

# *Plectranthus* (Labiatae) and allied genera in Southern Africa

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## ABSTRACT

A revision is presented of the 40 species of *Plectranthus*, 1 species of *Rabdosia* and 3 species of *Solenostemon* which are indigenous, semi-naturalized or widely cultivated in Southern Africa. Descriptions, illustrations, keys and distribution data are provided. The following new names are published: *P. mutabilis* Codd, *P. psammophilus* Codd, *P. rubropunctatus* Codd, *P. unguentarius* Codd, *P. ornatus* Codd (nom. nov. for *Coleus comosus* Hochst. ex Guerke), *P. zatarhendi* (Forsk.) E. A. Bruce var. *tomentosus* (Benth.) Codd, —var. *woodii* (Guerke) Codd, *P. madagascariensis* (Pers.) Benth. var. *aliciae* Codd, *Solenostemon scutellarioides* (L.) Codd and *S. shirensis* (Guerke) Codd.

## CONTENTS

	Page		Page
Introduction .....	372	20. <i>P. mutabilis</i> Codd .....	404
History .....	372	21. <i>P. psammophilus</i> Codd .....	405
References .....	441	Sect. <i>Plectranthus</i> .....	406
Key to Genera .....	374	22. <i>P. verticillatus</i> (L.f.) Druce .....	407
PLECTRANTHUS .....	374	23. <i>P. strigosus</i> Benth. ....	409
Key to Species .....	374	24. <i>P. purpuratus</i> Harv. ....	410
Subgen. <i>Nodiflorus</i> Codd .....	376	25. <i>P. oertendahlia</i> Th. Fries jun. ....	411
1. <i>P. tetragonus</i> Guerke .....	376	26. <i>P. elegantulus</i> Briq. ....	412
2. <i>P. esculentus</i> N.E. Br .....	377	27. <i>P. ciliatus</i> E. Mey. ex Benth. ....	414
Subgen. <i>Xerophilus</i> Codd .....	378	28. <i>P. fruticosus</i> L'Herit. ....	415
3. <i>P. xerophilus</i> Codd .....	378	29. <i>P. grallatus</i> Briq. ....	418
Subgen. <i>Burnatastrum</i> (Briq.) Codd .....	380	30. <i>P. rubropunctatus</i> Codd .....	420
4. <i>P. candelabrififormis</i> Launert .....	380	31. <i>P. rehmannii</i> Guerke .....	421
5. <i>P. mirabilis</i> (Briq.) Launert .....	381	32. <i>P. swynnertonii</i> S. Moore .....	422
6. <i>P. hereroensis</i> Engl. ....	382	33. <i>P. dolichopodus</i> Briq. ....	423
7. <i>P. spicatus</i> E. Mey. ex Benth. ....	383	34. <i>P. zuluensis</i> T. Cooke .....	424
8. <i>P. cylindraceus</i> Hochst. ex Benth. ....	385	35. <i>P. saccatus</i> Benth. ....	426
Subgen. <i>Coleus</i> (Lour.) Codd .....	387	(a) var. <i>saccatus</i> .....	427
9. <i>P. unguentarius</i> Codd .....	387	(b) var. <i>longitubus</i> Codd .....	428
10. <i>P. amboinicus</i> Lour .....	388	36. <i>P. hilliardiae</i> Codd .....	428
Subgen. <i>Calceolanthus</i> Codd .....	389	37. <i>P. ambiguus</i> (Bol.) Codd .....	429
11. <i>P. tetensis</i> (Bak.) Agnew .....	390	38. <i>P. ecklonii</i> Benth. ....	431
12. <i>P. caninus</i> Roth .....	390	39. <i>P. petiolaris</i> E. Mey. ex Benth. ....	431
13. <i>P. neochilus</i> Schltr. ....	392	40. <i>P. laxiflorus</i> Benth. ....	434
14. <i>P. ornatus</i> Codd .....	393	RABDOSIA .....	436
15. <i>P. barbatus</i> Andr. ....	394	Subgen. <i>Pyramidium</i> (Benth.) Codd .....	436
Subgen. <i>Plectranthus</i> .....	395	<i>R. calycina</i> (Benth.) Codd .....	436
Sect. <i>Coleoides</i> Benth. ....	395	SOLENOSTEMON .....	437
16. <i>P. dinteri</i> Briq. ....	396	Subgen. <i>Solenostemoides</i> (Briq.) Codd .....	438
17. <i>P. grandidentatus</i> Guerke .....	396	1. <i>S. rotundifolius</i> (Poir.) J. K. Morton ...	438
18. <i>P. zatarhendi</i> (Forsk.) E. A. Bruce ....	398	2. <i>S. latifolius</i> (Hochst. ex Benth.) J. K.	
(a) var. <i>zatarhendi</i> .....	398	Morton .....	439
(b) var. <i>tomentosus</i> (Benth.) Codd ....	399	3. <i>S. scutellarioides</i> (L.) Codd .....	439
(c) var. <i>woodii</i> (Guerke) Codd .....	401	Index .....	441
19. <i>P. madagascariensis</i> (Pers.) Benth. ....	402		
(a) var. <i>madagascariensis</i> .....	403		
(b) var. <i>aliciae</i> Codd .....	404		
(c) var. <i>ramosior</i> Benth. ....	404		

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## INTRODUCTION

The genera dealt with in this revision are *Plectranthus* L'Herit. (in which *Coleus* Lour. and certain other genera are included), *Rabdosia* (Bl.) Hassk. (*Isodon* Kudo) and *Solenostemon* Schumach.

The clarification of the species problems in these groups has been made possible largely by the opportunity to study field populations and by the cultivation of a wide range of plants in the garden of the Botanical Research Institute, Pretoria. In addition it has been possible to consult type material of nearly all the species during visits to various European herbaria and by means of loans from several overseas herbaria, whose kind assistance is gratefully acknowledged. In this way the nomenclatural confusion in the literature has largely been cleared up.

The delimitation of genera is, however, far from clear and is likely to remain so until a thorough study of the tropical central and east African species has been undertaken. The Southern African species now placed in *Plectranthus* fall into four or five main groups, each of which could be regarded as a separate genus. However, the distinctions appear to become blurred in tropical Africa and so it is considered inadvisable to erect new genera at this stage. The treatment of the West African Labiatae by Morton (1962) has been largely followed, while observations by Launert (1968) and Blake (1971) are of particular interest. An outline of my views was recently published (Codd, 1971) and forms the basis of the present treatment.

One of the main problems in the Plectranthinae has centred round the generic limits of *Plectranthus* and *Coleus*. Until recently, Bentham's treatment (1832, 1848), based simply on the stamens being free in *Plectranthus* and united in *Coleus*, has been followed with the result that these two genera have grown to be the largest in the group. A rough count in Index Kewensis yielded about 490 species names in the former and about 312 in the latter, though it must be remembered that a number of names are duplicated through transfer from one genus to the other.

Unfortunately the stamen character has proved to be unreliable in certain groups and a different approach to the classification of these species, based mainly on calyx shape, has been sought (Morton, 1962; Codd, 1971; Blake, 1971). If the present tendency is followed, about 100 names will go from *Plectranthus* to *Rabdosia* (91 were transferred by Hara, 1972) and about a similar number should be transferred from *Coleus* to *Solenostemon* as emended by Morton (see Codd, 1971). If the remainder of the *Coleus* species are incorporated in *Plectranthus*, the resulting group, though somewhat heterogeneous, is not excessively large. A classification along these lines would simplify the allocation of species to their respective genera.

## HISTORY

*Plectranthus* L'Herit., Stirp. Nov. fasc. 4: 84 (March 1788) was based on two species, *P. punctatus* (L.f.) L'Herit. and *P. fruticosus* L'Herit. About the

same time *Germanea* Lam., Encycl. 2: 690 (April 1788) was described, also with two species, *G. urticifolia* Lam. and *G. maculosa* Lam. *P. fruticosus* and *G. urticifolia* have proved to be conspecific and the two generic names have generally been treated as synonymous. Until recently the exact dates of publication were unknown, so that *Plectranthus* was formally conserved. With the dates established as above, of *Plectranthus* by Britten & Woodward, J. Bot. Lond. 43: 268 (1905) and of *Germanea* by Rothmaler, Chronica Bot. 5: 439 (1939), conservation becomes unnecessary.

*P. punctatus* was proposed as lectotype species by Miss M. L. Green in Prop. Brit. Bot. 107 (1929), probably because it is the older epithet. However, *P. fruticosus* was cited by Phillips, Gen. ed. 2: 650 (1951) and was supported by Bullock & Killick in Taxon 6: 239 (1957) on the grounds that the characters of this species agree better with L'Heritier's generic description, especially as to the spur on the corolla which suggested the generic name. This proposal was accepted (Taxon 9: 85, 1960).

Bentham (1832, 1848) monographed the species then known, dividing *Plectranthus* into seven sections: *Germanea* (Lam.) Benth., *Coleoides* Benth., *Heterocylix* Benth., *Melissoides* Benth., *Isodon* Schrad. ex Benth., *Pyramidium* Benth. and *Amethystoides* Benth. In Benth. & Hook.f., Gen. Pl. 2: 1175 (1876), Bentham revised this arrangement, recognizing two primary groups: Sect. *Germanea* and sect. *Isodon*. In sect. *Germanea*, with *Germanea* and *Coleoides* as subsections (in which the great majority of conventional *Plectranthus* spp. are placed), the calyx is 2-lipped with the upper lip consisting of a single broad tooth and the lower lip of four narrower acute or acuminate teeth; the cymes are usually (not always) sessile with the pedicels arising from the axis of the inflorescence. Sect. *Isodon*, with *Isodon*, *Pyramidium*, *Amethystoides* and *Melissoides* as subsections, was distinguished by the calyx being equally 5-toothed, in some groups more or less 2-lipped with the upper lip composed of 3 teeth and the lower lip of 2 teeth; the cymes are pedunculate and branched.

A similar classification was adopted by Briquet (1897, pp. 352-357), though *Germanea* and *Isodon* were treated as subgenera. In each subgenus the largest sections, *Coleoides* and *Isodon*, respectively, were subdivided into a number of series. A separate genus, *Burnatastrum* Briq., was based on three species previously in Bentham's Sect. *Isodon*, namely, *Plectranthus lanceolatus* Benth. and *P. lavanduloides* Bak. (both from Madagascar) and *P. spicatus* E. Mey. ex Benth. (from South Africa). The genus was separated on grounds of the circinnate calyx and the flowers being arranged in dichasia. However, when other species are taken into account, it will be seen that these characters tend to grade into *Plectranthus*.

In the present treatment, *Burnatastrum* is placed as a subgenus of *Plectranthus*, while the concept is enlarged to include *P. hereroensis* Engl., *P. cylindraceus* Hochst. ex Benth., *P. mirabilis* (Briq.) Launert and *P. candelabrifformis* Launert. Certain tropical species may well belong here also.

The African species were dealt with by Baker in *Fl. Trop. Afr.* 5: 398–420 (1900), in which 78 species were reviewed, and Cooke in *Fl. Cap.* 5, 1: 266–288 (1910), who records 42 species. Both follow basically Briquet's classification into the two groups *Germanea* and *Isodon*, though Cooke omits mention of *Burnatastrum* Briq. In fact, Cooke's treatment is unsatisfactory in many respects, with closely related species being widely separated and several species misinterpreted.

Briquet's concept of *Isodon* is now generally regarded as being generically distinct from *Plectranthus*. The species occur mainly in Asia and Malesia, with a few in Africa (see p. 436 for further discussion). Asiatic species were separated under the generic name *Isodon* Schrad. by Kudo in *Mem. Fac. Sci. & Agr. Taihoku Imp. Univ.* 2: 118–141 (1929), and as *Amethystanthus* Nakai in *Bot. Mag. Tokyo* 48: 785 (1934) for Bentham's section *Amethystoides*. The African species were given separate status in the genus *Homalocheilos* J. K. Morton. Blake (1971) points out that there is an earlier name for the genus, *Rabdosia* (Bl.) Hassk. in *Flora* 25, Beibl. 2: 25 (1842), based on *Elsholtzia* Willd. sect. *Rabdosia* Bl., *Bijdr. Fl. Ned. Ind.* 825 (1825), the type of which is *E. javanica* Bl., l.c. It may be noted, however, that Keng in *Gard. Bull. Singapore* 24: 13–180 (1969) largely follows Bentham's concept of *Plectranthus* and *Coleus* (see *Solenostemon*, p. 439) in his revision of the Malesian species.

Mention should also be made of *Englerastrum* Briq. in *Bot. Jahrb.* 19: 178 (1894), based on a single tropical African species, *E. schweinfurthii* Briq. This is a depauperate soft herb with leaflike bracts subtending slender racemose inflorescences; the calyx is subequally 5-toothed and the stamens are shortly united at the base. Fries in *Notizbl. Bot. Gart. Berl.* expanded the concept to include species such as *Plectranthus tetragonus* Guerke (see p. 376) and *P. floribundus* N.E.Br. (see p. 377). This view was supported by Alston in *Kew Bull.* 1926: 295 (1926) but Hutchinson & Dandy in *Kew Bull.* 1926: 479 (1926) reduced the genus to about seven species which conform with the original concept. The genus seems scarcely distinct from *Rabdosia*, judging by the leaflike bracts along the stems.

*Coleus* Lour., *Fl. Cochinch.* 372 (1790), was based on *C. amboinicus* Lour., l.c., a species probably of African origin but widely cultivated in the tropics (see p. 388). It was pointed out by Loureiro that the stamens are united at the base and Bentham (1832, 1848) came to regard this characteristic as being of over-riding importance. Thus, although he acknowledged that he had created an artificial assemblage, he enlarged *Coleus* to include three very different sections:

Sect. 1. *Calceolus*, containing species such as *C. spicatus* Benth. and *C. barbatus* (Andr.) Benth. Flowers in dense verticillasters, calyx villous in the throat, upper tooth of calyx large, broadly ovate.

Sect. 2. *Aromaria*, containing the single species *C. amboinicus* Lour. which he included under *C. aromaticus* Benth. Flowers in dense verticillasters, calyx glabrous in the throat, upper tooth of calyx large, oblong, horizontal.

Sect. 3. *Solenostemon*, containing species such as *C. scutellarioides* (L.) Benth., *C. blumei* Benth. and *C. latifolius* Hochst. ex Benth. Flowers in loose to compact dichasia, calyx glabrous within,

upper lip ovate, erect, lateral lobes obsolete or short and truncate, lower lip united into an oblong lobe, entire or forked at the apex.

Sect. *Aromaria* has remained monotypic (though a second species is added in this revision, p. 387). The question arises whether to retain it as a separate genus, when the calyx shape differs only slightly from *Plectranthus*, or to follow Morton (1962) and Launert (1968) who include it in *Plectranthus*. The latter course is consistent with my view of variation in *Plectranthus* and, in the present revision I have placed *Coleus* as a subgenus of *Plectranthus* (cf. the treatment of *Burnatastrum*, p. 380).

Many species names, running into hundreds, have been added to sections *Calceolus* and *Solenostemon* so that a completely distorted view of the genus *Coleus* came to be adopted.

Blake (1971) suggested that *Coleus* could be upheld as a genus with sect. *Calceolus* included in it. However, sect. *Calceolus* differs as much from true *Coleus* as it does from *Plectranthus*. An alternative would be to accord generic rank to sect. *Calceolus* and, if only the South African species are considered, this would seem to be fully justified. However, in tropical Africa the distinction is far from clear. It is, therefore, included in *Plectranthus* as subgen. *Calceolanthus* (p. 389).

Sect. *Solenostemon* derives its name from the genus *Solenostemon* Schumach. (see p. 437), based on the West African *S. ocymoides* Schumach. & Thonn. When Bentham (1832) included it in *Coleus* he renamed it *C. africanus* Benth. and enlarged the concept of the section to include certain species from Madagascar, Asia and Malesia in which the calyx has a somewhat different shape. In typical *Solenostemon* the two lowest calyx teeth are fused into an ovate to oblong, entire or emarginate lip which curves upwards closing the mouth of the tube, while the lateral teeth are reduced or obsolete. In the species which Bentham added, the lower lip of the calyx is strap-shaped and forked at the apex, while the lateral calyx teeth are short and rounded to deltoid. In his later treatment, Bentham (1848) added the African species *C. latifolius* Hochst. ex Benth., and many more species from Africa and elsewhere have subsequently been described (Codd, 1971). Benth. & Hook, f., *Gen. Pl.* 2: 1175 (1876) reinstated *Solenostemon* Schumach. in its strict sense while the additional species were retained in *Coleus*. Briquet's (1897) treatment was essentially similar, though here the additional species were given sectional status in *Coleus* as sect. *Solenostemoides* Briq.

With the transfer of true *Coleus* (*C. amboinicus* Lour.) to *Plectranthus*, Morton (1962) included sect. *Solenostemoides* Briq. in the genus *Solenostemon*, but gave it the name sect. *Coleoidea*, pointing out that it is, in some respects, intermediate between true *Solenostemon* and *Plectranthus*. However, the calyx is easily recognizable and separation from *Plectranthus* appears to be fully justified.

The genus *Solenostemon*, as amended by Morton, is common in tropical Africa and Asia, extending to Malesia. The species are, however, very variable and considerable difficulty in determining species limits will be encountered when the group comes to be revised. Probably one of the best known is the commonly cultivated "Coleus" with variegated leaves known usually as *Coleus blumei*. This may have influenced Keng (1969) to retain *Coleus* in the Benthamian sense for the Malesian species.

## KEY TO GENERA

Calyx 2-lipped to subequally 5-toothed, if 2-lipped then the lower lip consisting of 4 distinct lanceolate-deltoid or subulate teeth:

Bracts small, abruptly differentiated from the leaves.....1. **Plectranthus**

Bracts leaf-like, becoming gradually smaller towards the apex.....2. **Rabdosia**

Calyx 2-lipped, the lowest pair of teeth united for more than two-thirds their length forming an oblong, emarginate lobe, the lateral pair of teeth much shorter, truncate.....3. **Solenostemon**

## 1. PLECTRANTHUS

**Plectranthus** L'Herit., Stirp. Nov. fasc. 4: 85 (March 1788); Willd., Sp. Pl. 3: 168 (1800); Benth., Lab. 29 (1832); in DC., Prodr. 12: 62 (1848); Benth. & Hook. f., Gen. Pl. 2: 1175 (1876); Briq. in Pflanzenfam. 4, 3a: 352 (1897); Bak. in Fl. Trop. Afr. 5: 398 (1900); Cooke in Fl. Cap. 5, 1: 266 (1910); Phillips, Gen. ed. 2: 649 (1951); Morton in J. Linn. Soc. (Bot.) 58: 231 (1962); Launert in Mitt. Bot. München 7: 295 (1968); Codd in Mitt. Bot. München 10: 245 (1971); Blake in Contr. Queensl. Herb. 9: 1-120 (1971). Lectotype: *P. fruticosus* L'Herit.

*Germanea* Lam., Encycl. 2: 690 (April 1788); Hiern, Cat. Afr. Pl. Welw. 1: 865 (1900). Type: based on two species, *G. urticifolia* Lam. and *G. maculosa* Lam.

*Coleus* Lour., Fl. Cochin. 372 (1790); emend. Benth., Lab. 47 (1832), partly; in DC., Prodr. 12: 70 (1848); Benth. & Hook. f. 2: 1176 (1876); Briq. in Pflanzenfam. 4, 3a: 359 (1897); Bak. in Fl. Trop. Afr. 5: 422 (1900); Cooke in Fl. Cap. 5, 1: 289 (1910); Phillips, Gen. ed. 2: 649 (1951), all partly. Type: *C.amboinicus* Lour.

*Neomuelleria* Briq. in Bot. Jahrb. 19: 186 (1894). Type: *N. welwitschii* Briq.

*Burnatastrum* Briq. in Pflanzenfam. 4, 3a: 358 (1897). Lectotype: *B. spicatum* (E. Mey. ex Benth.) Briq.

*Ascocarydion* G. Tayl. in J. Bot. Lond. 69, Suppl. 2: 162 (1931). Type: *A. mirabile* (Briq.) G. Tayl.

Annual or perennial herbs or subshrubs; stems and leaves often succulent or semi-succulent. *Inflorescence* a lax panicle or racemose cyme, often congested or subspicate; flowers in verticils, few-flowered cymes or dichasia, occasionally solitary; bracts small, abruptly differentiated from the leaves. *Calyx* 2-lipped to subequally 5-toothed; when 2-lipped, upper tooth the largest, lower lip of 4 lanceolate-deltoid or subulate teeth; tube often villous within, sometimes gibbous below. *Corolla* bilabiate, tube usually bent and variously expanded near the base, occasionally expanding gradually or straight; upper lip usually 4-lobed, shorter than the lower lip; lower lip entire, boat-shaped. *Stamens* 4, rarely 2 abortive (*P. zuluensis*), attached at the mouth, of the corolla tube, free or united in a sheath at the base, didynamous, declinate in the lower lip of the corolla; anthers 1-theous. *Style* lying with the stamens in the lower lip of the corolla; stigma shortly 2-lobed.

A genus of about 300 species, common in Africa South of the Sahara and extending to southern Arabia, India and Australasia. Of the 40 species dealt with below, 38 are indigenous to Southern Africa, the two semi-naturalized species being *P. ornatus* Codd (= *Coleus comosus* Hochst. ex Guerke) and *P. barbatus* Andr.

## Key to Species

Flowers yellow, in pseudoracemes borne terminally as well as from the upper nodes of the usually leafless stems:

Plants annual; stems with conspicuous bristles; corolla 4-5 mm long.....1. *P. tetragonus*

Plants perennial with edible tuberous rootstock; stem without bristles; corolla 14-16 mm long.....2. *P. esculentus*

Flowers white or shades of blue, violet or purple (rarely yellow), disposed in cymes, verticils or dichasia; inflorescence usually terminal, paniculate, racemose or subspicate, borne on leafy stems:

Mature calyx subequally 5-toothed, often erect or finally circinnate (in *P. cylindraceus* the uppermost calyx tooth is slightly larger than the other 4 but is difficult to see because of the dense covering of hairs):

Flowers in 10-20-flowered sessile cymes; racemes slender up to 35 cm long, peduncle up to 30 cm long; plants with long horizontal tuberous roots.....3. *P. xerophilus*

Flowers in pedunculate or sessile paired cincinni (often compact and glomerate in *P. cylindraceus* and *P. spicatus*) or in 3-flowered pedunculate cymes; roots not tuberous:

Flowers in 3-flowered pedunculate cymes, forming a diffusely branched panicle 30-40 cm long.....4. *P. candelabriformis*

Flowers in pedunculate or sessile paired cincinni:

Leaves broader than 3 cm, chartaceous or leathery; inflorescence a lax or dense panicle less than 30 cm long, flowers blue:

Leaves thick-textured, densely grey velvety-tomentose below; robust plants with erect, sparingly branched tomentose stems up to 2 m tall.....5. *P. mirabilis*

Leaves thin-textured, subglabrous to sparingly pubescent below; herbaceous, branched plants usually less than 1 m tall.....6. *P. hereroensis*

Leaves less than 3 cm broad, semi-succulent; inflorescence subspicate, flowers in clusters, mauve, purple or, rarely, whitish:

Stems decumbent; flowers purple, subglabrous, in loose clusters; corolla 7-8 mm long.....7. *P. spicatus*

Stems usually erect; flowers mauve (rarely whitish or pale yellow), tomentose, in densely glomerate clusters; corolla 4-5 mm long.....8. *P. cylindraceus*

Mature calyx with upper tooth distinctly broader than the rest, oblong to ovate or subrotund, remaining 4 teeth deltoid to subulate; calyx finally horizontal, teeth spreading:

Upper tooth of calyx horizontal, oblong to ovate, usually rounded at the apex; flowers in glomerate, densely tomentose clusters:

Leaves obovate, cuneate at the base; corolla 4-5 mm long.....8. *P. cylindraceus*

Leaves ovate, broadly truncate to cordate at the base; corolla more than 5 mm long:

Stems erect, woody at the base; corolla white, 10-12 mm long.....9. *P. unguentarius*

- Stems procumbent, succulent; corolla mauve to whitish, 7–9 mm long.....10. *P. amboinicus*  
 Upper tooth of calyx erect, ovate-deltoid to broadly ovate or subrotund; inflorescence paniculate, racemose or subspicate:
- Mature calyx densely villous in the throat; stamens united at the base; inflorescence subspicate with pedicels erect, appressed to the rhachis:  
 Bracts rounded at the apex, subpersistent; stems procumbent, slender, sparingly branched.....11. *P. tetensis*
- Bracts acute to abruptly acuminate, early deciduous, forming a conspicuous imbricate coma at the apex of the inflorescence; stems erect to procumbent, sometimes mat-forming:  
 Erect or spreading semi-succulent herbs up to 60 cm tall; leaves ovate-lanceolate to obovate, 2–5 × 1,5–3,5 cm:  
 Corolla less than 1 cm long; annual plants.....12. *P. caninus*  
 Corolla exceeding 1 cm long; perennial or weakly perennial plants:  
 Corolla 1–2 cm long; inflorescence elongate, 7–15 cm long with 5–12 spaced fruiting verticils below the flowers; indigenous.....13. *P. neochilus*  
 Corolla 2–2,5 cm long; inflorescence compact, 3–5 (–9) cm long with 1 or 2, rarely more, spaced fruiting verticils below the flowers; cultivated or semi-naturalized..14. *P. ornatus*  
 Erect bushy herbs up to 2 m tall; leaves not succulent, ovate to broadly elliptical, 5–9 cm × 3–5 cm; cultivated or semi-naturalized.....15. *P. barbatus*
- Mature calyx glabrous in the throat; stamens free to the base; inflorescence usually paniculate, if subspicate, then pedicels spreading to ascending:  
 Bracts deciduous before the flowering-stage (occasionally persisting in abnormal cases); fruiting calyx gibbous ventrally; flowers in dense verticils, (3–) 4–12 to each bract scar:  
 Stems erect or decumbent; flowers mauve to purple (rarely white):  
 Leaves deeply dentate; rhachis coarsely glandular-hispid, pubescence often yellowish (S.W. Africa).....16. *P. dinteri*  
 Leaves crenate-dentate; rhachis sparsely to densely glandular-tomentose, pubescence greyish:  
 Leaves 4–10 cm long, if less then sparingly to fairly densely strigose:  
 Leaves densely tomentose on both surfaces:  
 Stems 30–60 cm tall; inflorescence 8–30 cm long, simple or with a pair of branches near the base.....18a. *P. zatarhendi* var. *zatarhendi*  
 Stems 50–150 cm tall; inflorescence 20–60 cm long, usually with 1 or 2 pairs of branches near the base.....18b. *P. zatarhendi* var. *tomentosus*  
 Leaves sparingly to fairly densely strigose.....18c. *P. zatarhendi* var. *woodii*  
 Leaves 2,5–4 cm long; stems 1-several often from a burnt perennial base.....19c. *P. madagascariensis* var. *ramosior*
- Stems procumbent; flowers white, mauve or blue:  
 Corolla 7–18 mm long:  
 Leaves deeply dentate or deeply and coarsely crenate-scalloped:  
 Leaves deeply dentate, densely tomentose; flowers white.....17. *P. grandidentatus*  
 Leaves deeply and coarsely crenate-scalloped, medium to densely strigose; flowers purple-blue to lilac.....20. *P. mutabilis*  
 Leaves crenate-dentate:  
 Leaves 4–10 × 3,2–10 cm, densely tomentose; flowers usually mauve (rarely white).....18b. *P. zatarhendi* var. *tomentosus*  
 Leaves 1,5–4 (–4,5) × 1,2–3,5 (–4) cm, sparingly to densely short tomentose; flowers usually white (rarely mauve).....19a. *P. madagascariensis* var. *madagascariensis*
- Corolla 5–6 mm long:  
 Leaves coarsely crenate with 3–4 pairs of rounded teeth; corolla white (Transkei).....19b. *P. madagascariensis* var. *aliciae*  
 Leaves obscurely crenate-dentate with 5–7 pairs of shallow teeth; corolla blue-mauve (Zululand).....21. *P. psammophilus*
- Bracts (often very small) persisting to the flowering stage; fruiting calyx enlarged and often oblique but not conspicuously gibbous ventrally; flowers in lax verticils with 1–3 flowers to each bract or in pedunculate 3–8-flowered cymes:  
 Corolla tube expanding abruptly at or near the base and declinate at or near the mouth of the calyx, often saccate or spurred dorsally:  
 Corolla tube less than 10 mm long (occasionally up to 10 mm long in *P. zuluensis* and then stem and leaves velvety pubescent):  
 Fertile stamens 2, staminodes 2; leaves softly velvety pubescent below..34. *P. zuluensis*  
 Fertile stamens 4; leaves subglabrous to strigose pubescent:  
 Leaves usually not exceeding 4 cm in length:  
 Leaves dotted below with minute red gland-dots (also on calyx and corolla):  
 Corolla tube scarcely narrowed near the throat; upper corolla lip 5–8 mm long; leaves glabrous to strigose.....22. *P. verticillatus*  
 Corolla tube narrowed near the throat; upper corolla lip 3–5 mm long; leaves rusty-strigose or densely grey-tomentose:  
 Stems and leaves rusty-strigose; petioles up to 2,5 cm long.....23. *P. strigosus*  
 Stems and leaves densely grey-tomentose; petioles up to 1 cm long..24. *P. purpuratus*  
 Leaves dotted below with minute colourless or honey-coloured gland-dots:  
 Straggling herb up to 20 cm tall; corolla white with a few purple spots..26. *P. elegantulus*  
 Erect to straggling herb 25–100 cm tall; corolla sky-blue.....33. *P. dolichopodus*  
 Leaves usually exceeding 4 cm in length (sometimes smaller in *P. ciliatus* but then leaves and calyx ciliate with multicellular purple-striped hairs):  
 Flowers in 3–8-flowered, often pedunculate cymes; corolla white, tomentose; upper lip of corolla 2 mm long.....31. *P. rehmannii*

- Flowers in 1–3-flowered sessile cymes; corolla glabrous or sparsely hairy:  
 Leaf margin with few (6–14) pairs of large teeth 8–10 mm long which bear small secondary teeth; corolla whitish with a fringe of hairs on the lower lip  
 32. *P. swynertonii*
- Leaf margin not as above, if coarsely toothed with small secondary teeth then usually more than 16 pairs of teeth; corolla glabrous to minutely pubescent:  
 Leaves dotted below with minute colourless or honey-coloured gland-dots:  
 Corolla white, mauve or pink and speckled with purple; corolla tube slightly narrowing towards the throat; upper lip of corolla 3–7 mm long:  
 Leaf margin and calyx ciliate with purplish multicellular hairs; stems decumbent; corolla whitish freely speckled with purple.....27. *P. ciliatus*  
 Leaf margin not ciliate, calyx with occasional multicellular hairs; stems erect; flowers mauve or pink with darker markings.....28. *P. fruticosus*  
 Corolla sky-blue; corolla tube widening from 1,5 mm at the base to 2,5 mm at the throat; upper lip of corolla 1,5–2 mm long.....33. *P. dolichopodus*
- Leaves dotted below with red gland-dots:  
 Leaves often thin-textured, apex acute, base abruptly cuneate, margin with coarse teeth often bearing small secondary teeth.....29. *P. grallatus*  
 Leaves usually thick-textured, apex obtuse to rounded, base truncate, shortly attenuate or markedly decurrent on the petiole, margin regularly crenate.....30. *P. rubropunctatus*
- Corolla tube more than 10 mm long or, if less, then upper lip of corolla about 10 mm or more long and equally broad (*P. saccatus*):  
 Corolla white, tube 10–13 mm long distinctly narrowing towards the throat; stamens 3 mm long.....25. *P. oertendahlia*  
 Corolla usually blue, if white then over 20 mm long, not or scarcely narrowing towards the throat; stamens 8–10 mm long:  
 Leaves broadly ovate to ovate-deltoid, subglabrous, base truncate; upper lip of corolla 10–16 mm long and equally broad:  
 Corolla tube 8–15 mm long.....35a. *P. saccatus* var. *saccatus*  
 Corolla tube 20–26 mm long.....35b. *P. saccatus* var. *longitubus*  
 Leaves broadly elliptical to obovate-elliptical, sparingly strigose, base cuneate; upper lip of corolla 5–6 mm long, tube 23–27 mm long.....36. *P. hilliardiae*
- Corolla tube expanding gradually from the calyx mouth or nearly parallel-sided for entire length, straight or curved:  
 Corolla tube straight, more than 12 mm long:  
 Corolla tube 20–25 mm long, nearly parallel-sided.....37. *P. ambiguus*  
 Corolla tube 12–16 mm long, widening slightly towards the throat.....38. *P. ecklonii*  
 Corolla tube curved, 7–10 mm long, rather like a miniature "Dutchman's Pipe":  
 Leaves coarsely dentate, truncate at the base; corolla purple.....39. *P. petiolaris*  
 Leaves regularly crenate-dentate, cordate; corolla white with vertical mauve stripes on upper lip.....40. *P. laxiflorus*

Subgen. **Nodiflorus** Codd, subgen. nov., a subgen. *Plectrantho* structura inflorescentiae, floribus in pseudoracemis brevibus dispositis, pseudoracemis nodis superis caulium exorientibus differt.

Type: *Plectranthus tetragonus* Guerke.

The species included in this subgenus tend to flower after the leaves have fallen. The flowers are borne singly or in pairs in short pseudoracemes which arise at the nodes along the upper half or two-thirds of the stem. In the two species included in the present treatment, flowers are yellow which is an unusual colour in the genus *Plectranthus*. If a narrow view were taken of generic limits it is probable that these differences would warrant separate generic rank. In this connection it may be noted that *P. defoliatus* Hochst. ex Benth. shows a distinct relationship to *P. esculentus* N.E.Br., though the flowers are 1–3 in the axils of each bract and the calyx is more or less equally 5-toothed. The two species now dealt with are as follows:

1. *P. tetragonus* Guerke
2. *P. esculentus* N.E.Br.

*P. tetragonus* is an annual while *P. esculentus* is a perennial with underground tubers which are edible, with the result that it is cultivated in various parts of Africa.

1. ***Plectranthus tetragonus*** Guerke in Bot. Jahrb. 19: 109 (1894); Bak. in Fl. Trop. Afr. 5: 401 (1900); Launert & Schreiber in Prodr. Fl. S.W. Afr. 123: 26 (1969). Type: Tanzania, Usambara, Mashena, *Holst* 3573.

*P. melanocarpus* Guerke, l.c. 109 (1894); Bak., l.c. 402 (1900). Type: Tanzania, Massai steppe, *Fischer* 511. *P. biflorus* Bak., l.c. 402 (1900). Type: Malawi, between Kondowe and Karonga, *Whyte* s.n. (K).

Annual, erect, 30 cm–1 m tall; stems solitary from a fibrous root system, 4-angled, unbranched or sparingly branched near the base, leafless at flowering, subglabrous to minutely tomentulose below and with conspicuous patent bristles 2–5 mm long above. *Leaves* "oblong, 8–10 cm long, 5–6 cm broad, decurrent on the 5–7 cm petiole, glabrous on both surfaces or sometimes pubescent on the nerves below" (fide Guerke). *Inflorescences* produced terminally and in the axils of the leaves often from near the base to the apex of the stem, simple or branched, racemose, 4–12 cm long; rhachis densely glandular-hispidulous; bracts ovate to elliptic, 1–2 mm long, persisting beyond the flowering stage. *Flowers* solitary or occasionally in pairs in the axils of each bract, opposite, sub-opposite or alternate, 2–3 mm apart; pedicels 3–4 mm long, minutely glandular-hispidulous. *Calyx* 2 mm long at flowering enlarging to 8–9 mm long in fruit, tubular and slightly bent, glandular-hispid; upper lip horizontal, ovate-rotund, 2 mm long, obtuse to apiculate at the apex; lower lip subequally 4-toothed, 2 mm long, teeth linear-lanceolate, subulate, the lower pair slightly the longer. *Corolla* yellow, 4–5 mm long, puberulous; tube 2–2.5 mm long, slightly geniculate near the base, 1 mm deep; upper lip erect, 0.75 mm long, emarginate; lower lip shallowly boat-shaped 2–2.5 mm long. *Stamens* free at the base, curved and enclosed in the lower lip, 2–2.5 mm long. *Style* coinciding with the stamens. Fig. 1.



FIG. 1.—*Plectranthus tetragonus*, Grootfontein District, South West Africa (Nordenstam 2587 in M),  $\times \frac{1}{2}$ .

A tropical African species occurring in Tanzania, Mozambique, Rhodesia, Zambia and Angola and entering the northern part of South-West Africa, where it is found in dry woodland, usually in rocky places.

S.W.A.—1917 (Tsumeb): Gross Otavi Mts., between farms Gross Otavi and Auro (-DA), Nordenstam 2587 (M); Otavi valley, Asis (-DA), Volk 658 (M).

This is a distinctive species with several remarkable features, namely, the flowers being solitary (rarely two) in the axils of the bracts (no doubt by the reduction of the usual cymes) resulting in short inflorescences of racemes (often branched), often from low down on the leafless stems to the apex, the conspicuous bristles on the stems and the long, slightly curved calyx tube, producing a distinctive facies.

Type material of *P. tetragonus* has not been seen. The present identification is based on the specimens so named in the Prodr. Fl. S.W.Afr., which are conspecific with specimens named *P. biflorus* Bak. at Kew. Gürke distinguishes *P. tetragonus* from *P. melanocarpus* on the basis of its larger rotund-ovate bracts and the shape of the upper calyx tooth. On this basis, all the material seen would be classified as *R. melanocarpus* but no doubt these characters vary and we are dealing with one species, so the name adopted by Launert and Schreiber is maintained.

2. *Plectranthus esculentus* N.E.Br. in Kew Bull. 1894: 12 (1894); in Hook., Icon. Pl. 25: t. 2488 (1896); Cooke in Fl. Cap. 5, 1: 185 (1910); Codd in Mitt. Bot. München 10: 249 (1971); Ross, Fl. Natal 305 (1972). Type: Natal, cult. Botanic Garden, Durban, Medley Wood 3633 (K!, holo.).

*P. floribundus* N.E.Br., l.c. 12 (1894); in Hook., Icon. Pl. 25: t. 2489 (1896); Cooke in Fl. Cap. 5, 1: 273 (1910). Lectotype: (Robyns & Lebrun, 1928): Natal, Inanda, Medley Wood 646 (K!). —var. *longipes* N.E.Br., l.c. 13 (1894); Bak. in Fl. Trop. Afr. 5: 403 (1900). Lectotype (Robyns & Lebrun, 1928). Rhodesia, Umzingwani River, Baines s.n. (K).

*Coleus dazo* A. Chev., Veg. Utiles de l'Afr. Trop. Franc. 1, 1: 106 (1905). Type: from West Africa. *C. floribundus* (N.E.Br.) Robyns & Lebrun in Rev. Zool. & Bot. Afr. 16: 359 (1928); Ann. Soc. Sci. Brux. sér. B. 49: 96 (1929), nom. illegit., non *C. floribundus* Bak. (1900). —var. *longipes* (N.E.Br.) Robyns & Lebrun, l.c. 360 (1928). *C. esculentus* (N.E.Br.) G. Tayl. in J. Bot. Lond. 69, Suppl. 2: 158 (1931).

*Englerastrum floribundus* (N.E.Br.) Th. Fries jun. in Notizbl. Bot. Gart. Berlin 9: 73 (1924). —var. *longipes* (N.E.Br.) Th. Fries jun. l.c. 77 (1924).

Erect to decumbent, perennial, aromatic herb or suffrutex from a tuberous-rooted base, 60–120 cm tall; stems 1—several from the base, unbranched or sparingly branched, 4-angled, leafless at flowering, shortly retrorse pubescent. Leaves drying fairly thick in texture, subsessile; blade oblong-elliptic to oblanceolate, 5–8 cm long, 1.3–2.5 cm broad, shortly scabrid hispidulous on both surfaces, dotted with brown gland-dots below; apex obtuse to rounded; base obtuse to cuneate; margin obscurely denticulate. Inflorescences occupying the apical 20–60 cm of the stem consisting of 2–4 racemes (occasionally branched) arising at each node; racemes 3–5 cm long; rhachis shortly and fairly densely hispidulous; bracts ovate to obovate 2–3 mm long, hispidulous, persisting beyond the flowering stage. Flowers appearing after the leaves are shed, solitary in the axil of each bract, opposite to sub-opposite, 2–5 mm apart; pedicels 3–5 mm long, minutely hispidulous. Calyx 4–5 mm long at flowering enlarging to 9–10 mm long in fruit, campanulate, glandular-hispidulous and gland-dotted; upper lip horizontal, 3 mm long and equally broad, obtuse to rounded at the apex; lower lip subequally 4-toothed, teeth linear-lanceolate, the median pair 3 mm long, the lower pair 3.5 mm long. Corolla yellow, 14–16 mm long, puberulous; tube 6–8 mm long, 1 mm deep at the base, slightly geniculate and expanding about the middle to 2.5 mm at the throat; upper lip erect, 2 mm long, emarginate and with 2 small ear-like lateral lobes; lower lip deeply boat-shaped, 7–8 mm long. Stamens usually united at the base, curved and enclosed in the lower lip, the lower pair the longer, 6–7 mm long. Style exceeding the stamens by 1–2 mm and finally exerted from the lower lip by 2 mm. Fig. 2.

Distributed from Equatorial Africa southwards to Angola, the eastern Transvaal and coastal Natal, in dry, wooded country, often spread by cultivation.

TRANSVAAL.—2230 (Messina): near Witvlag (-CC), Pole Evans 3709; Entabeni (-CC), Taylor 803. 2330 (Tzaneen): Tshakoma (-AB), Van Warmelo sub TRV 36173; Modjadji's Reserve (-CB), Krige 223; Velcich s.n.; Magoebaskloof (-CC), Gerstner 5436; 5821. 2430 (Lydenburg): Nelspruit (-BD), Rogers 21441; Waterval Boven (-CB), Rogers 4775; Mason s.n.; Godwan River (-DA), Prosser 1259; Kaapsche Hoop (-DB), Wager sub TRV 15575. 2531 (Komatipoort): White River (-AC), Wessels s.n.; Plaston (-AC), Holt 323; Barberton (-CC), Galpin 591.

SWAZILAND.—2631 (Mbabane): Bremersdorp (-AD), Fleishack sub PRE 15166; Stegi (-BD), Keith s.n.; Hlatikulu (-CD), Stewart sub TRV 8899.

NATAL.—Cultivated: Cult. Botanic Gardens, Durban, Medley Wood 3633 (K); 5620 (K). 2731 (Louwsburg): Ngome (-CD), Tustin s.n. 2831 (Nkandla): Ngoya (-CD), Sim 2945. 2930 (Pietermaritzburg): Inanda (-DB), Medley Wood 615; 3843 (K). 3030 (Port Shepstone): Umgaye (-AD?), Rudatis 1100.



FIG. 2.—*Plectranthus esculentus*, showing the edible roots (Magoebaskloof, Gerstner 5821),  $\times 1$ .

*P. esculentus* is related to *P. tetragonus*, as shown by the flowers appearing in short pseudo-racemes after the leaves have been shed and the yellow corolla colour, which is unusual in the genus *Plectranthus*. The chromosome number  $2n=24$  recorded by De Wet (1958) is also a deviation from the basic number 7 usual for *Plectranthus* subgen. *Plectranthus*.

Taylor, l.c. was the first to unite *P. esculentus* and *P. floribundus* and his choice of the former epithet (which is unavoidable in the genus *Coleus*) must be followed. The inclusion of *C. dazo* in synonymy also seems to be correct judging by a specimen of *Chevalier* 7257, so named, seen in G. It is probable that *P. densus* N.E.Br. and *P. primulinus* Bak. should also be included but an investigation of these two species has not been undertaken.

Subgen. **Xerophilus** Codd, subgen. nov., a subgen. *Plectrantho* calyce subaequaliter 5-dentato, labio antico corollae cucullato et staminibus basi breviter connatis differt.

Type species: *Plectranthus xerophilus* Codd.

The single species in this subgenus, *P. xerophilus*, is very distinctive and was at first considered to be worthy of separate generic status. If a narrow view were taken of *Plectranthus*, such a step would be justified. The relationships of the species are discussed after its description below.

3. ***Plectranthus xerophilus* Codd** in Bothalia 11: 282 (1974). Type: Transvaal, Lydenburg District, near Marone, Codd & Dyer 7729 (PRE!, holo.).

Perennial slender shrub with thick horizontal tuberous roots; stems erect, semi-woody, terete to obscurely 4-angled, sparingly branched, 1–1.7 m tall (including inflorescence), finely grey tomentose. *Leaves* subsessile to shortly petiolate, petiole 2–5 mm long, finely grey tomentose; blade subcoriaceous, ovate to elliptic, 3.5–9 cm long 2.5–7 cm broad, upper surface dark grey-green, strigose, lower surface reticulate, densely grey tomentose, tomentum of crisped multicellular hairs, short gland-tipped hairs and numerous sessile dark reddish-brown gland-dots; apex obtuse to rounded; base cuneate to truncate; margin coarsely crenate. *Inflorescence* terminal, subspicate or paniculate with 1–3 pairs of basal branches, carried on slender peduncles up to 30 cm long; racemes up to 35 cm long; bracts early deciduous, lanceolate to linear-lanceolate, acuminate, 1.5–3 mm long, densely crisped tomentulose. *Flowers* densely clustered in 12–20-flowered verticillasters, verticillasters 0.3–2.5 cm apart; pedicels 2–4 mm long, densely crisped tomentulose. *Calyx* 2 mm long at flowering stage enlarging to 4 mm long in fruit, subequally 5-toothed, densely crisped tomentulose and gland-dotted; teeth lanceolate, up to 1.5 mm long, the uppermost slightly broader than the rest.



*Corolla* violet to mauve-purple, crisped tomentulose and gland-dotted without, glabrous within, bilabiate; tube 1 mm wide for 2 mm and then curved upwards, expanding into the upper lip, 4 mm wide at the throat; upper lip hooded, 3 mm long, obscurely

4-lobed; lower lip boat-shaped, 4-6 mm long. *Stamens* shortly connate at the base, 7-8 mm long, curved upwards in the lower corolla lip. *Style* curved upwards, exerted from the throat by 9-10 mm. Fig. 3, 4.



FIG. 3.—*Plectranthus xerophilus*, Lydenburg District (Codd 8504),  $\times 1$ .

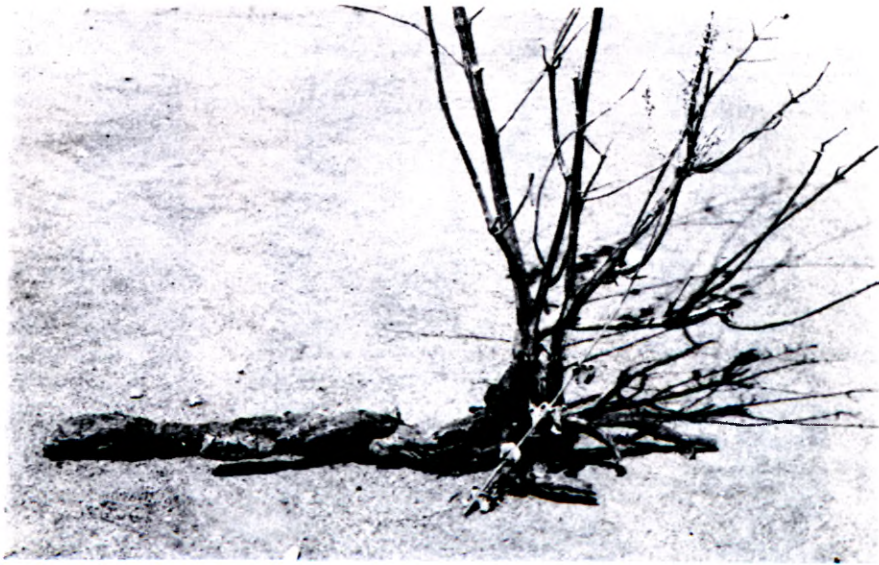


FIG. 4.—*Plectranthus xerophilus*, Lydenburg District (Hardy 2259).

Found on dry rocky slopes in the eastern and northern Transvaal and shows a marked ability to survive under hot, arid conditions. Its flowering season is from March to May.

TRANSVAAL.—2229 (Waterpoort): 6 km N. of Mara (–DC), Meeuse 10199, 2231 (Phalaborwa): Kruger National Park, Makadzi area (–CC), Van der Schijff 3853, 2429 (Zebediela): 24 km E. of Malipdrift (–BB), 31 5 35, Obermeyer & Verdoorn 23; between Chuniespoort and Malipdrift (–BC), Pole Evans 4370; near Chuniespoort Police Station (–BD), Meeuse 10351, 2430 (Pilgrim's Rest): 3 km S. of Mica (–BB), Leach 11637; 3 km S.E. of Steelpoort (–CA), Codd & Dyer 7712; 50 km N. of Burgersfort (–CA), Leach & Jones 13249; 30 km N. of Steelpoort Bridge on road to Penge Mine (–CB), Codd 10489; near Marone (–CD), Codd & Dyer 7729; Codd 8504; 16 km N. of Ohrigstad (–DA), Codd 10020; Echo Caves Motel, 30 km S. of Erasmus Pass tunnel (–DA), De Winter 7725; Blyde River Gorge near Mariepskop (–DB), Marsh s.n.; 48 km N. of Lydenburg (–DC), Dyer 3959.

