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**On some poorly known taxa of *Aichryson* sect. *Aichryson* and *A. bituminosum* sp. nova (*Crassulaceae*)**

**Abstract**

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Chorological and taxonomic data on three poorly known species of the genus *Aichryson* on the Canary Islands, *A. bollei*, *A. brevipetalum* and *A. porphyrogenetos*, are provided. *A. bituminosum* from Gran Canaria, Canary Islands, is described as a species new to science and illustrated. Illustrations and emended descriptions are also given for *A. bollei* and *A. brevipetalum*, and a key to all pubescent-leaved species of *A. sect. Aichryson* is provided.

**Introduction**

After the first comprehensive treatment by Praeger (1932), the genus *Aichryson* Webb & Berth. (Webb & Berthelot 1836-50: 180. 1840) was the last time taxonomically revised by Bramwell (1968), who accepted 14 species. 13 of them are endemic to the mid-Atlantic archipelagos (Canary Islands, Madeira, Azores), while *A. gattefossei* (Batt. & Jahand.) Bramwell, previously included in the genus *Sedum* L., is restricted to Morocco. Recently the Canarian endemic *A. laxum* (Haw.) Bramwell has been reported as subsynchronous in Portugal (Santos 1997). Unlike other Canarian *Crassulaceae* genera such as *Aeonium* Webb & Berth., *Monanthes* Haw. and *Greenovia* Webb & Berth., little research has been done in *Aichryson*, probably due to its short life span, although its taxonomy still provides a good number of problems.

This paper aims at taxonomic clarification in the group of pubescent-leaved species of *Aichryson* sect. *Aichryson*. There are the cases of *A. bollei* Webb ex Bolle and *A. brevipetalum* Praeger, two endemics from La Palma island, neglected by many authors and considered doubtful by Bramwell (1968). Due to the confusing original description, *A. bollei* was rediscovered only about one hundred years after its original discovery. The recent typification of the name *A. bollei* (Bañares 1997) is here supplemented by an emended description based on new additional material. The second species, *A. brevipetalum* is an inconspicuous herb, which has been collected the first time since its discovery in 1927 by the author in 1999; an emended description is provided and the name typified. The circumscription of *A. porphyrogenetos* Bolle, a widespread but locally rare endemic of Gran Canaria and Tenerife, is further clarified. As previously assumed (Bañares 1997) the species is apparently extinct at its type locality in the Tenteniguada valley on

Gran Canaria. Another species in this latter valley, which formerly has been misidentified, or misinterpreted, as the hybrid *A. porphyrogennetos* Bolle × *A. punctatum* (C. Sm. ex Buch) Webb & Berth., is described as a new species.

***Aichryson bituminosum* Bañares, sp. nova**

Holotypus: Spain, Islas Canarias, Gran Canaria, Tenteniguada, 5.1996, *Bañares 42121* (TFC; isotypus: B).

*Aichryson bituminosum* ab aliis speciebus generis hac combinatione characterum differt: habitu herbacea, usque ad 25 cm alta, parve ramificata, glanduloso-pubescenti; foliis spatulatis, glanduloso-pubescentibus, viscosis, odoratis bituminosis, lamina 1.5-3 × 1.2-2.5 cm, margine parve papilloso, nigro-punctato; inflorescentia paniculata, 2-3-ramificata, laxa; floribus 8-9-meris, calycis glanduloso-pubescentibus, petalis ellipticis calyce 1.5plo longioribus, margine parve crenulato in parte superiore.

*Biennial herb* up to 25 cm tall, simple or scarcely branched, subviscid and with the smell of bitumen. *Stem* 5-8(-12) mm in diam. in adult plants, greenish, sometimes weakly suffused with red at flowering, densely and entirely glandular-pubescent. *Leaves* light green (sometimes weakly suffused with red abaxially), spatulate, glandular-pubescent, petiole 1-2.5 cm, lamina rhombic 1.5-3 × 1.2-2.5 cm, broadest at or below the middle, sometimes concave, apex obtuse and emarginate, margin not or scarcely papillose, black-dotted but not crenulate. *Inflorescence* a lax panicle, 2-3 branched, densely glandular-pubescent; branches 2.5-7 cm, with spatulate to oblanceolate leaves, 5-10-flowered, pedicels 3-5 mm. *Flowers* 8-9-merous; calyx glandular-pubescent, to 2/3 divided into lanceolate acuminate segments 3-4 × 1-1.2 mm; petals light yellow, elliptic, apiculate, 4.5-5.2 × 1.6-2 mm (apiculus 0.5-0.8 mm), 1.5 × as long as the sepals, margin usually crenulate at apex, abaxially puberulent; stamens 3.5 mm, glabrous; carpels 4 mm, adaxially pubescent; hypogynous scales 0.5 mm, pedicellate, palmate. Flowering in May.

