RESEGREGATION OF *BARBIERIA* FROM *CLITORIA* (LEGUMINOSAE: PHASEOLEAE: CLITORIINAE)

PAUL R. FANTZ

Department of Horticultural Science, Box 7609
North Carolina State University
Raleigh, NC 27695-7609, U.S.A.

ABSTRACT

Barbieria is a monotypic genus that was transferred to subtribe Clitoriinae and included within the genus *Clitoria* in 1981 by Lackey. The morphology of *Barbieria* is compared with *Clitoria* and contrasted with genera *Centrosema*, *Periandra* and *Clitoriopsis*. *Barbieria* is found to be an abberrant member of *Clitoria* with characters supporting its recognition as a separate genus in the Clitoriinae. A key to genera of subtribe Clitoriinae and a taxonomic treatment of *Barbieria* is presented.

RESUMEN

Barbieria es un género monotípico que fue transferido a la subtribu Clitoriinae e incluido dentro del género *Clitoria* por Lackey en 1981. La morfología de *Barbieria* se compara con *Clitoria* y se contrasta con los géneros *Centrosema*, *Periandra* y *Clitoriopsis*. *Barbieria* ha resultado ser un miembro aberrante de *Clitoria* con caracteres que corroboran su reconocimiento como un género separado en Clitoriinae. Se presenta una clave de los géneros de la subtribu Clitoriinae y el tratamiento taxonómico del género *Barbieria*.

Barbieria DC. is a monotypic genus of questionable taxonomic affinities, having been placed historically into several tribes including its own. Lackey (1981) assigned *Barbieria* to subtribe Clitoriinae Benth. (Leguminosae Juss., Phaseoleae DC.), and concluded that it was a member of the genus *Clitoria* L. Mabberley (1987) and Smith and Lewis (1991) recently reconfirmed *Barbieria* as a synonym of *Clitoria*. My preparation of manuscripts for the genera *Clitoria* and *Centrosema* (DC) Benth. for Douglas Stevens' *Flora de Nicaragua* Project, Julian Steyermark's *Flora of Venezuelan Guayana* Project, and the *Flora Mesoamerica* Project required examination of specimens of *Barbieria* throughout its range.

I strongly disagree with Lackey's assignment of *Barbieria* to *Clitoria*. *Barbieria* has a number of characters that make it an abberant member when placed within *Clitoria*. Proponents of Lackey regarded the morphological differences as minor, due to the adaptation of *Barbieria* from bee to bird pollination. The objective of this paper is to compare the morphological characters of *Barbieria* with *Clitoria*, as well as contrast differences with other genera to support its recognition as a distinct genus within the Clitoriinae.

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SUBTRIBE CLITORIINAE

Lackey (1981) recognized four genera in Phaseoleae subtribe Clitoriinae: *Centrosema* (DC.) Benth., *Periandra* Benth., *Clitoria* L. and *Clitoriopsis* Wilczek. He characterized the subtribe by the resupinate flowers, naked calyx interior, and prescence of bracteoles and hooked [micro-uncinate] trichomes. Leaves were reported to be 3- or 1-foliolate, to 5–9-foliolate in a few members of *Clitoria* and *Centrosema*.

These four genera also are similar in other respects. They are woody genera with members being trees, shrubs to shrublets, lianas, or suffrutescent herbs (= subshrubs of some authors). The more advanced species have an underground xylopodium from which arises one or more aerial stems annually during the rainy season. These stems produce leaves, flowers and fruits, then die back to near ground level during the dry season. Collectors frequently only voucher the aerial stems, leading some early and modern authors to treat these plants (and genera) as herbaceous or even as annuals.

Leaves are pinnately compound with 3-foliolate leaves being prevalent, 3–7-foliolate leaves being infrequent (5 species) and 7–11-foliolate leaves being rare, occurring only in *Clitoria lasciva* Boj. ex Benth. Stipules and stipels are persistent and striate. Inflorescences are pseudoracemose, often axillary, multiflowered, bearing flowers on paired pedicels, or reduced to 1–2 apical flowers. Bracts are persistent and striate. Bracteoles persist and commonly are appressed to the calyx. Flowers are resupinate and large in size, with smaller flowers being 2.5–4 cm long. The calyx has five teeth with the upper two (dorsal) subconnate and the vexillary tooth commonly longer. Petals are clawed with the vexillum large, showy, obovate to suborbicular, prominately veined and complicate. The vexillary stamen is free to more or less connate basally; the staminal sheath is incurved; anthers are yellow. The ovary is densely pubescent, subsessile, with a 1–2 mm gynophore or prominately stipitate; the style is incurved. Fruits are linear, straight to falcate, short-stipitate (subsessile) to prominately stipitate, beaked, with dehiscence by spiral twisting of the valves. Pubescence consists of macrotrichomes easily viewed at 10X and micro-uncinate trichomes hidden beneath and more easily viewed at 30X.

The four recognized genera can be segregated on several morphological features of the flowers and fruit (Table 1). The calyx is campanulate (*Centrosema*, *Periandra*) or infundibular (*Clitoria*, *Clitoriopsis*). The lengths of the vexillum, wing and keel petals vary, but the keel petal is shortest in all genera. Anthers are uniform or rarely dimorphic (*Clitoriopsis*). Curvature of the style varies, as does the degree of dilation near the stigma and its pubescence. Fruits are ecostate or costate, flat or turgid, and if turgid, vary in degrees of depression between seeds.

TABLE 1. Comparison of genera in subtribe *Clitoriinae*.

