

A synopsis of *Peristrophe* (Acanthaceae) in southern Africa

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ABSTRACT

A synopsis of *Peristrophe* Nees (Acanthaceae) in southern Africa is provided. *Peristrophe* comprises nine species, one with two subspecies in southern Africa. A key for identification and descriptions of species not included in recent literature are provided. Morphology of tertiary bracts, indumentum on stems and distribution is illustrated and diagnostic characters, distribution, habitat, flowering time and conservation status are discussed for each species.

INTRODUCTION

I undertook a revision of *Peristrophe* Nees in southern Africa (Balkwill 1985) and while doing so, published an account of the *Peristrophe grandibracteata* complex (Balkwill *et al.* 1988) and some new species (Balkwill *et al.* 1985; Balkwill & Getliffe Norris 1989). I thought that the discussions under these species and that of Brummitt (Wood *et al.* 1983: 451) clarified the fate of previously recognised species, but from Welman (1993), it seems that this is not the case. At present, no satisfactory key to the southern African species is available in the literature and there is likely to be a long delay before further accounts of Acanthaceae are published in the *Flora of southern Africa* series. I have therefore decided that it would be constructive to publish a synopsis to aid in the identification of species of this genus.

***Peristrophe* Nees** in Wall., *Plantae Asiaticae Rariores* 3: 112 (1832); Endl.: 707 (1839); Meisn.: 297 (1840); Nees: 374 (1841); Nees: 492 (1847); Harv.: 286 (1868); Benth. & Hook.f.: 1071 (1876); C.B. Clarke: 554 (1885); Lindau: 331 (1895a); C.B. Clarke in Burkill & Clarke: 242 (1899); C.B. Clarke: 84 (1901); Hutch. & Dalziel: 264 (1936); Heine: 424 (1963); Agnew: 609 (1974); R.A. Dyer: 593 (1975). Type species: *Peristrophe baphica* (Spreng.) Bremek. in *Nova Guinea new ser.* 8: 149 (1957) [= *P. tinctoria* (Roxb.) Nees comb. illeg.].

Suffruticose annuals or evergreen perennials up to 2 m high. *Leaves* petiolate, simple, opposite, widely ovate to lanceolate, acuminate to acute, entire, attenuate at base, herbaceous, usually with eglandular trichomes, especially on midrib. *Inflorescence* of monochasial cymes (inflorescence units) enclosed by a pair of tertiary bracts, with (1)2 or 3(4) inflorescence units umbellately arranged, often compounded. *Bracts*: secondary bracts 2, free, narrowly triangular to lanceolate, sessile or leaflike; tertiary bracts lanceolate to broadly ovate, acuminate. *Flowers* perfect, zygomorphic, occasionally cleistogamous. *Calyx* with short tube and lanceolate lobes,

margins usually membranous, inner surface pubescent, trichomes appressed and eglandular. *Corolla* bilabiate, resupinate; tube narrowly cylindrical below, subcampanulate above, with 2 pairs of longitudinal hairy ridges within, with eglandular and sometimes glandular trichomes without; lip in lower position elliptic or ovate, minutely emarginate; lip in upper position narrowly elliptic, 3-lobed; flowers lilac to purple, occasionally white, with dark purple honey guides on white background on lip in upper position. *Stamens* 2, exserted; filaments epipetalous, linear, usually white or yellow; anthers bithecal, thecae superposed and separated, approximated or slightly overlapping, introrse, purple. *Disc* shallowly cupular, with two small awns, nectariferous. *Gynoecium* bicarpellate; stigma bilobed; style exserted, filiform, glabrous to sparsely strigose; ovary superior, with septum in median longitudinal axis, ovoid or ellipsoid, bilocular, with two ovules in each locule. *Fruit* a stipitate capsule, clavate or obtrilobate, placentae inelastic at the bases and bearing retinacula, dehiscent loculicidally. *Seeds* discoid, usually 2 in each locule, rough and tuberculate.

The genus *Peristrophe* occurs in Africa and the East Indies and comprises about 25 species, of which nine occur in southern Africa. *Peristrophe* is very closely related to *Dicliptera* Juss. and differs only in the nature of the placental bases, which are inelastic in *Peristrophe* and elastic in *Dicliptera*. Some workers have tried to apply other characters (e.g. width of the tertiary bracts) as generic characters, and this has led to the incorrect classification of species such as *P. angolensis* (S. Moore) K. Balkwill, *P. transvaalensis* (C. B. Clarke) K. Balkwill and *P. hereroensis* (Schinz) K. Balkwill, all of which were described in the genus *Dicliptera*. Another species that has been confused with *Dicliptera* is *P. bivalvis* (L.) Merr., which has been confused with *Dicliptera foetida* (Forssk.) Blatt. (Wood *et al.* 1983). In southern Africa, the shape and venation of the tertiary bracts, if used simultaneously, can act as a guide to the genera. The tertiary bracts of the southern African species of *Peristrophe* are either narrow and single-veined, or if broad, then the veins are pinnate and the secondary veins are reticulate near the margins (Figure 1), whereas the bracts of *Dicliptera* are 3-, 5- or even 7-veined from the base and

