

NOTES ON ARABIAN *POLYGALA* L. (*POLYGALACEAE*)

by
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Resumen

PAIVA, J. A. R. (1988). Notas sobre *Polygala* L. de Arabia (*Polygalaceae*). *Anales Jard. Bot. Madrid* 45(1): 151-158 (en inglés).

Se señala *P. steudneri* Chodat como novedad florística para la Península Arábiga. Se rehabilita *P. dhofarica* Baker, especie muy próxima de *P. mossii* Exell y *P. rupicola* Hochst. & Steudel ex Richard. *P. schwartziana* Paiva es un nombre nuevo para *P. subaphylla* Schwartz, non H. Perrier. Se propone también una nueva combinación: *P. senensis* Klotzsch var. *callicola* (Chodat) Paiva.

Palabras clave: *Polygalaceae*, *Polygala*, corología, nomenclatura, taxonomía, Península Arábiga.

Abstract

PAIVA, J. A. R. (1988). Notes on Arabian *Polygala* L. (*Polygalaceae*). *Anales Jard. Bot. Madrid* 45(1): 151-158.

P. steudneri Chodat is a novelty from the Arabian Peninsula. *P. dhofarica* Baker, a very close species to *P. mossii* Exell and *P. rupicola* Hochst. & Steudel ex Richard, is recognized. *P. schwartziana* Paiva is a new name for *P. subaphylla* Schwartz, non H. Perrier. A new combination is proposed: *P. senensis* Klotzsch var. *callicola* (Chodat) Paiva.

Key words: *Polygalaceae*, *Polygala*, chorology, nomenclature, taxonomy, Arabian Peninsula.

After having studied a small collection of *Polygala* L. from the Arabian Peninsula which belongs to the Edinburgh Royal Botanic Garden, some novelties were found. Most of the plants were collected by J. S. Collenette, J. J. Lavranos, A. G. Miller, R. Whitecombe & D. Wood.

Most of the taxa were known from the Arabian Peninsula such as: *P. abyssinica* R. Br. ex Fresen., *P. erioptera* DC. subsp. *erioptera*, *P. irregularis* Boiss., *P. mascatensis* Boiss., *P. senensis* Klotzsch var. *senensis*, *P. thurmanniana* Chodat and *P. tinctoria* Vahl. But some novelties were found such as: one species not yet known in that area (*P. steudneri* Chodat); the recognition of *P. dhofarica* Baker; a new name (*P. schwartziana* Paiva); and a new nomenclatural combination [*P. senensis* Klotzsch var. *callicola* (Chodat) Paiva].

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1. *A species previously unrecorded in the Arabian Peninsula*

P. steudneri Chodat occurs in the East African mountains (Uganda, Tanzania, Kenya and Ethiopia) in alpine areas over 2000 m high. So, it was not a surprise to find this species of *Polygala* at a very high altitude (3600 m) on a mountain in Yemen.

The species was collected in Yemen, amongst volcanic gravel. Sometimes, it also grows amongst exposed laval rocks in the African mountains.

The Arabian specimen we have studied has thick leaves, whilst the African ones do not have that type of leaves. Perhaps that is because of the type of soil (volcanic gravel) and the exceptionally high altitude of the place (3600 m).

P. steudneri Chodat in Mém. Soc. Nat. Genève 31, 2(2): 390 (1893)¹. Dur. & Schinz, Comp. Fl. Afr. 1(2): 246 (1898). Cuf. in Bull. Jard. Bot. État 26(3), Suppl.: 411 (1956)

Typus. ETHIOPIA: Bachit M., 4000 m, *Steudner*, s.n. (B; holotypus).

P. negrii Chiov. in Ann. Bot. (Rome) 9(3): 315 (1911). Cuf. in Bull. Jard. Bot. État 26(3), Suppl.: 409 (1956) *Syn. nov.*

Syntypus. ETHIOPIA: Mangasciá Mt., near Addis Ababa, 2800 m, *Negri* 401 (FI); Gubba, Uaciacrá Mt., 2900 m, 19-V-1909, *Negri*, 424 (FI).

