

# The South African Species of *Orthosiphon*

by

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When M. Ashby reviewed the African species of *Orthosiphon* Benth. in Journ. Bot. Lond. 76: 1 (1938) he did not deal with the genus *Nautochilus* Brem., described in Ann. Transv. Mus. 15: 253 (1933). Later, in reply to an enquiry from the National Herbarium, the Keeper of Botany of the British Museum, Natural History, quotes him as saying: "As to the value of this genus, I had not sufficient material to draw any definite conclusions. . . . There seems some doubt as to whether it should not be included with *Orthosiphon*, there being an obvious affinity with the *O. serratus* group". Phillips in his Gen. S. Afr. Flow. Pl. ed. 2: 653 (1951) reduces *Nautochilus* to synonymy under *Orthosiphon* without comment. Although still more material of certain species is desirable, the evidence now available supports the reduction of *Nautochilus*.

Bremekamp typified his genus with *N. labiatus* (N. E. Br.) Brem. and described three additional species, namely, *N. urticaefolius* Brem., *N. breyeri* Brem. and *N. amabilis* Brem. The first two of these are now regarded as being forms of *N. labiatus*. The last mentioned has smaller leaves and flowers and, as shown below, forms a link with *Orthosiphon pseudoserratus* M. Ashby.

In evaluating *Nautochilus*, it must be compared with typical *Orthosiphon* and with *Orthosiphon* Sect. *Serrati* M. Ashby. The latter Section consists of three species, *O. serratus* Schltr., *O. pseudoserratus* M. Ashby and *O. tubiformis* R. Good, and appears to be restricted to southern Africa. A character that seems to be of importance in separating Sect. *Serrati* from typical *Orthosiphon* is the place of attachment of the upper pair of stamens. In typical *Orthosiphon*, as represented by *O. australis* Vatke, the two upper stamens are attached about 1–2 mm from the throat and the filaments are filiform and glabrous. In Sect. *Serrati*, the two upper filaments are attached near the base of the corolla tube, while the filaments are slightly swollen and pubescent in the lower part. Another character which may have significance is the shape of the disc. In the few typical species of *Orthosiphon* examined, the disc is flat except for the development of an anterior lobe equal to the height of the ovary. In Sect. *Serrati*, the disc is annular, surrounding the ovary, and reaching to the lower half or the top of the ovary. *Nautochilus* is similar to Sect. *Serrati* in both these characters.

The superficial floral characters of *Nautochilus labiatus* which strike one as being unusual are the well-exserted stamens, the declinate corolla tube and the large upper and lower lips of the corolla. Taking the stamen character first, in typical *Orthosiphon* the anthers are scarcely exserted from the throat of the corolla tube and usually lie in the lower lip or in the throat of the corolla; this situation is also found in two species of Sect. *Serrati*, *O. serratus* and *O. tubiformis* but, in *O. pseudoserratus*, the stamens are exserted as in *Nautochilus*. Regarding the corolla tube and lobes, in *N. amabilis* the corolla tube is slightly declinate and the corolla lobes are only slightly longer than in *O. pseudoserratus*. In *O. pseudoserratus*, the corolla tube is almost straight, with only a slight bend near the base. Thus in corolla characters there are intermediates linking *Nautochilus* with *Orthosiphon*.

It therefore seems clear that *Nautochilus* Brem. cannot be upheld in its present form. A more natural demarcation from *Orthosiphon* Benth. would be one based on (a) the attachment of the upper pair of stamens being near the base of the corolla

tube, not near the throat; (b) the filaments being slightly swollen and pubescent in the lower part; and (c) the disc being annular, not flat with an enlarged anterior lobe, as in *Orthosiphon*.

On this basis, Sect. *Serrati* Ashby would be included in *Nautochilus* Brem. Genera in the Labiatae have been erected on even more slender grounds than those listed above. No advantage can be seen in such a treatment and it is preferred to place *Nautochilus* as a subgenus of *Orthosiphon*.

**Orthosiphon** Benth. subgen. **Nautochilus** (Brem.) L. E. Codd, subgen. nov.

*Nautochilus* Brem. in Ann. Transv. Mus. 15: 253 (1933).

*Orthosiphon* Benth. sect. *Serrati* Ashby in J. Bot. Lond. 76: 1 (1938).

Upper pair of stamens attached about 2 mm from the throat of the corolla tube; bracts up to 4 mm long; disc flat except for an enlarged anterior lobe (Subgen. *Orthosiphon*):

Rhachis pubescent but lacking stipitate glands; leaves glabrous to pubescent, not conspicuously dotted with red sessile glands below nor appressed canescent:

Petioles 4–20 mm long; leaves ovate to broadly ovate, obtuse to truncate at the base 1. *australis*

Petioles 0–2 mm long; leaves ovate to ovate-lanceolate, cuneate..... 2. *rubicundus*

Rhachis with numerous short stipitate glands; leaves either dotted with red sessile glands below or appressed canescent:

Leaves 2–3 cm long, scabrid pubescent with numerous red sessile gland-dots below; stems simple, less than 50 cm long..... 3. *vernalis*

Leaves 8–12 mm long, densely appressed canescent especially on the lower surface; stems much branched, usually exceeding 50 cm..... 4. *fruticosus*

Upper pair of stamens attached near the base of the corolla tube; bracts usually exceeding 4 mm long (occasionally less in *O. pseudoserratus* and *O. amabilis*); disc annular (Subgen. *Nautochilus*):

Leaves lanceolate or elliptic to obovate, if broadly ovate then margin distinctly serrate; lower lip of corolla less than 8 mm long:

Corolla tube exceeding 2 cm in length; leaves usually less than 2 cm long and 1 cm broad

5. *tubiformis*

Corolla tube less than 2 cm in length; leaves usually exceeding 2 cm long and 1 cm broad:

Leaves usually exceeding 4 cm in length and 2 cm in breadth; stamens exceeding the throat of the corolla by 4–6 mm..... 6. *serratus*

Leaves usually less than 4 cm in length and 2 cm in breadth; stamens exceeding the throat of the corolla by 7–8 mm..... 7. *pseudoserratus*

Leaves broadly ovate to subrotund, distinctly petiolate; margin crenate; lower lip of corolla more than 8 mm long:

Leaves less than 2.5 cm long and 2 cm broad..... 8. *amabilis*

Leaves more than 2.5 cm long and 2 cm broad..... 9. *labiatus*

1. *O. australis* Vatke in Linnaea 40: 179 (1876); Linnaea 43: 86 (1881–82); Bak. in Fl. Trop. Afr. 5: 373 (1900); Ashby in Journ. Bot. Lond. 76: 40 (1938). Type: Portuguese East Africa, Rios de Sena, *Peters*.