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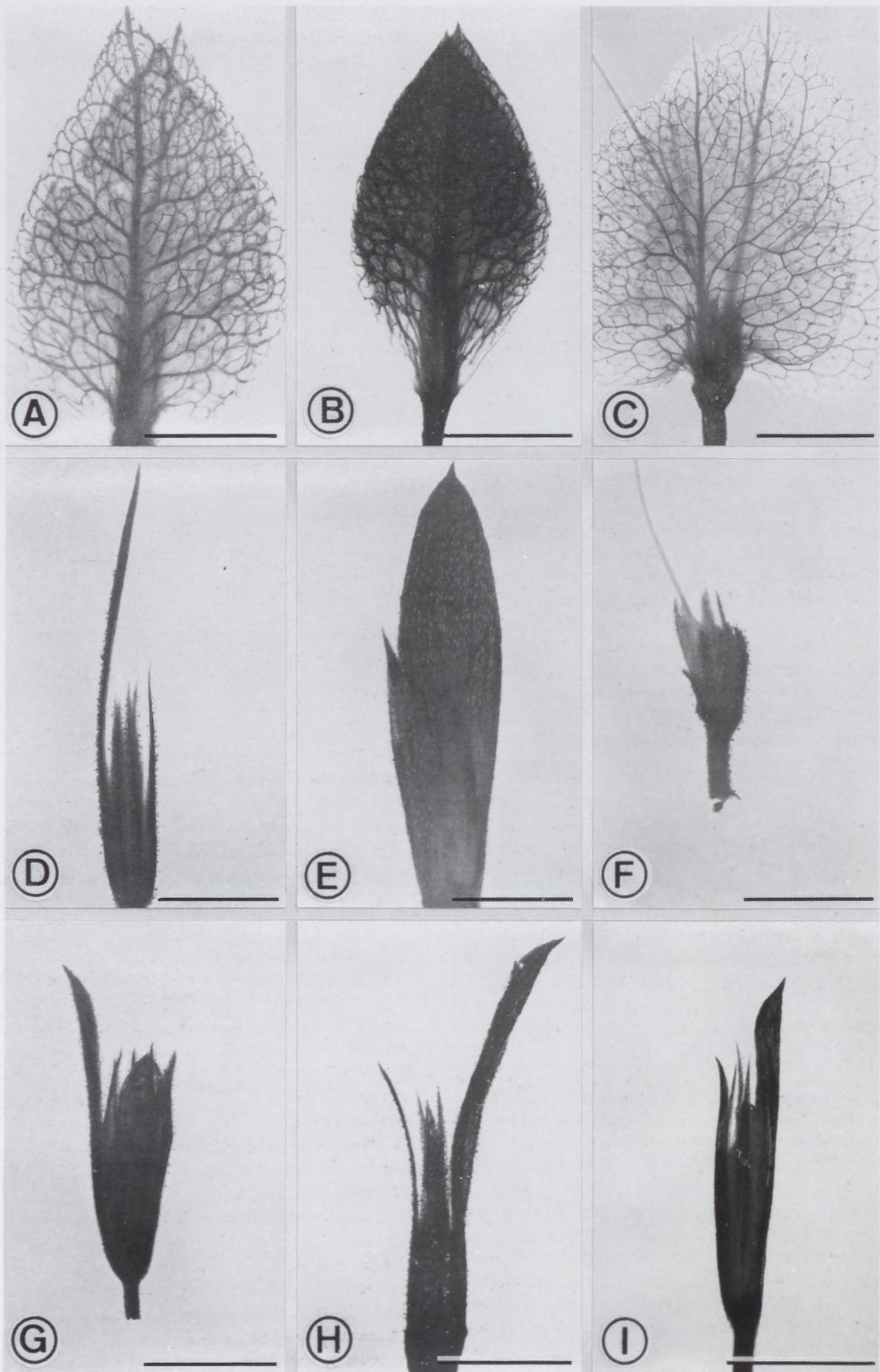


FIGURE 1.—Inflorescence units of southern African species of *Peristrophe*, illustrating tertiary bracts. A, *P. grandibracteata*, Muller 1311 (WIND); B, *P. hereroensis*, De Winter 2356 (PRE); C, *P. namibiensis*, De Winter & Leistner 5828 (WIND); D, *P. paniculata*, Goldblatt 1929 (NBG); E, *P. transvaalensis*, Balkwill 764 (J); F, *P. cliffordii*, Balkwill 793 (J); G, *P. gillilandiorum*, Bruce 58 (K); H, *P. cernua*, Balkwill 168 (J); I, *P. decorticans*, Balkwill 801 (J). Scale bar: 4 mm.

the secondary veins do not form conspicuous reticulations near the margins.

Nees (1832, 1847), recognised two sections in *Peristrophe* and subdivided the first of these into two subsections, but he did not name the sections or subsections. Since that time, three species of *Peristrophe* have been described from Namibia and these do not belong in the groups described by Nees. Thus, it seems that Nees's (1847) first section comprises three groups, but these three groups are sufficiently different to be recognised at the rank of section. The species of *Peristrophe* in southern Africa belong to two of these groups (referred to as sections 2 and 3 below). It would be premature to formally describe these sections here, before a modern and monographic account of the genus has been completed.

Section 1: inflorescence of two to seven monochasial cymes (inflorescence units) umbellately arranged, 'umbels' sometimes compounded. *Tertiary bracts* spatulate, ovate to obovate, with three, five or seven veins from the base, remaining green when mature. *Capsule* clavate.

Included species (none southern African): *P. baphica* (the type of the genus), *P. montana* Nees and *P. speciosa* Nees.

Section 2: differs from Section 1 by having only two inflorescence units in each 'umbel'; a single primary vein

from the base of the tertiary bracts; tertiary bracts that have conspicuous secondary veins and become membranous when mature (Figure 1A–C); and capsules that are obtrullate in profile.

Inflorescence of monochasial cymes (inflorescence units), usually two umbellately arranged. *Tertiary bracts* ovate to widely ovate, 9.1–14.4 × 6.1–13.8 mm, with a single vein from the base, becoming membranous when mature. *Capsule* obtrullate in profile.

Included species (all southern African): *P. grandibracteata*, *P. hereroensis* and *P. namibiensis*.

Section 3: differs from Sections 1 and 2 by the narrower, less conspicuous tertiary bracts, which are lanceolate to oblanceolate (not ovate to broadly ovate) and narrower than 4 mm (Figure 1D–I) and from Section 2 by the tertiary bracts that are green (not membranous and conspicuously veined) at maturity and by having clavate (not obtrullate) capsules.

Inflorescence of monochasial cymes (inflorescence units), usually 3–4 umbellately arranged, often compounded. *Tertiary bracts* lanceolate to oblanceolate, 3.0–18.0 × 0.4–3.2 mm, green. *Capsule* clavate.

Included southern African species: *P. cernua*, *P. cliffordii*, *P. decorticans*, *P. gillilandiorum*, *P. paniculata* and *P. transvaalensis*.

Key to the southern African species of *Peristrophe*

- 1a Tertiary bracts broader than 5 mm, veins pinnate, secondary veins forming reticulation at bract edges; capsules obtrullate in profile: Section 2:
 2a Secondary bracts leaflike, longer than 7 mm; tertiary bracts widely cuneate at base; leaves lanceolate, length : breadth ratio more than 2.4 : 1:
 3a Young stems appearing white, densely pubescent with eglandular trichomes with enlarged, ornamented terminal cells 1. *P. grandibracteata*
 3b Young stems appearing green, not densely pubescent, trichomes without enlarged terminal cells 2. *P. hereroensis*
 2b Secondary bracts not leaflike, shorter than 7 mm; tertiary bracts reniform or cordate at base; leaves ovate to widely ovate, length : breadth ratio smaller than 2.4 : 1:
 4a Leaf length : width ratio less than 1.75 : 1; tertiary bract length : breadth ratio less than 1.25 : 1; capsules pubescent 3.1. *P. namibiensis* subsp. *namibiensis*
 4b Leaf length : width ratio greater than 1.75 : 1; tertiary bract length : breadth ratio greater than 1.25 : 1; capsules glabrous 3.2. *P. namibiensis* subsp. *brandbergensis*
 1b Tertiary bracts narrower than 4 mm, with a midrib only, or if more veins present, then not forming reticulation at edges of bract; capsules clavate: Section 3:
 5a Corolla 6–14 mm long, plant annual, up to 2 m high; rootstock not woody and seldom branched 4. *P. paniculata*
 5b Corolla longer than 14 mm; plant suffruticose perennial, up to 1.2 m high; rootstock woody and often branched:
 6a Tertiary bracts longer than 14 mm and length : breadth ratio less than 6.2 : 1 5. *P. transvaalensis*
 6b Tertiary bracts shorter than 13 mm, but if longer, then length : breadth ratio greater than 6.2 : 1:
 7a Mature stems densely pubescent between ridges; found in the Limpopo River valley:
 8a Tertiary bracts up to 5 mm long, length : breadth ratio less than 6 : 1 6. *P. cliffordii*
 8b Tertiary bracts longer than 7 mm, length : breadth ratio greater than 7 : 1 7. *P. gillilandiorum*
 7b Mature stems glabrous or sparsely pubescent between ridges or not found in the Limpopo River valley:
 9a Occurring in Zimbabwe, Botswana and Northern Province; lip in lower position (6.5)–7.5–9.2–(10.2) mm long 8. *P. decorticans*
 9b Occurring in KwaZulu-Natal and Eastern Cape; lip in lower position (7.2)–9.8–16.5–(22.3) mm long 9. *P. cernua*

SECTION 2

1. *P. grandibracteata* Lindau in Botanische Jahrbücher 49: 404 (1913); P.G.Mey.: 49 (1968), p. p.; K.Balkwill et al.: 48 (1988). Type: Namibia, Kuibis, (–DB), *Range 613* (SAM!), lecto., designated by Balkwill et al.: 48 (1988); BOL!).