*P. xerophilus* was first collected near Malipdrift in 1935 (Obermeyer & Verdoorn 23) and has been cultivated in our Botanic Garden for more than 20 years.

The delay in describing it may be largely attributed to uncertainty regarding its correct generic position. In certain respects its characteristics would place it in the genus *Coleus*, for example, the densely glomerate verticils, the bracts being very early deciduous and the stamens being shortly connate at the base. On the other hand the calyx shape, which is subequally 5-toothed, is not found in *Coleus*, but is reminiscent of *Burnatastrum*, a genus usually included in *Plectranthus*.

The modern tendency to take a broad view of *Plectranthus*, and to include *Coleus* within it, removes some of these difficulties. However, *P. xerophilus* possesses characteristics which are unusual even in this broader concept of *Plectranthus*, for example the thick horizontal roots, the slender woody stems which are subterete, not 4-angled, and the peculiar hooded upper lip of the corolla. Consideration was given to according it separate generic status, but there appears to be insufficient grounds for such a view if a broad concept of *Plectranthus* is adopted.

The dense tomentum on the underside of the leaves of *P. xerophilus* and the fact that the bracts are shed at a very early stage gives this species a superficial resemblance to *Plectranthus* Sect. *Coleoides* Benth., including species such as *P. zatarhendi* Forsk. and *P. tomentosus* Benth., but these species have the conventional *Plectranthus* corolla and 1–4 calyx shape (i.e. the upper calyx tooth much larger than the other four).

Subgen. **Burnatastrum** (Briq.) Codd, stat. nov.

*Burnatastrum* Briq. in Pflanzenfam. 4.3a: 358 (1897).

*Plectranthus* Sect. *Isodon* Schrad. ex Benth., Lab. 40 (1832); in DC., Prodr. 12: 55 (1848), partly.

Lectotype: *P. spicatus* E. Mey. ex Benth.

Briquet based his genus *Burnatastrum* on the South African *P. spicatus* E. Mey. ex Benth. and two Madagascar species, *P. lanceolatus* Benth. and *P. lavanduloides* Bak. In separating the genus from *Plectranthus*, Briquet stressed the remarkable circinnate, equally 5-toothed calyx. The structure of the inflorescence is also different, the flowers being arranged in scorpioid dichasia, not in small, shortly pedunculate or sessile cymes as in *Plectranthus*.

If *Burnatastrum* were upheld as a distinct genus, one would almost certainly include in it certain allied species, e.g. *P. cylindraceus* Hochst. ex Benth. (calyx slightly circinnate), *P. hereroensis* Engl. and *P. mirabilis* Briq. (calyx erect, not circinnate, markedly ventricose) on the grounds of the similar inflorescence and equally 5-toothed calyx, even though these were excluded by Briquet.

The question would then arise whether one should go further and include other species with more-or-less subequally 5-toothed calyx, such as *P. candelabrififormis* Launert and *Neomuelleria welwitschii* Briq. in which the inflorescence has a much simpler structure. Because of this gradation from *Burnatastrum* to *Plectranthus* it has been decided to give it subgeneric rank and the following five species are dealt in this group:

4. *P. candelabrififormis* Launert
5. *P. mirabilis* (Briq.) Launert
6. *P. hereroensis* Engl.
7. *P. spicatus* E. Mey. ex Benth.
8. *P. cylindraceus* Hochst. ex Benth.

4. ***Plectranthus candelabrififormis*** Launert in Mitt. Bot. München 7: 300 (1968); Launert & Schreiber in Prodr. Fl. S.W.Afr. 123: 24 (1969). Type: S.W. Africa, 16 km E. of Runtu, Merxmüller & Giess 1912 (M!, holo.).

Erect, perennial, aromatic herb or suffrutex up to 1 m tall, branched; branches ascending, 4-angled, striate, sparingly pubescent with longish multicellular hairs. Leaves drying thin-textured; petiole 2.3–6 cm long, pilose; blade ovate, 6–15 cm long, 3.5–8 (–11) cm broad sparingly pilose on both surfaces,

dotted below with minute orange gland-dots; apex acute to subacuminate; base rounded to subcordate; margin regularly crenate-dentate with 15–20 pairs of teeth. *Inflorescence* terminal and on lateral branches, paniculate with 1 or 2 main branches near the base, 30–40 cm long; rhachis hispidulous; bracts sessile or shortly petiolate, ovate-lanceolate to narrowly elliptical, 5–10 (–12) mm long, 5 mm broad, ciliate, gland-dotted below, usually persisting beyond the flowering stage, each subtending a pedunculate cyme. *Flowers* in 3-flowered cymes on a slender peduncle 2 cm long; pedicels 5–10 mm long, puberulous. *Calyx* 3–5 mm long at flowering enlarging to 9 mm long in fruit, ventricose, hispidulous and freely orange gland-dotted; teeth subequal, horizontal, linear-lanceolate, up to 4.5 mm long, the uppermost tooth slightly wider than the others. *Corolla* violet, 6.5–7.5 mm long, sparingly pubescent and orange gland-dotted on the lips; tube 3–3.5 mm long, slightly kneeed near the base and 1 mm deep, expanding slightly to the throat; upper lip erect 3.5–4 mm long and equally broad, emarginate and with 2 lateral ear-like lobes; lower lip boat shaped, 3.5 mm long, curved upwards. *Stamens* free at the base, curved and enclosed in the lower lip, 3 mm long. *Style* co-equal with the stamens. Fig. 5.

Found on sandy soil in thickets, grassy depressions and disturbed soil in Tanzania, Zambia and the extreme north of South West Africa.

S.W.A.—1719 (Runtu): 16 km E. of Runtu (–DD), *Merxmüller & Giess* 1912 (M).



FIG. 5.—*Plectranthus candelabrifomis*, near Runtu, South West Africa (holotype: *Merxmüller & Giess* 1912 in M),  $\times \frac{1}{4}$ .

Launert indicated that the subequally 5-toothed calyx would place this species in *Burnatastrum* if this were separated at generic level, but here the resemblance ends and there are more differences than similarities. For example, the flowers are arranged in 3-flowered cymes, not in many-flowered scorpioid dichasia and the bracts are small and persistent, as against the early deciduous bracts of *Burnatastrum*.

It is now included in Subgen. *Burnatastrum* as a matter of convenience, rather than erect another monotypic subgenus to accommodate it. Its nearest relationship appears to be with *P. equisitiformis* (E. A. Bruce) Launert, which has its flowers in 1–3-flowered sessile cymes and in which the upper calyx tooth is more distinctly broader than the others.

A close examination of the base of the calyx shows the presence of a very short stipe about 0.5 mm long, at which point abscission of the calyx takes place. This is reminiscent of *Holostylon* spp. but the style in *P. candelabrifomis* is shortly bilobed, not entire as in that genus.

5. *Plectranthus mirabilis* (Briq.) Launert in Mitt. Bot. München 7: 299 (1968); Launert & Schreiber in Prodr. Fl. S.W.Afr. 123: 25 (1969); Codd in Mitt. Bot. München 10:248 (1971). Lectotype: Angola, Malange, *Mechow* 489 (Z).

*Coleus mirabilis* Briq. in Bot. Jahrb. 19: 183 (1894); Bak. in Fl. Trop. Afr. 5: 440 (1900); Codd in Flow. Pl. Afr. 36: t. 1417 (1963). —var. *mechowianus* Briq., l.c. (1894). Type: Angola, between Malanga and Cuango Rivers, *Mechow* s.n. —var. *poggeanus* Briq., l.c. (1894). Type: Upper Congo, Lulua River, *Pogge* 350. —var. *hypisodontus* Briq., l.c. (1894). Type: Angola, Malange, *Mechow* 489. —var. *buchnerianus* Briq., l.c. (1894). Syntypes: Angola, Moma, near Malange, *Buchner* 81, 82, 83, 84, 85. *C. leucophyllus* Bak. in Kew Bull. 1895: 292 (1895); Fl. Trop. Afr. 5: 442 (1900). Type: Malawi, Mivero, *Carson* 26.

*Ascocarydion mirabile* (Briq.) G. Tayl. in J. Bot. Lond. 69, Suppl. 2: 162 (1931).

Erect, perennial, aromatic woody herb or suffrutex. 1–3.5 m tall; stems 1—several from the base, unbranched or sparingly branched, 4-angled, appressed grey-tomentulose with dense, short multi, cellular hairs and scattered orange gland-dots. *Leaves* drying fairly thick in texture; petiole 1–2 cm long, pubescence as for the stem; blade ovate to ovate-lanceolate, 6–12 cm long, 3–6 cm broad, dull green and tomentulose especially on the nerves above, white-felted below, freely dotted with orange gland-dots on both surfaces; apex acute; base obtuse to cuneate, attenuate on the petiole; margin regularly and finely crenate-dentate except in the lower third with 25–30 pairs of teeth. *Inflorescence* terminal, paniculate, dense, 10–30 cm long, 4–7 cm in diameter, unbranched or with 1 or 2 branches near the base; rhachis densely and shortly grey-tomentulose and gland-dotted; bracts broadly ovate, abruptly acuminate, 9–12 mm long, 7–8 mm broad, glandular appressed tomentulose, early deciduous, present only at the immature apex of the inflorescence. *Flowers* arranged in opposite and decussate, pedunculate many-flowered dichasia; peduncle 4–10 mm long, pedicels 1 mm long. *Calyx* purple-tinged, 4–5 mm long at flowering, enlarging to 7–8 mm long in fruit, becoming erect, ventricose, glandular-hispid; teeth subequal, horizontal, lower 4 triangular-lanceolate, 3.5 mm long, uppermost tooth slightly broader, up to 4.5 mm long. *Corolla* deep blue, 1.3–1.5 cm long, pubescent and gland-dotted over the whole outer surface; tube at first narrowly cylindrical, ascending for 3–4 mm and 1 mm in diameter, then sharply decurved and expanding for 3 mm to 4 mm deep at the throat; upper lip erect, 4 mm long, obscurely 4-lobed; lower lip

deeply boat-shaped, 8–9 mm long. *Stamens* united at the base, curved and enclosed in the lower lip or slightly exerted, 7–9 mm long. *Style* slightly exceeding the stamens by 1–2 mm.

Found in moist peaty soil in depressions and along river banks in Zaire, Malawi, Zambia, Angola and northern South West Africa.

S.W.A.—1819 (Karakuwisa): Omuramba Omatako (–DC), *Schoenfelder 1049*; *Marsh s.n.*; *Giess 10088*; *Merxmüller & Giess 2155*; *Le Roux 183*. 1821 (Andara): Popa Falls, near Andara (–AB), *Maguire 1700*.

With its tall, erect stems, grey-white foliage and deep blue flowers, this is one of the most striking members of the genus. Taylor, l.c., separated it as a monotypic genus on the basis of the so-called winged seeds. However, the seeds are flattened on the margin, not strictly winged and this differs only in a matter of degree from other species. In floral characters it is closely allied to *P. hereroensis* and would fall within the compass of *Burnatastrum*, if this were separated as a distinct genus, although the calyx is not circinate as in *P. spicatus* (see p. 383).

Briquet, l.c. described four varieties without designating one of them as the typical. Type material has not been seen but Taylor, l.c., is followed in placing them together in synonymy and in including *C. leucophyllus* Bak. also.

Chromosome number  $2n = 42$  (De Wet, 1958, as *Coleus mirabilis*).

**6. *Plectranthus hereroensis* Engl.** in Bot. Jahrb. 10: 267 (1888); Dinter in Fedde Repert. 22: 380 (1926); Taylor in J. Bot. Lond. 69, Suppl. 2: 160 (1931); Launert & Schreiber in Prodr. Fl. S.W. Afr. 123: 25 (1969). Type: S.W. Africa, Hereroland, Kaiser Wilhelmsberg near Okahandja, *Marloth 1350* (B, holo.†; G!; GRA!; K!; lecto.; M!; PRE!; SAM!).

*P. matabeleensis* Bak. in Fl. Trop. Afr. 5: 417 (1900). Syntypes: Rhodesia, Matabeleland, Shasha River, *Holub 1403–1406* (K). *P. myrianthus* Briq. in Bull. Herb. Boiss. ser. 2, 3: 1001 (1903); Cooke in Fl. Cap. 5, 1: 271 (1910); Codd in Mitt. Bot. München 10: 248 (1971). Type: Witwatersrand, *Hutton 877* (Z, holo.; GRA!; K!; NH!). *P. otaviensis* Dinter in Fedde Repert. (Beih.) 53: 116, 117 (1928), nomen subnudum based on *Dinter 5699* from Otavi (B!; PRE!; SAM!). *P. aurifer* Dinter ex Launert in Mitt. Bot. München 2: 312 (1957); Dinter in Fedde Repert. (Beih.) 53: 117 (1928), nomen subnudum. Type: S.W. Africa, Nossib, *Dinter 7367* (M!, holo.; K!).

*Neomullera damarensis* S. Moore in J. Bot. Lond. 39: 265 (1901). Type: Damaraland, *Een s.n.* (BM, holo.).

*Coleus myrianthus* (Briq.) Brenan in Mem. N.Y. Bot. Gard. 9: 43 (1954).

Erect, annual or weakly perennial, aromatic herb, 50–100 (–120) cm tall; stem usually solitary, branching above, 4-angled, striate, finely and sparsely to densely glandular-puberulous or tomentulose. *Leaves* drying thin to medium in texture; petiole 2–7 cm long, pubescence similar to the stem; blade ovate to ovate-triangular, subglabrous to tomentulose, freely dotted with reddish to brownish gland-dots below; apex acute; base truncate; margin regularly and conspicuously finely or coarsely crenate-dentate with 5–20 pairs of teeth. *Inflorescence* terminal on the main stem and side branches, panicle, lax or dense, 10–25 cm long, simple or with 1 or 2 pairs of branches near the base; rhachis glandular-puberulous to minutely hispidulous, often gland-dotted; bracts linear-oblong to spatulate, 2–3 mm long, persisting beyond the flowering stage. *Flowers* arranged in opposite and decussate, pedunculate, lax or dense dichasia; peduncle 8–20 mm long, pedicels 1–2 mm long, glandular-puberulous. *Calyx* 2.5 mm long at flowering, enlarging to 5–7 mm long in fruit, becoming erect, ventricose, glandular-scabrid; teeth subequal, horizontal, triangular-lanceolate to

subulate, 1–2 mm long, the upper 3 slightly longer and broader than the lower 2. *Corolla* pale to deep blue (rarely white), 6–11 mm long pubescent and with scattered gland-dots; tube at first narrowly cylindrical, ascending for 2.5–3 mm and 0.5 mm in diameter, then sharply decurved and expanding for 2.5 mm to 3 mm deep at the throat; upper lip erect, 2 mm long, emarginate and with 2 narrow lateral ear-like lobes; lower lip deeply boat-shaped, 4–6 mm long. *Stamens* free or united at the base for 1–1.5 mm, curved and enclosed in the lower lip, 4–5 mm long. *Style* subequal to the lower stamens or exerted by 1 mm. Fig. 6.

Found in shady, south-facing kloofs, usually on dry, rocky, wooded hillsides at medium to high altitudes, in northern South West Africa and central and northern Transvaal, extending to Angola, Zambia and Rhodesia.

S.W.A.—1712 (Posto Velho): Otjhipaberg, Kaokoveld (–BC), *Davies, Thompson & Miller 66*; 17 km W. of Entanza on road to Ombepera (–BD), *De Winter & Leistner 5463*. 1812 (Sanitatas): Sanitatas (–BA), *Hall 430*; 13 km W. of Okonjombo (–BD), *Giess & Leippert 7550*. 1915 (Okankuejo): farm Cauas Okava (–CA), *Giess & Leippert 7310*. 1916 (Gobaub): farm Nimitz (–DC), *De Winter 3023*. 1917 (Tsumeb): Nosit (–BD), *Dinter 7367* (K,M); *Schoenfelder S641*; farm Goab-Pforte (–CA), *Giess, Volk & Bleissner 6391*; Otavi (–CB), *Dinter 5699*; 5756; *Kings 2974*; *Cole T7*; Guchab (–CB), *Dinter 7655*. 2014 (Welwitschia): near Welwitschia, *Volk sub Giess 6120*. 2017 (Waterberg): Waterberg (–AC), *Liebenberg 4760*; *Giess, Volk & Bleissner 6618*. 2114 (Uis): Brandberg (–BA), *Giess 3686*; *Wiss s.n.* 2116 (Okahandja): near Okahandja (–DD), *Marloth 1350*; *Dinter 564* (G, GRA, K, M, SAM).

TRANSVAAL.—2229 (Waterpoort): Hanglip (–DD), *Meeuse 10165*. 2230 (Messina): Entabeni Forest Station (–CC), *Loock 2*; *Codd 4193*; 8399; *Munro s.n.* 2328 (Baltimore): Blouberg (–BB), *Leeman 112*; *Codd 8755*; *Van der Schijff 5387*; *Strey & Schlieben 8508*. 2329 (Pietersburg): near Louis Trichardt (–BB), *Young sub TRV 26636*; Matoks (–BC), *Hutchinson & Gillett 4470* (K); 30 km E. of Pietersburg (–DC), *Van Vuuren 1452*. 2330 (Tzaneen): Westfalia Estate (–CA), *Scheepers 972*. 2427 (Thabazimbi): Krantzberg (–BC), *Codd & Erens 3975*. 2429 (Zebediela): Pyramid Estate (–AA), *Galpin 9063*. 2527 (Rustenburg): 26 km N. of Brits (BD), *Codd 6555*; near Rustenburg (–CB), *Rose Innes 202*; Breeds Nek (–CD), *Vahrmeijer 1745*; Jacksonstuijn (–DA), *Repton 879*; *Van Vuuren 183*; near Jacksonstuijn (–DA), *Leistner 185*; Hornsnek (–DB), *Codd 4182*; Scheerpoort (–DD), *Van Vuuren 499*. 2528 (Pretoria): near Pretoria (–CA), *Leendertz 3735*; *Mogg 12435*; 15144. 2627 (Potchefstroom): Witpoortje (–BB), *Moss sub TRV 19664*. 2628 (Johannesburg): near Johannesburg (–AA), *Saunders 7* (K); *Dinter 877* (G, GRA, K, Z); *Gilmore 488*; Suiderbosrand, Wolwekloof (–CB), *Bredenkamp 815*.

*P. hereroensis* falls naturally in subgenus *Burnatastrum*. It varies a good deal in characters such as pubescence, size and number of leaf-margin teeth, and size of calyx and corolla, and this variation is reflected in the number of species names which have been allocated. However, no clear pattern of variation can be seen and it seems best at this stage to take a broad view of the species and not to uphold infra-specific groups.

An interesting feature is the variation in the degree of union of the stamens. These may be free, or the two lower ones united at the base, or all four united in a sheath for 2–3 mm. This has resulted in the species being placed in *Coleus* as well as in *Plectranthus* and, in addition to the synonyms listed, the following may also prove to be synonyms on closer investigation: *C. polyanthus* S. Moore, *C. matopensis* S. Moore and *C. gazensis* S. Moore.

In this respect, *C. hereroensis* is intermediate between *P. spicatus* (stamens always free) and *P. mirabilis* (stamens always united at the base).

In addition to the names listed by Dinter without adequate description, *P. otaviensis* Dinter and *P. aurifer* Dinter, he distributed specimens of his No. 7655 annotated *P. grandidentatus* Dinter.



FIG. 6.—*Plectranthus hereroensis*, near Pretoria (Codd 8627),  $\times 1$ .

*P. hereroensis* comes nearest to *P. mirabilis* but is not likely to be confused with the latter. It is a smaller, more bushy plant occupying shady, rocky places, annual or weakly perennial, lacking the dense grey tomentum of *P. mirabilis*. The attractive blue flowers (a white-flowered population has also been recorded) make it a promising garden plant and, in this connection, it has been noted that plants grown from seed collected in the Matoppas (= *C. polyanthus*?) are particularly successful in cultivation. Specimens showing this affinity have been grown in the Botanic Gardens in Durban and Kirstenbosch and have been recorded as a garden escape at St. Michaels-on-Sea (Nicholson 792).

Chromosome number  $2n=28$  (De Wet, 1958).

7. *Plectranthus spicatus* E. Mey. ex Benth. in E. Mey, Comm. 230 (1837); Drege, Zwei Doc. 133, 141 (1843); Benth. in DC., Prodr. 12: 60 (1848); Cooke in Fl. Cap. 5, 1: 270 (1910); Compton, Fl. Swaz. 67 (1966); Codd in Mitt. Bot. München 10: 248 (1971); Ross, Fl. Natal 305 (1972). Lectotype: Cape, Glenfilling, Drege (4731b in Herb. Benth., K!, lecto.; MO!; P!; S!).

*P. subspicatus* Hochst. in Flora 67 (1845). Type: Uitenhage, Krauss 1112.

*Burnatastrum spicatum* (E. Mey. ex Benth.) Briq. in Pflanzenfam. 4, 3a: 358 (1897).

Procumbent, succulent, aromatic herb with ascending inflorescences up to 60 cm high; stems usually several from the base, branching, 4-angled, up to 1 m long, finely crisped tomentulose and gland-dotted to subglabrous. *Leaves* fleshy, drying fairly thick in texture, subsessile to shortly petiolate; petiole 0-8 mm long; blade obovate 1,5-5 cm long, 0,8-2,5 cm broad, subglabrous to minutely hispidulous, veins indistinct, dotted with reddish gland-dots below; apex obtuse; base cuneate; margin coarsely crenate with 3-4 pairs of irregular teeth, mainly in the upper half. *Inflorescence* terminal,

elongate, dense or interrupted, 9-30 cm long, 1,5-3 cm in diameter, simple or occasionally with a pair of branches near the base; rhachis minutely crisped tomentulose and red gland-dotted; bracts linear-lanceolate to ovate-lanceolate, acuminate, 4-6 mm long, deciduous at about the early flowering stage. *Flowers* arranged in opposite and decussate, compact, several- to many-flowered, subsessile dichasia; pedicels 0,5-1,5 mm long, puberulous and gland-dotted. *Calyx* 2 mm long at flowering, enlarging to 5 mm long in fruit, slightly ventricose, circinate with the mouth erect, scabrid and freely red gland-dotted;



FIG. 7.—*Plectranthus spicatus*, Alexandria, Cape Province (Archibald 5981),  $\times 1$ .

teeth subequal, linear-lanceolate, the uppermost tooth distinctly longer than the rest at flowering stage, only slightly longer and up to 2 mm long at fruiting stage. *Corolla* purple, 7–8 mm long, minutely pubescent and with scattered gland-dots; tube at first narrowly cylindrical, 0.5 mm in diameter and ascending for 2.5 mm, then sharply decurved and expanding for 2.5 mm to 2 mm deep at the throat; upper lip erect, 2.5 mm long and equally broad, emarginate and with 2 narrow ear-like lateral lobes; lower lip deeply boat-shaped, 2.5–3 mm long. *Stamens* free at the base, curved and enclosed in the lower lip, 2.5–3 mm long. *Style* subequal to the lower stamens or slightly exerted by 1 mm. Fig. 7.

Found in dry woodland, often associated with other succulent plants, in rocky places or brackish flats, from the Humansdorp District along the coastal areas of the eastern Cape Province and Natal to eastern Swaziland and the eastern Transvaal Lowveld.

TRANSVAAL.—2531 (Komatipoort): 11 km S. of Pretoriuskop (–AB), *Codd 6500*; White River (–AC), *Rogers 23127*; Kruger National Park, Bukwenene (–AD), *Van der Schijff 3019*; *Van der Schijff & Marais 3738*. 2731 (Louwsburg): Pongola Flats (–BC), *Verdoorn 1728*.

SWAZILAND.—2631 (Mbabane): Komati Pass (–BA), *Compton 31523*; near Stegi (–BD), *Compton 32320*.

NATAL.—2632 (Bella Vista): Ndumo Game Reserve (–CD), *Pooley 626* (NH). 2731 (Louwsburg): Pongola Valley (–BC), *Hall sub NBG 575/56*; Magut (–DA), *Gerstner 3415* (NH). 2732 (Ubombo): 6 km N. of Ingwavuma (–AA), *Codd 7036*; Lebombo Mts. (–AA), *Strey 8149*; Bombopoort, E. of Gollela, *Hardy 1795*; False Bay Park (–CD), *Ward 3665*. 2831 (Nkandla): Nkweleni Valley (–DA), *Lawn 364* (NH); Umhlatuzi Valley (–DD), *Lawn 559* (NH). 2832 (Mtubatuba): Hluhluwe Game Reserve (–AA), *Codd 9630*. 3030 (Port Shepstone): Oribi Flats, Umzimkulu Gorge (–CB), *McClellan 402*.

CAPE.—3228 (Butterworth): Xobo Valley (–AB), *Van Breda 871*; near Butterworth (–AC), *Pegler 2026*; Komga, Kei River (–CA), *Flanagan 2308*. 3324 (Steytlerville): Kouga River (–CC), *Fourcade 3228*. 3325 (Port Elizabeth): near Enon (–BC), *Drege s.n.* (P); Bethelsdorp (–CD), *Zeyher 3542*; near Uitenhage (–CD), *Leach 8152*; Port Elizabeth—Addo road, (–DA), *Long 986*. 3326 (Grahamstown): Glenfilling (–BD), *Drege b* K. MO, P. S); Alexandria (–CB), *Archibald 4276*; 5981.

The species is based on two *Drege* gatherings and the sheet labelled 4731b ex Herb Benth. (K) is chosen as the lectotype.

Briquet based the genus *Burnatastrum* on *P. spicatus* and two Madagascar species, *P. lanceolatus* Benth. (1832) and *P. lavanduloides* Bak. *P. spicatus* is very similar to *P. lanceolatus*, the main difference being the more lanceolate leaves of the latter. In separating the genus, Briquet stressed the remarkable circinate, equally 5-toothed calyx. However, there is a clear affinity between *P. spicatus* and *P. cylindraceus* (excluded from *Burnatastrum* by Briquet) which has a less markedly curved calyx, and with *P. hereroensis* and *P. mirabilis* in which the calyx is erect and markedly ventricose. From these the affinity extends to *P. candelabiformis* and *P. welwitschii* (*Neomullera welwitschii* Briq.) in which the structure of the inflorescence begins to resemble typical *Plectranthus*.

It is interesting to note the change in shape of the calyx as it matures. At the flowering stage the upper tooth is distinctly larger than the lower four but, as it becomes older it becomes more curved and, at the fruiting stage, all five teeth are erect and the uppermost tooth is only slightly longer than the other four.

The type of *P. subspicatus* Hochst. (*Krauss* from near Uitenhage) has not been seen but Bentham (1848) included it under *P. spicatus* and this decision appears to be correct.

8. *Plectranthus cylindraceus* Hochst. ex Benth. in DC., Prodr. 12: 60 (1848); A. Rich., Tent. Fl. Abyss. 2: 182 (1851); Briq. in Pflanzenfam. 4, 3a: 354 (1897); Bak. in Fl. Trop. Afr. 5: 414 (1900); Compton, Fl. Swaz. 66 (1966); Launert & Schreiber in Prodr. Fl. S.W.Afr. 123: 24 (1969); Codd in Mitt. Bot. München 10: 248 (1971); Ross, Fl. Natal 305 (1972). Type: Ethiopia, Samen, near Gapdia, *Schimper 1113* (K!, holo.; BM!; G!; P!).

*P. marrubioides* Hochst. ex Benth. in DC., Prodr. 12: 60 (1848); A. Rich., l.c. 181 (1851); Briq., l.c. 354 (1897); Bak., l.c. 414 (1900). Type: Ethiopia, Samen, near Jaja, *Schimper 1925* (K!, holo.; BM!; G!; P!). *P. moschosmoides* Bak., l.c. 414 (1900). Type: Angola, Huilla, *Welwitsch 5489* (K!, holo.; BM!). *P. villosus* T. Cooke in Kew Bull. 1909: 378 (1909); Fl. Cap. 5,1: 275 (1910). Type: Natal, Entumeni, *Medley Wood 3955* (K!, holo.; NH). *P. densiflorus* T. Cooke in Kew Bull. 1909: 378 (1909); Fl. Cap. 5,1: 276 (1910). Type: Natal, near the Mooi River, *Medley Wood 4475* (K!, holo.; GRA!; NH!; SAM!). *P. glomeratus* R. A. Dyer in Flow. Pl. S. Afr. 24: sub t. 946 (1944), nom. illegit. Type: as for *P. villosus* T. Cooke. *P. spiciformis* R. A. Dyer in Flow. Pl. S. Afr. 24: t. 946 (1944). Type: Transvaal, Hammaskraal, *Mogg sub PRE 27138* (PRE!, holo.).

Perennial, succulent, aromatic herb forming a dense cluster from which arise annually several to many stems 60–150 cm tall; stems woody at the base, usually branching, obscurely 4-angled, finely tomentulose and usually with translucent gland-dots. *Leaves* sessile or shortly petiolate, petiole up to 5 mm long; blade broadly obovate to oblong-obovate 2–5.5 cm long, 1.5–4 cm broad, fleshy, shortly and softly tomentulose on both surfaces with pale to yellow gland-dots below, veins indistinct; apex obtuse; base cuneate; margin coarsely crenate with 3–5 pairs or irregular teeth, mainly in the upper half. *Inflorescence* terminal, short and dense or elongate and interrupted, usually crowded towards the apex, 8–35 cm long, 8–20 mm in diameter, occasionally simple, usually with 1–several pairs of branches; rhachis shortly and densely crisped tomentulose; bracts ovate-lanceolate to broadly ovate or suborbicular, 4–6 mm long, 3–5 mm broad, abruptly acute, minutely tomentulose, persisting to the late flowering stage. *Flowers* in dense, glomerate, many-flowered, opposite and decussate, subsessile dichasia, densely villous, making the structure difficult to discern; pedicels 0.5–1.5 mm long, glandular-puberulous. *Calyx* 1.5–2 mm long at flowering, enlarging to 3 mm long in fruit, slightly curved upwards, villous and usually gland-dotted; teeth more or less subequal, the uppermost distinctly larger than the rest, lanceolate-deltoid, 1.5 mm long, the lower 4 teeth deltoid-subulate 0.5–1 mm long, the lowest pair shorter than the lateral. *Corolla* pale



FIG. 8.—*Plectranthus cylindraceus*, Soutpansberg (Codd 8365),  $\times 1$ .

mauve and white, whitish or yellow (*P. densiflorus*), 4–5 mm long; tube straight 0,5 mm deep at the base, expanding to 1,75 mm at the throat, pubescent on the lobes; upper lip erect, 1 mm long and equally broad, emarginate and with 2 narrow ear-like lateral lobes; lower lip concave, 2 mm long. *Stamens* free at the base, declinate, 2,5–4 mm long, exserted. *Style* coinciding with the lower pair of stamens. Fig. 8.

Growing communally in dry woodland, on termite mounds under thorn trees and on brackish soil, as well as in crevices on exposed rocky slopes; widespread

in Africa from Ethiopia southwards to Angola and northern South West Africa in the west and, in the east, to northern, central and eastern Transvaal, eastern Swaziland and Natal.

S.W.A.—1918 (Grootfontein): 32 km W. of Grootfontein (—CA), *De Winter* 2882; Spitskoppe (—CA), *Dinter* 7412a; *Schoenfelder* 5804.

TRANSSVAAL.—2229 (Waterpoort): Wylliespoort (—DD), *Codd* 8365; Soutpansberg (—DD), *Leach* 8050. 2328 (Baltimore): Blouberg (—BB), *Codd* 8700; *Strey & Schlieben* 8501; *Van der Schijff* 5369; Kwarrihoek (—CD), *Steyn* 81. 2329 (Pietersburg): Soutpansberg, Lejuma (—AB), *Schlieben* 10637; between Louis



Trichardt and Pietersburg (–BD), *Schweickerdt & Verdoorn 447*; Pietersburg (–CD), *Pole Evans 2663*; Boyne (–DD), *Gerstner 5323*, 2428 (Nylstroom); Sterkkrivierdam Nature Reserve (–BC), *Jacobsen 2389*; near Warmbaths (–CD), *Leistner 144*; Naboomspruit (–DA), *Galpin M 288*; 34 km N.E. of Nylstroom (–DA), *Bruce 165*, 2429 (Zebediela); Percy Fyfe Nature Reserve (–AA), *Huntley 1991*; Potgietersrus (–AA), *Rogers sub TRV 4818*; *Maguire 2519*; Ganspoort (–BB), *Dyer 5409*; Sekukuniland (–DB), *Barnard 420*, 2430 (Pilgrim's Rest); Mica (–BB), *Hardy 908*; 26 km N.W. of Lydenburg (–CD), *Codd 8780*, 2527 (Rustenburg); 22 km S. of Northam (–AA), *Codd 8679*; on road from Thabazimibi to Beestekraal (–AD), *Coetzee 1174*; Jacksonstun (–DA), *Obermeyer 408*; near Brits (–DB), *Rehm s.n.* 2528 (Pretoria); near Hammanskraal (–AD), *Mogg s.n.*; *sub PRE 27138*; *Pole Evans 4821*; *Repton 4200*; Meintjieskop (–CA), *Schlieben 7981*; Daspoort (–CA), *Leendertz 154* Wonderboom Reserve (–CA), *Repton 1620*; Swing Bridge, 32 km N.E. of Pretoria (–CB), *Repton 1266*; Six Miles Spruit (–CC), *Van Niekerk sub TRV 13222*, 2529 (Witbank); 27 km N.W. of Middelburg (–CB), *Mogg 17313*; farm Doornkop, N. of Middelburg (–CB), *Du Plessis 1407*, 2531 (Komatiport); Nyamazane Bantu Trust (–AC), *Buitendag 511*; Kruger National Park, Klokwe (–AD), *Van der Schijff 870*; Bukwenene (–AD); *Van der Schijff 3016*; *Van der Schijff & Marais 3739*; Ship Mt. (–AD), *Codd 6037*; *Van der Schijff 385*; 3774; 7 km W. of Malelane Camp (–AD), *Codd 5516*; Komatiport (–BD), *Dyke sub Marloth 5516*; Crocodilepoort Mt. (–CA), *Codd 7769*; Boulders (–CB), *Van der Schijff 2533*; Barberton (–CC), *Thornicroft 807* (NH); *Rogers sub TRV 23803*; *Pole Evans 4683*.

SWAZILAND.—2631 (Mbabane): near Stegi (–BD), *Lavranos 27*; *Compton 30859*; 31530.

NATAL.—2632 (Bella Vista): Ndumo Game Reserve (–CC), *Pooley 521* (NH), 2732 (Ubombo): Lebombo Mts., Jozini area (–AC), *Ward 4185*; Ubombo (–CA), *Gerstner sub NH 22917* (NH), 2830 (Dundee): Weenen, Mooi River (–CD), *Medley Wood 4475* (GRA, K, NH, SAM); 11696; near Muden (–CD), *Edwards 2769*, 2831 (Nkandla); Middledrift (–CC), *Edwards 2067*; Entumeni (–CD), *Medley Wood 3955* (K, NH), 3030 (Port Shepstone): Gibraltar (–CB), *Strey 9729*.

Throughout its wide range in Africa, *P. cylindraceus* is remarkably uniform and infraspecific categories are not evident. The type, *Schimper 1113*, from Ethiopia, is at a young stage but is recognizable as the same as our plant in Southern Africa. There is some variation in density of inflorescence, while *P. densiflorus* is stated by Medley Wood, in both of his gatherings from near Weenen (Nos. 4475 and 11696), to have yellow flowers. The only other gathering from this area, *Edwards 2769*, is described as having blue flowers, and shades of blue or mauve are usual for this species. In no other respect does the type of *P. densiflorus* differ, and varietal rank merely for a deviation in flower colour seems hardly justified. The flower colour cannot be discerned on dried specimens.

The glomerate flower clusters are so densely pubescent that structure is difficult to ascertain, but it is evident that the flowers are arranged in compact dichasia as in *P. spicatus*. It differs from *P. spicatus* in the denser pubescence, the calyx being smaller and less markedly circinate, and the smaller, paler corolla. Although the calyx may be described as subequally 5-toothed, the uppermost tooth is distinctly longer and broader than the rest.

Chromosome number  $2n = 28$  (De Wet, 1958, as *P. spicatus* and *P. villosus*).

Subgen. *Coleus* (Lour.) Codd, stat. nov.

*Coleus* Lour., Fl. Cochinchin., 372 (1790).

*Coleus* Sect. *Aromaria* Benth., Lab. 51 (1832); in DC., Prodr. 12: 72 (1848); Briq. in Pflanzenfam. 4, 3a: 359 (1897).

Type species: *C. amboinicus* Lour., l.c.

The typification of *C. amboinicus*, and thus of Subgen. *Coleus*, is complicated and is discussed on p. 388.

The genus was separated mainly on the basis of the stamens being united at the base, not free as in *Plectranthus*. This characteristic led Benth. (Lab.,

1832 and in DC., Prodr. 12, 1848) to enlarge the genus to include three sections:

Sect. *Aromaria*: containing the single species *C. amboinicus* Lour. (which he renamed *C. aromaticus* Benth.).

Sect. *Calceolus*: containing species such as *C. barbatus* (Andr.) Benth. and *C. spicatus* Benth. This section is now treated as Subgen. *Calceolanthus* (see p. 389).

Sect. *Solenostemon*: containing species such as *C. scutellarioides* (L.) Benth. and *C. latifolius* Hochst. ex Benth. Following Morton (1962, 1963), this section is now included in an emended concept of *Solenostemon* Schumacher, as a separate genus (see p. 437).

While Sect. *Aromaria* has remained monotypic, many species names have been added to Sections *Calceolus* and *Solenostemon*, so that a completely distorted view of *Coleus* came to be accepted.

As pointed out by Morton (1962) and Launert (1968) the degree of union of the stamens in "*Coleus*" species varies and the only character, apart from the union of the stamens, that can be used to separate *C. amboinicus* from *Plectranthus* is the oblong upper tooth of the calyx. Thus there seems little justification for upholding *Coleus* as a separate genus and it is now included in synonymy but given subgeneric status. The remaining "*Coleus*" sections will then be distributed mainly to the genera *Plectranthus* and *Solenostemon* respectively.

It is probable that *P. amboinicus* originated in Africa and was dispersed by the early Portuguese voyagers. Specimens such as *Welwitsch 5556* from Angola are a very good match of the plant from India described as *C. aromaticus* Benth., and a good deal of variation occurs in this area. A second species, *P. unguentarius* is now described from South West Africa, making two species in the Section, both of which are recorded from Southern Africa, namely:

9. *P. unguentarius* Codd

10. *P. amboinicus* (Lour.) Spreng.

9. *Plectranthus unguentarius* Codd, sp. nov., *P. amboinico* (Lour.) Spreng. affinis, sed habitu erecto robustiore, pedicellis longioribus differt.

*P. amboinicus* sensu Launert & Schreiber in Prodr. Fl. S.W.Afr. 123: 24 (1969).

Suffrutex perennis. *Caulis* erectus, parce ramosus, 1–1,5 m altus, obscure quadrangularis, cano-tomentosus. *Folia* subcarnosa, breviter petiolata; petiolus 1–1,5 cm longus; lamina late obovata vel subrotundata, 4–6 cm longa, 4–6 cm lata, supra dense strigosa, subtus dense cano-tomentosa glanduloso-punctata, valde reticulata, apice rotundato, basi cuneata vel attenuata, margine profundo crenato. *Inflorescentia* subspicata, robusta, erecta usque ad 35 cm longa; rhachis dense lanata; bractee late ovatae acutae, 3 mm longae, subsistentes. *Verticillastri* 1–3 cm distantes, dense glomerati, tomentosi, ca 40-floribus; pedicelli 4–5 mm longi, dense tomentosi. *Calyx* demum 5–6 mm longus, glanduloso-tomentosus; lobus posticus ovatus, acutus, horizontalis, 2,5 mm longus, 2 mm latus; 4 dentes antici breviter subulati. *Corolla* alba, 1–1,2 cm longa, glanduloso-pubescentis; tubus leviter geniculatus, prope basin 1 mm diam., ad fauce 2 mm diam.; labium posticum erectum, 1,5–2 mm longum, obscure 4-lobatum; labium anticum cymbiforme, 5–7 mm longum. *Stamina* 4, filamentis ad basin breviter connatis, superna 5 mm longa, inferna 7 mm longa. *Stylus* in labio antico inclusus vel breviter exsertus.

Type.—South West Africa, Kaokoveld, 17 km S. of Kaoko Otavi on road to Sesfontein, 21/4/57, *De Winter & Leistner* 5595 (PRE, holo.).

Perennial erect robust semi-succulent suffrutex 1–1.5 m tall; stems woody at the base, obscurely 4-angled, sparingly branched, densely cano-tomentose and with minute gland-dots. *Leaves* semi-fleshy, slightly aromatic, drying fairly thick-textured; petiole 1–1.5 cm long, pubescence as for the stems; blade broadly obovate to subrotund, 4–6 cm long and equally broad, densely appressed pubescent and veins indistinct above, woolly-tomentose and distinctly reticulate veined below, freely dotted with minute reddish-brown gland-dots; apex rounded; base cuneate to abruptly attenuate on to the petiole; margin coarsely crenate except in the lower third with 8–12 pairs of rounded teeth. *Inflorescence* a terminal spike-like raceme of interrupted densely glomerate verticillasters, verticillasters 1–3 cm apart, simple or with a pair of branches near the base up to 35 cm long; rhachis densely woolly-tomentose; bracts broadly ovate, 3 mm long, 2.5 mm broad, acute, densely tomentose, persisting to early flowering stage. *Flowers* in very dense  $\pm 20$ -flowered sessile cymes, densely tomentose, producing  $\pm 40$ -flowered verticillasters; pedicels erect to ascending 4–5 mm long, densely tomentose. *Calyx* 2.5–3 mm long at flowering, enlarging to 5–6 mm in fruit, glandular-tomentose; tube short, campanulate; uppermost tooth by far the largest, horizontal, broadly ovate, 2.5 mm long and 2 mm broad, abruptly acute at the apex, the lower 4 teeth short, subulate. *Corolla* white, 1–1.2 cm long, glandular-pubescent; tube slightly bent about the middle, 1 mm deep at the base, expanding to 2 mm at the throat; upper lip short, erect, 1.5–2 mm long and equally broad and somewhat hooded, emarginate and with 2 obscure lateral lobes; lower lip boat-shaped, 5–7 mm long, horizontal. *Stamens* united at the base for 1–2 mm, curved upwards in the lower lip, 5–7 mm long, enclosed or slightly exerted. *Style* exerted by about 1 mm. Fig. 9.

Recorded from the Kaokoveld, northern South West Africa, in dry Mopane woodland, on high rocky situations up to 2 300 m altitude, with broken fragments of limestone and weathered dolomite.

S.W.A.—1712 (Posto Velho): Kaokoveld, Baynes Mts., Otjihipaberg, *Davies, Thompson & Miller* 88. 1813 (Ohopoho): Kaokoveld, 17 km S. of Kaoko Otavi on road to Sesfontein, *De Winter & Leistner* 5595.

In the herbarium, *P. unguentarius* can be distinguished from *P. amboinicus* by several small differences: the stouter stems and inflorescences, the reddish-brown gland-dots on the underside of the leaves, the more coarsely crenate leaf margin, the more numerous flowers in each verticil (40 or more, as against about 20 in *P. amboinicus*) and the longer pedicels. In the field the two would not be confused because of the difference in habit, *P. unguentarius* having robust, erect, semi-woody stems, sparingly branched, as against the creeping, succulent, much-branched stems of *P. amboinicus*. In *P. amboinicus* the leaves are fleshy and highly aromatic, being used medicinally or to flavour food; in *P. unguentarius* the leaves are not fleshy and are described as slightly aromatic. On the other hand, the roots are aromatic and are used as one of three ingredients of a pomade used by ladies of the Kaokoveld. Leaves of *Fagara* sp. are said to be one of the other ingredients, but the third ingredient is unknown.

10. *Plectranthus amboinicus* (Lour.) Spreng., Syst. Veg. 2: 690 (1825), as "Amboinensis"; Launert in Mitt. Bot. München 7: 298 (1968); Ross, Fl. Natal



FIG. 9.—*Plectranthus unguentarius*, Kaokoveld, South West Africa (*De Winter & Leistner* 5595),  $\times \frac{1}{2}$ .

305 (1972). Type: a specimen in BM which is practically unrecognizable; representative specimen chosen by Launert, l.c.: Siam, *A. F. G. Kerr* s.n. (BM).

*Coleus amboinicus* Lour., Fl. Coch. 372 (1790); Briq. in Pflanzenfam. 4, 3a: 359 (1897); Merrill in Addisonia 20: 11 (1937); Compton, Fl. Swaz. 67 (1966); Codd in Mitt. Bot. München 10: 248 (1971). —var. *violaceus* Guerke in Bot. Jahrb. 19: 210 (1894); Bak. in Fl. Trop. Afr. 5: 434 (1900); Hiern, Cat. Afr. Pl. Welw. 1: 865 (1900). Type: Tanzania, Lake Chala, *Volkens* 321 (K!; BM!). *C. aromaticus* Benth. in Wall., Pl. As. Rar. 2: 15 (1831); Lindl. in Bot. Reg. 18: t. 1520 (1832); Benth., Lab. 51 (1832); in DC., Prodr. 12: 72 (1848); Hook. f., Fl. Brit. India 4: 625 (1885); Trimen, Handb. Fl. Ceylon 3: 374 (1895). Hiern, Cat. Afr. Pl. Welw. 1: 865 (1900). Type: India, Patna, *Buchanan-Hamilton* (in Herb. Wallich, K!). *C. crassifolius* Benth. in Wall., Pl. As. Rar. 2: 15 (1831); Lab. 52 (1832). Type: India, *Wight* (in Herb. Wallich, K!).

*Plectranthus aromaticus* Roxb., Hort. Beng. 45 (1814), nom. nud. *P. aromaticus* (Benth.) Roxb., Fl. Ind. ed. 2, 3: 22 (1832).

*Majana amboinica* (Lour.) Kuntze, Rev. Gen. 2: 524 (1891), nom. invalid.

Perennial, succulent, strongly and pleasantly aromatic herb with many spreading stems up to 1.5 m long, ascending at the inflorescences to 50 cm; stems somewhat woody at the base, obscurely 4-angled, freely branched, fairly to densely villous. *Leaves* fleshy, strongly aromatic, drying thick-textured; petiole 4–10 mm long, usually more villous than the stems; blade broadly ovate to ovate-deltoid, densely appressed pubescent above, woolly-tomentose and with distinct nerves below, both surfaces dotted with pale to brownish gland-dots; apex obtuse to rounded; base truncate, sometimes abruptly attenuate; margin finely crenate with 7–10 pairs of teeth. *Inflorescence* terminal, slender, elongate, 10–30 cm long, of interrupted, densely glomerate verticillasters, simple or

occasionally with a pair of branches near the base; verticillasters 1–3 cm apart; rhachis shortly and densely crisped tomentulose and gland-dotted; bracts broadly ovate to subrotund, shortly acute, 2–3 mm long and equally broad, persisting to the flowering stage. *Flowers* in dense, 4–10-flowered sessile cymes, densely villous making the structure difficult to discern; pedicels erect to ascending, 1.5–2.5 mm long, densely glandular-villous. *Calyx* 2.5–3 mm long at flowering, enlarging to 5–6 mm long in fruit, glandular-villous, tube short, campanulate; uppermost tooth by far the largest, horizontal, oblong to broadly oblong, up to 3 mm long and 2 mm broad, rounded to abruptly apiculate at the apex, the lower 4 teeth subulate, 1.5–2 mm long. *Corolla* lilac, mauve or whitish, 7–9 mm long; tube slightly bent about the middle, 1 mm deep at the base, expanding slightly to 1.5 mm at the throat, pubescent; upper lip erect, 1.5–2 mm long and equally broad, emarginate and with 2 lateral ear-like lobes; lower lip boat-shaped, 4 mm long, horizontal. *Stamens* united at the base for 1–2 mm, curving upwards in the lower lip, enclosed or slightly exerted, 4–5 mm long. *Style* coinciding with the lower pair of stamens. Fig. 10.



FIG. 10.—*Plectranthus amboinicus*, Zululand (Ward 3182),  $\times \frac{1}{2}$ .

Distributed from Kenya to Angola in the west and, in the east, to Mozambique, Swaziland and northern Natal; in Southern Africa found on rocky, wooded slopes, loamy flats with succulent plants or the margin of sand forest, near the sea or up to 150 m altitude (in Southern Africa).

SWAZILAND.—2731 (Louwsburg): Ingwavuma Poort (–BB), Compton 28621; 29081.

NATAL.—2632 (Bela Vista): Ndumo Game Reserve (–CD), Ward 3182; Tinley 459. 2732 (Ubombo): Mkuzi Game Reserve (–CA), Ward 3983.

The typification of the species presents a problem because Loureiro cites several discordant elements in his protologue, but his description is detailed and there has not been any doubt as to the plant described. Lauernt, l.c., mentions the presence in BM of a Loureiro specimen which may be regarded as the type, but it is in such a poor state of preservation that it would be scarcely recognizable but for a few floral fragments. He therefore clarifies the concept by designating a specimen collected in Siam by A. F. G. Kerr as a representative specimen.

*P. amboinicus* has become widely distributed by cultivation, first in the Far East and, later, in the West Indies and tropical America. Its strong, not unpleasant aroma has led to its use medicinally (see Watt, *Indian Medicinal Plants* 2: 1017, 1918) and as a popular spice for flavouring food, being known as Soup Mint, French Thyme, Spanish Thyme, Country Borage (Lauernt) and Indian Mint (Hiern). According to Trimen, l.c., it is employed in Ceylon as a medicine, especially for cattle, and a plant is always to be found growing in a little box suspended on the side of the native carts.