*lc.* – Fig. 1.

*Distribution.* – Local in the central part of Gran Canaria, from San Mateo (near La Lechucilla) to Tenteniguada valley, at 900-1600 m (Fig. 4). The species is confined to shady and humid places, on cliffs and rocky walls in N and NE exposures, between Roque Grande and Roque del Pino (UTM-Hayford/Pico de las Nieves: 28RDR471938; 28RDR472936), Roque Saucillo (28RDR 462949), Barranco Coruña (28RDR475947), El Rincón (28RDR476944; 28RDR479945), near La Lechucilla (San Mateo) (28RDR471970; 28RDR475971; 28RDR468970).

*Additional specimens examined.* – SPAIN: CANARY ISLANDS: GRAN CANARIA: Tenteniguada, El Rincón, 800 m, 16.7.1949, *E. Sventenius 7189* (ORT); *ibid.*, 5.1984, *Bañares 25037* (TFC); *ibid.*, 4.2001, *Bañares 42126* (TFC); Roque Saucillo (NE), 1650 m, 18.6.1988, *Roca & Marrero 16708* (LPA); between Roque Grande and Roque de los Pinos, 5.2000, *Bañares 42125* (TFC).

*Related taxa.* – *Aichryson porphyrogennetos* Bolle differs by its strongly branched stems entirely suffused with red, by larger and more pubescent leaves without black-edged crenulation, and petals with a somewhat longer (c. 1 mm) apiculus. *A. laxum* (Haw.) Bramwell has dichotomously branched stems, is hardly viscid (greasy) and without smell, the lamina is usually broadest near base (3-3.5 cm wide) and the leaf margins have neither papillae nor black-edged crenulations, the flowers are 9-12-merous, the calyx segments linear-lanceolate and 0.6-0.9 mm wide, the petals linear-lanceolate and 0.9-1.1 mm wide, and the carpels are usually pubescent on both sides. *A. bollei* Webb ex Bolle differs by its branched, more densely pubescent stems usually also strongly suffused with red, the dark green, crenulate leaves, the wider, 2-5-branched inflorescence, the acute to subacute, purple-tipped calyx segments, and the entire, deep yellow, purple-tipped petals that are 1.3 times as long as the sepals. *A. parlatorei* Bolle differs by its annual life span, the 5-12 cm tall, not viscid but greasy, puberulent, usually unbranched, reddish stems 2-4 mm in diam., the crenulate, papillose, narrow leaves (0.7-1.5 cm wide) usually broadest