Diagnostic characters: densely white hairy stems (Figure 2A) and broad bracts (Figure 1A). *Distribution:* southern Namibia, south of 24° latitude and west of 18° longitude (Figure 3). *Habitat:* deep sandy soils and dry rocky slopes in the Namib Desert and Bushy Karoo-Namib shrubland (White 1983). *Flowering time:* April to June. *Conservation status:* although not highly localised, *P. grandibracteata* is known from only five specimens,

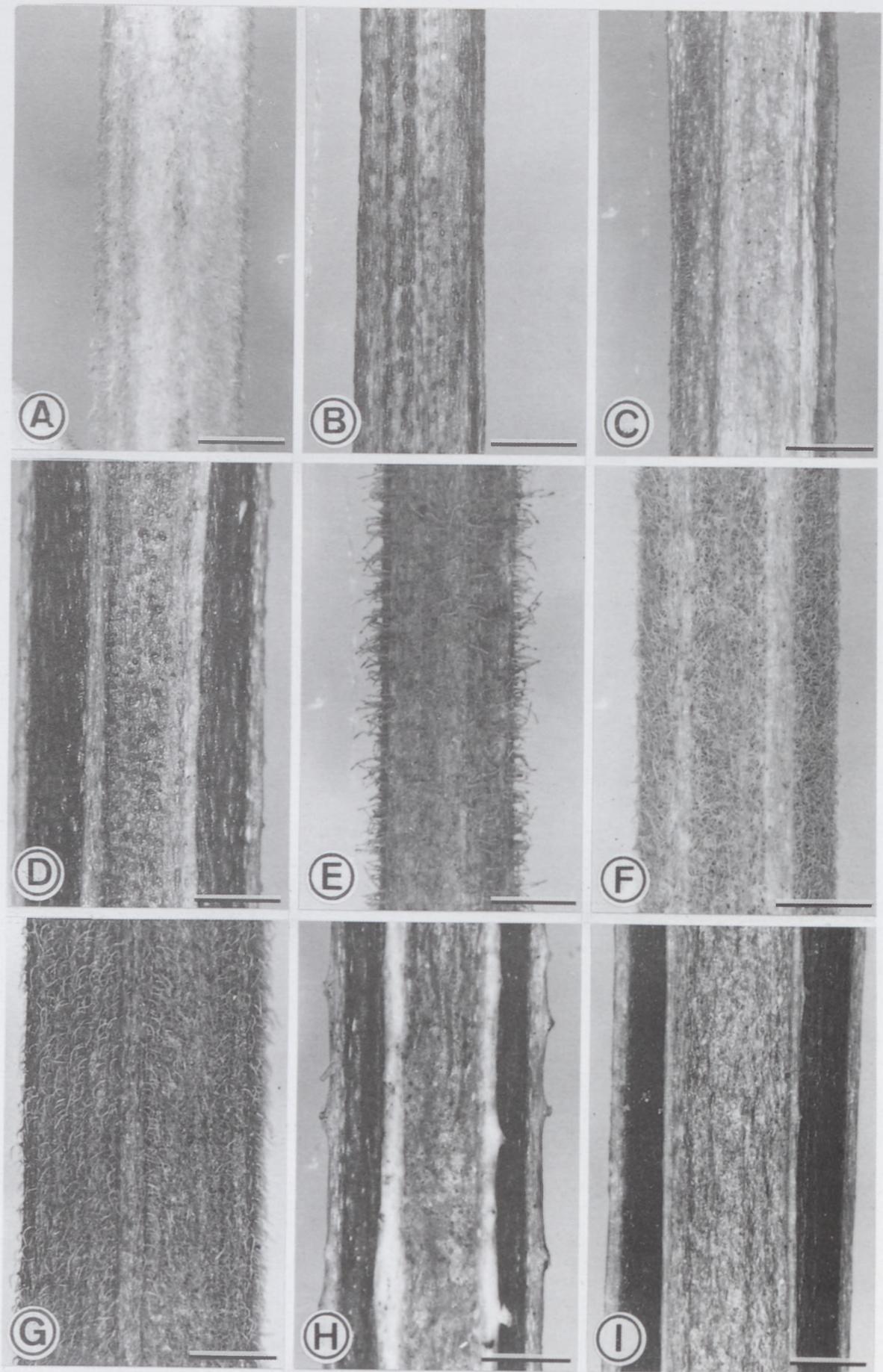


FIGURE 2.—Indumentum on stems of southern African species of *Peristrophe*. A, *P. grandibracteata*, Muller 1311 (WIND); B, *P. hereroensis*, De Winter 2356 (WIND); C, *P. namibiensis*, De Winter & Leistner 5828 (PRE); D, *P. paniculata*, Goldblatt 1929 (NBG); E, *P. transvaalensis*, Balkwill 764 (J); F, *P. cliffordii*, Balkwill 793 (J); G, *P. gillilandiorum*, Bruce 58 (K); H, *P. cernua*, Balkwill 168 (J); I, *P. decorticans*, Balkwill 801 (J). Scale bar: 1 mm.

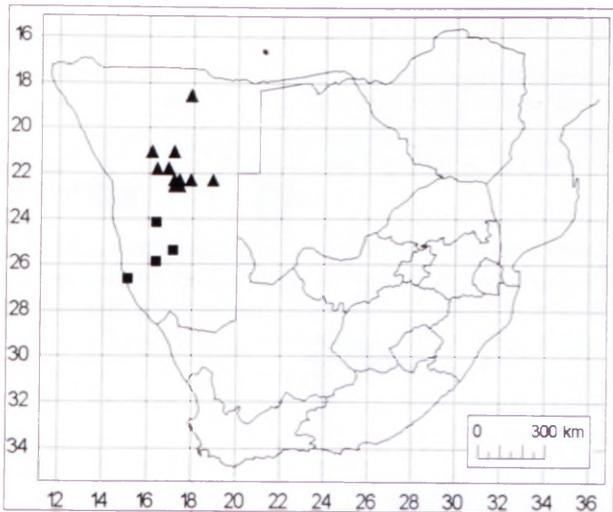


FIGURE 3.—Distribution of *Peristrophe grandibracteata*, ■, *P. hereroensis*, ▲.

suggesting it is rare and its conservation status requires investigation.