*O. glabratus* var. *africanus* Benth. in DC., Prodr. 12: 51 (1848). Type: Magaliesberg, Burke 162 (K, holo., PRE!). *O. wilmsii* Guerke in Bot. Jahrb. 26: 81 (1898); N. E. Br. in Fl. Cap. 5, 1: 255 (1910); Ashby in Journ. Bot. Lond. 76: 44 (1938). Type: near Lydenburg, *Wilms* 1115 (K, BM). —var. *komghensis* N. E. Br., l.c. 256 (1910). Type: Komgha, *Flanagan* 477 (K, holo., PRE!). *O. neglectus* Briq. in Bull. Herb. Boiss. Ser. 2, 3: 988 (1903). Type: Pretoria, Wonderboompoort, *Rehmann* 4510. *O. inconcinus* Briq., l.c. 991 (1903); N. E. Br., l.c. 256 (1910). Type: Natal, Camperdown, *Wood* 4963 (K, NH).

*Plectranthus bolusii* T. Cooke in Kew Bull. 1909: 377 (1909), partly, as to *Bolus* 11011. Syntypes: Potgietersrus, *Bolus* 11011 (BOL!); Houtbosch, *Rehmann* 6167.

Perennial herb, often branching from the base; stems semi-woody, decumbent or ascending, simple or sparingly branched, 12–60 cm long or even longer, subglabrous to pubescent with simple and multicellular hairs, rarely densely pubescent. *Leaves* opposite, petiolate; lamina ovate to broadly ovate, 1.5–5 cm long, 1–3 cm broad, subglabrous to pubescent, especially on the nerves below, with simple and multicellular hairs and scattered to numerous sessile pale brownish gland-dots; apex acute to obtuse, base truncate to abruptly and shortly cuneate; margin coarsely and distantly serrate to subentire; nerves fairly distinct below, indistinct above; petiole 0.5–2.5 cm long, slender, pubescent. *Inflorescence* simple, 4–15 cm long; verticils 1–2 cm apart; rhachis densely pubescent with simple, often crisped, and long multicellular hairs; bracts subrotund, abruptly acuminate, 2.5–3 mm long, pubescent below, glabrous above, persistent, subtending 2–3 flowers; pedicel 2–3 mm long, pubescent. *Calyx* campanulate, 5–6 mm long at flowering, enlarging to 7–9 mm in fruit, pubescent with simple and multicellular hairs intermingled with pale yellowish sessile gland-dots; upper tooth erect, broadly ovate, rounded to apiculate, markedly decurrent; lower 4 teeth triangular-subulate, the lower two often distinctly longer, especially in fruit, the lateral two broad-based, usually with a distinct shoulder above. *Corolla* white to mauve, pubescent without, bilabiate; tube 7 mm long, slightly compressed laterally, straight, 1.5 mm deep at the base, 2–2.5 mm deep at the throat; upper lip erect to slightly reflexed, 3–3.5 mm long and equally broad, 3-lobed, the central lobe the largest, distinctly emarginate; lower lip horizontal, concave, 4.5–5.5 mm long. *Stamens* didynamous, exerted from the throat by 2 mm; lower two filaments attached in the throat, glabrous; upper two filaments attached 1.5–2 mm from the throat, glabrous; anthers 1-theous. *Disc* flat or crenate with a distinct anterior lobe exceeding the ovary. *Ovary* 4-lobed; style filiform, 8–9 mm long; stigma thickened, minutely bifid.

Distributed from Sudan and Ethiopia through east tropical Africa as far south as Komga in the Cape Province. It inhabits dry, wooded country and is often common, especially on overgrazed veld. Flowering extends, in South Africa, from November to April or even later.

TRANSVAAL.—Marico: Zeerust, *Leendertz* in TRV 11524; *Thode* A1487; Lekkerlach, *Louw* 628. Rustenburg: 15 miles N. of Rustenburg, *Codd* 9216. Pretoria: Magaliesberg, *Burke* 162; Onderstepoort, *Theiler* in TRV 12363; Swing Bridge, *Repton* 3328. Potgietersrus: *Bolus* 11011 (BOL); *Leendertz* 1439; *Thode* A1761; 5 miles E. of Potgietersrus, *Codd* 8974; 8 miles E. of Potgietersrus, *Comins* 903. Groblersdal: Loskop Dam, *Codd* 8436. Lydenburg: Krugers Post, *Burt* *Davy* 7276. Letaba: 3½ miles W. of Letaba Camp, *Codd & Dyer* 4695. Pilgrim's Rest: Kruger National Park, 5 miles N.E. of Skukuza, *Codd & de Winter* 5059. Nelspruit: Kruger National Park, 10 miles E. of Skukuza, *Codd & de Winter* 5038; 17 miles N.E. of Pretorius Kop, *Codd* 5204; Numbi, *van der Schijff* 725; 1597; Pretorius Kop, *van der Schijff* 1205; 2040; Sigaas, *van der Schijff* 3222. Barberton: Komatipoort, *Schlechter* 11755; Kaapmuiden, *Rogers* 25044; 8 miles N. of Barberton, *Codd* 8154.

SWAZILAND.—Stegi: Malinda, *Compton* 30798. Hlatikulu: near Gollel, *Compton* 30798.

NATAL.—Hlabisa: 10 miles N.W. of Mtubatuba, *Codd* 9621; Hluhluwe Game Reserve, *Ward* 2275, 2276; *Tinley* 588; 590. Weenen: Muden Valley, *Repton* 1195; 1 mile W. of Muden, *Codd* 8604. Camperdown: *Medley Wood* 11972; *Marais* 833; Botha's Hill, *McClellan* 137. Ixopo: 20 miles N. of Highflats, *Codd* 9370.

CAPE.—Komga: *Flanagan* 477.

