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FARSISTAN EXPEDITION: 1910.

J. F. SMITH.

No. 250

Bot. Name.—*Euphorbia cheiradenia*, P.Vern.—*Daracht-i-sang*.Loc.—*Pir-i-zan* pass, between *Kasrun* and *Shiraz*, rocky slopes.

Date—7-6-1910.

Alt. 9500'.

Coll.—*J. F. Smith*.

if written with care they might eventually be edited and published with detachable pages, printed on one side only, when they would form a valuable addition to the distribution labels and a general source of reference.

VI. THE PACKING OF SPECIMENS.

The specimens when dried must be protected against dampness and the attacks of insects and other animals. They should be made up into parcels, placing a little powdered naphthaline inside, and wrapped up tightly in some waterproof material, such, for instance, as Indian waxcloth. In this way the packets may travel long distances even if no special boxes be available. Herbarium specimens which have been dried in "retainers" may be left in them; but generally these will be required again and the plants will therefore have to be transferred to other paper for packing. For this purpose ordinary newspaper or so-called "strawpaper" will be very serviceable. Should some of the specimens be bulky and likely to press on others which are more delicate and brittle, stouter pieces of paper or pieces of cardboard should be inserted in the bundle where necessary.

XVIII.—ECHIUMS FROM THE ATLANTIC ISLANDS: I.

T. A. SPRAGUE AND J. HUTCHINSON.

(With plate.)

The Echiiums of the Atlantic Islands have long attracted attention on account of their arborescent or fruticose habit, and some have been in cultivation since 1777. They formed the subject of a valuable posthumous memoir by Auguste de Coincy, published in 1903.* Among the characters considered important by de Coincy were the nature of the annulus inside the base of the corolla, the relative height of the insertion of the stamens, and

* Bull. Herb. Boiss. ser. 2, vol. iii. pp. 261-277, 488-499.

the length of the style-arms. He draw attention to the existence of gyno-dioecism in several species (*virescens*, *giganteum* sensu lato, *hierrense* and *Decaisnei*), and described four new ones *Webbii*, *exasperatum*, *Bourgaenum* and *gentianoides*), three of which had been proposed by Webb in manuscript. Bolle* had previously described two of Webb's manuscript species (*hierrense* and *callithyrsum*), and *E. leucophaeum*, Webb, mss., is recognised as distinct in the present paper.

Webb seems to have projected a revision of the Canarian *Echiums*, and it is to be regretted that this never appeared, as his knowledge of the flora of the Canaries was unrivalled. It is evident, from the names which he left in manuscript, that he would have adopted in certain cases smaller specific units than those formerly recognised by him in the *Phytographia Canariensis*, and that in no case would he have united species so diverse in habit and with such well-marked technical characters as *giganteum* and *aculeatum*. Christ† regarded these two as distinct species, and described *leucophaeum* as a variety of *aculeatum*, whereas Bornmüller‡ treated *leucophaeum* and *aculeatum* as varieties of *giganteum*, and de Coincy§, who knew them only in a dried state, was unable to distinguish *leucophaeum* from *giganteum* and regarded *aculeatum* as a mere form of the latter. Bornmüller considered that the differences in breadth of leaf, spininess, and indumentum were dependent on local conditions, *aculeatum* occurring, according to him, in the hottest and driest places, *leucophaeum* in somewhat moister localities, and *giganteum* usually in shady bushy places. Neither *giganteum* nor *aculeatum*, however, alters appreciably under cultivation, so that the characters mentioned are relatively fixed; and as they are associated with others derived from habit, the shape of the calyx-segments, the degree of zygomorphy of the corolla, the height of insertion of the stamens, the length of the style-arms, and the nature of the nutlets, the three species can hardly be regarded as otherwise than distinct.

The Canarian species of *Echium* and certain other genera have an extremely restricted distribution, and some which look very much alike in a dried state may be distinguished at a glance in the field, so that they require for their elucidation a knowledge of local topography and observation in the field, in addition to critical work in the herbarium.

