. 1829; ex Amer. J. Sci. Arts, Ser. 1, 23: 259. 1833. Nom. nud. Specimens bearing this name at K, MPU and P belong to *Oziroë arida*.

Oziroë arida can be segregated from *O. biflora* by its short rachis and normally one flower per node. The specimen *Eggli & Leuenberger 2953*, collected at the northern limit of the range of *O. arida* in the province of Limarí seems intermediate with O. *biflora.* Some inflorescences with a more elongated raceme with up to 20 flowers, sometimes two per node. Additional material from this region should be investigated.

4. **Oziroë biflora** (Ruiz & Pav.) Speta, Phyton (Horn) 38: 56. (August) 1998. *Scilla biflora* Ruiz & Pav., Fl. peruv. 3: 69, lám. 302, a. 1802. *Ornithogalum biflorum* (Ruiz & Pav.) D. Don in Sweet, Brit. Fl. gard. Ser 2: tab. 246. 1838. *Fortunatia biflora* (Ruiz & Pav.) J. F. Macbr., Field Mus. Nat. Hist., Bot. Ser. 11 (1): 9. 1931. *Camassia biflora* (Ruiz & Pav.) Cocucci, Kurtziana 5: 184. 1969, excl. descr. et tab. *Oziroë biflora* (Ruiz & Pav.) Ravenna, Onira 3: 40 (November) 1998. Comb. superfl. TYPE: Peru: Habitat in Provinciae Chancay et Limae, *Ruiz, H. & Pavón, J. A. s. n.* (holotype, MA not seen, photo at B). Figs. 2, 3, 4, 8

Anthericum limaense Poelln., Revista Sudamer. Bot. 7: 100. 1942-1943. TYPE: Peru: Lima, cerro Amancaes, *Raimondi 9910* (holotype: B). (See under observations).

Scilla triflora Phil., Fl. atacam.: 51. 1860. TYPE: Chile. Paposo, *Philippi s. n.* (holotype, SGO 46871).

Plant 20-95 cm high. Bulb globose, 2,5-3,5 cm diam.; subterranean neck 3,5-9 cm long. Leaves 25-60 cm long x 2-12(-20) mm wide, acute. Inflorescence a raceme; scapes 1 or 2, (5-)10-25(-60) cm long, basally wine red, green above; rachis (8-)10-25(-30) cm long, with 15-25(-35) flowers, (1-)2(-4) per node; pedicels 1,5-6(-8) cm long, longer in fruiting stage; outer bract 3,5-10 mm long, setiform. Flowers white, tepals (6-)7-8,5(-10) mm long x 2-3,5(-4) mm wide, outside with brownish-red to greenish-rose midvein, the outer lanceolate, the inner ellipsoidal, usually wider than the outer. Filaments subulate; anthers whitish to pale yellow, 1,5-2(-2,8) mm long. Ovary globose to conical, 3,5-3 mm diam.; ovules ca. 4 per locule; style ca. 2 mm long. Capsule globose, 5-10 mm diam. Seeds ca. 3,5 mm long, pear shaped to ellipsoid, shiny, rugose.

Chromosome number: 2n=34 (S. Arroyo-Leuenberger, unpubl.: from *Eggli & Leuenberger 1760*, and *Eggli et al. 2995*).

Distribution and ecology

Peru (south of 10° S lat.) to north central Chile ca. 30° S lat., from sea level to 900 m s. m. Common in sandy areas and on hillsides, in Chile associated, e.g., with *Oxalis gigantea* Barn., *Balbisia sp.*, *Opuntia miquelii* Monv., *Eulychnia breviflora* Phil. and *Echinopsis sp*. and numerous other shrubs. Flowering and fruiting mostly from September to December.

Common name: "Lágrima de Virgen", Muñoz Pizarro (1966: 176).

