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## REVISION OF *CYCLOLOBIUM* (*LEGUMINOSAE-PAPILIONOIDEAE*)

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*Cyclolobium* (*Leguminosae-Papilionoideae-Millettieae*) has traditionally comprised six species, but doubts have been expressed as to their distinctness. Analysis of morphological variation across the range of the genus indicates *Cyclolobium* comprises a single species, *C. brasiliense* Benth.

*Keywords.* Biogeography, *Fabaceae*, louveira, neotropics, seasonally dry tropical forest.

### INTRODUCTION

*Cyclolobium* (*Leguminosae-Papilionoideae-Millettieae*) is a small genus of trees native to South America. The most recent revision (Hoehne, 1941) described six species, but suggested that some of these were poorly defined. Because many new collections have been made since Hoehne's publication, a new revision is timely.

*Cyclolobium* was first described by Bentham (1837) from specimens collected by Pohl in Minas Gerais, Brazil, which were named *C. brasiliense*. Three years later Hooker (1840) described a second species, *C. clausenii*, collected from Minas Gerais by Claussen, which was distinguished by leaflet characters. Specimens of *Cyclolobium* were also collected further north by Blanchet in Bahia, and named as a further species, *C. blanchetianum*, by Tulasne (1844), its most distinctive characteristic being its long stipels. Hassler (Chodat & Hassler, 1904) recorded *C. clausenii* and *C. blanchetianum* from his Paraguayan collections, extending the geographic range of the genus. Sampaio & Hoehne (1941) described *C. vecchii*, from São Paulo, Brazil, in the same year that Hoehne published the only comprehensive review of *Cyclolobium*. The final species to be published was *C. nutans* by Rizzini in 1980, from specimens collected in Goiás, Brazil.

*Cyclolobium* is characterized by unifoliolate leaves, but this feature is shared by some species of *Poecilanthe*, and the two genera are very similar in floral characters. These similarities caused confusion for early workers. Bentham (1860) described *C. hostmannii* from material collected in Surinam, and Ducke (1922) described *C. amazonicum* from the Rio Negro, but both species were later transferred to *Poecilanthe* (Ducke, 1932; Amshoff, 1939). The two genera are distinguished by their fruits – woody, indehiscent or tardily dehiscent pods in *Poecilanthe*, and flattened, indehiscent, winged fruits in *Cyclolobium*.

The tribal affinities of *Cyclolobium* and *Poecilanthe* have long been debated.

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Bentham (1860) placed both genera in *Dalbergieae*, whereas Geesink (1981) placed both in *Millettieae*. Geesink (1984), perhaps over-emphasizing the differences in the fruits of the two genera, later moved *Poecilanthe* to *Robinieae*, thus separating it from *Cyclobium*, which remained in *Millettieae*. More recently, evidence from chemistry (Greinwald *et al.*, 1995), root nodule morphology (Sprent, 2000), chloroplast *matK* and *trnL* sequences (Hu *et al.*, 2000; Pennington *et al.*, 2001), nuclear phytochrome sequences (Lavin *et al.*, 1998) and nuclear ribosomal internal transcribed spacer sequences (Crisp *et al.*, 2000) has suggested that *Poecilanthe* and *Cyclobium* are indeed closely related, and have links with genera of genistoid legumes, particularly of tribe *Brongniartaeae*.

**Cyclobium** Benth., Leg. Gen. 2: 92 (1837). Type: *Cyclobium brasiliense* Benth.

*Trees*. *Stipules* present and caducous. *Leaves* unifoliolate, stipellate. *Racemes* axillary. *Flowers* pedicellate. *Bracts* and *bracteoles* persistent or caducous. *Calyx* 5-lobed, imbricate in bud, teeth unequal. *Corolla* papilionoid with 5 free petals. *Androecium* of 10 stamens, diadelphous; filaments fused up to half or two thirds of length; vexillary stamen free; anthers dorsifixed. *Gynoecium* shorter than androecium; ovary stipitate, with 2–5 ovules. *Fruit* flattened, winged, indehiscent, 1-seeded.

**Cyclobium brasiliense** Benth., Leg. Gen. 2: 92 (1837). **Fig. 1.**

Type: Brazil, Minas Gerais, *J.E. Pohl* 3505 (holo. K!; iso. F!, NY!).

Syn.: *Cyclobium claussenii* Benth., J. Bot. (Hooker) 2: 64 (1840). Type: Brazil, Minas Gerais, *P. Claussen* & *B. Delessert* s.n. (lecto. K!, designated here; isolecto. F!, NY!).

*Cyclobium blanchetianum* Tul., Arch. Mus. Paris 4: 84–85 (1844). Type: Brazil, Bahia, *Blanchet* 2319 (holo. K!; iso. F!, F!).

