BEGONIA SECTION *BACCABEGONIA* REITSMA, SECT. NOV.

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1. INTRODUCTION

WARBURG (1894) arranged the continental African *Begoniaceae* into 9 sections. Ever since, students in *Begoniaceae* disputed this classification, among whom IRMSCHER (1961) and HALLÉ (1967). However, apart from minor corrections and suggestions WARBURG's arrangement has not been changed fundamentally, and stands up till now. In the course of the study of *B. baccata* and *B. crateris* we found that it is not warranted to accommodate these two species in any of the sections known at present. Accordingly, the creation of a new section was found necessary (see 2.2). Thus, the new section *Cristasemen* DE WILDE (this issue) included, the number of African sections is raised to 11.

2. CIRCUMSCRIPTION OF BEGONIA SECTION BACCABEGONIA REITSMA

2.1. LATIN DESCRIPTION OF THE NEW SECTION

Type species: *B. baccata* Hook.f.

Plantae paulo ramosae monoecae fruticosae usque 4 m altae. Indumentum quoad densitatem variabile, pilis sessilibus squamiformibus vel dentatis vel stellatis formatum. Stipulae deciduae naviformes, exteriores cuiusque paris in parte superiori carinatae. Folia longe petiolata, basi profunde cordata usque peltata, apice acute acuminata, margine fere integra, saepe maxima.

Inflorescentia axillaris, cymosa, usque 27 cm longa, floribunda bisexualis, usque 30 ♀ et 46 ♂ flores ferens, floribus ♂ primum florentibus, axibus componentibus base bracteis deciduis praeditis. Tepala 2 in flore masculo et in flore femineo, alba. Androecium fasciculum a 19–116 staminibus liberis formatum, antheris lateraliter dehiscentibus. Flores feminei cum 4–7 stylibus apice hippocrepiformiter furcatis, brachiis ambobus fascia spirali papillosa stigmatosa provisis, spiris 1½ usque 2. Ovarium fere globosum, apterum, 4–7-loculare, placentis septiformibus plerumque bis ramosis ergo quisque loculus 4 placentas ovuliferas continens. Infructescentia usque 30 cm longa, usque 21 fructus ferens. Fructus maturus carnosus, bacciformis, valvis irregularibus dehiscens. Crescens in São Tomé, altitudine 0–1500 m.

2.2. TAXONOMIC POSITION AND RELATION TO THE OTHER AFRICAN SECTIONS

WARBURG (1894: 140) accommodated *B. baccata* in section *Squamibegonia* Warb. This was followed by ENGLER (1921: 614) where, unfortunately, the name

B. baccata was omitted from the text, although the short description: 'Spreiten von 2–3 dm Durchmesser, mit kurzer Spitze, auf San Thomé', leaves no doubt about the identity of the species meant. From Fig. 262 E in IRMSCHER (1925: 565) it might be concluded that this author placed *B. baccata* in section *Squamibegonia* as well. DE WILDE and ARENDS (1980) presented arguments to exclude *B. baccata* and *B. crateris* from section *Squamibegonia* and, hesitatingly, referred both species to section *Mezierea* (Gaud.) Warb. This opinion was already expressed by BARKLEY (1972) without any further discussion.

Considering the characters of the ovaries and fruits of both species it is clear that they show affinities to the sections *Mezierea, Squamibegonia* and *Tetraphila* A.DC., all characterized by exalate ovaries and fundamentally parietal placentation, as was demonstrated by REITSMA (1984); the remaining continental sections show axile placentation and, as a rule, alate ovaries. Confronted with the question where to accommodate the two present species within the three sections mentioned, it became clear that none of them justified such an attribution. This led to the concept of a new section *Baccabegonia*. In Table 1 some major characters are listed allowing differentiation among the four sections.

Regarding pollen morphology the section *Baccabegonia* has a rather isolated position. Its pollen may be readily distinguished from that of the other African sections. Major affinities are with the primitive pollen type found within section *Mezierea* (VAN DEN BERG, 1985).

Micromorphology of the seed-coat was studied by DE LANGE (see 4.).

The somatic chromosome number for *B. baccata* and *B. crateris* varies from

TABLE 1. Important characters to discriminate the sections *Baccabegonia, Mezierea, Squamibegonia* and *Tetraphila*.

	Baccabegonia	Mezierea	Squamibegonia	Tetraphila
Number of perianth segments	♀ flowers: 2 ♂ flowers: 2	♀ flowers: 2 ♂ flowers: 2, 4	♀ flowers: 2 ♂ flowers: 2	♀ flowers: 4 ♂ flowers: 4
Shape of ovary	globose	ellipsoid	obovoid	fusiform
Placentation*	septal; 4 placentae per locule	parietal	(pseudo-)axile	usually septal: 2 placentae per locule
Number of ovules* per cross-section	250–300	80–100	110–115	4–56
Fruits	dehiscent	indehiscent	indehiscent	dehiscent
Somatic chromosome numbers**	36 (+ 1 or 2)	24, 48	36 (+ 1 or 2)	36 (+ 1 or 2)

* See REITSMA, 1984.

** See DE WILDE & ARENDS, 1980: p. 416–420 (*Squamibegonia*): ARENDS, unpublished (*Baccabegonia, Mezierea, Tetraphila*).

