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Studies on Grass Flora Associated With Paddy Field of Wayanad District, Kerala, South India

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Abstract: There are 33 species grasses belonging to 24 genera, which are common throughout the study area of paddy fields of Wayanad. Out of 33 species 17 grasses are common weeds, 6 species used for grain, 7 of them used in ethnomedicine, some of them are good soil binders, for making brushes and brooms and also used in paper industry. In the present study morphological characters and key for identification of these 33 species of grasses have been enumerated. Various morphological aspects and uses of the grasses associated with paddy field of Wayanad have been discussed.

Key words: Taxonomy, Grasses, Paddy field, Wayanad District

Introduction

Grasses inhabit the earth in greater abundance than any comparable group of plants, they occur in every soil under all kinds of climatic situation. By any reckoning, the grasses are a successful family due to its adaptability to changeable environment, their ability to co-exist with grazing herbivores and also their effective reproductive system (Bor, 1960). Despite the fact that the grasses are so important to us, they have been neglected due to small size of floral organs, special terminology and complicated structure of spikelet and inflorescence. As grasses form an exceedingly natural family, it is very difficulty for the beginners to readily distinguish them from one another. Since the spikelets are very minute, it needs careful dissection for correct identification (Sreek. & V. J. Nair. 1991).

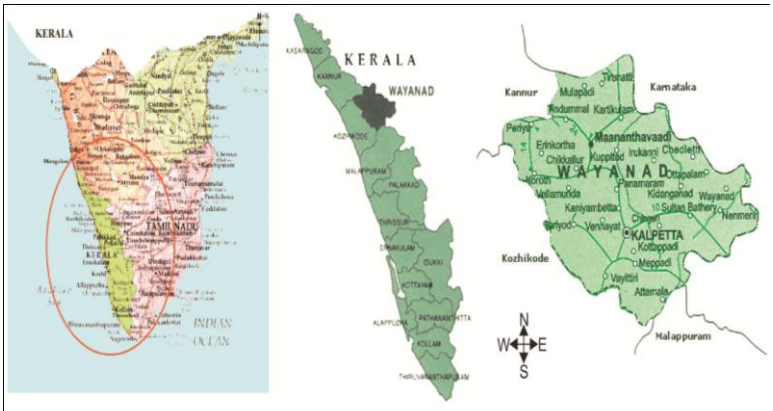

Fig. 1. Location map of Wayanad District

Wayanad district located in the north east part of Kerala, is with a hilly terrain on the Southern West Ghats and the most characteristic feature of the district is its low ridges of hills, with sharp peaks and extensive valleys. The altitude varies from 700-2100 meters above mean sea level. It is located between $11^0$26'28" & $11^0$58'2" N latitudes and 76^0 26' 11" & 76^0 46' 38" East longitudes (Fig.1). It is bounded on the east by Nilgiris and Mysore district of Tamil Nadu and Karnataka respectively, on the north by Coorg district of Karnataka, in the south by Malappuram district and on the west by Kozhikode and Kannur districts of Kerala state. It has a geographical area of 2,131 sq km. Wayanad is unique for its rich wealth of flora and diverse ethnic cultures (Nadesapanicker *et al*., 2010). Wayanad is the homeland of numerous tribal communities of South India. Before the advent of tea and coffee plantation, these people lived mainly along the river valleys and cultivated paddy by clearing the forests, gathered food and also took to hunting. The paddy fields are now converted into annual, biennial and perennial crop cultivated fields. And the wetland area is decreased to one tenth of the actual size. Many of the wetland grasses have disappeared due to the excessive use of pesticides and fungicides in banana cultivated fields. The present study has been carried out to provide a comprehensive taxonomic account of the grasses associated with paddy fields of Wayanad.

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Materials and Methods

Extensive plant exploration trips were conducted throughout the study area. The present study is based on critical, minute and systematic study of grasses associated with paddy field of Wayanad. Collections were made throughout the district during the period from November 2011 to March 2014. Field observations such as habitat, frequency, habit, colour, phenology, etc. were noted in the field book. Illustrations and descriptions were made in most cases using fresh specimen. Herbarium specimen were prepared for further study. Detailed observations were made using a binocular stereomicroscope and specimen were identified with the help of works of Bor (1960) and Sreekumar & V. J. Nair (1991), and herbaria (CALI and MH). Necessary drawing was made with the help of Camera Lucida. Colour photographs were also taken in the field for easy identification of the taxa. The nomenclatural corrections were made according to the latest International Code of Botanical Nomenclature (St. Louis Code, 2000). For abbreviations of authors, Brummit and Powell (1992) are followed. A full set of voucher specimen used for this investigation is deposited in St Mary's College Herbarium (SMCH). Each species is described with a plate containing illustrations of the whole plant (habit), part of rachis, spikelets, glumes, lemma, palea, lodicules, stamens, pistil and grain. For this the classification of Clayton and Renvoiz (1986) is adopted, where the family is divided into six subfamilies of which two subfamilies are represented in the study area. So the treatment is restricted to these two subfamilies. An artificial key is provided for these 33 grass species. For each species the correct nomenclature, relevant synonyms, detailed morphological description, vernacular names, flowering and fruiting time, habitat and distribution, and uses are provided.