*Cyclobium louveira* Chanc., Fl. Florestal du Globe: 624 (1920) nom. inval.

*Cyclobium vecchii* A. Samp., Arq. Bot. Est. S. Paulo I: 63, tab. 85 (1941).

Type: Brazil, São Paulo, *O. Vecchi* 29 (holo. SP).

*Cyclobium nutans* Rizzini & Heringer, Rodriguesia 52: 26, figs 5–6 (1980).

Type: Brazil, Goiás, *E.P. Heringer* 15944 (holo. RB!).

*Tree* to 20m; d.b.h. 12–60cm; bole sometimes twisted, sometimes branching into many trunks almost from the base. *Bark* thick and corky, fissured, knobbly or scaling in an irregular pattern. *Twigs* pale grey to dark grey, lenticellate, ridged or rugose and slightly fissured; youngest twigs green, glabrous or with short, erect, rufous hairs or long, pale hairs; pubescent twigs may become glabrous at maturity. *Stipules* linear, 0.8–7 × 0.7–2.5mm, pubescent, often densely so. *Leaves* 2.8–15.5cm long; *petiole* 3–25mm long, pubescent or rarely glabrous; *petiolules* (between insertion of stipels and the lamina) 1–3mm long, pubescent, often densely so, with short, erect or long, spreading rufous hairs, rarely glabrous; *stipels* 0.2–3mm long, shorter, equalling or longer than the petiolule, setose, densely pubescent or rarely glabrous; *laminae* 3–12.8 × 1.6–8cm, thinly to stiffly chartaceous, ovate, often broadly so, elliptic to