2n = 37 to 38. This variation in the number may be attributed to the presence of 1 or 2 accessory chromosomes. The somatic karyotypes of the two species are very similar. Hence they cannot be distinguished by their chromosomes. The total somatic chromosome length varies from 29 to 35 μm for the cells of which the chromosomes could be measured. When the karyotypes of the species of the section *Baccabegonia* are compared with those found in other African *Begonia* species, they are most similar to those observed for the species of the section *Squamibegonia* (ARENDS, pers. comm.).

In our judgment the macromorphological characters of section *Baccabegonia* point to a strong affinity with section *Squamibegonia*. Other differential characters besides the fruit and placentation characters listed in Table 1, are the considerable lengthening of the inflorescence-axes, the absence of a perianth-tube in the female flowers of section *Baccabegonia* and, moreover, the absence of bracts which envelop the inflorescence and are persistent in the infructescence of section *Squamibegonia*. In combination these characters, in our opinion, delimitate the section *Baccabegonia* proposed here and justify its status among the other African sections.

3. THE SPECIES B. BACCATA HOOK. F. AND B. CRATERIS EXELL.

3.1. HISTORY AND TAXONOMY

B. baccata was validly published by J. D. HOOKER in 1866. The description is accompanied by a coloured plate, which erroneously shows unisexual inflorescences. In a description of this species by the same author in the Flora of Tropical Africa (1871, vol. 2: 573) it is stated that the peduncles (actually the inflorescences!) are unisexual; a comprehensible error as the female flowers do not show when the male flowers are at anthesis, whereas the male flowers are already shed when the female flowers reach anthesis (see also DE WILDE & ARENDS, 1980: 381).

As far as could be traced the first specimen of *B. crateris* ever collected was discovered by Aug. CHEVALIER in 1905 (no. 13748). However, it was not until 1944 that it was recognized as a separate taxon and validly published by EXELL who based his description on a single collection, viz. *Exell no. 224*. In the protologue he erroneously used the occurrence of bisexual inflorescences in *B. crateris* as a character to keep it apart from *B. baccata*; actually both taxa show this type of inflorescence. As this character appears to be fallacious, the differentiation of both taxa becomes more complicated and, only after considerable consideration, it was decided to maintain their status. EXELL, in his protologue to *B. crateris*, already stated that in the field both species are very similar in appearance. This also holds for plants of both taxa at present in cultivation at the

Department of Horticulture of this University at Wageningen. Here, plants of *B. crateris* look duller in general appearance, probably due to the heavier indumentum, as compared to the more shining plants of *B. baccata.* As spatial separation in the natural habitat was not obvious (pers. comm. DE WILDE AND ARENDS), mutual gene-flow should not be ruled out. Additional field-work is needed to clarify pollination biology and to search for possible ecological breeding barriers and for the occurrence of hybrid populations.

Although MONOD (1960: 54) and FERREIRA (1965: 533) followed by BARKLEY (1972) expressed the opinion that *B. crateris* is a later synonym of *B. baccata,* this is not followed here. Use of the combined differential characters (see also 3.2.) simple leads to one of both species, certainly when complete material is available.

3.2. KEY TO THE SPECIES AND SPECIES DESCRIPTIONS

- Plants ferruginously tomentose in almost all parts. Full-grown leaves usually peltate. Filaments at least as long as the anthers, usually longer and up to 3½ times the anther-length. Pedicels not elongated in fruit . . . . . *B. crateris*

- Plants glabrescent, more rarely tomentose. Full-grown leaves deeply cordate. Filaments at best as long as the anthers (rarely a few longer), usually shorter. Pedicels as a rule considerably elongated in fruit. . . . . *B. baccata*

Description of B. baccata Hook.f. **Fig. 1; Map 1**

B. baccata Hook.f. in Curt. Bot. Mag. **92**, t. 5554. 1866; Hook.f. in OLIVER, Fl. Trop. Afr. **2**: 573. 1871; C. DE CANDOLLE in Bol. Soc. Brot. **10**: 124. 1893; O. WARBURG in ENGL., Nat. Pflanzenfam. 1st ed. **3** (6a): 140, fig. 49E. 1894; E. IRMSCHER in ENGL., Nat. Pflanzenfam. 2nd ed. **21**: fig. 262 E. 1925; A. W. EXELL, Cat. Vasc. Pl. S. Tomé: 187. 1944; TH. MONOD in Bull. I.F.A.N. sér. A. **22**(1): 54. 1960; J. H. FERREIRA in Garcia de Orta (Lisboa) **13**(4): 533. 1965.