Perennial herb up to 18 cm tall, procumbent, much branched from a woody rootstock, with slender crisped-pubescent stems. Leaves petiolate (petiole 0.5-0.75 mm long, slightly winged and crisped-pubescent), 7-12 × 1.5-3.5 mm, elliptic, rounded or obtuse and mucronate at the apex, slightly cuneate towards the base, crisped-pubescent on the margins and main veined on both sides. Flowers mauve or pink in terminal and exceptional lateral racemes, 2-4 cm long, with a crisped-pubescent rachis and caducous, lanceolate and glabrous bracts and bracteoles (up to 1 mm long). Pedicels 1.5-1.75 mm long, glabrous. Posterior sepal 2.75-3 mm long, glabrous; wing-sepals 5-5.5 × 3-3.5 mm elliptic, with a conspicuous stripe, glabrous; anterior sepals 2.5-2.75 mm long, free, glabrous. Upper petals 3-3.5 × 1.5 mm; carina 5 × 2-5 mm, crest 2.5 mm long. Stamens 8. Capsule 3-4 × 2.5 mm, ellipsoid, glabrous, very narrowly winged. Seeds 2.5 × 1 mm cylindrical, with short, silky hairs; caruncular appendages 1.5 mm long, up to the middle length of the seed.

YEMEN: Track joining Sana'a-Hodeida road to summit of Jebel an Nabi Shu'ayb, 3600 m, 2-II-1979, *Wood*, 11010 (E).

Alpine, over 2000 m high, grassland, rocky grassy places, exposed laval rocks and volcanic gravel.

2. *The recognition of Polygala dhofarica Baker*

Some authors (CHODAT, 1896; CUFODONTIS, 1956) considered *P. dhofarica*

¹ Chodat indicates, before his description of that species, a drawing as "Tab. nostra XXX, fig. 7". But figure 7 is missing from that "Tabula". Certainly it was an involuntary omission.

Baker (endemic to Oman) as a synonym of *P. rupicola* Hochst. & Steudel ex Richard (endemic to Ethiopia). The two species are very close and are also related to *P. mossii* Exell (endemic to Namibia). The three species belong to the *P. abyssinica* complex, which is scattered from NE to SE and SW Africa and the Arabian Peninsula to SW Asia.

It is understandable that the monographer of the genus (R. Chodat) has considered *P. dhofarica* Baker as a synonym of *P. rupicola* Hochst. & Steudel ex Richard, because he only knew the type material of the former (BENT, 186; K) and the Ethiopian material collected by Schimper of the latter.

These three species are perennial herbs or suffruticose, but they can be distinguished as shown in the following table and illustrated in the plate.

TABLE 1

	<i>P. mossii</i>	<i>P. rupicola</i>	<i>P. dhofarica</i>
Stem pubescency	glabrous or puberulous	patent-pubescent, rarely glabrescent	crisped-pubescent or glabrescent
Peciole pubescency	puberulous	patent-pubescent	crisped-pubescent
Rachis of the inflorescence	puberulous or glabrous	patent-pubescent	glabrous, rarely crisped-pubescent
Bracts	0.75 mm long; puberulous or glabrous	2-2.5 mm long; patent-pubescent	1.25-1.5 mm long; glabrous
Bracteoles	0.5 mm long; puberulous or glabrous	1.5 mm long; patent-pubescent	0.75-1 mm long; glabrous
Pedicels	1 mm long; puberulous or glabrous	1.5-2 mm long; patent-pubescent	1.25-1.5 mm long; glabrous
Margin of the capsule	narrowly winged, wing 0.5 mm broad	narrowly winged, wing 0.5 mm broad (near the apex)	widely winged, wing 1.5-2 mm broad (near the apex)

P. dhofarica Baker in Kew Bull. 1895: 181 (1895). Blatter in G. King, *Records Bot. Survey India* 8(1): 54 (1919). Schwartz in *Mitt. Inst. Allg. Bot. Hamburg.* 10: 133 (1939). Fig. 1, A₁-A₄

Typus. OMAN: Hadramant, Dhofar Mountains, 300 ft; J. T. Bent, 186 (K; holotypus).