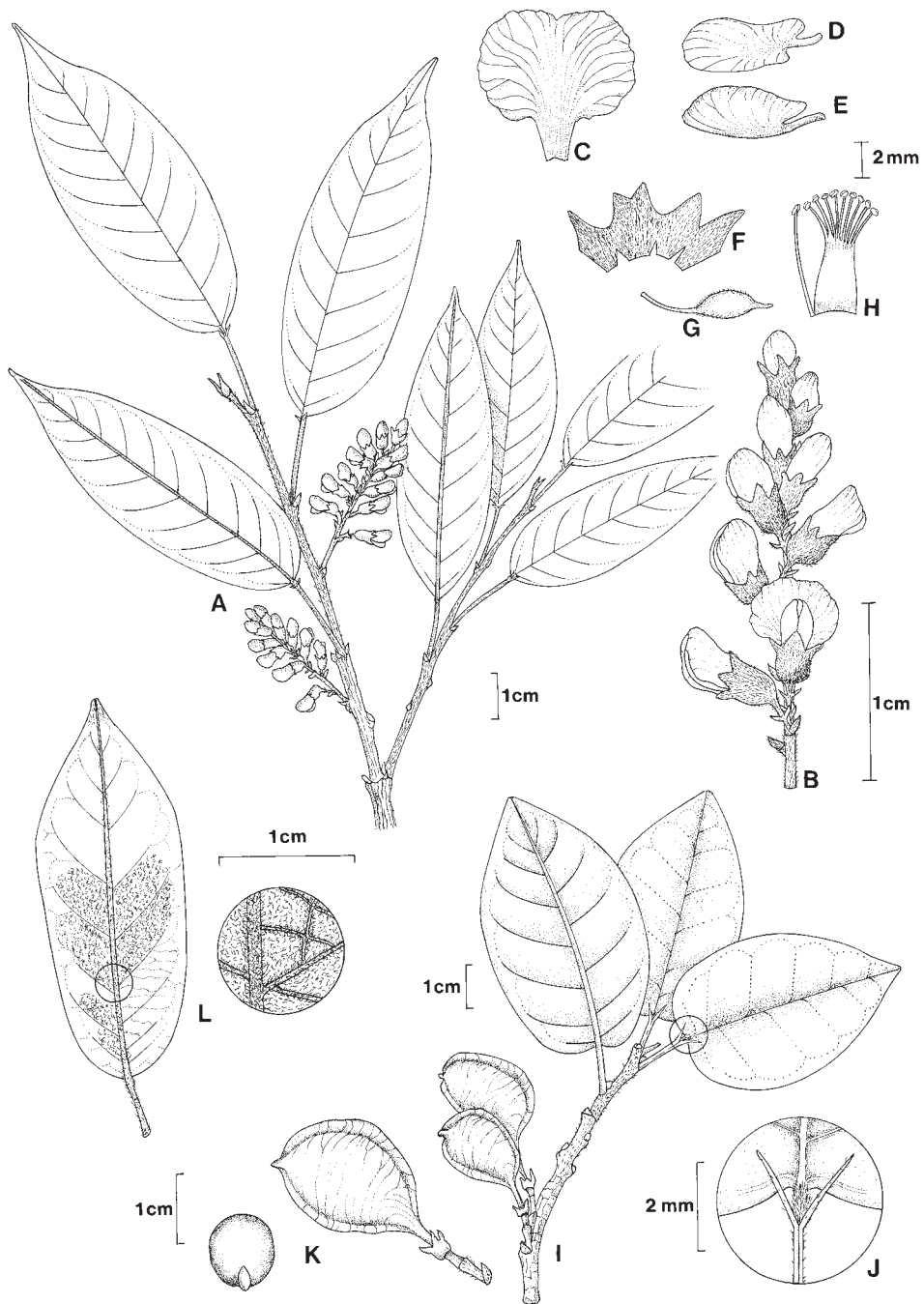


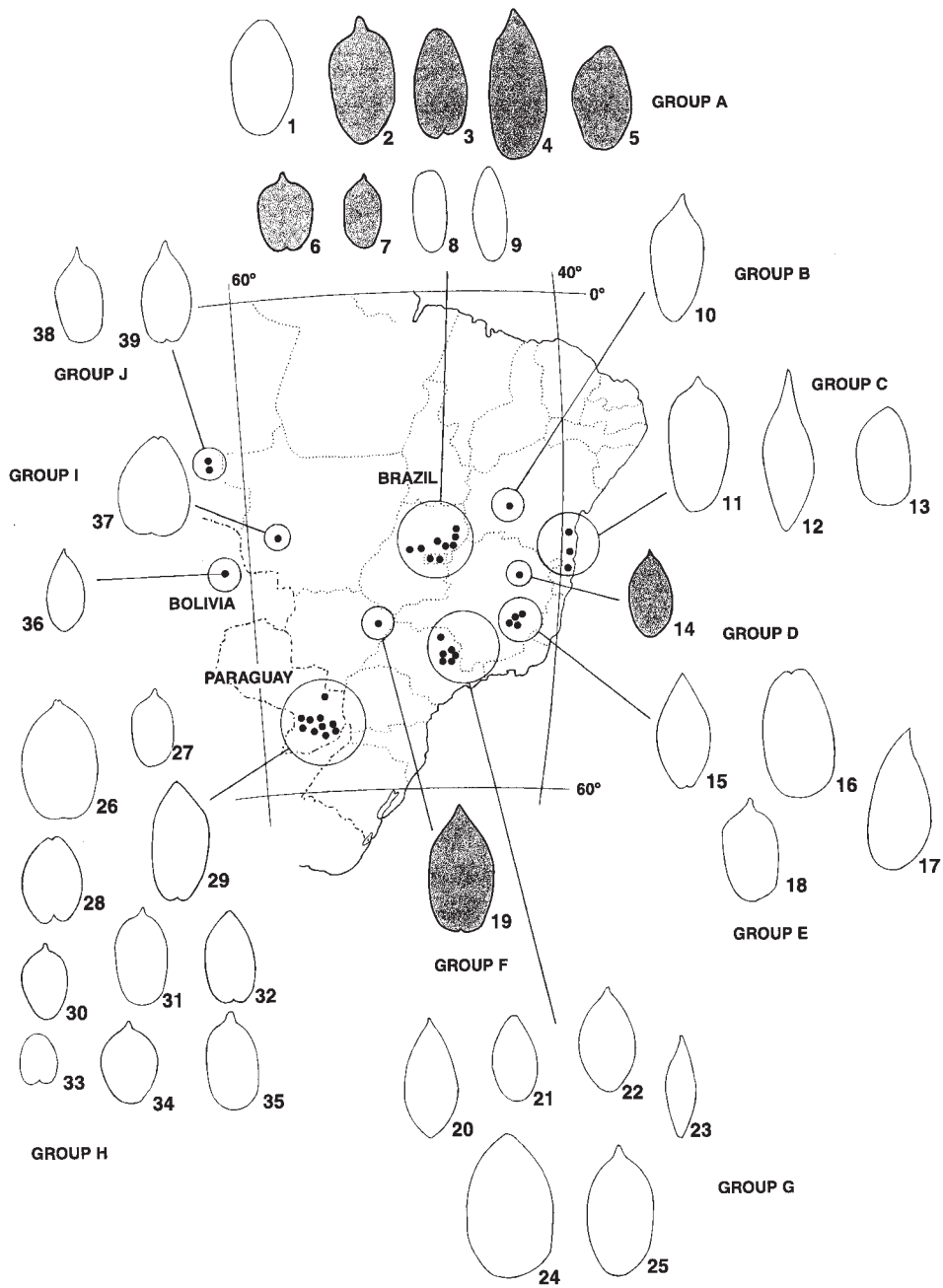
FIG. 1. *Cyclobium brasiliense*. A, habit (drawn from *O. Handro* 2300); B, inflorescence; C, standard; D, wing; E, keel; F, calyx; G, gynoecium; H, stamens; I, fruiting twig (drawn from *B. Balansa* 4425); J, detail of stipels; K, fruit and seed; L, leaflet undersurface with enlargement (drawn from *B.A.S. Pereira* 2029). Drawn by Maureen Chisam Warwick.