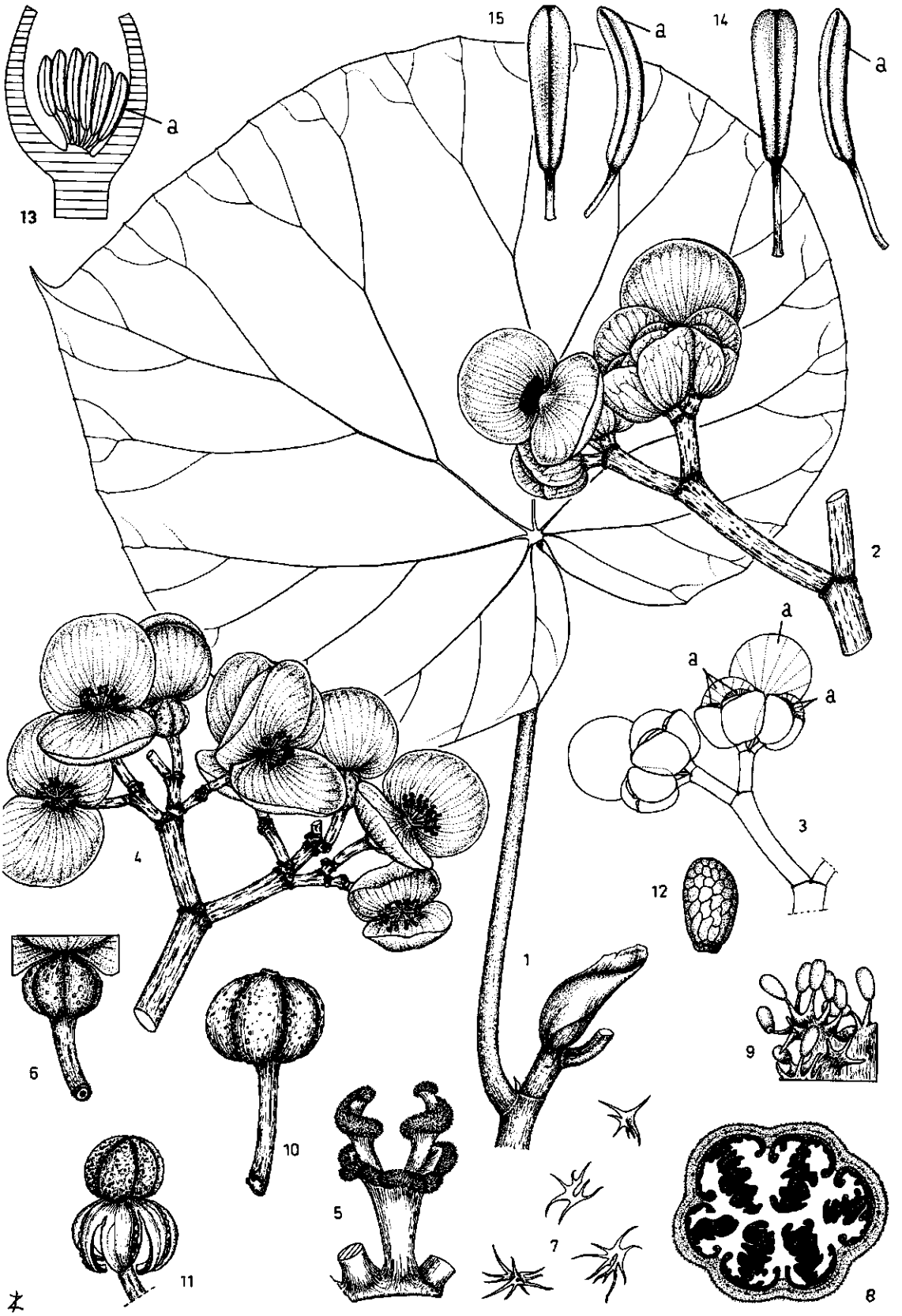
Holotype: *Mann no. 1087;* K (5 sheets); isotypes in B and P.

Description: Stout, poorly branched shrubby plants, up to 4 m tall, often rupestral. Stems erect, rarely pendent, woody in the lower part, up to 5 cm diam.; pale-brown to red, usually squamulose, glabrescent, the herbaceous parts often loosely covered with a ferruginous indumentum of sitting, scaly, denticulate to stellate hairs (representing the only type of indumentum occurring on the plant); the nodes sometimes with adventitious aerial roots. Leaf-scars conspicuous, about 1–1½ cm diam. Stipules caducous, boat-shaped, in folded position up to 6,5 × 2,5 cm, glabrous or nearly so, the bigger outer one conspicuously keeled in the upper part. Leaves herbaceous; petioles red to brown, 12–30(–41) cm long, glabrescent to tomentose; the blade asymmetric, obliquely orbicular to ovate,

especially in the young leaves sometimes (sub-)peltate, 22–40(–50) × 20–40(–50) cm; the upper surface glabrous to glabrescent, the lower surface covered with scattered hairs, more intensely on the nerves; deeply cordate at base, cuspidate to acuminate at apex, acumen up to 3 cm long; margin entire; palmately 7–9-nerved, mostly with 4 prominent nerves, the nerves branching dichotomously. Inflorescences conspicuous, axillary, representing androgynous, dichasial cymes with branches up to the eighth order and counting up to 46 male and 30 female flowers in a single inflorescence; at complete development reaching up to 27 × 34 cm, flowering strictly proterandrous; peduncles 5–13 cm long; the axes elongating in the course of flowering. Bracts of successive order early caducous, arranged in pairs; the two bracts of each pair boat-shaped and unequally sized, the outer one the broadest and overlapping the inner one largely, glabrous. Peduncle and axes of the inflorescence glabrescent to tomentose.
Male flower: tepals two, white, broadly ovate, cordate at base, 24–43 × 25–47 mm; androecium fasciculate, stamens (19–)40–100(–116); filaments free, white, (0,2–)0,8–3,0(–4,2) mm long; anthers yellow, 2,5–3,5(–3,8) mm long and 0.6–0.8 mm diam., tapering towards the base, opening laterally with two longitudinal slits. Female flower: tepals two, white, orbicular to broadly ovate, slightly cordate at base, 18–37 × 21–43 mm. Styles (4–)5–6(–7), yellow, at their base fused over 1–2 mm, the free parts including the stigmas 5.0–8.5 mm long, horseshoe shaped forked, each arm covered with a continuous, 1,5–2 times spirally twisted, papillose stigmatic band. Ovary (sub-)globose, somewhat urceolate, 7–11 × 8–13 mm, longitudinally shallowly (4–)5–6(–7)-grooved, (4–)5–6(–7)-locular, covered with scattered hairs or even tomentose; placentation septal, the septiform placentas branching once or often twice resulting in 2–4 ovula-bearing placenta branches per locule. Pedicels (4–)5–13(–21) mm long. Infructescence up to 30 cm long and containing up to 21 fruits; the fruit-bearing stipes (5–)9–30(–34) mm long. Mature fruit glossy, orange-red with white lenticels in vivo, almost glabrous, subglobose, 12–17 × 16–25 mm, baccate, with many seeds, dehiscent; the fleshy pericarp rupturing from the apex towards the base, forming irregular shaped valves, in number more or less corresponding with the number of locules. Seeds yellow-brown, ca 0,5 × 0,25 mm.