During the course of an expedition to the Canaries in the summer of 1913 (see *K. B.*, 1913, pp. 287-299), the writers were fortunate in seeing both *E. giganteum* and *E. aculeatum* growing near Puerto Orotava, Tenerife, the former in a wild state, the latter in the garden of the Grand Hotel Taoro. On visiting the island of La Palma, two other *Echiums* were seen and collected which obviously represented distinct species. These are

* Ind. Sem. Hort. Berol. 1867, app. 1, pp. 6-7.

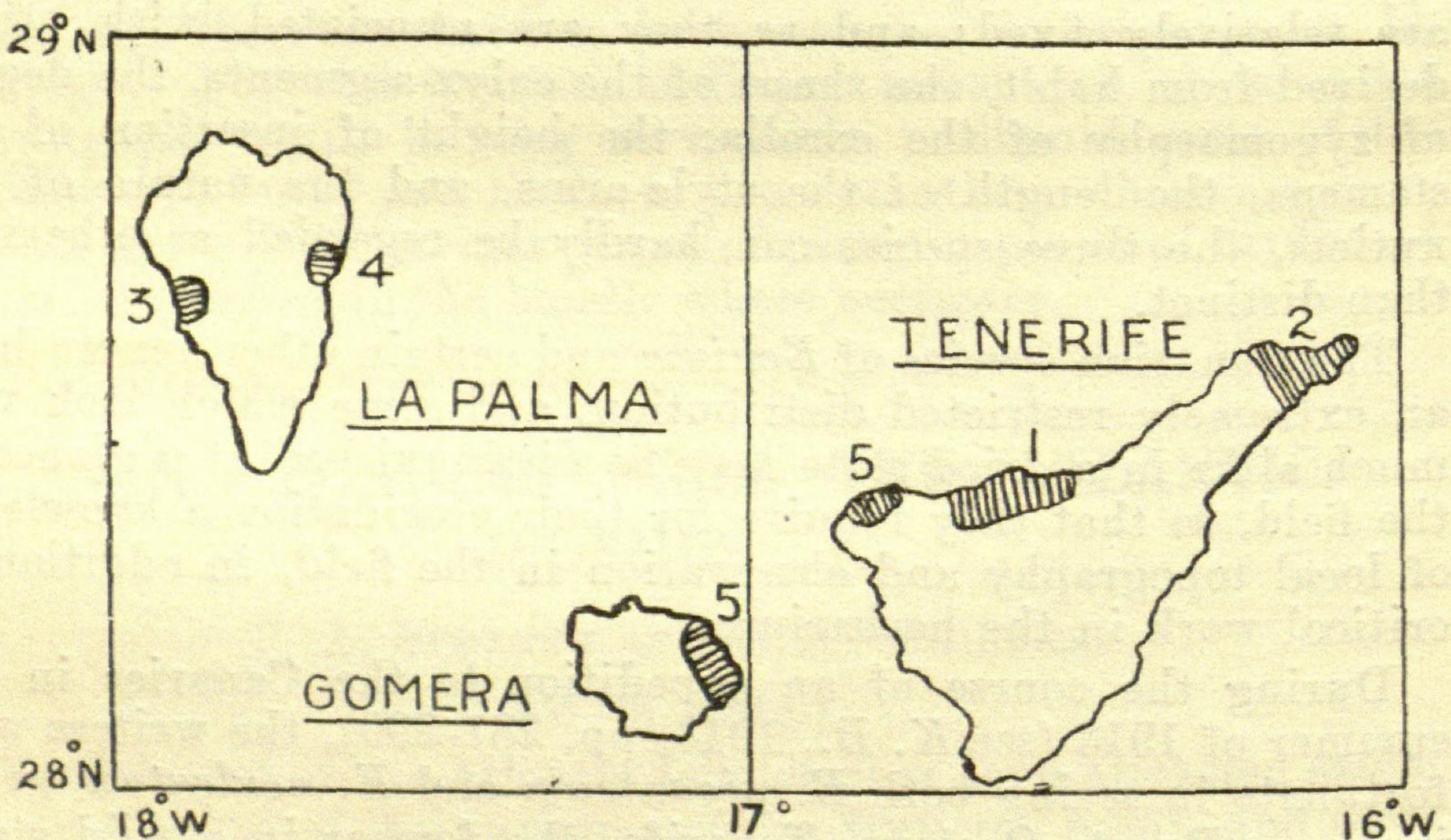
† Engl. Jahrb. vol. ix. p. 128.