Character	Centrosema	Periandra	Clitoria	Clitoriopsis
CALYX	Campanulate	Campanulate	Infundibular	Narrow infundibular
PETALS				
Vexillary spur	Present	Absent	Absent	Absent
Auricled wing	Present	Present	Present	Present
Wing vs vexillum	Much shorter	Much shorter	Much shorter	Slightly shorter
Keel vs vexillum	Much shorter	Much shorter	Much shorter	Slightly shorter
Keel vs wing	Slightly shorter	Slightly shorter	Much shorter	Subequal
GYNOECIUM				
Ovary	Subsessile	subsessile	Stipitate or few subsessile	Stipitate
Style curvature	Broad U-shaped	Broad J-shaped	Geniculate	Weakly incurved
Style pubescence	Barbellate basally	Glabrous	Barbellate apically	Glabrous
ANDROECIUM				
Anthers	Uniform	Uniform	Uniform	Dimorphic
FRUIT				
Costa	2 per valve	Absent	1 per valve or absent	Absent
Valves	Flat	Flat	Flat or turgid	Flat
Depression between seeds	Absent	Absent	Absent to present	Absent
LEAVES				
Leaflet number	(1)3 (5–7)	(1)3	(1)3 (5–11)	3

THE GENUS *CLITORIA*

Species of *Clitoria* fall into three distinct groups based upon morphology. Fantz (1979) reported that botanists have traditionally treated these groups as sections. However, one could argue that these groups represent three distinct genera due to morphological differences in the calyces and fruits supported by leaflet number and habit. However, all three groups are similar in floral characters that are unique within the papilionaceous legumes. Flowers are resupinate, large and showy, with stalked ovaries bearing geniculate, bearded styles, within infundibular calyces that persist in fruit. Bentham (1858) concluded that *Clitoria* would be rendered more natural by retaining these groups together than by segregation, and treated them as sections. Baker (1879) elevated two sections to subgenus *Clitoria* and subgenus *Neurocarpum* (Desv.) Bak. Fantz (1979) agreed with Bentham and elevated the third section to subgenus *Bractearia* (Mart. ex Benth.) Fantz.

MORPHOLOGY OF *BARBIERIA*

Lackey (1981) did not indicate affinities of *Barbieria* within the genus *Clitoria*. *Barbieria* consists of one species (a liana) with a wide distribution, occurring in the western Antilles and southern Mexico south to Peru, east to Brazil. Botanists often note *Barbieria* as rare to infrequently observed in the localities where the species is collected. The morphology of *Barbieria* will be reviewed in the following discussions with comparisons made to *Clitoria* and to other genera of Clitoriinae to determine potential affinities.

Inflorescence.—Similarities to the Clitoriinae include axillary pseudoracemes, persistent bracts and bracteoles, paired flowers, and micro-uncinate trichomes. Inflorescences in *Barbieria* are elongate, slender, and multiflowered. The closest placement in *Clitoria* would be subg. *Bractearia*. However, inflorescences of *Bractearia* are nodose, and often are borne cauliflorously in lianaceous species before leaves and axillary inflorescences are produced, characters not noted in *Barbieria*. Bracts of *Clitoria* are in three series. The inner pair is smallest, caducous to deciduous, located between the pedicels; the middle pair is largest, persistent, located opposite the pedicels; and the outer pair are deciduous to semipersistent, nearly as large as the middle pair, and located between the pedicels. *Barbieria* appears to have bracts only in two series. An inner row of bracts has not been observed. Bracts and bracteoles (Fig. 1F) of *Barbieria* are acuminate to subulate apically, unlike any *Clitoria* or other genus in the Clitoriinae. Bracteoles of *Bractearia* are described by collectors as dark greenish-yellow to strong reddish-orange. Bracteoles of *Clitoria*, when noted by collectors, are described always as shades of green.

Flowers.—Similarities to the Clitoriinae include the large, showy, resupinate flowers with clawed petals and complicated banner petal. Mature flowers of *Barbieria* appear dissimilar to those of *Clitoria* (Fig. 1A), with the banner petal spreading downward away from the conspicuously protruding keel. *Clitoria* has the banner broadly U-shaped around the keel, the latter inconspicuous and somewhat hidden by the flaring apices of the wing petals. Color is commonly associated with the standard, with *Barbieria* described as scarlet or vivid to brilliant red, a color not associated with *Clitoria*, but is associated with some *Periandra*. Nectar guides are inconspicuous. Flowers of *Clitoria* bear a standard with blue to lilaceous to violaceous pigmentation, or white, with numerous conspicuous veins of darker pink to violet hues commonly from a yellowish to whitish medial patch. Proponents of Lackey noted that *C. javitensis* (H.B.K.) Benth. has light red flowers, but the floral pigmentation is violaceous-pink, not red. Wings and keels of *Clitoria* are described as pale or off-white with the wings bearing violaceous pigmentation near the apex of the flaring blade.

