

Systematic studies on the grasses of Velliangiri hills, a part of Nilgiri Biosphere Reserve, India-with special reference to Indian endemics

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Abstract

This paper highlights the notes on the occurrence of 57 species of endemic grasses, spreading over 25 genera belonging to the family Poaceae that have been collected from Velliangiri hills, a part of Nilgiri Biosphere Reserve, the Western Ghats of Coimbatore District, Tamil Nadu, India. Of the 57 species of endemics, 19 species are rare and threatened, four species are reported as additions to the flora of Tamil Nadu and 16 species are forms additions to the flora of Coimbatore district also. *Tripogon pungens* is rediscovered after its type collection, which is endemic to southern Western Ghats, India

Keywords : endemic grasses, nilgiri biosphere reserve, poaceae, Velliangiri hills, western ghats

INTRODUCTION

The grasses are a natural and homogenous group of plants with remarkable diversity, belonging to the family Poaceae, the fourth largest family of flowering plants in the world, with over 700 genera and ca 10,000 species. In India there are about 264 genera and 1291 species, mostly confined to Western Ghats. About 120 genera and 400 species are reported from Western Ghats (Nair and Daniel, 1986). In Tamilnadu, there are about 145 genera and 436 species. Grasses control soil erosion, make turf, form lawns and provide major source for alcohol (Sreekumar and Nair, 1991). The study of the grasses has not attracted the desired attention, as the group is considered difficult for identification. Their spikelets being minute, the grasses require careful dissection for correct determination. Being a botanically neglected group, grasses need a separate taxonomic group. Hence, an attempt was made in the present study on the grasses of Velliangiri hills, Tamil Nadu.

STUDY AREA AND METHODOLOGY

Velliangiri hills comes under Boluvampatti Reserve Forests of Nilgiri Biosphere Reserve and is one of the major hill ranges of Western Ghats which lies between the longitude 6° 40' and 7° 10' E and latitude 10° 55' and 11° 10' N and form the western boundary of Coimbatore District, Tamil Nadu and bordering the Palghat District of Kerala. This area consists of seven hillocks that are vegetationally very rich and socio-religiously important. A famous temple, called Velliangiri Andavar temple also called "Thenkailayam" which is situated at the peak

of reserve forest (1840 m msl.) is one of most popular pilgrimage places and is the highest point of Velliangiri hills. The altitude ranges from 480 and 1840 m above msl. The forest types met within the study area are southern tropical thorn forests (scrub jungles), tropical dry deciduous forests, tropical wet evergreen forests, temperate forests (sholas) and southern montane humid grasslands (Champion and Seth, 1968). The soil type is red, loamy, acidic and ferruginous. The average rainfall of the hills is 4500 mm at peak and 3500 mm at foothills per annum. The festive season for pilgrims to visit the Velliangiri Andavar temple is March-June and no moon days of every month.

Intensive floristic survey conducted in the Velliangiri hills during 2003-2005, had resulted in the collection of 1715 taxa spreading over 154 families of angiosperms. Among them, the family Poaceae ranks first with 243 species of grasses. Of the 243 species, 57 species are endemics (Bor, 1960; Ahmedullah and Nayar, 1987; Henry *et al.*, 1989; Nayar, 1996; Matthew, 1999) which are spreading over 25 genera. Of the 57 species of endemics, 19 species are coming under rare and threatened category. Four species are reported as additions to the flora of Tamil Nadu and 16 species are forms additions to the flora of Coimbatore district. The species *i.e. Tripogon pungens* is rediscovered after its type collection which is strictly endemic to southern Western Ghats. Correct nomenclature, description, ecology, distribution and specimen examined together with phenological data were given for each species for further collection and easy identification. The specimens are deposited at Kongunadu Arts and Science College Herbarium (KASCH), Coimbatore, Tamil Nadu South India.

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ENUMERATION

1. *Agrostis peninsularis* Hook.f., Fl. Brit. India 7: 255. 1896;

Annuals. Culms tufted, erect or geniculate, slender up to 40 cm high. Leaves linear-lanceolate, 5-15 x 0.2-0.5 cm, acute or acuminate. Panicles ca 18 cm long, lax, open. Spikelets elliptic or oblong-elliptic, ca 3 mm long; callus glabrous.

Ecology: Rare in shola border at about 1600 m above msl.

Flowering & Fruiting: August-December; **Specimen Examined:** MM 1602.

Distribution: Hills of Peninsular India; Rare and threatened.

2. *Agrostis pilosula* Trin. in Mem. Acad. Imp. Sci. Saint-Petersbourg, Ser. 6, Sci. Math., Seconde Pt. Sci. Nat. 6: 372. 1841, var. *filifolia* Bor in Kew Bull. 9: 459. 1954 et in Grass. Burma, Ceylon, India, Pakistan 389. 1960.

Annuals. Culms erect or geniculately ascending, 10-30 cm high. Leaves linear, 3-18 x 0.1-0.4 cm, scabrid. Panicles broadly ovate, loose and open, rarely contracted, pyramidal or lanceolate, 3-15 cm long; pedicels inflated at tip. Spikelets elliptic-lanceolate or linear-elliptic, 2-3 x 0.5-1.5 mm, 1-flowered.

Ecology: Rare in shola border and open grasslands at about 1500 m above msl.

Flowering & Fruiting: August-December; **Specimen Examined:** MM 1145.

Distribution: Southern Western Ghats, Palni hills & Nilgiri Biosphere Reserve; Rare and threatened.

ANDROPOGON L.

3. *Andropogon longipes* Hack. in Flora 68: 138. 1885.

Annuals. Culms tufted, erect or rarely geniculate, 50 cm high. Leaves linear-lanceolate or lanceolate, 5-15 x 0.3-0.5 cm, sparsely hairy on both surfaces, acute or acuminate. Racemes 2, ca 4.5 cm long; axils hairy. Sessile spikelets lanceolate, compressed; callus villous.

Ecology: Rare in shola border at Velliangiri top at about 1800 m above msl.

Flowering & Fruiting: July-September; **Specimen Examined:** MM 1731.

Distribution: Southern Western Ghats of Tamil Nadu, Nilgiris & Velliangiri hills; Rare and threatened.

Notes: Previously this narrow endemic species was reported only from Nilgiris of Tamil Nadu State. Hence, the present collection shows the extension of its known range of distribution other than the type locality.

ARTHRAOXON Beauv.

4. *Arthraxon depressus* Stapf. ex Fischer in Kew Bull. 1933: 349. 1933 et Fl. Pres. Madras 3: 1198. 1957.

