Taxonomic Notes on *Ophiopogon* of South Asia V

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*Ophiopogon caulescens* (Blume) Backer, *O. prolifer* Lindl., *O. malayanus* Ridl., *O. dracaenoides* (Baker) Hook. f. and *O. pierrei* L. Rodr. are taxonomically reviewed. Both *O. prolifer* and *O. malayanus* are treated as conspecific with *O. caulescens*. The filaments of *O. caulescens* are united laterally along their entire length or about halfway from the base up. The ovaries of *O. dracaenoides* and *O. caulescens* are concave at the apex. This consistency in the ovary structure implies a close relationship between the two species. *Ophiopogon dracaenoides* is recorded as new to Thailand. *Ophiopogon pierrei* is distinguishable from *O. caulescens* by the free filaments and the ovary which is nearly hemispheric at the apex.

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(8) *Ophiopogon caulescens*, *O. prolifer* and *O. malayanus*

*Chloopsis caulescens* described by Blume (1827) from Java was later transferred by Backer (1924) to *Ophiopogon*. The present survey confirmed that *O. caulescens* (Blume) Backer (Fig. 1) is distributed not only in Java but also in Sumatra, Borneo and the Philippines. Meanwhile, *O. prolifer* was described by Lindley (1846) from Penang, Malaysia. Taxonomically *O. prolifer* has long been a questionable species. For example, Maximowicz (1870) treated this species under 'species dubiae', with a comment that *O. prolifer* is probably to be excluded from the genus *Ophiopogon*. Baker (1879) also treated this species as 'species dubia' (under *Flueggea*). Hooker (1892) noted that *O. prolifer* resembles *Liriope* a good deal. Ridley (1904) regarded *O. prolifer* as a little known and doubtful species. Jessop (1979) reduced *O. prolifer* to a synonym of *O. caulescens* with some doubt. The type specimen of *O. prolifer* has long been missing, and this condition must have been a major cause for the taxonomic ambiguity of the species for years. However, a sketch of the type specimen (Fig. 2) is preserved at Kew [Hooker (1892) also examined this sketch and described it]. After examining this sketch and the original description of *O. prolifer*, I found that several specimens from the Malay Peninsula [A.F.G.Kerr 7804 (L), 7877A (K, BM), 10827 (K, BM, L, P), 21720 (K) – Fig. 3] are consistent with this species. According to the protologue by Lindley (1846), the stamens of *O. prolifer* are united in a very short fleshy ring, and the style is pyramidal. The above specimens from the Malay Peninsula also show the similar characteristics; i.e. the neighbouring filaments are united laterally...
along their entire length, forming an annular, cup-shaped short androphore, and the style is tapering to the apex (Fig. 6A). The vegetative features of these specimens also conform to those of _Ophiopogon prolifer_. Therefore, the specimens from the Peninsula can be identified as _Ophiopogon prolifer_.

Meanwhile, _Ophiopogon prolifer_ closely
Fig. 2. A sketch of the type specimen of *Ophiopogon prolifer* preserved at Kew (K). Scale bar=5 cm.

resembles *O. caulescens* mentioned earlier. As in *O. prolifer*, the filaments of *O. caulescens* are also united laterally. But in *O. caulescens* the united part of the filaments are usually restricted to their lower half (Fig. 6B). This difference in the degree of the filament connation between *O. caulescens* and *O. prolifer* may not deserve a specific delimitation. Further, there seems to be no other particular difference between the two species. Therefore, *O. prolifer* appears to be conspecific with *O. caulescens*. *Ophiopogon caulescens* here circumscribed shows a wide range of variation in some characters. For example, the width of the leaves varies markedly among the specimens. The specimens in Figs. 1 and 3 represent respectively the narrow-leaf form and the wide-leaf form of this species.

*Ophiopogon malayanus* was described by Ridley (1904) from Langkawi on Gunong Raya and Perak at Padang Rengas, Malaysia. As yet I have not examined the type specimen of this species, but several specimens from a type locality, Langkawi [A.F.G.Kerr 21720, K–Fig. 3; E.J.H.Corner (Singapore field no.37872), K, L; E.Soepadmo & B.A.Mahmud 1214, K, L], were made available for this study. All these specimens are assignable to *O. caulescens* (=*O. prolifer*). The general habits described in the protologue of *O. malayanus* are also consistent with *O. caulescens*. I agree with Jessop (1979) who earlier treated the two species as conspecific.