Distribution: Endemic on the island of São Tomé (see Map 1). The fact that *B. baccata* has been collected mainly along the coast and above 800 m alt. is probably explained by the very intensive cultivation of the intervening area.

Ecological notes: *B. baccata* is frequently observed growing on rocks, both near the ocean shore and inland along watercourses. It even occurs on walls. The preference for moist conditions is obvious. Its altitudinal range is 0–1500 m, which implies that *B. baccata* is lacking in the highest parts of the real mist forest region extending from 1400–2024 m alt. (EXELL, 1944: 16–23). MONOD (1960: 50) indicated that it is growing between 800–1750 m, overlooking the lower part of its altitudinal range. Neither FERREIRA (1965: 533) nor we found evidence of the occurrence of *B. baccata* above an altitude of 1500 m. As appears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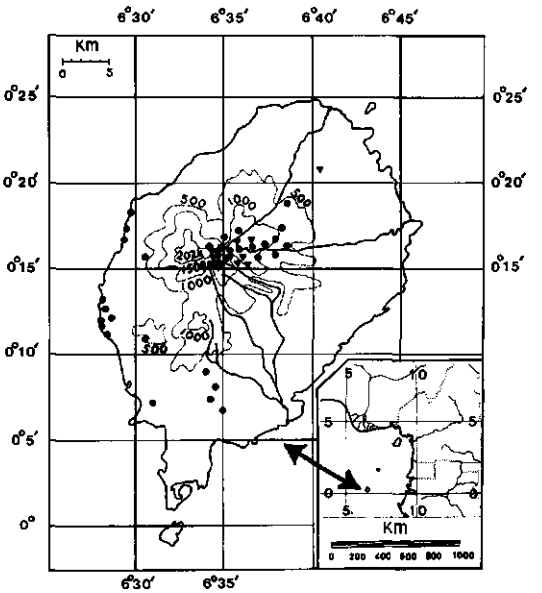


MAP 1. Collecting localities of *B. baccata* Hook.f. (●) and *B. crateris* Exell (▼). Altitude in meters.

from collectors' notes this species is often found at forest-edges and in open places in wooded surroundings, for instance secondary forests and old deserted plantations.

Vernacular name: fia boba d'obo.

Specimens examined: Monte Rosa, *Chevalier 14193* (P); Porto Alegre, *Chevalier 14208* (P); S. Pedro, *Chevalier 13656*-bis (P); Monte Café and Pic de São Tomé, *Chevalier 14545; 14546* (P); between Nova Moka and Lagõa Amelia, *De Wilde, Arends & Groenendijk 105* (WAG); Nova Moka, *Espirito Santo 155* (BM, COI, LISJC); Ribeira Peixe, *Espirito Santo 3881* (COI, LISC); ibid., *Espirito Santo 3898* (LISJC); Juliana de Sousa, *Espirito Santo 3965* (LISJC); sin. loc., *Espirito Santo 4254* (LISC); Binda, *Espirito Santo 4344* (LISC); S. Nicolau, *Espirito Santo 4463* (LISC); Santa Catarina, *Espirito Santo 5005* (LISC); Lagõa

FIG. 1. *Begonia baccata* Hook.f. – 1: branch with leaf (upper side) and terminal bud (× ½); 2: part of inflorescence in ♂ flowering stage ((× ½); 3: 2 schematically (a: terminal flowers (♂) of the dichasium); 4: part of the inflorescence in the ♀ flowering stage (× ½); 5: style, abaxial side (× 5); 6: ovary and pedicel (× 1); 7: peltate hairs, frontal view (× 15); 8: cross section of ovary, ca in the middle (× 3); 9: detail of placenta tissue bearing ovules (× 20); 10: mature fruit with elongated pedicel (× 1); 11: dehisced fruit (× 1); 12: mature seed (× 30); 13: longitudinal section of ♂ flower, schematically (a: dorsal side; ca × 3); 14: stamen with relatively long filament, side view and frontal view (a: dorsal side; × 10); 15: stamen with relatively short filament, side view and frontal view (a: dorsal side; × 10). Material used: 1: *Espirito Santo 4463* and *Groenendijk 115*; 2–3 and 13–15: *Groenendijk 131* (spirit mat.); 4–9: *Groenendijk 132* (spirit mat.); 10: *Groenendijk 71* (spirit mat.); 11–12: *De Wilde, Arends and Groenendijk 105* (spirit mat.).