The present concept of *O. australis* is based on Ashby's work, with the addition of *O. wilmsii* and its synonyms. It is probable that *O. dissimilis* N. E. Br. should also be included and very likely other tropical African species as well. Typical *O. australis*



occurs in the eastern Transvaal lowveld. *O. wilmsii* is the inland form subjected to colder conditions and periodic burning. It branches more freely from the base and has shorter stems, smaller and thicker-textured leaves with the gland-dots more densely placed in the somewhat wrinkled under surface. There are, however, many intermediates linking it with *O. australis*, and thus *O. wilmsii* could, at most, be regarded as a variety of *O. australis*. It is not known if the type of *O. australis* (a Peters specimen, in Berlin) still exists.

Regarding *Plectranthus bolusii* T. Cooke, it was noted by N. E. Brown in Fl. Cap. 5, 1: 256, 282 (1910) that *Bolus* 11011 belongs in *Orthosiphon wilmsii* Guerin (now included in *O. australis* Vatke), and this is confirmed by an examination of the specimen in Bolus Herbarium. The other syntype, *Rehmann* 6167, and the specimen of *Wood* 4488 cited by Cooke as probably a robust specimen of *P. bolusii*, are both *Orthosiphon labiatus* N. E. Br.

2. *O. rubicundus* (D. Don) Benth. in Wall., Pl. As. Rar. 2: 14 (1831); Lab. 26 (1832); Ashby in Journ. Bot. Lond. 76: 41 (1938). Type: from India.

Perennial herb, often branching from the base; stems semi-woody, erect or decumbent, simple or sparingly branched, 25–60 cm long, glabrous to sparingly pubescent with scattered multicellular hairs. Leaves opposite, subsessile to sessile; lamina ovate to ovate-lanceolate, 3·5–8 cm long and 1·8–4 cm broad, glabrous to sparingly pubescent on both surfaces or, sometimes, only on the nerves below, with scattered sessile yellowish gland-dots; apex acute to obtuse, base obtuse to cuneate; margin distinctly and somewhat distantly serrate to obscurely crenate, often entire in the lower third; nerves distinct below, indistinct above; petiole 0–2 mm long. Inflorescence simple or occasionally with a pair of branches at the base, 5–20 cm long, congested or with verticils up to 1·5 cm apart; rhachis densely pubescent with long multicellular hairs; bracts broadly ovate, abruptly acuminate, 2·5–3 mm long, pubescent below, glabrous above, subsistent, subtending 2–3 flowers; pedicel 2 mm long, pubescent. Calyx campanulate, 4–5 mm long at flowering, enlarging to 8–9 mm long in fruit, hispidulous with simple and multicellular hairs and scattered sessile pale yellowish gland-dots; upper tooth erect, broadly ovate, apiculate, decurrent; lower 4 teeth triangular-subulate, subequal at flowering stage, the two lateral broader-based and shorter in fruit. Corolla white to mauve, pubescent without, bilabiate; tube 6 mm long, slightly compressed laterally, straight, 1·5 mm deep at the base, 2 mm deep at the throat; upper lip erect, 3·5 mm long, 3 mm broad, 3-lobed, the central lobe the largest, emarginate; lower lip horizontal, concave, 4 mm long. Stamens didynamous, exerted from the throat by 2 mm; lower two filaments attached in the throat, glabrous; upper two filaments attached 1–1·5 mm from the throat, glabrous; anthers 1-theous. Disc flat with an anterior lobe equal to the ovary. Ovary 4-lobed; style filiform, 8–9 mm long; stigma thickened, minutely bifid.

Recorded from China, India and tropical Africa, reaching its southernmost limit in northern Transvaal, where it grows in grassy places in fairly dense woodland and flowers from October to January.

TRANSVAAL.—Soutpansberg: Elim, *Obermeyer* in TRV 29238; Tshakoma, *Obermeyer* in TRV 31570.

The synonymy given by Ashby, l.c., has not been investigated and his identification of the above two specimens, together with other material from tropical Africa, is accepted.

3. *O. vernalis* L. E. Codd, sp. nov., *O. rubicundo* Benth. affinis sed floribus solitariis, foliis calyce corolla rubro-punctatis differt.

*Herba* perennis; caules 1–3 e basi orti, simplices erecti subquadrangulares 20–30 cm alti pubescenti. *Folia* opposita ovata vel ovato-lanceolata vel elliptica 2–3 cm longa 1–1.5 cm lata scabrido-pubescentia infra rubro-punctata, margine involuto obscure crenato-dentato, apice obtuso, basi obtusa vel truncata, petiolo 1–2 mm longo. *Inflorescentia* simplex 8–15 cm longa; rhachis glanduloso-pubescentia rubro-punctata; bractae lanceolatae acuminatae 3–4 mm longae persistentes; flores solitarii, pedicellis 3–5 mm longis. *Calyx* 5-dentatus campanulatus bilabiatus scabrido-glandulosus rubro-punctatus; dens superior late ovatus acutus vel obtusus suberectus decurrens; dentes inferiores 4 subaequales triangulo-subulati. *Corolla* bilabiata purpurea pubescens rubro-punctata; tubus cylindricus 7–8 mm longus ad faucem 2.5 mm latus; labium superiorius erectum 5–6 mm longum 2.5 mm latum 4-lobatum; labium inferiorius horizontale concavum 6–7 mm longum. *Stamina* didynamia, 2 mm exserta; antherae 1-thecae. *Discus* lobo anteriore. *Ovarium* 4-lobatum 0.5 mm longum, stylo filiformi 8–9 mm longo, stigmate minute bilobato. *Nucellae* suborbiculares 2 mm longae.

SWAZILAND.—Manzini District: Malkerns, 11th October, 1961, *I'Ons* 60/43 (PRE, holotype); 26th October, 1960, *I'Ons* 60/43. Mankaiana District: Evelyn Baring Bridge over Usutu River, *Compton* 29167; 31098.