2. *P. hereroensis* (Schinz) K.Balkwill in Getliffe Norris et al. in South African Journal of Botany 51: 489 (1985); K.Balkwill et al.: 48 (1988). Type: Namibia, Otjihua, (–BB), *Dinter 459* [Z!, lecto., designated by Balkwill et al.: 48 (1988), 2 sheets; GRA! K!, SAM!].

DiCLIPTERA hereroensis Schinz in Vierteljahrsschrift der Naturforschenden Gesellschaft in Zürich 61: 438 (1916).

Diagnostic characters: *P. hereroensis* can be distinguished from *P. grandibracteata* by its green stems with sparse eglandular hairs (Figure 2B) rather than white stems with dense ornamented eglandular hairs. It differs from *P. namibiensis* by the tertiary bracts that are widely cuneate at the base (Figure 1B) (not reniform or cordate), secondary bracts that are longer than 7 mm (not shorter than 6 mm) and by the narrower leaves [length : breadth ratio greater than (not less than) 2.4 : 1]. **Distribution:** northern Namibia (Figure 3). **Habitat:** on various kinds of soils, usually in the shade of trees of *Acacia*, in Kalahari *Acacia* wooded grassland and deciduous bushland and the Kalahari/Karoo-Namib transition (White 1983). **Flowering time:** between November and July, with a peak in March and April. **Conservation status:** *P. hereroensis* is known from 17 collections from a number of different localities. It is unlikely to be rare or threatened.

3. *P. namibiensis* K.Balkwill in Balkwill et al. in South African Journal of Botany 54: 52 (1988). Type: Namibia, Farm Blässkranz (REH 7), Berghang, (–AC), *Merxmüller & Giess 28127* (PRE, holo.; WIND!).

Diagnostic characters: *P. namibiensis* differs from *P. grandibracteata* by its green (not white) stems and from *P. grandibracteata* and *P. hereroensis* by its much smaller secondary bracts that are not leaflike and by its cordate tertiary bracts (Figure 1C).

3a. subsp. *namibiensis*

Diagnostic characters: leaf length : width ratio of less than 1.75 : 1; tertiary bract length : breadth ratio of less

than 1.25 : 1; and pubescent capsules distinguish subsp. *namibiensis*. **Distribution:** southern half of Namibia (Figure 4). **Habitat:** on dolomite koppies (and possibly other habitats) in the Kalahari/Karoo-Namib transition and Namib Desert (White 1983). **Flowering time:** April to August. **Conservation status:** this taxon is known from only five collections, suggesting that its conservation status requires investigation.

3b. subsp. *brandbergensis* K.Balkwill in Balkwill et al. in South African Journal of Botany 54: 52 (1988). Type: Namibia, Outjo Farm OU 516, Sandsteinruecken, *Giess & Barnard 7921* (WIND, holo.; NBG!, PRE!).

Diagnostic characters: leaf length : width ratio greater than 1.75 : 1; tertiary bract length : breadth ratio greater than 1.25 : 1; and glabrous capsules distinguish subsp. *brandbergensis*. **Distribution:** northern half of Namibia (Figure 4). **Habitat:** Bushy Karoo-Namib shrubland and Namib Desert (White 1983). **Flowering time:** April to August. **Conservation status:** this taxon is known from nine collections (some quite recent) from a number of localities; it is unlikely to be threatened.

SECTION 3

4. *Peristrophe paniculata* (Forssk.) Brummitt in Wood et al. in Kew Bulletin 38: 451 (1983). Type: Yemen, *Forsskål 385* [C, designated by Brummitt (Wood et al. 1983), seen on microfiche 38: III. 3–4 at J].

Dianthera paniculata Forssk. (1775).

Dianthera bicalyculata Retz.: 297 (1775 [published in 1776]); Retz.: 10 (1779); Vahl: 6 (1790). *Justicia bicalyculata* (Retz.) Vahl: 13 (1791); Willd.: 81 (1797); Vahl: 113 (1804); Roem. & Schult.: 143 (1817); Roxb.: 127 (1820); Roem. & Schult.: 130 (1822); Wall.: 2457 a–g (1830); Roxb.: 126 (1832). *Peristrophe bicalyculata* (Retz.) Nees: 113 (1832); Nees: 496 (1847); Hook.f. & Benth.: 484 (1849); A.Rich.: 160 (1850); Dalzell & Gibson: 197 (1861); T.Anderson: 47 (1864); T.Anderson: 521 (1867); C.B.Clarke: 554 (1885); Lindau: 331 (1895a); Lindau: 371 (1895b); Lindau: 80 (1897); C.B.Clarke in Burkill & Clarke: 242 & 514 (1899); C.B.Clarke: 85 (1901); Chev.: 501 (1920); Schnell: 20 (1953); Dandy: 28 (1954); Andrews: 185 (1956); Heine: 424 (1963); Cufodontis: 959 (1964); P.G.Mey.: 49 (1968); Agnew: 609 (1974); Solms: 113 & 244

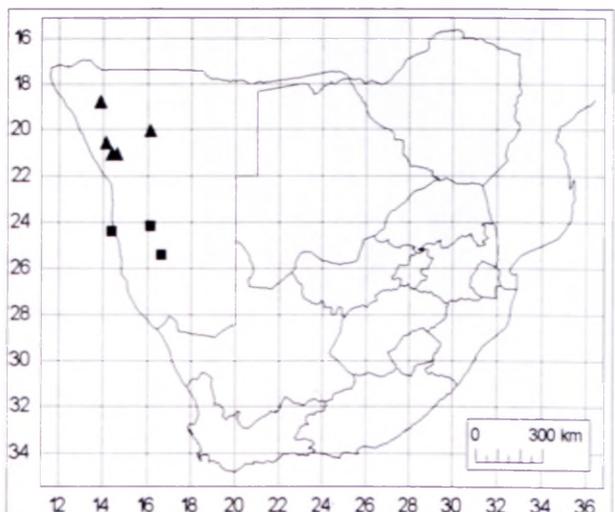


FIGURE 4.—Distribution of *Peristrophe namibiensis* subsp. *namibiensis*, ■, subsp. *brandbergensis*, ▲.

(1867). Type: possibly *Koenig* (on microfiche of Linnean herbarium, fide Wood et al. 1983).

Dianthera malabarica L.f.: 85 (1782), nom. illeg. *Justicia malabarica* (L.f.) Aiton: 27 (1789), nom. illeg. Type: as for *D. bicalyculata* Retz.

Justicia ligulata Lam.: 632 (1785); Cav.: 52, t. 71 (1791); Lam.: 40, t. 12, fig. 2 (1791); Lam.: 95 (1811), nom. illeg. Type: as for *Dianthera paniculata* Forssk.