There has been speculation as to its country of origin but it undoubtedly occurs naturally in Africa from Kenya southwards to Angola and Natal. It is common near Lourenço Marques (e.g. Inhaca Island) where it would have been accessible to the early voyagers to the East.

Subgen. *Calceolanthus* Codd, subgen. nov., subgen. *Plectrantho* affinis sed fauce calycis villosa, filamentis basi connatis differt.

*Coleus* sect. *Calceolus* Benth., Lab. 49 (1832); in DC., *Prodr.* 12: 71 (1848); Briq. in *Pflanzenfam.* 4, 3a: 359 (1897).

Type species: *P. caninus* Roth.

In southern Africa one could regard subgen. *Calceolanthus* as a clear-cut genus with no intermediate species linking it with *Plectranthus*. However, in tropical Africa there are several species of very similar facies in which the stamens are united at the base, but in which the calyx is not villous in the throat. It therefore seems best to include the group in *Plectranthus* at the present stage in our knowledge.

The section *Calceolus* was included in *Coleus* by Bentham because of the filaments being united at the base. Although this character breaks down in certain groups, e.g. in subgen. *Burnatastrum* and the genus *Solenostemon*, in subgen. *Calceolanthus* the union of the filaments is a constant character.

Three species belonging to the subgenus occur naturally in our region, namely:

11. *P. tetensis* (Bak.) Agnew (= *Coleus vagatus* E. A. Bruce)
12. *P. caninus* Roth
13. *P. neochilus* Schltr.

In addition, two tropical species are widely cultivated in South Africa and have become semi-naturalised. They are, therefore, included in the present treatment, namely:

14. *P. ornatus* Codd (= *Coleus comosus* Hochst. ex Guerke)
15. *P. barbatus* Andr.

11. *Plectranthus tetensis* (Bak.) Agnew, Upland Kenya Wild Flow. 635 (1974).

*Coleus tetensis* Bak. in Fl. Trop. Afr. 5: 431 (1900). Type: Mozambique, near Tete, Kirk s.n. (K!, holo.). *C. decumbens* Guerke in Bot. Jahrb. 19: 211 (1894); Bak., l.c. 431 (1900); Compton, Fl. Swaz. 67 (1966). Syntypes: Kenya, Duruma district, Hildebrandt 230; Tanzania, Kilimanjaro, Volkens 327 (BR!), non *Plectranthus decumbens* Hook. f. (1864). *C. vagatus* E. A. Bruce in Bothalia 6: 227 (1951); Codd in Mitt. Bot. München 10: 248 (1971). Type: Transvaal, 2,5 km E. of Skukuza, Codd 5489 (PRE!, holo.; K!).

*Plectranthus vagatus* (E. A. Bruce) Codd in Ross, Fl. Natal 305 (1971), non rite publ.

Perennial, trailing, semi-succulent, not unpleasantly aromatic herb, branching sparingly at the base; stems 4-angled, procumbent, up to 70 cm long with ascending inflorescences up to 20 cm, shortly and fairly densely tomentulose with scattered multicellular hairs and usually dotted with reddish glands. *Leaves* softly succulent; petiole 5–10 mm long, pubescent as for the stems; blade ovate to obovate, 1,5–2,5 cm long, 1,2–2 cm broad, shortly appressed pubescent, usually with orange-red gland-dots below; apex obtuse to rounded, base obtuse to cuneate; margin obscurely crenate-dentate with 4–5 pairs of teeth. *Inflorescence* a terminal spikelike raceme, dense and enclosed in the bracts but not markedly 4-angled at the apex, often laxer and interrupted below; rhachis fairly densely tomentulose with tufts of long multicellular hairs below the verticillasters; bracts oblong-ovate, rounded at the apex, 6–9 mm long, 3–6 mm broad, villous on the margin, persisting to about the flowering stage. *Flowers* in sessile 4–6-flowered cymes, forming 8–12-flowered verticillasters; verticillasters densely placed above, up to 5 mm apart below; pedicels erect, appressed to the rhachis, 3 mm long, villous. *Calyx* 1,5 mm long at flowering enlarging to 4–5 mm long in fruit, pilose and red gland-dotted without, densely villous inside; upper lip large, broadly ovate, abruptly acute, 2,5–3 mm long and 3–4 mm broad; lower 4 teeth subequal, deltoid-subulate, 2 mm long. *Corolla* mauve-purple, 1,5–1,8 cm long, sparingly pubescent and with scattered red gland-dots; tube at first ascending and narrowly cylindrical, 0,5 mm in diameter, then geniculate and expanding about the middle to 3,5 mm deep at the throat; upper lip erect 3,5–4 mm long, 3 mm broad, emarginate at the apex and with 2 lateral ear-like lobes; lower lip deeply boat-shaped, ascending, 9–11 mm long. *Stamens* united at the base for 2 mm and curved within the lower lip, of two lengths, enclosed or shortly exerted, 7–9 mm long. *Style* shortly exerted. Fig. 11.

Distributed from Tanzania through Mozambique and Rhodesia to the northern and eastern Transvaal Lowveld and northern Zululand, usually associated with dry thorn-scrub and woodland on brackish flats.

TRANSVAAL.—2230 (Messina): Messina (–AC), Rogers 20708. 2231 (Pafuri): Klopperfontein (–CA), Obermeyer sub TRV 28402. 2330 (Tzaneen): Great Letaba (–CC), Breijer sub TRV 17613. 2331 (Phalaborwa): Tendi River (–CB), Van der Schijff 3536. 2431 (Acornhoek): 2,5 km E. of Skukuza (–DC), Codd 5489. 2531 (Komatipoort): Kruger National Park, Sigaas River (–AD), Brynard & Pienaar 4431; Bukwenene (–AD), Van der Schijff 3020; Van der Schijff & Marais 3736; 8 km N.E. of Malelane (–BC), Codd 6083; Komatipoort (–BD), Dyke sub Marloth 5516; Kaapmuiden (–CB), Mogg s.n.; Malelane (–CB), Leach 8361; Barberton (–CC), Buttendag 853; Lomati River (–DA), Jenkins sub TRV 9909.

SWAZILAND.—2631 (Mbabane): on road to Komatipoort (–BA), Pole Evans 3461.

NATAL.—2632 (Bela Vista): Ndumo Game Reserve (–CD), Tinley 440.

*P. tetensis* is sometimes confused with *P. neochilus* in the herbarium but it can be readily distinguished from the latter by the slender, trailing, less villous stems and the rounded, flattish bracts (distinctly



FIG. 11.—*Plectranthus tetensis*, Kruger National Park (Van der Schijff & Marais 3736),  $\times 1$ .

pointed in *P. neochilus*, *P. caninus* and *P. ornatus*) which persist until the flowering stage, and the tufts of villous hairs on the rhachis and bracts.

The name *Coleus decumbens* Guerke cannot be transferred to *Plectranthus* because of the earlier *P. decumbens* Hook. f. (1864).

Chromosome number  $2n = 32$  (De Wet, 1958, as "*Coleus vagatus*").

12. *Plectranthus caninus* Roth, Nov. Pl. Spec. 279 (1821); Launert & Schreiber in Prodr. Fl. S.W.Afr. 123: 24 (1969). Type: India, Heyne s.n. (Herb. Wall., K!, iso.).

*Coleus spicatus* Benth. in Wall., Pl. As. Rar. 2: 15 (1831); Lab. 49 (1832); in DC., Prodr. 12: 71 (1848); Wight, l.c. t. 1431 (1849); Hook. f., Fl. Brit. India 4: 624 (1885). Type: India, Wight s.n. (Herb. Benth., K!, holo.). *C. caninus* (Roth) Vatke in Linnaea 37: 318 (1871), partly, excl. Schimper 622; Guerke in Bot. Jahrb. 19: 212 (1894); Briq. in Pflanzenfam. 4, 3a: 359 (1897); Codd in Bothalia 7: 433 (1961). *C. flavovirens* Guerke in Engl., Pflanzenw. Ost.-Afr. C 347 (1895). Type: East Africa, Volkens 1771 (BR!, iso.). *C. omahenkense* Dinter in Fedde Repert. (Beih.) 53: 123 (1928). Syntypes: S.W. Africa, Grootfontein, Etemba, Dinter 3265; Otjukuara, Dinter 3265.

Annual, erect, branching, semi-succulent, somewhat unpleasantly aromatic herb, 15–40 cm tall; stems 4-angled, villous with short and long hairs and dotted with orange-red gland-dots. *Leaves* slightly fleshy; petiole 4–20 mm long, shortly tomentose;

blade oblanceolate to obovate-oblanceolate or long-elliptic or ovate-lanceolate 3–5.5 cm long, 2.5–3.5 cm broad, sparingly hispidulous on both surfaces, especially on the nerves below, gland-dotted and often with short glandular hairs; apex acute to obtuse; base cuneate; margin subentire to obscurely crenate-dentate with 4–7 pairs of shallow teeth. *Inflorescence* a terminal dense spikelike raceme 2.5–6 (–9) cm long, simple or occasionally with a pair of branches near the base, 4-angled and enclosed in large bracts in the bud stage; rachis hidden by the flowers; bracts densely imbricate, broadly ovate, concave, apiculate, 4–6 mm long, 2–3 mm broad, whitish-green, purple-tipped, villous, early deciduous. *Flowers* in sessile 3–4-flowered cymes forming 6–8-flowered

expanding to 1 mm deep about the middle; upper lip erect to recurved, 1–1.5 mm long, obscurely 4-lobed; lower lip boat-shaped, horizontal, 5–6 mm long. *Stamens* united at the base for 1.5 mm and curved within the lower lip or slightly exerted, 5–6 mm long. *Style* coinciding with the stamens. Fig. 12, 13.

Tends to grow communally under trees in dry, open woodland or on rocky outcrops; found in India and from Ethiopia southwards through tropical East Africa to Rhodesia, Zambia and northern South West Africa.

S.W.A.—1817 (Tsintsabis): Farm Kakuse, east of Etosha Pan (–DA), *Sachs s.n.* 1917 (Tsumeb): Farm Sissekab (–AC), *Gies, Volk & Bleissner 6418*; 19 km from Otavi on Grootfontein road (–CB), *Hardy 2114. 2218* (Gobabis): near Gobabis (–BD), *Tölken 5420*.



FIG. 12.—*Plectranthus caninus*, Gobabis, South West Africa (Tölken 5420).

verticillasters; verticillasters closely appressed; pedicels erect, 2–2.5 mm long, puberulous. *Calyx* 2 mm long at flowering enlarging to 5 mm long in fruit, glandular-pubescent without, densely villous inside; upper lip large, broader than long, 2 mm long, 4 mm broad, abruptly apiculate, decurrent on the tube; lower 4 teeth subequal, linear-subulate, 2 mm long. *Corolla* blue-purple, 8–10 mm long, slightly puberulous on the lips, tube slightly geniculate and

*P. caninus* is a plant of semi-desert areas and varies a good deal in stature, branching and leafiness according to the growing conditions; otherwise, the floral characters are fairly constant (see also notes on p. 393). In South West Africa it is an annual but whether this applies throughout its entire range is not known. It is related to *P. neochilus* but can usually be distinguished by the shorter, compact; (not interrupted) inflorescences and shorter corolla

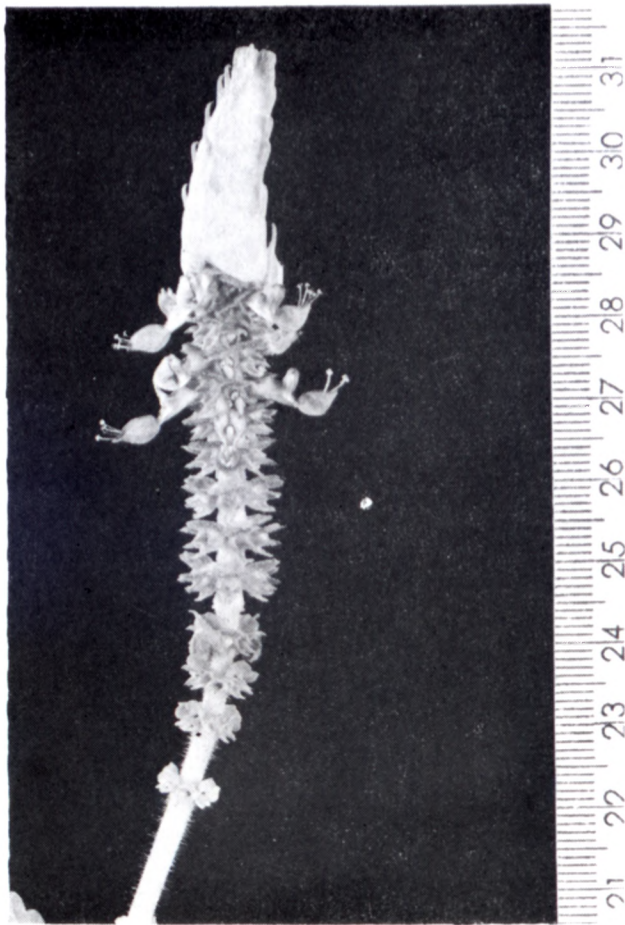


FIG. 13.—*Plectranthus caninus* (Tölken 5420),  $\times 1$ .

(8–10 mm long as against 12–18 mm long in *P. neochilus*). *P. neochilus* is a perennial but may behave as an annual under periodic very dry conditions in South West Africa.

Briquet, l.c., includes *C. heynei* Benth. as a synonym of *C. caninus* (Roth.) Vatke and it is possible that *P. monadelphus* Roxb. may also be conspecific, but it has not been possible to investigate the typification of these species in the present study.

It is doubtful if the combination *Coleus caninus* can be attributed to Vatke as he does not cite the basionym. The plant which he was discussing, Schimper 622, is not *P. caninus* but *P. ornatus* (= *Coleus comosus*) (see p. 393).

13. *Plectranthus neochilus* Schltr. in J. Bot. Lond. 34: 394 (1896); Cooke in Fl. Cap. 5, 1: 285 (1910); Launert & Schreiber in Prodr. Fl. S.W.Afr. 123: 25 (1969); Ross. Fl. Natal 305 (1972). Type: Transvaal, Barberton, Rimers Creek, Galpin 968 (K!, holo.; GRA!, NH!).

*Coleus schinzii* Guerke in Bull. Herb. Boiss. 6: 555 (1898); Bak. in Fl. Trop. Afr. 5: 430 (1900). Type: S.W. Africa, Ovamboland, Tsumeb, Schinz 56 (Z!, holo.; PRE, photo.). *C. pentheri* Guerke in Ann. Naturhist. Hofmus. Wien 20: 48 (1905); Cooke in Fl. Cap. 5, 1: 289 (1910); Bruce in Hook. Ic. Pl. 34: t. 3375 (1938); Type: Cape Province, Albany District, Breakfast Vlei, Krook in Hb. Penther 1716 (W!, holo.; PRE!). *C. neochilus* (Schltr.) Codd in Bothalia 7: 432 (1961); Letty, Wild Flow. Transv. 288, t. 143, 2 (1962). *C. carnosus* Dinter, ined.; Dinter ex Elioison, S. Afr. Flow. for the Gard. 165 (1955), illustr. only.

Perennial, or sometimes annual, decumbent, to erect, often much branched and bushy, succulent, unpleasantly aromatic herb 12–50 cm tall; stems solitary to many often first forming a loose or dense mat, ascending, obscurely 4-angled, branched, finely tomentulose to sparingly or fairly densely villous, often with a mixture of long and short hairs, with scattered orange gland-dots. Leaves succulent, viscid,

tending to fold along the midrib; petiole 5–15 mm long, pubescent like the stems; blade obovate to elliptic-ovate, 2–5 cm long, 1.5–3.5 cm broad, sparingly to fairly densely appressed pubescent especially on the nerves below, with orange gland-dots below; apex obtuse to rounded; base cuneate to attenuate; margin obscurely crenate with 4–6 pairs of teeth mainly in the upper half. Inflorescence a terminal spikelike raceme 7–15 cm long, 4-angled and with a coma of large imbricate bracts in the young stage, dense at the apex, laxer and interrupted below; rhachis fairly densely glandular-tomentulose; bracts imbricate, ovate, acuminate, concave, 6–10 mm long, 4–6 mm broad, greenish-white tipped with purple, tomentulose and gland-dotted, early deciduous. Flowers in sessile 3-flowered cymes forming 6-flowered verticillasters; verticillasters densely placed above becoming laxer below and spaced 5–15 mm apart; pedicels erect, appressed to the rhachis, 3–4 mm long, glandular-puberulous. Calyx 3 mm long at flowering enlarging to 6 mm long in fruit, glandular-scabrid and gland-dotted, densely villous in the throat; upper lip large, broader than long, 2.5 mm long, 5–6 mm broad with a short median apicule; lower 4 teeth subequal, lanceolate-subulate, 2 mm long. Corolla mauve purple, rarely whitish, the upper lip paler and bluish, 1.2–2 cm long, slightly puberulous on the lips and with scattered orange gland-dots; tube ca 0.75 mm in diameter at the base, at first horizontal, slightly geniculate about the middle and expanding to 1.5 mm deep at the throat; upper lip erect to recurved, 2 mm long and equally broad, emarginate and with 2 obscure lateral lobes; lower lip boat-shaped, horizontal, 8–11 mm long. Stamens united at the base for 2–3 mm and curved within the lower lip, 8–11 mm long, slightly exserted. Style finally exserted by 4–5 mm. Fig. 14, 15.



FIG. 14.—*Plectranthus neochilus*, Barberton (Codd 9531).



FIG. 15.—*Plectranthus neochilus*, Lebombo Mts. (Codd 7798),  $\times 1$ .

Found under trees in dry, open woodland and among rocks (especially dolomite) in grassland, in the eastern Cape Province, central and northern Natal, central and eastern Transvaal, and northern South West Africa, extending to Botswana, Zambia and Rhodesia.

S.W.A.—1917 (Tsumeb): Tsumeb (–BA), *Schinz* 56 (Z); Nosib (–BD), *Schoenfelder* 1021; 5643; 6 km S.W. of Otavi (–CB), *De Winter* 2853; Auros (–DA), *Dinter* 5634. 2016 (Otjiwarongo): farm Cleveland, 6 km N. of Otjiwarongo (–BC), *Giess, Volk & Bleissner* 6334.

TRANSVAAL.—2329 (Pietersburg): 43 km from Pietersburg on road to Dendron, *Coetzee* 1280. 2428 (Nylstroom): Towoomba Pasture Research Station (–CD), *Sidey* 1401; Mosdene, near Naboomspruit (–DA), *Galpin M* 287; *Schlieben* 9176. 2429 (Zebediela): Potgietersrus (–AA), *Rogers sub TRV* 4817; Percy Fyfe Nature Reserve (–AA), *Huntley* 1110. 2430 (Pilgrim's Rest): Lulu Mts., Sekukuniland (–CC), *Barnard & Mogg* 704. 2526 (Zeerust): 24 km S.W. of Zeerust (–CA), *Leistner* 549. 2527 (Rustenburg): near Silikaatsnek (–DB), *Pole Evans* 4761. 2528 (Pretoria): Pienaars River (–AD), *Pedro* 696; *Weydermann & Oberdieck* 1610; Rooikop (–BA), *Smuts & Gillett* 2008; 21 km S.E. of Pretoria (–CD), *Codd* 2570; Rietvlei Research Station (–CD), *Acocks* 11262. 2529 (Witbank): Doornkop, near Middelburg (–CB), *Du Plessis* 1137; 1403. 2530 (Lydenburg): near Lydenburg (–AB), *Atherstone s.n.* 2531 (Komatiipoort): Louws Creek (–CB), *Van Dam sub TRV* 21150; near Barberton (–CC), *Galpin* 968 (K, GRA, NH); *Thorncroft* 109 (K); 13 km S.E. of Barberton (–CC), *Codd* 9531.

NATAL.—2830 (Dundee): Mooi River (–CD), *Medley Wood* 4340 (K); near Muden (–CD), *Codd* 8602; Tugela Valley (–CD), *Sidey* 3670. 2930 (Pietermaritzburg): Byrne (–CC), *Medley Wood* 3199 (K).

CAPE.—3129 (Port St. Johns): Lusikisiki (–BC), *Flanagan* 2886. 3227 (Stutterheim): near Dohne (–CB), *Acocks* 9547; near Komga (–DB), *Flanagan* 557. 3228 (Butterworth): Cintza River Mouth (–CC), *Galpin* 6554. 3326 (Grahamstown): Breakfast Vlei (–BB), *Krook sub Penther* 1716 (W).

*P. neochilus* varies a good deal in vegetative characters. In the eastern Cape Province the stems are semi-prostrate to decumbent, about 10–20 cm long, with numerous glands and short appressed pubescence on leaves and stems, and with scattered multicellular hairs on the stems. In the Transvaal, South West

Africa and Rhodesia, the stems are usually more ascending, 30–50 cm tall, and usually more conspicuously villous. It appears to behave sometimes as an annual in South West Africa; elsewhere the plants are perennial, often with somewhat tuberous roots, especially those found in grassy places. A low-growing form, up to about 15 cm tall, less pubescent and which flowers a few weeks later than the tall form, is known in cultivation and may be worthy of varietal rank. Its origin is unknown, but it makes a dense, mat-like growth and is useful as a ground cover. It is said to have been brought to the Voortrekker Monument, Pretoria, in response to a general request for succulent plants with which to plant the surrounding garden.

The floral characters are relatively constant. In the bud stage the inflorescence is a 4-angled spikelike raceme 3–4 cm long, composed of 4 rows of densely imbricate, ovate, acuminate bracts. The bracts are shed as each verticil of flowers starts to open. As flowering proceeds, the rhachis elongates with the result that the verticils become separated by intervals of 5–15 mm, producing an interrupted spikelike raceme of up to 15 cm long. Depending on the length of the inflorescence, 5–12 spaced verticils may be seen below the coma of bracts, the uppermost 3 or 4 still flowering and the lower ones in fruit, with the rhachis easily visible between the verticils. The corolla varies in length from 1.2 to 2 cm.

Chromosome number  $2n = 32$  (De Wet, 1958, as “*Coleus pentheri*”).

The three species *P. caninus*, *P. neochilus* and *P. ornatus* (= *Coleus comosus*) form a closely related group and were discussed in *Bothalia* 7: 432 (1961). The small amount of tropical material received since then supports the conclusion reached that the three may be regarded as distinct on the basis mainly of the floral characters, as outlined below.

*P. caninus*: plants annual; inflorescence 2–5, rarely up to 9 cm long, dense throughout; corolla 0.8–1 cm long. *Distribution*: S.W. Africa, through tropical Africa to Ethiopia and in India.

*P. neochilus*: plants perennial (occasionally behaving as annual in S.W. Africa); inflorescence 7–15 cm long, lax below with 5–12 spaced fruiting verticils below the flowers; corolla 1.2–2 cm long. *Distribution*: eastern Cape Province, Natal, Transvaal, S.W. Africa, Botswana, Zambia and Rhodesia.

*P. ornatus*: plants perennial; inflorescence 3–5, rarely up to 9 cm long with one or two, rarely more, spaced fruiting verticils below the flowers; corolla 2–2.5 cm long. *Distribution*: chiefly Kenya and Ethiopia.

14. *Plectranthus ornatus* Codd, nom. nov. Type: Ethiopia, *Schimper* II. 1328 (P!, holo.).

*Coleus comosus* Hochst. ex Guerke in *Bot. Jahrb.* 19: 212 (1894); Bak. in *Fl. Trop. Afr.* 5: 426 (1900); Bruce in *Hook. Ic. Pl.* 34: t. 3374 (1938); non *Plectranthus comosus* Sims in *Bot. Mag.* t. 2318 (1822). *C. spicatus* sensu A. Rich., *Tent. Fl. Abyss.* 2: 183 (1851), as to syn. and spec. cited. *C. caninus* sensu Vatke in *Linnaea* 37: 318 (1971); sensu Engl., *Hochgebirgsfl. Trop. Afr.* 359 (1892).

Perennial, decumbent to trailing, unpleasantly aromatic succulent herb, branching freely at the base, up to 30 cm tall; branches obscurely 4-angled, glandular-tomentulose. *Leaves* succulent, drying thick textured; petiole 2–10 mm long; blade obovate to broadly obovate, 2–3 cm long, 1.5–2.5 cm broad (up to  $5 \times 4$  cm in cultivated specimens), sparingly to fairly densely appressed pubescent especially on the nerves below and usually with orange gland-dots; apex rounded; base cuneate; margin finely crenate-dentate in the upper half, with 4–6 pairs of small

teeth. *Inflorescence* a terminal dense spike-like raceme 4–6 (–9) cm long, 4-angled and with a coma of large imbricate bracts in the bud stage, with one or two spaced verticils (rarely more) at the base; rhachis glandular-tomentulose; bracts imbricate, ovate, acuminate, 8–12 mm long; 6–8 mm broad, greenish-white tipped with purple. *Flowers* in sessile 3-flowered cymes, forming 6-flowered verticillasters; verticillasters densely placed with the exception of 1–3 in the lower part; pedicels erect, appressed to the rhachis, 3–4 mm long, glandular-puberulous. *Calyx* 3 mm at flowering enlarging to 6 mm long in fruit, glandular-hispid and gland-dotted without, densely villous in the throat; upper lip large, broader than

Closely related to *P. neochilus* but it seems as if the two can be kept distinct. For the main differences, see notes under the latter on p. 393. Both species are in cultivation and are sometimes confused by gardeners.

Although the name *Coleus comosus* was proposed by Hochstetter for a *Schimper* specimen (II.1328) at an early stage, it was included under *Coleus spicatus* by A. Richard and under *P. caninus* by Vatke and Engler (see literature citations). *P. caninus* Roth (= *Coleus spicatus* Benth.) is an annual with much smaller flowers (see p. 393). Gürke upheld *C. comosus* as distinct and provided sufficient descriptive



FIG. 16.—*Plectranthus ornatus*, cultivated in Pretoria (Codd 8238),  $\times 1$ .

long, up to 2,5 mm long, 6 mm broad with a median apicule; lower 4 teeth subequal, linear-subulate, 3–4 mm long. *Corolla* bluish mauve with dark purple mottling on the upper lip, 2–2,5 cm long, slightly puberulous and with occasional orange gland-dots; tube ca 0,75 mm in diam. for about 1/3 its length, then slightly geniculate and expanding to 3 mm deep at the throat; upper lip 6 mm long, 4 mm broad, deeply emarginate and with 2 narrow lateral lobes; lower lip boat-shaped, horizontal, 1,2–1,5 cm long, sometimes split longitudinally. *Stamens* united at the base for 3–4 mm and curved within the lower lip, 12–14 mm long, anthers sometimes exserted. *Style* finally exserted by 4–5 mm. Fig. 16.

Grows over rocks in semi-shade at altitudes of 1 000 to 1 500 m, often above the forest zone, from Ethiopia to Tanzania. Cultivated and semi-naturalized in South Africa.

CULTIVATED.—Transvaal: from Mrs. Eliovson's garden in Johannesburg, Codd 8238. Natal: Dundee, from a garden, Aug. 1960, collector not recorded. Cape: cult. Kirstenbosch National Botanic Garden, Barker 2.

matter contrasting it with *C. caninus* to validate the name. Unfortunately on transfer to *Plectranthus* it must receive a new epithet as there is an earlier *P. comosus* Sims (1822) which is a synonym of *P. barbatus* Andr.

Chromosome number  $2n = 32$  (De Wet, 1958, as "*Coleus comosus*").

15. *Plectranthus barbatus* Andr., Bot. Rep. t. 594 (1809). Type: the Bot. Rep. plate based on a plant cultivated in England, raised from seed sent from Abyssinia by Lord Valentia.

*P. forskohlaei* sensu Ait. f., Hort. Kew. ed. 2,3: 425 (1811); sensu Sims in Bot. Mag. t. 2036 (1819). *P. comosus* Sims in Bot. Mag. t. 2318 (1822). Type: the Bot. Mag. plate based on a plant cultivated in England originally from India.

*Coleus barbatus* (Andr.) Benth. in Wall., Pl. As. Rar. 2: 15 (1831); Lab. 49 (1832); in DC., Prodr. 12: 71 (1848); Hook. f., Fl. Brit. India 4: 625 (1885); Trimen, Handb. Fl. Ceylon 3: 373 (1895); Bak. in Fl. Trop. Afr. 5: 429 (1900); Bruce in Kew Bull. 1935: 322 (1935); Andrews, Flow. Pl. Sudan 3: 208, t. 53 (1956). *C. forskohlii* sensu Briq. in Pflanzenfam. 4, 3a: 359 (1897).



Erect, bushy, semi-succulent, somewhat unpleasantly aromatic herb or shrub up to 3 or 4 m tall; stems 4-angled, densely grey woolly tomentose and freely dotted with reddish gland-dots. *Leaves* semi-succulent; petiole 1–2 cm long; blade ovate to broadly elliptical, 4–9 cm long 2.5–5 cm broad, densely woolly tomentose on both surfaces and copiously gland-dotted below; apex obtuse to rounded; base obtuse to cuneate; margin regularly crenate-dentate with 10–24 pairs of smallish teeth. *Inflorescence* a terminal spike-like raceme 20–32 cm long, enclosed in large imbricate bracts in the bud stage, elongating and becoming lax with age; bracts broadly ovate, acuminate, concave, 12–16 mm long, 10–12 mm broad, whitish green, shortly tomentose, freely gland-dotted and with ciliate margins, early deciduous. *Flowers* in sessile 3–4-flowered cymes, verticillasters 1–2.5 cm apart; pedicels erect, 4–5 mm long, glandular-puberulous. *Calyx* 4 mm long at flowering enlarging to 7 mm long in fruit, glandular-hispidulous without, densely villous in the throat; upper lip broadly ovate, abruptly acuminate, 3–4 mm long and 2–3 mm broad; lower 4 teeth subequal, linear-subulate, 3–4 mm long. *Corolla* pale blue-mauve, 1.7–2 cm long, sparingly pubescent and gland-dotted; tube geniculate about the middle and expanding from 2 mm at the base to 3 mm at the throat; upper lip erect, 3 mm long, emarginate and with 2 narrow lateral lobes; lower lip boat-shaped 1–1.3 cm long. *Stamens* united at the base for 3 mm and curved within the lower lip with the anthers slightly exerted. *Style* finally exerted by 4–5 mm.

Occurs at forest margins and among rocks in shady places at fairly high altitudes in Ethiopia and Sudan to Tanzania and also in India. Cultivated in various parts of the World, including South Africa, where it has become semi-naturalized in places.

CULTIVATED.—Transvaal: Pretoria, *Repton 3477; Codd 6631; Schlieben & Mendelsohn 12754*. Natal: Pietermaritzburg, *Cronwright s.n.; Durban North, Strey 3872*. Cape: Grahamstown, *Britten s.n.; Troughton s.n.*; Kirstenbosch, *Barker 1*; foothills of Stellenbosch Mts., *Bos 8*.

This attractive plant was first introduced into cultivation in England from Ethiopia in 1806 and was named *P. barbatus* Andr. in 1809. Later it was again introduced from India and received the name *P. comosus* Sims (1822). The application to it of the epithet "forskohlaei" is based on a misidentification, according to Miss Bruce in *Kew Bull.* 1935: 322 (2935). *P. forskohlaei* Vahl is, in any case, an illegitimate name based on *Ocimum hadiense* Forsk., which is, apparently, correctly placed in *Ocimum*.

The plants grown in South Africa rarely exceed 2 m in height but collectors indicate that it grows to 4 m tall in forest margins in tropical East Africa.

#### Subgen. *Plectranthus*.

*Plectranthus* L'Herit. sect. *Germanea* (Lam.) Benth., Lab. 32 (1832); in DC., Prodr. 12: 62 (1848). —sect. *Coleoides* Benth., 11.cc. —subgen. *Germanea* (Lam.) Briq. in *Pflanzenfam.* 4, 3a: 354 (1897).

Herbs or subshrubs usually softly succulent; flowers in sessile or shortly pedunculate cymes, not in paired dichasia; calyx clearly 2-lipped, the upper lip broad, scarcely decurrent on the tube and approximately equal in length to the lower lip, the latter of 4 narrow acuminate teeth, the lowermost pair usually slightly the longer and often shortly united at the base; corolla tube variously gibbous to ± sigmoid, sometimes with a basal spur; stamens free.

The ideal treatment of *Plectranthus* would be to restrict the genus to the above circumscription which agrees, with certain exceptions, to Briquet's subgen. *Germanea*.

Two sections can be recognized, though Bentham's allocation of species needs to be revised. In his original work of 1832 he restricted his sect. *Germanea* to *P. fruticosus* L'Herit. on the basis of its spurred corolla adding, in 1848, *P. saccatus* Benth. and *P. ciliatus* Benth. in which the corolla tube is distinctly saccate at the base. As there is considerable variation in the degree of swelling of the corolla tube, this is not a reliable basis for separating the two groups and has resulted in something of a mixture in Bentham's sect. *Coleoides*.

A more meaningful grouping is obtained by using calyx shape and whether the bracts are early deciduous or not. These characters are also associated with the number of flowers per cyme, as indicated below.

Floral bracts usually early deciduous; calyx distinctly gibbous ventrally; flowers in up to 15-flowered sessile cymes.....sect. *Coleoides*

Floral bracts persisting to beyond the flowering stage; calyx not markedly gibbous ventrally; cymes, when sessile, 1–3-flowered.....sect. *Plectranthus*

Sect. *Coleoides* Benth., Lab. 32 (1832); in DC., Prodr. 12: 63 (1848), partly; Briq. in *Pflanzenfam.* 4, 3a: 354 (1897), partly; Codd in *Mitt. Bot. München* 10: 247 (1971). Lectotype: *P. madagascariensis* (Pers.) Benth.

As here outlined, the section is restricted to those species in which the floral bracts are shed before the flowers open (sub-persistent in *P. zatarhendi* var. *tomentosus*, see p. 399); the base of the mature calyx is distinctly gibbous ventrally and is attached to the pedicel at a sharp angle; and the sessile cymes are usually many-flowered (occasionally 3-flowered in some forms).

This section is somewhat transitional between true *Plectranthus* (i.e. sect. *Plectranthus*, see p. 406) and subgen. *Calceolanthus* (p. 389) but, whereas the stamens are united in the latter, they are always free in sect. *Coleoides*.

An interesting point is that the chromosome numbers recorded in this section by De Wet (1958) were usually  $2n=42$  (*P. tomentosus*, *P. woodii*) though occasionally  $2n=28$  (*P. pachyphyllus*), while in sect. *Plectranthus* the number was, with rare exceptions,  $2n=28$  (*P. fruticosus*, *P. ciliatus*, *P. grillatus*, *P. saccatus*, *P. dolichopodus*, etc.). In subgen. *Calceolanthus*, on the other hand, the numbers he recorded were  $2n=32$  (*Coleus pentheri*, *C. comosus*, *C. vagatus*). The species names are those used by De Wet and may be consulted by looking in the index at the end of this paper.

Members of the section occur from South Africa and the Mascarenes, through east tropical Africa to southern Arabia, Malesia and Australia.

Species limits in this group are difficult to determine and differences of opinion may well occur regarding the number of species which should be upheld. In the present treatment the Southern African material is classified into the following components:

16. *P. dinteri* Briq.

17. *P. grandidentatus* Guerke

18. *P. zatarhendi* (Forsk.) E. A. Bruce

(a) var. *zatarhendi* (= *P. pachyphyllus* Guerke ex Cooke)

(b) var. *tomentosus* (Benth.) Codd (= *P. tomentosus* Benth., *P. zeylanicus* Benth.)

(c) var. *woodii* (Guerke) Codd (= *P. woodii* Guerke)

19. *P. madagascariensis* (Pers.) Benth.  
 (a) var. *madagascariensis* (= *P. hirtus* Benth.)  
 (b) var. *aliciae* Codd  
 (c) var. *ramosior* Benth.  
 20. *P. psammophilus* Codd  
 21. *P. mutabilis* Codd

It is admitted that the distinctions are often blurred and that intermediates are found. However, the fact that most specimens can be allocated with some certainty seems to indicate that distinct species are in the process of evolving.

The oldest name in the complex is *P. zatarhendi* (Forsk.) E. A. Bruce, based on *Ocimum zatarhendi* Forsk. from southern Arabia. Christensen in Dansk Bot. Arkiv. 4: 21 (1922) throws doubt on Forskal's intention to use "zatarhendi" as a specific epithet, but Bruce in Kew Bull. 1935: 590 (1935) concludes that the method of presentation is consistent with the legitimate publication of *O. zatarhendi* as a species name and this view has since been followed. The unfortunate discrepancies found in the Fl. Aegypt.-Arab. may be attributed to the posthumous publication of Forskal's notes by Niebuhr. If a very broad view were taken, the majority of our specimens (with the possible exception of *P. madagascariensis* and *P. psammophilus*) could be accommodated in that species. It is considered that such a treatment would be less satisfactory than the present one and would not reflect the great variation which occurs, nor would it indicate the presence of several natural groups.

Among our described "species", *P. pachyphyllus* probably comes closest to *P. zatarhendi* in having short densely tomentose stems, a short simple inflorescence, and thick-textured, broadly ovate, crenate-dentate leaves (see figs. 18, 19). The concept is enlarged to include var. *tomentosus* with a more robust stature and long, branched inflorescences, and var. *woodii* with more sparsely tomentose stems and leaves.

16. ***Plectranthus dinteri*** Briq. in Bull. Herb. Boiss. 2 ser. 3: 1070 (1903). Type: South West Africa, Hereroland, Waterberg, *Dinter* 336 (B. holo.†).

*P. zatarhendi* sensu Launert & Schreiber in Prodr. Fl. S.W.Afr. 123: 26 (1969).

Erect annual or perennial semi-succulent aromatic herb up to 40 cm (rarely to 1 m) tall; stems 4-angled, simple or sparingly branched, densely glandular-yellowish-tomentose with long and short multicellular hairs, gland-tipped hairs and sessile gland-dots. *Leaves* softly succulent drying thickish to thin-textured; petiole 2.5–4 cm long, tomentose like the stems; blade ovate to broadly ovate, 3–9 cm long, 2.5–7 cm broad, coarsely glandular-strigose to glandular-tomentose on both surfaces, freely dotted with small red gland-dots below; apex acute to obtuse; base truncate; margin coarsely to deeply dentate with 3–6 pairs of triangular teeth 3–8 mm long. *Inflorescence* terminal, simple or with a pair of branches near the base, 10–25 cm long; rhachis glandular-hispid with coarse candle-like gland-tipped hairs, shorter hairs and gland-dots; bracts broadly ovate, 1.5–2 mm long, early deciduous (before flowering). *Flowers* in sessile 3–6-flowered cymes forming 6–12-flowered verticillasters; verticillasters 1–2.5 cm apart; pedicels 3–5 mm long, glandular-puberulous. *Calyx* 2 mm long at flowering enlarging to 4 mm long in fruit with a distinctly gibbous base, purple-tinged, glandular-scabrid and red gland-dotted; upper lip suberect, ovate, obtuse to abruptly acute, scarcely decurrent on the tube, up to 2 mm

long; lower lip = equally 4-toothed, up to 2 mm long, teeth linear-lanceolate, subulate. *Corolla* mauve to purple, pubescent and red gland-dotted especially on the lips, 8–10 mm long; tube 4–5 mm long, expanding gradually to 2.5 mm at the throat, bent about the middle; upper lip erect to recurved, 2 mm long and equally broad, apex emarginate and with 2 lateral ear-like lobes; lower lip boat-shaped, equal to or slightly longer than the tube, 4–5 mm long, horizontal. *Stamens* free at the base, 4–5 mm long, curved and more or less enclosed within the lower lip. *Style* coinciding with the upper stamens.

Found in the north-central part of South West African in sandy places and rock crevices, particularly on the dolomite formation.

S.W.A.—1917 (Tsumeb): 13 km from Tsumeb on Otavi road (–BA), *Hardy* 2130; Nosib (–BD), *Dinter* 2426 (SAM); *Schoenfelder* 5805; Auros (–DA), *Dinter* 5606; Kombat (–DA), *Cole* T12, 2017 (Waterberg); Waterberg Plateau (–AC), *Giess, Volk & Bleissner* 6579, 2217 (Windhoek); 16 km E. of Windhoek, *Leach & Bayliss* 12931.

No material of the type, *Dinter* 366, has been seen but there is no doubt concerning the concept and *Dinter* 2426 and 5606 may be regarded as fully representative.

With its deeply dentate leaves it is reminiscent of *P. grandidentatus* Guerke but there are several differences, mainly in the pubescence. The distinction can best be seen on the rhachis which, in *P. grandidentatus* is shortly tomentulose often with fine gland-tipped hairs, while in *P. dinteri* it is coarsely glandular-hispid with characteristic stout candle-like gland-tipped hairs. This character distinguishes *P. dinteri* from all other members of the complex.

Launert & Schreiber, l.c., included *P. dinteri* in *P. zatarhendi* and, naturally, if such a wide concept is adopted, the oldest epithet, *zatarhendi* must be used.

17. ***Plectranthus grandidentatus*** Guerke in Bull. Herb. Boiss. 6: 554 (1898), partly: Cooke in Fl. Cap. 5, 1: 278 (1910); Compton, Fl. Swaz. 66, 157 (1966); Van der Schijff, Check List Kruger Nat. Park 82 (1969); Codd in Mitt. Bot. München 10: 248 (1971); Ross, Fl. Natal 305 (1972). Lectotype: East Griqualand, Enyembe Mt., *Tyson* sub Herb. Austr. Afr. 1517 (K!) (see note below).

Perennial semi-succulent aromatic herb; stems procumbent, 4-angled, up to 2 m long, fairly dense to densely shaggy tomentose, usually greyish. *Leaves* softly succulent, often drying thick-textured; petiole 1.5–4.5 cm long, tomentose like the stems; blade ovate to broadly ovate, 2–7 cm long, 1.8–7.5 cm broad, sparingly hispid to densely strigose-pubescent above, medium to densely floccose-tomentose below and freely dotted with minute sessile red to brown gland-dots; apex acute; base truncate; margin deeply dentate with 4–7 pairs of triangular teeth 3–7 mm long. *Inflorescence* terminal often on short lateral shoots, usually simple, occasionally with 1–2 pairs of branches near the base, 9–24 cm long; rhachis densely glandular-tomentulose; bracts broadly ovate to subrotund, 3 mm long, early deciduous (before flowering). *Flowers* in sessile 3–6-flowered cymes forming 6–12-flowered verticillasters; verticillasters 5–10 mm apart; pedicels 2–3 mm long, densely glandular-puberulous. *Calyx* 2 mm long at flowering enlarging to 4 mm long in fruit with a distinctly gibbous base, purple tinged, glandular-scabrid; upper lip erect, broadly ovate, obtuse to rounded, scarcely decurrent on the tube, up to 2 mm long; lower lip = equally 4-toothed, up to 2 mm long, teeth linear-lanceolate, subulate. *Corolla*

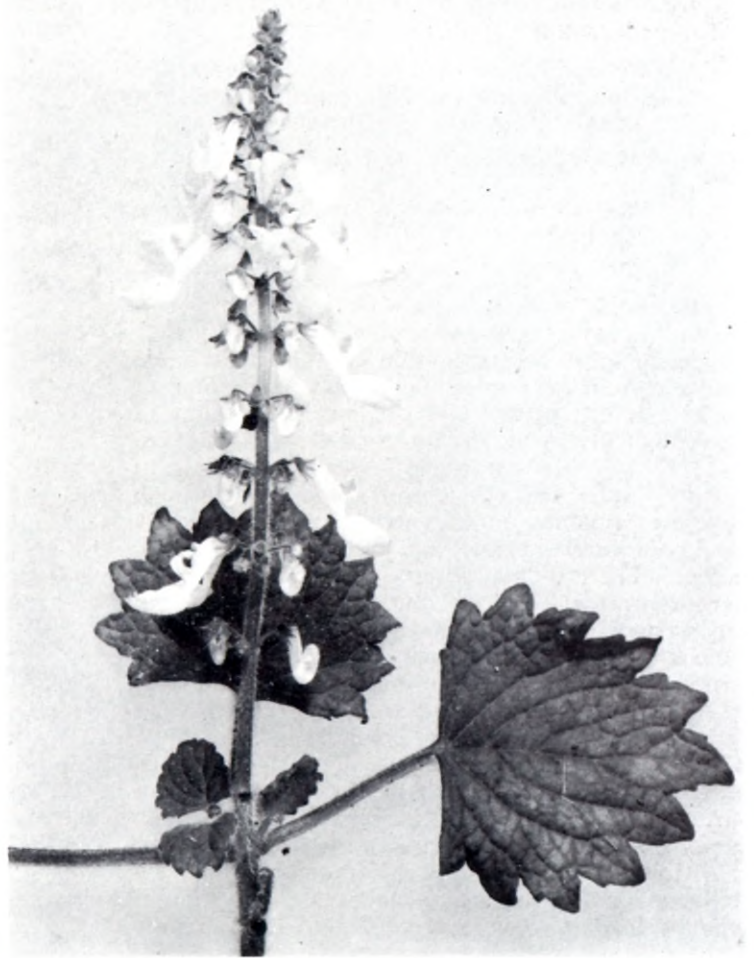


FIG. 17.—*Plectranthus grandidentatus*,  
Tabankulu, eastern Cape Province  
(*Story* 4209),  $\times 1$ .

white (rarely purple) pubescent and red gland-dotted, especially on the lips; tube 3–5 mm long expanding at the base to 1.5 mm deep and enlarging to 2.5 mm at the throat, slightly bent; upper lip erect, recurved towards the apex, emarginate and with 2 lateral ear-like lobes; lower lip boat-shaped, longer than the tube, 4–8 mm long, horizontal. *Stamens* free at the base, 5–8 mm long, curved and enclosed within the lower lip or shortly protruding. *Style* coinciding with the upper stamens. Fig. 17.

Found in relatively dry, rocky places and forest margins from about Queenstown in the eastern Cape through central and northern Natal to Swaziland and eastern Transvaal, reaching the Soutpansberg.

TRANSVAAL.—2329 (Pietersburg): Hanglip (–BB), *Meeuse* 10161; Louis Trichardt (–BB), *Breyer* sub TRV 22721; 10 km S. of Pietersburg (–CD), *Codd* 10458; Boyne (–DD), *Gersner* 5381. 2430 (Pilgrim's Rest): near Vaalhoek (–DB), *Meeuse* 10014. 2530 (Lydenburg): Lunsclip Waterfall (–AD), *Strey* 3195; Schagen (–BD), *Liebenberg* 2349; Nelshoogte Forestry Station (–DD), *Codd* 9558. 2531 (Komatipoort): Ship Mt., 16 km S.E. of Pretoriuskop (–AB), *Codd* 5149; 6044; Van der *Schijff* 3773; near Barberton (–CC), *Codd* 8168; 8190. 2630 (Carolina): Iswepe (–DC), *Sidey* 1601. 2729 (Volksrust): near Volksrust (–BD), *Mogg* 7040.

SWAZILAND.—2631 (Mbabane): Mukusini Hills (–AC), *Compton* 31604; Millers Falls (–AC), *Compton* 25866; Black Umbuluzi Falls (–AD), *Compton* 26587; near Mankaiana (–CA), *Compton* 27709.

NATAL.—2730 (Vryheid): Paul Pietersburg (–BD), *Gilmore* 1710; near Utrecht (–CB), *Breyer* sub TRV 17005. 2829 (Harri-smith): Biggarsberg (–BB), *Rehmann* 7065 (Z); *Codd* 8621; near Colenso (–DB), *Rehmann* 7179 (Z); *Acock's* 10251; *Pole Evans* 4777. 2830 (Dundee): near Helpmekaar (–AD), *Codd* 5933; 13 to 16 km from Kranskop on Mambula road (–DD), *Dyer* 4352; 4357. 2929 (Underberg): near Estcourt (–BB), *Pentz* 307; Umkomaas Valley between Boston and Bulwer (–DD), *Dyer* 4870. 2930 (Pietermaritzburg): Mt. Ashley (–AC), *Moll* 1316; Karkloof (–AC), *Moll* 3519; Byrne (–CC), *Strey* 10846.

CAPE.—3029 (Kokstad): Zuurberg, near Kokstad (–BC), *Tyson* 1177; Emyembe (–BD), *Tyson* sub *Herb. Austr. Afr.* 1517 (K); *Tyson* 2163 (K). 3126 (Queenstown): near Queenstown (–DD), *Galpin* 2090b; 8163; Shiloh (–DD), *Baur* 797 (K). 3129 (Port St. Johns): 10 km S. of Tabankulu, *Story* 4209.

*P. grandidentatus* is a fairly clear-cut entity characterised by trailing or straggly stems, floccose-tomentose stems and leaves, deeply dentate leaves which are broadly truncate at the base and usually white flowers. It has relatively thickish, succulent leaves and stems which are no doubt associated with its ability to grow in fairly dry habitats. There is a good deal of variation in leaf size. At one end of the scale it approaches *P. madagascariensis* and occasional specimens may be difficult to classify with certainty while, at the other end, there is some tendency to grade into *P. zatarhendi*, possibly as a result of hybridization. This may result in the occasional mauve or purple flowers noted by collectors, whereas usually the white flowers stand out clearly from the purple calyces.