Perennials. Culms tufted, erect or geniculate up to 40 cm high. Leaves ovate-lanceolate, 2.5-3.5 x 1-1.5 cm, rounded or shallowly cordate at base, acute-acuminate, pubescent on both surfaces. Racemes 2-4, ca 5 cm long; joints 3-4 mm long, pubescent. Sessile spikelets ca 6.5 mm long.

Ecology: Common in grassy hill slopes and shola border at about 1400 m above msl.

Flowering & Fruiting: August-November; **Specimen Examined:** MM 3281.

Distribution: India.

5. *Arthraxon lanceolatus* (Roxb.) Hochst. in Flora 39: 188. 1856; Ramachandran in J. Econ. Tax. Bot. 22(2): 460. 1998. *Andropogon lanceolatus* Roxb., Fl. Ind. 1: 262. 1820.

Annuals or stoloniferous perennials. Culms erect or geniculate, 20-70 cm high, wiry. Leaves lanceolate, 1-5 x 0.2-0.9 cm, acuminate. Racemes digitate, 2-4, 2-5 cm long. Sessile spikelets lanceolate, 5-6 mm long.

Ecology: Rare in shola border at about 1300 m above msl.

Flowering & Fruiting: August-December; **Specimen examined:** MM 1554.

Distribution: Southern Western Ghats; Rare and threatened.

Notes: This rare and endemic grass is represented in MH only by the collection of C.A. Barber made during 1902 and 1905 from Andhra Pradesh. This species can be easily distinguished by the presence of echinate ornamentation in lower glume of sessile spikelet.

ARUNDINELLA Raddi

6. *Arundinella ciliata* (Roxb.) Nees ex Miq. in Verh. Kon. Ned. Inst. 3(4): 30. 1851. *Holcus ciliatus* Roxb., Fl. Ind. 1: 321. 1820.

Annuals. Culms tufted, erect up to 25 cm high. Leaves elliptic-lanceolate or linear-lanceolate, 2-12 x 0.5-1.2 cm, flat, acuminate, tuberculate-pilose. Panicles oblong-lanceolate, 2-15 cm long. Spikelets oblong.

Ecology: Common in open grassy hill slopes, footpaths and rock crevices at about 800 m above msl.

Flowering & Fruiting: September-December; **Specimen Examined:** MM 1397.

Distribution: Hills of Peninsular India.

7. *Arundinella leptochloa* (Nees ex Steud.) Hook.f., Fl. Brit. India 7: 76. 1896. *Panicum leptochloa* Nees ex Steud., Syn. Pl. Glumac. 1: 62. 1854.

Perennials. Culms erect or geniculate, up to 1 m high. Leaves lanceolate or linear, 1-15 x 0.5-2 cm, rounded or shallowly cordate at base, acuminate. Inflorescence of contracted panicle, 10-37 cm long, lax. Spikelets elliptic-lanceolate.

Ecology: Common in grassy hill slopes at about 1000 m above msl.

Flowering & Fruiting: Throughout the year; **Specimen Examined:** MM 1820.

Distribution: Peninsular India.

8. *Arundinella mesophylla* Nees ex Steud., Syn. Pl. Glumac. 1: 115. 1854.

Perennials. Culms tufted, erect or decumbent, up to 70 cm high. Leaves lanceolate or linear-lanceolate, 2-15 x 0.1-1.5 cm, flat, acute to short acuminate at apex. Panicles 2-15 cm long, often spreading; axis hirsute-glabrous. Spikelets lanceolate.

Ecology: Common in open grasslands and rocky hill slopes at 1500 m above msl.

Flowering & Fruiting: July-December; **Specimen Examined:** MM 899.

Distribution: Hills of Peninsular India.

9. *Arundinella metzii* Hochst. ex Miq. in Verh. Konik. Nederl. Inst. 3(4): 31. 1851; Murugesan & Balasubramaniam in My Forest 42(4): 380. 2006. *A. pygmaea* Hook.f., Fl. Brit. India 7: 72. 1896.

Annuals. Culms erect or geniculate, up to 60 cm high. Leaves lanceolate or linear-lanceolate, 4-10 x 0.5-1 cm, rounded or shallowly cordate at base, acute to acuminate. Panicles lax, 10-15 x 3.5-7.5 cm, oblong. Spikelets ovate-lanceolate or elliptic-lanceolate, 2.5-3.5 mm long.

Ecology: Rare near perennial streams at about 1600 m above msl.

Flowering & Fruiting: October-December; **Specimen examined:** MM 930.

Distribution: Peninsular India.

10. *Arundinella purpurea* Hochst. ex Steud., Syn. Pl. Glumac. 1: 115. 1854.

Perennials. Culms solitary or loosely tufted, erect up to 50 cm high. Leaves lanceolate or linear-lanceolate, 5-20 x 0.3-1.5 cm, flat, scabrid on both surfaces, acuminate. Panicles 3-20 cm long. Spikelets dense, purple, elliptic-lanceolate, 3-5 mm long.

Ecology: Common in open grasslands at about 1500 m above msl. Locally abundant.

Flowering & Fruiting: August-December; **Specimen Examined:** MM 882.

Distribution: Peninsular India.

11. *Arundinella purpurea* Hochst. ex Steud., Syn. Pl. Glumac. 1: 115. 1854, var. *laxa* Bor, Kew Bull. 1955: 407. 1955 et Grass. Burma, Ceylon, India, Pakistan 424. 1960.

Perennials. Culms erect up to 80 cm high. Leaves lanceolate or linear-lanceolate, 3-30 x 0.3-1.5 cm, rounded, acuminate. Panicles 7-25 cm long, lax. Spikelets elliptic-lanceolate, 3-5 mm long, glabrous.

Ecology: Rare in open grasslands at about 1500 m above msl.

Flowering & Fruiting: October-December; **Specimen examined:** MM 1426.

Distribution: Southern India; Rare and threatened.

Notes: It is closely allied to *A. purpurea* var. *purpurea*, but differs in having lax, yellowish panicles, larger pedicels and laxly arranged tomentose hairs on leaves. In MH this species is represented by only one specimen from Kerala.

12. *Arundinella tuberculata* Munro ex Lisboa, J. Bomb. Nat. Hist. Soc. 5: 344. 1891.

Annuals. Culms erect up to 50 cm high, tubercle based hairy. Leaves linear-lanceolate, 5-12 x 0.5-0.7 cm, rounded or attenuate at base, ciliate, acuminate. Panicles lax, spreading, ca 10 cm long. Spikelets acuminate.

Ecology: Rare in open grasslands and on moist rocks at about 1200 m above msl.