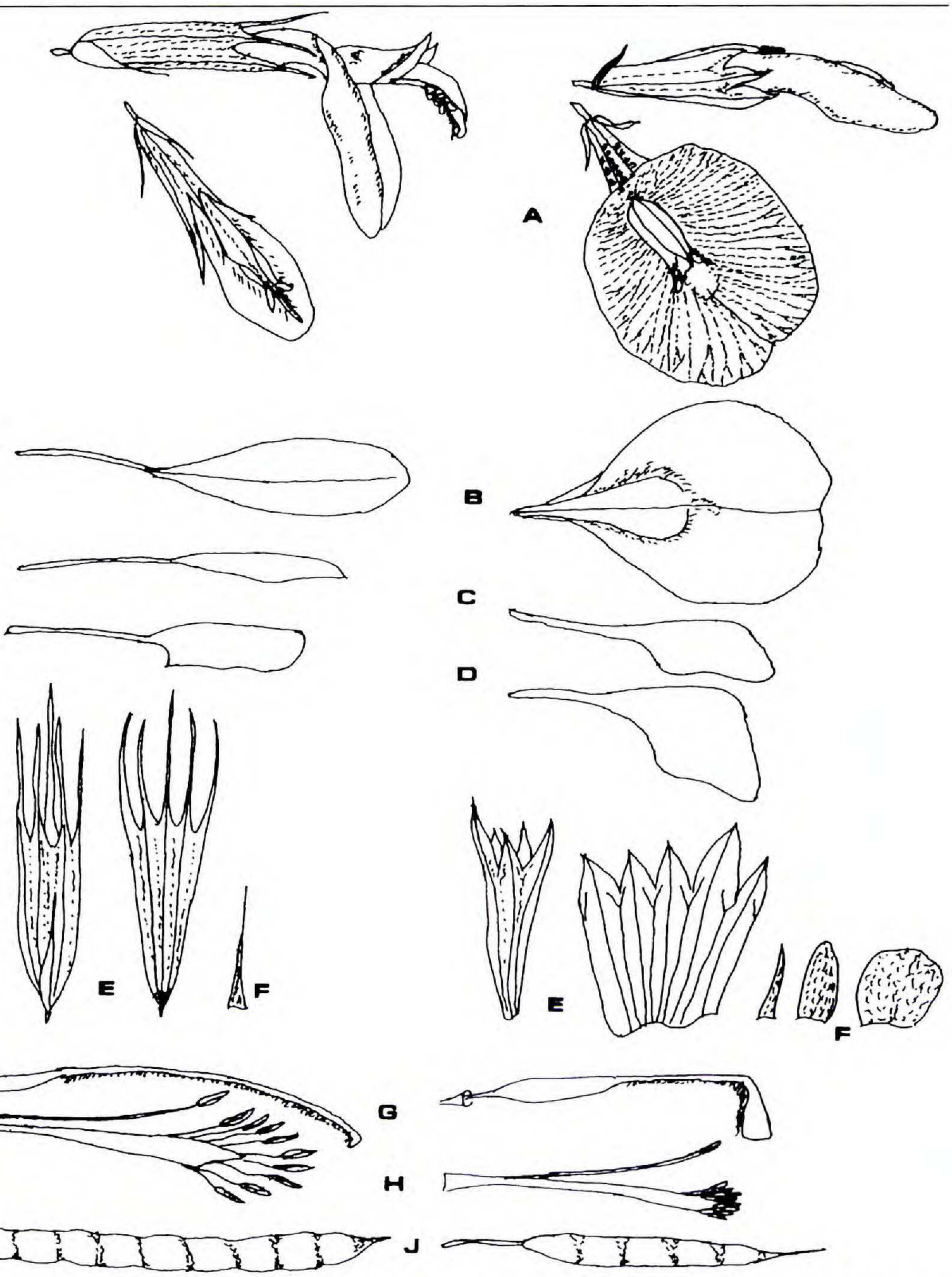

FIG. 1. A comparison of some morphological features of *Barbieria* (left) with *Clitoria* (right). A: Flower, two views. B: Standard or banner (vexillum) petal. C: Keel (carina) petal. D: Wing (alae) petal. E: Calyx, intact and split-open views. F: Bracteole(s). G: Gynoecium. H: Androecium. J: Legume; *Clitoria* subg. *Neurocarpum* represented.

Calyx.—The calyx (Fig. 1E) of *Barbieria* is narrowly infundibular making it similar to *Clitoriopsis*, not *Clitoria*. The calyx tube of *Barbieria* is elongated, appearing somewhat cylindrical with a length/width ratio of 4–5, and is 20-veined. A prominent raised vein extends into each lobe with three smaller veins in between, one extending to the sinus, and the other

pair into each adjacent lobe. Calyx lobes are deltoid-ovate basally with elongated subulate apices. The upper dorsal pair are free nearly to the base. The calyx is described as dark to vivid to blood red in color. *Barbieria* is unique within the Clitoriinae in bearing the upper calyx lobes free and bearing subulate apices.

The calyx of *Clitoria* is infundibular. The calyx tube does not appear elongated, as the length/width ratio is 2–3. The veination pattern is striated in subg. *Bractearia* and 10-veined in the other two subgenera, with a prominate vein into each lobe and into each sinus. Calyx lobes are acute to short-acuminate, not subulate apically. The upper dorsal pair is subconnate. The calyx, when noted by collectors, is described as green to purplish-tinged.

Petals.—*Barbieria* has an elongated oblong-oblanceolate standard (Fig. 1B) with the keel length subequal the standard (as in *Clitoriopsis*) and wings much shorter than the keel. The shape of the standard and the wings being much shorter than the keel are unique characters within the Clitoriinae. The standard is broadly ovate to suborbicular in all other genera of the Clitoriinae. The wings are subequal to slightly longer than the keel in the other genera, except for *Clitoria*, where the wings are conspicuously much longer with flaring apices.

The keel blade (Fig. 1C) in *Barbieria* is narrow elliptic-oblong, acute, and weakly incurved. The keel blade in *Clitoria* is broadly oblong, broadly acute to subobtuse, and strongly falcate. The wing petals (Fig. 1D) have nearly straight, oblong blades in *Barbieria*. The wings of *Clitoria* have strongly falcate, oblong-spatulate blades.