‡ Engl. Jahrb. vol. xxxiii. p. 466.

§ Bull. Herb. Boiss. ser. 2, vol. iii. p. 273.

now described for the first time. One, a large bush with pink flowers, occurred in the Barranco de las Angustias on the western side of the island, and has been named *Echium Bond-Spraguei* (pl. fig. 3) in compliment to Dr. Thomas Bond Sprague, thanks to whom the writers were enabled to visit the Canaries; the other, which had white flowers and very short style-arms, was found in the Barranco del Carmen on the eastern side of the island, and has been named *E. brevirame* (pl. fig. 4).

The five species, (1) *giganteum*, (2) *leucophaeum*, (3) *Bond-Spraguei*, (4) *brevirame* and (5) *aculeatum*, constitute a very natural group. To a certain extent they form a series in the above order, the two extremes of which are represented by *giganteum*, which has the broadest and least spinulose leaves and the longest style-arms, and *aculeatum*, which has the narrowest and most spiny leaves, and (together with *brevirame*) the shortest style-arms. If the same series were traceable in the other characters and in the geographical distribution, there would be a *prima facie* case for the union of the five species. A glance at the accompanying plate and text-figure will show that these conditions are not fulfilled. The corolla is more distinctly zygomorphic in species (1) and (4) than in the others; and the broadest and shortest calyx-segments occur in (2). Secondly, the two extremes, (1) and (5), occur in the middle of the area of distribution and the intermediates to the extreme east and west. The most striking point in the distribution is that (5), though restricted in Tenerife to a small area in the north-west, occurs also in Gomera. It is the only species of the *giganteum* group which is represented in two of the islands.



The following key should be used in conjunction with the plate and the descriptions given in the enumeration, as it necessarily contains only a selection of the distinctive characters:—

Leaves narrowly oblanceolate, up to 3.5 cm.

broad, almost destitute of spinules;

calyx-segments broadly linear; style-

arms 2-2.5 mm. long (fig. 1) 1. *E. giganteum*.

Leaves oblanceolate-linear or linear, up to 1 cm. broad, more or less spinulose:—

Style-arms 1–2 mm. long:—

Calyx-segments oblong-lanceolate
(fig. 2) 2. *E. leucophaeum*.

Calyx-segments linear-lanceolate
(fig. 3) 3. *E. Bond-Spraguei*.

Style-arms 0.2–0.5 mm. long:—

Lateral calyx-segments shorter than
the corolla-tube (fig. 4)... .. 4. *E. brevirame*.

Lateral calyx-segments longer than
the corolla-tube (fig. 5) 5. *E. aculeatum*.

1. ***E. giganteum***, *Linn. f. Suppl.* p. 131 (1781); *Ait. Hort. Kew.* vol. i. p. 187; *Vent. Jard. Malm.* t. 71; *J. F. Jacq. Ecl. Pl.* p. 93, t. 63; *Lehm. Pl. Asperifol.* p. 406; *Webb & Berth. Phyt. Canar. sect. 3*, p. 48, t. 149; *Christ in Engl. Jahrb.* vol. ix. p. 128; *Bornmüller in Engl. Jahrb.* vol. xxxiii. p. 465; *De Coincy in Bull. Herb. Boiss. ser. 2*, vol. iii. p. 271, partim (*forma genuina*).