Specimens examined

CHILE. **Region II** (de Antofagasta). *Prov. Antofagasta*: 7 km above (E of Taltal) towards the Panamericana, river bank and mountain slopes to the S of the road, 280-400 m s.m., 26-XI-1991 (fl, fr), *Eggli & Leuenberger 1760* (B); Taltal, vicinity of Aguada de Miguel Diaz, ca. 24°35´S, 1-4-XII-1925 (fl, fr), *Johnston 5371* (S); Taltal, ca. 200 m s. m., X-1925 (fl), *Werdermann 768* (B, LIL, S, SI, Z). **Región III** (de Atacama). *Prov. Copiapó*: 22 km N of Caldera along Panamericana to Chañaral, 60 m s.m., 24-XI-1991 (fl, fr), *Eggli & Leuenberger 1746* (B); Without collector, without date, Copiapó, as *Scilla angustifolia* Phil. (CORD); 1 km on Panamericana N of turnoff to Bahia Inglesa and Caldera (8 km from Bahia Inglesa), 100-160 m s.m., 28-XI-1991 (fl), *Eggli & Leuenberger 1800* (B); idem, cult. hort. Berol., 10-VI-1992 (fl), *Cubr 29950* (B); Monte Amargo, ca. 200 m s.m., X-1924 (fl), *Werdermann 457* (LIL, S, SI, Z). *Prov. Huasco*: Mun. Huasco, 22 km N of Huasco Bajo towards Carrizal Bajo (28 km S of Carrizal Bajo), just N of the mouth of the

Fig. 6.- *Oziroë pomensis*. Habit, from *Eggli et al. 2764* (photo B. Leuenberger).

Quebrada Taisani, 100-200 m s.m., 28°18.48´S 71°09.17´W, 22-X-1997 (fl), *Eggli & Leuenberger 3008* (B, CONC, SGO, ZSS); 11 km N of Huasco Bajo towards Carrizal Bajo (4 km S of Los Toyos), 20-70 m s.m., 28° 23.38´S 71°11.18´W, 22-X-1997 (fl, fr), *Eggli et al. 2995* (B, CONC, SGO, ZSS); 150 m s.m., 28º09´S 71º09.17´W, 19-XI-1997 (fl, fr), *Billiet & Jadin 7044* (BR). ca. 3 km E of Huasco, 20-60 m, 30-XI-1991, *Eggli & Leuenberger 1828 d* (B); idem cult. hort. Berol. 20-III-1998 (fl), *Cubr 36298* (B). **Región IV** (de Coquimbo). *Prov. Coquimbo*: (fl), *Sparre 2692* (S); Ovalle, Quebrada del Teniente, 19-IX-1952, *Pfister s. n.* (CONC 12768); Fray Jorge, 7-X-1947 (fl, fr), *Sparre 2869* (S); Ea. Fray Jorge, 14-VIII-1917 (fl), *C. & I. Skottsberg 766* (GB, S); Fray Jorge, 14-IX-1947 (fl), *Jiles 304* (SI). Pque. Nacional Fray Jorge, 300 m s.m., 30º40´S 71º40´W, 21-X-1991 (fl, fr), *Billiet & Jadin 5237* (BR). *Prov. Elqui*: 3 km SW of Los Choros towards the migratory birds observation station, 40 m s.m., 29°18.21´S 71°19.76´W, 19-X-1997(fl, fr), *Eggli & Leuenberger 2965* (B, CONC, ZSS); Mun. La Higuera, 10 km W of the Panamericana on gravel road to El Tofo and Chungungo, 2 km W of culmination of road at turnoff to El Tofo (= 9 km above Chungungo), 580 m s.m., 29°26.91´S 71°15.26´W, 25-X-1997 (fl, fr), *Eggli & Leuenberger 3038* (B, CONC, SGO, ZSS); Mun. Coquimbo, 18 km N of northern access road to Guanaqueros-Tongoy (= 2 km N of turnoff to Totoralillo), slopes W of the Panamericana, 140 m s.m., 30° 02.39´S 71°22.87´W, 31-X-1997 (fl, fr), *Eggli & Leuenberger 3082* (B, CONC, SI); Coquimbo (fl, fr), *Cuming 890* (K, photo at B).

PERU. "Perou" (fl, fr), *Dombey* 133 (P), (fl), *Dombey s. n.* (P). **Arequipa.** 28 km al NW de Puerto Chala, 230 m s.m., 23-VIII-1957, *Rahn 89* (C). Cachendo, 16º58´S 71º 47´W, 900 m s.m., 10-X-1923, *Guenther & Buchtien 349a* (LPB). Prov. de Caravelí, Atico, 10-20 m s.m., 10-XI-1949 (fl), *Ferreyra 6361* (US). **Lima**: Lomas about Lima, *Mathews 747* (K, photo at B). *Prov. Lima*. Vicinity of Lima, San Agustín, loma vegetation, 28-IX-1940 (fl), *Asplund 13820* (US, S); Lomas de Pacta, ca. 60 km from Lima city, near Punta Hermosa, 200 m s.m., XII-1982 (fl), *León 416* (AAU). *Prov. Matucana*: rocky northern slope, 12-IV to 3-V-1922 (fl), *Macbride & Featherstone 213* (S).