Koorders (1911) recorded *O. japonicus* (Thunb.) Ker Gawl. from Java. His description of the species includes the following passage; “aufrechtes Kraut order Halbstrauch...Stengel in großer Zahl aus dem (night- knolligen) Rhizom hervorsprossend”. This passage seems largely consistent with *O. caulescens*. I have never seen a specimen of wild *O. japonicus* (s. str.) from Java. Although I still have not examined Koorders’ material from Java, it is highly probable that his record of *O. japonicus* from Java includes *O. caulescens*.

Fig. 3. *Ophiopogon caulescens* (=*O. prolifer*, *O. malayanus*) from Langkawi, Malay Peninsula (A.F.G.Kerr 21720, K), which is the type locality of *O. malayanus*.


*Mondo japonicum* (Thunb.) Farw. var. *proliferum* (Lindl.) Farw. in Amer. Midl. Nat. 7: 42 (1921), auct. speciei ‘(L.f.)’.


*Mondo malayanum* (Ridl.) Farw. in Amer. Midl. Nat. 7: 42 (1921).


Glabrous perennial herb. Stem elongate, rhizomatiform, up to 38 cm or longer, to ca.1 cm in diameter, decumbent in lower part, ascending in upper part, emitting ligneous prop roots to ca.3.5 mm in diameter. Leaves fasciculate on apex of stem or borne in shortly distinct tufts on stem, linear to linear-oblong, acute or obtuse, attenuate to base which is sheathing with scarious wings, to ca.60 cm long, 17 mm wide, entire or minutely serrulate on margins, glaucous between veins on abaxial surface. Scape decumbent, to ca.33 cm long, complanate, fluted, often narrowly 2-winged, usually purplish. Inflorescence racemose. Flowers secund, cernuous, 1–3 (4) in axils of bracts. Bracts lanceolate to ovate, acute to caudate, to 2.6 cm long, arcuate, margins often scarious and often minutely serrulate in upper part. Pedicels (including basal stalky part of perianth) 3–8 mm long (true pedicel excluding perianth part to ca.5 mm long), articulate usually around middle (articulation site variable). Perianth lobes 6, oblong-ovate, recurved at apex, 4.5–5.7 (–7.2) mm long, 2–2.3 (–3.2) mm wide. Stamens 6. Anthers lanceolate, apiculate, 1.7–2.8 mm long. Filaments short, 0.6–1.2 mm long, united laterally along their entire length or about halfway from base up. Pistil 1. Style subulate, 3.5–5 (–6.3) mm long, Stigma often minutely 3-toothed. Ovary inferior, concave in central part of apex. Seeds globular.

Distribution: S Thailand (Malay Peninsula), Malaysia (Malay Peninsula, Borneo), Indonesia (Sumatra, Java, Borneo) and the Philippines.

Representative specimens (incl. a sketch of type material) examined:

**Thailand. Malay Peninsula.** Kao Luang, Prachuap, 900–1000 m, fls purple, Jul. 4, 1926, fl. or buds, A.F.G.Kerr 10827 (BM, K, L, P); Bachaw, Pattani, ca.400 m, fls blue, Jul. 13, 1923, fl., A.F.G.Kerr 7877A (BM, K); Kao Kalakiri, Pattani, ca.800 m, flower perianth white, Sept. 11, 1923, fl., A.F.G.Kerr 7804 (L).