Flowering & Fruiting: August-September; **Specimen Examined:** MM 1525.

Distribution: Peninsular India; Rare and threatened.

13. *Arundinella vaginata* Bor, J. Indian Bot. Soc. 27: 66. 1948.

Perennials. Culms tufted, erect, 30-50 cm high, densely villous below the panicle. Leaves linear-lanceolate, 10-20 x 0.3-0.8 cm, involute, acuminate, densely tubercled ciliate above. Panicles 10-15 cm long, compact, spiciform, interrupted; racemes ca 4 cm long. Spikelets elliptic-lanceolate.

Ecology: Rare in open grasslands at about 1700 m above msl.

Flowering & Fruiting: August-December; **Specimen Examined:** MM 1465.

Distribution: Southern Western Ghats of Tamil Nadu & Kerala; Rare and threatened.

BOTHRIOCHLOA O. Kuntze

14. *Bothriochloa foulkesii* (Hook.f.) Henrard in Blumea 3: 457. 1940; Bor, Grass. Burma, Ceylon, India, Pakistan 107. 1960. *Andropogon foulkesii* Hook.f., Fl. Brit. India 7: 174. 1896.

Perennials. Culms tufted, erect, up to 45 cm high. Leaves linear-lanceolate, flat, 6.5-17.8 x 0.25-0.45 cm, glabrous. Racemes 3-8, subdigitate, or distant on rachis; villous at raceme axils. Sessile spikelet ellipsoid.

Ecology: Rarely in open grasslands near marshes at about 1500 m above msl.

Flowering & Fruiting: August-November; **Specimen Examined:** MM 954.

Distribution: Southern Western Ghats of Nilgiris, Palnis.

Notes: This rare species was reported from Nilgiris and Palni Hills of Tamil Nadu (Bor, l.c.). Present collection shows the extended distribution to Velliangiri hills.

15. *Bothriochloa kuntzeana* (Hack.) Henrard in Blumea 3: 456. 1940. *Andropogon kuntzeanus* Hack. in A. DC. Monog. Phan. 6: 478. 1889. *Amphilophis kuntzeana* (Hack.) Haines, Bot. Bihar, Orissa 1017. 1924.

Perennials. Culms tufted, ascending up to 1 m high. Leaves linear-lanceolate or linear, flat, 10-20 x 0.25-0.75 cm, glabrous, scaberulous. Racemes 3-13, ca 6 cm long; raceme axis densely villous or glabrescent. Sessile spikelet lanceolate or linear-lanceolate.

Ecology: Rare in open grasslands at about 1600 m above msl.

Flowering & Fruiting: August-November; **Specimen Examined:** MM 1268.

Distribution: Peninsular India.

BRACHIARIA (Trinius) Grisebach

16. *Brachiaria semiundulata* (Hochst. ex A. Rich.) Stapf. in Fl. Trop. Africa 9: 556. 1919. *Panicum semiundulatum* Hochst. ex A. Rich., Tent. Fl. Abyss. 24: 715. 1841. *P. villosum* auct. non Lam., 1791.

Annuals. Culms, creeping or decumbent, up to 30 cm high. Leaves ovate-lanceolate, ovate-oblong, 2-6 x 0.5-1.5 cm, densely villous. Panicles 2-7.5 cm long. Racemes 4-12, densely spiculate, 0.5-1.5 cm long. Spikelets obovate.

Ecology: Abundant in open grasslands at about 1500 m above msl.

Flowering & Fruiting: August-November; **Specimen Examined:** MM 3126.

Distribution: India.

CAPILLIPEDIUM Stapf.

17. *Capillipedium huegelii* (Hack.) A. Camus, Rev. Int. Bot. Appl. Agric. Trop. 1: 308. 1921. *Andropogon huegelii* Hack. in A. DC. Monog. Phan. 6: 492. 1889.

Annuals. Culms tufted, erect or straggling, up to 1 m high. Leaves elliptic-lanceolate, linear-lanceolate, 3-15 x 0.4-1 cm, flat, scabrid, acute-short acuminate. Panicles 5-15 cm long. Racemes 2-8. Sessile spikelets purple, ovate-oblong.

Ecology: Common along footpaths up to 1000 m above msl.

Flowering & Fruiting: July-November; **Specimen Examined:** MM 1166.

Distribution: Peninsular India.

CHLORIS O. Swartz.

18. *Chloris bournei* Rang. & Tad., J. Indian. Bot. 2: 189. 1921 et in Handb. South Indian Grass. tt. 202 & 203. 1921.

Perennials. Culms tufted, up to 60 cm high. Leaves linear, 4-10 x 0.2-0.4 cm, acuminate, scaberulous above, smooth beneath. Spikes 3-8, 6-7 cm long, purple tinged. Spikelets biseriate, ca 2.5 mm long.

Ecology: Rare in foothills near watercourses.

Flowering & Fruiting: October-February; **Specimen examined:** MM 1057.

Distribution: Peninsular India.

CHRYSOPOGON Trinius

19. *Chrysopogon asper* (Heyne ex Hook.f.) Blatter and McCann, Bomb. Grass. 68. 1935. *Andropogon asper* Heyne ex Hook.f., Fl. Brit. India 7: 189. 1896.

Perennials. Culms tufted, up to 50 cm high. Leaves linear-lanceolate, 7.5-25 x 0.5-1.5 cm, rounded shallowly cordate or semi-amplexicaul at base, serrulate at margin. Panicles 12-17 cm long, lax. Sessile spikelets oblong, 5.5-6.5 mm long, awned. **Ecology:** Common in open grasslands and foot paths at about 1200 m above msl.

Flowering & Fruiting: September-December; **Specimen Examined:** MM 1250.

Distribution: Peninsular India.

20. *Chrysopogon hackelii* (Hook.f.) Fischer in Gamble, Fl. Pres. Madras 1739. 1934 & 3: 1205. 1957. *Andropogon hackelii* Hook.f., Fl. Brit. India 7: 194. 1896.

Perennials. Culms up to 90 cm high. Leaves linear-lanceolate, 10-30 x 0.5-1 cm, acute or acuminate at apex. Panicles 5-15 cm long, open. Sessile spikelets oblong, 4.5-6.5 mm long, awned. Lower glume linear-oblong, 5.5-6.5 x 1.2-1.5 mm, subcoriaceous, 5-7-nerved.

Ecology: Common in grassy hill slopes at about 1200 m above msl.

Flowering & Fruiting: September-December; **Specimen Examined:** MM 1089.

Distribution: Peninsular India.