Amelia, *Espirito Santo 5034, 5149, 5150* (LISC); between Bassalar (not localized) and Quija, *Espirito Santo 5138* (LISC); between Lagõa Amelia and Esperança, *Espirito Santo 5155* (LISC); Vanhulst (Macambrará), *Exell 184* (BM, BR, COI); Traz-os-Montes, *Gama & Penetra s.n.* (COI); ocean shore rocks between Diogo Vaz and Santa Catarina, *Groenendijk 7, 65, 115* (WAG); S. Nicolau, 6 km from Monte Café, *Groenendijk 9* (WAG); Praia Grande, 5 km S.W. of Ribeira Peixe, *Groenendijk 38* (WAG); along a track from St. Adelaide to Zampalma, *Groenendijk 66, 67* (WAG); Lagõa Amelia, *Groenendijk 71* (WAG); between Binda and Juliana da Sousa, *Groenendijk 131, 132* (WAG); sin. loc., *Mann 1087* (K: holotype; B, P: isotypes); sin. loc., *Mildbraed 3473* (B); sin. loc., *Moller 146* (B); Bom Successo, *Moller 219* (COI); Lagõa Amelia, *Monod 11736* (BM, COI); along the Rio Paga Fogo, *Rozeira 2151* (COI); between Ermelinda and Cacumbé, *Rozeira 2843* (COI); near the border of the Mussacavu, *Rozeira 2931* (COI); between the rivers Quija and Chufe Chufe, *Rozeira 2971* (COI); S. Manuel, *Rozeira 2992* (COI); Monte Palissota (not localized), *Rozeira 3136* (COI); Formoso, *Rozeira 3246* (COI); Lagõa Amelia, *Rozeira 3319* (COI); between Binda and Juliana da Sousa, *Rozeira 3346* (COI).
Culta: Department of Horticulture, Agricultural University, Wageningen, The Netherlands, from material sent by *Bredero (s.n.)*, 1977.

Description of B. crateris Exell **Fig. 2; Phot. 1; Map 1**

B. crateris Exell, Cat. Vasc. Pl. S. Tomé: 189, fig. 9. 1944; De Wilde and Arends, loc. cit.: 383. 1980.

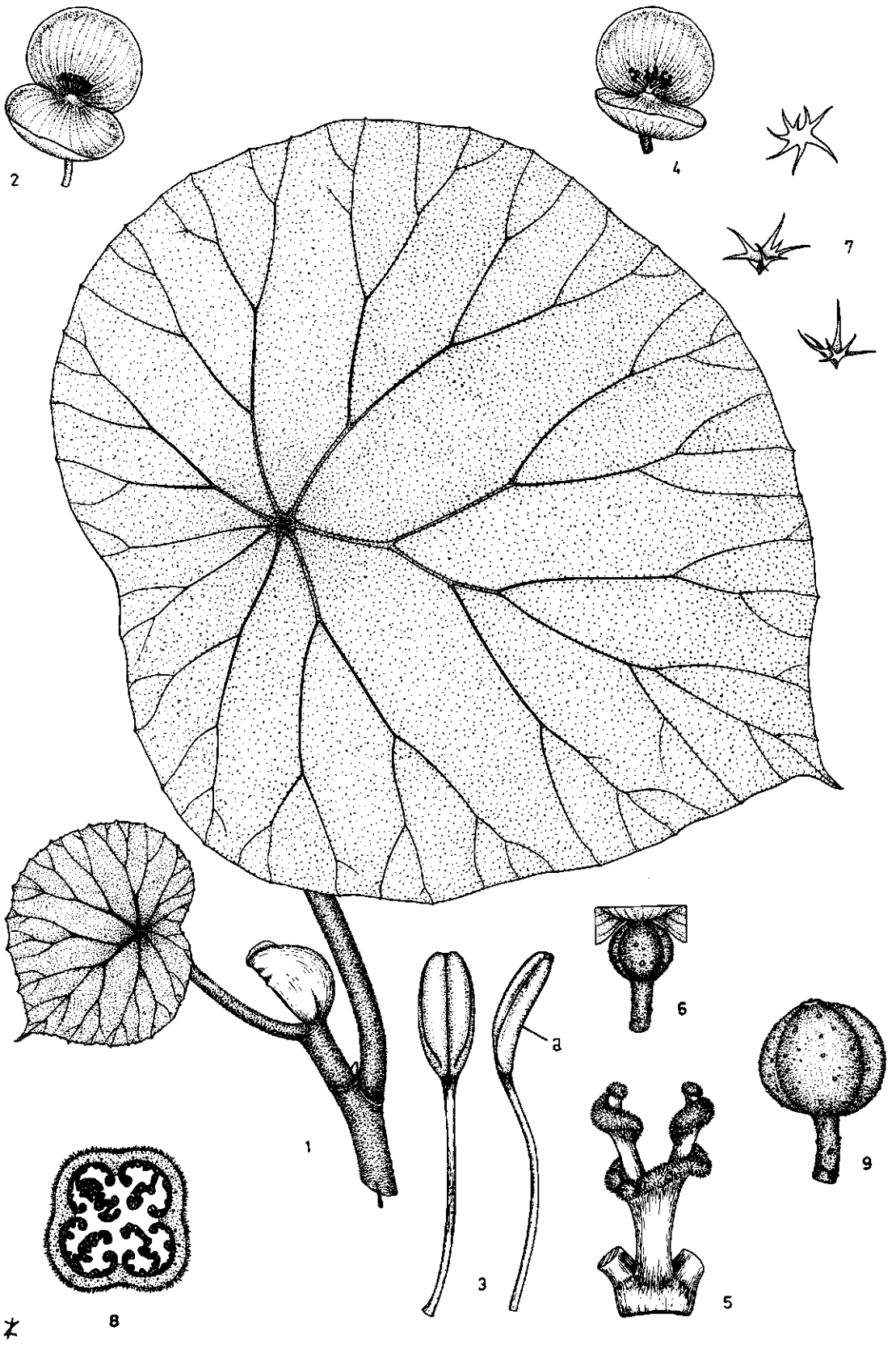
Type: *Exell no. 224* (S. Tomé, Lagõa Amelia, on the crater rim, 1480 m; holotype in BM, isotype in COI).