Suffruticose annual up to 2 m high with relatively small tap root system. *Leaves* ovate to lanceolate, acuminate to acute, sometimes rounded, attenuate at base, (12–)17–46 (–65) × 3–14 (–38) mm, very thin, slightly scabrid above, soft below, with simple hairs and cystoliths; petiole 0.9–3.9 (–36.0) mm. *Inflorescence* of monochasial cymes (inflorescence units), (1)2 or 3(4) umbellately arranged, usually compounded; inflorescence axis (8.0–)11.8–19.4 (–31.0) mm; longest peduncle of inflorescence units (7.0–)10.9–18.6 (–30.0) mm. *Bracts*: secondary bracts lanceolate, (2.5–)3.5–4.6 (–7.8) × (0.2–)0.4–0.6 (–1.0) mm, with short broad-based eglandular trichomes; tertiary bracts lanceolate, acuminate, larger one (7.0–)9.2–14.9 (–18.0) × (0.4–)0.6–1.1 (–1.5) mm, sparsely strigose, with short-stalked and sessile glandular trichomes on surface. *Calyx*: tube 1 mm deep; lobes lanceolate, 3 mm long, margins membranous at base, and strigose, with glandular trichomes more common towards base, outer surface sparsely strigose, with sessile glandular trichomes, inner surface sparsely strigose, with appressed eglandular trichomes. *Corolla*: tube (5.0–)5.2–6.6 (–7.0) mm deep, with medium, straight and curved eglandular trichomes; lip in lower position elliptic, 3.5–7.2 (–7.3) × (1.8–)1.9–2.7 (–3.2) mm; lip in upper position narrowly elliptic, (5.0–)5.2–6.9 (–8.0) × (1.2–)1.3–1.7 (–1.8) mm; lilac, purple or deep purple. *Stamens*: filaments with short, curved, ornamented eglandular trichomes, white; anther thecae superposed, not touching, purple. *Disc* very shallowly cupular, upper edge crenate with 2 small triangular awns. *Gynoecium*: stigma bilobed; style glabrous; ovary ovoid, very hairy and glandular. *Fruit* (9.0–)9.4–12.3 (–14.0) × (2.0–)2.2–2.8 (–3.5) mm, hairy. *Seeds* discoid, 2.2–2.4 (–2.5) mm, rough and tuberculate.

The names *P. paniculata* and *P. bicalyculata* were both validly published in publications bearing the date 1775. They are taxonomic synonyms but *P. paniculata* has priority (Wood et al. 1983). The species has only been collected between February and August, and most often in May in southern Africa. The specimens collected in the earlier months are of younger and smaller plants than those collected in the later months. This is particularly noticeable in the series collected in 1963: *Giess, Volk & Bleissner 5503* (26/02/1963); *Giess, Volk & Bleissner 6464* (25/04/1963); *Leippert 4653* (09/05/1963); *Giess & Leippert 7317* (05/06/1963) (Figure 5). This suggests that the species is an annual, although it has been said to reach 2 m high (fide notes on *Smith 1293* in PRE).

Diagnostic characters: smaller flowers, less than 13.7 mm long, very shallow disc and small simple tap root system serve to separate *P. paniculata* from all other southern African species of *Peristrophe*. It has often been confused with *P. decorticans* and can be separated from the latter species by the mature bark, which is smooth and black in *P. paniculata* and white and peeling in *P. decorticans*; by the ratio of length of larger tertiary bract to that

of the shorter, which is (1.4–)1.6–2.2 (–2.6) : 1 in *P. paniculata* and 1.2–1.4 (–1.6) : 1 in *P. decorticans*; and on the basis of distribution: *P. paniculata* grows in Namibia and in northwestern Botswana; *P. decorticans* in eastern Botswana and in Northern Province. The fruits of *P. paniculata* are more densely sericeous than those of any other species in southern Africa, but the small flowers are the most reliable character with which to distinguish *P. paniculata*. *Distribution*: *P. paniculata* is a widely distributed species and ranges as far east as India, and as far west and south as Namibia (Figure 6). *Habitat*: in southern Africa, it is found in the semi-arid savanna and semidesert areas. *Flowering time*: February to August. *Conservation status*: this widespread species is well represented in many herbaria. The first flowers formed are cleistogamous so that the seed bank is rapidly replenished after seeds germinate. This species is neither rare nor threatened.

5. *Peristrophe transvaalensis* (C.B. Clarke) K. Balkwill in Getliffe Norris et al. in South African Journal of Botany 51: 489 (1985). Type: Northern Province, without precise locality, *Holub s.n.* (K, holo!).

Dicliptera transvaalensis C.B. Clarke: 92 (1901).

Evergreen suffruticose perennial up to 1 m high. *Leaves* ovate to narrowly elliptic, acuminate, attenuate at base, 26–41 (–42) × 8–13 (–14) mm, with many multicellular eglandular trichomes and cystoliths; petiole (1.7–)2.0–4.3 (–4.6) mm. *Inflorescence* of monochasial cymes (inflorescence units), (1 or 2)3(4) umbellately arranged, sometimes compounded; inflorescence axis (4.0–)4.2–7.0 (–7.4) mm long; longest peduncle of inflorescence units (2.4–)4.1–12.9 mm long. *Bracts*: secondary bracts 2, free, lanceolate, (4.7–)5.1–6.6 × 0.6–1.0 (–1.1) mm, pubescent, sessile; tertiary bracts oblanceolate, unequal, larger one (13.6–)13.8–16.1 (–16.4) × (0.4–)0.6–1.1 (–1.5) mm, almost tomentose, trichomes multicellular and eglandular. *Calyx*: tube 1.5 mm deep; lobes, lanceolate, 5.5 mm long, margins membranous and ciliate, with small glandular trichomes on outer surface. *Corolla*: tube (7.3–)7.5–9.0 mm long, sericeous to tomentose; lip in lower position ovate, (7.1–)8.8 (–9.0) × 2.0–2.7 mm; lip in upper position narrowly elliptic, 7.0–8.4 (–8.8) × (2.4–)2.5–3.5

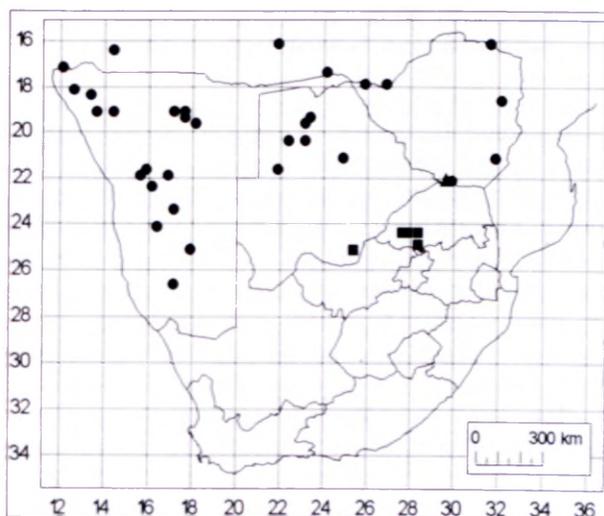


FIGURE 6.—Distribution of *Peristrophe paniculata*, ●; *P. transvaalensis*, ■; *P. cliffordii*, ▲.