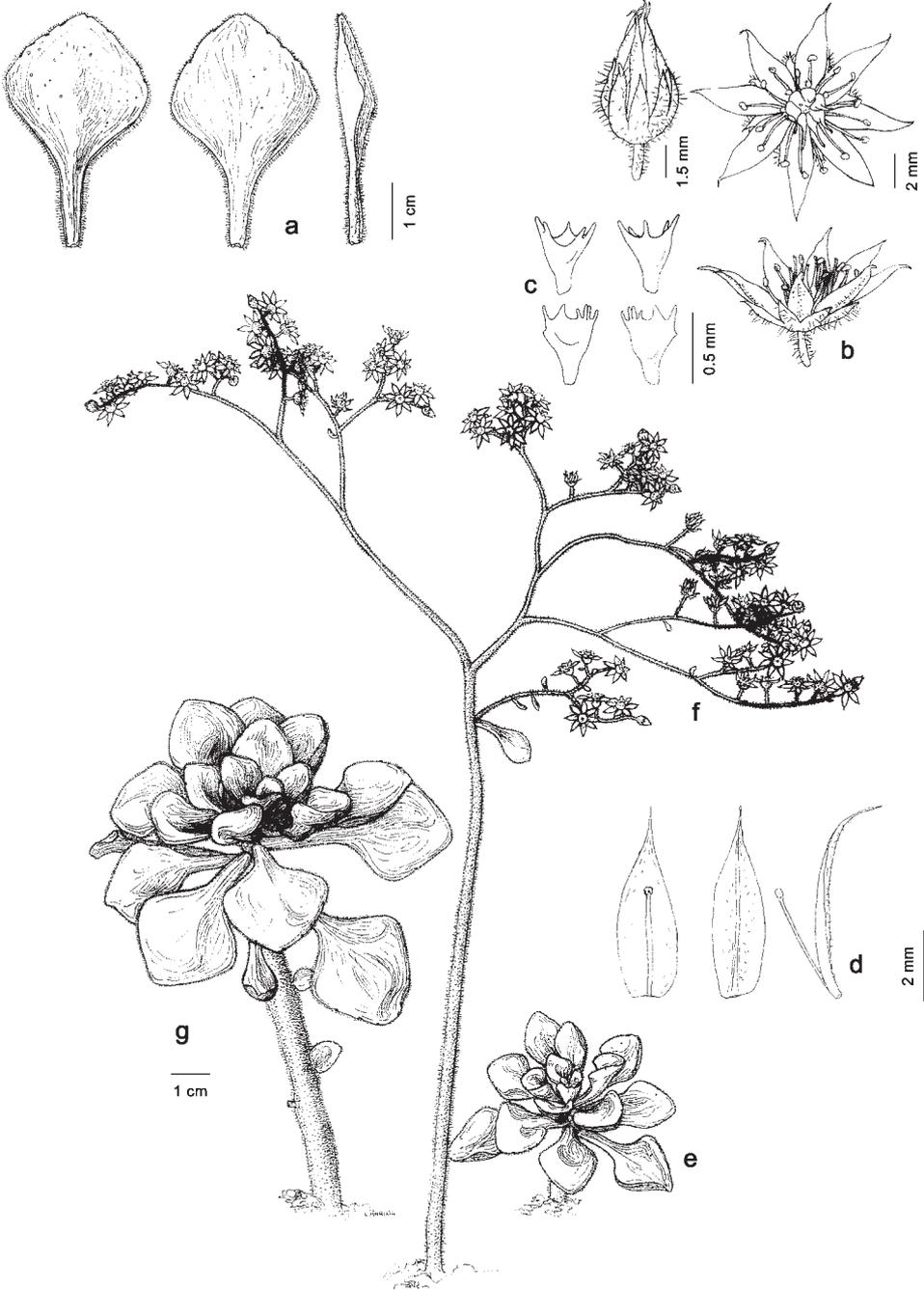


Fig. 1. *Aichryson bituminosum* Bañares – a: leaves; b: flowers; c: hypogynous scales; d: petals and stamens; e: young plant; f: plant at anthesis; g: adult plant. – Drawings after Bañares 42121 (TFC).

near apex, the simple or 1-2-branched inflorescence, and the entire and hardly apiculate petals. *A. pachycaulon* subsp. *praetermissum* Bramwell is a glabrous to subglabrous plant with strongly crenulate and papillose leaves.

*Remarks.* – *Aichryson bituminosum* has been collected previously by Sventenius (Santos & Fernández 1979), Roca & Marrero (in schedis) and Bañares (1990), but misidentified with other taxa. The species is locally common in several locations around the Tenteniguada valley. The individual plants show identical characters as well as annual reproduction and recruitment.

Most likely, it is our new species that was (mis)interpreted by Praeger (1929) as the hybrid *Aichryson porphyrogenetos* Bolle × *A. punctatum* (C. Sm. ex Buch) Webb & Berth. Unfortunately, Praeger did not provide any illustration of the hybrid and our search in several herbaria where he presumably deposited material (DBN, E, K) was in vain (M. Jebb in litt.; H. Hoy in litt.; E. Lucas in litt.). However, both assumed parents are not present in the area, our species is fully fertile, and morphologically an intermediate position between the aforementioned species is rather superficial.

*Aichryson bollei* Webb ex Bolle in *Bonplandia* 7: 244. 1859 ≡ *Sempervivum bollei* (Bolle) Christ in *Bot. Jahrb. Syst.* 9: 160. 1888. – Lectotypus (designated by Bañares 1997: 282): Canary Islands, La Palma “Barranco del Río, an quelligen, schattigen Stellen”, 24.9.1852, C. Bolle: *Herbarium atlanticum n° 1298* [B!; isolectotypus (n° 1297) B!].

*Biennial herb* up to 20 cm tall, densely branched, subviscid and with the smell of bitumen. *Stem* 5-8 mm in diam. in adult plants, reddish brown, densely glandular-pubescent, branches greenish, ascending. *Leaves* dark green, reddish brown variegated, spatulate, densely glandular-pubescent (with multicellular trichomes 350-1200 µm long, expanded base 50-85 µm diam. and subcapitate glandular apex 34-42 µm diam.), petiole 1.5-3.5 cm, lamina rhombic 1.5-3 cm long and wide, broadest at or below the middle, sometimes concave, apex obtuse and emarginate, margin papillose and usually with black-edged crenulations. *Inflorescence* a dense 2-5-branched, densely glandular-pubescent panicle; branches up to 13 cm with linear to spatulate leaves, 10-20-flowered, pedicels 3-6 mm. *Flowers* 7-8-merous; calyx glandular-pubescent, to 2/3 divided into lanceolate, acute to subacute, purple-tipped segments of 2.5-3.5 × 1-1.2 mm; petals yellow, elliptic, 4-6 × 2-2.5 mm, with a purple apiculus 0.4-0.5 mm, 1.3 × as long as the sepals, puberulent abaxially; stamens 3-3.5 mm, glabrous; carpels 3.5 mm, pubescent adaxially; hypogynous scales 0.5 mm, pedicellate and palmate. Flowering in May-June.