Perennial herb 20–30 cm tall; stems 1–3 arising annually from a woody rootstock, erect, simple or sparingly branched, subquadrangular, pubescent with simple hairs and long multicellular hairs intermingled with sessile red gland-dots. *Leaves* opposite, ovate to ovate-lanceolate or elliptic, 2–3 cm long and 1–1.5 cm broad, scabrid-pubescent on both surfaces especially on the nerves below, pubescence of short simple hairs and long multicellular hairs with sessile red gland-dots densely placed below, sparsely scattered on the upper surface; margin slightly thickened, obscurely crenate-dentate to almost entire; apex obtuse to rounded, base rounded to truncate; petiole 1–2 mm long. *Inflorescence* simple, 8–15 cm long; rhachis glandular-pubescent with long multicellular hairs scattered among densely placed shorter gland-tipped hairs and sessile red gland-dots; verticils 3–10 mm apart; bracts lanceolate, acuminate, 3–4 mm long, pubescent and gland-dotted below, subglabrous above, persistent, each subtending a solitary flower; pedicels 3–5 mm long. *Calyx* campanulate, bilabiate, purple, scabrid-pubescent with multicellular hairs, short gland-tipped hairs and sessile red gland-dots, 5–6 mm long at flowering stage, enlarging to 9–11 mm long in fruit; upper tooth broadly ovate, acute to obtuse, decurrent on the tube, suberect or horizontal, 3.5–4 mm long and 2.5 mm broad at fruiting stage; lower 4 teeth subequal, triangular-subulate, the two lateral broader-based and shorter than the two lower. *Corolla* bilabiate, purple, pubescent with white appressed crisped hairs intermingled with numerous sessile red gland-dots without, minutely puberulous within; tube cylindrical, slightly compressed laterally, straight, 7–8 mm long, 2.5 mm broad at the throat; upper lip erect, 5–6 mm long, 4–5 mm broad, 4-lobed; lower lip horizontal, concave, 6–7 mm long. *Stamens* didynamous, exserted by 2 mm from the throat; the two lower attached in the throat, glabrous; the two upper attached 1.5 mm from the throat, curving upward, glabrous; anthers 1-thecous, 2-lobed. *Disc* flat with an enlarged anterior lobe exceeding the ovary. *Ovary* 4-lobed, 0.5 mm long; style filiform, 8–9 mm long; stigma minutely bilobed. *Nutlets* 2 or 3 developing, suborbicular, slightly compressed, 2 mm long. PLATE 1.

Recorded so far from a restricted area in Swaziland. It grows on grassy slopes where it is apparently subjected to regular burning, the slender stems arising annually from the base and producing their flowers in spring. Its nearest affinity appears to be *O. rubicundus* Benth., from which it is readily distinguished by the solitary flowers in the axils of the bracts, the densely stipitate-glandular rhachis and the numerous sessile, red gland-dots on the undersides of the leaves and on the calyx and corolla.

4. *O. fruticosus* L. E. Codd, sp. nov. distincta, in subgenus *Orthosiphone*, habitu fruticoso, foliis parvis subintegris canescentibus.



*Frutex virgatus* 60–90 cm altus, caulibus subquadrangularibus glabrescentibus. *Folia* opposita lanceolata elliptica vel oblanceolata 8–12 mm longa 2·5–5 mm lata dense canescentia, apice acuta, basi cuneata, petiolo 1–1·5 mm longo, margine involuto integro vel subintegro. *Inflorescentia* simplex 4–9 cm longa; rhachis dense glanduloso-puberula; bractae ovatae vel lanceolatae 2–3 mm longae glanduloso-puberulae persistentes, flores 1–3 subtentae; pedicelli 3–5 mm longi. *Calyx* 5-dentatus campanulatus bilabiatus glanduloso-puberulus; dens superior late ovatus acuminatus suberectus decurrens; dentes inferiores 4 subaequales triangulo-subulati. *Corolla* bilabiata purpurea pubescens glanduloso-punctata; tubus cylindricus 7–8 mm longus ad faucem 2·5 mm latus; labium superius erectum 5–6 mm longum 3–4 mm latum 4-lobatum; labium inferius horizontale concavum 6 mm longum. *Stamina* didynama, 2 mm exserta; antherae 1-thecae. *Discus* lobo anteriore. *Ovarium* 4-lobatum 0·5 mm longum, stylo filiformi 8–9 mm longo, stigmatibus minute bilobato. *Nucellae* suborbiculares 2 mm longae.

TRANSVAAL.—Lydenburg District: 6½ miles S.W. of Steelpoort Station, *Codd* 9777 (PRE, holotype); 7½ miles N.W. of Maartenshoop, *Codd* 8797; Steelpoort River Valley, *Pole Evans* 4695; 22 miles N. of Schoonoord, *Acocks* 20952.

Twiggy small shrub 60–90 cm tall; branches subquadrangular and appressed grey tomentulose when young, becoming terete and glabrescent with age; bark on old stems greyish, often splitting off in thin strips. *Leaves* opposite or fasciculate on short shoots, lanceolate to oblanceolate, 8–12 mm long, 2·5–5 mm broad, densely canescent especially on the lower surface, pubescence of dense, short, appressed grey hairs; apex acute, base cuneate into a short petiole 1–1·5 mm long; margin involute, entire or subentire, rarely obscurely dentate. *Inflorescence* simple, 4–9 cm long; rhachis densely glandular-puberulous; verticils 1–1·5 cm apart; bracts ovate to lanceolate, 2–3 mm long, glandular-puberulous, persistent, subtending 1–3 flowers; pedicels 3–5 mm long. *Calyx* campanulate, bilabiate, glandular-puberulous, 4–5 mm long at flowering stage, enlarging to 7–8 mm long in fruit; upper tooth the largest, purpletinged, broadly ovate, acuminate, suberect, decurrent, 2·5–3 mm long at fruiting stage; lower 4 teeth subequal, triangular-subulate, the two lateral broader-based than the two lower. *Corolla* bilabiate, purple, sparingly pubescent with scattered orange sessile gland-dots without, glabrous within; tube cylindrical, slightly compressed laterally, straight, 7–8 mm long, 2·5 mm broad at the throat; upper lip erect, 5–6 mm long, 3–4 mm broad, 4-lobed; lower lip horizontal, concave, 6 mm long. *Stamens* didynamous, exserted by 2 mm from the throat; the two lower attached in the throat, glabrous; the two upper attached 1·5 mm from the throat, glabrous; anthers 1-theous. *Disc* flat with an anterior lobe exceeding the ovary. *Ovary* 4-lobed, 0·5 mm long; style filiform, 8–9 mm long; stigma minutely bilobed. *Nutlets* usually 3 developing, suborbicular, somewhat compressed, 2 mm long. PLATE 2.

Recorded so far only from Sekukuniland in the Lydenburg District, where it grows in dry bushveld, often on stony slopes. It flowers in autumn from February to April. The shape of the disc and the point of attachment of the upper pair of stamens places it in the subgenus *Orthosiphon*, in which subgenus it appears to have no close relative. Its shrubby habit and small leaves are reminiscent of *O. tubiformis* in subgenus *Nautochilus*, but its corolla is much shorter and the leaves are appressed grey pubescent, not scabrid-pubescent.