elliptic-ovate, ovate-orbicular, oblong or obovate; *apex* acute to obtuse, with an acumen 2–15mm long, often ending in a small protruding mucro, rarely retuse; *base* acute, obtuse, cordate to subcordate or rounded; *upper surface* glabrous or with sparse rufous hairs on veins or with dense to moderately dense rufous hairs, particularly on veins; *undersurface* glabrous, or with sparse appressed or tangled rufous hairs on veins, or densely covered with tangled rufous hairs all over the lamina; some hairs may be caducous; leaf margins glabrous or pubescent, hairs persistent or caducous. All veins plane above, raised below; *secondary veins* 5–10 pairs, camptodromous, ascending at an acute or obtuse angle to the midvein and joining the next secondary vein; *tertiary veins* often only faintly visible. *Inflorescence* 1–8.5cm long, racemose, axillary, densely rufous-pubescent; *pedicels* 1.5–4.5mm long, densely pubescent; *bracts* 0.8–2.5 × 0.5–1mm, ovate to broadly ovate, densely pubescent, caducous; *bracteoles* 0.8–1.5 × 0.2–1mm, ovate, often narrowly so, densely pubescent, caducous. *Flowers* 5–13mm long, variously described as maroon, wine-coloured with purple tips, dark red, or chocolate-coloured, strongly perfumed; *calyx* 3.5–6mm long, lobes triangular, dorsal lobes 1–1.5mm long, lateral lobes 1.5–2.7mm long, ventral lobe 1.8–2.5mm long, densely pubescent with appressed rufous hairs; *standard* 6.4–9 × 5.5–8mm, claw 1–4mm long; *wings* 5.2–9 × 2–3mm, claw 1–2.8mm long; *keels* free, 5–8.5 × 1.8–3mm wide, claw 1.2–2.5mm long; *stamens* 10, diadelphous, 5–9mm long, filaments fused up to half or two thirds of length; *style* 2–4mm long; *ovary* 1.8–4.5 × 0.6–1.5mm, densely to very sparsely pubescent; *ovules* 2–5. *Fruit* 1-seeded, transversely ovate, glabrous, smooth or with a raised vein-like pattern, 2.5–4.6 × 1.6–2.5cm; *seed* 12–14 × 6–14mm, olive green, smooth.

*Distribution* (Fig. 2). Brazil: from Rondônia and Goiás, east to Bahia and south to São Paulo, Mato Grosso do Sul and Paraná. Paraguay: Cordillera de Altos and Ybycuí National Park. Bolivia: Santa Cruz.

FIG. 2. Distribution of *Cyclolobium brasiliense* and variation of leaflet morphology. In some cases dots do not indicate exact localities because these could not be determined for older collections. Shaded leaflets have an undersurface of dense, tangled hairs; leaflets without shading have a glabrous undersurface or appressed hairs mainly on the veins. Drawn by Maureen Chisam Warwick.

GROUP A: 1, J.A. Ratter et al. R7230V; 2, E.P. Heringer 15944; 3, W.J. Burchell 7962; 4, J.A. Ratter et al. R7431; 5, A. Glaziou 20884; 6, J.A. Ratter et al. R7365V; 7, B.A.S. Pereira & D. Alvarenga 2562; 8, W.J. Burchell 6810; 9, J.A. Ratter et al. R7432. GROUP B: 10, H.M. Curran 85. GROUP C: 11, P.R. Belém & R.S. Pinheiro 2726; 12, L.A. Mattos Silva et al. 2612; 13, Blanchet 2319. GROUP D: 14, J.E. Pohl 3505. GROUP E: 15, P. Claussen 963; 16, P. Claussen 250; 17, P. Claussen & B. Delessert; 18, L. Riedel 2924. GROUP F: 19, J.A. Ratter et al. R7599V. GROUP G: 20, O. Handro 879; 21, M. Kuhlmann 3459; 22, R. Alvarenga 3358; 23, M. Kuhlmann 3934; 24, B. Costa 7564; 25, O. Handro 835. GROUP H: 26, G.S. Hartshorn 2503; 27, B. Balansa 4425; 28, L. Bernardi 18759; 29, T. Rojas 12779; 30, O. Handro 3348; 31, E. Hassler 6100a?; 32, E. Hassler 10609; 33, K. Fiebrig 555; 34, K. Fiebrig 349; 35, P.R. Belém 2726. GROUP I: 36, R. Guillen 2820; 37, G. Hatschbach 62527. GROUP J: 38, J.M. Pires & R.T. Martin 9966; 39, C.A. Cid Ferreira 8987.



