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Notes on the identity of *Vernonia shevaroyensis* (Asteraceae) and its neotypification

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वरनोनिया शेवारोयेन्सिस (एस्टेरेसी) की पहचान पर टिप्पणी एवं इसका नियोटाइपिफिकेशन

बन्दना भट्टाचार्जी, पी. लक्ष्मीनरासिम्हन, सोभन कुमार मुखर्जी, एस. कलियामूर्ती एवं अभिषेक भट्टाचार्जी

सारांश

वरनोनिया शेवारोयेन्सिस गैम्बल को प्रस्तुत शोध पत्र में *वरनोनिया विवेकानाथानाई* उनियाल के विषमरूपी समप्ररूप के रूप में प्रतिपादित किया गया है, एवं मूल संग्रहण की अनुपस्थिति में *वी. शेवारोयेन्सिस* का नवप्ररूप (नियोटाईप) भी स्थापित किया गया है।

ABSTRACT

Vernonia shevaroyensis Gamble is treated here as a heterotypic synonym of *Vernonia vivekanathanii* Uniyal and a neotype has been designated for *V. shevaroyensis* in the present communication in absence of any original material of the name.

Keywords: Compositae, endemic, *Monosis wightiana,* synonym, *Vernonia vivekanathanii,* Vernonieae.

INTRODUCTION

De Candolle (1834) described *Monosis wightiana* characterized by 'single flowered head' Schultz (1847) transferred '*Monosis? tomentosa* DC.' to *Vernonia* Schreb. as *Vernonia monosis* Sch. Bip. (replacement name) because *Vernonia tomentosa* Elliott was a pre-occupied name. While transferring *Monosis wightiana* DC. to *Vernonia*, Clarke (1876) named it *Vernonia monosis* Benth. ex C.B. Clarke due to the pre-occupied *Vernonia wightiana* Arn., but the replacement name was also a later homonym and thus illegitimate due to the earlier published *Vernonia monosis* Sch. Bip. However, Clarke also gave importance to the 'single flowered head' of *Monosis wightiana* and treated it as a distinct species (as *Vernonia monosis* Benth. ex C.B. Clarke). Later Hooker (1881) considering the 'single flowered head' as a mere variation, reduced *Monosis wightiana* DC. as a doubtful variety of *Vernonia arborea* Buch.-Ham. as '*Vernonia arborea* var. ? *wightiana*', whereas Gamble (1921) treated *Vernonia monosis* Benth. ex C.B. Clarke (*nom. illegit.*) as a distinct species. Uniyal (1995) supported Gamble in treating *Vernonia monosis* as a distinct species, but proposed a new name *viz.*, *Vernonia vivekanathanii* Uniyal for the illegitimate *Vernonia monosis* Benth. ex C.B. Clarke (non *Vernonia monosis* Sch. Bip.). He also differentiated it from *Vernonia arborea* by the presence of single flowered head and presence of biseriate vesicular glandular hairs on fruits. Karthikeyan & al. (2009) treated *Vernonia vivekanathanii* as a distinct species; whereas Nayar & al. (2014) treated *Vernonia vivekanathanii* as a synonym of *Monosis wightiana*. During the