21. *Chrysopogon orientalis* (Desv.) A. Camus, Lecomte, Fl. Indo-china 7: 332. 1922. *Rhaphis orientalis* Desv., Opusc. Sci. Phys. Nat. 69. 1831 *Andropogon wightianus* Nees ex Steud., Syn. Pl. Glumac. 1: 395. 1854.

Perennials. Culms densely tufted, erect up to 80 cm high. Leaves oblong, ca 10 cm long, flat or folded, pubescent adaxially. Panicles oblong, ca 14 cm long. Sessile spikelet ca 8 mm long.

Ecology: Fairly common in open grasslands at about 1300 m above msl.

Flowering & Fruiting: August-December; **Specimen Examined:** MM 1238.

Distribution: Throughout Western Ghats.

22. *Chrysopogon verticillatus* (Roxb.) Trin. ex Steud., Nomencl. Bot. ed. 2. 1: 360. 1840. *Andropogon verticillatus* Roxb., Fl. Ind. 1: 267. 1820.

Perennials. Culms tufted, erect up to 1 m high. Leaves linear-lanceolate, flat, 3-20 x 0.4-1.4 cm, finely acuminate, sparsely pilose beneath. Panicles pyramidal, ca 15 cm long, branches verticillate. Sessile spikelet ca 8 mm long.

Ecology: Rarely found in open grasslands at about 1500 m above msl.

Flowering & Fruiting: August-December; **Specimen Examined:** MM 1079.

Distribution: Peninsular India; Rare and threatened.

CYMBOPOGON K.P.J. Sprengel

23. *Cymbopogon polyneuros* (Steud.) Stapf., Kew Bull. 1906: 361. 1906. *Andropogon polyneuros* Steud., Syn. Pl. Glumac. 1: 385. 1854. *A. schoenanthus* L. var. *versicolor* Hack. in A. DC. Monog. Phan. 6: 610. 1880.

Perennials. Culms tufted, up to 1 m high. Leaves linear, 20-40 x 1-2.5 cm, acuminate. Panicles ca 25 cm long; spathes ca 6 cm long with narrow false blades, ca 7 cm long; spatheoles ca 3.5 cm long; rachis glabrous. Sessile spikelet oblong, ca 4.5 mm long.

Ecology: Rare in open grasslands and dry rocky places at about 1700 m above msl.

Flowering & Fruiting: August-November; **Specimen Examined:** MM 1470.

Distribution: Hills of Peninsular India.

24. *Cymbopogon travancorensis* Bor, J. Bomb. Nat. Hist. Soc. 52: 174. 1954.

Perennials. Culms erect up to 2 m high. Leaves linear, ca 50 cm long, acuminate. Panicles lax, ca 50 cm long; spathes ca 5 cm long; spatheoles ca 3 cm long. Racemes 1.2-1.9 cm long. Sessile spikelets oblong, 3-4 x 0.75-0.8 mm, awned.

Ecology: Occasional on dry rocky places, grassy hill slopes and in evergreen forest margins at about 1000 m above msl.

Flowering & Fruiting: September-January; **Specimen Examined:** MM 458.

Distribution: Hills of Peninsular India.

CYNODON Richard

25. *Cynodon barberi* Rang. & Tad., J. Bomb. Nat. Hist. Soc. 24: 846. 1916 et Hand. South Ind. Grass. tt. 194 & 195. 1921.

Perennials. Culms erect or prostrate, up to 20 cm high; stoloniferous. Leaves linear-lanceolate, flat ca 1-7 x 0.2-0.4 cm, rounded or slightly cordate at base, scabrid along margin, acute or acuminate. Racemes 3-5, ca 5.5 cm long. Spikelets ovate-oblong, ca 2.2 mm long.

Ecology: Occasional along forest border from foothills up to 1000 m above msl.

Flowering & Fruiting: October-December; **Specimen Examined:** MM 1265.

Distribution: Peninsular India.

DICHANTHIUM Willemet

26. *Dichanthium oliganthum* (Hochst. ex Steud.) Cope, Kew Bull. 35: 703. 1980. *Andropogon oliganthus* Hochst. ex Steud., Syn. Pl. Glumac. 1: 368. 1854.

Annuals. Culms tufted, geniculate up to 20 cm high. Leaves lanceolate, 2-7 x 0.2-0.5 cm, flat, with undulate and ciliate margin, acuminate. Raceme solitary, terminal, ca 4.5 cm long, subtended by a narrow, hairy spatheole, ca 2 cm long. Sessile spikelets oblong.

Ecology: Occasional along footpaths and open grasslands at about 1500 m above msl.

Flowering & Fruiting: August-December; **Specimen examined:** MM 405.

Distribution: Peninsular India; Rare and threatened.

DIGITARIA Heister ex Fabricius

27. *Digitaria brownii* (Roem. & Schultes) Hughes, Kew Bull. 1923: 313. 1923. *Panicum brownii* Roem. & Schultes, Syst. 2: 462. 1817.

Annuals. Culms tufted, geniculate up to 40 cm high. Leaves linear-lanceolate, 8-15 x 0.4-0.6 cm, rounded or

narrowed at base, convolute at margin, acute-acuminate. Racemes 3-10, digitate, ca 10 cm long, axils ciliate. Spikelets in pairs, congested or closed together, very woolly or hairy, the hairs long.

Ecology: Occasional in foothills up to 900 m above msl.

Flowering & Fruiting: September-November; **Specimen Examined:** MM 383.

Distribution: Peninsular India.

28. *Digitaria tomentosa* (Koenig ex Willd.) Henrard, Blumea 1: 100. 1934.

Annuals. Culms geniculate up to 40 cm high. Leaves linear, 5-12 x 0.4-0.5 cm, flat or plicate, acute-short acuminate, 1.2-2.2 mm long. Panicles ca 20 cm long; rhachis pilose at branch-axils. Spikelet solitary, oblong.

Ecology: Rare in footpaths and moist areas of grasslands at about 900 m above msl.

Flowering & Fruiting: September-November; **Specimen Examined:** MM 1061.

Distribution: Peninsular India.

DIMERIA R. Brown

29. *Dimeria fischeri* Bor in Kew Bull. 1952: 564. 1953 et Grass. Burma, Ceylon, India, Pakistan 140. t. 3. f. 10. 1960.

Annuals. Culms geniculate, slender, filiform, up to 30 cm high. Leaves linear-lanceolate, 0.7-4.5 x 0.1-0.4 cm, covered with sparse tubercled hairs. Raceme solitary, 0.8-4.5 cm long. Spikelets oblong-lanceolate.