Folia lata (usque ad 3.5 cm.), anguste oblanceolata, acuta vel obtusa, spinulis fere carentia, nervis lateralibus subtus distinctis, subtus vix sericea. *Calycis segmenta* late linearia, obtusa, medio latiora, in basin paulo angustata; segmenta lateralia corollae tubo breviores vel eum aequantia, 8–9 mm. longa, 1.4–1.6 mm. lata. *Corolla* alba, manifeste zygomorpha, lobo antico ceteris superante; lobus anticus 3–3.75 mm., laterales 2.5–3 mm., postici 2–2.5 mm. longi. *Stamina* antica 6.5–7 mm. supra basin corollae, 6–7 mm. infra apicem lobi antichi inserta. *Stylus* tenuiter pilosus, pilis ascendentibus; rami 2–2.5 mm. longi, apice vix incrassati. *Nuculae* deorsum valde angustatae, satis graciles, pauci-echinulatae.

CANARY ISLANDS. Northern coast of Tenerife:—In steep places, *Masson* (coll. 1778). Near Puerto Orotava: border of a field by the road between Puerto Orotava and Santa Ursula, young fl. Nov. 26, *Lowe* 99 bis; El Durasno, fl. and fr. May 26, *Sprague & Hutchinson* 98; Barranco Martianez, fl. Jan., *Burchard* 77 (Zürich Polytechn.); on rocks at El Burgado, fl. Feb., *Bourgeau* I. 896; rocks to the east, and hill west of San Antonio, fl. Dec., *Lowe* 98 bis; sea cliffs at La Pata, fl. Dec., *Lowe* 98 bis. Icod el Alto, 600 m., fl. Jan., *Collett*. In shaded rocky places between Icod de los Viños and Garachico, 200 m., *Bornmüller* 2660 (ex *Bornmüller*, l.c.). Garachico, on maritime rocks, fl. Feb., *Pitard* (Zürich Polytechn.). Risco de Oro, on rocks, 120 m., *Dinn* 5.

E. giganteum may be readily recognised by its broad unarmed leaves, long style-arms and relatively slender pauci-echinulate nutlets.

2. ***E. leucophaeum***, *Webb ex Bourg. Pl. Canar. I.* 466, II. 1438; *De Coincy in Bull. Herb. Boiss. ser. 2*, vol. iii., p. 271, in syn.; sp. nov.

Folia conferta, angusta (usque ad 1 cm. lata), linearia vel

oblanceolato-lineararia, acuta, spinulis parvis debilibus margini parallelis, nervis lateralibus subtus indistinctis, subtus sericea. *Cincinnati* patuli, sub fructu patentis. *Calycis segmenta* oblongo-lanceolata, subacuta, medio latiora; segmenta lateralia corollae tubo conspicue breviora, 5.5–6.5 mm. longa, 1.5–2 mm. lata. *Corollae* lobus anticus 2.5–3 mm., laterales 2.2–3 mm., postici 2.5 mm. longi. *Stamina antica* 6–7 mm. supra basin corollae, 5.5 mm. infra apicem lobi antici inserta. *Stylus* tenuiter pilosus pilis suberectis, parte media incrassata applanataque; rami 1–2 mm. longi. *Nuculae* crassae, modice echinulatae.—*E. aculeatum*, var. *leucophaeum*, Christ in Engl. Jahrb. vol. ix. p. 128; Bornmüller in Engl. Jahrb. vol. xxxiii. p. 465 (plantis palmensibus exclusis). *E. giganteum*, var. *leucophaeum*, Bornmüller, l.c. 466.

CANARY ISLANDS. North-eastern Tenerife: north middle region of the Anaga Mountains, on steep rocks, fl. March 20, *Perraudière*; in dry rocky places of the lower region, fl. March *Bourgeau* I. 53; Anaga Mountains, Barranco de Igueste and Barranco de Draguillo, fl. April, *Schröter*; in rocky places near Bajamar, fl. May, *Bourgeau* I. 466; in rocky places in the barrancos of Bajamar and Bufadero, fl. March, *Bourgeau* II. 1438; La Goleta, fr. June, *Murray*.

E. leucophaeum differs from *E. giganteum* in the shorter, broader calyx-segments, shorter style-arms, stouter, more echinulate nutlets and in the lateral cymes, which are spreading in fruit.

3. *E. Bond-Spraguei*, sp. nov.