Gynoecium.—*Barbieria* has a sessile ovary (Fig. 1G) with a gynophore lacking, to 0.5 mm long. The style is linear, not dilated above, barbellate much of its length, and scarcely geniculate just below the stigma. This gynoecium is unique within the Clitoriinae as other genera bear a gynophore below the ovary and have an incurved style dilated above. *Clitoria* has a stalked ovary (rarely subsessile) with a style distinctly geniculate, with the style dilated and bearded above the abrupt incurved point. A subsessile ovary (gynophore 1–4 mm long) occurs in *Centrosema* and *Periandra*.

Androecium.—The vexillary stamen in *Barbieria* (Fig. 1H) is free at the base with the others connate, similar to *Clitoriopsis*. The nine connate stamens bear anthers on elongated filiform filaments as in *Clitoriopsis* and *Periandra*. *Barbieria* is unique in bearing white anthers (yellow in other genera). The vexillary stamen in *Clitoria* is more or less connate at the base. Nine stamens are connate with short filaments bearing yellow anthers.

Legume.—The legume (Fig. 1J) of *Barbieria* is sessile, linear, ecostate, and enclosed at the base by the persistent calyx. The valves are strongly-transversely impressed between the seeds, turgid and convex around the seeds. The style scarcely persists as a beak. Legumes are variable in *Clitoria*,

but stipitate and bearing a beak. Legumes are flat in subgenera *Bractearia* and *Clitoria*, and other genera of subtribe Clitoriinae. Legumes of subgenus *Neurocarpum* are turgid, convex around the seeds, and ecostate to costate with a medial raised vein on the valve.

Seeds.—Seeds of *Barbieria* are viscid, a character found elsewhere only in *Clitoria* subgenus *Neurocarpum*. The other subgenera of *Clitoria* and genera of Clitoriinae have smooth seeds.

Leaves.—Leaves of *Barbieria* are similar to Clitoriinae by being odd-pinnately compound, petiolate, bearing persistent stipules and stipels and micro-uncinate trichomes beneath macrotrichomes. Leaflets are commonly 15–21, oblong and obtuse. The only close match in leaflet number is *C. lasciva* Bojer ex Benth. (subg. *Clitoria*), a Madagascarean endemic with 7–11-fololiate leaves. Lackey (1981) omitted reporting this higher leaflet number in the characterization of the subtribe and commented that *Clitoria* subg. *Clitoria* [reported as sect. *Ternatea*] is more reminiscent of some Galegeae.

CONCLUSION

Clitoria is a genus with morphological variation in the habit, leaflet number, calyx and fruits. However, flowers are similar in structure in all subgenera, and unique within the papilionaceous legumes. Flowers are resupinate, large and showy, with stalked ovaries bearing geniculate, bearded styles, within broad infundibular calyces that persist in fruit.

Barbieria becomes an aberrant member of genus *Clitoria* when placed in any subgenus. *Clitoria* subgenus *Bractearia* can be segregated from *Barbieria* by the nodose pseudoracemes, flat prominately stipitate fruits of much larger size, multistriated calyx, and trifoliolate leaves. *Clitoria* subgenus *Clitoria* can be segregated from *Barbieria* by the flat, short-stipitate fruits, 10-veined calyx, and suffrutescent habit. *Clitoria* subgenus *Neurocarpum* can be segregated from *Barbieria* by the trifoliolate and unifoliate leaves, 10-veined calyx, stipitate fruits and non-lianaceous habit.

Should *Barbieria* be placed in a separate subgenus within *Clitoria*? Not in my view. Table 2 contrasts these two genera. *Barbieria* can be segregated from all species of *Clitoria* by the scarlet color of the flowers, the oblong shape of the standard blade borne on a long claw, the length of the various petals with the wing petals being the shortest and the keel subequal the standard, the standard spreading away from the keel at maturity, the sessile ovaries and fruits with inconspicuous beaks, the free calyx lobes on a narrower, elongated tube (length 4–5 times longer than wide) with 20 veins, the subulate apices of bracteoles, bracts, stipules, and calyx lobes, the bracts oriented in two series, the free vexillary stamen, white anthers, elongate free filaments, a slender non-dilated style barbellate lengthwise, and higher leaflet number.

TABLE 2. Morphological comparison of *Barbieria* and *Clitoria*.

Character	Barbieria	Clitoria
HABIT	Liana	Tree, Shrub, Liana, Suffrutescent Herb
LEAVES		
Leaflet Number	(9)13–25	(1)3 (rarely 5–11)
Stipule apex	Subulate	Acute
INFLORESCENCE		
Bract series	2 rows	3 rows
Bract apex	Subulate	Acute to obtuse
Bracteole apex	Subulate	Acute to obtuse
Bracteole color	Greenish-yellow/ reddish-orange	Green
Flower color	Red	White or blue to violaceous, rarely pink
Vexillum (vs Keel)	Spreading	Surrounding keel
CALYX		
Tube configuration	Narrow infundibular	Broad infundibular
Tube L/W ratio	4–5	2–3
Tube veination	20-veined	10-veined or striate
Tube color	Dark red	Green to purplish tinged
Lobe shape	Broad, subulate	Deltoid
Fusion upper 2 lobes	Nearly free	Subconnate
COROLLA		
Standard shape	Oblong-oblanceolate	Obovate
Standard claw	Long-clawed	Short-clawed
Wing shape	Oblong	Falcate-oblong
Keel (vs wings)	Longer	Shorter
Keel (vs standard)	Subequal	Much shorter
GYNOECIUM		
Ovary	Sessile	Stalked
Style curvature	Weakly incurved	Geniculate
Style pubescence	Barbellate length	Barbellate apically
Style apex	Not enlarged	Dilated
ANDROECIUM		
Vexillary stamen	Free to base	Connate near base
Free Filaments	Elongate,filiform	Short
Anthers	White	Yellow
LEGUME		
Attachment	Sessile	Stipitate
Surface	Turgid around seeds	Flat or turgid around seeds
Beak	Inconspicuous	Prominent
SEEDS		
Shape	Subreniform	Lenticular or subreniform
Surface	Viscid	Smooth or viscid