(-3.6) mm; light purple with dark purple honey-guides on white background on lip in upper position. *Stamens*: filaments with short and long multicellular eglandular trichomes, white; anther thecae superposed, purple. *Disc* shallowly cupular with crenate top and 2 short stubby awns. *Gynoeceum*: stigma shortly bilobed; style sparsely strigose; ovary ovoid, sparsely pubescent. *Fruit* pubescent, 9.0–10.1 × 2.1–2.5 mm. *Seeds* 2.0–2.2 × 1.8–2.0 mm, rough and tuberculate.

It was necessary to transfer *P. transvaalensis* from the genus *Dicliptera* as the placentae are inelastic at the base. *Diagnostic characters*: the closest ally to *P. transvaalensis* is *P. angolensis* which has a characteristic inflorescence structure with many inflorescence units contracted into an axil, and an occasional inflorescence unit with a very long peduncle. In contrast, the inflorescence units of *P. transvaalensis* are not contracted into the leaf axils. The broader tertiary bracts of these two species serve to separate them from the other species of *Peristrophe* in southern Africa. *P. transvaalensis* has a marked vestiture of multicellular uniseriate eglandular trichomes, which imparts a grey-green colour to the leaves of living plants; this feature is very unusual in this section of the genus. *Distribution*: Botswana and southwestern Northern Province (Figure 6). *Habitat*: interface of Acocks's (1988) Sourish Mixed Bushveld and Sour Bushveld [now Mixed Bushveld (Van Rooyen & Bredenkamp 1996a) and Waterberg Moist Mountain Bushveld (Van Rooyen & Bredenkamp 1996b)]. *Flowering time*: in the field the plants were beginning to flower in January, and were flowering profusely when revisited in May, whereas the plants in cultivation were still in flower in August of the same year. It appears that the species flowers throughout the year, but more profusely in winter. *Conservation status*: *P. transvaalensis* is not a common species and is known from only six gatherings from a relatively restricted area and populations of the plant are sparse. The conservation status of this species requires urgent investigation.

6. ***Peristrophe cliffordii*** K.Balkwill in Balkwill et al. in South African Journal of Botany 51: 485 (1985). Type: Northern Province, East [should be west] of Messina, on road to Weipe, 2.8 km from Messina-Pontdrift road, (-BA), *Balkwill* 793 (NU, holo.!, PRE!).

Diagnostic characters: *P. cliffordii* can be separated from all other species of *Peristrophe* in southern Africa by its much smaller tertiary bracts (Figure 1F) that are covered in rust-coloured glandular and eglandular hairs. In addition, it, *P. gillilandiorum* and *P. transvaalensis* have many grey hairs between the ridges on the stems (Figure 2E) which separates them from *P. grandibracteata*, which has dense white hairs on its stem, and all other species, which have no or very few hairs between the ridges on the stem. The broader leaves separate this species from *P. gillilandiorum*, and the much smaller tertiary bracts separate it from *P. transvaalensis*. *Distribution*: highly localised near Weipe, west of Messina in the Northern Province (Figure 6). *Habitat*: on Kalahari sands amongst *Colophospermum mopane* in the frost-free Limpopo Valley. *Flowering time*: autumn and winter. *Conservation status*:

this species is extremely rare and localised. Repeated droughts coupled with browsing do not augur well for it.

7. ***Peristrophe gillilandiorum*** K.Balkwill in Balkwill et al. in South African Journal of Botany 51: 488 (1985). Type: Northern Province, Dongola, Farm Schroda, (-AB), *Bruce* 58 (PRE, holo.!, K!).

Diagnostic characters: the long, narrow leaves of this species are distinctive. For other differences, see under *P. cliffordii*. *Distribution*: very localised in southern Zimbabwe (on Sentinel Ranch) and Northern Province (mainly on the Farm Schroda) (Figure 7). *Habitat*: rocky ridges and on deep clay amongst *Hyphaene coriacea* Gaertn. *Flowering time*: autumn and winter. *Conservation status*: *P. gillilandiorum* is known from only five specimens and is highly localised. One of the habitats (heavy clay) is being ploughed and planted to cotton, making this species both rare and threatened.

8. ***Peristrophe decorticans*** K.Balkwill in Balkwill & Getliffe Norris in South African Journal of Botany 55: 254 (1989). Type: Northern Province, Louis Trichardt Dist., beside N1, at gate to Plaas Marius, north of Wyliespoort, *K.Balkwill* 801 (J, holo.!, E!, K!, NU!, PRE!).

P. kotschyana sensu K.Balkwill: 293 (1985); K.Balkwill et al.: 485, 488 (1985); K.Balkwill et al.: 514–520 (1986), non Nees.

Diagnostic characters: *P. decorticans* differs from *P. paniculata*, with which it has often been confused, by its perennial (not annual) habit, woody (not herbaceous) stem bases, white, peeling (not black) bark, strigose (not glandular-pubescent or glabrous) tertiary bracts, larger [14.7–19.0 (not 6.6–13.7) mm long] flowers and usually glabrous (not pubescent) capsule. *P. decorticans* differs from *P. cernua* by its white peeling (not green or white, non-peeling) bark, strigose (not densely glandular) tertiary bracts and presence of honey-guides on the lip in the lower position. *Distribution*: *P. decorticans* occurs in Botswana, North-West, Northern Province and Mpumalanga (Figure 7). *Habitat*: bushveld, usually in the shade of trees. *Flowering time*: plants have been collected in flower throughout the year, with peaks in December, January,

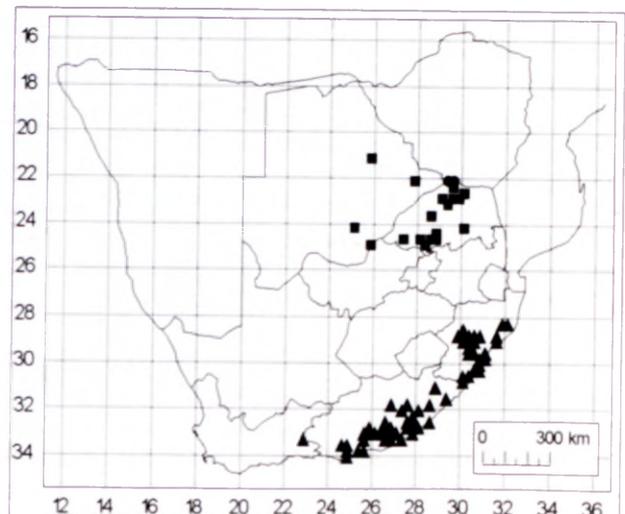


FIGURE 7.—Distribution of *Peristrophe gillilandiorum*, ●; *P. decorticans*, ■; *P. cernua*, ▲.

May, July and November. In cultivation, plants flower sporadically in all seasons, although they produce more flowers in autumn and early winter. *Conservation status*: this species is widespread in southern Africa and is fairly frequent where it occurs; it is neither rare nor threatened.