Perennial herb with woody base, up to 25 cm tall, with crisped-pubescent or glabrescent stems from a much divided root-stock. Leaves petiolate (petiole 0.5-1 mm long, crisped-pubescent), 5-15 × 2-4 mm, oblong elliptic to lanceolate, mucronate at the apex, narrowed towards the base, shortly and sparingly crisped-pubescent. Flowers reddish-purple, pedicels 1.25-1.5 mm long, glabrous, in dense terminal or rarely pseudolateral racemes, up to 7 cm long, with glabrous, rarely crisped-pubescent, rachis; bracts 1.25-1.5 mm long, elliptic-lanceolate, glabrous, bracteoles 0.75-1 mm long, elliptic-lanceolate, glabrous, caducous. Posterior sepals 3 mm long, elliptic, glabrous; wing sepals 7-7.5 × 4-4.5 mm, elliptic, gla-

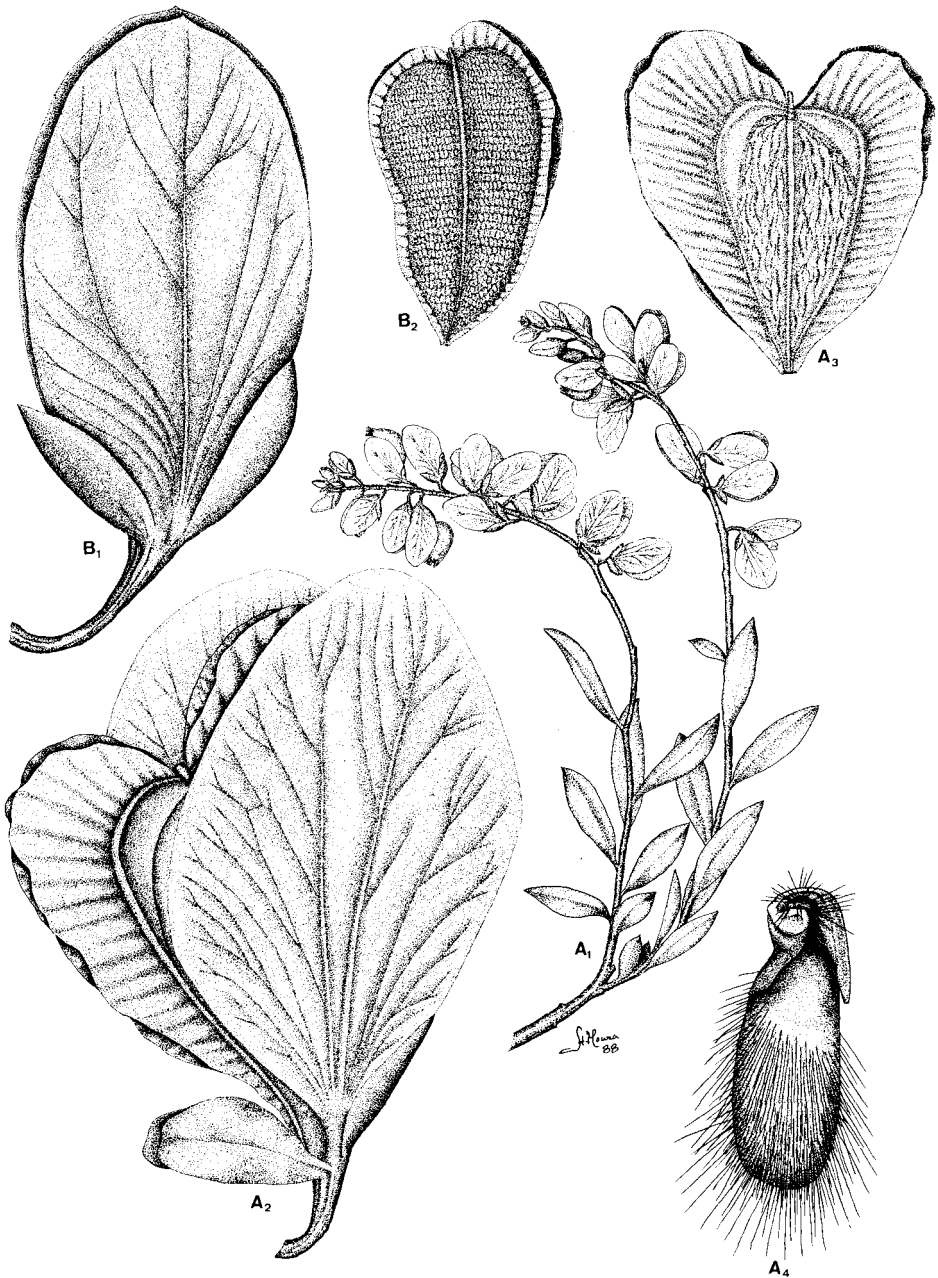


Fig. 1.—A: *Polygala dhofarica*. A₁, habit ($\times 1$); A₂, calyx and capsule ($\times 11$); A₃, capsule ($\times 7.5$); A₄, seed ($\times 15$). Miller 2657. B: *Polygala rupicola*. B₁, calyx ($\times 11$); B₂, capsule ($\times 7.5$). Hagos 208.

brous; anterior sepals 2-2.25 mm long, free, glabrous. Upper petals 3-4 × 2-3 mm, spatulate, emarginate to lobate at the apex; carina 6.5-7 × 3-3.5 mm, crest 2.25-2.5 mm long. Stamens 8. Capsule 5-5.5 × 5-6 mm, obovoid, with margin widely winged, wing 1.5-2 mm broad, glabrous. Seed 3.5-3.75 × 1-5 mm, ellipsoid, with dense, white, silky hairs; caruncle 1.25 mm long, caruncular appendages 0.25-0.5 mm long.