Ecology: Rare in open grasslands at about 1500 m above msl.

Flowering & Fruiting: November; **Specimen examined:** MM 1052.

Distribution: Southern India; Rare and threatened.

30. *Dimeria lawsonii* (Hook.f.) Fischer, Fl. Pres. Madras 1713. 1934 & 3: 1188. 1957. *D. pusilla* Thw., var. *lawsonii* Hook.f., Fl. Brit. India 7: 103. 1896.

Annuals. Culms tufted, erect or geniculate, slender, 6-20 cm high. Leaves oblong-lanceolate or linear-lanceolate, 2-7 x 0.2 - 0.5 cm, with a few bulbous based hairs, acute to short acuminate. Raceme solitary, 1.5-4.5 cm long. Spikelets oblong-lanceolate, 5-6 mm long.

Ecology: Rare on moist rocks and marshy grasslands at about 1000 m above msl.

Flowering & Fruiting: August; **Specimen examined:** MM 1585.

Distribution: Southern India; Rare and threatened.

GARNOTIA A.T. Brongniart

31. *Garnotia arundinacea* Hook.f., Fl. Brit. India 7: 243. 1896.

Perennials. Culms erect or trailing up to 2.5 m high; nodes bearded. Leaves oblong-lanceolate or lanceolate, 5-15 x 1-3 cm, rounded or shallowly cordate at base, acuminate; sheaths hairy; ligule truncate. Panicles lax, 10-25 cm long. Spikelets oblong-lanceolate.

Ecology: Occasional in shola border and hill slopes at about 1300 m above msl.

Flowering & Fruiting: October-February; **Specimen Examined:** MM 897.

Distribution: Western Ghats.

32. *Garnotia elata* (Arn. ex Miq.) Janowski in Fedd. Repert. Spec. Nov. Regni Veg. 17: 86. 1921. *Berghausia elata* Arn. ex Miq., Verh. Kon. Ned. Inst. 3(4): 32. 1851.

Perennials. Culms densely tufted, erect up to 2 m high. Leaves linear, or lanceolate, 25-60 x 0.5-1 cm, rounded or attenuate at base, acuminate; sheaths keeled, ca 2.5 cm long; ligule ciliolate, ca 4 mm long. Panicles ca 60 cm long, condensed.

Ecology: Occasionally found between the rock crevices at about 1700 m above msl.

Flowering & Fruiting: September-January; **Specimen Examined:** MM 396.

Distribution: Southern India.

33. *Garnotia schmidii* Hook.f., Fl. Brit. India 7: 242. 1896.

Perennials. Culms tufted, erect, up to 1.5 m high. Leaves linear, 20-50 x 0.1-0.6 cm, canaliculate above, glabrous, acute or acuminate; leaf sheaths flabellate; ligules membranous, short, 1.5-2.5 mm long. Panicles with 3-8 cm long, erect, with fastigiate branches. Spikelets scabrid, with densely bearded base.

Ecology: Very rare in the crevices of rocks at about 1700 m above msl.

Flowering & Fruiting: September-November; **Specimen examined:** MM 1067.

Distribution: Southern Western Ghats of Nilgiris, & Vellingiri hills; Rare and threatened.

ISACHNE R. Brown

34. *Isachne bourneorum* Fischer in Bull. Misc. Inform. Kew 1932: 323. 1932 et Fl. Pres. Madras 3: 1244. 1957.

Perennials. Culms erect or ascending from prostrate branches, up to 35 cm high with profusely branched rhizomatous base. Leaves linear-lanceolate, rarely ovate-lanceolate, 1.5-7.5 x 0.5-1.7 cm, rounded at base, acute-short acuminate. Panicles ca 10.5 cm long; pedicel 0.8-1.5 cm long. Spikelets ovoid-obovoid, ca 4.5 mm long.

Glumes unequal, cuspidate at apex, setose in the upper half.

Ecology: Occasional in open grasslands at Velliangiri top at about 1800 m above msl.

Flowering & Fruiting: July-November; **Specimen Examined:** MM 783.

Distribution: Hills of Peninsular India.

35. *Isachne deccanensis* Bor in Bull. Misc. Inform. Kew 1949: 95. 1949 et in Grass. Burma, Ceylon, India, Pakistan 579. 1960.

Perennials. Culms branched, erect or ascending, up to 30 cm high. Leaves flat, linear-lanceolate, 4-12 x 0.2-0.4 cm, rounded at base, acute-short acuminate. Panicle ca 10 cm long, compact or effuse. Spikelets obovoid, 3.5-4 mm long, purple. Florets 1.5-1.8 mm long. Glumes broadly elliptic, 2-2.5 mm long, equal, broadly acute, scabrous in upper half.

Ecology: Rarely found along stream banks at about 1500 m above msl.

Flowering & Fruiting: August-December; **Specimen Examined:** MM 504.

Distribution: Southern Western Ghats, Nilgiri Biosphere Reserve & Palnis.

36. *Isachne gracilis* Hubb. in Kew Bull. 1927: 77. 1927; Ramachandran *et al.*, in J. Bomb. Nat. Hist. Soc. 102(3): 364. 2005; Murugesan & Balasubramaniam in My Forest 42(4): 381. 2006.

Annuals. Culms erect or geniculate, slender up to 10 cm high. Leaves elliptic-lanceolate or oblong-elliptic, 0.9-2.5 x 0.2-1.2 cm, chartaceous, sparsely villous, rounded, acute to short acuminate. Panicles terminal, slender, lax, 2-5 x 1-3 cm, axils glabrous. Spikelets globose, 0.4-1.1 mm long.

Ecology: Very rare on wet rocks at about 1500 m above msl.

Flowering & Fruiting: July; **Specimen examined:** MM 1117.

Distribution: Southern Western Ghats; Rare and threatened.

37. *Isachne kunthiana* (Wight & Arn. ex Steud.) Miq., Fl. Ind. Bot. 3: 460. 1856, var. *latifolia* Fl. Brit. India 7: 22. 1986. *Panicum kunthianum* Wight & Arn. ex Steud. Syn. Pl. Glumac. 1: 96. 1854.

Perennials. Culms tufted, erect or geniculate up to 40 cm high. Leaf blades flat, ovate-lanceolate, 3-7 x 1.5-3 cm, sparsely hairy, rounded or attenuate at base, acute-short acuminate. Panicles ca 8.5 cm long. Spikelets ovoid-elliptic.

Ecology: Commonly found near marshy areas at about 1500 m above msl.

Flowering & Fruiting: July-November; **Specimen Examined:** MM 346.