Gürke based his species on one *Tyson* and nine *Rehmann* specimens, not all of which are included in the present concept of *P. grandidentatus*. The *Rehmann* specimens listed below, annotated by Gürke, are in Z. They are now classified as follows:

- Rehmann* 4508 4509, from Wonderboompoort near Pretoria, are *Iboza brevispicata* N.E. Br.
- Rehmann* 6149, 6160, 6161, from Houtbosch, are nearer to *P. zatarhendi* than to *P. grandidentatus*.
- Rehman* 7038, 7040, from near Newcastle, have rather small, less deeply dentate leaves and are somewhat intermediate between *P. grandidentatus* and *P. madagascariensis* var. *ramosior*.

*Rehman* 7065 from Biggarsberg and *Rehman* 7179 from near Colenso fit in fairly well with the present concept of *P. grandidentatus*.

*Tyson* sub Herb. Austr. Afr. 1517 in Kew Herbarium is selected as the lectotype. This gathering does not appear to be represented in Zurich or in Berlin.

Chromosome number  $2n = 42$  (De Wet, 1958).

18. ***Plectranthus zatarhendi*** (Forsk.) E. A. Bruce in Kew Bull 1935: 590 (1935). Type: Arabia *Forskål* 348 (C!, holo.).

Perennial aromatic semi-succulent herb; stems erect to decumbent, 50–150 cm tall, 4-angled, sparsely to very densely tomentose, often with glandular hairs, long and short hairs intermingled. *Leaves* medium to thick textured; petiole 1–4 cm long, tomentose like the stems; blade ovate to subrotund (3,5–) 4–10,5 cm long, (2,5–) 3–10 cm broad, sparingly strigose to densely appressed tomentose above, sparingly pubescent (mainly on the nerves) to very densely woolly-tomentose below and usually gland-dotted, sometimes gland-dots absent or obscured by the tomentum; apex acute to rounded; base cuneate to subcordate; margin shallowly to fairly distinctly crenate-dentate with 4–15 pairs of teeth. *Inflorescence* terminal or with 1–2 pairs of branches near the base, 12–60 cm long; rachis sparsely to densely and shortly glandular-tomentose; bracts broadly ovate to subrotund, up to 4 mm long, usually early deciduous but frequently persisting to the flowering stage (in var. *tomentosus*). *Flowers* in sessile 4–15-flowered cymes forming 8–25-flowered verticillasters; verticillasters 1–3 cm apart; pedicels 2–4 mm long sparsely to densely and shortly glandular-hirsute. *Calyx* 2 mm long at flowering enlarging to 5 mm long in fruit with a distinct gibbous base ventrally, often purple-tinged, glandular-scabrid and usually gland-dotted; upper lip erect, broadly ovate, obtuse, scarcely decurrent on the tube, up to 2 mm long; lower lip  $\pm$  equally 4-toothed, up to 2 mm long, teeth linear-lanceolate, subulate. *Corolla* 8–13 mm long usually in shades of mauve to purple, rarely white, pubescent and gland-dotted on the upper and lower lips; tube expanding gradually from the base and bent about the middle; upper lip erect, often recurved towards the apex, emarginate and with 2 lateral somewhat obscure ear-like lobes; lower lip boat-shaped usually longer than the tube, horizontal. *Stamens* free at the base, curved and enclosed within the lower lip or shortly protruding. *Style* coinciding with the upper stamens. Fig. 18.

According to the present concept, the species occurs in forest margins, dry woodland and rocky places in grassland, and is distributed from the Cape Province through Natal, Swaziland, Transvaal, tropical East Africa and Somalia to southern Arabia. The form described as *P. zeylanicus* Benth. is evidently cultivated in Ceylon.

See note on p. 396 regarding the validity of the name *P. zatarhendi*.

Judging from the few specimens seen from Arabia and Somalia, the typical form has relatively short, somewhat decumbent stems, large, densely tomentose, rather shallowly crenate-dentate leaves (Fig. 18) and a short, simple or rarely branched inflorescence with 4–8 flowers in the axil of each bract. In South Africa this is fairly well matched by the entity described as *P. pachyphyllus* Guerke ex T. Cooke and no satisfactory grounds can be found for separating it from typical *P. zatarhendi*. Two further groups are separated at varietal level, namely: (a) var. *tomentosus* (Benth.)

Codd, which includes *P. zeylanicus* (Benth.), consisting of plants of robust stature up to 1.5 m tall with large, normally branched inflorescences and 5–15 flowers in the axil of each bract and (b) var. *woodii* (Guerke) Codd in which the stem and leaf pubescence is more sparsely strigose. There are intermediates connecting these groups and thus varietal status appears to be appropriate.

#### Key to varieties

Stems and leaves densely to very densely tomentose:

Stems 1 or more from a perennial often burnt base, up to 60 cm long; inflorescence simple or frequently with a pair of branches near the base. . . . . (a) var. *zatarhendi*

Stems robust, usually solitary and erect, branching above (occasionally decumbent), up to 150 cm tall; inflorescence large, with 1 or 2 pairs of branches near the base (rarely simple). . . . . (b) var. *tomentosus*

Stems and leaves sparsely to fairly densely strigose. . . . . (c) var. *woodii*

#### (a) var. *zatarhendi*.

*Ocimum zatarhendi* Forsk., Fl. Aegypt. Arab. 109 (1775). Type: Arabia, *Forskål* 348 (C!, holo.).

*Plectranthus zatarhendi* (Forsk.) E. A. Bruce in Kew Bull. 1935: 590 (1935). *P. crassifolius* Vahl, Symb. 1:44 (1790); Willd., Sp. Pl. 3: 169 (1800); nom. illegit. Type: as for *O. zatarhendi* Forsk. *P. pachyphyllus* Guerke ex T. Cooke in Fl. Cap. 5,1:285 (1910). Type: Natal, Inchanga, *Rehmann* 7878 (Z!, holo.). *P. aegyptiacus* C. Chr. in Dansk Bot. Arkiv. 4,3: 22 (1922), nom. illegit. Type: as for *P. zatarhendi*.

*Germanea crassifolia* (Vahl) Poir. in Lam., Encycl. Suppl. 2: 764 (1812), nom. illegit. Type: as for *O. zatarhendi*.

*Coleus zatarhendi* (Forsk.) Benth. in DC., Prodr. 12: 71 (1848); Schwartz, Fl. Trop. Arab.

Stems 1-few arising from a perennial base, erect or decumbent, 30–60 cm long, sparingly branched, densely glandular-tomentose; leaves broadly ovate, 3,5–8  $\times$  2–5,5 cm, densely tomentose on both surfaces, shallowly crenate-dentate; inflorescence 8–30 cm long, simple or, occasionally, with a pair of branches near the base, flowers 4–8 in the axil of each bract, bracts early deciduous. Fig. 18.

Found in the midlands and central coastal Natal and in mountainous parts of eastern and central Transvaal, among rocks in dry woodland or on exposed rocky places in grassland where it is subjected to frequent burning. It extends through east tropical Africa to southern Arabia.

TRANSVAAL.—2328 (Baltimore): about 80 km N.W. of Potgietersrus (–DA), *Maguire* 2576, 2428 (Nylstroom); Zandrivierpoort (–AC), *Coetzee* 981; Twentyfour Rivers (–AD), *Rogers* 23627; Paiala River (–BC), *Breyer* sub TRV 17783; poort on Palala Road (–BC), *Smuts & Gillett* 3431, 21 km N.W. of Warmbaths (–CC), *Acocks* 25573, 2429 (Zebediela); Sekukuniland, Schoonoord (–DD), *Barnard & Mogg* 874, 2529 (Witbank); near Waterval (–CA), *Repton* 1204; 2530 (Lydenburg); near Izaak Siding, *Galpin* 13300.

NATAL.—2830 (Dundee); Ntunjambile Mt. (–DD), *Codd* 9660, 2831 (Nkandla); Babanango (–AC), *King* 262; on road from Hluhluwe to Nongoma (–BB), *Wells* 2068; 13 km S. of Nkandla (–CA) *Edwards* 1396; *Codd* 9684, 2930 (Pietermaritzburg); near The Dargle (–AC), *Marais* 815; Groot Noodsberg (–BD), *Strey* 6043; 8 km from Merrivale on Boston Road (–CA), *Moll* 768; near Inchanga (–DA), *Rehmann* 7878; *Eshuis* s.n.; Inanda (–DB), *Strey* 5164; near Botha's (–DC), *Medley Wood* 4775; Krantzklouf (–DD), *Haygarth* sub TRV 24983; Kloof Nature Reserve (–DD), *Dohse* 258; Westville (–DD), *Moll* 2343; Emberton (–DD), *Strey* 5432, 3030 (Port Shepstone); Umgaye (–BC), *Rudatis* 685.

The above description is based largely on the plants occurring in South Africa which apparently cannot be separated from typical *P. zatarhendi*. Further study is, however, required. For example, little is known of the root system. The only complete specimen seen is *Dohse* 258 which shows several horizontal fleshy roots. Whether this will provide a diagnostic character remains to be seen.



FIG. 18.—*Plectranthus zatarhendi* (holotype: Forskahl in C),  $\times 1$ .

Chromosome number  $2n = 28$  (De Wet, 1958, as "*P. pachyphyllus*").

The type of *P. pachyphyllus* is included here although the leaves (11–14 mm  $\times$  9–12 mm) are somewhat smaller than the other specimens cited. They may be at an immature stage. The thick texture and dense tomentum suggest that the specimen belongs in this group rather than in *P. madagascariensis* var. *ramosior*, which occupies a similar ecological niche mainly on the Magaliesberg and Witwatersrand formations.

As indicated on p. 404 it is probable that the smaller-leaved var. *ramosior* was derived from *P. zatarhendi* rather than from *P. madagascariensis*. In addition to being smaller, the leaves of var. *ramosior* are not as thick-textured and are usually less densely tomentose than those of *P. zatarhendi*.

At the other end of the scale is var. *tomentosus* with usually larger leaves, more robust stature and larger, branched inflorescences.

Although *P. dinteri* Briq. was included in *P. zatarhendi* by Launert & Schreiber in Prodr. Fl. S.W. Afr. 123: 26 (1969), it is now kept distinct on the grounds of the more deeply dentate leaves and markedly glandular-hispidulous rhachis.

(b) var. **tomentosus** (Benth.) Codd, stat. nov.

*P. tomentosus* Benth. in E. Mey., Comm. 229 (1837); Drege, Zwei Doc. 159, 160 (1843); Benth. in DC., Prodr. 12:67 (1848); Briq. in Pflanzenfam. 4,30: 357 (1897); Wood, Natal Pl. 4:t.316 (1906); Cooke in Fl. Cap. 5,1:286 (1910), partly; Dyer in Flow. Pl. S. Afr. 24:t.960 (1944); Compton, Fl. Swaz. 67 (1966); Codd in Mitt. Bot. München 10:248 (1971); Ross, Fl. Natal 305 (1972). Type: Port Natal, Drege (K! holo.; MO!; P!; S!). *P. zeylanicus* Benth., Lab. 36 (1832); Fl. Brit. India 4:622 (1885); Trimen, Handb. Fl. Ceylon 3:371 (1895); Blake, Contr. Queensl. Herb. 9: 11, 44, t.28 (1971). Type: Ceylon, Macrae (CGE, holo.).

Stems densely to shaggily tomentose, usually solitary, erect and branched above, up to 1,5 m tall or decumbent to 70 cm long, roots fibrous; leaves broadly ovate to subrotund, 4–10,5  $\times$  3,2–10 cm, densely tomentose on both surfaces shallowly to



FIG. 19.—*Plectranthus zatarhendi* var. *tomentosus* (isotype: Port Natal, Drege in MO).

fairly distinctly crenate-dentate with usually 6–15 pairs of teeth; inflorescence 18–60 cm long usually with 1 or 2 pairs of branches near the base, occasionally simple, flowers 5–15 in the axil of each bract, bracts often persisting to flowering stage. Fig. 19.

Found mainly in semi-coastal areas from about Komga in the eastern Cape through coastal Natal, extending inland to Swaziland and the eastern Transvaal, in dry woodland and rocky grassland. Cultivated in Ceylon and India.

TRANSVAAL.—2230 (Messina): near Lake Funduzi (–CD), *Meeuse* 9431; Makonde (–DA), *Van Warmelo* 5116/15. 2330 (Tzaneen): Wesfalia Estate (–CA), *Scheepers* 954. 2430 (Pilgrim's Rest): The Downs (–AA), *Codd* 9466; 18 km S.W. of Ofcolaco (–AB), *Joubert* 2; 8 km S.E. of P.O. Steelpoort (–CC), *Codd* 7718; Ohrigstad Dam Nature Reserve (–DC), *Jacobsen* 2364; 29 km N. of Lydenburg (–DC), *Joubert* 1. 2530 (Lydenburg): near Lydenburg (–AB), *Wilson* 1125 (K); near Badplaas (–DC), *Leach* 8857. 2531 (Komatiport): Crocodilepoort Mt. (–CA), *Codd* 7768; near Barberton (–CC), *Holt* 46.

SWAZILAND.—2531 (Komatiport): Piggs Peak (–CC), *Compton* 27621. 2631 (Mbabane): Komati Bridge (–AA),

*Compton* 26862; Komati Pass (–AA), *Compton* 31511; Usutu Canal (–AC), *Compton* 27760; near Mankaiiana (–CA), *Compton* 27709.

NATAL.—2731 (Louwsburg): near Ngome (–CD), *Codd* 7015; 9587. 2830 (Dundee): near Nqutu (–BA), *Codd* 8964; 14 km W. of Muden (–CD), *Codd* 8608; about 15 km from Krantzkop on Mambula Road (–DD), *Dyer* 4351; 4352. 2831 (Nkandla): Ntonjaneni (–AD), *Andrews* 14; 4 km N. of Hlabisa (–BB), *Codd* 9613; near Mtunzini (–DC), *Mogg* 4416; Ngoye (–DC), *Medley Wood* 5752; 10 km S.E. of Eshowe (–DC), *Codd* 9647. 2832 (Mtubatuba): Hluhluwe Game Reserve (–AA), *Ward* 2993; 3202; 20 km S. of Mtubatuba (–CA), *Strey* 5611. 2929 (Underberg): Estcourt Research Station (–BB), *West* 712; 8 km E. of Estcourt (–BB), *Acocks* 10140. 2930 (Pietermaritzburg): 6 km E. of Greytown (–BA), *Admiraal & Drijfhout* 2898; Ahrens (–BB), *Fisher* 926; Richmond, Tala Farm (–CD), *Moll* 3055; Inanda (–DB), *Medley Wood* 488 (K); near Durban (–DD), *Drege* s.n. (K, MO, P, S); *Krauss* 75 (K); *Sanderson* 126 (K); 550 (K); *Rehmann* 8820 (Z); 3030 (Port Shepstone): Uvongo (–CD), *Liebenberg* 8022; *Nicholson* 864; St. Michaels-on-Sea (–CD), *Nicholson* 1115; Shelly Bay, 11 km S. of Port Shepstone, *Mogg* 12163.

CAPE.—3128 (Umtata): near Old Morley (-DD), *Codd* 9270. 3129 (Port St. Johns): 5 km S.W. of Ludalasi Store (-CD), *Codd* 9288. 3227 (Stutterheim): near Komga (-DB), *Flanagan* 740. 3228 (Butterworth): near Kentani (-CB), *Pegler* 488.

Both Hooker f., *Fl. Brit. India* 4: 622 (1885), and Trimen, *Handb. Fl. Ceylon* 3: 371 (1895) state that *P. zeylanicus* is commonly cultivated in native gardens for medicinal purposes and that it is not known in the wild state. It cannot be separated from typical *P. tomentosus* which grows along the Natal Coast and it may be assumed that the Asiatic plants came originally from Natal. A parallel is found in *P. amboinicus*, now widely cultivated in the East, which also originated in Africa. The varietal epithet *tomentosus* has been adopted as it is already familiar in South Africa.

In its typical form it is a robust, erect plant with one or two stems arising from a strong, fibrous root system, reaching 1.5 m tall when in flower with a large, branched, inflorescence of pale mauve flowers (see *Flow. Pl. S. Afr.* 24: t. 760, 1944).

However, similar plants but with shorter, decumbent stems are found, particularly in Swaziland and Transvaal, and the distinction between this form and var. *zatarhendi* is far from clear. Some of these specimens have fairly deeply crenate-dentate leaves and there may be difficulty in distinguishing them from *P. grandidentatus*. Usually in such cases the dense shaggy white tomentum of *P. grandidentatus*

is used as a diagnostic character. Thus specimens such as *Codd* 8168 and 8190 from Barberton are included in *P. grandidentatus*, while *Meeuse* 9431 and *Van Warmelo* 5116/15 from the Soutpansberg area, with finer tomentum, are placed in var. *tomentosus*.

Chromosome number  $2n=42$  (De Wet, 1958).

The plants separated as var. *woodii* usually have smaller, less tomentose leaves and less branched inflorescences, but here again it is not always easy to allocate plants which show intermediate characteristics.

(c) var. *woodii* (*Guerke*) *Codd*, stat. nov.

*Plectranthus woodii* *Guerke* in *Bot. Jahrb.* 26:76 (1898) (sphalm. "Wodii"); *Cooke* in *Fl. Cap.* 5.1:287 (1910); *Codd* in *Mitt. Bot. München* 10: 248 (1971); *Ross*, *Fl. Natal* 305 (1972). Type: Natal, Ipolweni, *Wood* s.n. (GRA., lectotype). *P. draconis* *Briq.* in *Bull. Herb. Boiss.* ser. 2,3: 1071 (1903); *Cooke* in *Fl. Cap.* 5.1:288 (1910). Type: Natal, Biggarsberg, *Rehmann* 7092 (Z!, holo.).

Stems 1-few, arising annually from a perennial base, decumbent or suberect, 30–60 cm long sparingly branched, glandular-puberulous to sparsely or fairly densely strigose; leaves ovate-elliptical to broadly ovate (3–)3.5–6 × 2.5–4.8 cm, shortly hispid to sparingly or fairly densely strigose, shallowly to fairly distinctly crenate-dentate with 4–7 pairs of teeth; inflorescence 10–35 cm long, simple or with a pair of branches near the base, flowers 3–8 in the axil of each bract, bracts early deciduous. Fig. 20.

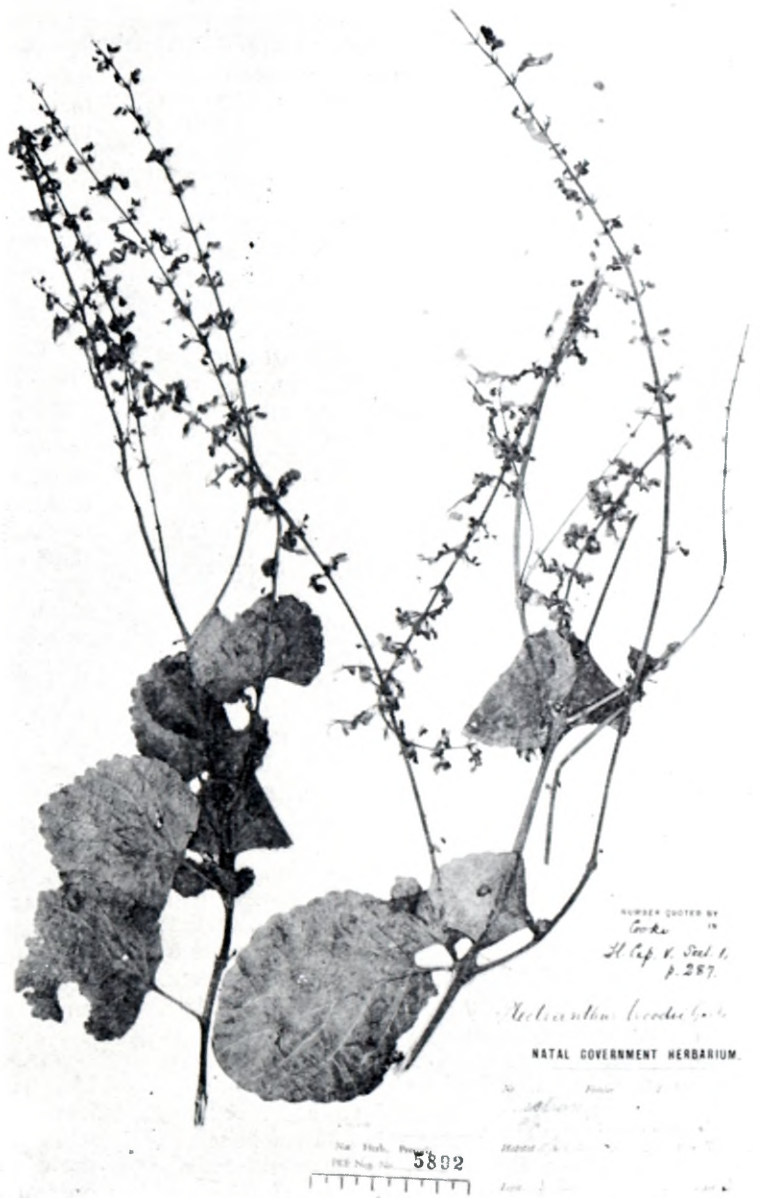


FIG. 20.—*Plectranthus zatarhendi* var. *woodii* (lectotype: Ipolweni, Natal, *Medley Wood* s.n. in GRA).

Found among rocks in dry *Euphorbia* and thorn scrub, in grassland and on wooded krantzes, mainly in central Natal, extending to the Transvaal and across the southern border into the eastern Cape Province.

TRANSVAAL.—2529 (Witbank): 67 km N.E. of Bronkhorst-spruit (–AC), *Lavranos* s.n.; 11 km E. of Loskopdam wall (–AD), *Codd* 9842; near Laerdrift (–BD), *Codd* 9844. 2531 (Komatiport): Kaapmuiden (–CB), *Mogg* s.n.; Barberton (–CC), *Pott* 5435.

NATAL.—2829 (Harrismith): Biggarsberg (–BB), *Rehmann* 7092 (Z); *Codd* 8620. 2830 (Dundee): near Tugela Ferry (–CD), *Codd* 5937; 5939; between Tugela River and Greytown (–DC), *Werdermann & Oberdieck* 1357; 16 km N.W. of Greytown (–DC), *Codd* 8596; 8597. 2930 (Pietermaritzburg): Ipolweni (–AD), *Medley Wood* s.n. (GRA); Ahrens (–BB), *Fisher* 974; near Harburg (–BC), *Marais* 799; Inanda (–DB), *Pole Evans* s.n.; Appelsbosch (–DD?), *Strey* 6420. Fields Hill (–DD), *Rehmann* 8032 (Z); Isipingo (–DD), *Forbes & Obermeyer* 10.

CAPE.—3029 (Kokstad): Umtamvuma Waterfall (–DD?), *Strey* 4472. 3030 (Port Shepstone): near Punzi Drift (–CC), *Codd* 9344.

The type of *P. draconis* Briq. is matched by *Codd* 8620 from the same area, the Biggarsberg. These two specimens are markedly less pubescent than the others cited above and are included with some hesitation. Further study may indicate that this form is worthy of separate rank.

Many specimens above appear to come from a perennial rootstock as is the case with var. *zatarhendi*, while others have leaves reminiscent of var. *tomentosus*. Var. *woodii* is distinguished from both these by the less dense tomentum on stems and leaves. Some specimens may be confused with *P. madagascariensis* but the leaves of var. *woodii* are usually larger although there is some overlapping in this respect.

Chromosome number  $2n = 42$  (De Wet, 1958).

*P. woodii* is based on two specimens from Natal: Ipolweni ("Ipolweni"), *Wood* s.n. collected on the 8th April 1891, and Fields Hill ("Vildshill"), Pinetown, *Rehmann* 8032. No material of either gathering is extant in Berlin, but the *Rehmann* specimen, annotated by Gürke, is present in Zurich. Unfortunately it is a scrappy specimen and its correct identity is a little uncertain. In order, therefore, to ensure that the name for the present concept of the group is preserved, an isotype of the *Wood* gathering in GRA is selected as the lectotype.

19. *Plectranthus madagascariensis* (Pers.) Benth., Lab. 37 (1832). Type: Madagascar, *Commerson* (Herb. Juss.!, holo.: P!).

Perennial aromatic herb; stems procumbent, up to 1 m long, or erect, up to 30 cm (excluding inflorescence), 4-angled, sparsely to densely short tomentose, often with longer hairs and glandular hairs intermingled. Leaves slightly succulent, drying thin to thickish in texture; petiole 0.5–3.5 cm long, tomentose like the stems; blade ovate to subrotund, sometimes broader than long, 1.5–3 (sometimes to 4.5) cm long, 1.2–4 cm broad, sparingly to densely and shortly strigose above, medium to densely and shortly tomentose below and freely dotted with reddish to brown gland-dots; apex obtuse to rounded; base truncate to cuneate; margin obscurely crenate to shortly crenate-dentate with 3–7 pairs of teeth. Inflorescence terminal and on lateral branchlets, usually simple, occasionally with 1–2 pairs of branches near the base, 9–25 cm long; rhachis sparsely to fairly densely and shortly glandular-hirsute; bracts broadly ovate to obovate, 3 mm long, early deciduous (before flowering). Flowers in sessile 3–8-flowered cymes forming 6–16-flowered verticillasters; verticillasters 0.5–2 cm apart; pedicels

2–3 mm long, shortly glandular-hirsute. Calyx 2 mm long at flowering enlarging to 5 mm long in fruit with a distinct gibbous base, often purple-tinged, glandular-scabrid and gland-dotted; upper lip erect, broadly ovate, obtuse, scarcely decurrent on the tube, up to 2 mm long; lower lip  $\pm$  equally 4-toothed, up to 2 mm long, teeth linear-lanceolate, subulate. Corolla white or various shades of mauve to purple, pubescent and reddish gland-dotted on the upper and lower lips, 0.5–1.8 cm long; tube expanding gradually from the base and bent below the middle; upper lip erect, recurved towards the apex, emarginate and with 2 lateral somewhat obscure ear-like lobes; lower lip boat-shaped, longer than the tube, horizontal. Stamens free at the base, curved and enclosed within the lower lip or shortly protruding. Style coinciding with the upper stamens.

The species, as here outlined, is found in forest margins, dry woodland and rocky places in grassland, and occurs in the Cape Province, Natal, Swaziland and Transvaal. It has also been recorded from Mozambique, Madagascar (?) and Mauritius.

The main criterion for separating *P. madagascariensis* from other species in this complex is leaf size. In this species the leaves rarely exceed 3.5 cm long but some overlapping may occur with the lower limits of leaf size in *P. zatarhendi*. In such cases (which are not very common), a certain amount of discretion must be used and a few specimens with leaves up to 4.5 cm long are considered to belong in *P. madagascariensis* rather than in *P. zatarhendi*. Some confusion may also occur with *P. grandidentatus*, but this species usually has larger leaves, thicker in texture with denser and more shaggy tomentum and, of course, more deeply dentate leaves. Occasional specimens may be difficult to allocate because of a certain amount of gradation of leaf size and margin character, especially in Natal. See also discussion under *P. mutabilis* (p. 405) for the reasons for separating this species, with its variable, crenate leaves, often lacking the glands dots characteristic of the other species in this complex.

A good deal of variation in habit, pubescence, colour and size of corolla is included in this concept of *P. madagascariensis* and three varieties are recognized. The typical variety has procumbent stems, rooting at the nodes, and white flowers (sometimes shades of mauve or lilac) and is largely concentrated in the eastern Cape Province, extending to coastal Natal with a somewhat doubtful record from Swaziland. A form with variegated leaves is commonly cultivated, but its place of origin is not known.

Var. *ramosior* occurs in the Transvaal, Swaziland and the more inland parts of Natal and eastern Cape Province. It has ascending (rarely procumbent) stems arising from a perennial rootstock and is adapted to drier and colder situations among rocks in grassland subjected to frequent burning. The burnt base of the plant is evident in many specimens. Incomplete specimens are not always easy to distinguish from var. *madagascariensis* while there is some gradation of leaf size in Natal with *P. zatarhendi* var. *zatarhendi*, which grows under essentially the same ecological conditions.

Var. *aliciae* is known from only two gatherings by Miss Alice Pegler near Kentani. It has thin textured leaves which are sparingly pubescent, and very small white flowers. It seems worthy of separate rank, though more collecting in the area is required in order to assess its status satisfactorily.



## Key to varieties

Corolla 7–18 mm long; leaves medium to thick textured, teeth usually small and pubescence fairly dense to dense:

Stems decumbent to procumbent, sparingly branched; flowers usually white (rarely mauve or purple).... (a) var. *madagascariensis*

Stems erect or ascending usually from a thick perennial (often burnt) base, usually branched with several inflorescences; flowers usually mauve or purple (rarely white).... (c) var. *ramosior*

Corolla 5 mm long; leaves thin textured, sparsely pubescent with few fairly large rounded teeth.... (b) var. *aliciae*

(a) var. *madagascariensis*.

*Ocimum madagascariensis* Pers., Syn. Pl. 2:135 (1807). Type: "Madagascar", Commerson (Herb. Juss.!, holo.; P!). *O. tomentosum* Thunb., Prodr. 96 (1800); Fl. Cap. ed. Schult. 448 (1823), non *Plectranthus tomentosus* Benth. Type: "Houteniquas", Thunberg (UPS!, holo.).

*Plectranthus madagascariensis* (Pers.) Benth., Lab. 37 (1832); in E. Mey., Comm. 230 (1837); Drege, Zwei Doc. 153, 160 (1843); Benth. in DC., Prodr. 12:68 (1848); Briq. in Pflanzenfam. 4,3a:357 (1897); Compton, Fl. Swaz. 67 (1966); Ross, Fl. Natal 305 (1972). *P. hirtus* Benth., Lab. 38 (1832); in E. Mey., Comm. 229 (1837); Drege, l.c. 140, 153 (1843); Benth. in DC., Prodr. 12:68 (1848); Briq., l.c. 357 (1897); Cooke in Fl. Cap. 5,1:284 (1910), partly; Blake, Contr. Queensl. Herb. 9:39 (1971); Codd in Mitt. Bot. München 10:248 (1971). Type: Cape, Masson (BM!). *P. mauritanus* Boj., Hort. Maurit. 254 (1837). Type: Sieber, Fl. Maurit. exs. 152 (K!, P!, G!, M!).

*Coleus madagascariensis* (Pers.) A. Chev. in Rev. Bot. Appliq. 33:338 (1953).

Stems decumbent to procumbent, sparingly branched, rooting at the nodes, ascending at the ends, fairly densely to densely tomentose; leaves drying thin to fairly thick in texture, somewhat sparsely to densely and shortly appressed tomentose; inflorescence usually solitary; corolla varying in length from 7–18 mm long, usually white, rarely mauve or bluish. Fig. 21.

Found in semi-coastal districts from about Knysna along the southern and eastern Cape to Zululand and Swaziland. Also in Mozambique, Madagascar(?) and Mauritius. It occurs in dry woodland and bush, usually among rocks or in sandy soil.

SWAZILAND.—2631 (Mbabane): Evelyn Baring Bridge, near Mankaiana (–CA), Compton 28680.

NATAL.—2832 (Mtubatuba): Hluhluwe Game Reserve (–AA), Ward 2623, 2930 (Pietermaritzburg): near Durban (–DD), Drege b (K,S), 2931 (Stanger): Ndulindi (–AB), Medley Wood 3980; 3030 (Port Shepstone): Umtwalume Waterfall (–AD), Strey 4408; Oribi Gorge (–CA), Nicholson 1011; 1043; 13 km N.W. of Port Shepstone (–CB), Codd 9357; near Mbeni (–CC), Codd 9348; Horseshoe farm (–CD), Strey 6421.

CAPE.—Without locality, Ekeberg s.n. (SBT); Masson s.n. (BM). 3126 (Queenstown): near Queenstown (–DD), Galpin 2090a, 3129 (Port St. Johns): between Umzimvubu and Umsikaba Rivers (–BC), Drege a (G, K, MO, P, S); Isilimela Mission (–CB), Codd 9748, 3227 (Stutterheim); Pirie (–CD), Kuntze s.n. (K); King William's Town (CD), Sim s.n.; Kei Road (–DA), Ranger s.n. near Komga (–DB), Flanagan 741; near East London (–DD), Comins 1509, 3228 (Butterworth): near Butterworth (–AC), Pegler 2027; near Kentani (–AD), Pegler 1516; Qora Mouth (–BC), Meeuse 9687, 3322 (Oudtshoorn): Outeniquas (–DC), Thunberg s.n. (UPS), 3323 (Willowmore): Uniondale (–CA), Schonland 3159; Keurbooms River Nature Reserve (–CD), Heinecken K86, 3325 (Port Elizabeth): Zwartwaterpoort (–BB), Burchell 3397 (K); Doorn Nek, Zuurburg (–BC), Story 2373; Longmore Forest Reserve (–CC), Marais 394; Schlechter 2599 (K); "Aloes", Uitenhage (–CD), I. L. Drege 3151; Addo and Zwartkops River (–DA), Ecklon & Zeyher 519; Ncanaha (–DB), Archibald 5929A; near Port Elizabeth (–DC), Galpin 6466, 3326 (Grahamstown): 3 km S. of Collingham (–BC), Story 2144; near Grahamstown (BC), Rogers 4618 (Z); Alexandria (–CB), Galpin 10829; Bushmans River (–DA), Zeyher 898 (K); 1359; Port Alfred (–DB), Rogers 16627 (Z); Kowie (–DB), Britten 428, 3327 (Peddie): East London (–BB), Galpin 3234; Munro PS 87.

This entity includes *P. hirtus* Benth., based on a Masson specimen from the Cape (holotype in BM) which, in its typical form, has somewhat trailing stems, small leaves and whitish flowers. No good reasons

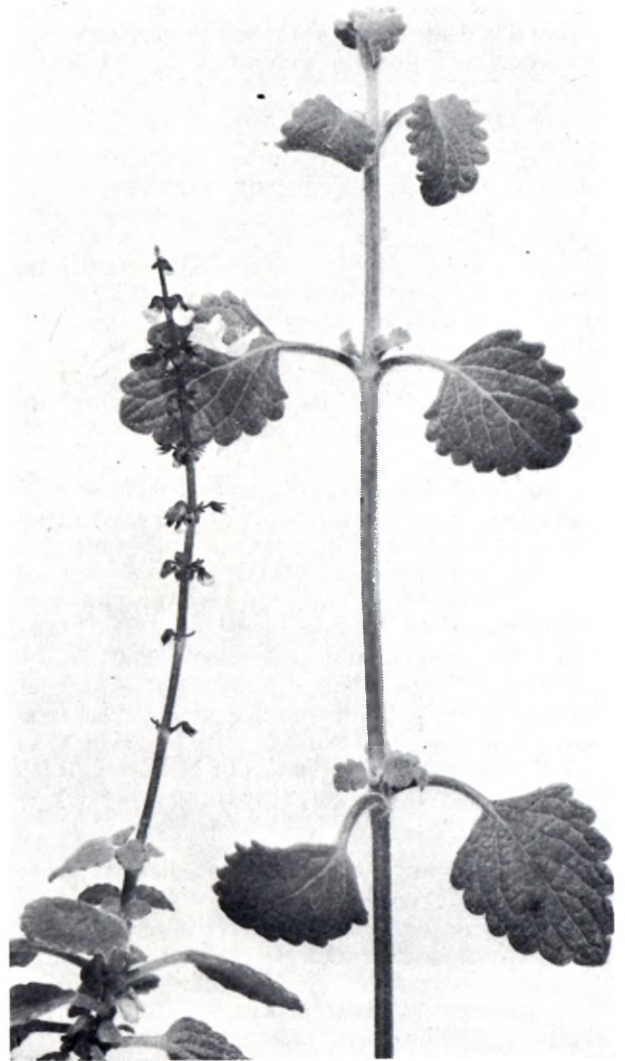


FIG. 21.—*Plectranthus madagascariensis* var. *madagascariensis*, Alexandria District, Cape Province (Archibald 5929A),  $\times 1$ .

can be found for keeping this distinct, even at varietal level, from *P. madagascariensis* (Pers.) Benth., judging from type material seen in the Jussieu and general herbarium, Paris. Unfortunately the localities given on the labels were not recorded at the time but Blake in Contr. Queensl. Herb. 9:39 (1971) notes that the plants were collected in Reunion and Mauritius and not in Madagascar.

The flower colour of plants occurring in the Mascarenes is not known, but this is not a very important character. Several specimens included in the above citations have flowers described as various shades of mauve, lilac or blue, for example: Compton 28680, Edwards 3010, Galpin 2090a, Pegler 1516 and Meeuse 9687. Some also have leaves rather large for *P. madagascariensis*, e.g. Galpin 2090a, Meeuse 9687, Flanagan 741 and Ranger s.n. (flower colour of last two not known) and the possibility of hybridization with *P. zatarhendi* (large leaves and mauve to purple flowers) cannot be excluded.

Further material is required of the plant represented by Story 2373 from Doorn Nek, Zuurburg, Alexandria District. Not only is this outside the general distribution range, but the flowers are much larger than usual: nearly 2 cm long, as against the average for the species of about 1,3 cm. The leaves are less deeply dentate and of thinner texture than is expected for *P. grandidentatus* (which often has large flowers) and the specimen is now placed tentatively in *P. madagascariensis* var. *madagascariensis*.

(b) var. *aliciae* Codd, var. nov., a var. *madagascariensis* sed foliis tenuioribus marginibus profunde crenato-dentatis, floribus minoribus 5 mm longis differt.

Type: 3228 (Butterworth): near Kentani (-AD), 1909, Pegler 909 (PRE, holo.).

Stems decumbent, 30 cm long, glandular hispid. *Leaves*: petiole 2-4 cm long, glandular-hispid; blade broadly ovate to subrotund, 2.5-4 cm long, 2.2-4 cm broad, sparingly appressed hirtellous on both surfaces, gland-dotted below; apex obtuse to rounded, base truncate; margin crenate-dentate with 3-4 pairs of large, rounded teeth. *Inflorescence* simple or occasionally branched at the base, 12-25 cm long; flowers in 3-4-flowered sessile cymes, forming 6-8-flowered verticillasters; bracts early deciduous. *Corolla* 5 mm long, white.

Known from only two gatherings in 1903 and 1909 from along streams in damp shady forest near Kentani by Miss Alice Pegler, after whom the variety is named. As was her custom when she collected the same species more than once, she gave the gatherings the same number.

CAPE.—3228 (Butterworth): near Kentani (-AD), 1903, Pegler 909; 1909, Pegler 909.

Further material is desired for study. The thin-textured leaves with 3-4 pairs of large, rounded teeth along the margins, together with the very small corolla would indicate that this form is worthy of separate status.

(c) var. *ramosior* Benth. in DC., Prodr. 12: 68 (1848). Type: "Macalisberg", Burke (K!; BM!).

Stems erect to decumbent or rarely trailing, sparingly to freely branched, fairly densely to densely tomentose with dense short hairs and scattered long hairs; leaves medium to thick in texture, scabrid to densely and shortly appressed tomentose; usually several inflorescences; corolla 0.8-1.2 cm long, usually mauve or bluish, rarely white.

Concentrated in central Transvaal, extending to Swaziland and the inland districts of central and northern Natal and eastern Cape Province usually in grass among rocks.

TRANSVAAL.—2428 (Nylstroom): Sterkrivierdam Nature Reserve (-BC), Jacobsen 2005. 2430 (Pilgrim's Rest): Dublin Mine (-AA), Miller 4265; 21 km S.W. of Ofcolaco (-AB), Codd 9451. 2527 (Rustenburg): Rustenburg Nature Reserve (-CB), Jacobsen 717; Castle Gorge (-CD), Meeuse 9254; Breedsnek (-CD), Codd 1052; Jacksonstun (-DA), Van Vuuren 481. 530; near Hartebeestepoort Dam (-DB) Young sub TRV 26950. 2528 (Pretoria): Magaliesberg (-CA), Repton 1328; Hornsnek (-CA), Hutchinson 2566; Codd 4183; 8630; Union Buildings (-CA), Van der Wal s.n.; Sixmilespurit (-CC), Van Niekerk sub TRV 13221; Doornkloof (-CC), Pole Evans 1034; Tygerpoort (-CD), Strey 2823; Trigaardtspoort (-DB), Repton 985; Brucee 96. 2530 (Lydenburg): 14 km E. of Sewefontein (-CB), Codd 8093; 18 km E. of Sewefontein (-CB), Codd 8107. 2626 (Klerksdorp): near Ventersdorp (-BD), Sutton 662. 2627 (Potchefstroom): near Potchefstroom (-CA), Louw 1310; 1672. 2628 (Johannesburg): Linksfeld Ridge (-AA), Gilliland sub J 27004; Kensington (-AA), Dekker 2; near Heidelberg (-AD), Leendertz 8130; Thode 4453; Repton 5000; Mogg 22955; Suikerbosrand (-CB), Bredenkamp 585.

O.F.S.—2627 (Potchefstroom): Parys (-CD), Obermeyer sub TRV 31683.

SWAZILAND.—2631 (Mbabane): 5 km S.W. of Mbabane (-AC), Codd 9512; Stroma (-AC), Compton 25321; Ngotshane (-AC), Compton 26786; Little Usutu River (-AC), Karsten s.n.

NATAL.—2930 (Pietermaritzburg): near Howick (-AC), Young 2325; Nagle Dam (-DA), Wells 1281.

CAPE.—3126 (Queenstown): near Queenstown (-DD), Galpin 8162. 3227 (Stutterheim): near Cathcart (-AC), Roberts 1734. 3327 (Peddie): Peddie (-AA), Sim 19592.

In its typical form, var. *ramosior* has several erect or ascending stems arising from a perennial rootstock. It is common on the rocky wooded and grassy

ridges of the Witwatersrand and Magaliesberg which were subjected to frequent burning in earlier days. Complete specimens frequently show the burnt base of the plant from which the stems arise annually. The stems are usually branched and each branch bears a simple inflorescence, resulting in a number of inflorescences per plant. However, herbarium specimens do not always show the base of the plant, making the distinction between this variety and var. *madagascariensis* less clear. There is also a tendency for some plants, especially in the eastern Transvaal, to have straggly stems and these are difficult to allocate with any degree of certainty. In the eastern Cape the distinction is also not very clear. For this reason the group is treated as a variety of *P. madagascariensis* whereas its affinity seems to lie near to *P. zatarhendi* var. *zatarhendi*. In fact, the main difference between these two is in size of leaf. Thus some specimens from Natal are intermediate between the two and the distinction is sometimes rather arbitrary. Var. *ramosior* tends to have mauve flowers (as does *P. zatarhendi* var. *zatarhendi*) while var. *madagascariensis* usually has white flowers, but this is not a reliable basis for separating the varieties as flower colour can vary in both.

Bentham bases var. *ramosior* on "regione Macalisberg, Burke". Two Burke specimens are at Kew labelled "Sand River" and "Vaal and Mooy Rivers" respectively. The latter is selected as the lectotype.

20. *Plectranthus mutabilis* Codd, sp. nov., affinis *P. madagascariensis* (Pers.) Benth., sed foliis profunde crenatis chartaceis vel membranaceis, amplitudine admodum variabilibus usque ad 5 × 5 cm differt.

Herba perennis, semi-succulenta; caules graciles, procumbentes, usque ad 40 cm longi, parce ramosi, breviter tomentosi vel villosi. *Folia* submembranacea, petiolata; petiolus 1.4-3 cm longus; lamina late ovata vel subrotunda, 1.5-5 cm longa, pariter lata, supra sparse vel dense strigosa, subtus sparse strigosa vel dense tomentosa, punctata vel impunctata, apice obtusa vel rotundata, basi truncata vel cordata, margine profundo crenata. *Inflorescentia* erecta, raro ramosa, 10-25 cm longa; rhachis minute glanduloso-hispidulus; bractae subrotundatae, 1.5-2 mm longae, mox deciduae. *Verticillastri* 1-2 cm distantes, 6-12-floribus; pedicelli 2-3 mm longi, glanduloso-hispiduli. *Calyx* 2-4 mm longus, basaliter gibbosus, glanduloso-scabridus; lobus posticus ovatus, suberectus, acutus vel obtusus, 2 mm longus; lobus anticus subaequaliter 4-dentatus; dentes lineari-lanceolati, 2.5 mm longi. *Corolla* azurea vel lilacina, 8-12 mm longa, pubescens; tubus 4-6 mm longus, deflexus, basi 2 mm late, fauce 3 mm late; labium posticum erectum vel recurvum 3 mm longum, 4-lobatum; labium anticum cymbiforme, 4-5 mm longum. *Stamina* 4, 4-6 mm longa, inclusa vel breviter exserta, filamentis liberis. *Stylus* stamina breviter excedens.

Type.—Transvaal, Pietersburg District, farm Bulbul at eastern end of Blouberg, Codd 7953 (PRE, holo.).

Perennial aromatic semi-succulent herb; stems slender, procumbent to hanging from rock ledges, up to 40 cm long, sparingly branched, shortly tomentose to villous-tomentose often with very long multicellular hairs intermingled with short hairs, especially at the nodes. *Leaves* softly semi-succulent, drying fairly thin in texture; petiole 1.4-3 cm long, shortly pubescent to villous; blade broadly ovate to subrotund, 1.5-5 cm long and equally broad, sparsely to densely strigose above, sparsely strigose on the nerves below to densely woolly tomentose, with or

without reddish or yellowish sessile gland-dots; apex obtuse to rounded; base truncate to cordate; margin deeply scalloped with 3–5 pairs of large rounded teeth. *Inflorescence* terminal, usually simple, occasionally with a pair of branches near the base, 10–25 cm long; rhachis minutely shortly glandular-hispidulous; bracts subtund 1,5–2 mm long, early deciduous, before flowering stage. *Flowers* in sessile, 3–6-flowered cymes, forming 6–12-flowered verticillasters; verticillasters 1–2 cm apart; pedicels 2–3 mm long, glandular-puberulous *Calyx* 2 mm long at flowering enlarging to 4 mm long in fruit with a distinctly gibbous base, glandular-scabrid with yellowish or red gland-dots or sometimes without gland-dots; upper lip suberect, ovate, obtuse to acute at the apex, up to 2 mm long; lower lip  $\pm$  equally 4-toothed up to 2,5 mm long, teeth linear-lanceolate, the lower pair slightly the longer. *Corolla* blue, purple-blue or lilac, 8–12 mm long, pubescent and usually, not always, with coloured gland-dots on the upper and lower lips; tube 4–6 mm long, 2 mm deep at the base expanding to 3 mm deep at the throat, distinctly bent below the middle; upper lip erect to strongly bent back, 3 mm long and equally broad, deeply emarginate at the apex and with 2 lateral ear-like lobes; lower lip boat-shaped, horizontal or slightly upcurved, 4–5 mm long. *Stamens* free at the base, curved and enclosed in the lower lip or slightly exserted, 4–6 mm long. *Style* slightly exceeding the stamens. Fig. 22.



FIG. 22.—*Plectranthus mutabilis*, Blouberg, northern Transvaal (holotype: Codd 7953 in PRE),  $\times \frac{1}{2}$ .

On rocky hillsides in the shade of forest or in exposed places, in rock crevices or hanging from rock ledges, found mainly on the Blouberg and Soutpansberg in northern Transvaal, but extending southwards to the Pretoria District.

TRANSVAAL.—2229 (Messina): Soutpansberg, Dandy Farm (–DC), *Meeuse* 10220; Soutpansberg, 10 km W. of main road (–DD), *Rodin* 4011; Punch Bowl Hotel (–DD), *Codd* 8340; Wylliespoort (–DD), *Bruce* 66A. 2328 (Baltimore): Blouberg, above Leipzig Mission (–BB), *Codd* 8692; *Strey & Schlieben* 8473; Blouberg, on route to Trig. Beacon, *Codd* 8753; Blouberg, at Trig. Beacon, *Codd & Dyer* 9040. 2329 (Pietersburg): farm Bulbul at eastern end of Blouberg (–AA), *Codd* 7953. 2428 (Nylstroom): Sterkriverdam Nature Reserve (–BC), *Jacobsen* 2005. 2430 (Pilgrim's Rest): 10 km S.W. of Penge Mine (–AD), *Codd* 8789. 2528 (Pretoria): Trigaardtspoort (–DB), *Repton* 985; *Bruce* 96. 2529 (Witbank): Loskopdam, Kloppersloop (–DA), *Theron* 1370.

This is a variable species and not always clearly recognizable, though its typical form suggests that the entity is worthy of specific rank. The great variation in leaf size from 1,5  $\times$  1,5 cm to over 5  $\times$  5 cm would lead to difficulty in allocating it to either of the two large species, *P. zatarhendi* or *P. madagascariensis*. From these two species it can be distinguished by the usually deep crenate scalloping of the leaf margin with 3–5 pairs of large rounded teeth and the usually thin texture. However, the texture and size of teeth vary according to the exposure of the situation. There is also considerable variation in the pubescence and degree of gland-dotting on the undersides of the leaves, the calyx and corolla. The flower colour shows some variation from deep blue to bluish-mauve or bluish-white.

21. *Plectranthus psammophilus* Codd, sp. nov., affinis *P. madagascariensis* (Pers.) Benth., sed corollis parvulis differt.