*Altitude.* 100–950m.

*Flowering.* May to November (Brazil), August to October (Paraguay).

*Habitat and ecology.* Although scattered over a large area, *C. brasiliense* grows primarily in seasonally dry tropical forest (*sensu* Pennington *et al.*, 2000). For example, the records from the Brazilian cerrado are from such forests growing on richer soils near streams or small rivers. Elsewhere, such as in Bahia (Brazil), some of the records are from more mesic habitats. The somewhat disjunct distribution of *C. brasiliense* may have been caused by vicariance of seasonally dry tropical forest that was more widespread during cool-dry phases of the Pleistocene (Prado & Gibbs, 1993; Pennington *et al.*, 2000).

*Vernacular names.* Brazil: louveira, cabruitinga (São Paulo, where these names were used to name two cities), mucitaíba (Bahia). Paraguay: ysypó copi.

*Uses.* *Cyclolobium brasiliense* is planted as an ornamental street tree because of its showy, fragrant flowers.

*Nomenclature.* Hooker's (1840) description of *C. clausenii* refers only to unspecified material collected by Claussen and Delessert. We have designated an unnumbered Claussen and Delessert collection which was received by Kew in 1839 (the year before the description was published) as the lectotype.

*Cyclolobium louveira* Chanc. is not validly published because no diagnosis or description is given (ICBN Art. 32.1c; Greuter *et al.*, 2000).

*Discussion.* Reducing *Cyclolobium* to a single species may appear to be extreme but it is justified on careful analysis of variation. This view is strengthened when previous publications casting doubt on the distinctness of some species are taken into account. Martius (1862) considered that *C. clausenii* might be a variety of *C. brasiliense*, because corollas and fruits are so similar. Hoehne (1941) thought it possible that all the six species in his account might be the same, and Rizzini (1980) acknowledged that *Cyclolobium* was a homogeneous genus of ill-defined species. More recently, Lewis (1987) considered that *C. blanchetianum* and *C. clausenii* were possibly conspecific.

Moreover, virtually all previous accounts (Hooker, 1840; Tulasne, 1844; Bentham, 1860; Martius, 1862; Hoehne, 1941) contain inaccuracies of measurement and description that render them somewhat unreliable. For example, Hooker (1840) distinguished *C. brasiliense* and *C. clausenii* by a discontinuity in leaflet length. This was given as 2.7–4cm for *C. brasiliense*, and as 8–16.2cm for *C. clausenii*. Our own measurements of the same specimens overlap, being 2.7–7.3cm for *C. brasiliense* and 4.5–13cm for *C. clausenii*. The review by Hoehne (1941) is also problematic, particularly in the key. For example, it omits the leaflet undersurface indumentum character that all previous authors had used to distinguish *C. brasiliense* from other species.

Examination of variation confirms the suspicion that the previously described species are not distinct. Initial work on *Cyclolobium* (Coleman, 1997) suggested that

there was a series of closely related, geographically separated groups, designated Groups A to J in Fig. 2. The specimens in these groups were examined in detail for correlating morphological differences. The character that seemed to show the most distinctive states was the indumentum of the undersurface of the leaflet. The specimens collected in Goiás (Group A, Fig. 2), which correspond with *Cyclolobium nutans* Rizzini, have a dense indumentum of tangled, rufous hairs (Fig. 3A, B). These are identical to those on the type of *C. brasiliense* Benth. (Group D, Fig. 2) from Minas Gerais. By contrast, the other groups are either glabrous on the leaflet undersurface or with a few appressed hairs, often only on the veins (Fig. 3C, D). However, even in the geographic area of Group A there are two collections with glabrous undersurfaces or with only a few appressed hairs primarily on the veins (*Burchell* 6810; *Ratter et al.* 7230V). Only one other specimen outside Groups A and D has an indumentum of dense, tangled hairs (*Ratter et al.* 7599V; Group F,