Distribution: Peninsular India.

38. *Isachne setosa* Fischer in Kew Bull. 1932: 247. 1932 et Fl. Pres. Madras 3: 1244. 1957.

Annuals. Culms erect or geniculate, slender up to 25 cm high. Leaves ovate, ovate-elliptic or ovate-lanceolate, 0.5-2.8 x 1.2-1.7 cm, rounded or cordate at base, acute-acuminate. Panicles lax, 1.5-4.5 cm long. Spikelets obovoid-elliptic, 2-3.5 mm long.

Ecology: Common in open grasslands and hill slopes at about 1500 m above msl.

Flowering & Fruiting: October-December; **Specimen Examined:** MM 582.

Distribution: Throughout Western Ghats.

ISCHAEMUM L.

39. *Ischaemum nilagiricum* Hack., Oesterr. Bot. Z. 51: 150. 1901; Sur in J. Econ. Tax. Bot. 25(2): 426. 2001.

Perennials. Culms erect up to 90 cm high. Leaves lanceolate, elliptic-linear-lanceolate, 5-20 x 0.5-1.5 cm, narrowed or rarely rounded at base, acute. Racemes 3-10, paniculate, each 2-10 cm long. Spikelets 2, elliptic-lanceolate, 5-6 mm long, awned. **Ecology:** Occasional along crevices of rocks in ravines, streams and stream banks, at about 800 m above msl.

Flowering & Fruiting: November-April; **Specimen Examined:** MM 1249.

Distribution: Throughout Southern Western Ghats; Rare.

Notes: This species can be easily distinguished from other species of the genus by the presence of numerous racemes.

40. *Ischaemum pilosum* (Klein ex Willd.) Wight, Madras J. Lit. Sci. 138. 1835; Sur in J. Econ. Tax. Bot. 25(2): 426. 2001. *Andropogon pilosum* Klein ex Willd., Sp. Pl. 4: 920. 1806.

Annuals. Culms creeping, stout, ascending up to 60 cm high. Leaves linear-lanceolate, 3-20 cm long, flat or convolute, coriaceous, glaucous, acuminate, base and mouth of sheath bearded. Spikes ca 12 cm long, spikelets fascicled, 1.3-3.8 cm long. Sessile spikelets ovate, 4.5-7.2 mm long.

Ecology: Occasional in open grasslands at about 1500 m above msl.

Flowering & Fruiting: September-November; **Specimen Examined:** MM 604.

Distribution: Hills of Peninsular India.

41. *Ischaemum rangacharianum* Fischer in Kew Bull. 1933. 352. 1933 et Fl. Pres. Madras 3: 1194. 1957; Sur in J. Econ. Tax. Bot. 25(2): 427. 2001.

Annuals or perennials. Culms geniculate or erect, up to 35 cm high. Leaves elliptic-lanceolate, linear-lanceolate, 1-12 x 0.4-1.2 cm. Racemes 2 or rarely solitary, 2-6.5 cm long; joints clavate-turbinate, 3-4 mm long. Sessile spikelets lanceolate, 5-6 mm long, awned.

Ecology: Very rare in open grasslands at about 1500 m above msl.

Flowering & Fruiting: September-March; **Specimen Examined:** MM 578.

Distribution: Throughout Southern Western Ghats; Rare and threatened.

42. *Ischaemum thomsonianum* Stapf. ex Fischer in Gamble, Fl. Pres. Madras 1722. 1934 et 3: 1193. 1957; Sur in J. Econ. Tax. Bot. 25(2): 432. 2001.

Annuals. Culms erect or prostrate or ascending and geniculate, creeping and rooting at the nodes up to 75 cm high. Leaves lanceolate, 2-15 x 0.4-1 cm, sessile, flaccid, narrowed to rounded at base, setaceously acuminate. Racemes 2 or 3, 3-5 cm long, often sheathed by the upper leaf. Sessile spikelets elliptic-lanceolate, awned.

Ecology: Rare along marshy lands and crevices of rocks at about 1200 m above msl.

Flowering & Fruiting: December-March; **Specimen Examined:** MM 1094.

Distribution: Southern Western Ghats; Rare.

LOPHOPOGON Hackel

43. *Lophopogon tridentatus* (Roxb.) Hack. in Engler & Prantl, Nat. Pflanzenfam. 2(2): 26. 1887. *Andropogon tridentatus* Roxb., Fl. Ind. 1: 261. 1820.

Annuals. Culms erect up to 25 cm high. Leaves linear or linear-lanceolate, 2-6 x 0.2-0.3 cm, flat or involute. Raceme solitary ca 2.8 cm long, branches ca 4, closely appressed, enclosed or exserted; joints cupular at top.

Ecology: Occasional in foothills.

Flowering & Fruiting: October-February; **Specimen Examined:** MM 1072.

Distribution: Peninsular India.

MANISURIS Linnaeus

44. *Manisuris myuras* L., Mant. Pl. 300. 1771. *Rottboellia myurus* (L.) Benth. in J. Linn. Soc. Bot. 9: 68. 1881.

Perennials. Culms tufted, ascending up to 50 cm high. Leaves linear, rarely lanceolate, 3-12 x 0.2-0.5 cm.

Raceme terminal, solitary, ca 6.5 cm long, greenish, compressed. Spikelets 2-nate, one sessile, other pedicelled. Sessile spikelet 3.5-3.8 mm long.

Ecology: Occasional in foothills.

Flowering & Fruiting: December-March; **Specimen Examined:** MM 1118.

Distribution: Peninsular India.

PASPALUM Linnaeus

45. *Paspalum canarae* (Steud.) Veldk. in Blumea 21: 72. 1973, var. *canarae* Bor, Grass. Burma, Ceylon, India, Pakistan 336. 1960. *Panicum canarae* Steud., Syn. Pl. Glumac. 1: 58. 1853.

Annuals. Culms creeping or geniculate, rarely erect. Leaves ovate-elliptic or elliptic-lanceolate, 1.5-5 x 0.3-1 cm, cordate or decurrent at base, acute or shortly acuminate, densely tubercle based hairy on both surfaces. Racemes 3-12. Spikelets broadly elliptic or ovate-acute, 1.2-1.85 mm long.

Ecology: Common in open moist grasslands at about 1500 m above msl.

Flowering & Fruiting: October-December; **Specimen Examined:** MM 323.

Distribution: Southern Western Ghats; Rare and threatened.