Barbieria has several morphological traits that are unique within the Clitoriinae. These include the imparipinnate leaves with a high leaflet num-

ber, subulate-acuminate apices of the stipules, bracts, bracteoles, and calyx lobes, the calyx with the upper two teeth free to near the base, the wings shorter than the other petals, the oblong-oblanceolate standard, and the sessile ovaries and fruits. These characteristics make *Barbieria* an aberrant member also from other genera of the Clitoriinae, and support its recognition as a separate genus.

Barbieria does have a lot of similarities with members of the Clitoriinae, including persistent stipules and stipels, appressed bracteoles, pseudoracemes with flowers paired at nodes, resupinate flowers with clawed petals, naked calyx interior, and the constant prescence of micro-uncinate trichomes underlaying macrotrichomes. It would appear that the placement of *Barbieria* within the Clitoriinae by Lackey (1981) has merit.

KEY TO GENERA AND SUBGENERA IN THE CLITORIINAE

1. Calyx with dorsal lobes free to near base; standard elongate-oblong; wing petals shorter than the keel; bracts, bracteoles, stipules and calyx lobes subulate-acuminate; anthers white; leaflets 15–21; fruits turgid, strongly depressed between the seeds and subsessile; seeds viscid. ..... **Barbieria**
1. Calyx with dorsal lobes connate below; standard broadly ovate to suborbicular; wing petals subequal to longer than the keel petals; bracts, bracteoles, stipules and calyx lobes acute to obtuse, non subulate-acuminate; anthers yellow; leaflets 3 or 1, rarely 5–11; fruits flat or prominately stipitate when depressed between the seeds; seeds smooth or occasionally viscid (*Clitoria* subg. *Neurocarpum*).
   2. Keel and wing petals subequal, each slightly shorter than the vexillum; anthers dimorphic, five dorsifixed, others basifixed on longer filaments; style weakly incurved from the near the base; calyx narrow infundibular (length ca 4–5 times the width). ..... **Clitoriopsis**
   2. Keel shorter than wing petals, each much shorter than the vexillum; anthers uniform; style strongly incurved, broadly U-shaped, or J-L-shaped near the apex; calyx broadly infundibular to campanulate.
      3. Calyx campanulate; keel petals slightly shorter than wing petals; style strongly, gradually curved inward, broadly U-shaped or J-shaped; fruit and ovary subsessile.
         4. Style glabrous; legume valves ecostate; vexillary spur absent. ..... **Periandra**
         4. Style pubescent, barbellate basally, less so above; legume valve cotate, with a prominent nerve or wing near the suture; vexillum spurred. ..... **Centrosema**
      3. Calyx broadly infundibular (length ca 2–3 times width); keel petals much shorter than the wing petals; style geniculate (L-shaped), abruptly incurved; fruit and ovary stipitate, rarely subsessile. ..... **Clitoria**
         5. Calyx subcoriaceous, striated; seeds large (7–16 mm diam.), lenticular; stipe (12–33 mm), staminal sheath (25–40 mm), ovary (10–20 mm), and petiolule (4–10 mm) elongated; inflorescence lignose, nodose, several to multi-flowered; leaflets larger (8–20 long × 3–23 cm wide). ..... Subg. **Bractearia**

5. Calyx cartilaginous to subpellucid, 10-veined; seeds small (3 × 8 mm), subreniform to ovoid; stipe (1–14 mm), staminal sheath (10–23 mm), ovary (5–9 mm), and petiolule (1–5 mm, rarely 6–8 mm) shortened; inflorescence sublignose, usually 1–2-flowered, rarely few-several-flowered; leaflets smaller (1–8 long × 1–4 cm wide).
   6. Legume flat, subsessile (stipe 1–4 mm), ecostate; seeds smooth, germination epigeal; calyx shrinking in fruit, subpellucid; cleistogamy absent; leaflets 5–11, rarely 3 and 1. ..... Subg. **Clitoria**
   6. Legume turgid, convex around seeds, stipitate (stipe 4–14 mm), costate or ecostate; seeds viscid, germination hypogeal; calyx persistent in size in fruit, subcartilaginous; cleistogamy present or absent; leaflets 3, rarely 3 and 1, or unifoliate. ..... Subg. **Neurocarpum**

TAXONOMIC TREATMENT OF *BARBIERIA*

BARBIERIA DC., Prodr. 2:234. 1825. TYPE SPECIES: *B. pinnata* (Pers.) Baill.