Herba perennis, semi-succulenta; caules graciles, decumbentes vel procumbentes, usque ad 50 cm longi, ramosi, glanduloso-hirsuti, punctati. *Folia* submembranacea, petiolata; petiolus 1–2 cm longus; lamina deltoideo-ovata, 2–4 cm longa, pariter lata, supra glanduloso-strigosa, subtus sparse glanduloso-strigosa copiose rufo-punctata, apice obtusa, basi truncata, margine obscure crenato-dentata. *Inflorescentia* erecta, gracilis, raro ramosa, condensata, 10–20 cm longa; rhachis glanduloso-hispidulus; bracteae late obovatae, 1,5–2 mm longae, persistentes. *Verticillastri* 1–4 mm distantes, 6–12-floribus; pedicelli 1,5–3 mm longi, breviter hispiduli. *Calyx* 1,5–3 mm longus, basaliter gibbosus, glanduloso-scabridus, punctatus; lobus posticus ovato-rotundus,  $\pm$  horizontalis, 1,5 mm longus; lobus anticus subaequaliter 4-dentatus, dentes lineari-lanceolati, 1–1,5 mm longi. *Corolla* lilacina, 5 mm longa, pubescens, rubropunctata; tubus horizontalis, 2,5 mm longus, prope basin expansus, cylindricus, 1 mm diam.; labium posticum erectum, 1 mm longum, 4-lobatum; labium anticum cymbiforme, 2,5 mm longum. *Stamina* 4, 2,5 mm longa, inclusa vel breviter exserta, filamentis liberis. *Stylus* stamina breviter excedens.

Type.—Natal, Ubombo District, Makatini Flats and cult. Natal Herbarium garden, *Strey* 5779 (PRE, holo.; NH).

Perennial aromatic semi-succulent herb; stems slender, decumbent to procumbent, up to 50 cm long, 4-angled, branching, glandular-hirsute with long multicellular hairs, shorter gland-tipped hairs and sessile red gland-dots, especially at the nodes. *Leaves* soft, drying fairly thin in texture; petiole 1–2 cm long glandular-hirsute; blade ovate-triangular, 2–4 cm long and equally broad, fairly densely glandular-strigose above, more sparingly and mainly on the nerves below, the under surface freely dotted with

reddish-brown gland-dots; apex obtuse; base truncate; margin obscurely crenate-dentate with 5–7 pairs of shallow teeth. *Inflorescence* slender, fairly condensed, terminal and on lateral branches, simple or with a pair of branches at the base, 10–20 cm long; rhachis glandular-hispidulous; bracts broadly obovate, 1.5–2 mm long, persisting until the flowering stage. *Flowers* in sessile, 3–6-flowered cymes forming 6–12-flowered verticillasters; verticillasters 1–4 mm apart; pedicels 1.5–3 mm long, shortly hispidulous. *Calyx* 1.5 mm long at flowering enlarging to 3 mm long in fruit with a distinct gibbous base, glandular-scabrid and gland-dotted; upper lip more or less horizontal, ovate-rotund, rounded at the apex, up to 1.5 mm long; lower lip  $\pm$  equally 4-toothed, the lower pair slightly the longer, 1–1.5 mm long, teeth linear-lanceolate. *Corolla* blue-mauve, 5 mm long, with a patch of pubescence and red gland-dots on the upper and lower lips; tube horizontal, 2.5 mm long, expanding in the calyx to 1 mm deep and parallel-sided; upper lip erect, 1 mm long and broad, emarginate at the apex and with 2 small lateral ear-like lobes; lower lip boat-shaped, horizontal, 2.5 mm long. *Stamens* free at the base, curved and enclosed in the lower lip or slightly exerted, 2.5 mm long. *Style* exerted by about 0.5 mm beyond the stamens. Fig. 23.



FIG. 23.—*Plectranthus psammophilus*, Makatini Flats, northern Natal (holotype: Strey 5779, PRE),  $\times \frac{1}{2}$ .

Known from several gatherings in northern Zululand where it grows at forest margins on sandy flats.

**NATAL.**—2632 (Bela Vista): Ndumu Game Reserve (CD) Ward 3100. 2732 (Ubombo): Makatini Flats (AD) and cult. Natal Herbarium garden, Strey 5779; Wearne s.n.; Sivingungu (DA), Vahrmeijer & Drijfhout s.n.

Allied to *P. madagascariensis*, this is a distinctive plant with slender, branched stems, slender, fairly dense inflorescences and extremely small flowers up to 5 mm long. From *P. madagascariensis* var. *aliciae* it differs in the more compact inflorescence and the finely toothed leaves.

#### Sect. *Plectranthus*.

Sect. *Germanea* (Lam.) Benth., Lab. 32 (1832); in DC., Prodr. 12:62 (1848).—sect. *Coleoides* Benth., Fl. cc., partly.

In this section the bracts persist to beyond the flowering stage; the calyx, although enlarging with maturity and somewhat oblique at the base, is not markedly gibbous ventrally; and the flowers are in few-flowered pedunculate cymes or in 1–3-flowered sessile cymes (in contrast to sect. *Coleoides*, p. 395).

No advantage can be seen in attempting to maintain a number of formal series in this section, as was done by Briquet in Pflanzenfam. 4, 3a:354 (1897). However, the corolla varies a good deal in South African species and a separation can be made into those in which the corolla is abruptly enlarged to saccate or spurred at the base (nos. 22–36 below) and those in which the corolla tube does not immediately widen on emerging from the calyx and is either straight (nos. 37 and 38) or somewhat sigmoid (nos. 39 and 40).

A deviation unique in the genus is shown by *P. zuluensis* in which the upper two stamens are abortive, resulting in flowers with 2 fertile stamens and 2 staminodes. Otherwise, species are delimited on variation in corolla shape, stamen length, leaf size, shape and margin, and pubescence of leaves and corolla. Flower colour is usually not discernible in dried specimens but is helpful in some cases when fresh flowers or collectors' notes are available.

The minute gland-dots on the underside of the leaves and often on calyx and corolla are useful in separating certain superficially similar species, especially when faced with sterile or scrappy specimens. Thus *P. fruticosus* (honey-coloured droplets) can be separated from *P. grallatus* and *P. rubropunctatus* (reddish to reddish-brown, flattened gland-dots). Similarly, among the smaller-leaved species, *P. elegantulus* and *P. oertendahlia* have colourless to honey-coloured dots like *P. fruticosus*, while *P. verticillatus*, *P. strigosus* and *P. purpuratus* are copiously dotted with red gland-dots.

Species in sect. *Plectranthus* are distributed from South Africa to tropical East and West Africa and India. In Southern Africa they occur in the eastern high rainfall part of the territory, with a concentration in Natal, being absent from the northern Cape and South West Africa.

The species dealt with are listed below. In contrast to sect. *Coleoides*, little difficulty is experienced in delimiting species in the typical section:

22. *P. verticillatus* (L.f.) Druce
23. *P. strigosus* Benth.
24. *P. purpuratus* Harv.
25. *P. oertendahlia* Th. Fries jun.
26. *P. elegantulus* Briq.
27. *P. ciliatus* E. Mey. ex Benth.
28. *P. fruticosus* L'Herit.
29. *P. grallatus* Briq.
30. *P. rubropunctatus* Codd
31. *P. rehmannii* Guerke
32. *P. swynnertonii* S. Moore
33. *P. dolichopodus* Briq.
34. *P. zuluensis* T. Cooke

35. *P. saccatus* Benth.  
 (a) var. *saccatus*  
 (b) var. *longitubus* Codd  
 36. *P. hilliardiae* Codd  
 37. *P. ambiguus* (Bol.) Codd  
 38. *P. ecklonii* Benth.  
 39. *P. petiolaris* E. Mey. ex Benth.  
 40. *P. laxiflorus* Benth.

22. ***Plectranthus verticillatus*** (*L.f.*) Druce in Rep. Bot. Exch. Cl. Brit. Isles 1916: 640 (1917); Ross, Fl. Natal 305 (1972). Type: Cape ("India, Montin"—see note below) (LINN 749.4, holo.).

*Ocimum verticillatum* L.f., Suppl. 276 (1781), as "Ocimum"; Willd., Sp. Pl. 3:163 (1800). *O. racemosum* Thunb., Prodr. 96(1800), as "Ocimum"; Fl. Cap. ed. Schult. 448(1823). Type: Cape, "Houteniquas", Thunberg (UPS!, holo.; SBT!).

*Plectranthus thunbergii* Benth., Lab. 37(1832); in E. Mey., Comm. 229(1837); Drege, Zwei Doc. 125, 147(1843); Benth. in DC., Prodr. 12:67(1848); Schinz in Mem. Herb. Boiss. 10:60(1895); Briq. in Pflanzenfam. 4,3a: 357(1897); Cooke in Fl. Cap. 5.1:280(1910); Codd in Mitt. Bot. München 10:247 (1971); nom. illegit. Type: based on *Ocimum verticillatum* L.f. and *O. racemosum* Thunb. *P. nummularius* Briq. in Bull. Herb. Boiss. ser. 2,3: 1072 (1903); Cooke l.c. 284 (1910), partly; Letty, Wild Flow. Transv. 289, t. 144: 2 (1962); Compton, Fl. Swaz. 67, 158 (1966); Codd, l.c. 247 (1971); Ross, Fl. Natal 305 (1972). Type: Natal, Camperdown, Rehmann 7702 (Z!, holo.).

Perennial semi-succulent aromatic herb; stems prostrate to ascending, brittle, softly succulent, 4-angled, up to 120 cm long, often rising to 25 cm above the ground, rooting at the nodes, subglabrous to shortly antrorse strigulose, with short multicellular hairs (longer tufts at the nodes), and usually sessile red gland-dots. Leaves softly to distinctly succulent, often glossy above and purple-tinged below; petiole 6–30 mm long, finely strigulose to subglabrous; blade ovate to rotund, 1.6–4 cm long, 1.2–4 cm broad, drying thin-textured, subglabrous to strigulose on both surfaces, usually thinly above and more densely on the nerves below, freely and conspicuously dotted with red to brownish sessile gland-dots; apex acute to rounded; base truncate to cuneate; margin crenate-dentate to shallowly crenate with 3–6 pairs of teeth. Inflorescence terminal, simple or with a pair of branches at the base, 4–22 cm long (usually about 10–15 cm); rachis subglabrous to finely (occasionally fairly densely) strigulose or finely glandular-tomentulose, often red gland-dotted; bracts ovate-lanceolate to linear, 2–4 mm long, usually ciliate and red gland-dotted, persisting beyond the fruiting stage. Flowers in sessile 1–3-flowered cymes forming 2–6-flowered verticillasters 6–15 mm apart; pedicels 3–5 mm long, finely strigulose or glandular-puberulous. Calyx 2,5 mm long at flowering enlarging to 7 mm long in fruit, purple-tinged, with short appressed hairs and red gland-dots; upper lip suberect, ovate, acute, 2–2,5 mm long, not decurrent on the tube; lower lip 4-toothed up to 3 mm long, teeth linear-subulate, the lower pair the longer, 2 mm long, the lateral 1,5 mm long. Corolla white to pale mauve with a few mauve spots on the upper lip or freely speckled with purplish spots, pubescent and with scattered red gland-dots; tube 4–6 mm long, expanding and slightly deflexed at or near the base forming a swollen to slightly saccate base 1,75–2 mm deep, scarcely narrowing to the throat; upper lip erect to bent backwards, 5–8 mm long, 3–4 mm broad, apex emarginate and with 2 lateral ear-like lobes; lower lip shallowly boat-shaped, 5–7 mm long, horizontal. Stamens free at the base, didynamous, curved within or slightly exceeding the lower lip, lower pair 6–7 mm long, upper pair about 5 mm long. Style coinciding more or less with the upper stamens. Fig. 24.

Occurs in forest margins, scrub forest, dry woodland and semi-shady, stony places from the Knysna area through the semi-coastal parts of the eastern Cape Province, eastern Natal, Swaziland and eastern Transvaal to the Soutpansberg, extending to southern Mozambique.

TRANSVAAL.—2229 (Waterpoort): 18 km W. of Mountain Inn (–DD), Meeuse 10239; Soutpansberg, on crest 10 km W. of Main road, Rodin 4010. 2329 (Pietersburg): Louis Trichardt (–BB), Letty 255; Breyer sub TRV 22726. 2330 (Tzaneen): Elim (–AA), Obermeyer 727; Westfalia Estate (–CA), Scheepers 640; Wolkberg (–CC), Meeuse 9922. 2331 (Phalaborwa): Kruger National Park, Boulders (–CB), Van der Schijff 2546. 2430 (Pilgrim's Rest): Shiluvane (–AB), Jumod sub TRV 10216; Mariepskop (–DB), Van Son sub TRV 31562; Blyde River Nature Reserve (–DB), Van der Schijff 6136. 2530 (Lydenburg): Kemps Heights (–AB), Codd 8197; 8320; Rosehaugh (–BD), Smuts 72; 77; Nelspruit Botanic Garden (–BD), Buitendag 466. 2531 (Komatiopoort): Kruger National Park, Numbi (–AA), Van der Schijff 2664; Bukwenene (–AD?), Van der Schijff & Marais 3737; near Malelane (–AD), Codd 6100; Barberton (–CC), Williams sub TRV 8241; Cythna Letty Nature Reserve (–CC), Müller 2259. 2730 (Vryheid): Piet Retief, Leipoldt s.n.

SWAZILAND.—2631 (Mbabane): near Komati Bridge (–AA), Compton 28831; 9 km S. of Forbes Reef (–AA), Bruce 308; Manzini (–AD), Compton 28805; Stegi (–BD), Compton 26583; Mankaiana (–CA), Compton 28678; Hlatikulu (–DC), Stewart sub TRV 10384; Compton 28764.

NATAL.—2632 (Bela Vista): Nduму Game Reserve (–CD), Ward 3099; Tinley 441; Oatley D5; Kosi system, Lake Shlangi (–DD), Vahrmeijer & Tölken 943. 2732 (Ubombo): 32 km from Jozini to Bazwana (–AC), Strey 5294; Jozini Dam (–AC), Repton 5978. 2831 (Nkandla): 5 km N. of Hlabisa (–BB), Codd 1987; Nhlwati (–BB), Ward 3212; Eshowe, Mandawe Valley (–CD), Gerstner 3396; Umhlatuzi Valley (–DC), Lawn 2069 (NH), 2832 (Mtubatuba): Hluhluwe Game Reserve (–AA), Ward 2624; Hitchins 57; Dukuduku (–AC), Moll 2743; near Richards Bay (–CC), Oatley 35. 2929 (Underberg): Estcourt (–BB), Acocks 10239; 11344. 2930 (Pietermaritzburg): Camperdown (–DA), Rehmann 7702 (Z); Isipingo (–DD), Ward 136; 5299. 2931 (Stanger): Zinkwazi (–AD), Moll 2910; 6 km N. of Umhlanga Rocks (–CA), Watmough 403; Brighton Beach (–CC), Forbes 509 (NH). 3030 (Port Shepstone): Horeshoc Farm (–CC), Strey 6155; Uvongo River (–CD), Whellan 1092; Wichmann's farm (–CD), Strey 11063.

CAPE.—Without precise locality: Sparrmann s.n. (S); Verreaux s.n. (G, P); Zeyher 274 (M, P). 3029 (Kokstad): Clydesdale Tyson sub Herb. Norm. 1296. 3129 (Port St. Johns): Lusikisiki (–BC), Galpin 10956; Umgazi Mouth (–CB), Wells 3456; Mqanduli District, near sea (–CC), Theron 1507. 3227 (Stutterheim): Stutterheim Commonage (–CB), Acocks 9530; near Konga (–DB), Flanagan 1722. 3228 (Butterworth): between Bashee River and Morley (–BB), Drege b (G, K, P, S); Qora Mouth (–BC), Flanagan 1210. 3322 (Oudtshoorn): Outeniquas (–CD?), Thunberg s.n. (UPS, SBT). 3325 (Port Elizabeth): Uitenhage, Zuurberg (–BD), Fries Norlindh & Weimark 431 (LD); Zuurberg Sanatorium (–BD?), Long 1256; Zwarkopsrivier (–CB?), Ecklon (P); Zeyher (P); Ecklon & Zeyher (S); Winterhoek Mts. (–CB), Fries, Norlindh & Weimark 945 (LD); near Uitenhage (–CD), Schlechter 2501 (K); near Port Elizabeth (–DC), Fries, Norlindh & Weimark 431 (LD). 3326 (Grahamstown): Coldspring (–AD), Gane sub TRV 25271; near Grahams-town (–BC), Burchell 3579 (K); Britten 461; Zuurberg Pass (–CB), Archibald 5849 b; Alexandria Forest (–CB), Galpin 10672. 3327 (Peddie): East London (–BB), Nanni 133. 3422 (Mossel Bay): Goukamma (as "Doukamma") (–BB), Drege a (K, P). 3423 (Knysna): Knysna (–AA), Breyer sub TRV 23642; Plettenberg Bay (–AB), Rogers 27114 (Z); Keurbooms River (–AB), Burchell 5150 (K).

The species exhibits a good deal of variation in pubescence, leaf-shape and flower colour, and certain of these differences are associated with geographic distribution. However, it was not found possible to subdivide the material satisfactorily into infraspecific groups.

Towards the south of the range, in the Cape and Natal coastal regions as far north as northern Zululand, the leaves tend to be ovate, somewhat cuneate at the base with crenate-dentate margins, while the flowers are white to pale mauve, with pale mauve vertical marks on the upper lip. In the Transvaal the plants are, in general, more robust, with larger, rounder leaves which are shallowly crenate, while the flowers are white, freely speckled with purple spots



FIG. 24.—*Plectranthus verticillatus*, Ngqeleni, Cape Province (Codd 9285), × 1.

on the upper and lower lips. There is a considerable amount of transition in the more inland Natal localities and in Swaziland.

The pubescence is more marked in some of the more northern plants, especially in Swaziland, where some specimens may be confused with *P. strigosus*, but variation in degree of pubescence is found throughout the distribution range. The semi-succulent leaves are often dark green and glossy and, as the plants are relatively drought- and disease-resistant, they are popular for ground cover in shade and for hanging baskets.

Regarding the typification of the epithet *Ocimum verticillatum*, our Liaison Officer at Kew in 1961 (Dr D. J. B. Killick) reported that the specimen

No. 749.4 in the Linnaean Herbarium is conspecific with the material cited above. It is annotated in very small letters "C.B.S." (writing not recognisable) and in pencil in Smith's writing: "verticillatum". Mr Sandwith, who was consulted in October 1961, considered that this specimen may be accepted as the one dealt with by Linn. fil. In favour of this view is the statement by Juel, Pl. Thunb. p. 7, last paragraph, where Linnaeus is quoted as writing to Thunberg that he has named Montin's Cape plants as well as those which Montin had received from Thunberg. The Linnaean specimen 749.4 could have been one of the latter, in fact, a similar specimen in the Thunberg Herbarium, Uppsala, is the type of *Ocimum racemosum* Thunb.

Willdenow altered the locality, cited as India by Linn. fil, to "C.B.S.", but does not state a reason for doing so. The species as interpreted at present does not extend to India but could, of course, have been cultivated there. Montin did not collect in either of these regions and it is most likely that the plant came from the Cape and that the information on its country of origin became confused.

The type of *P. nummularius* Briq., *Rehmann* 7702 from Camperdown (in Z), is a scrappy specimen and it is not certain whether it belongs to the southern or the northern form of the species. The leaf shape tends to resemble the latter.

*P. verticillatus* is most closely related to *P. strigosus* and *P. purpuratus*, species with denser pubescence than *P. verticillatus*. Some specimens may be difficult to classify on pubescence alone, but there are good floral characters for separating them. In *P. verticillatus* the corolla is larger and the tube is more or less parallel sided while the stamens are 5–7 mm long; in *P. strigosus* and *P. purpuratus* the corolla is smaller and the tube has a distinct constriction near the throat while the stamens are much shorter, reaching only 1–3 mm in length.

The distinctions between *P. verticillatus* and *P. oertendahlia* are discussed under the latter (p. 411).

Although *P. verticillatus* is often confused with *P. madagascariensis* (= *P. hirtus*) in herbaria, the two are not closely related. Both have trailing stems and small, ovate to subrotund leaves. *P. madagascariensis* is normally more conspicuously pubescent than *P. verticillatus* and, although sterile specimens are sometimes superficially similar, the conspicuous red gland-dots on the underside of the leaves of *P. verticillatus* can be used to separate the two species. Flowering specimens should present no difficulty as the bracts in *P. madagascariensis* are shed before the flowers open (persistent in *P. verticillatus*), the corolla lacks red gland-dots and the mature calyx has a different shape, being distinctly more declinate and saccate on the underside.

Among the specimens cited under *P. nummularius* by Cooke in *Flora Capensis*, *Wood* 3980 is *P. madagascariensis* while the Kew specimen of *Wood* 3981 is a mixture of *P. verticillatus* and *Aeollanthus parvifolius*.

Chromosome number:  $2n=28$  (De Wet, 1958).

23. ***Plectranthus strigosus* Benth.** in E. Mey., *Comm.* 229 (1837); *Drege*, *Zwei. Pfl. Doc.* 153 (1843); Benth. in DC., *Prodr.* 12:68 (1848); Briq. in *Pflanzenfam.* 4,3a:357 (1897); Cooke in *Fl. Cap.* 5,1:280 (1910); Compton, *Fl. Swaz.* 67 (1966); Codd in *Mitt. Bot. München* 10:247 (1971). Lectotype: Cape, Olifantshoek Forest (Alexandria), *Ecklon* (K!) (see note below).

*P. strigosus* var. *lucidus* Benth. in DC., *Prodr.* 12:68 (1848); Cooke, l.c. 280 (1910). Type: Cape, Bathurst, *Burchell* 3924 (K!, holo.). *P. parviflorus* Guerke in Kuntze, *Rev. Gen.* 3, 2: 261 (1898); Cooke l.c. 281 (1910); non Willd. (1806). Type: East London, *Kuntze* s.n. (NY, holo.; PRE, photo.). *P. kuntzeanus* Domin., *Biblioth. Bot.* 89: 1118 (1928). Type: as for *P. parviflorus* Guerke.

Perennial semi-succulent aromatic herb; stems decumbent to ascending, brittle, softly succulent, 4-angled, up to 30 cm long, forming small mats 30 cm across and up to 10–25 cm tall, rusty-hispid with multicellular purplish hairs and red gland-dots. *Leaves* softly succulent, fairly thick textured, purple-tinged below; petiole 5–15 mm long, rusty-hispid like the stems; blade broadly ovate to subrotund, 1.3–3.5 cm long, 0.8–3 cm broad, subglabrous to strigose on both surfaces, denser on the nerves below with long grey to rusty multicellular hairs and numerous red

gland-dots on the under surface, apex obtuse to rounded; base truncate to shortly cuneate; margin obscurely crenate with 4–6 pairs of shallow teeth, ciliate. *Inflorescence* terminal, usually simple, occasionally with a pair of branches near the base, 4–15 cm long (usually about 6–10 cm); rhachis densely glandular-hispidulous, often with red gland-dots; bracts ovate to lanceolate, 2–3 mm long, usually ciliate and red gland-dotted, persisting beyond the fruiting stage. *Flowers* in sessile 1–3-flowered cymes forming 2–6-flowered verticillasters; verticillasters 5–12 mm apart; pedicels 3–5 mm long, densely glandular-puberulous. *Calyx* 2.5 mm long at flowering enlarging to 6 mm long in fruit purple-tinged, sparingly strigulose and with red gland-dots; upper lip suberect, ovate, acute, scarcely decurrent on the tube, up to 2 mm long; lower lip 4-toothed, 2–3 mm long, teeth linear subulate, the lower pair the longer, up to 2 mm long. *Corolla* whitish to mauve with a few darker markings in vertical rows on the upper lip, pubescent and with red gland-dots; tube 3–5 mm long, expanding in the calyx to form a swollen base 1.5 mm deep, narrowing to 1 mm deep at the middle or near the throat; upper lip erect 4–5 mm long, 3 mm broad, apex emarginate and with two rounded lateral lobes projecting forward; lower lip shallowly boat-shaped 3–4 mm long, horizontal. *Stamens* free at the base, didynamous, 1.5–3 mm long, scarcely visible. *Style* coinciding with the upper stamens. Fig. 25.

A species with a disjunct distribution, being found from the Alexandria to Lusikisiki Districts in the Cape and again in Swaziland, occurring in shady, rocky places and in scrub forest.

SWAZILAND.—2631 (Mbabane): near Forbes Reef (–AA), *Compton* 26001; *Hilliard & Burt* 3565; Mbabane (–AC), *Ihlenfeldt* 2466; 3 km N. of Mbabane (–AC), *Schlieben* 9498; Mpalaleni (–AC), *Compton* 32207; Mankaiana (–CA), *Compton* 27725.

CAPE.—3128 (Umtata): near Old Morley (–DD), *Codd* 9269. 3129 (Port St. Johns): between Umzimvubu and Umsikaba Rivers (–BC), *Drege* 4779 c (K). 3228 (Butterworth): near Kentani (–AD), *Pegler* 910. 3326 (Grahamstown): near Grahamstown (–BC), *Galpin* 278; Blaauwkrantz (–BC), *Britten* 861; *Marloth* 10922; Alexandria (Olifants Hoek) Forest (–CB), *Ecklon* (K); Kariega Mouth (–DA), *Britten* 2370; *Acocks* 18351; Kowie West (–DB), *Britten* 742. 3327 (Peddie): Woolridge (–AB), *Bayliss* 3349; East London (–BB), *C. A. Smith* 3674.

In addition to the above, two *Drege* specimens in Kew, annotated as coming from "Zuurbergen" and "Van Stadens River" respectively, and cited under *P. hirtus* by Benth. in E. Mey., *Comm.* 229 (1837) and Cooke in *Fl. Cap.* 5,1: 284 (1910), appear to belong rather in *P. strigosus*. The two species are often confused but in *P. strigosus* the bracts persist beyond the fruiting stage while in *P. madagascariensis* (= *P. hirtus*) they are shed before the flowers open.

It may be accepted from Benth. method of presentation that he based the species on *Ecklon* material as well as the specimen cited as being collected by *Drege* "ad Cataractam magnam" between the Umzimvubu and Umsikaba Rivers, probably what we now know as the Magwa Falls. This gathering, represented in Kew by the specimen *Drege* 4779c, is a rather odd specimen with leaves larger than any of the others cited above and its identity is not altogether certain in relation to our modern material. It looks a bit like *P. ciliatus*, a species known from Magwa Falls, but is considered to belong rather to our concept of *P. strigosus*. In view of the unusual character of this specimen, it is preferred to select the *Ecklon* specimen ex *Herb. Benth.* from Olifants Hoek Forest (our present Alexandria Forest) as the lectotype. It is mounted on the same sheet as *Drege* 4779c.



FIG. 25.—*Plectranthus strigosus*, Transkei (Codd 9269),  $\times 1$ .

Chromosome number  $2n = 28$  (De Wet, 1958).

It is strange that between the two areas where *P. strigosus* occurs one finds the closely related species *P. purpuratus* (i.e. around Camperdown in Natal). In corolla characters the two are very similar and the main distinction is in the dense, velvety pubescence of the stems and leaves of *P. purpuratus*, which species also forms more compact plants with shorter stems than *P. strigosus*. No intermediates between the two species are known and so the two are maintained as distinct.

24. ***Plectranthus purpuratus*** Harv., Thes. Cap. 1: 53, t. 83 (1859); Cooke in Fl. Cap. 5, 1: 282 (1910); Codd in Mitt. Bot. München 10: 247 (1971); Ross, Fl. Natal 305 (1972). Type: a plant cultivated at Kew, without date, from seed sent by Mr. Vause ("Vance") of Port Natal (TCD, holo; K!).

Perennial succulent herb forming small mats up to 20 cm tall; stems decumbent to ascending, obscurely 4-angled, brittle with short internodes, densely velvety tomentulose and red gland-dotted. *Leaves* succulent, drying thick-textured, purple below; petioles 3–8 mm long, velvety tomentulose; blade broadly ovate, subrotund or broadly obovate 5–15 mm long and equally broad, densely and finely appressed grey

velvety on both surfaces nerves indistinct above, copiously red gland-dotted below; apex obtuse to rounded, base obtuse to shortly cuneate; margin obscurely crenate to subentire with 3 or 4 pairs of shallow teeth. *Inflorescence* terminal, simple or occasionally branched below, 4–10 cm long, rhachis finely glandular-velvety with occasional red gland-dots; bracts ovate-lanceolate 1–1.5 mm long, persisting beyond the fruiting stage. *Flowers* in sessile 1–2 (rarely 3)-flowered cymes forming 2–4-flowered verticillasters; verticillasters 4–8 mm apart; pedicels 3–4 mm long densely glandular-puberulous. *Calyx* 2.5 mm long at flowering enlarging to 5–6 mm long in fruit, puberulous and freely red gland-dotted; upper lip suberect broadly ovate, acute, decurrent on the tube, up to 2 mm long; lower lip 4-toothed, 2.5 mm long, teeth deltoid-subulate, subequal, the lower pair slightly longer. *Corolla* white with a few blue-mauve marks in the throat, pubescent and with orange gland-dots; tube 3 mm long, expanding in the calyx to form a swollen base 2 mm deep, narrowing to 1 mm deep about the middle and expanding again slightly towards the throat; upper lip erect, 3 mm long and equally broad, emarginate and with 2 rounded lateral lobes projecting forward; lower lip slightly concave, 3 mm long, horizontal. *Stamens*



free at the base, didynamous, obscured by the lateral corolla lobes, 0,5 and 1,5 mm long. *Style* coinciding with the longer stamens, stigma deeply bifid. FIG. 26.

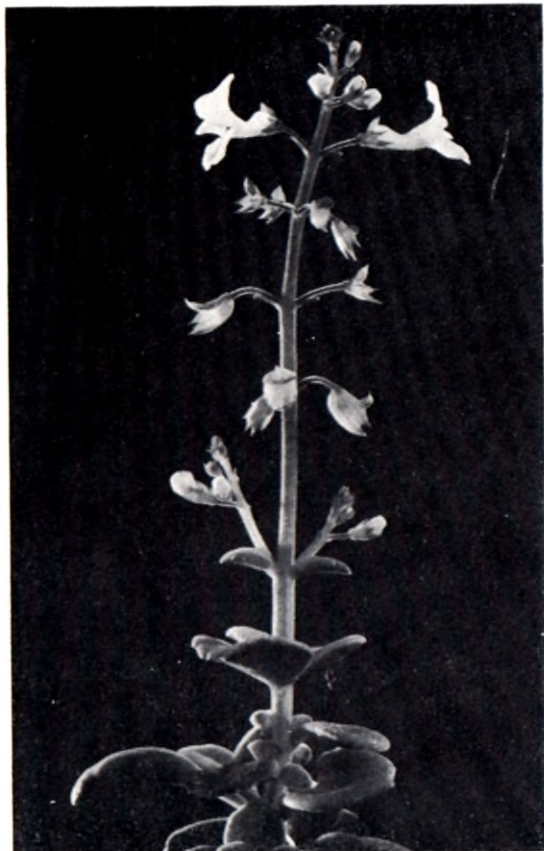


FIG. 26.—*Plectranthus purpuratus*, Nchanga, Natal (*Eshuis s.n.*),  $\times 1$ .

Found in dry, rocky places and on krantzes in a restricted area between Pietermaritzburg and Durban.

NATAL.—Without precise locality: Hort. Kew, seed sent by "Mr. R. Vause", Port Natal, without date (K); Jan. 1862 (K); Feb. 1863 (K); Nov. 1939, Miss Bruce's handwriting on label (K); *Cooper 3106* (K), 2930 (Pietermaritzburg) Table Mt. (-CB), *Killick 504*; Nchanga (-DA), *Eshuis s.n.*; Umzinyati, Inanda (-DB), *Medley Wood 1223* (NH, SAM); *s.n.* (K); Monteseel (-DC), *Strey 5208*; Shongweni Dam (-DC), *Morris 895*; Westville, near Durban, *Ward 6393*.

Considering the restricted distribution of the species and its relatively insignificant appearance, it is of interest that it found its way into cultivation in England at such an early stage. Seed was sent to Kew by Mr. R. Vause (not Vause or Vance as has appeared on labels or in literature) of Durban. Miss M. D. Gunn informs me that Mr. Vause was a member of the Durban Botanic Garden Committee during the time of McKen and was elected Hon. Secretary in 1858.

As discussed under *P. strigosus* (p. 409), the main difference between *P. strigosus* and *P. purpuratus* lies in the dense velvety greyish tomentum of the latter as against the more strigose rusty pubescence of *P. strigosus*. *P. purpuratus* also has a more compact habit with more marked purple coloration on the underside of the leaves. In floral characters the two are almost identical though the stamens are even more inconspicuous in *P. purpuratus*. Another species with very shortly exerted stamens is *P. oertendahlii* (see below).

A remarkable character shown by *P. verticillatus*, *P. strigosus* and *P. purpuratus* is the presence of a red gland-dot situated between the anther cells. It is apparent that these three species form a closely related group.

Chromosome number:  $2n=28$  (De Wet, 1958),  $2n=30,56$  (Morton, 1962).

25. *Plectranthus oertendahlii* Th. Fries jun. in Acta Hort. Gothoburg. 1:253 (1924). Type: Cult. Uppsala (UPPS, holo.).

Perennial semi-succulent herb, freely branched, up to 20 cm tall; branches decumbent, 4-angled, up to 20 cm long, rooting at the lower nodes, shortly appressed glandular-tomentulose with short antrorse multicellular, purple-tinged hairs and subsessile glands, the hairs longer at the nodes. *Leaves*: petiole 1-3 cm long, glandular-tomentulose and purple-tinged as in the stems; blade broadly ovate to suborbicular 3-4 (-4,5) cm long, 2,5-4 (-4,5) cm broad, semi-succulent, drying thin-textured, hispid with forward-pointing bristles on both surfaces, green with pale nerves above, purple-tinged below with raised nerves, freely dotted with transparent gland-dots; apex obtuse to rounded, base obtuse to shortly cuneate; margin shallowly crenate-dentate with 5-7 pairs of teeth, shortly hispid. *Inflorescence* terminal, simple or paniculate, 7-20 cm long, with up to 2 pairs of branches near the base; rhachis densely and shortly glandular-hispidulous; bracts lanceolate, acuminate, 5-6 mm long, persisting beyond the fruiting stage, glandular-hispidulous, shortly ciliate. *Flowers* in sessile, usually 3-flowered cymes forming usually 6-flowered verticillasters, verticillasters 1,2-1,5 cm apart; pedicels 3-5 mm long, densely glandular-hispidulous. *Calyx* 4 mm long at flowering, enlarging to 8 mm long in fruit, finely glandular-hispidulous, purple-tinged; upper lip erect, ovate, acute, up to 3 mm long, slightly decurrent on the tube; lower lip 4-toothed, up to 5 mm long at maturity, teeth lanceolate-subulate, 1,5-2,5 mm long, the lower pair distinctly longer. *Corolla* suffused with pale mauve, paler towards the lobes, the upper lip with 4 erect purplish stripes, minutely puberulous outside; tube 1,2-1,3 cm long, laterally compressed, expanding in the calyx forming a saccate base 4 mm deep and narrowing to 1,75 mm at the throat; upper lip erect, 5 mm long, 4-5 mm broad, bilobed at the apex and with 2 small, lateral ear-like lobes; lower lip shallowly boat-shaped, horizontal to slightly deflexed, 4-5 mm long. *Stamens* free, of two lengths, the lower the longer, 3 mm long. *Style* exerted by 3 mm. Fig. 27.

Described in 1924 from plants that had been cultivated in Scandinavia for more than 20 years and recently located in wooded river valleys near the coast in the Port Shepstone District of Natal.

NATAL.—3030 (Port Shepstone): Oribi Gorge (-CA), *Nicholson 1055*; 1060; 1191; cultivated in Grahamstown in 1936, *Britten 6539* (GRA); Uvongo River (-CD), *Nicholson 1025*; 1202; *Strey 11063*.

CULTIVATED.—Plant received from the Botanical Institute, Lund, and cultivated in Pretoria, *Codd 10782*.

Although cultivated in Sweden since the early part of this century, its country of origin remained unrecorded. The next gathering known was by Miss Lilian Britten in 1936 who grew a plant in Grahamstown, collected earlier in the Oribi Gorge, Natal. Fortunately she made a herbarium specimen before her plant was lost to cultivation, but its identity was not recognized at the time. It is only recently, due to the enthusiasm and assiduous collecting around Port Shepstone of Mr H. B. Nicholson, and later by Mr Strey, that its occurrence in the wild state has been established. It appears to have a limited distribution, although often locally very common, and one can only speculate how it reached Scandinavia so many years ago. Mr Nicholson points out that there are strong historical links between this part of the country and Sweden, the Hermansburg Mission Society having



FIG. 27.—*Plectranthus oertendahlii*, cultivated, Pretoria (ex hort. Lund, Sweden),  $\times \frac{1}{2}$ .

settled in the area in 1897 while a Swedish surveyor was responsible for the development of the township of Uvongo and insisted on the retention of large park areas.

The flowers on naturally occurring plants are often smaller than on the cultivated type plant, while the nerves on the upper surface are not always as pallid, but there is little doubt that the gatherings listed from Port Shepstone District represent *P. oertendahlii* and that the wild origin of this species has been cleared up.

*P. oertendahlii* is related to *P. ciliatus* but lacks the long, purple-striped multicellular hairs of the latter species (except at the nodes), while the smaller, suborbicular leaves with few teeth are reminiscent of *P. verticillatus*. In the herbarium, *P. oertendahlii* is most likely to be confused with *P. verticillatus* but the red gland-dots shown by the latter species are lacking, while the corolla tube does not narrow towards the throat as in *P. oertendahlii*. There are also differences in stem pubescence and flower colour.

The species name commemorates I. A. Oertendahl, chief gardener in the University Botanic Garden, Uppsala, when the species was described by Prof. Fries.

26. *Plectranthus elegantulus* Briq. in Bull. Herb. Boiss. ser. 2,3:1005 (1903); Cooke in Fl. Cap. 5,1:286 (1910); Ross, Fl. Natal 305 (1972). Type: Natal, Karkloof, *Rehmann* 7368 (Z!, holo.; PRE, photo.).

Soft, straggling herb up to 20 cm tall, pleasantly aromatic; branches softly succulent, 4-angled, spreading-erect, up to 30 cm long, finely glandular-strigulose with short, appressed antrorse multicellular hairs. *Leaves*: petiole 1.5–4 cm long, glandular-strigulose as in the stems; blade broadly elliptic to broadly ovate, 2.5–4 cm long, 2–3.5 cm broad, thin textured, subglabrous to sparingly hispidulous above, thinly strigulose on the nerves below, both surfaces dotted with minute simple pale honey-coloured droplets, the underside of the leaf not suffused with purple; apex acute to obtuse, base abruptly cuneate for 3–5 mm; margin finely ciliate, regularly crenate-dentate with 5–8 pairs of teeth. *Inflorescence* terminal, suberect, usually simple, rarely with a pair of branches from near the base; racemes 4–12 cm long; rachis finely antrorse strigulose to hispidulous; bracts ovate-lanceolate to lanceolate, long acuminate, 2.5–4 mm long, persisting to the fruiting stage, gland-dotted as in the leaves and with finely ciliate margins. *Flowers* in sessile 1–3-flowered cymes forming 2–6 flowered verticillasters; verticillasters 1–1.5 cm apart; pedicels 4–6 mm

long, minutely glandular-puberulous. *Calyx* 4 mm long at flowering stage enlarging to 7–8 mm in fruit, finely glandular-puberulous with a few fringing multicellular hairs; upper lip erect, ovate, acute, not decurrent on the tube, 3 mm long, lower lip 4-toothed, 4 mm long at maturity, the lower pair the longer, linear-subulate, median pair deltoid-subulate. *Corolla* whitish with a few purple spots on the upper and lower lip, minutely puberulous outside; tube 4–5

mm long, scarcely deflexed, expanding in the calyx forming a saccate base, narrowing slightly towards the throat; upper lip erect, 4–5 mm long and equally broad, bilobed at the apex and with 2 small lateral inconspicuous earlike lobes; lower lip boat-shaped 3 mm long, horizontal to slightly deflexed. *Stamens* free, the lower pair the longer, up to 2 mm long. *Style* horizontal, 3 mm long. Fig. 28.



FIG. 28.—*Plectranthus elegantulus*, Karkloof, Natal (Codd 8582),  $\times 1$ .

A small straggly herb on forest floors, usually in moist places, restricted to the Natal Midlands.

NATAL.—2929 (Underberg): near Deepdale (-DD), *Pole Evans* 4863; *Strey* 4817. 2930 (Pietermaritzburg): Karkloof area (-AC), *Rehmann* 7368 (Z); *Dimock-Brown* 349; *Codd* 8582; *Moll* 3446; *Byrne* (-CC), *Galpin* 12018, 3029 (Kokstad); *Ingeli Mt.* (-DA), *Hilliard & Burt* 5782 (NH).

*P. elegantulus* is closely related to *P. ciliatus* but is a smaller plant with smaller leaves and flowers. The pubescence on the stems is finer and shorter, consisting of short, appressed hairs and usually lacking the long, multicellular, purple-striped hairs characteristic of *P. ciliatus*.

In poorly prepared herbarium specimens there may be a tendency to confuse *P. elegantulus* with certain other species with small, few-toothed leaves, such as *P. verticillatus* and *P. saccatus*. The first can be readily separated by the presence of red gland-dots on the undersides of the leaves. *P. saccatus* is a more erect shrublet with strikingly large, usually blue-mauve flowers and has subglabrous to minutely puberulous stems and leaves.

Chromosome number:  $2n=28$  (De Wet, 1958).

27. *Plectranthus ciliatus* E. Mey. ex Benth. in E. Mey., *Comm.* 227 (1837); *Drege*, *Zwei Doc.* 150 (1843); *Benth.* in *DC.*, *Prod.* 12:62 (1848); *Cooke* in *Fl. Cap.* 5, 1:275 (1910); *Verdoorn* in *Flow. Pl. Afr.* 27: t. 1051 (1949); *Compton*, *Fl. Swaz.* 66 (1966); *Ross*, *Fl. Natal* 305 (1972). Type: "Omsamwubo" (Umzimvubu, i.e. near Port St. Johns), *Drege* s.n. (K, numbered 4777!, lecto.: MO:P:S).

*P. natalensis* Guerke in *Bull. Herb. Boiss.* 6: 552 (1898); *Cooke* in *Fl. Cap.* 5, 1: 283 (1910), partly, excl. *Tyson* 1793, *Wood* 558. Type: Natal, Camperdown, *Rehmann* 7701 (Z), holo.; PRE, photo.).

Soft, straggling herb or shrublet up to 60 cm tall, pleasantly aromatic; branches softly succulent, 4-angled, spreading-erect, up to 60 cm long, glandular pilose with few to many long multicellular spreading to forward-pointing hairs and short stiff hairs, the hairs having maroon-purple sap, giving a purplish colour to the branches. *Leaves*: petiole 1.5–3.5 cm long, densely glandular shaggy as in the stems; blade broadly elliptic, broadly ovate or, rarely, subrotund, (3.5–)4–8 cm long, 3–5, 5 cm broad, thin-textured and smooth to thickish and rugose, sparingly hispid above, nerves prominent and strigose below, both surfaces freely dotted with minute simple honey-coloured droplets, the underside of the leaf usually suffused with purple; apex acute to obtuse, base attenuate to abruptly cuneate for 6–12 mm; margin regularly and shallowly crenate with 8–14 pairs of teeth, conspicuously ciliate. *Inflorescence* terminal, erect, simple or with a pair of branches near the base; racemes 6–20 cm long; rachis antrorse-strigose with multicellular and shorter hairs; bracts ovate-lanceolate to narrowly lanceolate, long-acuminate, 3–6 mm long, persisting to the fruiting stage, gland-dotted as in the leaves and with conspicuously ciliate margins. *Flowers* in sessile, usually 3-flowered cymes forming ± 6-flowered verticillasters, verticillasters 1–2 cm apart; pedicels 5–8 mm long, minutely strigulose. *Calyx* 4–5 mm long at flowering stage enlarging to 8–10 mm long in fruit, appressed hispid to glandular puberulous, fringed with multicellular hairs; upper lip erect, ovate, acute, not decurrent on the tube, up to 4 mm long; lower lip 4-toothed, 4 mm long at maturity, the lower pair much the longer, linear-subulate, median pair deltoid-subulate. *Corolla* whitish background freely speckled with purple on the inner surface of upper and lower lips, sparingly glandular outside; tube 5–8 mm long slightly deflexed and expanding in the calyx forming a

saccate base, narrowing slightly towards the throat; upper lip erect, 5–7 mm long and equally broad, bilobed at the apex and with 2 small, lateral, acute, ear-like lobes; lower lip boat-shaped, 3–6 mm long, horizontal to deflexed. *Stamens* free, the lower pair the longer, up to 8 mm long, horizontal to recurved. *Style* horizontal to ascending, slightly exceeding the stamens. Fig. 29.

A soft straggling plant on forest floors and moist, shady places, distributed from Uniondale and Knysna along the eastern Cape semi-coastal areas to eastern Natal and the mountains of eastern Transvaal.

TRANSVAAL.—2430 (Pilgrim's Rest): Mount Sheba, near Pilgrim's Rest (-DD), *Jones & Leach* 27, 2531 (Komatipoort): 4 km W. of Havelock Mine (-CD), *Codd* 9528.

SWAZILAND.—2631 (Mbabane): Hlatikulu, *Stewart* s.n. (K).

NATAL.—2731 (Louwsburg): near Ngome Mission Station (-CD), *Codd* 7016, 2830 (Dundee): Qudeni Forest (-DB), *Fisher & Schweickerdt* 135, 2831 (Nkandla): Nkandla Forest (-CA), *Codd* 6968; Entonjaneni (-CB), *Andrews* 12; Eshowe (-CD), *Lawn* 129 (NH); *Gerstner* 2211 (NH); *Mecbold* s.n. (M); Entumeni (-CD), *Medley Wood* 3997 (K); *Gerstner* 2781, 2832 (Mtubatuba): Mpate River (-AA), *Ward* 3393; Dukuduku Forest (-AC), *Strey* 7586, 2930 (Pietermaritzburg): 8 km N.W. of York, *Codd* 8577; near Greytown (-BA), *Galpin* 14743; Noodsberg (-BD), *Edwards* 3001; Table Mt., near Pietermaritzburg (-CB), *Killick* 329; Camperdown (-DA), *Rehmann* 7701 (Z); 7703 (Z); Inanda (-DB), *Johnson* 1311; *Medley Wood* 63 (K, NH); Inchanga (-DC), *Rehmann* 7916 (Z); Fields Hill, near Pinetown, *Rehmann* 8033 (Z); 8034 (Z); Nkutu Falls (-DD), *Redshaw* 12; Molweni Kloof (-DD), *Hilliard & Burt* 3811; Westville (-DD), *Ward* 4949, 2931 (Stanger); Durban (-CC), *Jenkins* sub *TRV* 7712, 3030 (Port Shepstone): near Dumisa (-AD), *Hilliard & Burt* 3815; Amanzimtoti (-BB), *Franks* sub *NH* 14574 (NH); Umgayi (-BC), *Ward* 5460; Oribi Flats (-CB), *McClellan* 548; Uvongo River (-CD), *Nicholson* 352 (NH); 1023; Izotsha (-CD), *Strey* 8085, 3130 (Port Edward): Umtamvuma River (-AA), *Nicholson* 997; Beacon Hill (-AA), *Strey* 7234; Port Edward (-AA), *Strey* 4938.

CAPE.—3029 (Kokstad): near Tabankulu (-CD), *Strey* 4199; 11 km S.S.W. of Bizana (-DD), *Acocks* 13409, 3128 (Umtata): Baziya (-CB), *Baur* 37 (K), 3129 (Port St. Johns): Magwa Falls (-BC), *Codd* 9313A; 9313B; Port St. Johns (-DA), *Galpin* 2842; between Umtata and Umzimvubu Rivers (-DA), *Drege* 4777 (K); s.n. (P, S), 3130 (Port Edward): Umtamvuna Waterfall (-AA), *Strey* 4471, 3226 (Fort Beaufort): Alice (-DD), *Sidey* 606, 3227 (Stutterheim): Amatola Mts. (-CA), *Erens* 2225; Pirie (-CD), *Kuntze* s.n. (K); *Sim* s.n.; Kei Road (-DA), *Rogers* 3201 (Z); near Komga (-DB), *Flanagan* 739; 1721, 3228 (Butterworth): near Kentani (-CB), *Pegler* 352, 3323 (Willowmore): near Stone's Hill (-CA), *Schonland* 3146, partly; Knysna Forest (-CC), *Keet* 736, 3326 (Grahamstown): near Grahamstown (-BC), *Burchell* 3580 (K, P); *Atherstone* 17; *Britten* 5219; *Strey* 2124.

*P. ciliatus* is allied to *P. fruticosus* and has similar honey-coloured gland-dots throughout the plant. It differs from *P. fruticosus* in being a smaller, straggling plant, the stems are more densely beset with purplish, multicellular hairs, the leaves are more cuneate at the base and the bracts and calyx are more conspicuously fringed with multi-cellular hairs. The flowers are also different, having a whitish background, freely speckled on the upper and lower lips with purple spots.

*P. grallatus* may readily be separated from *P. ciliatus* by its red gland-dots and more spreading, hispid pubescence on the stems, as against the antrorse strigose pubescence of *P. ciliatus*. *P. grallatus* also has whitish flowers but with only a few purple spots on the upper lip.

*P. elegantulus* is in all ways a smaller plant than *P. ciliatus*, with smaller leaves and shorter, finer pubescence.