Description: *B. baccata* and *B. crateris* are very similar in appearance; therefore, in the following description the differential characters are stressed.

Poorly branched shrubby plants, up to 3 m tall, often rupestral. Stems densely ferruginously tomentose as are the petioles, peduncles, axes of the inflorescence, ovaries and fruits. Stipules glabrous. Full-grown leaves usually peltate, more rarely (sub-)cordate; the lower surface especially on the prominent nerves covered with a more or less dense ferruginous indumentum, the upper surface scattered with hairs; in sicco the leaves often greyish-brown and firm (as compared to greenish and more tender in *B. baccata*). Male flowers containing 32–44 (58) stamens; filaments 3–5 mm long, anthers 1,5–2,5(–3,0) mm long; the length of the filaments and anthers shows within the same flower less variability as compared to *B. baccata*. Female flowers: styles 4–6; ovary 4–6-locular. Pedicels (3–)4–9(–10) mm long, scarcely lengthening and in the fruit 5–11 mm long.

Distribution: São Tomé (see Map 1). It is obvious that *B. crateris* is lacking in the lowest regions of the island; it has never been collected on coastal rocks. All specimens were collected between 900 and 1500 m alt. with one exception

PHOT. 1. Huge specimen of *B. crateris* Exell (upper half of the phot.) in its natural habitat, in the foreground Miss LIZA GROENENDIJK; surroundings of Lagõa Amelia, São Tomé (Phot. J. C. ARENDS).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only, viz. *Chevalier 13748* (ca 300 m alt., surroundings of Boa Entrada).

Ecological notes: The absence of *B. crateris* from the coastal region supports the idea that this species has a clear preference for a constant high humidity of the air as is found in the higher mountainous regions. There, similar to *B. baccata*, it favours rocky mossy places near watercourses. The mature fruits expose after dehiscence the yellow placenta-tissue (similar to *B. baccata*), which suggests a zoochorous dispersal.

Specimens examined: Boa Entrada and surroundings, *Chevalier 13748* (P); Calvario, *Espirito Santo 5060, 5064, 5066, 5067, 5069* (LISC); Lagõa Amelia, crater rim, *Exell 224* (BM: holotype; COI: isotype); ibid., *Groenendijk 72* (WAG); along track from Lagõa Amelia to Pico Calvario, *Groenendijk 107* (WAG); Lagõa Amelia, *Monod 11786* (BM); Calvario, *Monod 11819* (BM, COI); sin. loc., *Monod 11820* (BM, COI); Traz-os-Montes, Calvario, *Rozeira 573* (COI); Lagõa Amelia, *Rozeira 3276* (COI).
Culta: Department of Horticulture, Agricultural University, Wageningen, The Netherlands, from material of *Groenendijk s.n.: Van Veldhuizen 673, 817* (WAG) and from *Groenendijk 107: Van Veldhuizen 597* (WAG).