46. *Paspalum canarae* (Steud.) Veldk. in Blumea 21: 72. 1973, var. *fimbriatum* (Bor) Veldk. in Blumea 21: 72. 1973; Murugesan & Balasubramaniam in My Forest 42(4): 381-382. 2006. *Panicum canarae* Steud., Syn. Pl. 1: 58. 1853. *Paspalum compactum* auct. var. *fimbriatum* Bor, Grass. Burma, Ceylon, India, Pakistan 336. 1960.

Annuals. Culms creeping or erect up to 15 cm high. Leaves oblong-elliptic or elliptic-lanceolate, 1.7-4.5 x 0.4-0.9 cm, decurrent at base, tubercle-based hairy. Racemes 4-15. Spikelets ovate-acute or broadly elliptic, 1-2 x 1-1.3 mm.

Ecology: Rare in marshy grasslands at about 1700 m above msl.

Flowering & Fruiting: October-November; **Specimen examined:** MM 1226.

Distribution: Throughout Western Ghats; Rare and threatened.

Notes: Bor (1960) first described this variety from Bombay Presidency. Ramachandran *et al.*, (1980) have reported its occurrence from Kerala. Hence, the present collection from the study area forms an addition to the grass flora of Tamil Nadu.

POMMEREULLA L.f.

47. *Pommereulla cornucopie* L.f., Diss. Nov. Gram. 31. 1779.

Perennials. Culms creeping with woody stolons, erect up to 15 cm high. Leaves linear or linear-lanceolate, 2.2-5.5 x 0.3-0.4 cm, flat, ciliate along margins, rounded; sheaths 1.5-2.7 cm long, basal one equitant. Racemes terminal, 2-4 cm long; rhachis flattened. Spikes partly enclosed in the upper spathiform leaf-sheaths, 1.5-5 cm long. Spikelets 4-6 mm long, turbinate, 2-3-flowered.

Ecology: Rare in foothills.

Flowering & Fruiting: November-March; **Specimen Examined:** MM 1214.

Distribution: Peninsular India.

PSEUDOXYTENANTHERA Soderstrom and Ellis

48. *Pseudoxytenanthera bourdillonii* (Gamble) Naithani, Jour. Bombay Nat. Hist. Soc. 87: 440. 1990; Tewari in A Monograph on Bamboo 124-125. 1995. *Oxytenanthera bourdillonii* Gamble, Ann. Roy. Bot. Gard. Calc. 7:76. t. 67.1896 et in Hook.f., Fl. Brit. India 7: 403. 1896.

Stragglers. Culms hollow with long internodes. Leaves 15-20 x 2-3 cm, linear-lanceolate, acuminate, unequally attenuate at base; sheaths 10-17 x 7-12 cm, striate, Inflorescence a large panicle of spicate, branchlets bearing globular heads of many spikelets; heads ca 3.5 cm across; rhachis striate. Spikelets robust, 1.4-1.8 cm long.

Ecology: Occasional along shola floor at about 1600 m above msl.

Flowering & Fruiting: December-February; **Specimen Examined:** MM 1514

Distribution: Southern Western Ghats of Tamil Nadu & Kerala; Rare and threatened

Notes: Gamble (l.c.) reported this endemic, rare and threatened species from Travancore hills of Kerala State based on Bourdillone's collections and so far not reported from the state of Tamil Nadu. Hence the present collection from the study area shows its extension of its known range of distribution.

SINARUNDINARIA Nakai

49. *Sinarundinaria wightiana* (Nees) C.S. Chao & Renvoize, Kew Bull. 44. 356. 1989. *Arundinaria wightiana* Nees in Linnaea 9: 482. 1834.

Perennials. Culms erect, up to 8 m high; nodes swollen with ciliate rim below; internodes ca 25 cm long; culm sheath ca 25 cm long, striate, golden brown ciliate above; imperfect blade subulate, ca 3.8 cm long, scabrid. Leaves oblong-lanceolate or linear-lanceolate, 10-15 x 1.5-2.5 cm, shortly petioled, long acuminate. Panicles terminal,

dense, spreading; branchlets capillary, flexuous. Spikelets linear, ca 1.7 cm long, 3-5-flowered.

Ecology: Occasional in shola border at about 1500 m above msl.

Flowering & Fruiting: March-May; **Specimen Examined:** MM 978

Distribution: Southern Western Ghats, Nilgiri Biosphere Reserve and Palni hills; Rare & threatened

TRIPOGON Roem. & Schult.

50. *Tripogon ananthaswamianus* Sreekumar *et al.*, Bull. Bot. Surv. India 25: 185. 1985 (1983); Ramachandran in Econ. Tax. Bot. 22(2): 460. 1998.

Perennials. Culms densely tufted, 30-70 cm high; nodes glabrous. Leaves linear, 10-20 x 0.1-0.3 cm, convolute, glabrous-sparsely villous or ciliate, glaucous on upper surface. Racemes 20-25 cm long, contracted. Spikelets 0.8-1.5 cm long, 6-11-flowered; callus villous.

Ecology: Commonly found in open grasslands at about 1400 m above msl.

Flowering & Fruiting: October- December; **Specimen Examined:** MM 1028.

Distribution: Southern Western Ghats of Tamil Nadu and Kerala.

Notes: One of the dominant species in grasslands of the study area.

51. *Tripogon bromoides* Roem. & Schultes, Syst. 2: 600. 1817.

Perennials. Culms tufted, erect up to 30 cm high. Leaves linear, 5-20 x 0.2-0.4 cm, convolute at margins, acuminate at apex. Spike(s) solitary or rarely 2, ca 20 cm long; rhachis smooth, scabrid on margin. Racemes 4-20 cm long; spikelets 2-seriate on rhachis, lanceolate, ca 1.2 cm long.

Ecology: Fairly common in grasslands and shola border at about 1700 m above msl.

Flowering & Fruiting: August-January; **Specimen Examined:** MM 1628.

Distribution: Peninsular India.

52. *Tripogon narayanii* P.V. Sreekumar, V.J. Nair & N.C. Nair in J. Bombay Nat. Hist. Soc. 80: 196. 1983.

Perennials. Culms densely tufted, erect up to 15 cm high; nodes glabrous. Leaves linear, convolute or flat, 7-15 x 0.1-0.3 cm, long ciliate on both surfaces; ligule a thin membrane, ca 1 mm long, densely ciliate. Racemes 5-10 cm long, contracted; rhachis glabrous. Spikelets obovate-oblong, ca 6.2 mm long.

Ecology: Rare in open grasslands at about 1200 m above msl.

Flowering & Fruiting: August-October; **Specimen Examined:** MM 314.

Distribution: Peninsular India.