**Malaysia. Malay Peninsula.** A sketch of the type specimen of *Ophiopogon prolifer* Lindl. (Penang, 1844, T.Lewis s.n.), drawn from Cambridge herbarium, July 1, 1880 (K); Pulau, Langkawi, Kedah, Gunong Raya, 2400 ft, fls white, Aug. 19, 1972, fl., E.Soepadmo & B.A.Mahmud 1214 (K, L); Langkawi, 1600 m, buds white, June 19, 1932, fl. (buds), A.F.G.Kerr 21720 (K); Langkawi, Gunong Raya, Nov. 15, 1941, E.J.H.Corner, Singapore field no.37872 (K, L). **Borneo.** Sarawak, 1200 ft, 1/2 day from Maputi, fl. white, tube mauve, Jul. 5, 1955, fl., W.M.A.Brooke 10190 (L); Sabah, Mt. Kinabalu, eastern shoulder, 3500 ft, Nov. 22, 1941, fr., W.L.Cheiw et al. s.n. (K); ibid., Apr. 18, 1961, fr., W.L.Cheiw et al. 639 (K); Mt. Kinabalu, eastern shoulder, Camp 1, 4000 ft, fls white, mauve at base, Jul. 29, 1961, fl., W.L.Cheiw et al. 1209 (K); Mt. Kinabalu, Dallas, 3000 ft, Aug. 9, 1931, fl. –fr., J. & M.S.Clements 26034 (UC, BM); Upper Kinabalu, 5000 ft, fl. cream and purplish, Nov. 24, 1933, fl. (buds), J. & M.S.Clements 50449 (K); Kinabalu, Kiab, Nov. 1915, fr., M.S.Clements 10056 (UC); Mt. Kinabalu, 5000 ft, fl. cream interior, purple exterior, Nov. 24, 1933, fl., Clements 50449 (BM); Mt. Kinabalu, Ulu Liwagu and Ulu Mesilau, 5000 ft, perianth green, but with purple tube, Aug. 8, 1961, fl., W.L.Cheiw et al. 2877A (K); Tambunan distr., Crocker
range, Km 58.5 on Kota Kinabalu—Tambunan road, 1425 m, pedicels purple, fls. cream-white, Oct. 1, 1983, fl., J.H. Beaman 7096 (K); Kot Belud distr., Melangkap Kappa on NW side of Mt. Kinabalu, 600—

Indonesia. Sumatra. Lampung prov., Mt. Tanggamus, 1200—1300 m, lower portion of flower blue-violet tinged, tepals otherwise white, anthers (brownish) green, Apr. 29, 1968, fl., M. Jacobs 8135 (C, K, L); Sumatra, fr. Korthals s.n. (L); W. Sumatra, Mt. Sago near Pajakumbuh, fls bluish-white, Mar. 9, 1957, fr., W. Meijer 5623 (L); G. Koerintji, ca. 1600 m, Mar. 5, 1920, buds, Bunnermeyer 8453 (L); G. Mealingtang (?), 1250 m, Jul. 31, 1910, buds, Bunnermeyer 4153 (L). Java. Without detailed locality and date, fl., De Vriese s.n. (K); without detailed locality and date, fr., De Vriese s.n. (K). Borneo. Kalimantan Selatan, at foot of Gunong Besar, Ratan Arai to Bato Kamba, 200—800 m, Feb. 21, 1979, G. Muruta et al. B-4239 (L).


(9) Ophiopogon dracaenoides

Flueggea dracaenoides was described by Baker (1874) from Sikkim and Khasi Hills (India). This species was later transferred by Hooker to Ophiopogon (1892). Lectotype of O. dracaenoides (chosen in this study) is shown in Fig. 4.

Ophiopogon dracaenoides shares with O. caulescens the following floral feature; the ovary is concave at the apex and the style arises from the bottom of its concavity (Figs. 6A—6C). This consistency in the floral structure implies their close relationship. Both species also share an elongate stem. On the other hand, the two species differ as follows; the filaments of O. dracaenoides are almost free, while those of O. caulescens are united laterally along their entire length or about halfway from the base up.

The shape and width of the leaves of O. dracaenoides vary among the specimens; some are broad and elliptic-ovate [e.g., A. Henry 12649 from Simao (Szemao), Yunnan, K], while others narrow and oblanceolate [e.g., A. Henry 11478 from Menzi (Mengtze), Yunnan, K].

A specimen from northern Thailand (F.H. Smiles 13, K) can be assigned to O. dracaenoides, though it is somewhat stunted and in the fruiting stage. This species has hitherto not been recorded from Thailand.


LECTOTYPE (here chosen): Sikkim, alt. 4—6000 ft, Jul. 19 (?), 1848, fl., J.D. Hooker & T. Thomson s.n. (K) [Figs. 4, 6C]


Mondo dracaenoides Farw. in Amer. Midl. Nat. 7: 42 (1921), p.p., excl. var. clarkei et var. reptans.