*lc.* – Fig. 2; Bramwell & Bramwell 1990: 127.

*Distribution.* – Since its discovery in the Barranco del Río (eastern La Palma), *Aichryson bollei* has been reported from several locations in the north, south and centre of the island of La Palma (Bramwell 1969, Santos 1983, Bramwell & Bramwell 1990, Á. Rebolé pers. comm.). I found it as locally common in Pared Vieja, Canal de Marcos y Corderos (MAB Reserve “El Canal y Los Tiles”), Hoya Grande, above Mirca, La Cumbrecita (Parque Nacional de Taburiente), Cumbre Nueva and Barranco de La Madera (Fig. 4). It grows in pine forest as well as in “monteverde” formations, sometimes forming local but dense patches in rock walls at altitudes from 600 to 1600 m.

*Additional specimens examined.* – SPAIN: CANARY ISLANDS: LA PALMA: La Cumbrecita, 1300 m, 8.6.1969, D. Bramwell 13 (TFC); Riscos del Cabrito, 1200 m (sobre Tegalate, Mazo), 1.6.1991, P. L. Pérez & J. Leal 41128 (TFC); Pared Vieja (cercañas de Zona Recreativa), 4.1995, Bañares 42117 (TFC); ibid. 4.1996, Bañares 42123 (TFC); La Cumbrecita, 1250 m (Parque Nacional de Taburiente), 4.2000, Bañares & Rebolé 42118 (B, TFC).

*Remarks.* – *Aichryson bollei* was overlooked because of the poor and misleading original description, e.g. referring to a stem indumentum of appressed hairs otherwise not known from *Aichryson*, which turned out to be a pubescent indumentum as is found in many taxa of the genus