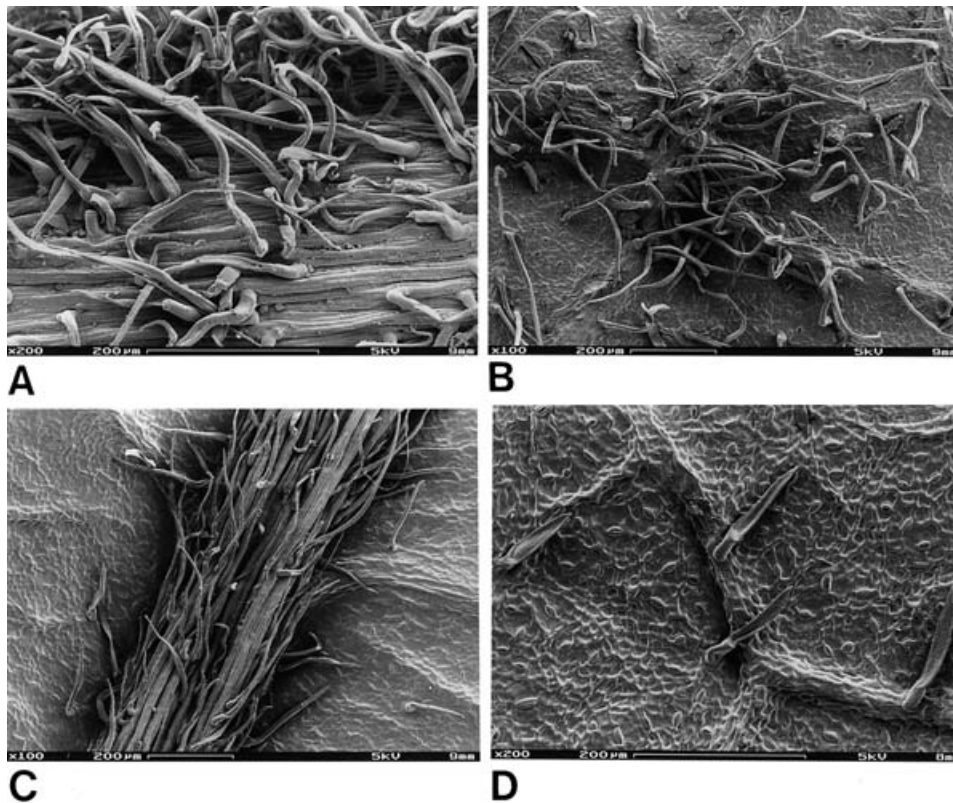


FIG. 3. Scanning electron micrographs of leaflet undersurfaces of *Cyclolobium brasiliense*. A, Group A: *J.A. Ratter et al.* R7432: dense, tangled hairs on midvein. B, Group A: *B.A.S. Pereira* 2029: dense, tangled hairs on lamina. C, Group A: *J.A. Ratter et al.* R7431: appressed hairs on midvein. D, Group H: *K. Fiebrig* 349: sparse, appressed hairs on veins. Photographed by Maureen Chisam Warwick.

Fig. 2). Two further Ratter collections from Goiás produce an intriguing puzzle: the trees were growing c.60m apart and had completely different bark. They also appeared to differ in their leaflet indumentum, which was confirmed by scanning electron microscopy. Specimen R7432 has dense, tangled indumentum (Fig. 3A) whereas R7431 has sparse, appressed hairs on its undersurface (Fig. 3C). However, because bark data are lacking for other *Cyclolobium* collections, the significance of bark morphology in *Cyclolobium* taxonomy remains unclear.

The type specimen of *C. blanchetianum* Tul., from the Atlantic coastal strip in Bahia, Brazil, has stipels longer than the petiolule. This feature also appeared to characterize most of the Paraguayan specimens (Fig. 1J; Group H, Fig. 2), which had been previously identified as the same species. Of 14 collections from Paraguay, eight have stipels which exceed the length of the petiolule, and a further five have stipels of differing sizes mostly longer than the petiolule. Only one collection has all stipels shorter than the petiolule. The other two collections from the Bahian area (*Belém & Pinheiro* 2726 and *Mattos Silva et al.* 2612) have all their stipels shorter than the petiolule. This illustrates a continuous range of stipel/petiolule ratio that is unsuitable as a character for species delimitation.

Tulasne described the secondary veins of *C. blanchetianum* as 'forming a very open angle with the midvein'. This initially seemed to be a significant difference between the Paraguayan specimens (Fig. 1I; Group H, Fig. 2) and Groups G and E (Fig. 1A, Fig. 2), because the secondary veins of the two latter groups appear to be at a more acute angle to the midvein. The angles of the secondary veins of all the mature and undamaged leaves of all *Cyclolobium* specimens were measured. This showed the variation to be continuous and not apparently useful.