9. *Peristrophe cernua* Nees in Linnaea 15: 374 (1841); Hook.: 126 (1840), nom. nud. as *Peritrophe cernua*; C.B. Clarke: 85 (1901). Type: Eastern Cape, 'Inter frutices ad flumen Zwartkopsrivier, Octobri' [= Inter frutices in campis ad flumen 'Zwartkopsrivier' prope praedium Pauli Mare, alt. I (Uitenhage), cum *Rhytiglossa ciliata*, floret Octobri—in original description], (–CD), *Ecklon Un. It.* 556 (GZU, holo.! 2 sheets, STE!).

Peristrophe oblonga Nees: 375 (1841). *Rhinacanthus oblonga* (Nees) Nees: 444 (1847). Type: Eastern Cape, südöstlich vom Katberg, Schumberg, *Ecklon* (S!).

Justicia caulopsila E.Mey.: 137, 195 (1843), nom. nud.

Peristrophe krebsii C.Presl: 94 (1844); C.B. Clarke: 86 (1901). Type: Eastern Cape, without precise locality, *Krebs pl. cap. exs. n. 251* (BR!).

P. caulopsila E.Mey. ex Nees: 498 (1847); C.Presl: 95 (1844), nom. nud.; T. Anderson: 48 (1864); Lindau: 331 (1895a); C.B. Clarke: 84 (1901). Type: Eastern Cape, Somerset Div., between Zuurberg Range and Kleinbruintjieshoogte, 2000–2500 ft, (–AD), *Drège* (K. lecto.!; G-DC seen on microfiche, here designated).

P. natalensis T. Anderson: 48 (1864); C.B. Clarke 85 (1901); J.H. Ross: 325 (1972). Type: KwaZulu-Natal, Port Natal, (–CC), *Gueinzus* (K. lecto.!; here designated).

Non *P. hensii* (Lindau) C.B. Clarke in Burkill & Clarke: 243 (1900); C.B. Clarke: 85 (1901).

Non *P. cernua* sensu Compton: 557 (1976).

Evergreen suffruticose perennial up to 1 m high. *Leaves* ovate, acuminate, reniform to cuneate and attenuate at base, (11–)18–37(–50) × (5–)8–16(–23) mm, with multicellular eglandular and short-stalked glandular trichomes; petiole (1.0–)1.2–5.5(–14.6) mm long. *Inflorescence* of monochasial cymes (inflorescence units), (1)2 or 3(4) umbellately arranged, often compounded; inflorescence axis (1.6–)3.3–10.8(–16.0) mm long; longest peduncle of scorpioid cymes (1.7–)4.5–11.6(–22.7). *Bracts*: secondary bracts lanceolate, (2.2–)2.6–4.5(–6.2) × (0.2–)0.3–0.5(–0.6) mm, pubescent; tertiary bracts lanceolate, unequal, larger one (4.7–)6.7–12.0(–16.0) × 1.0–1.3(–1.6) mm, with multicellular eglandular and large and small short-stalked glandular trichomes. *Calyx*: tube 1 mm deep; lobes 3.5 mm long, margins membranous and ciliate, with large and small glandular trichomes. *Corolla*: tube (5.5–)8.0–9.8(–12.0) mm deep, sericeous, with medium-headed glandular trichomes; lip in lower position ovate, (7.2–)9.8–16.5(–22.3) × (2.4–)2.9–5.6(–8.6) mm; lip in upper position narrowly elliptic, (8.0–)10.0–16.2(–21.3) × (1.6–)2.2–3.4(–4.0) mm; purple with dark purple honey-guides below filaments on lip in lower position, and on white background on lip in upper position. *Stamens*: filaments with short and long, straight and curved, multicellular, eglandular trichomes, white; anther thecae superposed, separated, purple. *Disc* cupular with crenate top and 2 short stubby awns. *Gynoecium*: stigma bilobed; style exserted, sparsely strigose; ovary ovoid, with curved multicellular eglandular trichomes and stalked glandular trichomes. *Fruit* a short-stalked clavate capsule, with glandular and eglandular trichomes, (9.4–)10.4–13.1(–14.0) × (1.5–)1.8–2.3(–3.0) mm. *Seeds* (2.0–)2.2–2.7(–2.9) × (1.5–)1.8–2.2(–2.3) mm, rough and tuberculate.

Diagnostic characters: *P. cernua* is closely allied to *P. decorticans* as discussed under the latter. *P. cernua* can be separated from *P. paniculata* by the larger flowers; from *P. transvaalensis* by the shorter, narrower tertiary bracts (cf. Figure 1E & H), and from *P. cliffordii* and *P. gillilandiorum* by the lack of curved eglandular trichomes between the ridges on the stem (Balkwill *et al.* 1986). *Distribution*: northern KwaZulu-Natal to Eastern Cape (Figure 7). *Habitat*: *P. cernua* is usually found in valley bushveld, and the few specimens that are found out of this veld type are found in coastal forest and thornveld communities. *Flowering time*: plants have been collected in flower throughout the year, but there is a very marked peak in collections in July and August. *Conservation status*: *P. cernua* is widespread and common where it occurs; it is neither rare nor threatened.

Identification of the type of *P. cernua* has been confused by the complexities of Ecklon & Zeyher's collections and numbering system. Zeyher collected and distributed material from the Uitenhage area before initiating a collecting pact with Ecklon (Gunn & Codd 1981). Until then, Ecklon had not collected near Uitenhage and had distributed his specimens through a botanical exchange called Unio Itineraria. Shortly after their pact was initiated, Ecklon collected at Uitenhage and wrote 'A list of plants found in the district of Uitenhage between the months of July 1829 and February 1830', in which *Justicia capensis* is listed under Family 40 (Ecklon 1830). Later he and Zeyher collected in the area together and distributed specimens with either or both their names on the labels and after their pact lapsed, Zeyher collected from there again. Their numbering system was not one with consecutive numbers for consecutive gatherings, but rather the localities were coded in numbers on the labels. Because of the coding system, inconsistencies occurred during the distribution of material so that specimens from the same gathering may have different data on the labels and specimens with the same number, locality and collecting data may be from different gatherings (Gunn & Codd 1981). Some specimens were distributed with personal numbers, some with combined numbers and some with locality numbers. It seems that the number 40 (probably the family number for Acanthaceae) is applied to any sheet they collected of *P. cernua*. Nees (1841) does not cite a herbarium for the type of *P. cernua* (and cites his own herbarium as well as others in 1847). The type was presumably in his own herbarium and distributed to GZU. There are two sheets at GZU that were collected by Ecklon, distributed through the Unio Itineraria and part of a mixed gathering labelled *Justicia capensis*, suggesting that they are part of the type gathering—these sheets are presumably the holotype. A sheet has been found at STE, bearing the number 556 (now crossed out), the name *Justicia capensis*, and an English version of the locality on the sheets at GZU—this sheet is most likely an isotype. One or both of the sheets presently housed at Kew, must represent the gathering(s) to which Hooker (1840) referred when offering Zeyher's material for sale. Hooker's listing of the species antedates Nees's description, but as it was not accompanied by a description, diagnosis or precise locality, it is a *nomen nudum*. It is uncharacteristic of Nees not to quote previous references when they existed, and unlikely that both Nees and Hooker would have inde-

pendently decided on the same name for the same species, so that it appears that Hooker must have seen Nees's manuscript before it was published, or that Ecklon and/or Zeyher may have circulated the specimens with a name which was taken up by Nees. It would, however, have been characteristic of Nees to cite the source of a name, even if he had taken it up from a label. One of the sheets at Kew bears the name *Justicia capensis* and a locality in Ecklon's hand. The sheets at Kew bearing the number 40 are undoubtedly those to which Hooker (1840) referred, most likely those to which Nees referred in 1847, but not those to which he referred in 1841. The Kew sheets also bear the name *Justicia capensis* and this may indicate that these sheets were amongst those to which Ecklon (1830) referred. It is therefore possible that the material at Kew is part of the type gathering (although it has the wrong month on the label). There are two Ecklon & Zeyher specimens and one Zeyher specimen from the type locality at SAM, all with the number 40, but none of these was collected in October and so are not considered part of the type gathering.