4. SEED STRUCTURE IN BEGONIA SECTION BACCABEGONIA REITSMA

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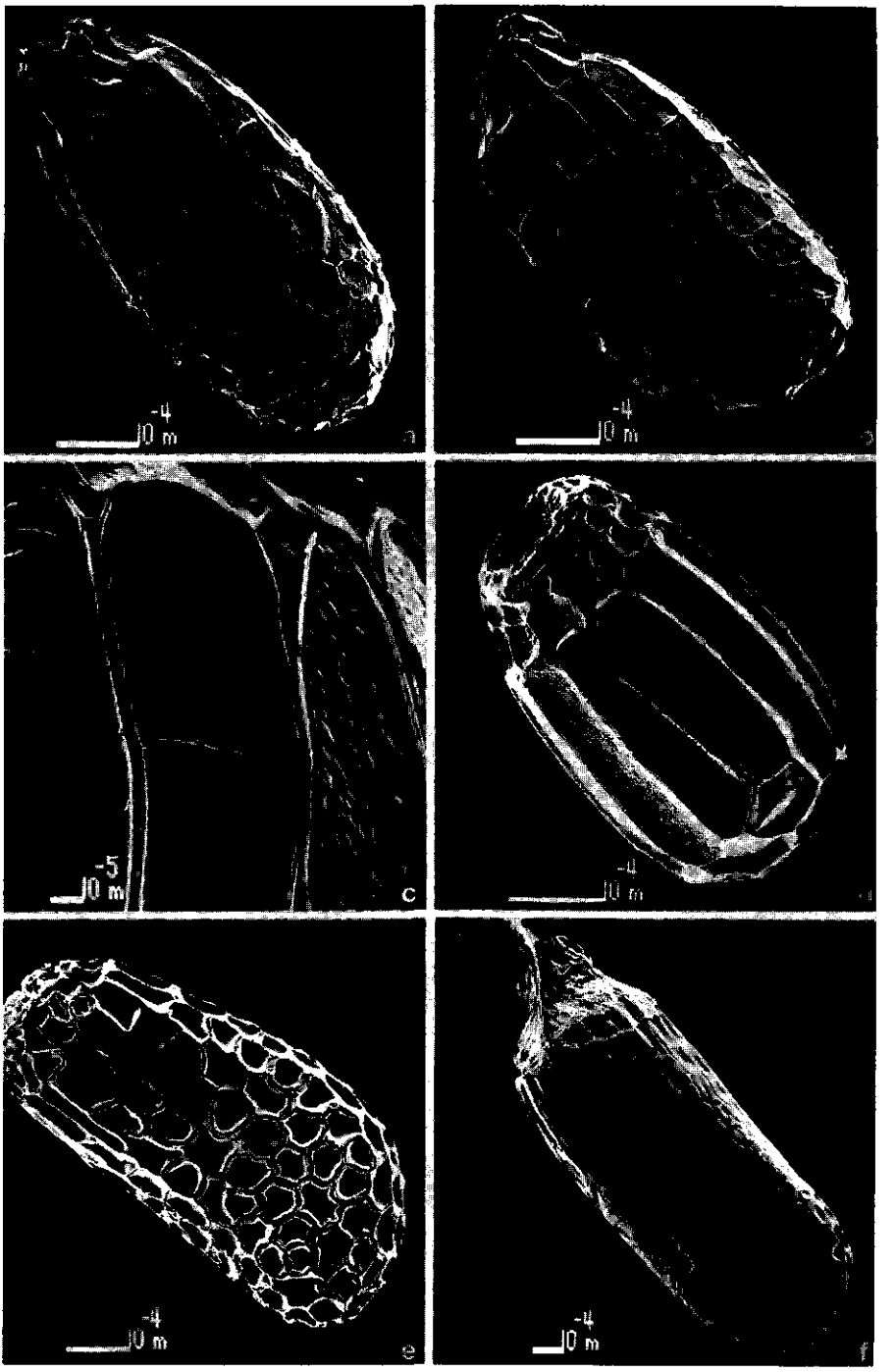
The seeds of *Begoniaceae* are characteristic at the family level by having so-called collar cells furthering germination. On the other hand there is a great diversity in size, shape and micromorphology (Bouman & De Lange, 1983), which provides an additional character set conceivably of importance for establishing intrageneric relationships.

Seed structure of *Begonia baccata* Hook.f. (Fig. 3a)
Seeds ellipsoid, but not always fully symmetrical. Variation in length from 5.5 to 6.3 $\times 10^{-4}$ m, in width from 3.0 to 3.3 $\times 10^{-4}$ m; mean 5.9 $\times$ 3.1 $\times 10^{-4}$ m. Length: width ratio 1.9. Collar cells varying in length from 1.3 to 3.0 $\times 10^{-4}$ m; mean 2.0 $\times 10^{-4}$ m. Collar: seed length ratio 1: 2.9. Seeds of the different samples show marked differences in size, e.g. the seeds of *Groenendijk 115*

Fig. 2. *Begonia crateris* Exell. – 1: non-flowering branch with leaf (upper side) and terminal bud (× ½); 2: ♂ fl. (× ½); 3: stamen, frontal view and side view (a: dorsal side; × 10); 4: ♀ fl. (× ½); 5: style, abaxial side (× 10); 6: ovary (4-locular) and pedicel (× 1); 7: peltate hairs (× 15); 8: cross section of ovary, ca in the middle (× 3); 9: mature fruit (4-locular) with slightly elongated pedicel (× 1).
Material used: 1: *Groenendijk 107* (herb.); 2–9: *Groenendijk 107* (spirit mat.).



FIGS. 3a-f SEM photomicrographs. a: *Begonia baccata* Hook.f., mature seed; b-c: *B. crateris* Exell, mature seed and detaill of collar cells; d: *B. oxyloba* Welwitsch ex Hook.f., mature seed; e: *B. ampla* Hook.f., mature seed; f: *B. fusicarpa* Irmsch., mature seed.

(WAG) measure upon the average 4.8 × 2.8 × 10^{-4} m with a length: width radio of 1.7.

Form of the collar cells rather irregular; anticlinal cell walls between the collar cells but rarely straight, mostly slightly curved. At their chalazal side these cells often dovetail into the adjacent testa cells. Also the borderline with the operculum is relatively irregular.

Arrangement of the testa cells irregular, only those adjacent to the collar cells sometimes in line. The basal form of the testa cells isodiametrical. Anticlinal walls mostly curved, sometimes straighter.

Operculum obtusate, sometimes slanting, built up of many irregular small cells, the lowermost more prominent. Anticlinal walls of the operculum cells more pronounced than those of the testa cells.

Micromorphology: No distinct anticlinal boundaries. Due to the strongly thickened inner periclinal walls, the testa cells have a shallow appearance. The outer periclinal walls are very thin and collapse in mature seeds, thus reflecting the structure of the inner periclinal walls (c.f. Fig. 3c). The surface of the outer cell walls smooth, the cuticle almost without clear micro-ornamentation. Remnants of cuticular striae are present on the anticlinal walls of the operculum cells and occasionally also on those of other cells. In seeds of *Groenendijk 115* (WAG) the surface of operculum and collar cells shows a faint pattern of parallel-running striae.