Observations: about *Camassia biflora* sensu Cocucci, see observation under *Oziroë argentinensis*.

Anthericum limaense is a new synonym, previously excluded from *Anthericum* and identified as *Fortunatia biflora* by R. Cruden (pers. comm.).

Oziroë biflora has larger flowers than *O. argentinensis*, and a longer inflorescence than *O. arida.*

5. **Oziroë pomensis** Ravenna, Onira 3: 41. 1998. TYPE: Argentina. Salta. Dpto. La Poma: ruta 40 entre Pueblo Viejo y El Rodeo, 2000 m s.m., 25-II-1987, *Nicora et al. 9171* (holotype, SI). Figs. 5, 6, 7

   O. totorensis Ravenna, Onira 3: 69. 1999. TYPE: Bolivia, Cochabamba. Totora, Chillispe, tierra colorada, 1800 m s.m., 18-XII-1921, *Steinbach 6005* (holotype, SI; isotype, LIL: mixed with *O. argentinensis*).

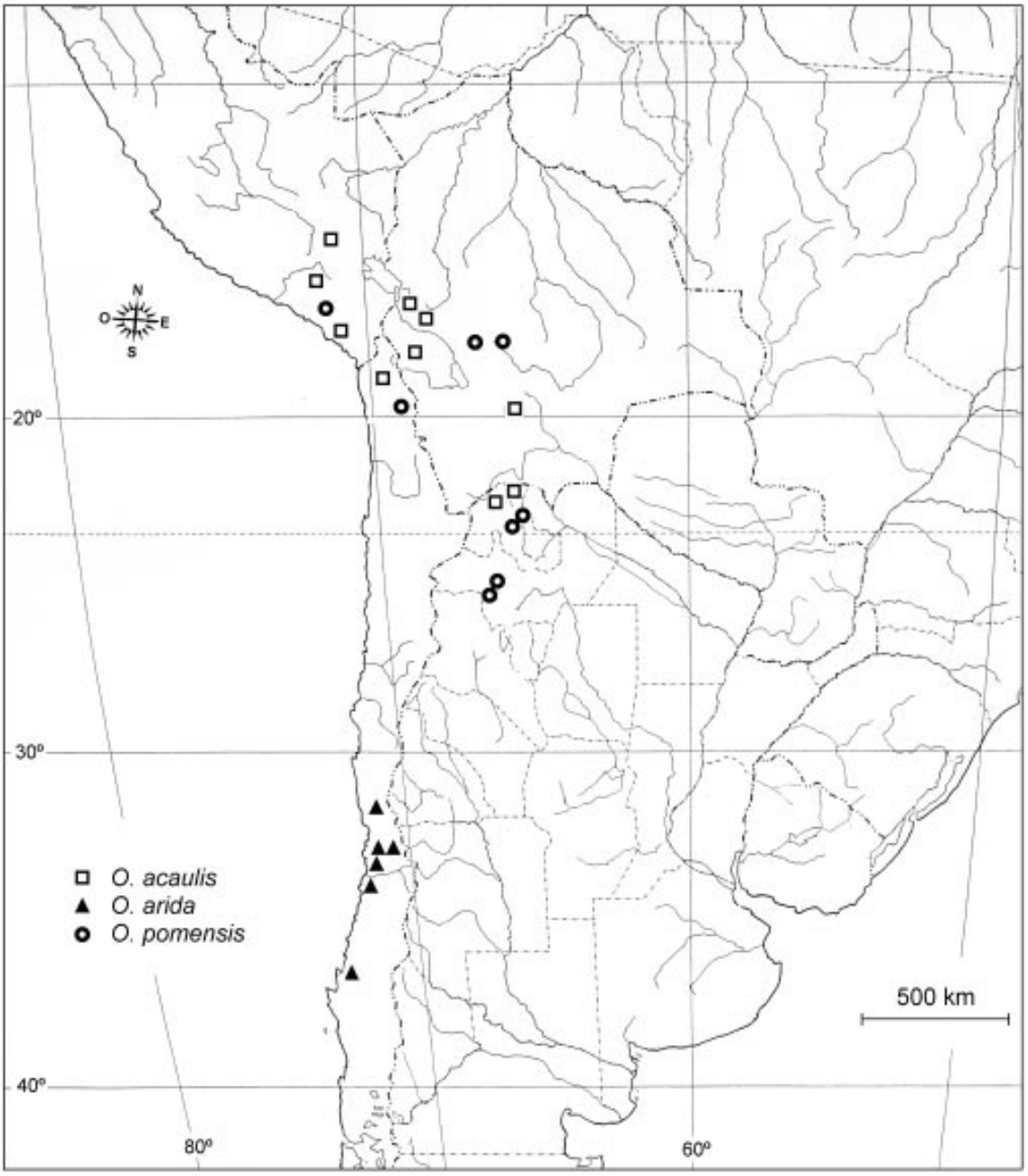

Fig. 7.- Map of distribution of *Oziroë acaulis*, *O. arida* and *O. pomensis*; symbols represent documented distribution.