YEMEN: Jabal Hadhur an Nabi Shwayib, 13-IX-1977, *Lavranos*, 15813 (E); Jebel Hisu Naduan, Wusab al Ali, 16-IX-1978, *Wood*, 2469 (E)².

OMAN: Jebal Qamar, 9 km N Dhalqut, 1100 m, 10-X-1979, *Miller*, 2657 (E); Jebel Khawr, Summit Ridge, 2900 m, 22-X-1979, *Miller & Whitecombe*, 2789 (E). Woodlands or open stony hills.

3. *A new name for Polygala subaphylla* Schwartz

Polygala subaphylla Schwartz (1939) is a later homonym of the validly published name *Polygala subaphylla* H. Perrier [in Bull. Trimestriel Acad. Malgache, Nouv., Sér. 14: 11 (1932); in Humb., Fl. Madag. Comor. 109 (Polygalacées): 14, t. III, fig. 6-9' (1955) = *P. arvicola* Bojer in Boutt., Rapp. Annuel Trav. Soc. Hist. Nat. Île Maurice 12: 13 (1843); in Ann. Sci. Nat. (Paris), Sér. 3, 20: 95 (1843). H. Perrier in Humb., tom. cit.: 14 (1955)], and it must be rejected (Art. 64.1 of the International Code of Botanical Nomenclature).

We rename it *Polygala schwartziana* Paiva, after the author of the rejected name (Oskan Schwartz).

***Polygala schwartziana* Paiva, nom. nov.**

P. subaphylla Schwartz in *Mitt. Inst. Allg. Bot. Hamburg* 10: 132 (1939), non H. PERRIER (1932). Fig. 2

Typus. DEM. REP. OF YEMEN (S. YEMEN): Hadramaut, coastal region, *Wissmann* 660 (HBG; holotypus)³.