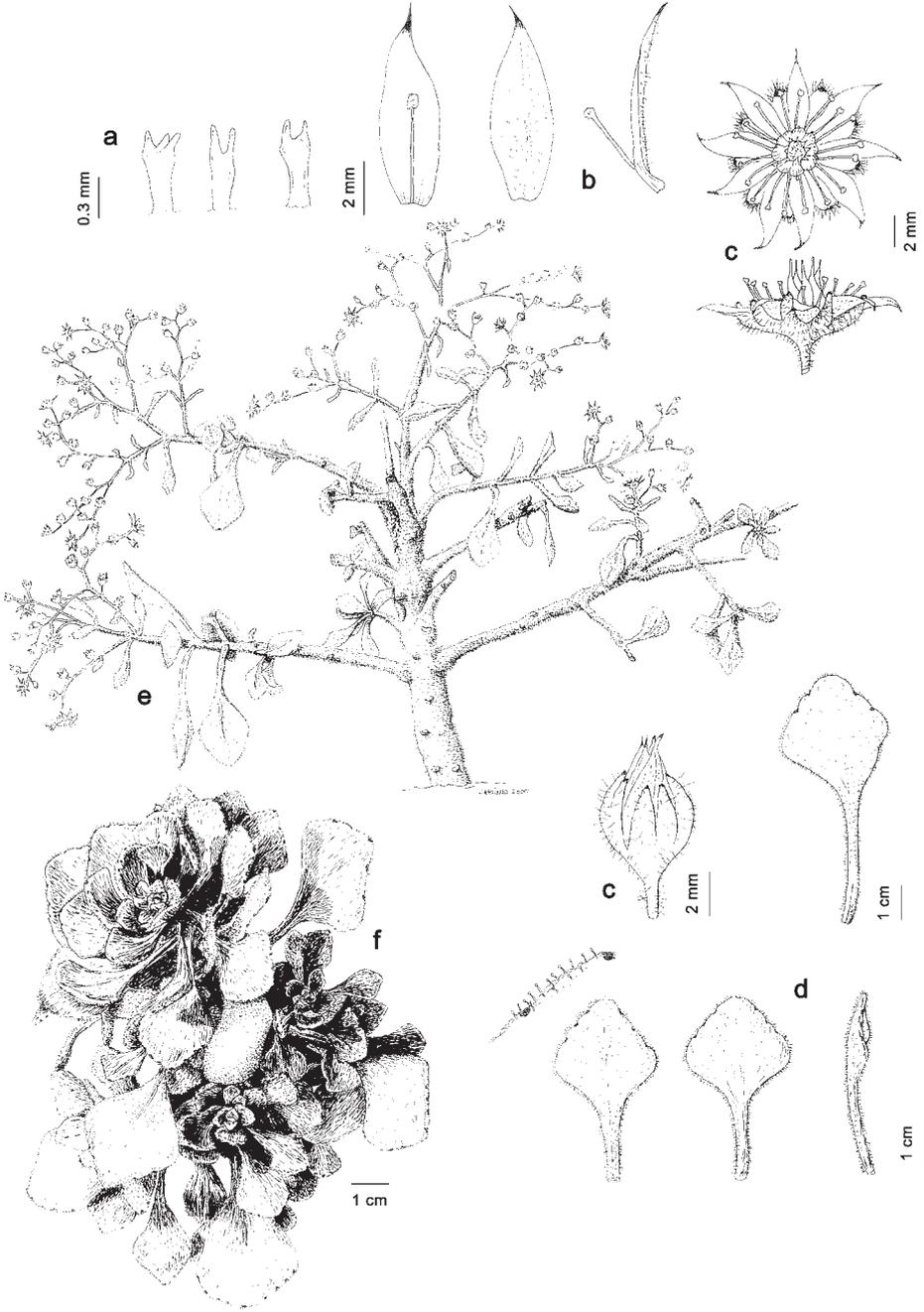


Fig. 2. *Aichryson bollei* Webb ex Bolle – a: hypogynous scales; b: petals and stamens; c: flowers; d: leaves; e: plant at anthesis; f: adult plant. – Drawings after Bañares & Rebolé 42118 (TFC).

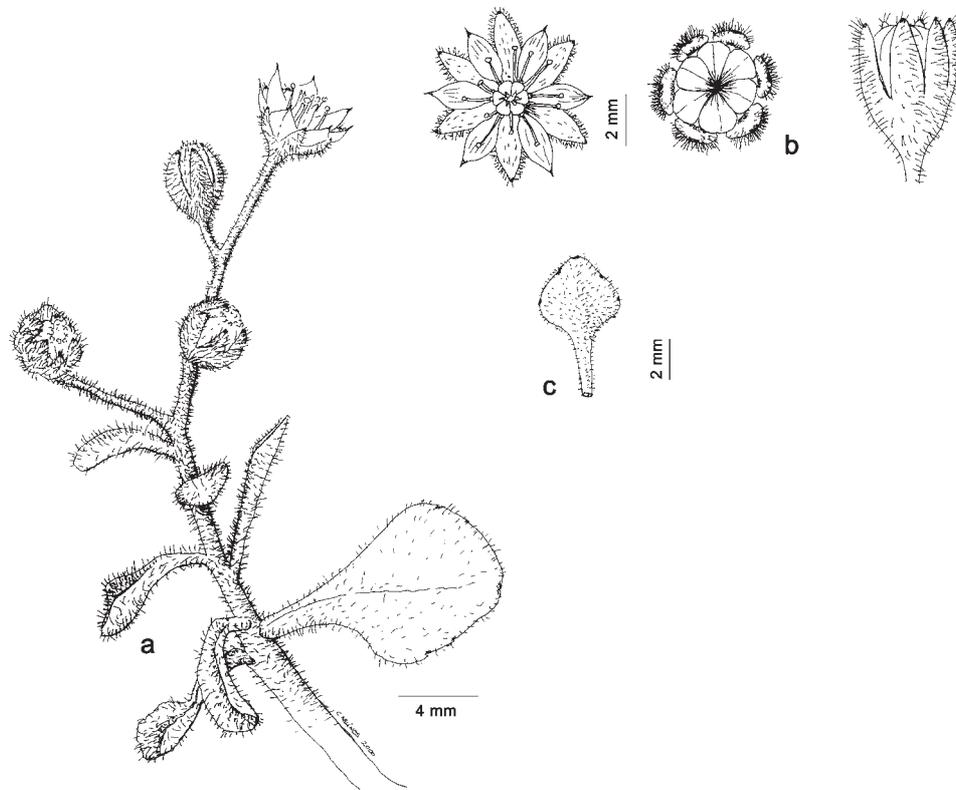


Fig. 3. *Aichryson brevipetalum* Praeger – a: plant at anthesis; b: flowers; c: young leaf. – Drawings after Bañares & Bermúdez 42122 (TFC).

(Bañares 1997). Distinctive characters, such as the commonly black-edged crenulations of the leaf margins, were not reported by Bolle and in fact lack in the type material; the pubescence of the petals and papillosity of the leaf margins were omitted in the original description. Unfortunately, the striking black dots of the leaves are not visible in herbarium material.

According to Praeger (1932) and Bramwell (1968), the species had not been found since Bolle's original collection. Praeger (1929), however, provided an accurate description of plants unequivocally referable to *A. bollei*, but not recognized by him as such for the reasons given above: "In several glens on La Palma (Barranco de Rio, Barranco de los Pinos, & c.) plants not yet in flower were seen which were close to *A. dichotomum*, but had the marginal purple-fringed crenulations of *punctatum*, up to 6 on each margin of the leaf; and the leaves were more rhombic than in *dichotomum*, and less densely hairy. I have a little doubt that these also were hybrids".