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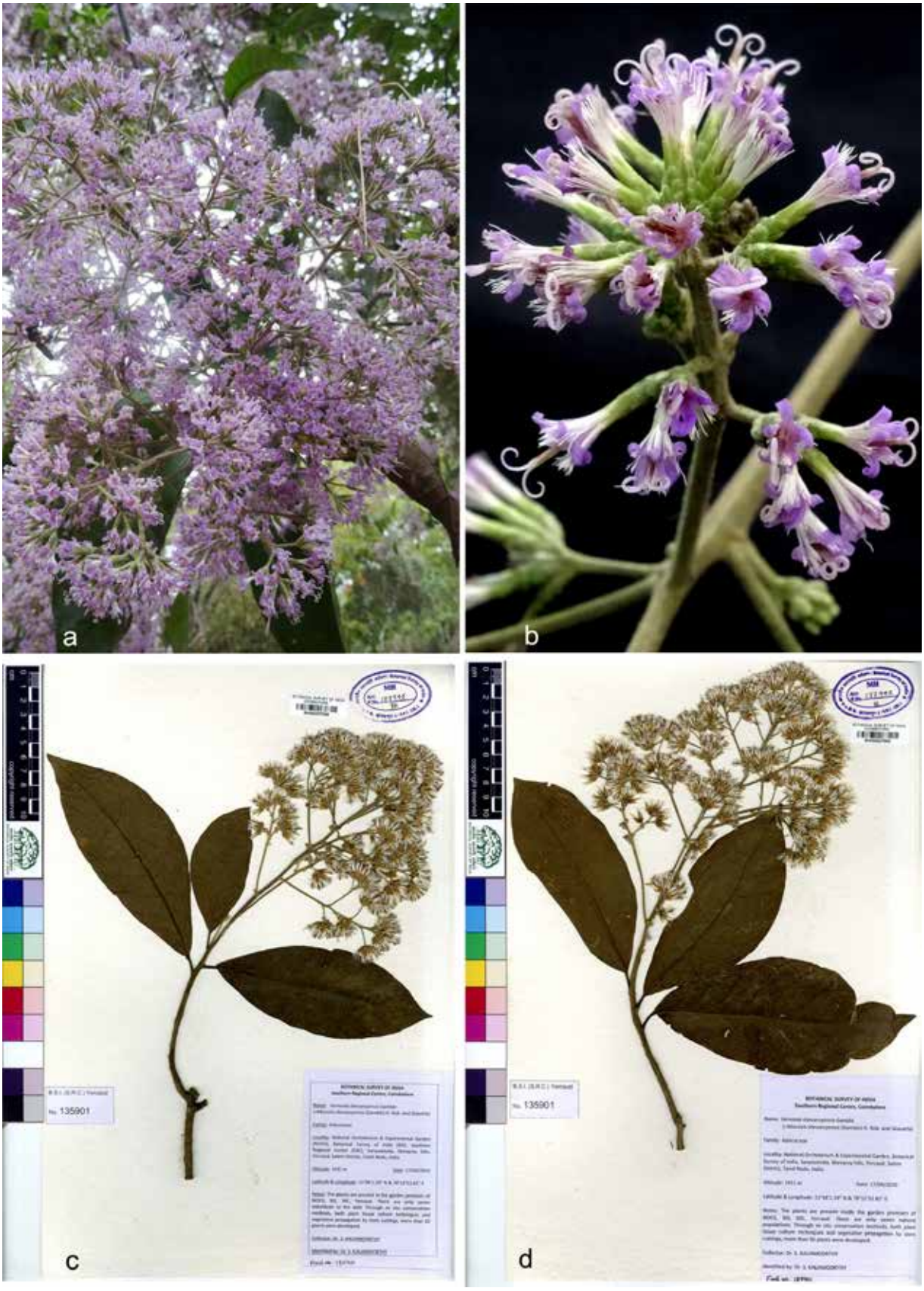

Plate 1. a & **b**. Portion of inflorescence of *Vernonia vivekanathanii* Uniyal; **c.** Neotype of *Vernonia shevaroyensis* Gamble; **d.** Isoneotype of *Vernonia shevaroyensis* Gamble.

revisionary study on Indian Vernonieae, the first author has observed that *Vernonia shevaroyensis* Gamble, an endemic species described by Gamble from Shevaroy Hills, India shares similar morphological characters with *Vernonia vivekanathanii* and is indistinct from the later. Therefore, *Vernonia shevaroyensis* is synonymised here under *Vernonia vivekanathanii* due to priority of the replaced synonym of *Vernonia shevaroyensis (= Monosis wightiana* DC.). A neotype has also been designated here for *Vernonia shevaroyensis* in absence of any original material of the name.

NOTE ON THE IDENTITY OF *VERNONIA SHEVAROYENSIS* GAMBLE

Though Gamble (1921) differentiated *Vernonia shevaroyensis* from *Vernonia monosis* (= *Vernonia vivekanathanii*) in having oblanceolate leaves with glabrous above, scabrid-pubescent beneath, *c.* 15.24–25.4 cm long lamina, main nerves *c.* 10–12 pairs, *c.* 1.27–1.52 cm apart on midrib, irregularly reticulate between; ribs of achene not prominent (vs. obovate leaves with pubescent nerves above, densely brown tomentose beneath, *c.* 10.16–20.32 cm long lamina, main nerves 10–15 pairs, *c.* 1.27–1.9 cm apart on midrib, with more or less regular transverse nervules; ribs of achene very prominent, with a few hairs and glands between them in *V. monosis*), we have found all these characters either variable or overlapping. Therefore, in the present treatment, *Vernonia shevaroyensis* is treated as a new synonym of *Vernonia vivekanathanii*.