Seed structure of *Begonia crateris* Exell (Fig. 3b, c).
The seeds of *B. crateris* very closely resemble those of *B. baccata* in shape and size. The mean size of the seeds is 6.1 × 3.2 × 10^{-4} m, with a length: width ratio of 1.9. Also in the micromorphology no distinguishing characters could be observed.

Sectional relationships
The seeds of these two species clearly belong to the *Mezierea-Squamibegonia-Tetraphila* section complex. However, they do not fit well into one of the three described sections (De Lange & Bouman, 1985). The complex is characterized by the presence of fleshy fruits and a presumably zoochorous way of dispersal, concomitant with a reduction or absence of a cuticular ornamentation. Section *Mezierea* seems to be the most original. The seeds are medium-sized (about 0.4 mm) and still show some cuticular structure. The collar cells are relatively large and straight and form a distinct transverse ring (Fig. 3d). Section *Squamibegonia* has relatively large seeds (0.7–0.8 mm), characterized by the absence of any cuticural sculpturing and by a cleavage of the anticlinal walls (Bouman & De Lange, 1982). The collar: seed length ratio varies from about 1: 5 to 1: 7 (Fig. 3e). Section *Tetraphila* forms a larger section comprising a few groups of species that show a striking variation in length from about 0.6 mm to more than 2 mm. All species lack a cuticular structure. On the other hand they are provided with an aril-like funicular outgrowth. In contrast to the two other sections, the fruits of this sec-

tion are dehiscent and expose their seeds. Also the collar: seed length ratio varies considerably from 1: 2 to 1: 6.5 (Fig. 3f).

Although the seeds of *B. baccata* and *B. crateris* show the greatest resemblance with those of *Mezierea*, their characters do not correspond with any of the species so far investigated.

Their seed micromorphology supports the inclusion of these two species into a separate section *Baccabegonia*.

SUMMARY

The present publication deals with a new small section in *Begonia*, section *Baccabegonia* Reitsma. It comprises two closely related species viz. *B. baccata* Hook.f. and *B. crateris* Exell, both endemics from the island of São Tomé in the Gulf of Guinea, Africa. Its position among other African sections is discussed. All taxa are typified and circumscribed, their distribution and ecology are given. The somatic chromosome number of both species is 2n = 36.

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REFERENCES

BARKLEY, F. A., 1972. The species of the *Begoniaceae*. The Buxtonian, **1**, Suppl. 5: 1–120.

BERG see VAN DEN BERG

BOUMAN, F. and A. DE LANGE, 1982. Micromorphology of the seed coats in *Begonia* Sect. *Squamibegonia* Warb. in: Acta Bot. Neerl. **31**(4): 297–305.

BOUMAN, F. and A. DE LANGE, 1983. Structure, micromorphology of *Begonia* seeds. The Begonian, **50**: 70–78, 91.

DE LANGE, A. and F. BOUMAN, 1985. The importance of seed morphology for the classification of African *Begonia* sections in: Acta Bot. Neerl. **34**. (in press).

DE WILDE, J. J. F. E. & J. C. ARENDS, 1980. *Begonia* Sect. *Squamibegonia* Warb. A taxonomic revision. Misc. Papers (Landbouwhogeschool Wageningen) **19**: 377–421.

ENGLER, A., 1921. *Begoniaceae* in: Die Pflanzenwelt Afrikas **3**(2): 612–621 in: Die Vegetation der Erde 9. – Leipzig.

EXELL, M. A., 1944. Catalogue of the vascular plants of São Tomé. – London.

FERREIRA, J. H. PEREIRA DE BARROS, 1965. *Begoniaceas* de S. Tomé e Principe in: Garcia de Orta (Lisboa) **13** (4): 525–544.

HALLÉ, N., 1967. Deux *Begonia* du Gabon analysés sur le vif: *B. triflora* Irmsch. et *B. ferramica* sp. nov. in: Adansonia sér. **2**, 7(4): 507–512.

IRMSCHER, E., 1925. *Begoniaceae* in: ENGLER & PRANTL, Nat. Pflanzenfam. 2nd ed. **21**: 548–588. – Leipzig.

IRMSCHER, E., 1961. Monographische Revision der *Begoniaceen* Afrikas I, in: ENGLER, Bot. Jahrb. **81**(1–2): 108–188.

LANGE see DE LANGE

MONOD, Th., 1960. Notes botaniques sur les îles de São Tomé et de Principe in: Bull. I.F.A.N. sér. A, **22**(1): 19–94.

REITSMA, J. M., 1984. Placentation in *Begonias* from the African continent in: Meded. Landbouwhogeschool, Wageningen 83-9: 21–53.

REITSMA, J. M., 1985. Placentation in African *Begonias* in: Acta Bot. Neerl. **34** (in press).

VAN DEN BERG, R. G., 1985. Polllen Morphology of the genus *Begonia* in Africa (thesis, Agricultural University, Wageningen).

WARBURG, O., 1894. *Begoniaceae* in: ENGLER & PRANTL, Nat. Pflanzenfam. **3**(6a): 121–150.

WILDE see DE WILDE.