5. *O. tubiformis* R. Good in Journ. Bot. Lond. 63: 173 (1925); Ashby in Journ. Bot. Lond. 76: 10 (1938); Letty, Wild Flows. Tvaal. 285, t. 142 (1962). Type: Pilgrim's Rest, Vaalhoek, *Rogers* 25104 (BM, holo., PRE!).

Virgate shrub 30–70 cm tall; stems erect, branched, subglabrous to hispid with multicellular hairs. *Leaves* opposite, shortly petiolate, lanceolate-elliptic to obovate, 1·4–2 cm long, 7–10 mm broad, usually scabrid pubescent on both surfaces, rarely

subglabrous above or appressed pubescent on both surfaces, pubescence of multicellular hairs and simple, often bulbous-based hairs; apex acute to obtuse, base cuneate; margin slightly thickened, serrate to subentire; nerves strongly reticulate below, indistinct above; petiole 2–4 mm long. *Inflorescence* simple, 5–17 cm long; rhachis shortly glandular-hispidulous; bracts ovate, acuminate, 5–8 mm long, glandular-puberulous below, glabrous above, persistent, subtending 1–3 flowers; pedicels 4–6 mm long, densely glandular-puberulous. *Calyx* campanulate, purple-tinged, 8–10 mm long at flowering, enlarging to 1.6 cm long in fruit, densely glandular-puberulous with short gland-tipped hairs; upper tooth subrotund, acute to abruptly apiculate, decurrent; lower 4 teeth subequal, triangular-subulate, the two lower usually slightly longer and narrower, the two lateral broader-based. *Corolla* whitish to pale mauve, sparingly pubescent without, bilabiate; tube long-cylindrical, 2–3.5 cm long, straight, somewhat compressed laterally, 1.5 mm deep near the base, 2 mm deep at the throat; upper lip erect, 7 mm long, 5 mm broad, 3-lobed, the central lobe the largest, subentire; lower lip horizontal, concave, 6 mm long. *Stamens* didynamous, exceeding the corolla tube by 5–6 mm; lower two filaments attached in the throat, glabrous, 5–6 mm long; upper two filaments attached near the base of the tube, pubescent below, slightly exceeding the corolla tube; anthers 1-theous. *Disc* annular, obscurely crenate, almost reaching the apex of the ovary. *Ovary* 4-lobed; style filiform; stigma exerted by 6 mm, shortly bilobed, lobes spreading.

Inhabits wooded, stony slopes in relatively dry parts at medium altitudes in the Lydenburg, Pilgrim's Rest and Letaba Districts. Easily recognized by the shrubby habit combined with the exceptionally long, narrowly cylindrical corolla tube.

TRANSVAAL.—Letaba: The Downs, *Junod* 4341. Pilgrim's Rest: Vaalhoek, *Rogers* 25014. Lydenburg: *Pole Evans* 4687; 1½ miles W. of Driehoek, *Codd & Dyer* 7696; 5 miles S.E. of Steelpoort P.O., *Codd & Dyer* 7714; 4 miles N. of Mogaba P.O., *Codd* 10022.

6. *O. serratus* *Schltr.* in Journ. Bot. Lond. 35: 431 (1897); Ashby in Journ. Bot. Lond. 76: 9 (1938). Type: Barberton, *Galpin* 499 (K, holo., PRE!).

Shrub 30–90 cm tall often branching from the base; stems erect, sparingly branched or simple, densely hispid with simple and multicellular hairs, sometimes also with gland-tipped hairs. *Leaves* opposite or ternate, shortly petiolate, broadly ovate to obovate-elliptic, 4–9 cm long, 2–3.5 cm broad, densely appressed pubescent to subglabrous on both surfaces, pubescence mainly of long multicellular hairs with scattered sessile, often somewhat sunken gland-dots, rarely with gland-tipped hairs also present; apex acute to obtuse, base cuneate to obtuse; margin distinctly and regularly serrate; nerves reticulate to subobscure below, indistinct above; petiole 3–8 mm long. *Inflorescence* simple, 8–32 cm long; verticils 1–3 cm apart; rhachis glandular-hispidulous; bracts ovate, long-acuminate, 6–10 (rarely–16) mm long, glandular-hispidulous below, glabrous above, persistent, subtending 2–6 flowers; pedicels 3–4 mm long, glandular-hispidulous. *Calyx* campanulate, purple, 7–8 mm long at flowering, enlarging to 1.5 cm long in fruit, glandular-hispidulous with scattered multicellular hairs, short gland-tipped hairs and sessile, yellowish gland-dots; upper tooth subrotund, abruptly acute, decurrent; lower 4 teeth subequal, triangular-subulate, the two lateral broader based. *Corolla* mauve to purple, glandular-puberulous without, bilabiate; tube (6–) 9–16 mm long, compressed laterally, straight, 1.5 mm deep at the base, enlarging to 2.5 mm at the throat; upper lip erect, 6–7 mm long, 3 mm broad, obscurely 3-lobed, the central lobe the largest, subentire; lower lip horizontal, concave, 5–6 mm long. *Stamens* didynamous, exceeding the corolla tube by 4–5 mm; lower two filaments attached in the throat, glabrous, 5 mm long; upper two filaments attached near the base of the tube, pubescent in the lower part, 1.1 to 1.2 cm long; anthers 1-theous. *Disc* annular, crenate, reaching the apex of the ovary. *Ovary* 4-lobed; style filiform; stigma exerted by 5 mm, bilobed, lobes spreading, 0.5 mm long.



Found in dense grass on stony hillsides, where it is usually subjected to regular burning, from eastern Transvaal and Swaziland to northern Zululand. A striking species when in flower with its numerous fairly large purple flowers. It varies a good deal in length of corolla tube, size and pubescence of leaves.