Shrub, erect or apically scandent or trailing. Leaves alternate, imparipinnate, petiolate, stipulate, stipellate; leaflets numerous, opposite, entire; petiolules quadrate; stipules persistent, striate, subulate-acuminate; stipels persistent, 1-nerved, linear-subulate. Inflorescence axillary or terminal, pseudoracemose, few-flowered, long-pedunculate; pedicels paired at nodes. Bracts 4, striate, lance-subulate, pubescent adaxially; the inner pair often persistant, opposite and appressed to the pedicel; the outer pair narrower, between the pedicels, deciduous. Bracteoles paired at calyx base, lanceolate, subulate-acuminate, striate, pubescent adaxially. Flowers papilionaceous, resupinate, showy, red. Calyx narrowly infundibular, persistent in fruit, 5-lobed, lobes free, deltate to rapidly subulate above, subequal with ventral lobe slightly longer. Vexillum complicate, long-clawed, spurless, oblong-oblanceolate; wings oblong, long-clawed, much shorter than the keel; keel long-clawed, elliptic-oblong, subequal to the vexillum. Stamens diadelphous, often persistent in fruit; vexillary stamen free nearly to base. Pistil enclosed within staminal sheath; ovary sessile, style linear, densely barbate, weakly incurved, weakly geniculate beneath stigma. Legume sessile, linear, straight, ecostate, enclosed at base by persistent calyx; valves strongly transverse-impressed between the seeds, spirally twisting upon dehiscence. Seeds smooth, transverse-oblong. (x = 10).

A monotypic genus widespread in the neotropics, but apparently rare locally since collections in herbaria are comparatively few.

Barbieria pinnata (Pers.) Baill., Hist. Pl. 2:263. 1870. *Galactia pinnata* Pers., Syn. Pl. 2:302. 1807. *Clitoria pinnata* (Pers.) R.H. Smith & G.P. Lewis, Kew Bull. 46:320. 1991. TYPE: PUERTO RICO, *M. Ledru s.n.* (HOLOTYPE: L; ISOTYPE: P).

Clitoria polyphylla Poir., Lam. Encycl. Suppl. 2:300. 1811. *Barbieria polyphylla* (Poir.) DC., Mém. Légum. 242. 1825. TYPE: PUERTO RICO, *M. Ledru s.n.* (P).

Barbieria maynensis Poepp. & Endl., Nov. Gen. & Spec. 3:58, t.245. 1845. TYPE: Peru (orientalis). Crescit in sylvis primaevis ad flumen Huallaga versus Tocache et Yurimaguas, Julio ad Decembrem floret, *sine coll. & no.* [*Poeppig* coll.?]

Shrub 1–2.5 m, or a woody vine scandent 9–12 m or trailing; branches striate-terete, 1–6 mm diam., densely hirsute, trichomes to 2 mm long, reddish-brown becoming whitish with age; pubescence of micro-uncinate (hooked) trichomes common (vidi 20–30×) beneath macrotrichomes; pith continuous. *Leaves* imparipinnate; leaflets (9)13–21(25), oblong to elliptic-oblong to ovate-oblong, broadly acute to obtuse, mucronate (to 1 mm long), (1.5)2.5–6 cm long, 1–2.5 cm wide, upper surface bright to dark green, micro-uncinate pubescent (beneath sparse strigose macrotrichomes when young), lower surface pale, whitish to bluish-green, moderately to densely appressed-pilose; petioles 1–4 cm long, densely rufo-pilose; rachis quadrangular-terete, sulcate above, 5–16 cm long, internodes 0.5–2.5 cm long, micro-uncinate beneath rufo-pilose trichomes; petiolules rugose, dark-colored, rufo-pilose, 2 mm long; stipules narrowly deltate-lanceolate, 5–8-striate, subulate-acuminate, 7–12 mm long, 1.2–2 mm wide, pubescence micro-uncinate; stipels linear-subulate, 1-striate, (1.5)3–5 mm long, ca 0.2–0.8 mm wide, pubescence micro-uncinate. *Inflorescence* 4–16(24) cm long, flowering toward apex; peduncle 4–11 cm long, rufo-pilose; rachis internodes 1–3.5 cm long; pedicels 3–5 mm long in flower, 5–7 mm long in fruit. Bracts deltate-ovate, acute, 3–8 mm long, 0.5–1 mm wide, pubescence micro-uncinate. Bracteoles lanceolate, subulate-acuminate, dark greenish-yellow becoming strong reddish-orange, 7–11 mm long, 2–3 mm wide, pubescence ciliate and micro-uncinate. *Flowers* 4.5–6.0 cm long, red. Calyx dark, vivid red; tube 16–22 mm long, 3–5 mm wide at base expanding to 6–8 mm wide at throat, venation 20-striate, one vein extending into each lobe to its apex, one vein extending to each sinus, and three less conspicuous veins between these two; lobes deltate-ovate, subulate-acuminate, dorsal and lateral lobes 8–11 mm long, to 2 mm wide basally, ventral lobe 10–12 mm long. Standard brilliant to blood red, paler toward spotted center, blade oblong-oblanceolate, 25–33 mm long, 14–17 mm wide; claw 21–24 mm long, 3–5 mm wide; wings red, blade oblong, flaring apically, 9–13 mm long, 3.5–6 mm wide; claw 26–33 mm; keel red, blade elliptic-oblong, weakly falcate, 17–23 mm long, 2.5–5 mm wide; claw 26–34 mm long. Staminal sheath white, 36–44 mm long, free filaments filiform, (4)6–8 mm long; anthers white, lanceolate, 0.9–1.2 mm long. Gynophore lacking or to 0.5 mm long; ovary linear, 8–11 mm long, 1–1.2 mm wide, pubescence dense, trichomes white, to 2 mm long, ascending-appressed; style (29)38–43 mm long, exserted beyond stamens, flattened, bearded lengthwise, geniculate 5–6 mm from distal end; stigma capitate. Legume

pale green becoming brown, subsessile, linear, straight, ecostate, enclosed at base by persistent calyx; stipe 0.5–1 mm long; valves puberulent-hirsute, strongly transverse-impressed between the seeds, 36–55 mm long, 4–6 mm wide, spirally twisting upon dehiscence 0.5–1.5 turns; beak inconspicuous, 1–2 mm long. Seeds 4–9 per pod, dull dark brown to black, viscid, transverse-oblong, 2.2–3 × 4–6 × 0.6–1.5 mm. (x = 10).