Folia oblanceolato-lineararia vel lineararia (vix usque ad 1 cm. lata), acuta vel subacuta, spinulis marginalibus et costalibus numerosis manifestis ascendentibus, nervis lateralibus plus minusve distinctis, subtus sericea. *Calycis segmenta* lineari-lanceolata, subacuta, basi et medio aequilata, a medio ad apicem angustata; segmenta lateralia corollae tubo breviora, 6–6.5 mm. longa, 1.2–1.5 mm. lata. *Corolla* rosea, in toto 12–13 mm. longa; lobus anticus 2.5–3 mm., laterales 2.5 mm., postici 2.5–3 mm. longi. *Stamina antica* 6.5–7 mm. supra basin corollae, 5.5–6 mm. infra apicem lobi antici inserta. *Stylus* inferne patule pilosus; rami 1–1.2 mm. longi. *Nuculae* (immaturae tantum visae modice echinulatae, cornu valde alato.—*E. aculeatum*, forma inermis, Webb, MSS.

CANARY ISLANDS. Palma: western region; Barranco de las Angustias, near Cruz de la Viña, fl. June 11, *Sprague & Hutchinson* 335; on dry rocks, *Webb*; Los Llanos, fl. June 13, *R. P. Murray*.

Murray's specimen is functionally female, as stated by De Coincy (Bull. Herb. Boiss. ser. 2, vol. iii. p. 274). The corolla is 7–8 mm. long, with distinct pockets outside, opposite the insertion of the three posticous stamens. The stamens are very slightly exerted. The anticous ones are inserted 3–3.5 mm. above the base of the corolla-tube, 4–4.5 mm. below the apex of the anticous lobe. The calyx and style-arms resemble those of the hermaphrodite plant. Several of the Canarian species of

Echium are known to be gyno-dioecious. The female plants are comparatively rare. The corollas are smaller than those of hermaphrodite plants, the stamens are included or very shortly exerted, and the anthers oblong-linear, sterile.

E. Bond-Spraguei is allied to *E. leucophaeum* and *E. brevirame*. It differs from the former in its more spinulose leaves, narrower calyx-segments, (usually) shorter style-arms, and in the lateral cymes which are not spreading in fruit; it may be distinguished from the latter by its less zygomorphic corolla, differently shaped calyx-segments, stamens inserted near the middle of the corolla, and longer style-arms.

4. ***E. brevirame***, sp. nov.

Folia oblanceolato-lineararia vel lineararia (usque ad 1 cm. lata), acuta vel subacuta, spinulis marginalibus satis numerosis manifestis ascendentibus, costalibus paucis sparsis, nervis lateralibus plus minusve distinctis, subtus sericea. *Calycis segmenta* lanceolato-lineararia, subacuta, a basi ad apicem angustata; segmenta lateralia corollae tubo breviora, 5.5–8 mm. longa, medio 0.8–1.2 mm. lata. *Corolla* alba, manifeste zygomorpha, in toto 12–13 mm. longa; lobus anticus 2.5 mm., laterales 2–2.5 mm., postici 2–2.5 mm. longi. *Stamina* antica 7.5–8.5 mm. supra basin corollae, 4–4.5 mm. infra apicem lobi antici inserta. *Stylus* grosse pilosus, pilis inferne patentibus; rami 0.2–0.4 mm. longi. *Nuculae* crassae, valde echinulatae.—*E. aculeatum* var. *leucophaeum*, Bornmüller in Engl. Jahrb. vol. xxxiii. p. 465, quoad stirpem palmensem.

CANARY ISLANDS. Palma: eastern region; northern face of Barranco Carmen, fl. May 31, *Sprague & Hutchinson* 162; Barranco del Rio, fl. June 9, *R. P. Murray*.

The leaves of the two small specimens gathered by Murray are rather more crowded than in typical *E. brevirame*, and the anticus stamens are inserted a little nearer the middle of the corolla. The specific name refers to the very short style-arms, which serve, with other characters, to distinguish this species from *E. Bond-Spraguei*. *E. brevirame* differs from *E. aculeatum* in the less spinulose leaves, the shorter calyx-segments, and the inflorescence.