Small plants 3-7(-12) cm high. Bulb globose, ca. 2,5 cm diam. or ellipsoid, 4 mm long x 2,5 mm wide; subterranean neck 5-10 cm long. Leaves procumbent, thickish, 12-24 cm long x 1,5-3(-4) mm wide. Inflorescence a short, sometimes corymbiform raceme; 1(-4) scapes (2-)3-7 cm long; rachis (1,5-)2-5 cm long, with 6-15(-18) flowers, 1(-2) per node; pedicels 0,7-20 mm long; outer bract 5-7 mm long. Flowers white, tepals 5,5-6 mm long x ca. 1, 5 mm wide, outside with brownish midvein. Filaments subulate; anthers greenish, 1,2 mm long. Ovary globose, 2,8 mm diam.; ovules 2-4 per locule; style 1,5-2 mm long. Capsule subovate to globose, cartilaginous, apiculate, 9-12 mm long x 7-9 mm diam.

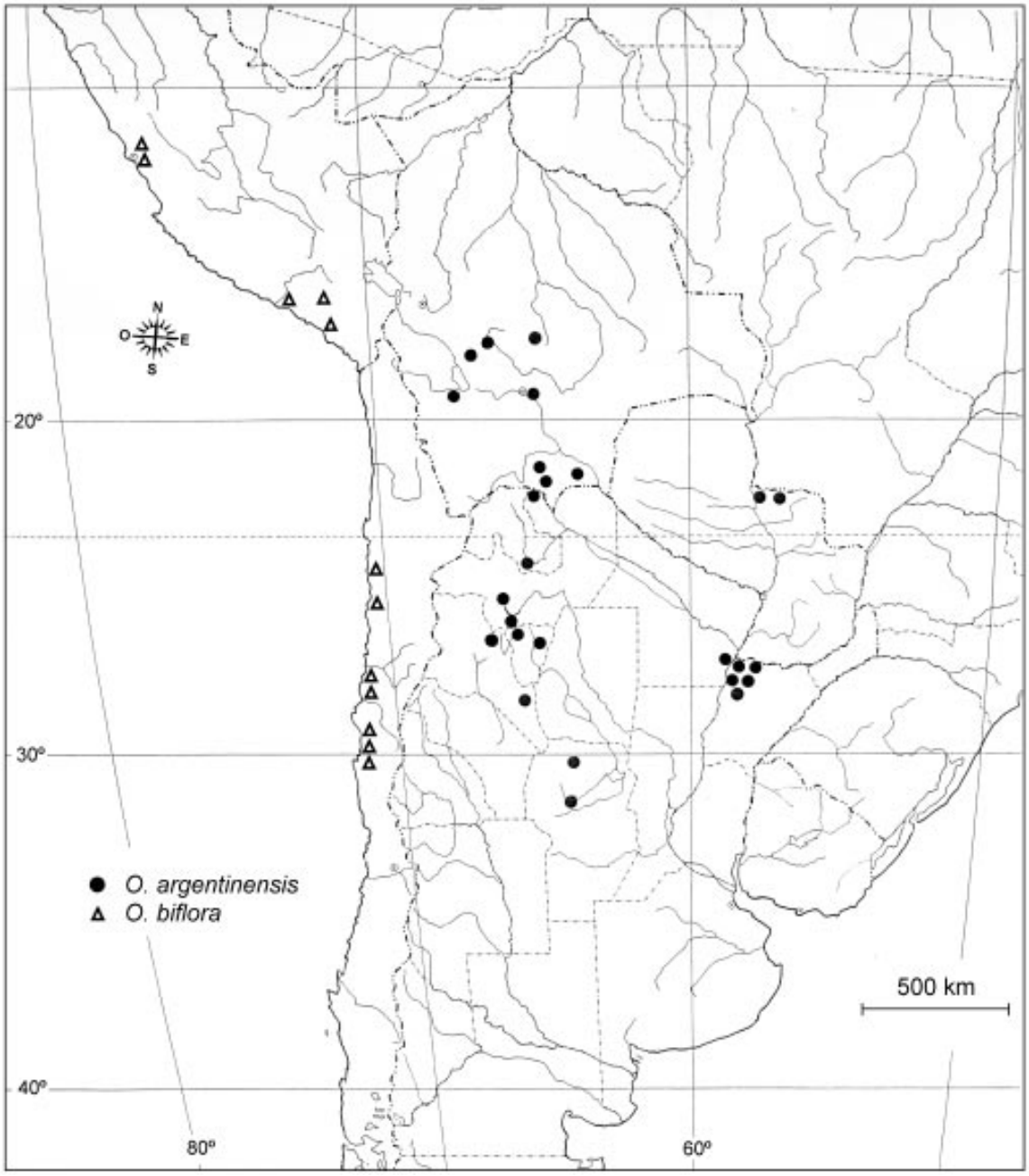

Fig. 8.- Map of distribution of *Oziroë argentinensis* and *O. biflora*; symbols represent documented distribution.

Seeds narrowly ellipsoid, trigonous, 4,5-5,5(-6) mm long x 1,8-2 mm wide, striolate.

Distribution and ecology

Central Bolivia, SW Peru, NW Chile and NW of Argentina, from 1800 to 3600 m s.m., in rocky soil, in thickets of *Baccharis boliviensis* (Wedd.) Cabrera, *Junellia* aff. *bisulcata* (Hayek) Moldenke, etc. In flower or fruit from December to March.

Specimens examined

ARGENTINA. **Salta.** *Dpto. La Poma*: ruta 40, al S de La Poma. 25-II-1999 (fl), *Guaglianone et al. 3189* (B, SI); idem, al S del Cajón, 25-II-1999 (fr), *Guaglianone et al. 3190* (B, SI). *Dpto. Molinos*: Cuesta de Isonza. Ruta 42 a