TRANSVAAL.—Lydenburg: Kantoorbos Forest Station, *Codd* 9786. Belfast: Elandspruitberg, *Schlechter* 3866; Elandshoek (Belfast District ?), *Rogers* in TRV 4736; Schoemanskloof, *Smuts & Gillett* 1056; 2146; 2158; 2200; *von Wolff* in TRV 34869; 34870; Waterval Boven, *Rogers* 14304; *Pole Evans* 2620; *L. Britton* 4810; *Mogg* in PRE 15101; Waterval Onder, *Galpin* 13806; *Rogers* in TRV 4737; *Airlie, Prosser* 1254. Nelspruit: *Liebenberg* 2679; *Noel* 71. Barberton: *Galpin* 499; *Williamson* 118; *Rogers* 18341; *Williams* in TRV 7656; *Meeuse* 10105; *C. A. Smith* 7056; *Clarke* 52; Rimers Creek, *Williamson* 247; Lomati Falls, *de Beer* in TRV 4939.

SWAZILAND.—Mbabane, Usutu Canal, Malkerns, *Compton* 27103; Mbabane, Komati Bridge, *Compton* 26932; Hlatikulu, *Compton* 26309; *Pierce* 60; 11 miles N.E. of Hluti, *Acocks* 15333; 9 miles N. of Mankaiana, *Codd* 4727; Komati Bridge, *Prosser* 1954; Bremersdorp, *Leach & Bayliss* 10618; without locality, *Wells* 2032; *Stewart* in TRV 12795.

NATAL.—Hlabisa: 4½ miles S. of Hlabisa, *Acocks* 13064; 2½ miles N. of Hlabisa, *Codd* 9614; Hluhluwe Game Reserve, *Ward* 1681.

7. *O. pseudoserratus* *M. Ashby* in Journ. Bot. Lond. 76: 8 (1938). Type: "Waterberg District, Moorddrift", *Leendertz* 2243 (BM, holo., PRE!).

Shrublet 30 cm or more tall; stems erect, branched or, apparently, sometimes simple, hispid-glandular with simple and multicellular, usually gland-tipped hairs. Leaves opposite, petiolate to subsessile, ovate to broadly elliptic, 2–4 cm long, 1.2–2 cm broad, densely glandular-pubescent on both surfaces, pubescence of simple, multicellular and short gland-tipped hairs intermingled with sessile yellowish gland-dots; apex obtuse, base rounded; margin serrate; nerves reticulate to subobscure below, indistinct above; petiole 2–5 mm long. Inflorescence simple, 3–15 cm long; rhachis glandular-hispidulous; verticils 0.7–2 cm apart; bracts ovate-lanceolate, acuminate, 3–6 mm long, glandular-pubescent below, subglabrous above, persistent, subtending 1–3 flowers; pedicels 3–4 mm long, glandular-hispid. Calyx campanulate, 5 mm long at flowering, enlarging to 1.1 cm long in fruit, glandular-hispidulous with multicellular hairs and short gland-tipped hairs intermingled with sessile, yellowish gland-dots; upper tooth broadly ovate, abruptly acuminate, decurrent; lower 4 teeth subequal, triangular-subulate, the two lateral broader based. Corolla white to mauve or pink, bilabiate, sparsely pubescent without, bilabiate; tube 5–7 mm long, laterally compressed, slightly declinate or almost straight, 1 mm deep at the base enlarging to 3 mm deep at the throat; upper lip erect, 3–4 mm long and 2–3 mm broad, 3-lobed, the central lobe the largest, emarginate at the apex; lower lip horizontal, occasionally reflexed later, boat-shaped, 5–6 mm long. Stamens didynamous, exerted from the throat by 7–8 mm; lower two filaments attached in the throat, glabrous, 7–8 mm long; upper two filaments attached near the base of the tube, slightly thickened and pubescent below, 1.1–1.2 cm long; anthers 1-theous. Disc annular, crenate, almost equal to the ovary or shorter. Ovary 4-lobed; style filiform, 1 cm long; stigma not thickened, minutely bilobed.

Recorded so far only from the Potgietersrus District, where it grows on rocky, wooded slopes at medium altitudes. Differs from *O. serratus* in the smaller, less serrate leaves and the more conspicuously exerted stamens. In corolla characters it resembles *O. amabilis* and differs from this species in leaf shape and shorter petioles.

TRANSVAAL.—Potgietersrus: *Thode* A1762; *Leendertz* 1494; Moorddrift, *Leendertz* 2243; Pyramid Estate, *Galpin* 9065; 9154; Naboomfontein, *Galpin* 13455; between Potgietersrus and Zebediela, *Pole Evans* 3094 (13).



8. *O. amabilis* (Brem.) L. E. Codd, comb. nov.

*Nautochilus amabilis* Brem. in Ann. Transv. Mus. 15: 254 (1933). Type: Potgietersrus, Swerwerskraal, *Bremekamp* in TRV 1220 (PRE, holo.!).

Twiggy shrub 60–90 cm tall; branches erect or spreading-ascending, pubescent, with numerous multicellular bulbous-based hairs interspersed with yellowish sessile gland-dots. *Leaves* opposite, petiolate; lamina broadly ovate to subrotund, 1–1.5 (rarely–2) cm long and 1–1.4 (rarely–1.8) cm broad, pubescent on both surfaces, lower surface greyish with long interwoven multicellular hairs intermingled with yellow sessile gland-dots, upper surface dark green with shorter and less dense pubescence; apex rounded, base truncate; margin regularly and finely crenate; nerves indistinct; petiole 5–12 mm long. *Inflorescence* simple, 7–14 cm long; verticils 1–1.5 cm apart; rhachis densely glandular-hispidulous with short gland-tipped hairs and scattered multicellular hairs and yellow sessile gland-dots; bracts ovate to subrotund, acuminate, 4–6 mm long, glandular-pubescent on both surfaces or on the lower only, subpersistent, subtending 1–3 flowers; pedicel 3–5 mm long, glandular-hispidulous. *Calyx* campanulate, purple-tinged, 4–5 mm long at flowering, enlarging to 9 mm long in fruit, glandular-hispidulous with short gland-tipped hairs, scattered multicellular hairs and numerous yellow sessile gland-dots; upper tooth more or less horizontal, subrotund, apiculate, markedly decurrent; lower 4 teeth triangular-subulate, subequal at flowering stage, the two lateral becoming broader-based and shorter than the two lower at fruiting stage. *Corolla* mauve or pink, sparsely puberulous without, bilabiate; tube 8–9 mm long, laterally compressed, slightly declinate, 1 mm deep at the base enlarging to 3 mm deep at the throat; upper lip at first erect, later recurving, 5 mm long and 2.5 mm broad, 3-lobed, the central lobe the largest, emarginate at the apex; lower lip at first horizontal, later reflexed, boat-shaped, 8–9 mm long. *Stamens* didynamous, exerted from the throat by 9 mm; lower two filaments attached in the throat, glabrous, 9 mm long; upper two filaments attached near the base of the tube, slightly thickened and pubescent near the base, 1.3 cm long; anthers 1-theous. *Disc* annular, slightly shorter than the ovary. *Ovary* 4-lobed; style filiform, 1.4 cm long; stigma not thickened, entire.