53. *Tripogon pungens* Fischer in Kew Bull. 1934: 170. 1934 et in Gamble, Fl. Pres. Madras 3: 1269. 1957.

Annuals or rarely perennials. Culms tufted, branched, erect or geniculate up to 15 cm high, slender and exerted above. Leaves equitant, rigid, slightly pungent, attenuate, acuminate with short spiny tip. Spikes 4-8.5 mm long. Spikelets 7-9-11-flowered, ovate-elliptic, 2.5-3.5 x 0.5-0.7 mm.

Ecology: Very rare in open grasslands at Velliangiri top at about 1800 m above msl.

Flowering & Fruiting: August-September; **Specimen Examined:** MM 629

Distribution: Southern Western Ghats of Tamil Nadu; Rare and threatened

54. *Tripogon ravianus* Sunil & Pradeep in SIDA 19(4): 803-806. 2001.

Perennials. Culms tufted, erect or geniculate up to 60 cm high; nodes glabrous. Leaves linear, ca 25 cm long, 2-4 mm across, scabrid at margins towards base, pubescent on upper surface, glabrous on lower surface; sheaths ca 7.5 mm long, glabrous, pubescent at apex with a tuft of 2-3.5 mm long hairs; ligule a fine membrane. Racemes terminal, 15-35 cm long; spike 15-35 cm long, rhachis smooth, glabrous. Spikelets 1-2.5 cm long, 13-25-flowered, linear.

Ecology: Common in open grasslands at about 1500 m above msl.

Flowering & Fruiting: August-January; **Specimen Examined:** MM 455

Distribution: Southern Western Ghats of Tamil Nadu, Nilgiris & Velliangiri hills.

Notes: This neo-endemic species was described by Sunil & Pradeep (l.c.) from Pykara, Nilgiri District of Tamil Nadu. Subsequent to type it was recollected from the study area indicates its occurrence in Western Ghats of Coimbatore District also.

55. *Tripogon wightii* Hook.f., Fl. Brit. India 7: 286. 1896.

Perennials. Culms erect or geniculate, up to 35 cm high. Leaves linear-lanceolate, 5-10 x 0.2-0.5 cm, attenuate at base, acute-short acuminate. Racemes 5-15 cm long. Spikelets oblong, ca 1.5-2 cm long, 11-13-flowered.

Ecology: Occasional on rocks at about 1500 m above msl.

Flowering & Fruiting: August-November; **Specimen Examined:** MM 481.

Distribution: Southern Western Ghats of Tamil Nadu & Kerala; Rare and threatened.

ZENKARIA Trinius

56. *Zenkaria elegans* Trin. in Linnaea 11: 150. t. 3. 1837.

Perennials. Culms densely tufted, erect or straggling up to 75 cm high. Leaves linear, 20-35 cm long, elongate, flat or convolute, rounded at base. Panicles effuse or contracted, ovate, 10-15 cm long. Spikelets elliptic-lanceolate or lanceolate, ca 4.2 mm long, 2-flowered.

Ecology: Common in foothills and marshy areas on rocks up to 1500 m above msl.

Flowering & Fruiting: July-January; **Specimen Examined:** MM 630

Distribution: India

57. *Zenkaria jainii* N.C. Nair., P.V. Sreekumar & V.J. Nair in J. Bombay Nat. Hist. Soc. 78(2): 352. 1981; Murugesan & Balasubramaniam in My Forest 42(4): 382. 2006.

Perennials. Culms erect from a decumbent rooting base, up to 30 cm high; nodes glabrous; internodes ca 6 cm long. Leaves linear-lanceolate, 10-25 x 0.8-1.5 cm. Panicles 5-12 cm long, densely flowered with capillary, villous, spreading branches. Spikelets ca 5 mm long, all alike, 2-flowered, bisexual.

Ecology: Rare in the crevices of moist rocks at about 1600 m above msl.

Flowering & Fruiting: August-December; **Specimen Examined:** MM 575.

Distribution: Southern Western Ghats of Tamil Nadu and Kerala.

Notes: This neo-endemic grass was described by N.C. Nair *et al.*, (1981) from Eravikulam National Park of Kerala State. Subsequent to type collection, this species was collected from Velliangiri hills, Coimbatore District of Tamil Nadu State indicates its occurrence in other parts of Western Ghats.

DISCUSSION

New record for Tamil Nadu

Of the 57 species of endemics reported from the present study area, four species *viz.*, *Arundinella metzii*, *Paspalum canarae* var. *fimbriatum*, *Pseudoxytanthera bourdillonii* and *Zenkaria jainii* are forms additions to the Grass flora of Tamil Nadu.

Additions to the flora of Coimbatore district

The following 16 species *viz.*, *Agrostis peninsularis*, *A. pilosula* var. *filifolia*, *Andropogon longipes*, *Arundinella metzii*, *Bothriochloa foulkesii*, *Dimeria fischeri*, *D. lawsonii*, *Garnotia schmidii*, *Isachne gracilis*, *Paspalum canarae* var.

fimbriatum, *Pseudoxytenanthera bourdillonii*, *Sinarundinaria wightiana*, *Tripogon pungens*, *T. ravianus*, *T. wightii* and *Zenkaria jainii* are first time reported from the Coimbatore district.

Rare and threatened species

The species viz., *Agrostis peninsularis*, *A. pilosula* var. *filifolia*, *Andropogon longipes*, *Arthraxon lanceolatus*, *Arundinella purpurea* var. *laxa*, *A. tuberculata*, *A. vaginata*, *Chrysopogon verticillatus*, *Dicanthium oliganthum*, *Dimeria fischeri*, *D. lawsonii*, *Garnotia schmidii*, *Isachne gracilis*, *Ischaemum rangacharianum*, *Paspalum canarae* var. *fimbriatum*, *Pseudoxytenanthera bourdillonii*, *Sinarundinaria wightiana*, *Tripogon pungens* and *T. wightii* are coming under the rare and threatened category. (Ahmedullah and Nayar, 1987; Henry et al., 1989; Nayar, 1996)

Rediscovery after type collection

Of the 57 species, only one species i.e. *Tripogon pungens* was rediscovered after its type collection. A.G. Bourne in 1899 described this species from Madurai District of Tamil Nadu State. After that, this rare and endemic grass was included in Flora of Palni Hills by Matthew (1999) based on the collections made by A.G. Bourne. Subsequent to Bourne's collection it was recollected from the study area after a lapse of 115 years. The prominent character of this species is leaves pungent, branched and thickened culms covered by old imbricate leaf sheaths. In MH this rare and endemic represented by single incomplete specimen without any necessary information.

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