Several specimens of *Drege* from "Omsamwubo" (Umzimvubu or Port St. Johns River) have been seen and the specimen ex *Herb. Benth.*, numbered 4777 in Kew, is selected as the lectotype. The type of *P. natalensis* Guerke, *Rehmann* 7701 (Z) falls within the range of variation of *P. ciliatus*.

Chromosome number  $2n=28$  (De Wet, 1958).



FIG. 29.—*Plectranthus ciliatus*, Magwa Falls, eastern Cape Province (Codd 9313A),  $\times 1$ .

28. *Plectranthus fruticosus* L'Herit., Stirp. Nov. fasc. 4: 85, t. 41 (March 1788); Ait., Hort. Kew. ed.1, 2: 322 (1789); Willd., Sp. Pl. 3: 168 (1800); Thunb., Fl. Cap. ed. Schult. 448 (1823); Benth., Lab. 32 (1832); in DC., Prodr. 12: 62 (1848); Briq. in Pflanzenfam. 4, 3a: 354 (1897); S. Moore in J. Bot., Lond. 41: 406 (1903); T. Cooke in Fl. Cap. 5, 1: 271 (1910); Burt in Bot. Mag. t. 9616 (1940); Dyer & Bruce in Flow. Pl. Afr. 28: t. 1101 (1951); Bailey, Stand. Cycl. Hort. 3: 2712 (1963); Bullock & Killick in Taxon 6: 239 (1957); Compton, Fl. Swaz. 66 (1966); Courtenay-Latimer *et al.*, Flow. Pl. Tsitsikama t. 54 (1967); Blake in Contr. Queensland Herb. 9: 3 (1971); Codd in Mitt. Bot. Staatssamml. München 10: 247

(1971); Ross, Fl. Natal 305 (1972). Type: t. 41 of L'Herit., Stirp. Nov. fasc. 4 (1788).

*Germanea urticifolia* Lam., Encycl. 2: 690 (April 1788); Tabl. Encycl. III: t. 514 (1819). Type: a cultivated plant as illustrated in Tabl. Encycl. III: t. 514 (1819).

*Plectranthus urticifolius* (Lam.) Salisb., Prodr. Stirp. Hort. Chapel Allerton Vig. 88 (1796). *P. galpinii* Schltr. in J. Bot., Lond. 34: 393 (1896); T. Cooke in Fl. Cap. 5, 1: 282 (1910); Phillips in Flow. Pl. S. Afr. 8: t. 294 (1928). Type: Transvaal, Barberton, Rimer's Creek, Galpin 939 (B, holo.; GRA!; NH!, PRE!). *P. arthropodus* Briq. in Bull. Herb. Boiss. ser. 2, 3: 1073 (1903); T. Cooke in Fl. Cap. 5, 1: 273 (1910). Type: Transvaal, Houtbosch, Rehmann 6151 (Z!, holo.; PRE, photo.). *P. charianthus* Briq. in Bull. Herb. Boiss. ser. 2, 6: 824 (1906). Type: Transvaal, Houtbosch, Rehmann 6157 (Z!, holo.; PRE,

photo.). *P. peglerae* T. Cooke in Kew Bull. 1909: 378 (1909); Fl. Cap. 5, 1: 283 (1910); Bews, Plant Forms and Evol. in S. Afr. 98 (1925). Type: Eastern Cape, Kentani. *Pegler* 377 (K!, holo.; GRA!; PRE!). *P. behrii* Compton in J. S. Afr. Bot. 11: 122 (1945); Lewis in Fl. Pl. Afr. 28: t. 1109 (1951); Batten & Bokelmann, Wild Flow. E. Cape 126, t. 100 (1966). Type: Pondoland, Lusikisiki, *Behr* sub NBG 1252/31 (NBG!, holo.; PRE, clono.).

Soft shrub 60 cm–2 m tall, freely branched, aromatic; roots fibrous; branches ascending, 4-angled, usually purplish, glandular-pilose with few to many antrorse multicellular hairs and minute sessile gland-dots, rarely (at high altitudes) the stems densely beset with short gland-tipped hairs, hairs longer and spreading at the nodes. *Leaves*: petiole 2–5 cm long, densely antrorse pilose; blade broadly ovate to ovate-elliptic or rarely, lanceolate-elliptic, 4–14 cm long, 3.5–11 cm broad, thin-textured and smooth to thickish and rugose, subglabrous to sparingly pilose above, more densely so on the nerves below, rarely (at high altitudes) densely glandular-hispidulous, sparingly to densely dotted with minute, simple, honey-coloured droplets, the underside of the leaf usually suffused with purple to a greater or lesser extent; apex obtuse to acute; base obtuse or truncate, then abruptly attenuate to the petiole for usually less than 1 cm (longer and more cuneate at the base in specimens from southern Cape Province); margin with 12–22 pairs of short broad obtuse teeth, teeth regular, entire or rarely with an occasional secondary small tooth. *Inflorescence* terminal with 1–3 pairs of branches at the base forming a pyramidal panicle 8–25 cm long; rachis glandular-puberulous with dense short hairs, occasional long antrorse multicellular hairs and sessile glands; bracts lanceolate to ovate-lanceolate, acuminate, 2–6 cm long, persisting to the fruiting stage, glandular-pilose with a few fringing multicellular hairs. *Flowers* in sessile, opposite (1–)3-flowered cymes forming 2–6-flowered verticillasters; verticillasters 0.5–2.5 cm apart; pedicels 4–9 mm long, glandular-hispidulous, with few scattered multicellular hairs. *Calyx* 4 mm long at flowering stage enlarging to 7 mm long in fruit, appressed hispid with numerous honey-coloured gland-dots and scattered multicellular hairs; upper lip erect, ovate, acute to acuminate, slightly decurrent on the tube, 2, 5 mm long; lower lip 4-toothed, 4 mm long at maturity, the lower pair the longer, subulate, median pair deltoid-subulate. *Corolla* bluish-mauve, rarely pink (*P. behrii*) or pale blue, speckled with darker spots on the upper lip, sparingly glandular outside; tube 3–8 mm long, deflexed and expanding in the calyx, saccate to distinctly spurred at the base, narrowing slightly towards the throat; upper lip erect, 2, 5–6 mm long and up to 7 mm wide, bilobed at the apex and with 2 small lateral ear-like lobes; lower lip boat-shaped, 2–5 mm long, at first horizontal and later strongly recurved below the tube. *Stamens* free, the lower pair the longer, up to 8 mm long, at first pointing forward and curved upwards at the tips, later coiled below together with the lower corolla lip. *Style* horizontal, exerted by 6–8 mm. FIG. 30.

Found in forest and scrub forest and in shady places among rocks from Caledon district in southwestern Cape, along the south coast to eastern Cape, eastern Natal at medium to low altitudes, Swaziland, and in the mountains of eastern central and northern Transvaal.

TRANSVAAL.—2229 (Waterpoort): 32 km N.E. of Louis Trichardt (–DD), *Gerstner* 5996, 2328 (Baltimore); Blouberg (–BB), *Codd* 8747; 9170, 2329 (Pietersburg); near Louis Trichardt (–BB), *Breyer* sub TRV 19519; *Young* sub TRV 26638; Houtboschberg (–DD), *Nelson* 431, 2330 (Tzaneen); 32 km E. of Louis Trichardt, *Meeuse* 9786; Westfalia Estate (–CA),

*Scheepers* 239; Woodbush Forest (–CC), *Rehmann* 6155 (Z); 6157 (Z); *Codd* 9413; *Prosser* 1907; *Letty* 457; Magoebaskloof (–CC), *Codd* 8412; 8414; New Agatha Forest Reserve (–CC), *Müller* & *Scheepers* 6, 2427 (Thabazimbi); Krantzberg (–BC), *Erens* 2100, 2428 (Nylstroom); Palala River, *Breyer* sub TRV 18031, 2430 (Pilgrim's Rest); The Downs (–AA), *Codd* & *Dyer* 7753; 20 km S.W. of Ofcolaco (–AA), *Codd* 9447; Mariëpskop (–DB), *Van Son* sub TRV 31560, partly; *Codd* 7857; *Meeuse* 9991; *Van der Schijff* 4409; 4462; 4464; 4822; 4990; 5525; 5633; Mount Sheba (–DD), *Jones* & *Leach* 5; near Pilgrim's Rest (–DD), *Galpin* 14500, partly, 2528 (Pretoria); Trichardtspoort (–DB), *Bredell* 8; *Bruce* 95, 2529 (Witbank); Loskopdam (–AD), *Theron* 1120; 1791; 24 km N.W. of Middelburg (–CB), *Codd* 10104, 2530 (Lydenburg); near Lydenburg (–AB), *Wilms* 1127 (G); 1182 (K); between Lydenburg and Dullstroom (–AC), *Pole Evans* 4291; Lunsklip Waterfall (–AD), *Strey* 3196; Spitskop (–BA), *Wilms* sub TRV 6448; Sabie Valley (–BB), *Galpin* 13750; Rosehaugh (–BD), *Holt* 360; Waterval Boven (–CB), *Rogers* 14480; 14486; near Kaapsche Hoop (–DB), *Bruce* 336, 2531 (Komatiipoort); Barberton (–CC), *Rogers* 25526; *Liebenberg* 2353; Rimers Creek (–CC), *Galpin* 939; *Codd* 8181; 8183, 2630 (Carolina); 10 km W. of P.O. The Brook (–BA), *Codd* 9495, 2730 (Vryheid); Piet Retief (–BB), *Leipoldt* s.n.

SWAZILAND.—2531 (Komatiipoort): near Havelock Mine (–CC), *Miller* 7245; *Codd* 7836; Piggs Peak, Kings Forest (–CC), *Compton* 29977, 2631 (Mbabane); near Mbabane (–AC), *Bolus* 12247 (BOL, K); *Compton* 25785; Black Umbuluzi valley (–AD), *Compton* 26792; near Mankaiana (–CD), *Stewart* s.n. (K).

NATAL.—Without locality, *Gerrard* 1235 (K), 2730 (Vryheid); Kaffir drift (–CB), *Thode* A341, 2731 (Louwsburg); near Ngame (–CD), *Gerstner* 4568; *Codd* 9570, 2830 (Dundee); near Helpmekaar (–AD), *Codd* 5934; Qudeni (–DB), *Gerstner* 663; *Codd* 6993; Krantzkop (–DD), *Dyer* 4350; *Codd* 9656; Krantzkop-Middeldrift road (–DD), *Edwards* 2102, 2831 (Nkandla); Nhlwati (–BB), *Ward* 3438; near Eshowe (–CD), *Codd* 9650; *Admiraal & Drifhout* s.n.; Ngoye (–DC), *Wylie* sub Wood 8521; Twinstreams (–DC), *Venter* 3388; 24 km N.W. of Port Durnford (–DD), *Codd* & *Dyer* 2823, 2930 (Pietermaritzburg); near Hylton (–AC), *Marais* 809; Karkloof forest (–AC), *Moll* 3498; Karkloof area (–AD), *Codd* 8580; 34 km from Howick on Mt. Alida road (–AD), *Ross* 2067; Tala farm (–CD), *Moll* 3057; Nchanga (–DA), *Codd* & *Dyer* 2804; Drummond (–DD), *McClellan* 140; Umbilo River Falls (–DD), *Rehmann* 8150 (Z), 2931 (Stanger); Oqaqeni (–AA), *Edwards* 1816, 3029 (Kokstad); (–DA), Ingeli Forest, *Codd* 8562; *Ward* 181, 3030 (Port Shepstone); Oripi Gorge (–CB), *Nicholson* 1049.

CAPE.—Without locality *Thunberg* s.n. (UPS); *Sparmann* s.n. (S); *Ekeberg* s.n. (SBT); *Ecklon* 668 (SAM), 3029 (Kokstad); Tonti Forest (–CD), *Forest Officer* 578, 3129 (Port St. Johns); 10 km W. of Port St. Johns (CB), *Codd* 9299; Isnuka Forest (–DA), *Galpin* 2841; Ntafufu (–DA), *Strey* 8533, 3226 (Fort Beaufort); Fort Fordyce (–CB), *Story* 2112, 3227 (Stutterheim); Pirie (–CD), *Kuntze* s.n. (K); *Sim* 19589, 3228 (Butterworth); near Kentani (–AD), *Pegler* 377; *Codd* 9248; Dwessa Forest (–BD), *Britten* 7009, 3322 (Oudtshoorn); Montagu Pass (–CD), *Schweickerdt* s.n.; *Rehmann* 276 (Z); near George (–DC), *Prior* s.n. (K); *Burchell* 6051 (K); *Schlechter* 2415; *Hutchinson* 1279a; Witfontein Forest Reserve (–DC), *Marais* 691; Wilderness (–DC), *Mogg* s.n. 3323 (Willowmore); Outeniqua (–CD), *Krauss* 194 (M); *Drege* s.n. (P); Blaauwkrantz River (–DC), *Penther* 1708 (M); Tsitsikama Forest (–DD), *Pappe* s.n. (SAM); *Galpin* 4423; *Schlieben* 10229; *Bokelmann* s.n. 3419 (Caledon); Genadendal (–BA), *Prior* s.n. (K); Rivier Sonder Einde Range, *Esterhuysen* 5069, 3420 (Bredasdorp); Grootvadersbosch (–AB), *Marloth* 3500; Voormansbosch (–AB), *Zeyher* 3545 (SAM); near Swellendam (–AB), *Ecklon* 70.10 (K); near Heidelberg (–BB), *Esterhuysen* 10367; National Bontebok Park (–CA), *Liebenberg* 6359, 3421 (Riversdale); Langeberg (–AB), *Muir* 2920, 3423 (Knysna); near Knysna (–AA), *Theron* 1013; *Werdermann & Oberdieck* 932; The Heads (–AA), *Williamson* 120; Deepwells Forest (–AA), *Keet* 419; *Schonland* 3587; *Marsh* 1324, near Garden of Eden (–AA), *Kapp* 108; *Bruce* 234; Plettenberg Bay (–AB), *Smart* sub TRV 26685, 3424 (Humansdorp); Clarkson (–AB), *Thode* A979.

There is a certain amount of variation in this species according to habitat conditions. Under forest conditions the plants are taller and more branched, the stems less pubescent and the leaves larger, thinner and smoother. Flower colour is normally pale to deep mauve with purple flecks on the upper lip of the corolla. A form with pinkish-lilac flowers was described as *P. behrii* Compton but it is known from only one or two gatherings in the Lusikisiki district and differs in no other respect from *P. fruticosus*. It is a popular horticultural subject and should rather have been given a cultivar name than separate taxonomic status.



FIG. 30.—*Plectranthus fruticosus*, Karkloof, Natal (Codd 8580),  $\times 1$ .

In typical *P. fruticosus* there is a distinct dorsal spur at the base of the corolla tube, from which the generic name *Plectranthus* is derived (Greek: *spur flower*), but this is not a constant character, particularly in Natal and the eastern Transvaal, where plants in some populations have corollas spurred to a greater or lesser degree, while in other populations the corolla is saccate or bulged at the base. For this reason *P. galpinii* Schltr. is now included in synonymy. Its corolla is saccate at the base and tends

to be paler in colour than typical *P. fruticosus*, but it differs in no significant respect. The type of *P. peglerae* T. Cooke has a spurred corolla tube and cannot be differentiated from *P. fruticosus*. *P. arthropodus* Briq. and *P. charianthus* Briq. are both based on *Rehmann* specimens from the Woodbush area, north-eastern Transvaal. Even though the type of *P. charianthus* consists of inflorescences only, both this and the type of *P. arthropodus* are recognisable as *P. fruticosus*, (see following page).

The two species most likely to be confused with *P. fruticosus* are *P. grallatus* Briq. and *P. rubropunctatus* Codd, and both occur in the Woodbush area. However, these two may readily be distinguished from *P. fruticosus* by the presence of conspicuous red to brownish gland-dots on the undersides of the leaves, bracts, calyx and corolla. These are best seen at a magnification of about 20x and with a bright artificial light source. They are larger, somewhat flattened to depressed in the centre and often appear as a ring of minute red gems, which are very different from the honey-coloured, simple gland-dots of *P. fruticosus*. These ruby-coloured gland-dots are found in many other species, but are diagnostic for separating *P. fruticosus* from *P. grallatus* and *P. rubropunctatus*. These three species have been studied in the eastern Transvaal and further distinctions have been noted. Flower colour in *P. grallatus* and *P. rubropunctatus* is usually white, flushed to some extent with mauve or pink, while the stems are glandular-hispid with spreading, not antrorse, multicellular hairs. At high altitudes on Mariepskop in the eastern Transvaal, both *P. rubropunctatus* and *P. fruticosus* apparently occur and here the distinctions between the two species are not as clear-cut as elsewhere. Here *P. fruticosus* develops thicker leaves with a more marked glandular-hispid pubescence of leaves and stems, while the red gland-dots of *P. rubropunctatus* are less marked or become obscured by the more dense pubescence. Elsewhere in its sympatric distribution from Swaziland to the Soutpansberg, the distinction between *P. rubropunctatus* and *P. fruticosus* presents no difficulty.

*P. grallatus* has a wide distribution from the eastern Cape to north-eastern Transvaal, but it occurs more inland, at higher altitudes and more exposed situations than *P. fruticosus*. In addition to the differences noted above, the leaves of *P. grallatus* have more coarsely dentate margins and the base of the leaf is longer attenuate into the petiole than in *P. fruticosus*. The distinctions between *P. grallatus* and *P. rubropunctatus* are discussed under these two species.

Chromosome number  $2n=28$  (De Wet, 1958).

29. *Plectranthus grallatus* Briq. in Bull. Herb. Boiss. ser. 2,3: 1004 (1903); Cooke in Fl. Cap. 5,1: 287 (1910); Trausel, Wild Flow. Drakensberg 160 (1969); Jacot-Guillarmod, Fl. Lesotho 239 (1971); Ross, Fl. Natal 305 (1972). Type: Cape, Mount Frere, *Schlechter* 6415 (Z.! holo.; GRA!; PRE!).

*P. transvaalensis* Briq., l.c. 1005 (1903); Cooke, l.c. 288 (1910); Phillips in Ann. S.A. Mus. 16: 241 (1917). Type: Transvaal, Houtbosch, *Rehmann* 6154 (Z.! holo.). *P. krookii* Guerke ex Zahlbr. in Ann. Naturhist. Hofmus. Wien 20: 48 (1905); Cooke, l.c. 274 (1910). Type: East Griqualand, between Insizwa Range and Umzimhlava River, *Krook* in Pl. Penher 1698 (W! holo., K!).—var. *grandifolia* T. Cooke, l.c. 275 (1910). Type: East Griqualand, near Kokstad, *Tyson* 1793 (K! holo.). *P. praetervisus* Briq. in Bull. Herb. Boiss. ser. 2, 6: 825 (1906). Type: Natal, Mt. Prospect, *Rehmann* 6965 (Z.! holo.). *P. cooperi* T. Cooke, l.c., 278 (1910), partly, as to *Cooper* 2982 (K!). *P. natalensis* forma *glandulosa* Phillips in Ann. S.A. Mus. 16: 241 (1917). Syntypes: several, including *Leerbe*, *Dieterlen* 417 (PRE!); near *Witzies Hoek*, *Flanagan* 1927 (PRE!). *P. ciliatus* sensu *Jacot-Guillarmod*, Fl. Lesotho 239 (1971); *P. fruticosus* sensu *Jacot-Guillarmod*, l.c. (1971).

Aromatic herb 40–150 cm tall; stems 1–3 arising from a tuberous rootstock, 4-angled, simple or sparingly branched, glandular-hispid; pubescence patent to crisped, mainly of short spreading hairs, gland-tipped hairs and some long, multicellular articulate hairs and scattered red gland-dots. Leaves: petiole 2–10 cm long, sparingly to densely glandular-hispid with pubescence similar to the stems; blade

broadly ovate 5–16 cm long, 3.5–14 cm broad, relatively thin textured, smooth to slightly rugose, thinly pilose above, denser below and often densely glandular-hispidulous, especially on the nerves, sparingly to densely gland-dotted, especially towards the margin with minute reddish to brownish gland-dots which are flattened to depressed in the centre and usually situated in a slight depression of the leaf surface, underside of leaf not suffused with purple; apex acute to abruptly acuminate, base abruptly to gradually cuneate, rarely truncate, usually attenuate to the petiole for 1–1.5 cm; margin with 14–20 pairs of rather pronounced, acute, irregular teeth, usually with secondary teeth. Inflorescence panicle with 1–3 pairs of branches near the base, pyramidal, 10–26 cm long; rachis puberulous to minutely or coarsely patent glandular-hispid with short gland-tipped hairs, short to longish multicellular hairs and usually some red gland-dots; bracts lanceolate to ovate-lanceolate, acuminate, 2–6 mm long, persisting to the fruiting stage, glandular-hispid with usually some fringing hairs and red gland-dots. Flowers in sessile, opposite 3-flowered cymes; verticillasters 0.6–2 cm apart; pedicels 4–8 mm long hispidulous. Calyx 4 mm long at flowering enlarging to 7–8 mm long in fruit, glandular hispid usually with red gland-dots; upper lip erect, ovate, obtuse to acute, slightly decurrent on the tube, 2.5 mm long, lower lip 4-toothed, 4 mm long, teeth deltoid-subulate, the lower pair longer than the median. Corolla white with a faint flush of pink or mauve on the upper lip, which usually has a few spots as well, sparingly pubescent outside and usually with some red gland-dots; tube 5–8 mm long slightly deflexed, expanding and saccate at the base, narrowing slightly towards the throat; upper lip erect, obovate, 4–6 mm long and up to 7 mm wide with a few purple dots near the base, bilobed at the apex and with two projecting, acute, ear-like lateral lobes; lower lip boat-shaped, 4–5 mm long, horizontal to slightly deflexed. Stamens free, the lower pair the longer, up to 7 mm long. Style exerted by 6–7 mm. FIG. 31.

Found in forest and scrub forest and in shady places among rocks from the eastern Cape Province, mainly along the Drakensberg escarpment and neighbouring areas in Natal, Lesotho and the eastern Orange Free State to central and eastern Transvaal.

TRANSVAAL.—2329 (Pietersburg): near Haenertsburg (–DD), *Codd* 9424; 9427A; Houtbosch (–DD), *Rehmann* 6154 (Z). 2427 (Thabazimbi): Krantzberg (–BC), *Codd & Erens* 3980; *Codd* 7869. 2430 (Pilgrim's Rest): Mamatzeei (–AA), *Junod* 291; The Downs (–AA), *Junod* 4330; Shilouvane (–AB), *Junod* 4334; Mariepskop (–DB), *Codd* 7869. 2527 (Rustenburg): Hartebeestpoort Dam, *Pole Evans* 4774. 2528 (Pretoria): Jack Scott Nature Reserve (–CC), *Wells* 2457. 2530 (Lydenburg): Dullstroom (–AC), *Galpin* 13358; Berlin (–DB), *Hofmeyr* s.n. 2531 (Komatipoort): Agnes Mine, near Barberton (CC), *Codd* 9546. 2627 (Potchefstroom): near Krugersdorp (BB), *Jenkins* sub *TRV* 10022; *Mogg* 23237; Witpoortjie (BB), *Gilmore* sub *TRV* 26374; *Young* sub *TRV* 26637; *Murray* s.n. 2730 (Vryheid): near Wakkerstroom (–AC), *Van Dam* sub *TRV* 24313; *Galpin* 9795; *Devenish* 401; 406.

O.F.S.—2828 (Bethlehem): near Bethlehem (–AB), *Potgieter* sub *TRV* 21896; Golden Gate National Park (–AD), *Liebenberg* 6825; 7475; *Roberts* 3239; 27 km E. of Clarens (–BC), *Marais* 1279; Fouriesburg (–CA), *Potts* 3107; Witzieshoek (DB), *Flanagan* 1927; *Junod* sub *TRV* 17316. 2829 (Harrismith): near Harrismith (–AC), *Sankey* 231 (K); near Swinburne (–AD), *Codd* 10525.

NATAL.—2729 (Volksrust): near Charlestown (BD), *C. A. Smith* 5661. Laingsnek (–BD), *Codd* 8632; Mt Prospect (DB), *Rehmann* 6965 (Z). 2730 (Vryheid): 24 km E. of Utrecht (CA), *Codd* 49A. 2731 (Louwsberg): Ngome Forest (CD), *Codd* 9569. 2828 (Bethlehem): Natal National Park (DB), *Schelpé* 1250 (NH); *Edwards* 543; Mont-aux-Sources, *Schelpé* 1512 (NH); *Bayer & McClean* 59. 2829 (Harrismith): Van Reenens Pass (–AD), *Medley Wood* 8925 (NH); *Phillips* s.n.; *Codd* 8513; Cathedral Peak Forest Station (–CC), *Killick* 1328; 2366; Tabamhlope (–DC), *West* 1096. 2830 (Dundee): 14 km S. of





FIG. 31.—*Plectranthus grallatus*, Mt. Frere, eastern Cape Province (isotype: *Schlechter* 6415 in GRA),  $\times 1$ .

Dundee (-AA), *Codd* 2419; near Weenen (-CC), *Medley Wood* 4378 (K); *Rogers* 28192, 2929 (Underberg); Cathkin Park, *Galpin* 11840; *Howlett* 113; Champagne Castle (-AB), *Bayer* 1262; *Acocks* 10075 (NH); *Strey* 7841; Giants Castle (-AD), *Symons* 193; *Bos* 991; *Trauseld* 374; 533; 583; near Otterburn Store (-BB), *Edwards* 2682; Mooi River (-BB), *Mogg* 7206; Loteni Nature Reserve (-BC), *Killick* 3856; near Underberg (-CD), *McClellan* 639, 2930 (Pietermaritzburg); 13 km W. of Nottingham Road (-AC), *Codd* 8525; near Howick (-AC), *Medley Wood* 7198; Balgowan (-AC), *Mogg* 3819; Dargle, *Moll* 2677.

LESOTHO.—2828 (Bethlehem); Leribe (CC), *Dieterlen* 417; Moteng (-CC), *Jacot Guillarmod* 3665, 2928 (Marakabia); Mahlatsas (-?), *Jacot Guillarmod* 460; *Jacot Guillarmod* 2208.

CAPE.—3028 (Matatiele); near Mount Frere (-DD), *Schlechter* 6415 (GRA, Z); *Acocks* 12546, 3029 (Kokstad); near Kokstad (-CB), *Tyson* 1793 (K); between Insizwa Mt. and Umzimhlava River, *Krook* 1698 (K, W), 3127 (Lady Frere); 25 km N.E. of Engcobo (-BD), *Marais* 1384; Glen Grey (-CA), *Galpin* 8042, 3128 (Umtata); 10 km N.E. of Halcyons Drift (-BD), *Marais* 869, 3226 (Fort Beaufort); Kaga Mts. (-CA), *Fitchett* 32, 3227 (Stutterheim); Hogsback (-CA), *Johnson* 1289; 1308; Pirie Forest (-CD), *Dodd sub Galpin* 8024.

Although *P. grallatus* is nearly as widespread in South Africa as *P. fruticosus* and occupies similar habitats, the two rarely occur together, one of the few exceptions being in the Woodbush area of the

north-eastern Transvaal. The two are frequently confused in the herbarium but are, in fact, quite distinct. The distinguishing characters are discussed at length under *P. fruticosus*.

*P. grallatus* and *P. rubropunctatus* are closely related and occasional specimens from the Mariepskop area are not easy to allocate with certainty. *P. rubropunctatus* is restricted to the eastern Transvaal and Swaziland from Mbabane to Woodbush and may be distinguished from *P. grallatus* mainly on leaf characters. In *P. rubropunctatus* the leaf margin has rounded teeth which are entire, while in *P. grallatus* the margin is more deeply dentate with larger, acute teeth which are again minutely denticulate. There is also a difference in the base of the leaf: in *P. grallatus* the leaf is abruptly attenuate for about 1–3 cm at the base but not markedly decurrent on the petiole; *P. rubropunctatus* exists in two forms, in the typical being attenuate and distinctly decurrent on the petiole and in the other being truncate to subcordate at the base.

*P. grallatus* shows a good deal of variation in texture, pubescence and size of leaves according to the degree of protection or exposure of the habitat. This has led to the somewhat extensive synonymy. The types of all synonyms have been seen and they do not deviate in any significant way from typical *P. grallatus*.

Chromosome number  $2n = 28, 56$  (De Wet, 1958).

A distinct variant has been found in the eastern Cape Province and the Weza Forest area of southern Natal. This form is smaller and more delicate than the typical *P. grallatus* and the upper lip of the corolla is marked with several vertical purple lines or rows of dots. In other respects the plants agree with *P. grallatus* and so separate status is not considered justified. Specimens representative of this form are not included in the citations above and are as follows:

NATAL.—3029 (Kokstad): Ingeli Forest (–DA), *Codd* 8561; *Strey* 6308; *Hilliard & Burt* 3477.

CAPE.—3128 (Umtata): Pot River Berg (–AB), *Galpin* 6818, 3227 (Stutterheim): Cata Forest Reserve (–CA), *Strey* 3265.

30. ***Plectranthus rubropunctatus*** *Codd*, sp. nov., affinis *P. grallato* *Briq.*, sed foliis crassioribus, marginibus aequaliter et non profunde crenatis differt.

*P.* aff. *arthropodus* sensu Compton, Fl. Swaz. 66 (1966).

Suffrutex vel herba perennis, erectus vel procumbens; caules semi-succulenti, 4-angulati, ramosi, 1–2 m longi, glanduloso-hispidi, rubropunctati. *Folia* petiolata; petiolus 2–8 cm longus; lamina late elliptica vel late ovata vel subrotunda, 4–15 cm longa, 3–10 cm lata, chartacea vel coriacea, supra hispidula, subtus reticulata, hispidula vel strigulosa, rubropunctata, apice obtusa vel rotundata, basi subcordata vel truncata vel decurrens, margine aequaliter et non profunde crenata. *Inflorescentia* erecta plerumque paniculata, 10–25 cm longa; bractae ovatae vel obovatae, acuminatae, persistentes, 2–6 mm longae, glanduloso-hispidae, rubropunctatae. *Verticillastri* 0,5–1,2 cm distantes – 6-floribus; pedicelli 4–6 mm longi, glanduloso-hispiduli. *Calyx* 4–7 mm longus, glanduloso-hispidus, rubropunctatus; lobus posticus late ovatus, erectus, 2,5 mm longus, acutus vel obtusus; lobi laterales deltoideo-subulati; antici lineari-subulati, 4 mm longi. *Corolla* alba vel pallidolilacina, minute pubescentia, rubropunctata; tubus 3–4 mm longus, prope basin leviter deflexus, saccatus; labium posticum erectum, 2,5–4 mm longum, pariter latum, obscure 4-lobatum; labium anticum cymbiforme, 2,5–4 mm longum. *Stamina* 4, filamentis liberis, supera 5 mm, infera 6 mm longa. *Stylus* 6–8 mm fauce exsertus.

TYPE: Transvaal, Barberton District, Nelshoogte Forest Station, *Strey* 4081 (PRE, holo.).

Perennial aromatic herb or sub-shrub up to 2 m tall or procumbent with stems up to 2 m long (Soutpansberg, Blouberg); stems semi-succulent, woody below, branched, 4-angled, usually purplish, glandular hispid, usually with dense short pubescence and gland-tipped hairs with few to many spreading multicellular hairs and scattered red gland-dots. *Leaves* chartaceous to somewhat coriaceous; petiole 2–8 cm long, finely to coarsely glandular-hispid; blade broadly elliptic or broadly ovate to subrotund, 4–15 cm long, 3–10 cm broad, upper surface minutely hispidulous, lower surface paler, reticulate-veined, hispidulous to strigulose especially on the veins, sparingly to copiously dotted with red to brownish flattened gland-dots; apex obtuse to rounded, base subcordate or truncate to shortly attenuate or markedly decurrent on the petiole; margin regularly and shallowly crenate with 12–30 pairs of teeth, teeth rounded, entire or rarely again minutely toothed. *Inflorescence* terminal, usually paniculate, with 1–3 pairs of branches near the base, 10–25 cm long; rachis densely glandular-hispidulous; bracts ovate to obovate, acuminate, 2–6 mm long, persisting to the fruiting stage, glandular-hispid with scattered red gland-dots and often a fringe of multicellular hairs. *Flowers* in sessile 3-flowered cymes forming 6-flowered verticillasters, verticillasters 0,5–1,2 cm apart; pedicels 4–6 mm long, glandular-hispidulous. *Calyx* 4 mm long at flowering enlarging to 7 mm long in fruit, glandular-hispid with scattered multicellular hairs and few to many red gland-dots; upper lip erect, broadly ovate, 2,5 mm long, acute to obtuse; lower lip 4-toothed, about 4 mm long, median teeth deltoid subulate, lower pair slightly longer linear-subulate. *Corolla* white, scarcely or noticeably suffused with a pinkish-mauve to bluish tinge, pubescent and with red gland-dots; tube 3–4 mm long, slightly deflexed, expanding within the calyx and saccate at the base, narrowing slightly towards the throat; upper lip erect, 2,5–4 mm long and equally broad in the upper part, emarginate at the apex and with 2 small lateral ear-like lobes; lower lip boat-shaped, 2,5–4 mm long, at first horizontal, later deflexed. *Stamens* free, the lower pair the longer, up to 6 mm long. *Style* exserted by 6–8 mm. FIG. 32.

Found as an under-storey soft shrub in forest, scrub-forest and in shady places among rocks and grass at relatively high altitudes from 1 200 to 2 000 m in the northern and eastern Transvaal and in Swaziland.

TRANSVAAL.—2229 (Waterpoort): between Mountain Inn and Hanglip (–DD), *Meeuse* 10191, 2230 (Messina); Entabeni Forest Reserve, Muchindudi Falls (–CC), *Codd* 4187, 2328 (Baltimore); Blouberg (–BB), *Strey & Schlieben* 8510, 2330 (Tzaneen); Westfalia Estate (CA), *Scheepers* 1106; Politi (–CA), *Byliss* BA 2756; Magoebaskloof, Debingini Falls (CC), *Obermeyer* sub TRV 31862, *Codd* 9421; New Agatha Forest Reserve, *Muller & Scheepers* 218, 2430 (Pilgrims Rest); Marovuni (–AA), *Junod* 72; Wolkberg (AA), *Meeuse* 9874, 9912; The Downs, (–AA), *Codd & Dyer* 7751; 16 km S.W. of Ofcolaco (AB), *Codd* 9446; *Joubert* 4; Mariepskop (–BD), *Codd* 7863; 7888; *Werdermann & Oberdeck* 1889; *Meeuse* 9946; 9953; 9979; *Van der Schijff* 4455; 4457; 4458; 4460; 4687; 4848; 4870; 4900; 4901; 4902; 7326; near Pilgrims Rest (–DD), *Galpin* 14500, partly; Graskop (–DD), *Galpin* 4484; Kowyns Pass (–DD), *Codd* 9478, 2530 (Lydenburg); between Lydenburg and Sabie (–BA), *Meeuse* 10048; Sabie (–BB), *Rogers* 23681; Nelshoogte Forestry Station (DB), *Codd* 8143; *Strey* 4080; 4081, 2531 (Komatiipoort); near Barberton (–CC), *Codd* 9543; *Strey* 5994; *Liebenberg* 2353.

SWAZILAND.—2531 (Komatiipoort); near Piggs Peak (CC), *Codd* 9526; *Compton* 27672; 28725; 29986; 32246; *Karsten* s.n. 2631 (Mbabane) between Mbabane and Piggs Peak; *Hilliard & Burt* 3555; 4 km N. of Forbes Reef (AA), *Ihlenfeldt* 2493; *Schlieben* 9547; near Mbabane (–AC), *Compton* 26748; 31996; 32251.



FIG. 32.—*Plectranthus rubropunctatus*, Nelshoogte, eastern Transvaal (holotype: Strey 4081 in PRE).  $\times \frac{1}{2}$ .

A good deal of variation in size and texture of leaves is associated with the habitat. Plants growing in dense forest have large, thin-textured leaves while those growing in exposed, drier situations e.g. among rocks above the forest zone, have smaller and thicker leaves.

There is also some interesting variation which is associated with geographic distribution. At the extreme north of the range, on the Blouberg and Soutpansberg, the stems are procumbent and trailing, while from Magoebaskloof southward to its southerly limit in Swaziland, the plants are erect and bushy. Further investigation is required to see if the procumbent form should be accorded separate status of some sort.

In the more southerly distribution area there is variation in the shape of the leaf base. In Magoebaskloof and on Mariepskop the leaf base is truncate or subcordate and is not decurrent on the petiole. Further south, at Nelshoogte and in Swaziland, the leaf blade tends to be distinctly decurrent on the petiole often giving the petiole a winged appearance. There are, however, intermediates in which the base is shortly cuneate as in *P. grallatus*; such plants can be distinguished from *P. grallatus* mainly by their more regular and shallower crenate-dentate leaf-margins and, usually, by the somewhat thicker texture of the leaf of *P. rubropunctatus*.

*P. grallatus* is its nearest affinity and the two species have similar reddish gland-dots on the underside of the leaf and other parts of the plant, and the

flowers of both are whitish, flushed with pink or mauve. They meet only in the Woodbush area of north-eastern Transvaal.

*P. fruticosus* often occurs together with *P. rubropunctatus* and the two may be confused, especially in the herbarium. They can, however, almost invariably be distinguished by the presence, in *P. rubropunctatus*, of red or brownish gland-dots on the underside of the leaves, especially towards the margins, as well as on the calyx and often on the corolla; in *P. fruticosus* the gland-dots are minute, pale to honey-coloured droplets. There is also a difference in flower colour: as mentioned above, the flowers of *P. rubropunctatus* are basically white with a flush of pink or mauve or, rarely, more or less uniformly bluish, while in *P. fruticosus* the flowers are bluish-mauve freely speckled with purple on the upper lip.

The main difficulty in distinguishing between the two is experienced at high altitudes on Mariepskop, where both *P. rubropunctatus* and *P. fruticosus* occur in exposed, rocky situations above the forest zone. Due to the more severe conditions, both species here exhibit smaller and thicker leaves and more markedly glandular-hispid pubescence on stems and leaves, with the result that the diagnostic gland-dots are not always discernible on herbarium specimens. A field study in this area would be of value to determine the degree of intergradation between the two species.

*P. arthropodus* Briq. and *P. charianthus* Briq. were both described from *Rehmann* specimens collected in the Woodbush area of the Transvaal. In recent years the name "arthropodus" has been wrongly applied in the National Herbarium to the plants now placed as *P. rubropunctatus* (see Compton, Fl. Swaz. pp. 66, 157, 1966). A re-examination of both type specimens revealed that both have the pale-coloured gland-dots of *P. fruticosus* so that these two names must be added to the synonymy of this species, while the plants with reddish gland-dots must receive a new name.

31. *Plectranthus rehmannii* Guerke in Bull. Herb. Boiss. 6: 553 (1898); Cooke in Fl. Cap. 5, 1: 274 (1910), partly, excl. *Thorncroft* 3259; Ross, Fl. Natal 305 (1972). Type: Natal, Karkloof, *Rehmann* 7359 (Z!, holo.; K!).

Erect, branched herb or subshrub 60–120 cm tall, aromatic; branches semi-succulent, somewhat woody at the base, 4-angled, finely appressed tomentulose with short, retrorse multicellular hairs and small subsessile glands. *Leaves*: petiole 1.5–6 cm long, appressed tomentulose like the stems; blade ovate to oblong-ovate, 8–14 cm long, 5–8 cm broad, thickish-textured, upper surface with sparsely scattered short multicellular hairs, lower surface paler, reticulate-veined, hispidulous along the nerves, freely dotted with orange-brown to dark gland-dots and small subsessile glands; apex acute to acuminate; base rounded to truncate, not or shortly attenuate into the petiole; margin finely and regularly crenate-serrate with over 50 pairs of teeth, ciliate. *Inflorescence* terminal, erect, 25–35 cm long, paniculate with 1–3 pairs of branches near the base; rhachis densely and finely glandular-tomentulose; bracts ovate-lanceolate, acuminate, 7–10 mm long, persisting to the early fruiting stage, later breaking off near the base, finely glandular-puberulous. *Flowers* in few-flowered cymes consisting of a central sessile flower and 2 lateral branches in each bract; peduncles of lateral cyme-branches up to 7 mm long, producing 8–16-flowered verticillasters, verticillasters 1, 2–2 cm apart; pedicels 3–6 mm long, glandular-puberulous. *Calyx* 2, 5 mm

long at flowering stage enlarging to 9 mm long in fruit and then at right angles to the pedicel, finely glandular-puberulous with scattered reddish gland-dots; upper lip suberect, broadly ovate, acute to obtuse, up to 3 mm long; lower lip sub-equally 4-toothed, 5 mm long, teeth deltoid-subulate, 2–2.5 mm long, the lower pair slightly the longer. *Corolla* white, covered with a tomentum of white multicellular hairs; tube 4 mm long, deflexed and

A clear-cut species with no near relationships, characterized by the finely crenate-serrate leaves and the small, saccate-based, white flowers covered with a white tomentum.

*Thorncroft* 3259 from Barberton, cited by Cook in *Flora Capensis* under *P. rehmannii*, is *P. laxiflorus*, a species which has finely toothed, cordate-based leaves and a very different corolla shape (see p. 434).



FIG. 33.—*Plectranthus rehmannii*, Karkloof, Natal (Codd 8587),  $\times 1$ .

much expanded at the base, 3 mm in depth at the base, narrowing somewhat towards the throat; upper lip very short and inconspicuous, 2 mm long, 3 mm broad, apex bilobed and with two minute lateral ear-like lobes; lower lip boat-shaped, curved upwards, 4 mm long. *Stamens* free, up to 2.5 mm long, the upper pair of anthers usually visible in the throat of the open corolla. *Style* slightly exceeding the stamens. FIG. 33.

A soft shrubby plant with a limited distribution in the Natal Midlands where it is often locally common in forest margin scrub.

NATAL.—2930 (Pietermaritzburg): Karkloof (–AC), *Rehmann* 7359 (K, Z); *Moll* 3497 (NH); Curry's Post (–AC), *Schlechter* 6804 (NH); *Hilliard* 4852; Shafton, Howick (–AC), *Evans sub NH* 19990 (NH); near Lidgetton (–AC), *Medley Wood* 6313; 13 km N.W. of York (–AD), *Codd* 8587; Swartkop (–CB), *Medley Wood* 10268; Byrne (CC), *Medley Wood* 3167 (K).

32. *Plectranthus swynnertonii* S. Moore in J. Linn. Soc. Bot. 40: 176 (1911). Type: Rhodesia, Chirinda Forest, *Swynnerton* 337 (K!).

Soft herb 40–75 cm tall pleasantly aromatic ("Cress-like"); branches slender, softly succulent, semi-prostrate, spreading or erect, finely glandular-puberulous with some scattered multicellular hairs and a fringe of longer hairs at the nodes. *Leaves*: petiole 4–13 cm long, slender, minutely glandular-puberulous with occasional multicellular hairs; blade broadly ovate to subrotund, 5–15 cm long, 4.5–14 cm broad, very thin textured, dark above with scattered appressed multicellular hairs, paler and reticulate-veined below, sparingly strigose on the veins and freely dotted with sessile yellowish to brownish gland-dots, often slightly sunken or flattened; apex obtuse to acute, base truncate to

subcordate; margin coarsely and deeply serrate-dentate, teeth 6–16 mm long usually with small secondary teeth. *Inflorescence* terminal, simple or sometimes with a pair of branches at the base; racemes 6–15 cm long; rhachis finely glandular-puberulous; bracts broadly ovate to obovate, acuminate, 2–4,5 mm long, persisting to the fruiting stage, finely glandular with a few fringing multicellular hairs towards the apex. *Flowers* in sessile or almost sessile (1–)3-flowered cymes forming 2–6-flowered verticillasters; verticillasters 1–3 cm apart; pedicels 3–5 mm long, glandular-puberulous. *Calyx* 4 mm long at flowering stage enlarging to 8 mm in fruit, finely puberulous; upper lip erect, broadly ovate, abruptly acute, slightly decurrent on the tube, 2,5 mm

horizontal to recurved. *Stamens* free, the lower pair the longer, up to 6 mm long. *Style* horizontal, exerted by 6 mm. FIG. 34.

A ground-layer herb to soft shrub in moist forest, usually on humus-rich well-drained soil, found in the mountain forests of northern and north-eastern Transvaal, and in similar situations in eastern Rhodesia.

TRANSVAAL.—2230 (Messina): Entabeni Forest Station, Soutpansberg (–CC), *Galpin 10249*; *Codd 8388*. 2330 (Tzaneen): Westfalia Estate near Duiwelskloof (–CA), *Scheepers 947*; *Bos 1168*; Woodbush Forest, Debingini Falls (–CC), *Codd 9420*; *Bruce & Kies 79*; 4 km N.W. of Magoebaskloof Hotel (–CC), *Leistner, Thom & Gilham 3284*.



FIG. 34.—*Plectranthus swynnertonii*, Soutpansberg (*Codd 8388*),  $\times 1$ .

long; lower lip 4-toothed, 4–5 mm long at maturity, the lower pair much the longer, linear-subulate, median pair deltoid-subulate. *Corolla* white, flushed with mauve-pink and with a few purple dots on the upper corolla lip inside, sparingly glandular and with an occasional yellow gland-dot outside and fringed with white hairs; tube 4–6 mm long, scarcely deflexed, expanding abruptly in the calyx forming a somewhat saccate base, narrowing towards the throat; upper lip erect, 4–6 mm long and up to 6 mm broad, bilobed at the apex and with 2 prominent, rounded ear-like lateral lobes; lower lip boat-shaped, 4–5 mm long,

Among South African species with persistent bracts, *P. swynnertonii* can readily be distinguished by its almost round leaves, which are very thin in texture, somewhat cordate at the base and with coarsely dentate margins, the teeth being 1–1,5 cm long with small secondary teeth. The gland-dots on the underside of the leaf are also distinct, being yellowish to pale brown, often rather flattened or sunken.

33. *Plectranthus dolichopodus* *Briq.* in Bull. Herb. Boiss. ser. 2,3: 1069 (1903); Cook in Fl. Cap. 5,1: 287 (1910), partly, excl. *Flanagan 740*; Ross, Fl.

Natal 305 (1972). Type: Natal, Karkloof, *Rehmann* 7383 (Z!, holo; PRE, photo.).

*P. cooperi* T. Cooke in Kew Bull. 1909: 377 (1909), partly as to *Wood* 1843 and *Gerrard* 1673.

Erect or straggling herb 25 cm–1 m tall, sparingly branched, arising from a mass of fine fibrous roots; branches softly semi-succulent to slightly woody, 4-angled, glandular-pilose to hispidulous, with long multicellular purple-striped spreading to antrorse hairs, short stiff unicellular hairs and gland-tipped hairs. *Leaves*: petiole slender 2–6 cm long, sparsely glandular-pilose; blade broadly ovate to ovate-deltoid, 3–10 cm long, 2.5–8 cm broad, chartaceous, upper and lower surfaces subglabrous with sparsely scattered multicellular hairs and minute colourless gland-dots, nerves inconspicuous above, slightly raised below; apex acute to abruptly acute, base broadly truncate, shortly attenuate for 3–6 mm into the petiole; margin coarsely crenate-dentate with 6–12 pairs of teeth, sparingly ciliate. *Inflorescence* terminal, erect, simple or paniculate 10–20 cm long; with 1 or 2 pairs of branches near the base; rhachis glandular-hispidulous; bracts obovate, acuminate 1.5–2 mm long, persistent beyond the fruiting stage, sparingly hispidulous, ciliate. *Flowers* in sessile, usually 3-flowered cymes (often fewer towards the apex), forming 2–6-flowered verticillasters, verticillasters 1–3 cm apart; pedicels 6–10 mm long, glandular-hispidulous, persistent, often with the basal part of the calyx still attached. *Calyx* purple tinged; 3 mm long at flowering stage, enlarging to 6 mm long in fruit, sparsely glandular-puberulous; upper lip erect, ovate, acute to acuminate, up to 2.5 mm long; lower lip 4-toothed, 3 mm long, the lower pair slightly the longer, linear-subulate, 2 mm long, the median pair deltoid-subulate, 1.5 mm long. *Corolla* sky-blue to deep blue, sparingly pubescent without; tube 5 mm long, deflexed and expanding in the calyx, 1.5 mm in depth at the base expanding to 2.5 mm at the throat; upper lip very short, 1.5–2 mm long suberect, 3 mm broad, bilobed at the apex; with 2 small ear-like lateral lobes; lower lip boat-shaped, curved upwards, 4–5 mm long, enclosing the stamens and style. *Stamens* free, up to 4 mm long, curved upwards in the keel. *Style* exceeding the stamens by 1 mm. FIG. 35.

A soft herb of cool forests with a somewhat disjunct distribution from Stutterheim District in the Cape, Natal Midlands and foothills of the Drakensberg, and the Mariepskop–Woodbush area in the Transvaal.

TRANSVAAL.—2330 (Tzaneen): Westfalia Estate (–CA), *Scheepers* 923; Woodbush Forest (–CC), *Schlechter* 4722, *Codd* 9427, *Letty* 458; *Taylor* 695; New Agatha Forest Reserve, *Müller & Scheepers* 174, 2430 (Pilgrim's Rest); The Downs (–AA), *Codd* 7752; Cyprus Point (–AB), *Jumod* 4328; Mariepskop (–DB), *Van Son* sub TRV 31563; sub TRV 31651, *Codd* 7862; *Meeuse* 9995; *Van der Schijff* 4376, 4452; *Bos* 1056.