A small, much-branched shrub, recorded from dry, wooded places and stream banks in the Potgietersrus and Lydenburg Districts. Closely related to *O. labiatus* but has smaller leaves and flowers. May be separated from *O. pseudoserratus* by the more rotund leaf blade, the long slender petioles and the longer corolla lobes.

TRANSVAAL.—Potgietersrus: Swerwerskraal, *Bremekamp* in TRV 1220. Lydenburg: Sekukuniland, *Barnard* 339; 421; near Branddraai, *Meeuse* 10020.

The specimen *Meeuse* 10020 differs from the others in having much less pubescent stems and leaves. The relatively small leaves and flowers match *O. amabilis*, but there is also a possibility that it is a depauperate specimen of *O. labiatus*.

9. *O. labiatus* N. E. Br. in Fl. Cap. 5, 1: 245 (1910). Type: Transvaal, Woodbush Mts., *Schlechter* 4434 (K, holo., PRE!).

*Nautochilus labiatus* (N. E. Br.) Brem. in Ann. Transv. Mus. 15: 253 (1933); Verdoorn in Flow. Pl. S. Afr. 23: t. 901 (1943); Letty, Wild Flows. Tvaal. 288, t. 143, 1 (1962). *N. breyeri* Brem., l.c. 254 (1933). Type: Louis Trichardt, *Breyer* in TRV 19400 (PRE, holo.!). *N. urticaefolia* Brem., l.c. 254 (1933). Type: Blaauwberg, Leipzig, *Bremekamp* & *Schweickerdt* 131 (PRE, holo.!).

*Plectranthus bolusii* sensu Fl. Cap. 5, 1: 282 (1910), partly, as to *Rehmann* 6167 and *Wood* 4488.

Soft shrub 0.6–1.8 m tall, branching from the base; stems ascending, freely branched, sparingly pubescent with long multicellular hairs, denser at the nodes, and usually scattered yellowish sessile gland-dots. *Leaves* opposite, petiolate; lamina

broadly ovate to subrotund, soft, 3–8 cm long and 2–6 cm broad, sparingly pubescent above, denser below with long multicellular hairs freely intermingled with sessile pale yellow gland-dots; apex acute to rounded, base truncate to abruptly and shortly cuneate; margin regularly and coarsely crenate; nerves fairly distinct below, indistinct above; petiole slender, 0.5–3 cm long. *Inflorescence* simple or, occasionally, with a pair of short branches at the base, 5–18 cm long; verticils 1–2 cm apart; rhachis glandular-pubescent with dense short gland-tipped hairs, scattered multicellular hairs and yellowish sessile gland-dots; bracts ovate, acuminate, 8–10 mm long, purplish, glandular-pubescent below, almost glabrous above, persistent, subtending 2–4 flowers; pedicel 5–6 mm long, glandular-puberulous. *Calyx* campanulate, purple, 5 mm long at flowering, enlarging to 1–1.5 cm long in fruit, glandular puberulous with short gland-tipped hairs, numerous yellowish sessile gland-dots and occasional multicellular hairs; upper tooth suberect, ovate-orbicular, abruptly apiculate or rounded, decurrent; lower 4 teeth triangular-subulate, subequal at flowering, the two lateral broader-based and shorter at fruiting stage. *Corolla* pale mauve to pink, sparsely pubescent without, bilabiate; tube 1–1.2 cm long, declinate, laterally compressed, 1.5 mm deep at the base, expanding to 4 mm deep at the throat; upper lip at first erect, later recurving, 7–8 mm long, 3–3.5 mm broad, 3-lobed, the central lobe the largest, subentire at the apex; lower lip at first horizontal, boat-shaped, later recurving below the tube, 8–12 mm long. *Stamens* didynamous, exerted beyond the throat by 9–12 mm, the longer (lower) usually just exceeding the lower lip; lower two filaments attached in the throat, glabrous, 10–12 mm long; upper two filaments attached near the base of the tube, slightly thickened and pubescent below, 1.4–1.6 cm long; anthers 1-theous. *Disc* annular, slightly shorter than the ovary. *Ovary* 4-lobed; style filiform, 1.1–1.4 cm long; stigma minutely bifid.

A distinctive species with its bushy habit, large leaves on long slender petioles and its large corolla with declinate tube and long, usually reflexed, lips. Found on dry, rocky, wooded hillsides and wooded watercourses from northern and eastern Transvaal, through Swaziland to northern Natal. Widely cultivated for its attractive flowers and long flowering season which, in nature, extends from January to May and, in cultivation, is even longer.

TRANSVAAL.—Soutpansberg: *Smuts* s.n.; Louis Trichardt, *Breyer* in TRV 19400; Wylliespoort, *Schlieben* 9264; *Ihlenfeldt* 2188; near Hangklip, *Meeuse* 10153; 11 miles W. of Louis Trichardt, *Prosser* 2005; Sand River Bridge, *Meeuse* 10205; Lejuma, *Meeuse* 10314. Pietersburg: Blaauwberg, *Smuts & Pole Evans* 905; *Bremekamp & Schweickerdt* 131; *Codd & Dyer* 9138; Houtboschberg, *Schlechter* 4434; *Rehmann* 6167 (K). Letaba: Shilouvane, *Junod* 2400; 4333; Gravelotte, *van Dam* in TRV 25003. Potgietersrus: Riebeeck West, *McDonald* 208. Rustenburg: Kransberg, *Codd* 3740. Belfast: Schoemanskloof, *Smuts & Gillett* 2203. Lydenburg: 6 miles S.W. of Penge Mine, *Codd & Dyer* 7736. Pilgrim's Rest: Erasmus Pass, *Strey* 3226. Nelspruit: Kruger National Park, 9 miles N.W. of Pretorius Kop, *Codd* 5146; Numbi, *van der Schijff* 3446; Ship Mt., *Acocks* 16700; near Malelane, *Codd* 5254; *van der Schijff* 4209; *Brynard & Pienaar* 4435. Barberton: *Thorncroft* in TRV 3260; near Joe's Luck Siding, *Codd* 9534.