Robinson & Skvarla (2006) treated *Monosis* DC. as distinct genus and recognized *Monosis wightiana* and *Monosis shevaroyensis* (= *Vernonia shevaroyensis*) as different species based on variable characters (leaves obovate-elliptic, brown-tomentose below in *Monosis wightiana* vs. leaves oblanceolate, rather scabrid below in *Monosis shevaroyensis*). Karthikeyan & al. (2009) treated *Monosis wightiana* and *Vernonia arborea* Buch.-Ham. var. *wightiana* (DC.) Hook. f. as synonym of *Vernonia arborea*. However, according to our study, *Vernonia shevaroyensis* and *Vernonia vivekanathanii* (= *Monosis wightiana*) are indistinct species, but definitely distinct from *Vernonia arborea* especially in having single flowered heads and glandular achenes, and due to priority *Vernonia shevaroyensis* is reduced here as a heterotypic synonym of *Vernonia vivekanathanii.*

Note on Neotypification of *Vernonia shevaroyensis* Gamble

While describing *Vernonia shevaroyensis,* Gamble (1920) cited the collection '*Perrottet* 376' from Shevaroy hills and mentioned its presence at 'Herb. Calcutta', i.e. at CAL. Robinson & Skvarla (2006) probably followed Gamble and mentioned the occurrence of '*Perrottet* 376' at CAL. During our study, we have searched the type at CAL and also at B, BM, DD, H, K, L, OXF, US, P, but could not locate. Therefore, in the absence of any original material, we are designating *S. Kaliamoorthy* 135901 (MH!) here as neotype of *Vernonia shevaroyensis* which is collected from the type locality (Shevaroy hills).

TAXONOMIC TREATMENT

Vernonia vivekanathanii Uniyal in Hajra & al. (eds.), Fl. India 13: 391. 1995; Karthik. & al., Flow. Pl. India Dicot. 1: 295. 2009. *Monosis wightiana* DC. in Wight, Contr. Bot. India: 5. 1834; Wight, Icon. Pl. Ind. Orient. 3: t. 1085. 1846; T.S. Nayar & al., Flow. Pl. West. Ghats 1(Dicots): 170. 2014. Type: India or. montibus "Neelgherry," *Wight* 1376 (syntype K, photo!); Wight in Wall., Numer. List No. 3028 (syntype G, photo!). *Strobocalyx wightiana* (DC.) Sch. Bip., Jahresber. Pollichia 18-19: 170. 1861. *Vernonia monosis* Benth. ex C.B. Clarke, Compos. Ind.: 24. 1876, *nom. illegit*., non Sch. Bip.: 1847; R.R. Rao & Razi, Syn. Fl. Mysore Distr.: 550. 1981. *Vernonia arborea* var. *wightiana* (DC.) Hook. f., Fl. Brit. India 3: 239. 1881. *Vernonia shevaroyensis* Gamble, Bull. Misc. Inform. Kew. 1920: 341. 1920; Gamble, Fl. Madras 2(4): 470. 1921; V. Chandras. in A.N. Henry & al., Fl. Tamil Nadu Anal. 2: 53. 1987; R.R. Rao & al., Fl. Ind. Enum. Aster.: 89. 1988; Uniyal in Hajra & al. (eds.), Fl. India 13: 387. 1995; Karthik. & al., Flow. Pl. India Dicot. 1: 294. 2009, **syn**. **nov**. Type: South India, Shevaroy Hills, *Perrottet* 376 (CAL, not found); **Neotype,** designated here: India, Tamil Nadu, Salem district, Shevaroy hills, Sanyasimala, Yercaud, National Orchidarium and Experimental Garden (NOEG), Botanical Survey of India (BSI), Southern Regional Centre (SRC), 17.04.2020, 1431 m. *S. Kaliamoorthy* 135901 (MH, MH00227006!); Isoneotypes: MH (MH00227004!, MH00227005!). *Monosis shevaroyensis* (Gamble) H. Rob. & Skvarla, Proc. Biol. Soc. Washington 19(4): 606. 2006; T.S. Nayar & al., Flow. Pl. West. Ghats 1(Dicots): 170. 2014. *Vernonia arborea* sensu Karthik. & al., Flow. Pl. India Dicot. 1: 291. 2009, *p.p.* non Buch.-Ham. 1824. Plate 1, 2

Medium sized to tall, evergreen trees. Leaves simple, alternate; lamina oblanceolate to obovate, rarely elliptic-lanceolate, 9–26 × 4–10 cm, round to cuneate at base, subacute to acute at apex, entire to repand-crenate at margins, abaxially scabrid-pubescent to brown-tomentose, adaxially glabrous except the veins; lateral veins 9 to 15 pairs; petioles 0.8–1.2 cm long. Synflorescence in axillary or terminal panicles, thyrse-like, homogamous capitulum at the end of the rigid divaricating branches of the panicle; peduncle 0.8–12 cm long. Capitulum subsessile, medium sized, *c.* 1 cm long. Involucre tubular,