NATAL.—Without locality: *Gerrard* 1673 (K), 2731 (Louwsburg); Ngome Forest (–CD), *Gerstner* 4513; *Codd* 9593, 2829 (Harrismith); Cathedral Peak (–CC), *Killick* 1676; 1965, 2830 (Dundee); Oudeni Forest (–DB), *Gerstner* 6711; *Fisher* 803, *Codd* 9674; Krantzkop (–DD), *Dyer* 4356; *Edwards* 2097, *Strey* 4232, 2929 (Underberg); Cathkin Park (–AB), *Galpin* 11839; Xumeni Forest (–DD), *Moll* 3001; Bulwer (–DD), *McClellan* 158, 2930 (Pietermaritzburg); Lidgettton (–AC), *Mogg* 6684; 13 km N.W. of York, *Codd* 8581; *Byrne* (–CC), *Medley Wood* 1843.

CAPE.—3029 (Kokstad): Ingeli Pass (–DA), *Acocks* 13564, 3227 (Stutterheim); near Toise River, *Flanagan* 2270.

The last mentioned specimen, *Flanagan* 2270, represents a considerable extension of the distribution range and confirmation of its occurrence in this area is desirable. There is, however, no sound reason for doubting the authenticity of the information on the label.

Although herbarium specimens are not always easy to identify, a mention on the collector's label of "sky-blue flowers" should be sufficient to eliminate the possibility of almost any other South African species. Other characteristics are the purple-tinged calyx, the membranous, subglabrous leaves on long slender petioles and the bunch of thin, fibrous roots.

The type, *Rehmann* 7383 in Z, is a rather scrappy immature specimen with only one half-open flower in a capsule, but the leaf texture, petioles and pubescence, together with the fibrous roots enable it to be linked without doubt to the modern gatherings cited above.

Cooke, in Fl. Cap., misunderstood this species. *Flanagan* 740, which he cites as *P. dolichopodus* is, in fact, a member of the *P. tomentosus*–*P. madagascariensis* complex, while the two specimens *Wood* 1843 and *Gerrard* 1673, included by Cooke in *P. cooperi* are, in fact *P. dolichopodus*.

Chromosome number 2n = 28 (De Wet, 1958).

*P. dolichopodus* has no close relative in South Africa but is closely related to material named *P. sylvestris* Guerke (1894) at Kew. The type of *P. sylvestris*, *Volkens* 965 from Mt Kilimanjaro, has not been seen, but the specimens in the *P. sylvestris* cover differ only slightly in the leaves being more acuminate at the apex and distinctly cuneate at the base. It seems also to be a more robust plant than *P. dolichopodus* with larger flowers. However, Gürke relates *P. sylvestris* to a different group, namely, Section *Coleoides* Benth.

Another apparently related species is *P. sphaerophyllus* Bak. but this species seems less close to *P. dolichopodus* than is *P. sylvestris*.

34. *Plectranthus zuluensis* T. Cooke in Kew Bull. 1909: 379 (1909); Fl. Cap. 5,1: 281 (1910); E. A. Bruce in Flow. Pl. Afr. 28: t. 1110 (1951); Codd in Mitt. Bot. München 10: 247 (1971); Ross, Fl. Natal 305 (1972). Type: Natal, *Gerrard* 1675 (K!, holo.).

Erect soft shrub 1–2 m tall, freely branched; branches ascending, softly woody below, semi-succulent above, obtusely 4-angled, shortly and finely tomentulose, especially the younger parts which are whitish and velvety to the touch, minutely dotted with dark gland-dots. *Leaves*: petiole 2.5–6 cm long, finely velvety pubescent; blade ovate to broadly ovate, 3–7 cm long, 2.5–5.5 cm broad, softly semi-succulent, drying thin-textured, thinly and shortly pubescent on both surfaces, denser on nerves and margins, gland-dots on lower surface colourless, nerves slightly raised below; apex acute, base truncate to shortly



FIG. 35.—*Plectranthus dolichopodus*,  
Karkloof, Natal (Codd 8581),  $\times 1$ .

cuneate; margin regularly and coarsely crenate with 7–12 pairs of teeth. *Inflorescence* terminal, simple or rarely branched near the base, 4–8 cm long; rhachis finely glandular-tomentulose; bracts ovate to lanceolate, 2–4 mm long, persisting beyond the fruiting stage. *Flowers* in sessile 3-flowered cymes forming 6-flowered verticillasters; verticillasters 5–12 mm apart; pedicels 2–5 mm long, glandular-tomentulose. *Calyx* 3 mm long at flowering, enlarging to 7 mm long in fruit, purple-tinged, glandular-hirsute, becoming subglabrous; upper lip suberect, ovate, obtuse, 2 mm

long, slightly decurrent on the tube; lower lip 4-toothed, up to 4 mm long, the lower pair the longer, linear-subulate, 2 mm long, the lateral deltoid 0.5–1 mm long. *Corolla* pale blue-mauve to almost white with usually six rows of mauve dots on the upper lip; tube 5–10 mm long, laterally compressed, expanding in the calyx forming a saccate base 2.5–4 mm deep at the base, narrowing to 2 mm at the throat; upper lip erect, 5–6 mm long, 4–5 mm broad, apex emarginate and with 2 obscure lateral lobes; lower lip shallowly boat-shaped, 5–6 mm long, at first



FIG. 36.—*Plectranthus zuluensis*, Nkandla Forest (Codd 9691),  $\times 1$ .

horizontal soon deflexed. *Stamens* free at the base, only the lower pair fertile with filaments 5–7 mm long, upper pair abortive, reduced to staminodes, 1–2 mm long. *Style* finally exerted by 5 mm. FIG. 36.

Restricted to Natal where it occurs in semi-coastal forests, often common along streams, from Port Shepstone District to Ngoye and Nkandla Forests in the north.

NATAL.—Without precise locality: *Gerrard* 1675 (K), 2830 (Dundee); near Krantzkop Mt. (–DD), *Burt* 3043; *Dyer* 4355, 2831 (Nkandla); Nkandla Forest (–CA), *Wylie sub NH* 9382 (NH); *Codd* 6969; 21 km S. of Nkandla (–CA), *Codd* 9691; Eshowe (–CD), *Thode A* 1255; *Lawn* 113 (NH); between Nkweleni and Empangeni (–DA) or (–DB), *Gerstner sub NH* 22235 (NH); Ngoye Forest (–DC), *Wylie sub NH* 12830 (NH); *Huntley* 234; *Wells & Edwards* 84; *Strey* 6110; *Venter* 2183, 2930 (Pietermaritzburg); Noodsberg (–BD), *Medley Wood* 5305 (NH); Little Noodsberg (–BD), *Strey* 6242; Nkutu Falls (–DD), *Johnson* 1491, 2931 (Stanger); near Mapumulo (–AA), *Strey* 9467; *Moll* 2972, 3030 (Port Shepstone); Umgai (–AD), *Strey* 10582; near Dumisa (–AD), *Hilliard & Burt* 3818; Ifafa (–BC), *Rudatis* 323; Mgai Farm (–BC), *Nicholson* 1154; Oribi Gorge (–CA), *Nicholson* 1010; 1044; 1046; Uvongo River (–CD), *Nicholson* 1024; Izotsha (–CD), *Strey* 8087 (NH).

*P. zuluensis* possesses the unusual characteristic of having only two fertile stamens (the lower pair) while the upper two are reduced to short staminodes. In all other respects the species fits into the genus

*Plectranthus*. The species can usually be recognized also by the softly velvety young branchlets.

The holotype, *Gerrard* 1675 from Natal, without details of locality, is in Kew Herbarium together with an immature specimen of the same species, *Gerrard* 1229.

Chromosome number:  $2n=28$  (De Wet, 1958).

35. *Plectranthus saccatus* *Benth.* in *E. Mey.*, *Comm.* 227 (1837). Type: Cape, "Omsamwubo" (Umzimvubu River, near Port St Johns), *Drege* (K, in *Herb. Benth.*!, lecto.; G!; P!; S!).

Erect to spreading soft shrub 50–120 cm tall, freely branched; branches woody below, semi-succulent above, purple-tinged, somewhat 4-angled, minutely glandular-puberulous with occasional longer multicellular hairs at the nodes. *Leaves*: petiole 1.5–5 cm long, glandular-puberulous, purple-tinged; blade broadly ovate to ovate-deltoid, 2–7 cm long, 1.5–5 cm broad, softly semi-succulent, drying thin-textured, sparingly glandular-puberulous to subglabrous, gland-dots colourless, nerves raised below; apex acute; base truncate to obtuse or shortly cuneate into the petiole; margin coarsely dentate with 3–6 pairs of teeth, purple-tinged and fringed with short hairs.



*Inflorescence* a short terminal raceme 5–12 cm long with relatively few but large flowers; rhachis densely and shortly glandular-puberulous; bracts lanceolate, acuminate, 1,5–2 mm long, persisting beyond the fruiting stage. *Flowers* very large, in sessile 1–3-flowered cymes, forming 2–6-flowered verticillasters; verticillasters 1–2 cm apart; pedicels 4–6 mm long, slightly thickened and apparently articulated near the apex, purple-tinged, minutely and densely glandular-puberulous. *Calyx* 3 mm long at flowering, enlarging to 8 mm long in fruit, minutely puberulous to subglabrous, with or without a few long multicellular hairs on the margins of the teeth; upper lip erect, ovate, obtuse, up to 2,5 mm long, slightly decurrent on the tube; lower lip 4-toothed, up to 5 mm long, the lower pair the longer, linear-subulate, 3 mm long, the lateral pair deltoid-subulate, 2 mm long. *Corolla* large, mauve to pale blue or, rarely, white, minutely puberulous, the upper lip with or without purple blotches; tube 0,8–1,5 cm (typical) or 2–2,6 cm long (var. *longitubus*), laterally compressed, expanding in the calyx forming a saccate base 4–6 mm deep at the base, parallel-sided or narrowing slightly towards the throat; upper lip erect, 1–1,6 cm long and equally broad, notched at the apex and with 2 small pendulous lateral lobes; lower lip boat-shaped, 8–12 mm long, at first horizontal, later deflexed. *Stamens* exerted or recurved within the lower lip of the corolla, subequal, 8–10 mm long, free or shortly

connate at the base. *Style* finally exerted by about 1 cm.

Occurs in forests or shady, rocky places not far from the coast, from the Kentani District in the eastern Cape Province to the Ingwavuma District in northern Natal.

*P. saccatus* may be distinguished from all other species by the large corolla, the upper lip, which is 1–1,6 cm long and equally broad, far exceeding that of any other species. There is a good deal of variation in corolla size and shape, the plants occurring at the extreme north end of the range at Gwalaweni Forest having exceptionally long corolla tubes. In view of the marked discontinuity in corolla-tube length shown by these northern plants, they are separated as a distinct variety.

#### Key to varieties

Corolla tube 0,8–1,5 cm long.....(a) var. *saccatus*

Corolla tube 2–2,6 cm long.....(b) var. *longitubus*

(a) var. **saccatus**.

*Plectranthus saccatus* Benth. in E. Mey., Comm. 227 (1837); in DC., Prodr. 12: 62 (1848); Wood & Evans, Natal Pl. 1: t. 85 (1899); Hook. f. in Bot. Mag. t. 7841 (1902); Cooke in Fl. Cap. 5, 1: 273 (1910); Batten & Bokelman, Wild Flow. E. Cape 127, t. 101 (1967); Codd in Flow. Pl. Afr. 41: t. 1601 (1970); Ross, Fl. Natal 305 (1972).

The leaf-blade tends to be smaller (2–5 cm long) and the corolla tube is distinctly shorter (0,8–1,5 cm long) than in var. *longitubus*. Fig. 37.



FIG. 37.—*Plectranthus saccatus* var. *saccatus*, Port St. Johns (Codd 9298),  $\times 1$ .

Distribution as for the species with the exception of the Gwalaweni Forest at the south end of the Lebombo Range.

NATAL.—Without locality: *Gerrard s.n.* (K); *Sanderson s.n.* (K). 2830 (Dundee): Qudeni Forest (–DB), *De Winter 8200*. 2831 (Nkandla): Nkandla Forest (–CA), *Wells 2490*; Hlinza Forest (–CD), *Moll 4990*; near Eshowe (–CD), *Codd 9651*; Ngoye Forest (–DC), *Wells & Edwards 80*. 2832 (Mtubatuba): Hluhluwe Game Reserve (–AA), *Ward 3061*. 2930 (Pietermaritzburg): Inanda (–DB), *Medley Wood 323* (K, NH); near Durban (–DD), *Medley Wood 7382*; 10208; *Rogers 15005*. 3030 (Port Shepstone): Oribi Gorge (–CA), *Nicholson 1056*; Izingolweni (–CC), *Medley Wood 3037* (K, NH); Izoetsha (–CD), *Strey 8084*. 3130 (Port Edward): Beacon Hill (–AA), *Strey 7223*; 10929.

CAPE.—3129 (Port St. Johns): Mkambati Leper Institute (–BD), *Marais 968*; Goss Point (–BD), *Strey 10148*; 10 km W. of Port St. Johns (–CB), *Codd 9298*; Isinuka (–DA), *Galpin 2840*; 11460; *Flanagan 2501*; near St. Johns River, *Drege s.n.* (G, K, MO, P, S). 3227 (Stutterheim): Tsomo River (–BA?), *Barber s.n.* (K). 3228 (Butterworth): near Kentani (–AD), *Pegler 338*.

*P. saccatus* var. *saccatus* shows some variation in corolla colour from mauve to blue, while the degree of marking of the upper lip varies from pale to deep purple; *De Winter 8200* from Qudeni Forest is particularly striking. The plant collected on the Mkambati Leper Institute (*Marais 968*) is distinctly more woody with more leathery leaves than other members of the species.

Chromosome number  $2n=28$  (De Wet, 1958).

The species is based on a gathering by Drege near the "Osamwubo" (Umzimvubu or St. Johns) River and several specimens have been seen. The specimen ex Herb. Bentham in Kew is selected as the lectotype.

(b) var. *longitubus* Codd, var. nov. a var. *saccato* tubo corollae 2–2,6 cm longo differt.

Type: 2732 (Ubombo): Ingwavuma District, Gwalaweni Forest (–AC), *Edwards 2930* (PRE, holo.).

Leaves tend to be larger, 3–7 × 2,5–5 cm, as against 2–5 × 1,5–4 cm in var. *saccatus*; the corolla tube is distinctly longer (2–2,6 cm long), but tends to be narrower (4–5 mm deep at the base as against 5–6 mm in var. *saccatus*). Fig. 38.

Recorded as yet only from the Gwalaweni Forest at the southern end of the Lebombo Range.

NATAL.—2732 (Ubombo): Gwalaweni Forest, *Edwards 2930*; *Vahrmeijer & Hardy 1699*; *Vahrmeijer 1913*.

The markedly longer corolla tubes shown by these plants appears to warrant their separation as a distinct variety. The leaves also tend to be larger and the corolla tube tends to be narrower, but there is overlapping in these characters. Although the flower colour is normally pale blue-mauve, occasional white-flowered plants are known from this locality.

36. *Plectranthus hilliardiae* Codd in *Bothalia* 11: 282 (1974). Type: Natal, near Umtamvuna River, *Hilliard & Burt 6767* (PRE!, holo.; NU).

Erect perennial herb 30–40 cm tall, aromatic; stems semi-succulent, 4-angled, sparingly branched, shortly antrorse pilose and gland-dotted with occasional long multicellular hairs and tufts of long stiff multicellular purple-tinted hairs at the nodes. *Leaves*: petiole 1,5–3,5 cm long, densely appressed glandular pilose similar to the stems; blade broadly elliptical to obovate-elliptical, 5,5–9 cm long, 4–6 cm broad, semi-fleshy when fresh, drying membranous, dark green and sparingly strigose above, under surface paler, reticulate-veined, sparingly strigose on the

nerves and freely dotted with small transparent sessile glands; apex acute to obtuse; base cuneate, attenuate into the petiole; margin ciliate, shallowly crenate–dentate above the middle. *Inflorescence* erect, 8–15 cm



FIG. 38.—*Plectranthus saccatus* var. *longitubus*, Ubombo District, northern Natal (*Vahrmeijer & Hardy 1699*), ×1.

long, simple or with a pair of branches near the base; rhachis glandular-tomentulose with multicellular and short gland-tipped hairs; bracts linear-lanceolate, acuminate, 3 mm long, persisting to the fruiting stage, with gland dots and long multicellular hairs. *Flowers* in sessile, usually 3-flowered cymes forming ±6-flowered verticillasters, verticillasters 1,5–2,5 cm apart; pedicels 4–5 mm long, finely glandular-hispidulous. *Calyx* 4–5 mm long at flowering stage, enlarging in fruit, glandular-hispidulous near the base, subglabrous above; upper lip ovate, erect, not decurrent on the tube, 2,5 mm long; lower lip 4-toothed, the lower pair longer than the median; teeth linear- to deltoid-subulate. *Corolla* pale bluish, purple-flecked on the lobes, minutely glandular-puberulous; tube 2,3–2,7 cm long, slight deflexed and expanding abruptly near the calyx to 4 mm wide and parallel-sided or narrowing to 3 mm wide at the throat; upper lip erect, 5–6 mm long and equally broad, bilobed at the apex and with two lateral ear-like lobes; lower lip shallowly boat-shaped, 4 mm long, horizontal or deflexed. *Stamens* free, the lower pair the longer, up to 8 mm long, horizontal to



FIG. 39.—*Plectranthus hilliardiae*, Umtamvuna River, Natal (Hilliard & Burt 6767, PRE, holotype),  $\times \frac{1}{2}$ .

recurved. *Style* horizontal to ascending, exerted by 8–10 mm. Fig. 39.

A softly semi-succulent herb which grows among rocks near and in the margins of scrub forest, known only from a restricted area on each side of the Umtamvuna River in southern Natal and Pondoland. The flowering time is February–March.

NATAL.—3130 (Port Edward): Umtamvuna River (–AA), Hilliard & Burt 6767; heights overlooking Umtamvuna River (–AA), Nicholson s.n.

CAPE.—3130 (Port Edward): Pondoland, Impahlane River, Thode 3187 (STE).

The species is named in honour of Dr. Olive M. Hilliard of Natal University, who, together with Mr B. L. Burt of the Royal Botanic Gardens, Edinburgh, has made such valuable contributions to our knowledge of the South African flora.

Its nearest affinity is *P. ambiguus* which it resembles in the long corolla tube. However, unlike *P. ambiguus*, the corolla tube of *P. hilliardiae* expands at the base to 4 mm deep and remains this width (or narrows slightly to 3 mm) at the throat. The tube is also slightly deflexed at the base, while the colour is a pale blue. The leaves of *P. hilliardiae* tend to be more softly succulent in texture and more elliptical in shape with a distinctly cuneate base than in *P. ambiguus*.

37. *Plectranthus ambiguus* (Bol.) Codd in *Bothalia* 8:159 (1964); Batten & Bokelmann, *Wild Flow. E. Cape* 125 (1966); Ross, *Fl. Natal* 305 (1972). Type: near Grahamstown, MacOwan (BOL!, holo.; SAM!).

*P. coloratus* E. Mey. ex Benth. in E. Mey., *Comm.* 228 (1837); Cooke in *Fl. Cap.* 5, 1: 279 (1910), partly, excl. *Gerrard* 1671; *Wood* 3036; 3977; *Gueinzus* s.n.; non Don (1825). Syntypes: between Umgazana and Umzimvubu Rivers, see note below, *Drege a* (BM!, K!, MO!; Hb. Drege, P!; S!); between Umzimvubu and Umkomaas Rivers, *Drege b* (Hb. Drege, P!). *P. dregei* Codd in *Flow. Pl. Afr.* 32: t. 1244 (1957). Syntypes: as for *P. coloratus* E. Mey. ex Benth.

Erect to decumbent herb or soft shrublet 40–120 cm tall, branching from near the base; branches ascending to spreading, softly woody below, semi-succulent above, 4-angled, shortly and densely to sparingly strigose-pubescent, with short antrorse multicellular hairs and gland-dots and tufts of long multicellular hairs at the nodes. *Leaves* very variable in size, texture and pubescence; petiole 1–7 cm long antrorse pubescent; blade ovate to broadly ovate, 2.5–12 cm long, 2–9 cm broad, thin to thickish and slightly rugose in texture, thinly pubescent to subglabrous above, more dense especially on the nerves below with longish multicellular hairs and numerous sessile honey-coloured to brown simple gland-dots; apex obtuse to acute; base abruptly cuneate to somewhat decurrent on the petiole; margin shallowly crenate with 6–12 pairs of teeth. *Inflorescence* a congested terminal panicle, rarely simple, 4–17 cm long, usually with 1–3 pairs of branches near the base; rhachis densely to sparingly antrorse glandular-pubescent; bracts obovate, 2–5.5 mm long, persisting to beyond the fruiting stage. *Flowers* in sessile 3-flowered cymes (often fewer on the branches of the inflorescence) forming usually 6-flowered verticillasters; verticillasters 2–6 mm apart; pedicels 3–5 mm long, glandular-tomentulose. *Calyx* 4 mm long at flowering enlarging to 8 mm long in fruit, usually suffused with purple, glandular-hispidulous (less so with age); upper lip erect, ovate to ovate-oblong, acute, up to 3 mm long; lower lip 4-toothed, up to 5 mm long, the lower pair the longer, linear-subulate, 2 mm long, the lateral deltoid-subulate, 1–1.5 mm long. *Corolla* violet to purple; tube long and straight, 2–2.5 cm long, not expanded and 1 mm deep at the base, almost parallel sided, expanding to 2 mm deep at the throat; upper lip erect, 4–5 mm long, 4 mm broad, broadly bilobed at the apex and with 2 obscure lateral ear-like lobes; lower lip shallowly boat-shaped, 3–5 mm long, horizontal to deflexed. *Stamens* free at the base didynamous, horizontal or recurved in the lower lip, upper pair 4–5 mm long, lower pair 6–7 mm long. *Style* finally exerted by 6–7 mm. Fig. 40.

Found in forest margins and on shady, rocky hillsides from the Albany and Bathurst Districts of the Cape along the eastern Cape, usually not far from the coast, to the Ngoye Forest in Natal.

NATAL.—2831 (Nkandla): near Eshowe (–CD), *Wylie sub NH 7993* (NH); Ngoye Forest (–DC), *Garland s.n.*, *Cooper* 117, 2930 (Pietermaritzburg); Inanda (–CB), *Medley Wood* 480 (K, NH); Durban (–DD), *Franks sub Wood 11809*; Isipingo (–DD), *Ward* 820; 4903, 3030 (Port Shepstone); without exact locality, *Dimock-Brown* 436; Dumisa (–AD), *Rudatis* 314; 16 km W. of Umzinto (–BC), *Codd* 8574; Oribi Gorge (–CA), *Codd* 9351; *Nicholson* 1041; 1048; Mehlomyama (–CB), *Acocks* 13311; Shelley Beach (–CD), *Strey* 8437; Uvongo (–CD), *Liebenberg* 8082; *Nicholson* 1021; Izotsha Falls (–CD), *Strey* 7430; 8086.

CAPE.—(or Natal) between Umzimvubu and Umkomaas Rivers, *Drege b* (P), 3129 (Port St. Johns); 16 km W of Port St. Johns (–CB), *Codd* 9296; between Umgazana and Umzimvubu Rivers (–DA), *Drege a* (BM, K, MO, P, S), 3227 (Stutterheim); Keiskammahoeck (–CA), *Sidey* 617; *Killick* 893; Amatola Mts. (–CA), *Erens* 2229. Pirie Forest (–CD), *Sim s.n.*; *Galpin* 3280; King William's Town (–CD), *Barber s.n.* (K); *Sim* 19590; Kei



FIG. 40.—*Plectranthus ambiguus*, Umzinto, Natal (Codd 8574),  $\times 1$ .

Road (-DA), *Ranger* 238; near Komga (-DB), *Flanagan* 738, 3228 (Butterworth); near Kentani (-AD), *Pegler* 907, 3326 (Grahamstown); near Grahamstown (-BC), *MacOwan* 987 (BOL, SAM); Kowie (-DB), *Britten* 1418, 3327 (Peddie); near Peddie (-AA), *Sim s.n.*; Fort Grey (-BB), *Galpin* 7826.

*P. ambiguus* is characterized by the long straight cylindrical corolla tube which is not saccate near the base. On the other hand, the leaves show a good deal of variation in size, texture and amount of pubescence, tending to be smaller and less pubescent towards the southern part of the distribution range.

The only other species with a straight, non-saccate corolla tube is *P. ecklonii*, a more robust species in which the corolla tube is slightly shorter (1,2-1,5 cm long) and widens noticeably towards the mouth. The corolla also tends to be a paler blue in colour.

Its nearest relative is the recently described *P. hilliardiae*, in which the corolla tube, although parallel-sided, expands at the base and is somewhat deflexed.

The name *P. coloratus* E. Mey. ex Benth. cannot be used because of the earlier *P. coloratus* Don (1825). It is based on two *Drege* specimens *a* and *b*. The locality of specimen *a* given in *Drege*, *Zwei Pfl. Doc.* 150 (1843), viz. "V, b, 50: zwischen Omtata und Omsamwubo", is not quite the same as the more restricted locality "inter Omgaziana et Omsamwubo" given by Bentham in E. Mey., *Comm.* 228 (1837).

The type of *P. ambiguus*, *MacOwan* 987, although rather immature, is recognizable as being the same species as *P. coloratus* E. Mey. ex Benth. The new name given for the latter, *P. dregei* Codd was, therefore, not necessary.

Chromosome number  $2n = 28$  (De Wet, 1958, as "*P. coloratus*").

38. *Plectranthus ecklonii* Benth. in DC., *Prodr.* 12: 64 (1848); Cooke in *Fl. Cap.* 5,1: 279 (1910); Batten & Bokelmann, *Wild Flow. E. Cape* 126, t. 101 (1966); Ross, *Fl. Natal* 305 (1972). Type: Cape, slopes of Katberg, *Ecklon* s.n. (K!, holo.).

*P. fruticosus* sensu Marloth, *Fl. S. Afr.* 3, 2: t. 46 (1932).

Erect soft shrub 70 cm–2.5 m tall, freely branched, aromatic; branches ascending, woody below, semi-succulent above, 4-angled, sparingly strigose-pubescent with short antrorse multicellular hairs and often with tufts of longer hairs at the nodes, glabrescent with age. *Leaves*: petioles 2–5 cm long with short multicellular hairs; blade ovate to oblong-elliptic, 6–17 cm long, 4–10 cm broad, firm-textured, often slightly rugose, thinly pubescent to subglabrous above, more dense especially on the nerves below with appressed multicellular hairs and numerous sessile reddish-brown gland-dots, rarely gland-dots apparently absent; apex acute; base cuneate to rarely obtuse; margin conspicuously crenate-dentate with 16–25 pairs of teeth, ciliate. *Inflorescence* a terminal panicle 12–25 cm long with usually 2–4 pairs of branches near the base; rhachis fairly densely to sparingly provided with multicellular hairs, often denser at the verticillasters; bracts ovate to obovate, 4–8 mm long, ciliate, otherwise subglabrous, usually persisting to the fruiting stage though sometimes shed earlier. *Flowers* in sessile usually 3-flowered cymes producing usually 6-flowered (sometimes fewer) verticillasters; verticillasters 5–15 mm apart; pedicels 5–7 mm long sparingly pubescent or puberulous to subglabrous. *Calyx* 5 mm long at flowering enlarging to 10–11 mm long in fruit, often suffused with purple, glandular-puberulous towards the base with scattered reddish gland-dots; upper lip erect, ovate, obtuse, 3 mm long; lower lip 4-toothed, up to 5 mm long, the lower pair the longer, linear-subulate, 3 mm long, the lateral deltoid-subulate, 2 mm long. *Corolla* pale blue or mauve to bluish-purple (rarely white), puberulous with red gland-dots; tube long and straight 1.2–1.5 cm long, not expanded and 1 mm deep at the base, expanding gradually to 3 mm deep at the throat; upper lip erect, 5–6 mm long, 4–5 mm broad, broadly bilobed at the apex and with 2 obscure lateral ear-like lobes; lower lip shallowly boat-shaped, 4–5 mm long, horizontal to deflexed. *Stamens* free at the base, horizontal to recurved in the lower lip, upper pair 6–8 mm long, the lower 12–16 mm long. *Style* finally exerted by 12–16 mm. Fig. 41.

Locally common understorey soft shrub at forest margins, in scrub forest or wooded stream banks, from Somerset East and Albany Districts in the Cape, mainly in the coastal or midland areas, to near Ingwavuma in Natal and to Barberton in the Transvaal.

TRANSVAAL.—2531 (Komatipoort): on road to Shiya-lo-Ngubo Dam (–CC), *Nel* 367.

NATAL.—Without locality: *Gerrard* 1671 (K); cultivated, Durban Botanic Garden, *Medley Wood* 5736, 2732 (Ubombo); Gwalaweni Forest (–AC), *Vahrmeijer & Driifhout* 1916; Mkuze Pass (–AC), *Vahrmeijer* 1412, 2831 (Nkandla); Nkandla Forest (–CA), *Codd* 6973; Entumeni (–CD), *Medley Wood* 3977 (K); Eshowe (–CD), *Lawn* 188 (NH); Ngoye Forest (–CD), *Wells & Edwards* 6; Hlinza Forest (–CD), *Moll* 4993, 2832 (Mtubatuba); Hluhluwe Game Reserve (–AA), *Ward* 2177, 2930 (Pietermaritzburg); 8 km N.W. of York, *Codd* 8578; near Durban (–DD), *Gueinzus* s.n. (K); Pinetown (–DD), *Wells* 1860, 3029 (Kokstad); Weza, Ingeli Forest (–DA), *Strey* 10898, 3030 (Port Shepstone); Oribi Gorge (–CA), *McClellan* 45; *Nicholson* 1059; near St. Michaels-on-Sea, *Nicholson* 1035, 3130 (Port Edward); Umtamvuna River (–AA), *Nicholson* 744.

CAPE.—3029 (Kokstad): near Tabankulu (–DC), *Strey* 4206, 3128 (Umtata); Baziya (–CB), *Baur* 187 (K), 3225 (Somerset East); Boschberg (–DA), *Burchell* 3139 (K); Somerset East, *Bowker* s.n. (K), 3226 (Fort Beaufort); Slopes of Katberg (–DA), *Ecklon* s.n. (K); near Alice (–DD), *Henrici* 3882, 3227 (Stutterheim); Amatola Mts. (–CA), *Erens* 2227; Pirie Forest (–CD), *Sim* 204; Donta Pass (–DA?), *Acocks* 9742; near Komga (–DB), *Flanagan* 737, 3228 (Butterworth); Colly-Wobbles (–AB), *Van Breda* 877; near Kentani (–AD), *Pegler* 376; *Codd* 9246; 9247; The Haven (–BB), *Theron* 1461, 3323 (Willowmore); Stones Hill, *Schonland* 3141, 3326 (Grahamstown); near Grahamstown (–BC), *MacOwan* 500.

*P. ecklonii* is one of the most robust of the South African species forming a soft shrub up to 2 m or more tall.

Its closest relative is *P. ambiguus* but it is readily distinguished by the shorter corolla tube, paler in colour, which widens towards the throat, the larger and laxer inflorescence, and the conspicuous reddish-brown gland-dots on the undersides of the leaves.

Chromosome number  $2n = 28$  (De Wet, 1958).

The specimen *Ecklon* s.n. ex Herb. Benth. in Kew may be regarded as the holotype.

39. *Plectranthus petiolaris* E. Mey. ex Benth. in E. Mey., *Comm.* 228 (1837); in DC., *Prodr.* 12: 66 (1848); Cooke in *Fl. Cap.* 5,1: 272 (1910). Type: Cape, between "Omtata et Omsamwubo", *Drege* (K!, numbered 4773b, lecto.).

*P. kuntzei* Guerke in Kuntze, *Rev. Gen.* 3, 2: 260 (1898); Cooke, l.c. 277 (1910). Type: Natal, Clairmont, *Kuntze* s.n. (K!).

Straggly branching herb up to 1 m tall; branches ascending to spreading, semi-succulent, 4-angled, pubescence a fairly dense mixture of short gland-tipped hairs, long retrorse multicellular hairs and thick broad-based hairs with tufts of longer hairs at the nodes. *Leaves* very variable in size; petiole 2–15 cm long, glandular retrorse pubescent as for the stems; blade broadly ovate-deltoid, 4–14 cm long, 3.5–11 cm broad, thin-textured, thinly and shortly strigose above, denser especially on the nerves below and with minute sessile colourless gland-dots; apex obtuse to acute; base truncate to subcordate; margin coarsely crenate-dentate with 6–12 pairs of teeth, the large teeth often again minutely toothed. *Inflorescence* slender, terminal, 10–25 cm long, simple or with 1–2 pairs of branches near the base; rhachis glandular-puberulous, sometimes with intermixed multicellular hairs; bracts broadly ovate to sub-round, ciliate, 2–3 mm long, persisting to fruiting stage. *Flowers* in sessile 1–3-flowered cymes forming 2–6-flowered verticillasters; verticillasters 1–3 cm apart; pedicels 4–7 mm long, glandular-puberulous. *Calyx* 2 mm long at flowering, enlarging to 8 mm



FIG. 41.—*Plectranthus ecklonii*, Tabankulu, eastern Cape Province (Story 4206),  $\times 1$ .

long in fruit, glandular-puberulous especially towards the base; upper lip ovate, suberect, obtuse, up to 3 mm long, decurrent on the tube; lower lip -toothed, up to 4 mm long, the lower pair slightly the longer, lanceolate-subulate, 2 mm long, the lateral deltoid, 1,5 mm long. *Corolla* deep violet-purple, often with bluish lips; tube not expanded at the base, 0,75 mm deep and ascending for 3 mm then deflexed and

starting to expand for 4-5 mm, reaching 3 mm deep at the throat; upper lip erect, 6-8 mm long, 4 mm broad, deeply notched at the apex and with 2 obscure lateral ear-like lobes; lower lip shallowly boat-shaped, 7-9 mm long, horizontal. *Stamens* free at the base, curved within the lower lip, subequal, 4-5 mm long. *Style* scarcely exceeding the stamens, usually remaining within the lower corolla lip. Fig. 42.



FIG. 42.—*Plectranthus petiolaris*, Port St. Johns (Codd 9295),  $\times 1$ .

Found on shady damp forest floors and rocky hillsides from the Port St. Johns area, usually not far from the coast, to Ngoye and the forests of the Makatini flats in northern Natal.

NATAL.—2732 (Ubombo): near Mbazwane (–BC), *De Winter & Vahrmeijer* 8543; Sordwana Bay, *Vahrmeijer & Tölken* 319. 2831 (Nkandla): Ngoye Forest (–DC), *Wells & Edwards* 86. 2832 (Mtubatuba): Baheni Stream (–AB?), *Ward* 3049; Dukuduku (–AC), *Strey* 5594. 2930 (Pietermaritzburg): Camperdown, (–DA), *Franks sub NH* 12832 (NH); Inanda, Groenberg (–DB), *Johnson* 1313; Ismont (–DC), *Strey* 8400 (NH); Port Natal, *Drege c* (P); Clairmont (–DD), *Kuntze s.n.* (K); Berea, Durban (–DD), *Medley Wood* 3390; 5754 (K, NH); Burman Bush, Durban (–DD), *Huntley* 112 (NH). 3030 (Port Shepstone): Ifafa (–BC), *Rudatis* 339; Oribi Gorge (–CA), *Codd* 9349; *Nicholson* 1047; 1054; Wichman's farm (–CD), *Strey* 8317.

CAPE.—3029 (Kokstad): Mntentu Bridge (–CD), *Strey* 10649 (NH). 3129 (Port St. Johns): between Umtata and Umzimvubu Rivers (–CB?), *Drege b* (MO, P, S); 4773 *b* (K); 16 km W. of Port St. Johns (–CB), *Codd* 9295.

There are only two South African *Plectranthus* species which have the characteristic corolla shape resembling a miniature "Dutchman's pipe", namely *P. petiolaris* and *P. laxiflorus* (see below), but the two are easily distinguished. In *P. laxiflorus* the leaves are finely and regularly crenate in contrast to the coarsely and irregularly dentate leaves of *P. petiolaris*, while the corolla of *P. laxiflorus* is white with faint mauve stripes on the upper lip as against the violet purple corolla of *P. petiolaris*. One of the most

useful distinguishing characters is that in *P. laxiflorus* the cymes are nearly always shortly pedunculate while in *P. petiolaris* they are sessile.

Three Drege gatherings are cited with the original description: (a) "prope Sparrbosch"; (b) "inter Omtata et Omsamwubo" and (c) "Port Natal". Specimens of Drege (b) have been seen in several herbaria (K, MO, P, S) and the one in Kew, numbered 4773 b, is selected as the lectotype. A specimen of Drege (c) has been seen in the Drege Herbarium in Paris, but no specimen of Drege (a) has been encountered. Judging from the locality, which is near Swellendam, it is most unlikely that the specimen is *P. petiolaris*. The only species known to occur in this area is *P. fruticosus*. It seems probable that the specimens sent to Bentham, no doubt annotated with E. Mey. manuscript names, were returned to E. Meyer and their subsequent fate has been the subject of speculation.

40. *Plectranthus laxiflorus* Benth. in E. Mey., Comm. 228 (1837); Drege, Zwei Doc. 145, 149, 157 (1843); Benth. in DC., Prodr. 12: 63 (1848); Cooke in Fl. Cap. 5, 1: 276 (1910); Hulme, Wild Flow. Natal t. 26, f.2 (1954); Compton, Fl. Swaz. 67, 157 (1966); Van der Schijff, Check List Kruger Nat. Park 82 (1969); Ross, Fl. Natal 305 (1972). Type: between Umzimkulu and Umkomaas Rivers, Drege (ex Herb. Benth. numbered 3586, K!, lecto.).

*P. hylophilus* sensu Cooke in Fl. Cap. 5, 1: 277 (1910).

*Germanea laxiflora* (Benth) Hiern, Cat. Afr. Pl. Welw. 1, 4: 861 (1900)

Erect to spreading aromatic herb, freely branched, 70–150 cm. tall; branches ascending to spreading, often rooting at the nodes, herbaceous, 4-angled, sparingly to densely tomentose especially towards the nodes with long retrorse white multicellular hairs, often with short gland-tipped hairs intermingled. *Leaves*: petiole 2.5–8 cm long, tomentose; blade broadly ovate-deltoid, 6–10 cm long, 4–6 cm broad, thin-textured to somewhat rugose, thinly appressed tomentulose above, denser especially on the raised nerves below, usually with reddish gland-dots (sometime absent); apex acute to acuminate; base cordate; margin regularly crenate-dentate with 14–20 pairs of teeth. *Inflorescence* simple or laxly branched 12–35 cm long with 1–3 pairs of branches near the base; rhachis glandular-tomentose with long spreading multicellular hairs and short gland-tipped hairs; bracts ovate to ovate-lanceolate 4–6 mm long, persisting beyond the fruiting stage. *Flowers* in usually 3-flowered pedunculate (rarely subsessile) cymes forming usually 6-flowered verticillasters; verticillasters 1.5–2.5 cm apart; peduncles about 5 mm long; pedicels 4–6 mm long, glandular-tomentulose. *Calyx* 2.5 mm long at flowering enlarging to 7 mm long in fruit, glandular-tomentulose especially towards the base and with scattered red gland-dots; upper lip scarcely larger than the other teeth, suberect, ovate-lanceolate, 2.5 mm long; lower lip 4-toothed, up to 3.5 mm long the lower pair slightly the longer, ovate-subulate, 2 mm long, the lateral deltoid, 1.5 mm long. *Corolla* whitish to pale mauve with 4–5 dark vertical lines on the upper lip, shortly pubescent and gland-dotted; tube not expanded at the base, 0.75 mm deep and ascending for 2.5 mm then curved downwards and starting to expand for 4–5 mm, reaching 2.5 mm deep at the throat; upper lip erect, oblong, 6–7 mm long, 4 mm broad, emarginate at the apex and with 2 obscure lateral ear-like lobes; lower lip boat-shaped, somewhat ascending. *Stamens* free to the base, curved within the lower lip, subequal, about 5 mm long.

*Style* slightly exceeding the stamens, usually remaining within the lower corolla lip. Fig. 43.

In forest margins and on shady stream banks, often locally common forming a dense growth, from about Humansdorp along the eastern Cape to Natal, Swaziland and eastern and northern Transvaal, extending into tropical Africa.

TRANSVAAL.—2229 (Waterpoort): Wylliespoort (–DD), *Hafström & Accocks* 1334, 2230 (Messina): Entabeni (–CC), *Obermeyer* 1192, 2329 (Pietersburg): Hanglip (–BB), *Meeuse* 10162, Louis Trichardt (–BB), *Breyer* sub TRV 22110; *Young* sub TRV 27246; Woodbush (–DD), *Van Warmelo* 218; Houtboschberg (–DD), *Schlechter* 4762, 2330 (Tzaneen): Tshakoma (–AB), *Obermeyer* 970; Westfalia Estate (–CA), *Scheepers* 170; *Bos* 1356; Duiwelskloof (–CA), *Galpin* 10109; 10110; Modjadje's Reserve (–CB), *Krige* 49; Woodbush (–CC), *Wager* sub TRV 23067; Magoebaskloof (–CC), *Mogg* s.n.; *Bruce* 193; New Agatha (–CC), *MacCallum* 137; *Letty* 370; *Müller & Scheepers* 27, 2430 (Pilgrim's Rest): The Downs (–AA), *Crundall* s.n.; Wolkberg near Malopetsi, *Meeuse* 9914; Shiluvane (–AB), *Junod* 777; Mariepskop (–DB), *Fitzsimons & Van Dam* sub TRV 22672; *Van Son* sub TRV 31565; *Codd* 7865; *Verdoorn* 2452; *Van der Schijff* 4448; De Hoek (–DD), *Taylor* 649; near Graskop (–DD), *Strey* 3727, 2530 (Lydenburg): between Lydenburg and Dullstroom (–AB or –AC), *Pole Evans* 4292; Lunsklip Falls (–AD), *Codd* 10014; Sabie (–BB), *Rogers* sub TRV 20558, 2531 (Komatipoort): Barberton (–CC), *Thorncroft* 3259; *Codd* 8185.

SWAZILAND.—2531 (Komatipoort); near Havelock Mine (–CC), *Codd* 7829; Piggs Peak (–CC), *Compton* 30041, 2631 (Mbabane): Forbes Reef area (–AA), *Compton* 32333; Mbabane (–AC), *Compton* 25056; 25589; Mankaiana (–CA), *Compton* 27706; Hlatikulu (–CD), *Stewart* 91 (K).

NATAL.—Without locality: *Gerrard* 2844 (K); *Sanderson* 392 (K); *Medley Wood* 4237 (K), 2730 (Vryheid): Dumuka Mt. (?), *Gerstner* 4581; 4650, 2731 (Louwsburg): 11 km W. of Ngome, *Codd* 9567; Ngome Forest, *Gerstner* 4523, 2830 (Dundee): Krantzokop-Middeldrift (–DD), *Dyer* 4354; *Edwards* 2099; 2100, 2831 (Nkandla): Babanango (–AC), *King* 342; Ntonjaneni (–AD), *Andrews* 7; Nkandla Forest (–CA), *Codd* 1388; 6964; *Lawn* 500 (NH); Melmoth (–CB), *Mogg* 6164; Eshowe (–CD), *Lawn* 154 (NH); Ngoye Forest (–DC), *Venter* 2283, 2929 (Underberg): 11 km W. of Nottingham Road (–BD), *Codd* 8521; near Lundy's Hill (–DB?) *Marais* 825; Deepdale (–DB), *Strey* 4816; 13 km from Donnybrook to Mondli (–DD), *Mauve* 4856, 2930 (Pietermaritzburg): Umvoti (–AB), *Nicholson* 873; Karkloof (–AC), *Moll* 3497; *Huntley* 377; Karkloof Range (–AD), *Ross* 2074; 13 km N.W. of York (–AD), *Codd* 8579; Town Hill (–CB), *Fisher* 336 (NH); Town Bush Valley (–CB), *Fisher* 1028 (NH); *Ross* 998 (NH); Byrne (–CC), *Galpin* 11963; Inanda (–DB), *Medley Wood* 1047 (K, NH); Everton (–DD), *Hilliard* 5021, 2931 (Stanger): near Stanger (–AD), *Pentz & Acocks* 10427; Amatikulu River (–BA), *Strey* 4204.

CAPE.—3029 (Kokstad): Insizwa (–CC), *Strey* 10781; Tonti Forest (–CD) *Forest Officer* 576, 3129 (Port St. Johns): Port St. Johns (–DA), *Galpin* 2844; *Theron* 1586, 3226 (Fort Beaufort): Katberg (–DA), *Ecklon & Zeyher* 91 (S); *Shaw* s.n. (K); on path to Big Tree (–DB), *Jacot-Guillarmod* 5601, 3227 (Stutterheim): Hogsback (–CA), *Johnson* 1282; Amatola Mts. (–CA), *Erens* 2228; Cata Forest Reserve (–CA), *Story* 3266, Keiskamahoe Forest (–CA), *Wells* 3152; Pirie Forest (–CD), *Sim* 19581; 19584; *B. H. Dodd* sub *Galpin* 8023; near Komga (–DB), *Flanagan* 104, 3228 (Butterworth): near Kentani (–AD), *Pegler* 161; between Quku and Kei Rivers, *Drege a* (G, MO, P), 3326 (Grahamstown): near Grahamstown (–BC), *Zeyher* 876 (K); *Ecklon & Zeyher* 196 (SAM); *Britten* 931; Howiesons Poort (–BC), *Zeyher* 3544; *Britten* 5249, 3424 (Humansdorp): Witte Elsbos (–AA), *Fourcade* 1217 (K).

The corolla shape of *P. laxiflorus* is similar to that found in *P. petiolaris* and the characteristics on which the two species may be separated are listed under the latter (see p. 433). A useful field character is that *P. laxiflorus* has a sharp citronella-like scent, unlike that of any other South African species.

Chromosome number  $2n = 28$  (De Wet, 1958).

Bentham based his species on an Ecklon specimen (unspecified) and three Drege gatherings: "(a) inter Key et Gekau, (b) inter Omtata et Omgeziana, (c) inter Omsamculo et Omcomas." There is a specimen of *Ecklon* s.n. from near Grahamstown at Kew while in several herbaria specimens of *Drege a* (G, P, MO) and *Drege c* (K, P, S) have been seen. The specimen of *Drege c* ex Herb. Bentham in K





FIG. 43.—*Plectranthus laxiflorus*, Blouberg, northern Transvaal (Codd 9799),  $\times 1$ .

is selected as the lectotype. No material of *Drege b* has been seen.

A superficial examination of tropical African species revealed several that are closely related to *P. laxiflorus* and some of them are likely to be placed in synonymy on closer scrutiny. The species which fall in this relationship are:

*P. johnstonii* Bak. in Fl. Trop. Afr. 5: 411 (1900). Type: Tanzania, Kilimanjaro, *Johnston* 69 (K!).

*P. triflorus* Bak., l.c. 417 (1900). Type: Tanzania, Kilimanjaro, *Thompson* s.n. (K!).

*P. kondowensis* Bak., l.c. 417 (1900). Type: Malawi, between Kondwe and Karonga, *Whyte* s.n. (K!).

*P. urticoides* Bak., l.c. 412 (1900). (= *P. laxiflorus* var. *genuinus* Briq.). Type: Angola, Pungo Andongo, *Welwitsch* 5545 (K!).

*P. hylophilus* Guerke in Bot. Jahrb. 19: 203 (1894). Type: Cameroons, *Preuss* 815 (no material seen).

*P. violaceus* Guerke, l.c. 201 (1894). Type: Tanzania, Lutindi, *Holst* 3317 (K!).

*P. albus* Guerke, l.c. 201 (1894). Type: Tanzania, Kilimanjaro, *Volkens* 744 (no material seen, but specimens so named in K have somewhat smaller flowers than *P. laxiflorus*).

*P. fraternus* T. C. E. Fries in Notizbl. Bot. Gart. Berlin 11: 26 (1930). Syntypes: Kenya, *R. E.* & *T. C. Fries* 604; 643; 884 (K!); 911 (K!); 1208 (K!). Similar to above.

Cooke in Fl. Cap. l.c. 277 (1910) cited *Junod* 777 from Shiluvane, Eastern Transvaal as *P. hylophilus* Guerke. It is, however, *P. laxiflorus*, as is *Thorncroft* 3259 from Barberton, cited by Cooke as *P. rehmannii*.

#### EXCLUDED SPECIES

*Plectranthus bolusii* T. Cooke is a mixture of *Orthosiphon suffrutescens* (Thonn.) J. K. Morton (*Bolus* 11011) and *O. labiatus* N.E. Br. (*Rehmann* 6167 and *Medley Wood* 4488).

*P. succulentus* Dyer & Bruce = *Thorncroftia succulenta* (Dyer & Bruce) Codd.

*P. thorncroftii* S. Moore = *Thorncroftia thorncroftii* (S. Moore) Codd.

## 2. RABDOSIA

**Rabdosia** (Bl.) Hassk. in Flora 25, Beibl. 2:25 (1842); Blake in Contr. Queensl. Herb. 9: 4 (1971); Hara in J. Jap. Bot. 47: 193 (1972). Type species: *Rabdosia javanica* (Bl.) Hassk.