Our present circumscription of the species is fully in accordance with Bramwell (1969), who was the first to rediscover the species on La Palma (see also Bramwell & Bramwell 1990).

***Aichryson brevipetalum*** Praeger in J. Bot. 66: 221. 1928. – Neotypus (designated here): "Seeds from Bco. de Agua, Palma, Canary I., ex hort. R.L. Praeger June 1929" (K!).

*Annual herb* 4-7 cm tall, stem unbranched, densely glandular-pubescent. *Leaves* light green, spatulate, glandular-pubescent, lamina rhombic, 6-8.5 × 4-7 mm, broadest at the middle or towards the tip, margin provided with black-edged crenulations, not papillose, apex blunt. *Inflores-*

*cence* simple or scarcely branched, densely glandular-pubescent; branches 2-5 cm, with small oblanceolate leaves, 4-10-flowered, pedicels 3-5 mm. *Flower buds* globular with erect calyx segments, exceeding the corolla. *Flowers* 6-7-merous; calyx glandular-pubescent, segments erect, ovate to sublanceolate, purple-tipped, blunt, 2-3 × 1-1.5 mm; petals yellow, usually erect, elliptic, purple-tipped, apiculate, 3-4 × 1-1.3 mm, puberulent abaxially, 1.3 × as long as the sepals; stamens 2-3.5 mm, glabrous; carpels 3-4 mm, pubescent adaxially; hypogynous scales 0.5 mm, pedicellate, palmate.

*lc.* – Fig. 3; Praeger 1932: 119.

*Distribution.* – *Aichryson brevipetalum* is a rare endemic of northeastern La Palma. During this study it was found only at its type locality, the Barranco del Río (Fig. 4). Santos (pers. comm.) recently found in the same location some deviating forms that seemed not to be hybrids. The species was previously reported from other localities of the northern and central parts of the island (Bramwell 1968, Bramwell & Bramwell 1990) but our search there was in vain, and also no herbarium specimens have been located.

*Additional specimen examined.* – SPAIN: CANARY ISLANDS: LA PALMA: Barranco del Río, 4.1999, Bañares & Bermúdez 42122 (B, TFC).

*Remarks.* – Since its original description in 1927, *Aichryson brevipetalum* has been rarely reported and collected. The inconspicuous nature of the plant renders identification difficult when not in flower, but as Praeger (1932) suggests, the species could be more widespread on La Palma.

The holotype of *Aichryson brevipetalum*, which is a specimen cultivated from seeds collected by Praeger in 1927 (“HAB. Insula La Palma, in rupestris prope rivulam Barranco del Río supra Santa Cruz. Descriptio ex plantis in hort. Bot. Glasnevin, ex seminibus ortis in Barranco del Río lectis Maio 1927”, see Praeger 1928) is not extant. However, one sheet in the herbarium of the Royal Botanic Gardens, Kew (K), annotated as “*A. brevipetalum* Praeger”, carries plants that were raised in 1929 from seeds collected by Praeger in 1927 on La Palma. The material has evidently the same provenance as the one used for the original description of 1928, but raised in a subsequent year only. The specimen at Kew, here selected as the neotype, consists of seven unbranched, pubescent, flowering plants, 7-9 cm high, with rhombic to spatulate leaves, an inflorescence of 2-3 divaricate, leafless and few-flowered branches, globular flower buds with the calyx exceeding the corolla, pubescent, blunt sepals and broadly oblanceolate, apiculate petals, puberulent on the back.

*Aichryson porphyrogennetos* Bolle in Bonplandia 7: 243. 1869 ≡ *Sempervivum porphyrogennetos* (Bolle) Christ in Bot. Jahrb. Syst. 9: 160. 1888. – Lectotypus (designated by Bañares 1997: 284): “Gran Canaria, Valle de Tenteniguada, 1856”, *C. Bolle: Herbarium atlanticum n° 1303* (B!).

The species has been comprehensively described by Praeger (1932), Kunkel (1977) and Kunkel & Kunkel (1978), and reported on Gran Canaria by Pitard & Proust (1908), Praeger (1929), Burchard (1929), Bramwell (1968), Santos & Fernández (1979), Bramwell & Bramwell (1990), Bañares (1990) and Suárez (1994).