Illustrations.—De Candolle (1826, tab. 39), Poeppig (1845, plate 264), and White (1980, fig. 6) provided excellent line drawings of vegetative and reproductive structures.

Vernacular names.—Peru: puspo poroto huasca (*Vigo 8307*), pusporota huasca (*Schunke 12412*).

Economic uses.—"One of the best ground cover crops" (*Schipp 1108*). Excellent potential as a climbing ornamental.

Phenology.—Plant vouchers have been collected with flowers (March) and fruits from April through December.

Habitat.—Moist soils in secondary growth, roadsides, riverine forests, forests edges or open areas with abundant sun. Elevation 390-1000 m.

Distribution.—Southern Mexico south to Peru and west to Venezuela and Brazil, and in the Caribbean. Collectors often noted that the plant rarely was observed in the area sampled.

Specimens examined ["g-"= gift specimen from institution cited]: CENTRAL AMERICA. **BELIZE (BRITISH HONDURAS)**. Rio Grande, *Schipp 1108* (F,MICH,MO,NY). STANN CREEK: 17 mi section, Stann Creek Valley, *Gentle 9255* (F,LL,MEXU, MICH,NY). **COSTA RICA**. *Larkowski 1261* (F). PUNTARENAS: Helechales, Potrero Grande, Buenos Aires, *Gómez-Laurito 10839* (F); Cabugra, Buenos Aires, *Ocampo 2424* (CR); vic. Buenos Aires, *Pittier 4714* (P); Terruba, Buenos Aires, *Poveda 869* (F); Buenos Aires de Puntarenas, *Zamora et al. 869* (F); Buenas Aires de Puntarenas, *Zamora 1186* (CR,F). SAN JOSE: Helechales de San Isidro del General, *León 1025* (CR); vic. El General, *Skutch 2263* (MO,NY); Río Convento near Panamerican Hwy, El General Valley, *Williams et al. 28704* (CR,F,NY); Valle de El General, *Yeilding 246* (F); San Isidro de El General, El Pilar de Cajón, *Zamora et al. 1520* (CR). **GUATEMALA**. ALTA VERAPAZ: between Samanzana & Candelaria via Seboquil, *Steyermark 45101* (F,NY); Cubilquitz, *Tuerckheim 7845* (F,M,MO,NY,P). **MEXICO**. Río Piedras, *Hioram s.n.* (P). NAYARIT: Sierra San Pedro Nolasco, *Jurgensen 780* (MO). OAXACA: *Galeotti 3431* (P); Comaltepec, *Liebmann 4654* (F).

CARIBBEAN. **CUBA**. *Wright 2302* (MO). ISLE OF PINES: vic. San Pedro, *Britton et al. 15105* (F,MO). **DOMINICAN REPUBLIC**. *Wright et al. 89* (F). LA VEGA: vic. Piedra Blanca, *Allard 13483* (MO); vic. Piedra Blanca, *Allard 17062* (F); Cordillera Central, Jarabacoa toward Buenavista, *Ekman 14189* (MO). MONTE CRISTI: Leonor, dist. Sabaneta, *Valeur 76* (F-2 sheets, MO). SAN CRISTOBAL. near El Cacao, San Cristóbal, *Liogier 17767* (F). SANTO DOMINGO: vic. Ciudad Trujillo, *Allard 13338* (US); Cordillera Central, Villa Altagracia, *Ekman 11179* (F). **HAITI**. ARTIBONITE: vic. Kalacroix, section Dessalines, *Leonard 7900* (F). NORD: trail to Citadel in vic. Dondon, *Leonard 8642* (MO). **PUERTO RICO**. Aquada ad Piedra Blanca, *Sintenis 5710* (F,MO). AGUADILLA. La Juanita near Las Marías, *Britton et al. 3939* (F,MO,US); vic. Maricao, *Britton & Cowell 4092* (F,US). HUMACAO. PR 966 near km 4.7, E of El Verde, Sierra de Luquillo, *Burch 3203* (MO,TENN); Lares ad

Palma Llanos, *Sintenis 5942* (F,MO). MAYAGÜEZ. near Mayagüez, *Holm 27* (MO). SAN JUAN. Río Piedras, *Otero 325* (MO).