Other characters of leaflet shape, leaflet apex and base shape, previously used to delimit species in *Cyclolobium*, vary continuously (Fig. 2). No characters, either individually or in combination, provide a basis for distinguishing taxa. Therefore, we consider *Cyclolobium* to comprise the single species *C. brasiliense*. Groups A and D (Fig. 2) might merit varietal status. However, even here, the sympatric occurrence of deviant specimens means that we have chosen not to recognize varieties.

*Selected specimens examined.* BOLIVIA. **Santa Cruz.** Ñuflo de Chavez, Concepción, El Carmen, en un bosque deciduo chiquitano sobre las laderas con afloramientos graníticos, 680m, 11 xii 1994, 16°27'S, 61°59'W, *R. Guillén* 2820 (E).

BRAZIL. **Bahia.** Guaratinga, plantação de cacau, 8 x 1966, *P.R. Belém & R.S. Pinheiro* 2726 (IPA, NY); Ilhéus, 1867, *Blanchet* 2319 (A, F, K); Forests of Rio Gronogy Basin, 100–500m, 1 x–30 xi 1915, *H.M. Curran* 85 (US); Município de Canavieiras, Est. que liga la maiveris Pimenteiros/Ouricana/Sta. Maria Eterna, ramal com entrada 1km apos Pimenteiros, lado esquerdo, 120m, 26 viii 1988, *L.A. Mattos Silva et al.* 2612 (K). **Distrito Federal.** Rio Corumbá, river bank, 15 i 1968, *E.P. Heringer* 11622 (UB); **Brasília.** Estação Experimental Biologica, 50km de Luziânia, margem do Rio Corumbá, 9 viii 1976, *E.P. Heringer* 15944 (RB); Apa de Cafuringa, mata ciliar do córrego Barreiroi, lado oeste da APA, 950m, 15°35'S, 48°10'W, 21 ix 1993, *B.A.S. Pereira & D. Alvarenga* 2562 (NY). **Goiás.** 1896, *A. Glaziou* 20884 (K); Luziânia, margem do Rio Corumbá, 20 ix 1969, *E.P. Heringer* 11960 (UB, US); Município de São João d'Aliança, Fazenda Farias, Córrego Farias, in a ravine, 8 ix 1984, *R.C. Mendonça*



& *J. Dalmácio* 352 (K); nr. Rio Parida on road to Nova Roma, 31.5km from Alto Paraíso, mesophytic forest, 14°07'S, 47°13'W, 26 v 1994, *J.A. Ratter et al.* R7230V (E); Rio Parida, 31.5km from Alto Paraíso de Goiás on road to Nova Roma, mesophytic gallery forest on steep bank of Rio Parida, 14°07'S, 47°13'W, 12 xi 1994, *J.A. Ratter et al.* R7431 (E, UB); Rio Parida, 31.5km from Alto Paraíso de Goiás on road to Nova Roma, in mesophytic forest of richer soils about 60m from river, 14°07'S, 47°13'W, 12 xi 1994, *J.A. Ratter et al.* R7432 (E, UB); Fazenda Brejão, 27km from Alto Paraíso de Goiás on road to Nova Roma, mesotrophic facies cerrado, 14°07'S, 47°16'W, 16 vi 1994, *J.A. Ratter et al.* R7365V (E, UB). **Mato Grosso.** Rio Cabaçal, Res. do Cabaçal, river margin, 9 v 1995, *G. Hatschbach* 62527 (K). **Mato Grosso do Sul.** c.30km S of Inocência on the dirt road to Tres Lagoas, in partially cleared cerrado, c.20°00'S, 51°52'W, 2 xi 1996, *J.A. Ratter et al.* R7599V (E, UB). **Minas Gerais.** iii 1839, *P. Claussen* 250 (F); *P. Claussen* 963 (F, GH, MO, NY); 1840, *P. Claussen* (K); Caxoeiras do Campos, Brasília, 1839, *P. Claussen & B. Delessert* (A, F, K, NY); Fazenda do Lopez perto de Minas Novas, x–xi 1820, *J.E. Pohl* 3505 (A, F, K, NY); Santa Luzia, Langsdorf Expedition to Brasil, 1824–29, *L. Riedel* 2924 (NY, US). **Paraná.** Foz do Iguaçu, Parque Nacional do Iguaçu, Cataratas, mata pluvial das margens do Rio Iguaçu, 14 vi 1989, *A.C. Cervi & G. Hatschbach* 2746 (K, MO, US). **Rondônia.** Mun. Alvorada do Oeste, Linha 64, a 7km da BR-429 em direção a Costa Marques, cerrado, solo argilo pedregoso, 11°25'S, 62°30'W, 1 v 1987, *C.A. Cid Ferreira* 8987 (F, GH, K, MO, NY); Rio Jamari – Cachoeira de Sta. Cruz, mata da terra firme, margem do rio, 28 vi 1965, *J.M. Pires & R.T. Martin* 9966 (NY). **São Paulo.** Mogí-Mirim, on the margin of River Mogí-Mirim, 17 i 1949, *R. Alvarenga* 3358 (MO); Moji-Guassú, Fazenda Campininha, 15 i 1960, *B. Costa* 7564 (F); Reserva Florestal, margem do Rio Moji-Guassú, perto de Pádua Sales, 20 xi 1958, *O. Handro* 835 (K, NY); Res. Florestal, perto de Pádua Sales, margem do Rio Moji-Guassú, 22 ix 1959, *O. Handro* 879 (K, NY); Reserva Florestal, Moji-Guaçu, margem do Rio Moji-Guaçu, 19 vii 1955, *M. Kuhlmann* 3459 (NY, US); Reserva Florestal, Moji-Guassú, 20 ix 1956, *M. Kuhlmann* 3934 (K, NY, US); São Paulo, Jardim Botânico e Parque do Estado, 9 x 1969, *B. Skvortsov* (F, NY). **Uncertain location and cultivated.** *W.J. Burchell* 6810 (GH, K); Cavalian de Americas, v 1865, *W.J. Burchell* 7962 (GH, K); environs de Rio Janeiro et D'Ouro Preto, Casa branca, dans le bois, 1883–84, *A. Glaziou* 14615 (F, K, NY); cultivada no Jardim Botânico de São Paulo, 1 x 1981, *O. Handro* 2300 (K, NY, UB); cultivated in Botanic Gardens of Rio de Janeiro, 13 i 1994, *B.B. Klitgaard & H.C. de Lima* 86 (K); cultivated in Botanic Gardens of Rio de Janeiro, 20 ix 1990, *G.P. Lewis* (K); Brasília, campus da UNB, plantada próximo à Faculdade de Medicina da UNB, 6 xi 1991, *B.A.S. Pereira* 2029 (K); Brasília, campus da UNB, plantada, margem direita da via que vai da Av. L-2 Sul à Medicina Tropical, 14 vi 1992, *B.A.S. Pereira & D. Alvarenga* 2104 (K).