5. ***E. aculeatum***, *Poir.* Encycl. Méth. vol. viii. p. 664; *Lehm.* Pl. Asperifol. p. 405, t. 5 (ic. mala); *Webb & Berth.* Phytogr. Canar. sect. 3, p. 50, excl. var.

Folia anguste lineararia (usque ad 5 mm. vel rare fere 1 cm. lata), acuta vel subacuta, margine et costa subtus spinosissima, spinis patulis, subtus sericea, nervis lateralibus plerumque indistinctis. *Calycis segmenta* lineari-subulata, acuta, a basi ad apicem angustata; segmenta lateralia corollae tubo longiora, 10–11 mm. longa, 0.8 mm. lata, conspicue spinosa. *Corolla* alba; lobus anticus 2.5–3 mm., laterales 2–2.5 mm., postici 3 mm. longi. *Stamina* antica 7 mm. supra basin corollae, 5.5 mm. infra apicem lobi antici inserta. *Stylus* supra medium incrassatus, pilis ascendentibus; rami 0.2–0.5 mm. longi.—*E. aculeatum*, var. *genuinum*, Bornmüller in Engl. Jahrb. vol. xxxiii. p. 465. *E. giganteum*, var. *aculeatum*, Bornmüller, l.c. 466.

CANARY ISLANDS. North-western Tenerife: Montaña de Taco, near Buenavista, *Webb*; at 200 m., fl. June, *Burchard* 260 (Zürich Polytechn.); Buenavista, on sunny rocks, fl. March, *Bourgeau* II. 1431. Gomera: San Sebastian, 300 m., fl. March, *Kuntze*; in dry places, *Pitard* 622 (Zürich Polytechn.); Hermigua, fl. April, *Lowe* 34.

The lateral cymes of *E. aculeatum* are much contracted, and leafy below, and form a leafy corymbose thyse in which the flowers are half hidden by the calyx-segments and bracts. The cymes are shorter, fewer-flowered and denser than in the other species.

EXPLANATION OF PLATE.

Fig. 1a, flower of *Echium giganteum*.

1b, style-arms.

1c, nutlet.

1d, leaf.

Fig. 2a, flower of *E. leucophaeum*.

2b, style-arms.

2c, nutlet.

Fig. 3a, flower of *E. Bond-Spraguei*.

3b, style-arms.

3c, nutlet (immature).

Fig. 4a, flower of *E. brevirame*.

4b, style-arms.

4c, nutlet.

Fig. 5a, flower of *E. aculeatum*.

5b, style-arms.

5c, leaf.