SWAZILAND.—Mankaiana, *Compton* 27511; Lebombos, *Hornby* 2857.

NATAL.—Ubombo: *Pole Evans* 2659. Mapumulo: Oqaqeni, *Edwards* 1815. Kranskop: 5 miles S. of Jameson's Drift, *Codd* 9669. Weenen: *Medley Wood* 4488 (NH); *Acocks* 10151; 3½ miles W. of Weenen, *Codd* 8616; Nkasine, *Edwards* 714.

The type of *Nautochilus breyeri* Brem. has smaller leaves with more finely crenate margins than in typical *O. labiatus* while in *N. urticaefolia* Brem. the leaves are more softly tomentose on the lower surface. These are considered to be forms of *O. labiatus*, which is a fairly variable species but, nevertheless, an easily recognizable entity.



## LITTLE KNOWN SPECIES

In his review of the African species of *Orthosiphon*, Ashby places the following among the doubtful or excluded species: *O. ambiguus* Bolus, *O. bolusii* N. E. Br. and *O. varians* N. E. Br. The holotypes of these species were kindly sent to me on loan by the Curator of the Bolus Herbarium, while additional material of certain species was forthcoming from the Compton Herbarium and the Albany Museum Herbarium. Two of the species are now transferred to other genera, while the third is placed in synonymy. In addition, the tropical species, *Plectranthus allenii* C. H. Wr., is transferred to *Orthosiphon*.

***Plectranthus ambiguus* (Bolus) L. E. Codd, comb. nov.**

*Orthosiphon ambiguus* Bolus in Journ. Linn. Soc. 18: 394 (1881). Type: near Grahamstown, MacOwan 987 (BOL, holo., SAM!).

*Plectranthus coloratus* E. Mey. ex Benth. in E. Mey., Comm. Pl. 228 (1837); Cooke in Fl. Cap. 5, 1: 279 (1910); non Don (1825). *P. dregei* L. E. Codd in Flow. Pl. Afr. 32: t. 1244 (1957).

Although MacOwan 987 is in an immature state, it is clearly recognizable as the same species as *Plectranthus coloratus* E. Mey. ex Benth., non Don, which was renamed *P. dregei* L. E. Codd.

***Hemizygia bolusii* (N. E. Br.) L. E. Codd, comb. nov.**

*Orthosiphon bolusii* N. E. Br. in Fl. Cap. 5, 1: 258 (1910). Type: Natal, Cathkin Peak, A. Bolus in Herb. Guthrie 4894 (BOL!).

This appears to be a distinct species of *Hemizygia* and, although the type was collected on 6/11/1897, no further material has been seen in South African Herbaria. It comes nearest to *H. foliosa* S. Moore, but has smaller, more pubescent leaves, simple racemes, 4-6-flowered verticils and the bracts are shed at a very early stage. In leaf character it resembles *Syncolostemon macranthus* (Guerke) M. Ashby, but differs again in the simple racemes, the more widely spaced verticils and the presence of villous hairs on the stem and rhachis. Although N. E. Brown reports that the lower pair of stamens may have free or united filaments, it is felt that this point requires further investigation, for which additional gatherings of the species are required. In floral characters it agrees with *Hemizygia*.

***Hemizygia petrensis* (Hiern) M. Ashby in Journ. Bot. Lond. 73: 353 (1935).**

*Orthosiphon petrensis* Hiern, Cat. Afr. Pl. Welw. 1: 859 (1898). *O. varians* N. E. Br. in Fl. Cap. 5, 1: 256 (1910). *O. holubii* N. E. Br., l.c. 258 (1910). *O. engleri* Perkins in Bot. Jahrb. 54: 344 (1917). *O. mossianus* Good in Journ. Bot. Lond. 63: 174 (1925).

*Hemizygia mossianus* (Good) M. Ashby, l.c. 356 (1935).

Ashby, l.c., already placed *O. holubii* and *O. engleri* as synonyms of *Hemizygia petrensis*. I have not seen the types of these species but, after examining the types of *O. varians* and *O. mossianus*, I have no hesitation in adding them to Ashby's concept of *H. petrensis*. In *O. varians* the leaves are ovate-lanceolate; by including this species in *O. petrensis*, the leaf shapes now accepted for *O. petrensis* vary from narrowly lanceolate to ovate-lanceolate. Ashby separates *O. mossianus* on the basis of its petiolate leaves, but this character breaks down and individual specimens may even be found in which the upper leaves are sessile and the lower ones petiolate. The specimens now included in the enlarged concept of *O. petrensis* show some variation in the density of pubescence, but are characterized by the presence of villous hairs, as against the short, dense, appressed tomentum of the closely related species, *H. canescens* (Guerke) Ashby. There are a few specimens with intermediate pubescence but, as the great majority can be classified on the basis of their pubescence, it is considered that both *H. canescens* and *H. petrensis* may be upheld as distinct though closely related species.

***Orthosiphon allenii* (C. H. Wr.) L. E. Codd, comb. nov.**

*Plectranthus allenii* C. H. Wr. in Kew Bull. 1908: 437 (1908), as "allenii". Type: Rhodesia, Lukanda River, C. E. F. Allen 471.

Ashby placed *Plectranthus allenii* C. H. Wr. as a synonym of *O. rubicundus* (D. Don) Benth. I am grateful to Mr. W. Marais, our Liaison Officer at Kew, for reporting on the type of *P. allenii* and confirming that it is distinct from *O. rubicundus*. It is a characteristic species with stems arising annually from a perennial rootstock with tuberous roots. The leaves are relatively large, 8–20 cm long and 3–8 cm broad, obovate, tapering towards the petiole, and are situated in a basal rosette or on a short stem up to 4 cm long. The habit thus resembles certain species of *Gerbera*. The inflorescence is usually unbranched and is borne on a slender peduncle 8–18 cm long, while the flowers have all the characteristics of a true *Orthosiphon*. The species has been recorded from Northern and Southern Rhodesia, Nyasaland, the Congo and Mozambique but not, as yet, from South Africa.





PLATE 1.—*Orthosiphon vernalis* L. E. Codd (*I'Ons* 60/43, holotype).



PLATE 2.—*Orthosiphon fruticosus* L. E. Codd (Codd 9777, holotype).