**PARAGUAY. Esperanza.** Sierra de Amambay, in altiplanitie et declivibus, ix 1907–08, *E. Hassler* 10609 (A, F, K, MO, NY, US); in regione collium, Cerros de Tobaty, ix 1900, *E. Hassler* 6100 (A, F, K, MO, NY); *ibid.*, *E. Hassler* 6100A? (NY). **Paraguari.** Sat frequens ad oram nemoris in Reserva Florestal Ybicuí, 15 x 1978, *L. Bernardi* 18027 (NY); Isla Alta, Tebicuary Mí, Paraguari, 17 xi 1978, *L. Bernardi* 18759 (MO, NY); Praedium militare circa Bella Vista, Amambay, 16 iv 1980, *L. Bernardi* 20617 (K, MO, NY); near Parque Nacional Ybycuí, cerrado type vegetation on sandstone rocks, 250–300m, 26°0'S, 56°50'W, 1 x 1985, *A. Gentry et al.* 51940 (MO); Ybycuí National Park, along northern road, warm temperate moist forest, c.26°0'S, 56°50'W, 19–28 iii 1980, *G.S. Hartshorn* 2503 (MO, NY); Parque Nacional Ybycuí, límite N del parque, Camino a Ao. Corrientes, campo abierto con islas pequeñas, 6 x 1984, *L. Perez* 402 (MO); Cordillera de Altos, viii 1902, *K. Fiebrig* 349 (A, E, F, K); Cordillera de Altos, 3 xii 1902, *K. Fiebrig* 555 (E); Cordillera de Altos, in alto planitie, 1898–1900, *E. Hassler* 3348 (A, F, K, NY); Cordillère de Valenzuela, sur les collines herbeuses, 8 i 1884, *B. Balansa* 4425 (A, K, NY, US); Valenzuela, pendiente arenosa de Serrania, 26 v 1945, *T. Rojas* 12779 (F, MO).

## EXCLUDED SPECIES

*Cyclolobium amazonicum* Ducke, Arch. Jard. Bot. Rio de Janeiro 3: 146 (1922) (= *Poecilanthe amazonica* (Ducke) Ducke).

*Cyclolobium hostmannii* Benth., J. Proc. Linn. Soc., Bot. 4: 52 (1860) (= *Poecilanthe hostmannii* (Benth.) Amshoff).

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