13,6 km del cruce con la recta de Tin Tin hacia Seclantás, 2830 m s.m. (fr) *Kiesling 9910* (SI). **Jujuy.** *Dpto. Humahuaca*: De Humahuaca a Palca de Aparzo, 13 km de Humahuaca, 3400 m s.m., 23º 12´S 65º 14´W, 16-II-1997 (fl) *Zuloaga et al. 5910* (SI); 10 km al N de Humahuaca, 3200 m s.m., 5-II-1971, *Ruthsatz 31* (BAA, SI); Cuesta de Chorrillos, 3120 m s.m., 27-I-1972, *Ruthsatz 325* (BAA, SI); camino de Iturbe a Humahuaca, 4-II-1944 (fl), *Soriano 686* (SI); Aparzo, 3600 m s.m., 28-I-1998 (fl), *Guaglianone et al. 3120* (SI); Puente sobre río Calete entre Aparzo y Palca de Aparzo, 3570 m s.m., 28-I-1998 (fl), *Guaglianone et al. 3125* (SI); subquebrada de Juire, 3450 m s.m., 29-I-1999 (fl), *Beck et al. 26757* (SI).

BOLIVIA. **Cochabamba**. *Prov. Mizque*: Canton Molinero. Rakaypampa, 2800 m s.m., 1-XII-1986 (fl), *Sigle 177* (LPB, SI).

CHILE. **Region I** (de Tarapaca). *Prov. Iquique*: 59-60 km E of Huara towards Chusmisa (=1 km above turnoff to Mocha, 8 km below turnoff to Usmagama), 2810-2850 m s.m., 19º 46.20´S 69º16.67´W, 26-II-1997, (fl), *Eggli et al. 2764* (B, CONC, SI, ZSS).

PERU. **Arequipa**. New road between Mollendo & Arequipa, 8500 ft. s.m., III-1943, *Sandeman 3982* (K).

Observations: An embryological study of this species (sub *O. acaulis*) was reported by Strittmatter & Galati (2000).

O. pomensis is a highly variable species and more experimental studies are needed in order to know if more than one species are involved in this taxon.

DUBIOUS NAMES AND EXCLUDED SPECIES

Ornithogalum geminiflorum Herb. ex Lindley, Bot. Reg. 24, misc. notice: 56. 1838. *Scilla geminiflora* (Herb. ex Lindl.) Kunth, Enum. pl. 4: 325. 1843. Type not located. According to the locality (Peru, Lima), and characteristics of the inflorescence, it could be *O. biflora*, but remains doubtful.