Erect grazed shrublet c. 1 m tall, with virgate subaphyllous glabrous or glabrescent stem. Leaves mainly on young branches, 10-20 × 1-2 mm, linear to linear-lanceolate, acute and submucronate at the apex, cuneate towards the base, glabrous. Flowers deep magenta, pedicels 2-2.5 mm long, glabrous, in elongated, terminal racemes, 3-10 cm long, with glabrous rachis and caducous bracts, 1.5-2 mm long and bracteoles 1-1.5 mm long. Posterior sepal 3-3.5 mm long; wing sepals 7.5-9 × 4-5 mm, elliptic to slightly obovate, glabrous; anterior sepals 2-3 mm long, free. Upper petals 4.5-5 × 1-1.5 mm, oblong-elliptic, carina 5.5-6.5 × 2.5-3 mm, crest 1.5-2 mm long. Stamens 8. Capsule 7-8.5 × 4-4.5 mm, obliquely applanate obovate-elliptic, emarginate at the apex, winged (wing 0.75-1 mm broad), glabrous. Seeds 6-6.5 × 2-2.5 mm, ellipsoid to oblong ovoid, with white silky hairs;

² In this specimen the capsule is rather narrowly winged.

³ I have asked the Hamburg Herbarium (HBG) for a photograph of that specimen and I got the following answer: "Since a number of plant families have been translocated during the war into what now is the German Democratic Republic, and since they have not been returned to us yet, the specimen you are interested in is not traceable in our herbarium."