Glabrous perennial herb. Stem decumbent in lower part, ascending in upper part, to 65 cm or longer, to ca. 5.5 mm in diameter, bearing tufts of leaves at intervals of ca. 3.5—20 cm, emitting at nodes ligneous roots to 3.5 mm in diameter, internodes covered with scanty leaves or their remnants after withering. Leaves including petiole to ca. 21.5 cm
long. Blades elliptic, obovate, narrowly oblong, or oblanceolate, acuminate at apex, attenuate into petiole, entire or serrulate on margins, often glaucous beneath, (7–) 15–27-veined, 6.5–14 cm long, (1–) 1.6–3.7 cm wide. Petioles slender, 3.5–9 cm long. Scape

Fig. 4. Lectotype of *Ophiopogon dracaenoides* (Sikkim, J. D. Hooker & T. Thomson s.n., K).
declinate, complanate, often fluted, to 12 cm long. Flowers 1–3 in axils of bracts, cernuous. Bracts lanceolate, scarious, to 1.8 cm long. Pedicels (incl. basal stalky part of perianth) 3–6 (–10.5) mm long (true pedicels excl. perianth part 1.7–3 mm long), jointed usually around middle. Perianth lobes 6, ovate-lanceolate, 4.5–5.5 mm long, ca. 2.3 mm wide. Stamens 6. Anthers narrowly lanceolate, 2.4–2.6 mm long. Filaments very short, ca. 0.5 mm long, almost free. Pistil 1. Style subulate, 5 mm long. Ovary inferior, concave in apical part. Seeds globose to ellipsoidal.

Distribution: E India (Sikkim, Assam, Khasi), N Thailand, Laos and SW China (SE Yunnan, W Guangxi and Guizhou).

Other representative specimens examined:

**India.** Sikkim, 4–6000 ft, Jul. 28, 1848 (?), fl., J.D. Hooker & Thomson s.n. (in part; of the two samples on the sheet, only the right one is *O. dracaenoides* (lectotype, K); ibid., 4–6000 ft., March 1850, fr., J.D. Hooker & Thomson s.n. (lectotype, K); ibid., 4–6000 ft, no date, fr., J.D. Hooker & Thomson s.n. (lectotype, K, L).

Assam, Lushai Hills, Sairep, 5000 ft, fruits bright blue, Jan. 1928, fr., N.E. Parry 479 (K); Khasia, 4–6000 ft, fl. white, July 19, 1850, fl., J.D. Hooker & Thomson s.n. (lectotype, K).

**Laos.** Luang Prabang, Muong-ngoii, 460 m, Apr. 2, 1932, Polaine 20641 (P).

**Thailand.** Northern Siam, Pu Sam Sum, Mar. 13, 1893, presented Oct. 1894, F.H. Smiles 13 (K).

**China.** Yunnan, Szemao, s.mts, 4000 ft, fr., A. Henry 12649 (K); Yunnan, Mengtze, 5000 ft, A. Henry 11478 (K); Yunnan, Ma-yu, 840–1300 m, Mt. Huanglianshan, Luchun, Oct. 30, 1995, fr., S.K. Wu et al. 802 (MAK); ibid., Oct. 31, 1995, fr., S.K. Wu et al. 2587 (MAK); Yunnan, Qi-ma-ba, 900–1200 m, Mt. Huanglianshan, Luchun, Nov. 4, 1995, S.K. Wu et al. 935 (MAK); Yunnan, Malipo county, Xiajinchang, ca. 1400–1550 m, Feb. 22, 1994, fr., S.K. Wu et al. 273 (MAK); Guizhou (Kouy-tcheou), Houang-tsao-pa, 1916, fl., M. Cavalerie 4580 (P); Kweichow, Houang-tsao-pa, 1900–1920, J. Cavalerie 7368 (E).