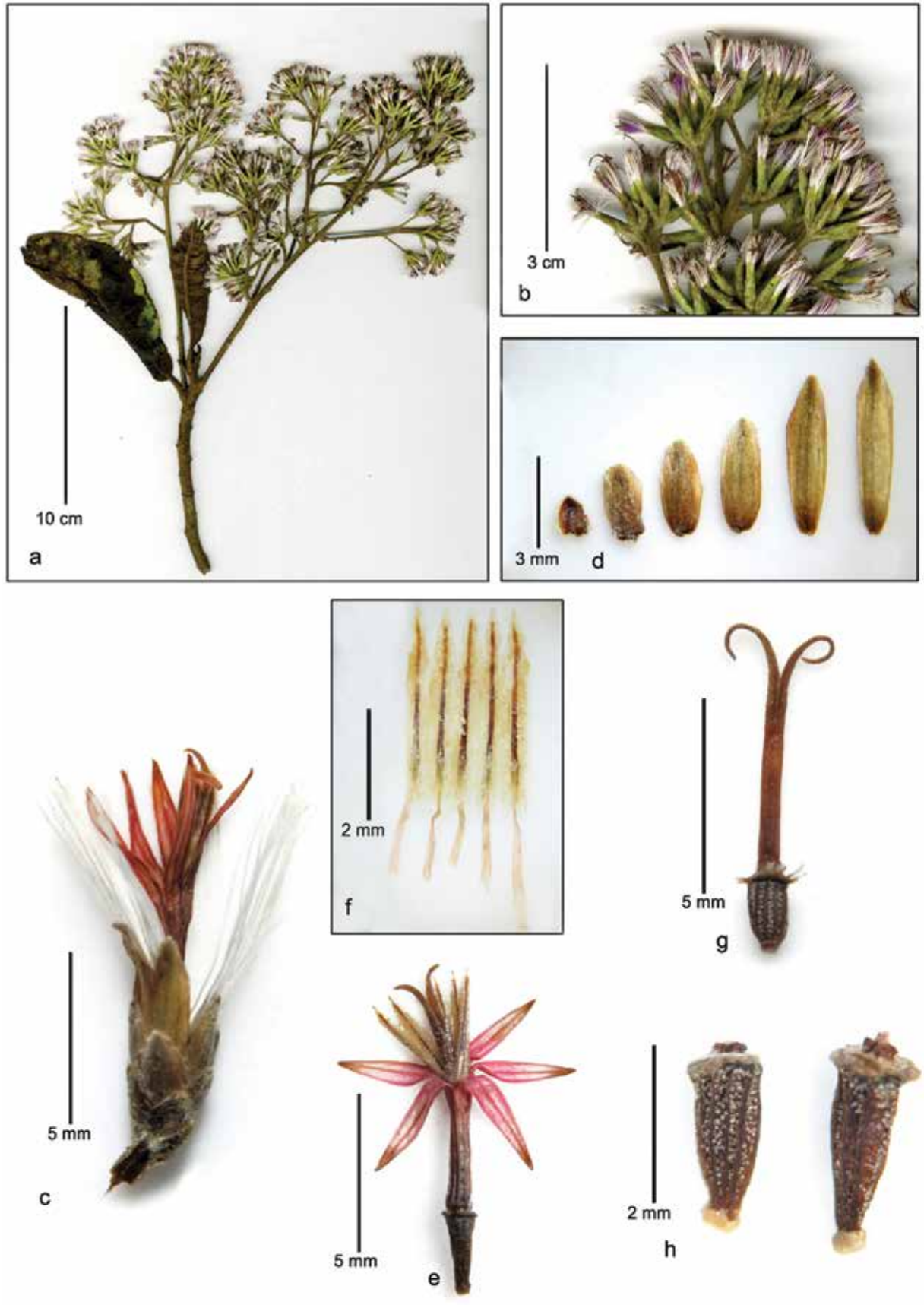

Plate 2: *Vernonia vivekanathanii* Uniyal. **a.** Inflorescence with leaves; **b**. Inflorescence (close-up); **c**. Single flowered head; **d**. Phyllaries; **e**. Flower (pappus removed); **f**. Stamens; **g**. Ovary with bifid style and stigmatic surfaces; **h**. Achenes (pappus removed).