Scilla angustifolia R. A. Phil., *Verh. Deutsch. Wiss. Verein Santiago de Chile* 2: 108. 1890, nom. nud. There is an identification by Philippi on a collection made by *D. F. Vidal Garmaz* in the north of Chile. One specimen from "Chile: Copiapó" with this name but without collector at CORD, belongs to *O. biflora*.

Fortunatia herrerae Macbride, a nomen nudum not found elsewhere, is listed by Brako and Jørgensen (1993) as a synonym of *Haylockia pseudocolchicum* (Kraenzl.) Hume (Amaryllidaceae).

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LIST OF EXSICCATAE

Only the first collector is listed; in specimens without collection number, the herbarium is mentioned; in brackets, the species number is indicated: (1) *Oziroë acaulis*; (2) *O. argentinensis*; (3) *O. arida*; (4) *O. biflora*; (5) *O. pomensis*.

Ahumada 4547 (2).
Argañarás s. n. (LIL 586604) (2).
Asplund 2041 (1); 13820 (4).
Bang 2500 (1).
Bastián 230 (2).
Beck 299, 4266, 4331, 16848 (1); 26757 (5).
Behn s.n. (SI), s. n. (SI) (3).
Bertero 480 (3).
Billiet 5237, 7044 (4).
Bridges 343 (3); 1317 (4).
Buchtien 740, 825 (1).
Burkart 22028, 30789 (2).
Cabrera 12501 (3); 18912 (1).
Cárdenas 710, 3939 (2).
Castellanos s. n. (BA 20027, 46663, 46666) (2).
Ceballos 303 (2).
Charpin 20099 (2).
Cristóbal 1421 (2).
Cubr 29950, 36298 (4).
Cuming 890 (4); s.n. (BR) (3).
Daviña 72 (2).
de Jussieu 399 (3).
De Sloover 150 (2).
Dombey 133, s. n. (P) (4).
D´Orbigny 1063 (2).
Eggli 1746, 1760, 1800, 1828 d (4); 2764 (5); 2939b, 2953 (3); 2965, 2995, 3008, 3038, 3082 (4); 3108, 3115, 3127 (3).

Evrard 8401 (2).
Eyerdam 24653 (2).
Fernández 387 (3).
Ferreyra 6361 (4).
Fiebrig 4153 (2).
García 2397 (2).
Gaudichaud 69, 299 (3).
Gay 2230 (1).
Geisse, s. n. (Z) (3).
Germain s. n. (K) (3).
Grandjot s. n. (S, Z, SI) (3).
Guaglianone 3120, 3125 (5); 3188 (2); 3189, 3190 (5).
Guenther 349 a (4).
Hammarlund 316 (2).
Harvey s. n. (K) (3)
Hicken 6; s. n. (SI 10504) (1).
Hjerting 161 (2).
Hunziker, A. T. 8497, 20117, 20118 (2).
Irigoyen 404 (2).
Jiles 304 (4).
Johnston 5371 (4).
Kiesling 9910 (5).
Krapovickas 20575, 20896 (2).
Kubitzki 99-84 (3).
Lechler 2825 (3).
León 416 (4).
Lillo 7847 (2).
Macbride 213 (4).
Mathews 747 (4).
Meyer 4993 (2); 23157 (1).
Mueller 2043 (1).
Nicora 276 (2).
Pedersen 466, 3076, 5338, 14544 (2).
Pfister s. n. (CONC 12768) (4).
Pflanz 4026 (2).
Philippi s. n. (B) (3).
Rahn 89 (4).
Reynolds 1 (3).
Ruthsatz 31, 325 (5).
Rosello 763/02 (1).
Sandeman 3982 (5).
Schinini 8676, 22775, 23248 (2).
Schulz 8809, 17168, 17240 (2).
Schwarz 9407, 10221 (2).
Schwabe s. n. (B) (3).
Sigle 177 (5).
Skottsberg 766 (4); 925 (3).
Sleumer 3605 (1).
Solomon 7159, 17775 (1).
Soriano 686 (5).
Sparre 2692; 2869 (4).
Steinbach 6005, mixed (2) and (5).
Stock s. n. (HBG) (3).
Werdermann 457, 768 (4).
Without collect., Valparaiso (CORD) (3).
Without collect., Copiapó (CORD) (4).
Wood 7902 (1).
Zöllner s. n. (HBG) (3).
Zuloaga 5910 (5).

INDEX OF SCIENTIFIC AND POPULAR NAMES
(*synonyms in italics*)

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