The size of the tertiary bracts and flowers of this species displays clinal variation (Balkwill *et al.* 1994). The smaller structures are present in Eastern Cape and the larger in KwaZulu-Natal. It is likely that this cline accounts for a number of the synonyms of *P. cernua*. This species sometimes produces white individuals (Balkwill 445) and white populations (Brink 327). As the description of *P. krebsii* differs from *P. cernua* mainly by the white corolla, it is possible that this name was applied to a white form of *P. cernua*. Ross (1972) recorded *P. hensii* from KwaZulu-Natal, but this name refers to a tropical species.

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- Chase* 2602 (4) SRGH. *Codd* 7549 (4) PRE, SRGH; 9290 (9) GRA, NBG, PRE. *Comins* 1561 (9) PRE; 359 (9) NU. *Compton* 19744 (9); 326 (4) NBG. *Cooper* 161 (9) K; 1618 (9) RUH. *Craven* 956 (4) WIND.
- Dahlstrand* 535 (9) GRA, J. *De Winter & Leistner* 5652 (4) PRE, WIND. *Dinter* 39, 2909 (4) SAM; 3004 (4) PRE, SAM. *Drummond* 6035 (4) PRE; 5560 (4) PRE, SRGH. *Drummond & Seagrief* 5177 (4) PRE. *Du Toit* 2393 (9) PRE. *Dyer* 4374 (9) PRE.
- Ecklon & Zeyher* 40 (9) BOL, K, SAM. *Edwards* 785 (9) NU.
- Fanshawe* 6829 (4) SRGH. *Fisher* 36 (9) NU. *Flanagan* 721 (9) BOL, NH, PRE, SAM. *Forward sub GRA* A1611 (9) GRA. *Fourcade* 2746 (9) BOL, STE; 5755 (9) NBG, STE.
- Gajadhur* 39 (9) UDW. *Galpin* 14806, sub BOL 32312, sub PRE 11553 (9) BOL, PRE; 2044 (9) BOL; 7749, 7805 (9) PRE. *Garrett* 20 (9) NU. *Gayapersad* 34 (9) UDW. *Germishuizen* 775, 811 (5) PRE. *Giess* 10377 (4) PRE, WIND; 10480, 15125 (4) WIND. *Giess & Leippert* 7317 (4) NBG, WIND. *Giess, Volk & Bleissner* 6464 (4) WIND; 5503 (4) PRE, WIND. *Gillett* 1293 (9) STE; 3804 (5) STE. *Goldblatt* 1929 (4) NBG, PRE, WIND. *Gonde* 92/74 (4) PRE, SRGH. *Govender* 4 (9) UDW. *Green* 188 (9) NH. *Grice s.n.* (9) NU.
- Hartley* 990 (5) J. *Harvey* 3597 (9) BOL. *Huntley* 2 (9) NU, PRE. *Hurter sub RUH* 3283 (9) RUH.
- Jacobsen* 4086 (673) (4) PRE; 51 (9) NU.
- Keerath* 2 (9) UDW. *Khan* 13 (9) UDW. *Kunhardt* 9 (4) SRGH.
- Lambrecht* 125 (4) PRE. *Le Roux* 1045 (4) WIND. *Leighton sub NBG* 48702 (9) NBG P4; *Leippert* 4653 (4) WIND. *Lewis* 4564, 4565 (9) SAM; 4566 (9) PRE, SAM. *Liebenberg* 7754 (9) PRE. *Lindstedt* 12 (9) PRE. *Long* 685 (9) GRA, MPE, PRE.
- Marloth* 1312 (4) PRE, STE. *Meeuse* 9644 (5) PRE. *Moll* 1713 (9) NU, PRE.
- Naidoo* 11 (9) UDW. *Napper* 1254 (4) PRE. *NH* 26839 (9) NH. *Nicholson* 1760 (9) PRE.
- Obermeyer sub Herb. Tvl Mus.* 33568 (9) PRE.
- Padwa* 279 (4) PRE, SRGH. *Paterson* 2093 (9) BOL. *Pearson* 2550 (4) BOL. *Phelan* 636 (9) NU. *Pilland* 16571 (9) BOL.
- Range* 1358 (4) SAM. *Rennie* 405 (9) BOL. *Rodin* 1069 (9) BOL, PRE. *Rogers* 13179 (4) BOL, NH, PRE.
- Schlechter* 2545 (9) COI, PRE; 2999 (9) COI. *Seydel* 1128 (4) PRE. *Sister Frances sub BOL* 15707 (9) BOL. *Smith* 1293 (4) PRE. *Story* 1284, 2227 (9) GRA, PRE.
- Taylor* 3516 (9) NBG; 491 (9) PRE; s.n. (9) GRA. *Thakersee* 5 (9) UDW. *Thoday sub Herb. Mus. Austr.-Afr.* 25204 (9) SAM. *Thode* 2749, sub STE 7964 (9) STE; A2736 (9) PRE. *Thorne sub Herb. Musei Austr.-Afr.* 35709 (4) SAM. *Thornton* 644 (4) PRE, SRGH. *Tweedie* 3854 (4) SRGH.
- Van Breda* 866 (9) PRE. *Van Son sub Tvl Museum* 28678 (4) PRE. *Van Wyk* 1650 (9) PRE, PLI. *Venter* 3821 (9) PRE. *Vesey-FitzGerald* 1209 (4) SRGH.
- Wager sub Tvl Mus.* 22382 (9) PRE. *Ward* 4974 (9) NU, PRE, UDW; 6925 (9) UDW; 741 (9) NH. *Wells* 1340 (9) NU, PRE. *West* 1238 (9) PRE. *Wild & Drummond* 7129 (4) PRE. *Wood* 11881 (9) BOL, SAM; 609 (9) BOL, K.
- Zeyher* 40 (9) SAM.

SPECIMENS EXAMINED

(and not quoted in other recent publications)

Abbott 1144 (9) PRU. *Acocks* 10164, 15970, 17940 (9) PRE. *Adam* 728 (4) PRE. *Adamson* D303 (9) PRE.