*Aichryson porphyrogennetos* seems widespread on the island but locally rare; it has been found in the present study in Utiaca (UTM-Hayford/Pico de las Nieves: 28RDR4699), above Valleseco, San Isidro (28RDS450005), Cueva Corcho, El Hornillo, Barranco de los Mocanes (28RDR504940), Barranco Azuaje, Barranco de La Virgen, Barranco de Los Tiles and near La Lechucilla (San Mateo)(28RDR471979) (Fig. 4). As assumed previously (Bañares 1990, 1997), the species seems to be extinct at its type locality and the last collections made in the Tenteniguada valley by Sventenius (no. 7187, 7189, ORT!) and Roca & Marrero (no. 16708, LPA!) were actually confused with *A. laxum* and *A. bituminosum*. Praeger (1929, 1932) reported the species in three localities on Tenerife (Bco. Tahodio, 750 m; Bco. de los Huelcos, 900-1200 m and Bco. Añavingo) but subsequently, Bramwell (1969) suggested that plants from this island are

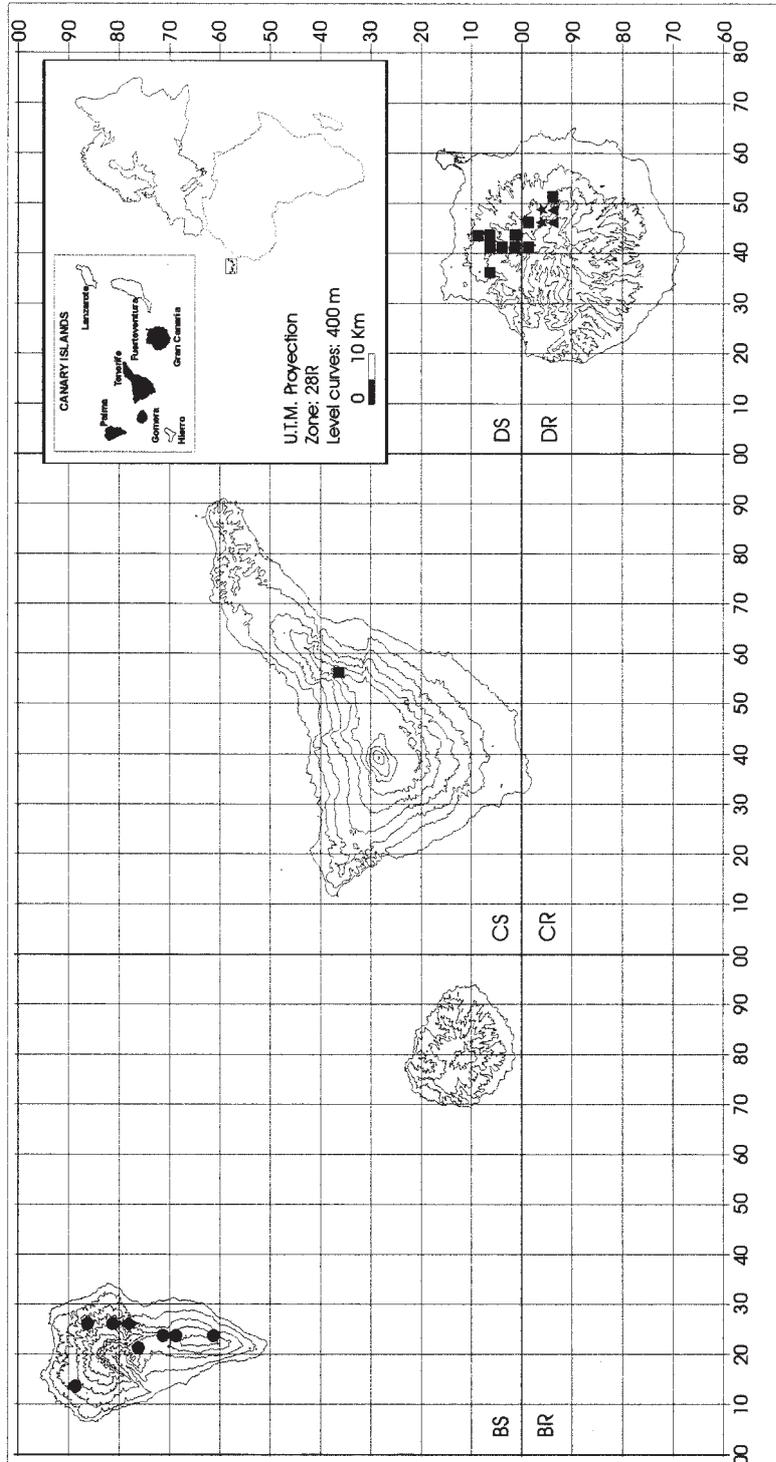


Fig. 4. Distribution of *A. bollei* Webb ex Bolle (●, ◆); *Aichryson brevipetalum* Praeger (◆); *Aichryson bituminosum* Bañares (▲, ★) and *Aichryson porphyrogemmetos* Bolle (■, ★). – After the author's field observations and revised herbarium specimens; the second symbol for a species which it shares with another species indicates sympatric occurrence of both in the same grid.