imbricate; phyllaries 5–6-seriate, outermost ovate or suborbicular, 1–2 mm long, subacute or acuminate at apex, villous almost throughout, innermost linear, 4.5–5 mm long, subacute or obtuse at apex, minutely fimbriate on margins and villous near apex. Floret single per capitulum, bisexual, actinomorphic, 0.8–1.0 cm long, purplish. Corolla 5-lobed, united up to 3/4th to form a tube, tube slender, *c.* 4 mm long, with free apices, apical part funnel shaped; free lobes linear-lanceolate, acute at apex, glabrous. Stamens 5, epipetalous, syngenesious, *c.* 5 mm long; anthers linear-sagittate, *c.* 2.5 mm long, 2-celled, dehiscing longitudinally, united to form a cylinder around style. Carpels 2, syncarpous; ovary inferior, 1.3–2.5 mm long, unilocular with single ovule in basal placentation; style slender, bifid at apex, branches equal, subulate, pilose. Achenes subcylindric-clavate, 2–3 × 0.5–1 mm, light brown to brown, with stylopodium at apex, 10-ribbed, glabrous or with a few hairs, with numerous glands in between the ribs. Pappus numerous, plumose, in two rows, 0.7–1.0 cm long, white, barbed, persistent, often slightly bent at base.

Flowering and *fruiting:* November–April

Habitat: In dense sholas, sometimes on hill-slopes

Distribution: INDIA (Karnataka, Kerala, Tamil Nadu); endemic

Etymology: The generic name was coined in honour of the English botanist and entomologist William Vernon (*c.*1666–1711), whereas the specific epithet was coined in honour of Shri K. Vivekanathan, former Scientist of Botanical Survey of India, Southern Regional Centre, Coimbatore for his keen interest in the genus *Vernonia*.

Chromosome number: 2n = 20 (Narayana, 1979)

Specimens examined: Kerala: Kottayam district, Pampadumparai, 1350 m, 14.04.1960, *J.C. Sengupta* 10226 (CAL); Quilon district, Pamba Dam-Vandiperiyan, 1000 m, 12.03.1980, *K. Vivekanathan* 66206 (CAL); Thrissur (Trichur) district, Sholaiyar-Malikkamparai Ghat road, 1350 m, 05.12.1984, *K. Ramamurthy* 80855 (CAL). Tamil Nadu: Coimbatore district, Annamalai, Andiparai shola, *c.* 1500 m, 10.03.1978, *A.A. Ansari* 1127 (CAL); Kanyakumari district, way to Muthukuzhivayal, *c.* 1000 m, 18.01.1978, *A.N. Henry* 52420 (CAL); Nilgiris district, Ooty (Ootacmund), Sims Park, 15.03.1981, *K. Sathish Kumar* s.n. (TBGT); Salem district, Yercaud, Nagalur road (5th km), 1500 m, 15.03.1976, *K.M. Mathew & V. Alphonse* 1636 (RHT); Shevaroy hills, Yercaud, Nagalur-Murapalam Forest, 04.06.1983, *E. Vajravelu* 77723 (MH); Peninsular India, without precise locality, *Wight* 1526 (CAL).

Additional note: Robinson (1990; 1999 a, b; 2007), Robinson & Skvarla (2006; 2007; 2009 a, b) and Robinson & al. (2008), mainly based on pollen and a few micro-morphological characters, divided the genus *Vernonia* by reinstating and describing many smaller genera, like *Acilepis* D. Don, *Baccharoides* Moench, *Cyanthillium* Blume, *Decaneuropsis* H. Rob. & Skvarla, *Distephanus* Cass., *Gymnanthemum* Cass., *Khasianthus* H. Rob. & Skvarla, *Monosis* DC., *Strobocalyx* (Blume ex DC.) Spach, *Tarlmounia* H. Rob. & al., *Uniyala* H. Rob. & Skvarla with *Vernonia s.str.* restricted to North America. During the present work, the authors also studied pollens of some Indian members under Scanning Electron Microscope to verify the justification of dividing *Vernonia* into several smaller genera which caused significant instability in nomenclature. However, it has been observed that most of these segregates are rather difficult to delimit as these are recognized by giving much emphasis on micro-morphology of pollen and other micro-morphological characters, rather than other easily observable characters. Therefore, in the present work, we have not followed Robinson's concept of *Vernonia s.str.* and treated the segregates (Indian members) under *Vernonia* by giving importance to multiple, easily observable characters to ease in identification and also to stabilize the circumscription and nomenclature. Molecular study on the entire tribe covering most of the members with good sampling is essential to take any concrete decision on the generic delimitation of *Vernonia s.l.*

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