**(10) Ophiopogon pierrei**

*Ophiopogon pierrei* (Fig. 5) was described by Rodriguez (1928) from Cambodian distribution. In general appearance *O. pierrei* closely resembles the narrow-leaf form of *O. caulescens* (Fig. 1). But, the two species differ in some floral characters; in *O. pierrei* the filaments are very short and free, and the ovary is nearly hemispherical (or convex) in the upper part (Fig. 6D), while in *O. caulescens* the filaments are more or less united laterally, and the ovary is deeply concave at the apex (cf. chap. 8, Figs. 6A, 6B). *Ophiopogon pierrei* seems more closely related to *O. stenophyllus* (Merr.) L. Rodr. (described from Guangdong, China) or to *O. chiniiii* F.T. Wang & Ts. Tang (described from Guangxi, China) than to *O. caulescens*, since the ovaries of both *O. stenophyllus* and *O. chiniiii* are also convex to some degree at the apex (Tanaka unpub.). I could examine only one specimen (the type) of *O. pierrei* in this study. The floral material remaining on the type sheet is too little to clarify all its features. Further research based on ample material is needed.

**Ophiopogon pierrei** L. Rodr. in Bull. Soc. Bot. Fr. 75: 999 (1928); in Lecomte, Fl. Indo-Chine 6: 663 (1934). [Figs. 5, 6D]

Glabrous perennial herb. Stem to more than 8 cm long, emitting several ligneous prop roots. Leaves fascicle on apex of stem, linear, acute, attenuate to base, minutely serrulate on margins, glaucous between veins on abaxial surface, to ca. 33.5 cm long, to 5.7 mm wide. Scape arching, complanate, ca. 11.5 cm long. Bracts ovate to narrowly lanceolate, caudate, almost entire, scarious, to 1.3 (–5.3) cm long. Pedicels 2.3–3 mm long (excluding basal part of perianth). Flowers 1–2 in axils of bracts. Perianth lobes 6, lanceolate, 5.8 mm long, ca. 2 mm wide. Stamens 6. Anthers narrowly lanceolate, apiculate at apex, 2.7–3 mm long. Filaments very short, free, to ca. 0.5 mm long. Pistil 1. Style filiform. Ovary, semiinferior, conic to hemispheric at apex.

Distribution: Cambodia.
Fig. 5. Type specimen of *Ophiopogon pierrei* (Cambodia, L. Pierre 6679, P).
Fig. 6. Diagrammatic sketches of the floral structure of four species of Ophiopogon (lateral view). A. O. caulescens from Malay Peninsula. B. O. caulescens from Sumatra, Java, Borneo and Philippines. C. O. dracaenoides. D. O. pierrei. In A, the neighboring filaments are united laterally along their entire length, while in B they are united about halfway from the base up.

Specimen examined:


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Reference
標本のスケッチ [基準標本（マレーシア，Penang）はかなり以前から所在不明となっている] から，今回検したマレー半島産のいくつかの標本が本種に該当すると判断した。本種の花糸は，(腹面寄りの) 側面で合生し環状の構造（雄器柄）を形成している。一方，ジャワから記載された O. caulescens にも花糸の合生が見られ（ただし，O. prolifer の花糸は側面のほぼ全長について合生しているが，O. caulescens では花糸の合生部分はその下半部に限られているものが多い），他の部分の性質も O. prolifer とよく類似している。O. caulescens と O. prolifer は種のランクで区別するほどの格別な差異を特に持たないと判断されるので，両種を同種として扱った（Jessop も疑問符付きで両種を同一種として見なしている）。O. malayanus は基準産地からの標本（マレーシア，Langkawi）と原記載から判断すると，やはり O. caulescens (= O. prolifer) と同種であると思われる（Jessop も両種を同一種と見なししている）。O. caulescens（O. prolifer と O. malayanus を含む）はタイ（マレー半島），マレーシア（マレー半島，ボルネオ），フィリピン，インドネシア（スマトラ，ジャワ，ボルネオ）に分布する。（2）O. dracaenoides の子房頂部中央は窪んでいるが，これと同様の構造は O. caulescens にも見られる。両種は延長する茎を持つことなど栄養体部分についても類似する点があるので，比較的近縁な種であると推定される。O. dracaenoides はインド東部，タイ北部，ラオス，中国西南部に分布する。タイにおける分布は初記録である。（3）O. pierrei は O. caulescens の細い葉を持つ個体とよく類似するが，O. caulescens では子房頂部の中央が窪んでいるが，O. pierrei では子房の上部は円錐状ないし半球状に膨れている。本種はカンボジアの基準産地でのみ知られている。

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