hardly different to *A. laxum*. However, some of Praeger's collections deposited at K definitely belong to *A. porphyrogenetos*. The revised sample, from Barranco de Añavingo (Praeger 4.1929, K!), is divaricately branched, densely glandular-pubescent, with rhombic leaves (usually broadest towards base), suffused purple-red and with papillose, not black-dotted margin, with 8-9-merous flowers, elliptic, strongly apiculate (apiculus 0.7 mm) petals (1.5 mm wide), and with adaxially pubescent carpels. Our search for *A. porphyrogenetos* in that locations in Tenerife was in vain; only plants found in Bco Tahodio are very similar in appearance to the species due to their typical subelliptic leaves suffused red, but with flower characters of *A. laxum*.

*Ic.* – Praeger 1932: 113; Kunkel & Kunkel 1978: 61.

*Additional specimens examined.* – SPAIN: CANARY ISLANDS: GRAN CANARIA: Los Tiles de Moya, 13.9.1966, *E. Sventenius* 7188 (ORT); *ibid.*, 20.4.1967, *E. Sventenius* 9300 (ORT); San Isidro (Teror), 6.1996, *Bañares* 42119 (TFC); Cueva Corcho, 3.7.1997, *A. Santos* 34387, 34388 (ORT); cercanías de Utiaca, 5.2000, *Bañares & Bermúdez* 42120 (TFC); *ibid.*, 6.2001, *Bañares & Bermúdez* 42124 (B, TFC). — TENERIFE: Barranco Añavingo (Arafo), 4.1929, *Praeger* (K).

#### Key to the pubescent-leaved species of *Aichryson* sect. *Aichryson*

C = Gran Canaria; F = Fuerteventura; G = La Gomera; H = El Hierro; P = La Palma; T = Tenerife)

1. Annual herbs, unbranched, delicate (flowering 5-10(15) cm tall) . . . . . 2
- Biennial or triennial herbs, branched, robust (flowering 15-45 cm tall) . . . . . 3
2. Leaf margins not papillose; calyx exceeding the corolla in bud; calyx segments ovate to sublanceolate, blunt; petals 3-4 × 1-1.3 mm, 1.3 × as long as the sepals . . . . .  
. . . . . *A. brevipetalum* (P)
- Leaf margins papillose; calyx not exceeding the corolla in bud; calyx segments lanceolate, acute; petals 5.1-5.5 × 2-2.4 mm, 1.5 × as long as the sepals . . . . . *A. parlatorei* (C, G, H, P, T)
3. Leaf margins neither papillose nor crenulate; petals linear-lanceolate or lanceolate . . . . . 4
- Leaf margins papillose; petals elliptic . . . . . 5
4. Plants hardly viscid (greasy), not aromatic; hairs longer than leaf section; flowers 9-12-merous; calyx segments linear-lanceolate (4-4.5 × 0.6-0.9 mm); petals linear-lanceolate, narrow (0.9-1.1 mm wide), abaxially puberulent; carpels pubescent adaxially and usually abaxially . . . . . *A. laxum* (C, F, G, H, P, T)  
[*A. laxum* × *A. punctatum* is a rare hybrid, growing between the parents and characterized by crenulate, papillose and sparsely black-dotted leaf margins, lanceolate, 1.3-1.7 mm wide petals, and only adaxially pubescent carpels].
- Plants viscid, aromatic; hairs shorter than leaf section; flowers 7-10-merous; calyx segments lanceolate (2.5-3 × 1-1.2 mm wide); petals lanceolate, 1.2-2 mm wide, apiculate (apiculus up to 1 mm); carpels pubescent adaxially only . . . . . *A. palmense* (P)
5. Leaf margins neither crenulate nor black-dotted; petals with 1 mm long apiculus . . . . .  
. . . . . *A. porphyrogenetos* (C, T)
- Leaf margins black-dotted; petals with 0.4-0.7 mm long apiculus . . . . . 6
6. Plants suffused with red; stems densely branched; leaf margins crenulate; calyx segments acute to subacute, purple-tipped; petals deep yellow, purple-tipped, 1.3 × as long as the sepals . . . . . *A. bollei* (P)
- Plants light green; stem simple or sparingly branched; leaf margins scarcely papillose, not crenulate; calyx segments acuminate; petals light yellow, usually serrulate, 1.5 × as long as the sepals . . . . . *A. bituminosum* (C)

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Orotava, Tenerife (ORT) for their comments and for making their specimens of *Aichryson* available. I thank Luz Marina Gómez and Carlos Rodríguez for producing the drawings, and G. Kunkel and Bernardo Navarro for providing herbarium specimen information and field data. I am also indebted to Dr U. Eggli and Dr A. Santos for their valuable criticism and suggestions improving the manuscript.

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