SOUTH AMERICA. **BOLIVIA**. Guanai, Tipuani, *Bang 1363* (F,MO-2 sheets,US); Rio Junsay (?), *Kuntze s.n.* (F,US); Guanai, *Rusby 2356* (F,MO-2 sheets). **BRAZIL**. AMAZONAS: São Paulo de Olivença, *Ducke 565* (F,MO); Rio Solimões, beside Estrada Bom Fim, São Paulo de Olivença, *Lleras et al. P17342* (MO); Lago de Tefé, opposite Tefé, *Lleras et al. P17490* (MO); Mun. Humaitá, estrada Humaitá-Pôrto Velho km 38, *Teixeira et al. 270* (MO,US). GOIÁS: ca. 17 km S of Goiás Velho, 6 km NE of Mossamedes, Serra Dourada, *Anderson 10141* (MO). MATO GROSSO: Santa Anna de Chapada (= dos Guimarães), *Regnell 3316a* (F). PARÁ: Mun. Itaituba, estrada Santarém-Cuiabá, BR-163 km 842, Serra do Cachimbo, *Silva 250* (MO). RONDONIA: Mun. de Colorado de Oeste, BR 364, Pôrto Velho-Cuiabá, km 20, *Cid et al. 4367* (MO,US). **COLOMBIA**. ANTIOQUIA: Mpio. San Rafael, 3.1 km E of San Rafael along Guatope-San Rafael Rd, *Brant & Roldán 1514* (g-MO). BOYACA: El Umbo, 130 m NW of Bogotá, *Laurence 488* (F,MO,US). META: Los Llanos, Villavicencio, *Haught 2457* (F). VAUPÉS: Cano Grande y San José del Guaviare, *Cuatrecasas 7378* (F); Mitú & vic., Urania, *Zarucchi 2249* (MO). **PERU**. AMAZONAS: Mirana, *Woytkowski 5648* (MO). CUZCO: Paucartambo, Pileopata, Izguierda, *Vargas 11642* (MO); Casnipala, *Weberbauer 6951* (F,F-frag.). HUÁNUCO: Monzón, *Woytkowski 5029* (MO). JUNIN: La Merced, *Killip & Smith 23758* (F); Río Paucartambo Valley near Perené Bridge, *Killip & Smith 25367* (F). LORETO: prov. Coronel Portillo, Bosque Nac. de van Humboldt, Ucayali, km 86 Pucallpa-Tingo Mariá rd, *Gentry & Salazar 29440* (MO); Yurimaguas, Río Huallaga, *Killip & Smith 27941* (F); Balsapuerto, *Klug 2978* (F,MO); Balsapuerto, *Klug 3095* (F,MO); alto Amazonas, Lagunas, trail to Argentina, *McDaniel & Rimachi 16433* (F,MO); alto Amazonas, Yurimaguas, Carretera del Caserio de Munich, *Rimachi 3013* (F,MO,TENN); 3 km S of Yurimaguas, *Straw 2416* (US). PASCO: Oxapampa prov., Serrania de San Matias E of Loma Linda, *Gentry et al. 42000* (g-MO); prov. Oxapampa, Iscozacin, *Smith 2080* (DUKE,MO). SAN MARTIN: W of Huicte, *Schunke 6524* (F). SAN MARTIN (MARISCAL CACERES): Dtto Tocache Nuevo, Pucayacu nr Tocache Nuevo, *Plowman & Schunke 7497* (F); Dtto. Tocache Nuevo, Quebrada de Ishichimi (Fundo Retiro), *Schunke 3913* (F,MO); Quebrada de Huaquisha (Rio Huallaga), *Vigo 7155* (MO); Almendras, camino a Pueblo Viejo, *Vigo 8186* (MO); Dtto. Tocache Nuevo, Fundo Jeroglifico, del Sr. Luis Ludena (Quebrada Ishichimi), *Vigo 8307* (MO); dtto. Tocache Nuevo, Quebrada Ishichimi, cerca al Fundo del San Luis Ludena, *Schunke 12412* (F). **VENEZUELA**. BARINAS: 0.5 km NW of Barinitas, *Steyermark & Wiehler 106605* (F,MO). BOLIVAR: Dist. Roscio, "El Abismo," Río El Samay, affluente Icabaru, *Holst & Liesner 2365* (F,MO,NY); km 316 S of El Dorado, 2 km S of Santa Elena de Uairén, *Steyermark 111328* (F,US-2,VEN). SUCRE. Dist. Benítez, entre Río Frió y Caño Yaguaima, *Benítez 2908* (MO); Dist. Benítez, Serranía de la Paloma, 28 km SE of Ajies rd to Guariquen, *Steyermark et al. 121405* (MO).

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REFERENCES

BAKER, J.G. 1879. Leguminosae, no. 76:*Clitoria*. In: J.D. Hooker, ed. Flora of British India. L.Reeve & Co., London.

BENTHAM, G.1858. Synopsis of the genus *Clitoria*. J. Linn. Soc., Bot. 2:33–44.

DE CANDOLLE, A.P. 1826. Mémoires sur la famille des Légumineuses. A. Belin. Paris. 5:241–244, tab. 39.

FANTZ, P.R. 1979. Taxonomic notes and new sections of *Clitoria* subgenus *Bractearia* (Leguminosae). Sida 8:90–94.

LACKEY, J.A. 1981. Tribe 10. Phaseoleae DC. (1825). In: R.M. Polhill and P.H. Raven, eds. Advances in legume systematics. Royal Botanic Gardens, Kew, England. Part I: 301–327.

MABBERLY, D.J. 1987. The plant book. Cambridge Univ. Press, Cambridge.

POEPPIG, E. 1845. Nova genera ac species plantarum. Friderici Hofmeister, Leipzig. 3:58-59, plate 264.

SMITH, R.H. and G.P. LEWIS. 1991. A new combination in *Clitoria* (Leguminosae - Papilionoideae). Kew Bull. 46:320.

WHITE, P.S. 1980. *Barbieria*. In: J.D. Dwyer and collaborators. Flora of Panama, part V. Family 83. Leguminosae subfamily Papilionoideae (conclusion). Ann. Missouri Bot. Gard. 67:553–555.