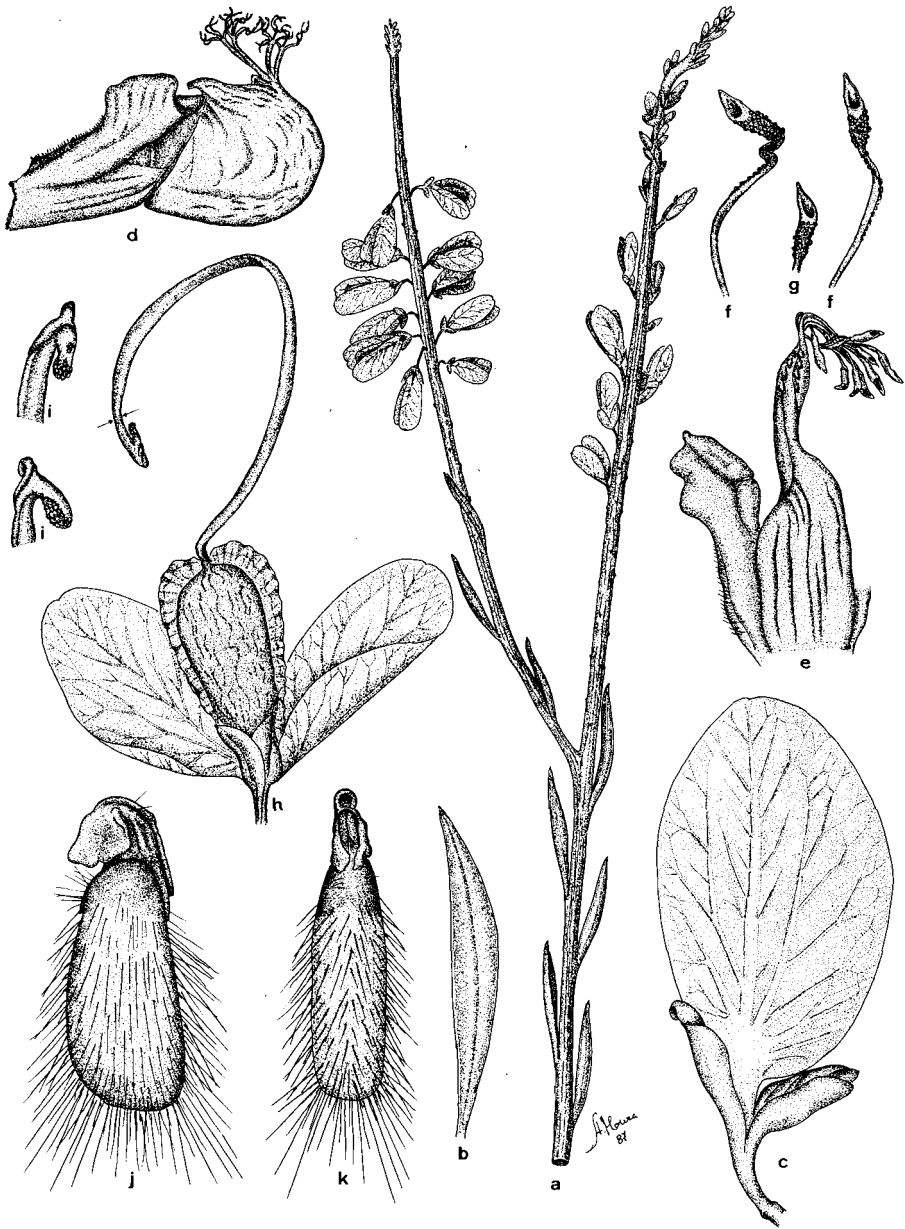


Fig. 2.—*Polygala schwartziana*. a, inflorescence ($\times 1.3$); b, leaf ($\times 5$); c, calyx ($\times 7$); d, corolla ($\times 7$); e, upper petals and staminal tube ($\times 7$); f, stamens ($\times 20$); g, anther ($\times 20$); h, calyx and pistil ($\times 4.7$); i, stigma ($\times 20$); j, seed (lateral view) ($\times 7$); k, seed (side view) ($\times 7$). *Collenette 3103*.

caruncle 1-1.5 mm long, unequally branched; canuncular appendages short, 1 mm long.

P. schwartziana Paiva is close to *P. abyssinica* R. Br. ex Fresen. but the former is a shrublet up to 100 cm tall, has stems without leaves (only young branches leafy), larger capsules (7-8.5 × 4-4.5 mm), with winged margin (wing 0.75-1 mm broad) and seeds (6-6.5 × 2-2.5 mm); whilst the latter is a perennial herb up to 30-50 cm tall and has leafy stems, smaller capsules (5-5.5 × 3-3.5 mm), with very narrowly winged margin (wing 0.25-0.5 mm broad) and smaller seeds (4-4.5 × 1.5 mm).

SAUDI ARABIA: Wadi Hammah, 50 km NNE of Najrán, 2000 m, 25-I-1980, *Collenette*, 1648 (E); W. of Buraydah, 1000 m, 14-II-1980, *Collenette*, 1860 (E); Jebel Radhua, N of Yanbu'al Bahr, 2100 m, 10-I-1981, *Collenette*, 2894 (E); 35 km E of Hamdah, 1300 m, 23-X-1981, *Collenette*, 2987 (E); Al Baha, 220 km SE of Mecca, 18-III-1980, *Lavranos & Collenette*, 18445 (E).

YEMEN: Marib road, 15 km NE of San'a, 2500 m, 12-IX-1977, *Lavranos*, 15789 (E); Wasit, 20 km N of Sadah, 1800 m, 22-III-1981, *Miller*, 3171 (E).

DEM. REP. YEMEN: 45 miles ESE of Bahat, 25-X-1981, *Collenette*, 3103 (E).

Sandstone hills, grassy slopes, at over 1000 m altitude.

4. *A new combination: Polygala senensis Klotzsch var. calcicola (Chodat) Paiva*

Polygala senensis Klotzsch is one of the extremely variable species of *Polygala* from East Africa.

It is a perennial herb or shrublet, occasionally annual, up to 60 cm high, often with annual shoots produced from a woody rhizome. *P. calcicola* Chodat is an extreme variation, and it is a prickly shrublet with smaller leaves (8-10 × 2-3 mm) and flowers (wings 6.5-8 × 6-7 mm), whilst *P. senensis* Klotzsch has larger leaves (10-30 × 5-10 mm) and flowers [wings 8-10(-14) × 7-8(-12) mm].

But sometimes it is not easy to identify these species, mainly in Somalia, where there are many transition forms between the two species, as, for instance the specimen Hildebrandt 1364 which is prickly and 1365 which is unprickly, although they were collected in the same locality. We prefer to consider *P. calcicola* Chodat as a variety of *P. senensis* Klotzsch.