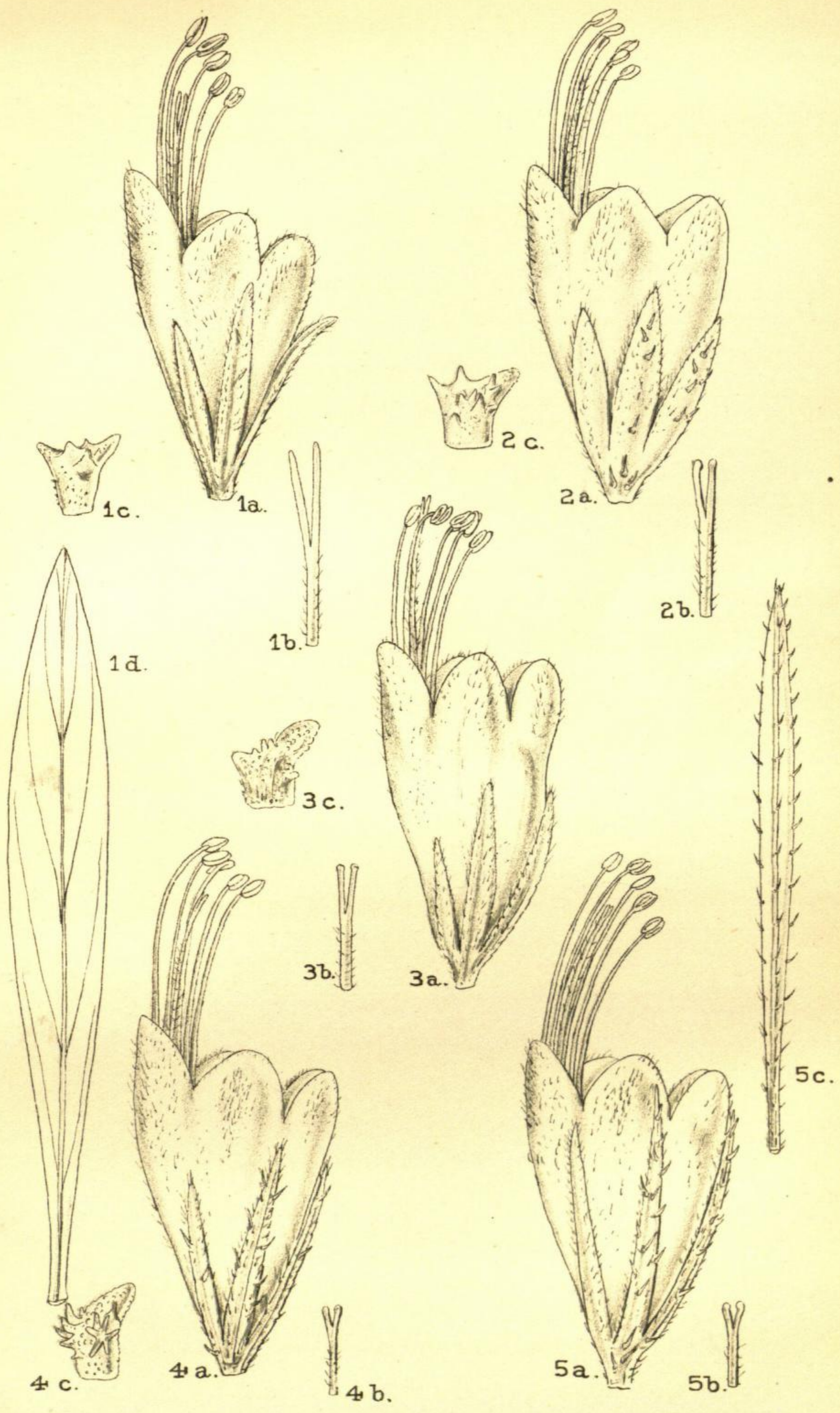
Flowers, $\times 3\frac{1}{2}$; style-arms, $\times 6$; nutlets, $\times 5$; leaves, natural size (1d, a small one).

XIX.—CONTRIBUTIONS TO THE FLORA OF SIAM.

ADDITAMENTA VI.

⁴⁵⁵³ **Clematis Kerriana**, *Drummond et Craib* [Ranunculaceae—Clematideae]; e grege *C. Vitalbae*, Linn., maxime *C. gouriana*, Roxb., affinis a qua propter foliola breviora basi vix cordata subcoriacea nec chartacea constanter pubescentia nunquam glabrata et antheras duplo longiores loculis omnino parallelis nec basi divaricatis bene distinguitur.

Herba sarmentosa, late scandens, ramis sublignosis angulatis alte inaequaliter sulcatis purpurascens pilis ad 0.5 mm. (statu exsiccato) longis cinereo-fulvescentibus crebre vestitis. *Folia* bipinnata vel (inferiora) pinnata, superiora longitudine 15–20 cm. attingentia, pinnis inter se 5–6 cm. distantibus, rhachi ramulis omnino simili plus minusve flexuosa; foliola subcoriacea, terna, terminale quam lateralia semper manifeste majus, circiter 1.8–5 cm. longum et 1.5 cm. latum, ovato-lanceolatum, basi plus minusve oblique rotundatum, rarissime obscure subcordatum, mox in apicem fere cuspidatum sensim attenuatum, lateralia acuta, vix acuminata, omnia subtrinervia, pagina superiore sordide viridia, plus minusve evidenter bullata, pilis albidis subadpressis laxiuscule conspersa, venis primariis manifeste impressis ceteris inconspicuis, pagina inferiore



Canary Echiums.

J. Hutchinson, del.
212. W. B. & L. 3. 14.

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