*Elsholtzia* Willd. sect. *Rabdosia* Blume, Bijdr. Fl. Ned. Ind. 825 (1825).

*Plectranthus* sections *Isodon* Schrad. ex Benth., *Pyramidium* Benth. and *Amethystoides* Benth., Lab. 29: 40 (1832); in DC., Prodr. 12: 55–61 (1848), partly;

*Plectranthus* subgen. *Isodon* (Benth.) Briq. in Pflanzenfam. 4, 3a: 352 (1897), partly.

*Isodon* (Benth.) Kudo in Mem. Fac. Sci. & Agr. Taihoku Imp. Univ. 2: 118 (1929); J. Soc. Trop. Agr. Taiwan 2: 145 (1930); Codd in Taxon 17: 239 (1968).

*Amethystanthus* Nakai in Bot. Mag. Tokyo 48: 785 (1934).

*Homalocheilos* J. K. Morton in J. Linn. Soc. (Bot.) 58: 249, 268 (1962); Fl. West. Trop. Afr. ed. 2, 2: 460 (1963).

Perennial herbs or erect or straggling subshrubs; stems woody, not succulent. *Inflorescence* paniculate with flowers arranged in pendunculate dichasia; bracts leaflike at the base becoming progressively smaller towards the apex, persistent. *Calyx* ± equally 5-toothed, the uppermost sometimes slightly smaller than the others, if somewhat 2-lipped then the upper lip 3-toothed and the lower 2-toothed. *Corolla* bilabiate, tube expanded and deflexed near the base; upper and lower lips relatively small. *Stamens* 4, free, attached at the mouth of the corolla tube, didynamous, declinate in the lower lip of the corolla. *Style* lying with the stamens in the lower lip of the corolla.

Species about 100, distributed mainly in Asia and Malesia with a few in Africa. One South African species of rather distant affinity is now included but is placed in a separate subgenus. See also p. 373 for historical notes.

Subgen. **Pyramidium** (Benth.) Codd, stat. et comb. nov.

*Plectranthus* sect. *Pyramidium* Benth., Lab. 44 (1832); in DC., Prodr. 12: 61 (1848); Briq. in Pflanzenfam. 4, 3a: 354 (1897). Type species: *Plectranthus ternifolius* D. Don from India.

Erect shrublets; flowers in dense, pyramidal panicles; ripe calyx erect, somewhat urceolate.

There are two species in the subgenus, *R. ternifolia* (D. Don) Hara and *R. calycina* (Benth.) Codd. Although the two are widely separated geographically, they are remarkably similar in appearance. *R. ternifolia*, which occurs in India, has narrower, more lanceolate-ovate leaves and a more markedly striate calyx with shorter teeth than *R. calycina*, which is restricted to the eastern part of South Africa.

The subgenus is in some respects intermediate between *Rabdosia* and *Plectranthus* but, because of the leaf-like bracts, it is best removed from *Plectranthus*. The alternative, to make it a separate genus, does not appear justified.

**Rabdosia calycina** (Benth.) Codd in Bothalia 11: 117 (1973); in Ross, Fl. Natal 305 (1972), without basionym. Lectotype: Cape, between St. Johns and Umsikaba Rivers, Drege 3584 (K!, lecto.; = Drege b in G!; MO!; P!; S!).

*Plectranthus calycinus* Benth. in E. Mey., Comm. 230 (1837); Drege, Zwei Pfl. Doc. 148, 152 (1843); Benth. in DC., Prodr. 12: 61 (1848); Briq. in Pflanzenfam. 4, 3 a: 352 (1897); Cooke in Fl. Cap. 5, 1: 270 (1910); Compton, Fl. Swaz. 66, 157 (1966); Trauseld, Wild Flow. Drakensberg 160 (1969); Codd in

Mitt. Bot. München 10: 250 (1971).—var. *pachystachyus* (Briq.) T. Cooke, l.c. 271 (1910). *P. pyramidatus* Guerke in Bull. Herb. Boiss. 6: 522 (1898). Type: Transvaal, Houtbosch, Rehmann 6179 (Z!). *P. pachystachyus* Briq. in Bull. Herb. Boiss. ser. 2, 3: 1003 (1903). Type: Natal, Umkomaas, Medley Wood 4621 (K!).

Erect, perennial, aromatic soft shrub or woody herb, 60–150 cm tall; stems 1-several arising annually from a perennial rootstock, woody below, simple or sparingly branched, markedly ribbed below, 4-angled above, glandular-puberulous to densely velvety-tomentose. *Leaves* opposite or ternate, sessile or shortly petiolate, coriaceous; blade ovate lanceolate to broadly ovate, 4–10 cm long, 2–4, 5 cm broad, subglabrous to strigose above, paler, reticulate-veined, subglabrous to densely velvety-tomentose and copiously punctate with minute orange to reddish-brown gland-dots below; apex acute to acuminate; base obtuse to shortly cuneate; margin regularly crenate-dentate with 12 to 22 pairs of teeth. *Inflorescence* a dense, cylindrical to pyramidal, terminal panicle, 10–30 cm long; rhachis sparsely to densely and shortly glandular-tomentose; bracts ovate, persistent, leaf-like at the base, becoming progressively smaller towards the apex. *Flowers* in pendunculate dichasia, densely placed; pedicels up to 4 mm long, glandular-hispidulous. *Calyx* equally 5-toothed, glandular-hispid, villous within, 2 mm long at flowering, enlarging to 7–9 mm long in fruit; mature calyx erect, somewhat urceolate, tube cylindrical, 10-ribbed, teeth lanceolate-deltoid, 2 mm long. *Corolla* 8–11 mm long, white to cream with a mauve margin on the lower lip (described by collectors as mauve, pinkish, white and mauve, or white and pink), densely tomentose and gland-dotted; tube 5–6 mm long, expanding abruptly and saccate dorsally at the base, sharply deflexed, laterally compressed, 4 mm deep at the base, narrowing to 3 mm at the throat; upper lip erect, 2 mm long and equally broad, notched at the apex and with a pair of lateral ear-like lobes; lower lip usually curved upwards, shallowly boat-shaped, up to 5 mm long. *Stamens* didynamous, 2, 5–3 mm and 3, 5–4, 5 mm long, curved and enclosed within the lower corolla lip. *Style* enclosed in the lower lip. Fig. 44.

Found usually among rocks in dense grassland and at forest margins, from the Amatola Mountains in the eastern Cape Province, throughout Natal, especially in the midlands and Drakensberg area, the mountains of Swaziland and eastern Transvaal, reaching its northern limit on the Soutpansberg and Blouberg.

TRANSVAAL.—2229 (Waterport): Farm Buckworth (–DC), Meeuse 10243; north of Louis Trichardt (–DD), Breyer sub TRV 22103; Rodin 4041; Meeuse 10164, 2230 (Messina): Entabeni Forest Station (–CC), Obermeyer 1235, 2329 (Pietersburg); Blouberg (–AA), Leeman 118; Codd 8759; Van der Schijff 5416; Strey & Schlieben 8517; Houtbosch (–DD), Rehmann 6179 (Z); Bolus 10982; Codd 9428; Meeuse 9813; near Huenerstburg (–DD), Codd 9433; Magoebaskloof (–DD), Codd & Muller 358; Burger 126; Iron Crown Mt. (–DD), Meeuse 9853, 2330 (Tzaneen); Duiwelskloof (–CA), Galpin 10113; Scheepers 657; New Agatha (–CC), McCallum s.n.; Muller & Scheepers 22, 2430 (Pilgrims Rest); The Downs (–AA), Crundall s.n.; near The Downs (–AC), Vahrmeijer 2366; Mariepskop (–DB), Van der Schijff 5100; Peach Hill (–DC), Galpin 14364; Ohrigstad Dam Nature Reserve (–DC), Jacobsen 2345; Graskop (–DD), Galpin 14357; 14414, 2530 (Lydenburg); Steenkampberg (–AA), Hardy 904; Dullstroom (–AC), Galpin 12471; Werdermann & Oberheck 2049; Mt. Anderson (–BA), Meeuse 10070; Strey 3544; Long Tom Pass (–BA), Leistner & Mauve 3215; farm Zwagershoek (–BA), Obermeyer sub TRV 28033; between Bellast and Dullstroom (–CA), Pole Evans 3991; Belfast (–CA), Pole Evans H 11564; Hutchinson 2742; Machadodorp (–CB), Young sub TRV 26639; Nelsberg (–DD), Taylor 1879, 2531 (Komatiport); Krokodilpoort (–AD), Nel 233; near Barberton (–CC), Galpin 820; Liebenberg 2431; Lomati Valley (–CC), Thornecroft 2051; near



FIG. 44.—*Radosia calycina*, Umzimkulu, eastern Cape Province (Ward 6279),  $\times \frac{1}{2}$ .

Angle Station (—CC), Clarke 40. 2630 (Carolina): Vossmans Beacon (—BA), Bruce 269; near Lochiel (—BB), Repton 894. 2729 (Volksrust): Amersfoort (—BB), Sidey 3510; Volksrust, Hagner sub TRV 10288. 2730 (Vryheid): near Wakkerstroom (—AC), Galpin 10215; Repton 916; Oshoek (—AC), Devenish 461.

O.F.S.—Without locality, Cooper 1016 (K). 2729 (Volksrust): near Mt. Pelaaan (—DC), Muller 916. 2828 (Bethlehem): Witziesshoek, Liebenberg 8127. 2929 (Harrismith): near Van Reenen, Phillips s.n.

SWAZILAND.—2531 (Komatiipoort): Havelock Mine (—CC) Miller 5190. 2631 (Mbabane): Mbabane (—AC), Compton 25023; 25600; 26715; 27873; Usutu Forest (—AC), Compton 27766; Hlatikulu (—CD), Stewart sub TRV 9628.

NATAL.—Without locality: Gerrard s.n. (K); Gerrard & McKen s.n. (K). 2729 (Volksrust): Langsnek (—BD), Rehmann 6961 (K); Majuba (—BD), Rogers sub TRV 3313; near Charlestown (—BD), C. A. Smith 5646; 5665. 2730 (Vryheid): near Utrecht (—CB), Breyer sub TRV 16951. 2828 (Bethlehem): Drakensberg National Park (—DB), Codd & Dyer 2775; Edwards 540; Sidey 1640; Mont-aux-Sources (—DD), Bayer & McClean

29. 2829 (Harrismith): Van Reenen (—AD), Medley Wood 13130; Cathedral Peak Forestry Station (—CC), Killick 1399; Admiraal & Drijfhout 2868; near Ladysmith (—DB), Kuntze s.n. (K); Wilms 2201 (K). 2830 (Dundee): Qudeni Forest (—DB), Gerstner 6795. 2831 (Nkandla): Inhlazatshe (—AA), Gerstner sub NH 22747 (NH); Babanango (—CA), King 276; Sidey 3701; Ulundi (—AD), Evans 485 (NH); Melmoth (—CB), Mogg 4590; Eshowe (—CD), Lawn 461 (NH); Ngoye Forest Reserve (—DC), Venter 2343. 2929 (Underberg): Cathkin Park (—AB), Galpin 11859; Champagne Castle (—AB), Acocks 10091 (NH); Giants Castle Reserve (—AB), Symons 384; Trauseld 574; 729; Nicholson 491 (NH); Tabamhlope Mt. (—BA), West 101; Dalton Bridge (—BB), West 772; Mooi River (—BB), Mogg 7149; Bamboo Mt., McClean 706; Underberg (—CD), McClean 705 (NH); Coleford (—CD), Moll 5151; between Boston and Bulwer (—DB), Dyer 4871; Everglades-Boston road (—DB), Moll 632. Mpendhle (—DB), C. A. Smith 8305B; Marwaga Mt. (—DC), McClean 222; Bulwer (—DD), Allsopp 831; Donnybrook (—DD), Medley Wood 13093. 2930 (Pietermaritzburg): Tweedie (—AC), Mogg 6747; Nottingham Road (—AC), McClean 815 (NH); near Dargle (—AC), Edwards 3078; 3079; Karkloof (—AC), Huntley 374 (NH); Greytown (—BA), Wylie sub NH 21943; Town Bush Valley (—CB), Rump sub NH 20592 (NH); Byrne (—CC), Galpin 12019; Strey 10943; Richmond (—CD), Bayliss 2194; Inanda (—DB), Medley Wood 489 (K). 3030 (Port Shepstone): Ellesmere (—AD), Rudatis 638; near Umkomaas (—BB), Medley Wood 4621; Oribi Flats (—CA), McClean 354; Izotsha Falls (—CB), Strey 7584; Umtamvuna Forest Reserve (—CC), Strey 6969. 3130 (Port Edward): near Port Edward (—AA), Bayliss 552.

CAPE.—3028 (Matatiele): near Mt. Frere (—DD), Lewis 4338 (SAM); Theron 2194. 3029 (Kokstad): Clydesdale (—BD), Tyson 2749; Ibsi Cuttings (—BD), Ward 6729; Mr. Frere-Cedarville road (—CA), Strey 10803; Kokstad (—CB), Pegler 1771; near Mt. Ayliff (—CD), Lewis 4336 (SAM); Harding (—DB), Olivier 121 (NH). 3126 (Queenstown): near Queenstown (—DD), Galpin 8161. 3127 (Lady Frere): Engcobo (DB), Britten 7033. 3128 (Umtata): Baziya (—CB), Baur 97 (K, SAM); near Mqanduli (—DD), Codd 9266. 3129 (Port St. Johns): near Magwa Store (—BC), Strey 8550; near Libode (—CA), Theron 2181; between Morley and Umtata River (—CC), Drege a (G, K, P); between St. Johns and Umsikaba Rivers (—DA?), Drege 3584 (K); b (G, MO, P, S). 3226 (Fort Beaufort): Amatola Mts. (—BD), Dyer 1980; Peffers Kop (—DB), Acocks 9760; Hogsback (—DB), Rattray 14; Johnson 1142; Killick 917; Comins 1459. 3227 (Stutterheim): Stutterheim (—CB), Story 3441; Pirie (—CC), Sim 19583; 19587; 3228 (Butterworth): Kentani (—CB), Pegler 162; Kei Mouth (—CB), Flanagan 1889.

There is a good deal of variation in pubescence with a gradient from south to north. Some Cape specimens are almost glabrous, while in the northern Transvaal many specimens are densely tomentose, especially on the under surfaces of the leaves. An extreme form is represented by Vahrmeijer 2366 from mountains near The Downs, with very densely tomentose leaves, while the rhachis, pedicels and calyx are markedly glandular-villous.

Chromosome number  $2n = 28$  (De Wet, 1958).

A few specimens from high altitudes (over 1 800 m) in the Soutpansberg and Blouberg differ in being freely branched shrubs with leaves densely tomentose below and smaller inflorescences, calyx and corolla. However, the distinctions are not clear cut. The branched habit may be because the plants grow in protected, rocky places which are not easily reached by fire.

### 3. SOLENOSTEMON

*Solenostemon* Schumach. in Schumach. & Thonn., Beskr. Guin. Pl. 271 (1827); Benth. & Hook. f. 2: 1175 (1876); Briq. in Pflanzenfam. 4, 3a: 359 (1897); Bak. in Fl. Trop. Afr. 5: 420 (1900); Hutch. & Dalz., Fl. W. Trop. Afr. 2: 289 (1931); emend. Morton in J. Linn. Soc. (Bot.) 58: 251 (1962); Codd in Mitt. Bot. München 10: 249 (1971); Blake in Contr. Queensl. Herb. 9: 6 (1971). Type: *S. ocymoides* Schumach. & Thonn. from West Tropical Africa.

*Coleus* sect. *Solenostemon* (Schumach.) Benth., Lab. 52 (1832); in DC., Prodr. 12: 72 (1848).

*Coleus* sect. *Solenostemoides* Briq., l.c. 360 (1897).

*Solenostemon* sect. *Coleoidea* J. K. Morton, l.c. 253 (1962) descr. angl.

Annual or perennial, softly woody or subsucculent, erect or straggling herbs or shrubs. Inflorescence paniculate with flowers arranged in dense or lax pedunculate or sessile dichasia; bracts sharply differentiated from the leaves, early deciduous. Calyx bilabiate, the uppermost lobe usually broadly ovate, the lateral teeth short and truncate to deltoid or obsolete, the lowermost lobe ovate to oblong and entire or emarginate, or strap-shaped and forked, formed from the union of the two lowest teeth for

their entire, or greater part of their length. *Corolla* usually violet coloured, tube expanding gradually from the base to the throat, twice curved, the lower lip large and deeply boat-shaped. *Stamens* 4, free or shortly united at the base, attached at the mouth of the corolla tube, didynamous, declinate in the lower lip of the corolla. *Style* lying with the stamens in the lower lip of the corolla.

The genus as amended by Morton is common in tropical Africa and extends to Asia and Malesia, with two species recorded from South Africa. More than 60 names have been published, mainly in *Coleus* (see Codd, l.c., 1971) but, due to the variation in vegetative characteristics, species limits are difficult to determine, and it is likely that the number of species eventually recognized will be considerably less than this.

The historical background is outlined on p. 373. *Solenostemon* Schumach. was placed as a section of *Coleus* by Bentham. To the typical species he added certain species from Madagascar, Asia and Malesia with a somewhat different calyx shape. In typical *Solenostemon* the two lowest calyx teeth are fused into an ovate to oblong, entire or emarginate lip which is bent upwards closing the mouth of the tube when mature, while the lateral teeth are reduced or obsolete. In the species which Bentham added, the lower lip of the calyx is strap-shaped and forked at the apex, while the lateral calyx teeth are short and rounded to deltoid.

Benth. & Hook. f., Gen. Pl. 2: 1175 (1876), reinstated *Solenostemon* Schumach. in its strict sense, while the additional species were retained in *Coleus*. Briquet (1897) also treated *Solenostemon* as a distinct genus and the additional species were placed in *Coleus* sect. *Solenostemoides* Briq.

With the transfer of true *Coleus* (i.e. the solitary species *C. amboinicus* Lour.) to *Plectranthus*, Morton, l.c., included sect. *Solenostemoides* Briq. in the genus *Solenostemon*, but gave it the name sect.

*Coleoidea*, pointing out that it is, in some respects, intermediate between true *Solenostemon* and *Plectranthus*. However, the calyx is easily recognizable and separation from *Plectranthus* appears to be fully justified. Whether sect. *Solenostemoides* should be included in *Solenostemon* is open to question and the alternative would be to make a separate genus of it. In the present treatment it is retained in *Solenostemon* but given subgeneric status.

Subgen. *Solenostemoides* (Briq.) Codd, comb. et stat. nov. Lectotype: *S. latifolius* (Hochst. ex Benth.) J. K. Morton.

*Coleus* sect. *Solenostemoides* Briq. in Pflanzenfam. 4, 3a: 360 (1897).

*Solenostemon* sect. *Coleoidea* J. K. Morton in J. Linn. Soc. (Bot.) 58: 253 (1962).

One of the best known species in this subgenus is the commonly cultivated "Coleus" with variegated and often incised leaves, usually referred to as *Coleus blumei* Benth. This possibly persuaded Keng, when dealing with the Malesian species in Gard. Bull. Singapore 24: 51 (1969), to retain the genus *Coleus* in a broad sense. He also found it necessary to take a broad view of species limits and included *C. blumei* and several others in *C. scutellarioides*. This species is widely cultivated and is frequently grown in South Africa, in gardens in the warmer areas, and as a pot-plant. It is, therefore, included in the key below and is transferred to *Solenostemon*.

A broad view is also taken of the indigenous material which was described as *Plectranthus tysonii* Guerke and *Coleus rehmannii* Briq., both of which are now included in *S. latifolius* (Hochst. ex Benth.) J. K. Morton.

The third species included in the key, *S. rotundifolius* (Poir.) J. K. Morton, is cultivated in native gardens for the edible, potato-like tubers and is not known in the wild state in South Africa.

#### Key to species

- Roots tuberous; flowers in densely glomerate clusters, corolla 5–7 mm long.....1. *S. rotundifolius*  
 Roots fibrous; flowers in dense or lax clusters, corolla 8–15 mm long:  
 Leaves not variegated, occasionally with a dark V-shaped mark near the base of the blade; indigenous  
 2. *S. latifolius*  
 Leaves variegated: cultivated plants.....3. *S. scutellarioides*

1. *Solenostemon rotundifolius* (Poir.) J. K. Morton in J. Linn. Soc. (Bot.) 58: 272 (1962). Type: Mauritius, Commerson (P, holo.).

*Germanea rotundifolia* Poir. in Lam., Encycl. 2: 763 (1812).

*Plectranthus rotundifolius* (Poir.) Spreng., Syst. 2: 690 (1825).

*Coleus dysentericus* Bak. in Kew Bull. 1894: 10 (1894); Fl. Trop. Afr. 5: 437 (1900). Type: Niger region, Barter 846 (K, holo.). *C. rotundifolius* (Poir.) A. Chev. & E. Perrot., Veg. Util. Afr. Trop. Franc. 1: 101, 119 (1905).

Perennial, aromatic, semi-succulent herb; rootstock producing ovoid, potato-like tubers; stems erect to decumbent, 30–60 cm tall, 4-angled, puberulous to shortly pubescent. *Leaves* fairly thick-textured, petiole 2–3 cm long, puberulous; blade ovate, 2.5–5 cm long, 2–3 cm broad, puberulous to strigose, gland-dotted below; apex acute, base cuneate; margin crenate-dentate. *Inflorescence* terminal, slender, simple 6–10 cm long; bracts ovate, acuminate, 2 mm long, deciduous. *Flowers* in compact, sessile dichasia; pedicels 0–1 mm long. *Calyx* 1.5 mm long, enlarging to 3 mm long in fruit, glandular-hispid; upper lip ovate; lateral teeth truncate; lower teeth fused for most of their length

forming an oblong, emarginate lobe. *Corolla* bluish-purple, 5–7 mm long, pubescent, gland-dotted; tube curved in an inverted U; upper lip erect, 1.5 mm long, 4-lobed; lower lip boat-shaped, 2.5 mm long. *Stamens* curved within the lower lip 2–2.5 mm long, shortly united at the base. *Style* slightly exceeding the stamens. Fig. 45.

Cultivated for the potato-like tubers in eastern Transvaal and Zululand; origin uncertain, probably tropical Africa.

TRANSVAAL.—Cult. Skinners Court, Pretoria, Mundy sub Tvl. Dept. Agr. 3457, cult. Division of Botany, Pretoria, Native Affairs Dept. 2330 (Tzaneen); Westfalia Estate (—CA), Scheepers 931, 2531 (Komatipoort); Barberton (—CC), Clarke 65.

NATAL.—Zululand, without precise locality, Curson s.n. 2731 (Louwsburg); Ngome (—CD), cultivated, Gerstner 4454.

There are probably further synonyms among the species listed by Chevalier & Perrottet, l.c., but no attempt has been made to sort these out. Three varieties of *S. rotundifolius* are also maintained by these authors.



FIG. 45.—*Solenostemon rotundifolius*, cultivated in Pretoria.

## 2. *Solenostemon latifolius* (Hochst. ex Benth.)

*J. K. Morton* in *J. Linn. Soc. (Bot.)* 58: 271 (1962); *Ross*, *Fl. Natal* 305 (1972). Syntypes: Ethiopia, *Schimper* 825; 1828 (K).

*Coleus latifolius* Hochst. ex Benth. in DC., *Prodr.* 12: 74 (1848); *A. Rich.*, *Tent. Fl. Abyss.* 2: 184 (1851), *Bak.* in *Fl. Trop. Afr.* 5: 437 (1900). *C. rehmannii* Briq. in *Bull. Herb. Boiss.* ser 2, 3: 1075 (1903); *Cooke* in *Fl. Cap.* 5, 1: 289 (1910). Type: Transvaal, Houtbosch, *Rehmann* 6156 (Z!, holo.).

*Plectranthus tysonii* *Guerke* in *Bot. Jahrb.* 24: 77 (1898); *Cooke*, l.c. 276 (1910). Type: Cape, Griqualand East, *Clydesdale*, *Tyson* 2769 (K!; G!; PRE!).

Perennial aromatic herb 20–70 cm tall; stems slightly succulent, suberect to procumbent, 20–150 cm long, 4-angled, sparingly hispidulous to shortly crisped tomentose. Leaves thin to medium-thick in texture; petiole 1.5–6 (—10) cm long, pubescence similar to the stems; blade broadly ovate-deltoid, 2.5–8 cm long, 2–6, 5 cm broad, sparingly pubescent to densely hispidulous, sometimes with a dark V-shaped mark, and dotted below with minute reddish-brown gland-dots; apex acute, base truncate; margin crenate to crenate-dentate with 6–12 pairs of somewhat rounded teeth. Inflorescence terminal, usually simple, 10–35 cm long; rhachis sparsely to densely hispidulous; bracts broadly ovate, acuminate, 3–5 mm long, early deciduous. Flowers in sessile or rarely pedunculate, usually compact, dichasia, or in reduced few-flowered sessile cymes in depauperate specimens; pedicels 2–5 mm long, hispidulous. Calyx 2 mm long at flowering, enlarging to 7 mm long in fruit, somewhat gibbous ventrally, glandular-hispidulous, often purple tinged; upper lip suberect, ovate, obtuse to rounded, 2 mm long, apex truncate to rounded; lower pair of teeth united, forming a strap-shaped lobe up to 4 mm long, forked at the apex. Corolla 11–14 mm long, blue-violet to purple, usually paler on the upper lip, sparingly pubescent and gland-dotted; tube twice bent, 1 mm deep and bent upwards for 1.5–2 mm then bent or curved downwards and expanding for 2–3 mm, reaching 2–3 mm deep at the throat; upper lip 2 mm long and equally broad, emarginate and with 2 small lateral ear-like lobes; lower lip large, boat-shaped, 7–9 mm long, horizontal. Stamens 7–8 mm long, united at the base for 2 mm or occasionally free to the base. Style exceeding the stamens by about 1 mm, often shortly exerted from the lower lip. Fig. 46.

Found in forests, open woodland and among rocks from East Griqualand to Natal, Swaziland and the mountains of eastern and northern Transvaal, extending to Ethiopia and west tropical Africa.

TRANSVAAL.—2230 (Messina): between Sibasa and Lake Funduzi (—CD), *Story* 4845. 2329 (Pietersburg): Houtbosch (—DD), *Rehmann* 6156 (Z); *Obermeyer sub TRV* 31863. 2330 (Tzaneen): Westfalia Estate (—CA), *Scheepers* 340; 598; *Bos* 1339; Magoebaskloof (—CC), *Codd* 8408; *Letty* 456. 2430 (Pilgrims Rest): Mariepskop (—DB), *Van Son sub TRV* 34759; *Codd* 7915; *Van der Schijff* 5140; God's Window (—DD), *Davidson* 252. Kowyns Pass (—DD), *Rauh & Schlieben* 9727.

SWAZILAND.—2531 (Komatipoort): near Piggs Peak (—CC), *Codd* 7820; 9522; *Clarke* 59. 2631 (Mbabane): near Mbabane (—AC), *Compton* 25030; 25612; 26793; 27680; *Codd* 9517, *Schlieben* 9520.

NATAL.—2831 (Nkandla): Ngoye (—DC), *Wylie sub Wood* 5638 (K). 2930 (Pietermaritzburg): Inchanga (—DA), *Eshuis s.n.* 3030 (Port Shepstone); *Dumisa* (—AD), *Rudatis* 262; *Umkomaas Valley* (—BA?), *Ward* 150; *Mehlomnyama* (—CB), *Codd* 9363.

CAPE.—3029 (Kokstad): *Clydesdale* (—BD), *Tyson* 2769; near *Rode* (—CC), *Acocks* 22111; *Umzimvubu Cutting* (—CC), *Strey* 11147 (NH).

There is a good deal of variation in size, texture and pubescence of leaves, depending mainly on the degree of dryness and exposure of the habitat, from moist, shady, forest conditions to more open valley bushveld. Some specimens from Swaziland (e.g. *Codd* 9517) have long, trailing stems and were at first considered worthy of separate status. The curvature of the corolla tube also varies considerably and could not be used as a criterion for separating the South African material into distinct groups. There is also variation in the degree to which the stamens are united at the base, most specimens having the filaments united for 1–2 mm while, in a few Natal specimens, the filaments are free to the base. This gives some indication of the difficulties which will be experienced when a revision of the tropical African material is undertaken.

Chromosome numbers  $2n=24, 48, 60$  (De Wet, 1958, as "*Coleus tysonii*", Morton, 1962).

## 3. *Solenostemon scutellarioides* (L.) *Codd*, comb. nov. Type: from Asia.

*Ocimum scutellarioides* L., *Sp. Pl.* ed. 2: 834 (1763); *Sims* in *Bot. Mag.* t. 1446 (1812).

*Plectranthus scutellarioides* (L.) R. Br., *Prodr. Fl. Nov. Holl.* 506 (1810). *P. blumei* (Benth.) *Launert* in *Mitt. Bot. München* 7: 301 (1968).



FIG. 46.—*Solenostemon latifolius*, Mariëpskop (Codd 7915),  $\times 1$ .

*Coleus scutellarioides* (L.) Benth. in Wall., Pl. As. Rar. 2: 16 (1830); Lab. 53 (1832); in DC., Prodr. 12: 73 (1848); Hook. f., Fl. Brit. India 4: 626 (1885); Keng in Gard. Bull. Singapore 24: 51 (1969). *C. blumei* Benth., Lab. 56 (1832); Hook. in Bot. Mag. t. 4754 (1853). Type: from Java.

Perennial aromatic herb, erect or procumbent, up to 1 m tall; stems semi-succulent, 4-angled, finely tomentose. Leaves very variable, petiolate; blade membranous, usually large, ovate-deltoid or broadly ovate to ovate-oblong, usually brightly coloured or blotched; margin crenate dentate or variously incised. Inflorescence terminal, simple or with a pair of branches near the base; rachis finely tomentose; bracts ovate, long acuminate, early deciduous. Flowers in sessile, several-flowered dichasia. Calyx about 7 mm long when mature; upper lip erect, ovate, 2 mm long, rounded at the apex; lateral teeth broadly oblong, 2 mm long, rounded to truncate; lower teeth united forming a strap-shaped lobe 4 mm long, forked at the apex. Corolla 8–10 mm long, blue-violet, paler on the upper lip, sparingly pubescent; upper lip short, 1–1.5 mm long; lower lip boat-shaped, 4–5 mm long. Stamens usually united at the base for 1–2 mm.

Originally from eastern Asia and Malesia, the many forms or hybrids with variegated leaves are widely grown in gardens in the tropics and as pot-

plants in cooler areas. Various forms are cultivated in South Africa.

TRANSVAAL.—Cultivated in Pretoria, Codd 9835.

This is the well known "Coleus" of gardens and this may have influenced Keng, l.c., to uphold the genus *Coleus* in the broad, Benthamian sense for the Malesian species. Keng places *C. blumei* as a synonym of *C. scutellarioides* and upholds four varieties which are, however, of doubtful value. Probably more synonyms will be added when the group comes to be revised as a whole.

Chromosome number  $2n=48$  (Morton, 1962).

Another species which has been grown in South Africa is the species described as *Coleus shirensis* Guerke from East Tropical Africa. It is a more robust plant than *C. latifolius* with larger leaves, more floriferous inflorescence and more villous rachis and pedicels. The transfer to *Solenostemon*, with *S. zambesiacus* Bak. as a synonym, is effected below.

*Solenostemon shirensis* (Guerke) Codd, comb. nov. Syntypes: Nyasaland, Buchanan 376 (K!); 602b; Mt. Mlanje, Whyte s.n. (K!).

*Coleus shirensis* Guerke in Bot. Jahrb. 19: 216 (1894); N.E. Br. in Bot. Mag. t. 8024 (1905).

*Solenostemon zambesiacus* Bak. in Fl. Trop. Afr. 5: 421 (1900). Syntypes: Nyasaland, Blantyre, Last s.n.; between Shibisa and Tshinmuzo, Kirk s.n. (K!).

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## INDEX

- Amethystanthus* Nakai ..... 373, 436  
*Ascocarydion* G. Tayl. .... 374, 381  
*Burnatastrum* Briq. .... 372, 374, 380  
*spicatum* (E. Mey. ex Benth.) Briq. .... 374, 383  
*Coleus* Lour. .... 373, 374, 387  
 sect. *Aromaria* Benth. .... 373, 387  
 sect. *Calceolus* Benth. .... 373, 387, 289  
 sect. *Solenostemoides* Briq. .... 373, 438  
 sect. *Solenostemon* Briq. .... 373, 387, 437  
*amboinicus* Lour. .... 373, 374, 388  
 var. *violaceus* Guerke ..... 388  
*aromaticus* Benth. .... 387, 388  
*barbatus* (Andr.) Benth. .... 394  
*blumei* Benth. .... 373, 438, 440  
*caninus* (Roth) Vatke ..... 390  
*caninus sensu* Vatke ..... 393  
*carnosus* Dinter ms. .... 392  
*comosus* Hochst. ex Guerke ..... 393  
*crassifolius* Benth. .... 388  
*dazo* A. Chev. .... 377  
*decumbens* Guerke ..... 390  
*dysentericus* Bak. .... 438  
*esculentus* (N.E. Br.) G. Tayl. .... 377  
*flavovirens* Guerke ..... 490  
*floribundus* (N.E. Br.) Robyns & Lebrun ..... 377  
 var. *longipes* (N.E. Br.) Robyns & Lebrun ..... 377  
*forskohlii sensu* Briq. .... 394  
*gazensis* S. Moore ..... 382  
*latifolius* Hochst. ex Benth. .... 439  
*leucophyllus* Bak. .... 381  
*madagascariensis* (Pers.) A. Chev. .... 403  
*matopensis* S. Moore ..... 382  
*mirabilis* Briq. .... 381  
 var. *buchnerianus* Briq. .... 381  
 var. *hypisodontus* Briq. .... 381  
 var. *mechowianus* Briq. .... 381  
 var. *poggeanus* Briq. .... 381  
*myrianthus* (Briq.) Brenan ..... 382  
*neochilus* (Schltr.) Codd ..... 392  
*omahekense* Dinter ..... 390  
*pentheri* Guerke ..... 392  
*polyanthus* S. Moore ..... 382  
*rehmannii* Briq. .... 439  
*rotundifolius* (Poir.) A. Chev. .... 438  
*schinzii* Guerke ..... 392  
*scutellarioides* (L.) Benth. .... 387, 440  
*shirensis* Bak. .... 440  
*spicatus* Benth. .... 390  
*spicatus sensu* A. Rich. .... 393  
*tetensis* Bak. .... 390  
*vagatus* E. A. Bruce ..... 390  
*zatarhendi* (Forsk.) Benth. .... 398  
*Elsholtzia* Willd. .... 373, 436  
 sect. *Rabdosia* Bl. .... 373, 436  
*javanica* Bl. .... 373  
*Englerastrum* Briq. .... 373  
*floribundus* (N.E. Br.) Th. Fries jun. .... 377  
 var. *longipes* (N.E. Br.) Th. Fries jun. .... 377  
*schweinfurthii* Briq. .... 373  
*Germanea* Lam. .... 372, 374  
*crassifolia* (Vahl) Poir. .... 398  
*laxiflora* (Benth.) Hiern ..... 434  
*maculosa* Lam. .... 372, 374  
*rotundifolia* Poir. .... 438  
*urticifolia* Lam. .... 372, 374, 415  
*Homalocheilos* J. K. Morton ..... 373, 436  
*Isodon* (Schrud. ex Benth.) Kudo ..... 373, 436  
*Majana amboinica* (Lour.) Kuntze ..... 388  
*Neomullera* Briq. .... 374  
*damarensis* S. Moore ..... 382  
*welwitschii* Briq. .... 374  
*Ocimum madagascariensis* Pers. .... 403  
*racemosum* Thunb. .... 407  
*scutellarioides* L. .... 439  
*tomentosum* Thunb. .... 403  
*verticillatum* L.f. .... 407  
*zatarhendi* Forsk. .... 398  
 PLECTRANTHUS L'Herit. .... 372, 374  
 sect. *Amethystoides* Benth. .... 372, 436  
 sect. *Coleoides* Benth. .... 372, 395  
 sect. *Germanea* Benth. .... 372, 395, 406  
 sect. *Heterocylix* Benth. .... 372  
 sect. *Isodon* Schrad. ex Benth. .... 372, 380, 436  
 sect. *Melissoides* Benth. .... 372  
 sect. *Pyramidium* Benth. .... 372, 436  
 subgen. *Burnatastrum* (Briq.) Codd ..... 380  
 subgen. *Calceolanthus* Codd ..... 389  
 subgen. *Coleus* (Lour.) Codd ..... 387  
 subgen. *Isodon* (Schrud. ex Benth.) Briq. .... 436  
 subgen. *Nodiflorus* Codd ..... 376  
 subgen. *Plectranthus* ..... 395  
 sect. *Coleoides* Benth. .... 395  
 sect. *Plectranthus* ..... 406  
 subgen. *Xerophilus* Codd ..... 378  
*aegyptiacus* C. Chr. .... 398  
*ambiguus* (Bol.) Codd ..... 429  
*amboinicus* (Lour.) Spreng. .... 388  
*aromaticus* (Benth.) Roxb. .... 388  
*arthropodus* Briq. .... 415, 421  
 aff. *arthropodus sensu* Compton ..... 420  
*aurifer* Dinter ex Launert ..... 382  
*barbatus* Andr. .... 394  
*behrii* Compton ..... 416  
*biflorus* Bak. .... 376  
*blumei* (Benth.) Launert ..... 439  
*bolusii* T. Cooke ..... 435  
*calycinus* Benth. .... 436  
 var. *pachystachyus* (Briq.) T. Cooke ..... 436  
*candelabriformis* Launert ..... 380  
*caninus* Roth ..... 389, 390, 393  
*chirianthus* Briq. .... 415, 421  
*ciliatus* E. Mey. ex Benth. .... 414  
*coloratus* E. Mey. ex Benth. .... 429  
*comosus* Sims ..... 393, 394  
*cooperi* T. Cooke ..... 418, 424  
*crassifolius* Vahl ..... 398  
*cylindraceus* Hochst. ex Benth. .... 385  
*densiflorus* T. Cooke ..... 385  
*densus* N.E. Br. .... 378  
*dinteri* Briq. .... 396  
*dolichopodus* Briq. .... 423  
*draconis* Briq. .... 401  
*dregei* Codd ..... 429  
*ecklonii* Benth. .... 431  
*elegantulus* Briq. .... 412  
*esculentus* N.E. Br. .... 377  
*floribundus* N.E. Br. .... 377  
 var. *longipes* N.E. Br. .... 377  
*forskohlaei sensu* Ait. f. .... 394  
*fruticosus* L'Herit. .... 372, 374, 415, 431  
*fruticosus sensu* Marloth ..... 415  
*galpinii* Schltr. .... 385  
*glomeratus* R. A. Dyer ..... 418, 421  
*grallatus* Briq. .... 382  
*grandidentatus* Dinter ms. .... 401  
*grandidentatus* Guerke ..... 396, 382  
*hereroensis* Engl. .... 428  
*hilliardiae* Codd ..... 403  
*hirtus* Benth. .... 434  
*hylophilus sensu* Cooke ..... 418  
*krookii* Guerke ex Zahlbr. .... 418  
 var. *grandifolia* T. Cooke ..... 431  
*kuntzei* Guerke ..... 409  
*kuntzeanus* Domin. .... 372, 385  
*lanceolatus* Benth. .... 372, 385  
*lavanduloides* Bak. .... 372, 385  
*laxiflorus* Benth. .... 434

<i>madagascariensis</i> (Pers.) Benth.	402, 409	<i>strigosus</i> Benth.	409
var. <i>aliciae</i> Codd	402, 404	var. <i>lucidus</i> Benth.	409
var. <i>madagascariensis</i>	403	<i>subspicatus</i> Hochst.	383
var. <i>ramosior</i> Benth.	399, 402, 404	<i>succulentus</i> Dyer & Bruce	435
<i>marrubioides</i> Hochst. ex Benth.	385	<i>swynnertonii</i> S. Moore	422
<i>matabelensis</i> Bak.	382	<i>ternifolius</i> D. Don	436
<i>mauritianus</i> Boj.	403	<i>tetensis</i> (Bak.) Agnew	390
<i>melanocarpus</i> Guerke	376	<i>tetragonus</i> Guerke	376
<i>mirabilis</i> (Briq.) Launert	381	<i>thorncroftii</i> S. Moore	435
<i>moschosmoides</i> Bak.	385	<i>thunbergii</i> Benth.	407
<i>mutabilis</i> Codd	404	<i>tomentosus</i> Benth.	399
<i>myrianthus</i> Briq.	382	<i>transvaalensis</i> Briq.	418
<i>natalensis</i> Guerke	414	<i>tysonii</i> Guerke	439
forma <i>glandulosa</i> Phillips	418	<i>unguentarius</i> Codd	387
<i>neochilus</i> Schltr.	392	<i>urticifolius</i> (Lam.) Salisb.	415
<i>nummularius</i> Briq.	407	<i>verticillatus</i> (L. f.) Druce	407
<i>oertendahlii</i> Th. Fries jun.	411	<i>villosus</i> T. Cooke	385
<i>ornatus</i> Codd	393	<i>woodii</i> Guerke	401
<i>otaviensis</i> Dinter	382	<i>xerophilus</i> Codd	378
<i>pachyphyllus</i> Guerke ex T. Cooke	398	<i>zatarhendi</i> (Forsk.) E. A. Bruce	396, 398, 402
<i>pachystachyus</i> Briq.	436	var. <i>tomentosus</i> (Benth.) Codd	399
<i>parviflorus</i> Guerke.	409	var. <i>woodii</i> (Guerke) Codd	401
<i>peglerae</i> T. Cooke	416	var. <i>zatarhendi</i>	398
<i>petiolaris</i> E. Mey. ex Benth.	431	<i>zeylanicus</i> Benth.	399
<i>praetervisus</i> Briq.	418	<i>zuluensis</i> T. Cooke	424
<i>primulinus</i> Bak.	378	RABDOSIA (Bl.) Hassk.	373, 374, 437
<i>psammophilus</i> Codd	405	subgen. <i>Pyramidium</i> (Benth.) Codd	436
<i>punctatus</i> (L. f.) L'Herit.	372	<i>calycina</i> (Benth.) Codd	436
<i>purpuratus</i> Harv.	410	<i>javanica</i> (Bl.) Hassk.	436
<i>pyramidatus</i> Guerke	436	<i>ternifolia</i> (D. Don) Hara	436
<i>rehmannii</i> Guerke	421	SOLENOSTEMON Schumach.	373, 374, 437
<i>rotundifolius</i> (Poir.) Spreng.	438	sect. <i>Coleoidea</i> J. K. Morton	373, 438
<i>rubropunctatus</i> Codd	418, 420	subgen. <i>Solenostemoides</i> (Briq.) Codd	438
<i>saccabilis</i> Benth.	426	<i>latifolius</i> (Hochst. ex Benth.) J. K. Morton	438
var. <i>longitubus</i> Codd	428	<i>ocymoides</i> Schumach. & Thonn.	373, 437
var. <i>saccatus</i>	427	<i>rotundifolius</i> (Poir.) J. K. Morton	438
<i>scutellarioides</i> (L.) R. Br.	439	<i>scutellarioides</i> (L.) Codd	439
<i>spicatus</i> E. Mey. ex Benth.	372, 383	<i>shirensis</i> (Guerke) Codd	440
<i>spiciformis</i> R. A. Dyer	385	<i>zambesiacus</i> Bak.	440



## Notes on African *Acacia* species

J. H. ROSS\*

### ABSTRACT

Information concerning miscellaneous African *Acacia* species is presented. *A. dekindtiana* A. Chev. and *A. hirtella* E. Mey. var. *inermis* Walp. are relegated to synonymy under *A. karroo* Hayne, the misapplication of the name *A. giraffae* Willd. is discussed, reasons for rejecting the names *Mimosa reticulata* L. and *Mimosa capensis* Burm. f. are elaborated, and the identity of *Mimosa senegalensis* Forsk. is disclosed.

A number of decisions arising from a continuation of studies on the African *Acacias* require explanation in print. These form the subject of this paper.

### ACACIA DEKINDTIANA A. CHEV.

A. Chevalier, in Rev. Bot. Appliq. 27: 509 (1947), based his description of *A. dekindtiana* on *Dekindt* 431 from Huila in southern Angola. The holotype, which consists of both flowering and fruiting material, is housed in the Paris Herbarium. The paired stipular spines are straight or almost so, the stems are dark brown with minutely flaking bark, and the young branchlets are sparingly pubescent. The petioles, leaf-rhachides and rhachillae are fairly densely clothed with short spreading hairs and the petioles and rhachides are distinctly sulcate adaxially. The leaves have 2-4 pinnae pairs and there is a slightly columnar gland on the rhachis at the junction of each pinna pair. The pinnae have up to 12 pairs of leaflets which have short marginal cilia. The inflorescences are capitate, on axillary peduncles and fascicled; the peduncles are glandular and fairly densely pubescent; the involuclers are  $\pm 2$  mm long and one-third to halfway up the peduncle. The corolla lobes are slightly reflexed. The pods are reddish-brown, falcate, up to 12 cm long and 7-9 mm wide, irregularly constricted between some of the seeds, longitudinally dehiscent; the valves are brittle, have a fine  $\pm$ longitudinal venation and very sparse short indumentum. The seeds are elliptic,  $\pm 7,5 \times 5$  mm.

*Dekindt* 431 matches several specimens of *A. karroo* Hayne from Botswana, South West Africa and southern Angola, for example, *Barbosa* 9727 (K) from the Huila district in Angola. As it is clear that *A. dekindtiana* is not specifically distinct from *A. karroo*, the species is now reduced to synonymy.

*Acacia karroo* Hayne, Arzneyk. Gebr. Gewächse 10: t.33 (1827). Type: South Africa, Cape Province, *Herb. Willdenow* 19184 fol. 2 (B, lecto.).

*A. dekindtiana* A. Chev. in Rev. Bot. Appliq. 27: 509 (1947); Torre in Consp. Fl. Angol. 2: 285 (1956). Type: Angola, Huila Distr., Huila, *Dekindt* 431 (P, holo.!).

*A. robusta* sensu Oliv. in Fl. Trop. Afr. 2: 349 (1871), non Burch.; Benth. in Trans. Linn. Soc. Lond. 30: 510 (1875) pro parte quoad specim. *Welwitsch*; Hiern, Cat. Afr. Pl. Welw. 1: 314 (1896); Bak.f., Leg. Trop. Afr. 3: 841 (1930) pro parte quoad specim. Angola.

*A. horrida* sensu Gossweiler in Agron. Angola 7: 249 (1953), non (L.) Willd.

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### ACACIA GIRAFFAE WILLD. AND ACACIA ERIOLOBA E. MEY.

Willdenow, when describing *Acacia giraffae*, Enum. Hort. Berol.: 1054 (1809), recorded that the species had been discovered in the interior of the Cape Province by the celebrated traveller Lichtenstein who sent him seeds and a dried specimen without flowers. The description of *A. giraffae* was based on a sterile specimen in the Willdenow Herbarium (No. 19171) in Berlin and the name *A. giraffae* has been applied subsequently to one of the dominant and, in many areas, most characteristic trees of the dry interior areas of southern Africa, particularly in the dry Kalahari thornveld.

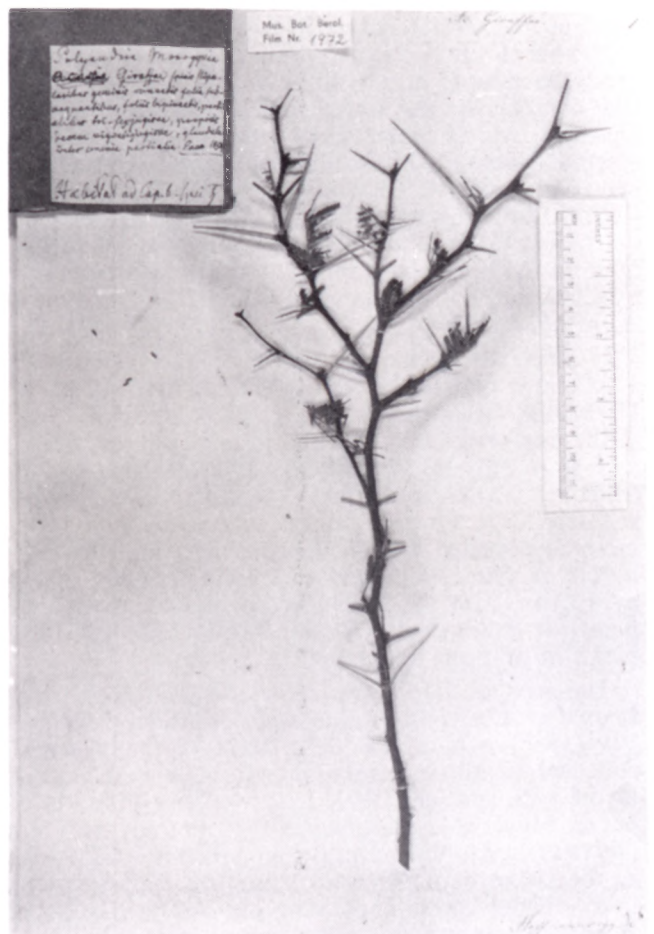


FIG. 1.—The holotype of *Acacia giraffae* Willd. (Willdenow Herbarium No. 19171). Reproduced by permission of the Director of the Botanischer Garten und Botanisches Museum, Berlin-Dahlem.