P. senensis Klotzsch in Peters, Reise Mossamb. Bot. 1: 113 (1861)
var. *calcicola* (Chodat) Paiva comb. et stat. nov.

P. calcicola Chodat in Mém. Soc. Phys. Genève 31, 2(2): 326 (1893). Cufod. in Bull. Jard. Bot. État 26, 3, Suppl.: 406 (1956)

Typus. SOMALI REPUBLIC: Meid, IV. 1875, *Hildebrandt*, 1364 (*P.*, holotypus; BM, isotypus).

Prickly shrublet about 50 cm high; stems slender, densely crisped-pubescent. Leaves 8-10 × 2-3 mm, narrowly oblanceolate to oblong-lanceolate, densely crisped-pubescent. Flowers yellowish, pedicels up to 5 mm long, crisped-pubescent, in lateral 3-10 flowered racemes, 1.5-2.5 cm long, with crisped (or

patent) pubescent rachis, persistent, ovate-acuminate bracts and bracteoles about 1 mm long. Posterior sepal 4×2.5 mm, keel-shaped, pubescent; wing sepals $6.5-8 \times 6-7$ mm, yellow, ovate-suborbicular, pubescent; anterior sepals 3×2.5 mm, free, keel-shaped, pubescent. Upper petals 5.5×2.5 mm, obliquely oblanceolate; carina 5.5×2.5 mm, with crest 3 mm long. Stamens 8. Capsule $6-7 \times 5$ mm, ellipsoid, pubescent, emarginate at the apex, margin very narrowly winged. Seeds 4×2 mm, densely sericeous; caruncular appendages broad, humped at the apex, and extending almost to the base of the seed.

SOMALI REP.: Sheik Abdahl, 25-V-1949, *Bally*, 7189 (K); Doo-Loo, II-1895, *Cole*, s.n. (K); s.loc., 11-IX-1929, *Collenette*, 52 (K); s.loc., 29-IX-1932, *Gillett*, 4085 (K); Buramo, Warietotug, 1100 m, 31-I-1933, *Gillett*, 4913 (K); Los Darley-Les Durela road, 19-IX-1952, *Hemming*, 53 (K); Meid, IV-1875, *Hildebrandt*, 1364 (BM, P); Malol Sheikh, 1-V-1973, *Ironsides*, 5/73/33 (K); Tabah road, between Erigaro and Maiot, 1500 m, 30-VII-1957, *Newbould*, 732 (K); Markhat, 12-VIII-1957, *Newbould*, 894 (K); s.loc., 1893, *Phillips*, s.n. (K); Belet Mein, 27-X-1957, *Popov*, 1038 (K); s.loc., 12-X-1968, *Richards*, 20 (K).

DEM. REP. YEMEN: Aden, 25 km N of Said, 1500 m, 16-IV-1953, *Griersau*, 254 (E).

OMAN: Jebel Akhdar, 24-X-1979, *Miller & Whitecombe*, 2810b (E).

Alkaline steppes at 1500-2000 m altitude.

BIBLIOGRAPHIC REFERENCES

- BAKER, J. G. & all. (1895). CCCCLXIX - Decades kewensis. *Plantarum Novarum in Herbario Horti Regii Conservatarum. Decades XX & XXI. Kew Bull.* 1895: 180-186.
- BLATTER, E. (1919). *Flora Arabica. In: G. King (Ed.), Rec. Bot. Surv. India* 8(1): 1-123.
- CHODAT, R. (1893). *Monographia Polygalacearum, II. Mem. Soc. Phys. Genève* 31, 2(2): I-XII, 1-492, t. 13-35.
- CHODAT, R. (1896). *Polygalaceae novae vel parum cognitae, VI. Bull. Herb. Boissier* 4, 12: 898-912.
- CUFODONTIS, G. (1956). *Enumeratio Plantarum Aethiopiae. Spermatophyta. Bull. Jard. Bot. État* 26, 3, Suppl.: 345-440.
- SCHWARTZ, O. (1939). *Flora des tropischen Arabien. Mitt. Inst. Allg. Bot. Hamburg* 10: 1-393.

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