Systematic Treatment

Key to the Species

1a. Spikelets with 1 - several florets, falling without glumes; glumes persistent ……24
1b. Spikelets stricty with 2 florets, falling with glumes at maturity, articulated below the glumes……2
2a. Spikelets unisexual, male and female spikelets in separate inflorescence or Different positions of same the inflorescence ……**5. *Coix lacryma-jobi***
2b. Spikelets bisexual, or with male or barren and bisexual spikelets mixed in the same inflorescence……3
3a. Spikelets similar, solitary or paired, glumes membraneous, lower lemma more or less similar to the upper glume in texture; upper lemma usually without awn…….4
3b. Spikelets dissimilar, often in pairs or in threes, one sessile and the other pedicelled, rarely solitary but then the upper lemma awned …. 20
4a. Spikelets awned or subtended by bristles or atleast aristate ……5
4b. Spikelets not awned and not supported by aristate……19
5a. Spikelets awned or aristate……6
5b. Spikelets subtended by a solitary or an involucres of bristles. .9
6a. Inflorescence digitate, or subdigitate racemes, glumes ciliate along the margins……**1. *Alloteropsis cimicina***
6b. Inflorescence in panicles of several racemes arranged on a central axis; glumes not ciliate……7
7a. Spikelets crowded, in 3-4 rows; glumes often acuminate and awned……8
7b. Spikelets not crowded, in 1-2 rows; glumes acute; never awned……**24.*Paspalidium flavidum***
8a. Ligules present as fringes of hairs; spikelet awned……**13.*Echinochloa crusgalli***
8b. Ligules absent, spikelet awned or not……**12. *Echinochloa colonum***
9a. Inflorescence in open panicles or the panicles contracted, spiciform……10
9b. Inflorescence of spiciform subsequent racemes digitate or subdigitate, or scattered on a central axis, rarely solitary……14
10a. Panicle contracted, narrow, spiciform or cylindrical. …….**30.*Sacciolepis interrupta***
10b. Panicles often lax, rarely contracted but never spiciform……11
11a. Infloresence of 2-several digitate or subdigitate racemes; lower glume absent or reduced to minute scale or rim……12
11b. Infloresence usually panicles, lax or contracted; lower glume well-developed……13
12a. Spikelets 1-2 mm long, hairs on the spikelets verrucose: Lower glume absent……**11.*Digitaria longiflora***
12b. Spikelets 2 - 4 mm long: hairs on the spikelets not verrucose; lower glume usually present……. **10. *Digitaria ciliaris***
13a. Spikelets oblong-lanceolate to narrowly lanceolate, acute; lower glume orbicular, obtuse……**23.*Panicum repens***
13b. Spikelets ovate- oblong to elliptic, acute or obtuse; lower glume broadly ovate, acute…….**22.*Panicum psilopodium***
14a. Lower glume well-developed……15
14b. Lower glume absent or reduced to minute scale or rim……16
15a. Rachis flat; spikelets secured, solitary; racems 3-8……..**3.*Brachiaria miliiformis***
15b. Rachis triquetrous; spikelets not secured often paired; racemes 3-16…….**4.*Brachiaria ramosa***

16a. Lower glume strictly absent, culms stoloniferous and mat forming…….**2.*Axonopus compressus***
16b. Lower glume reduced to minute scale; culms not as above……. 17
17a. Spikelets with a ciliate fringe from the margins of the upper glume……**25.*Paspalum conjugatum***
17b. Spikelets without a ciliate fringe, rarely fimbriate with tubercle-based hairs. 18 18a. Spikelets obovate or orbicular, obtuse……**27.*Paspalum scrobiculatum***
18b. Spikelets ovate-elliptic or lanceolate, acute……**26.*Paspalum distichum***
19a. Second lemma more or less smooth; bristles falling with the spikelets……. **28. *Pennisetum hohoenackeri***
19b. Second lemma transversely rugose; bristles present……**31. *Setaria pumula***
20a. Spikelets of each pair similar, the sessile and the pedicelled hermaphrodite; joints of the panicle thin……**16. *Imperata cylindrica***
20b. Spikelets in each pair dissimilar, sessile hermaphrodite; joints of the raceme and the panicle thick……21
21a. Inflorescence a solitary, digitate or subdigitate recemes……22
21b. Inflorescence a true or false panicle……. 23
22a. Lower glume of sessile spikelet broadly or narrowly winged on both sides towards apex, wing often auriculate……**18. *Ischaemum indicum***
22b. Lower glume of sessile spikelet not winged towards apex, oblong lanceolate, acuminate……**19. *Ischaemum timorense***
23a. Racemes usually white hairy, spikelets paired……**29. *Saccharum spontaneum***
23b.Racemes without white hair, spikelets all in threes…. ……**6. *Chrysopogon aciculatus***
24a. Stamens 6……25
24b. Stamens 1-3……26
25a. Spikelets with 2 sterile lemmas below fertile floret ……. .**21. *Oryza rufipogon***
25b. Spikelets without 2 sterile lemmas below fertile floret…. **20.*Leersia hexandra***
26a. Inflorescence of several digitate or sub digitate racemes or spikes. ….27
26b.Inflorescence panicle……29
27a. Spikelets awned, lowest floret of a spikelet bisexual, others reduced to awns or male or empty florets. 28
27b. Spikelets not awned; all floret of a spikelet fertile……31
28a. Racemes 3-6, upto 6cm long; leaves upto 8cm long; hairs on lemma not clavate……**8.*Cynodon dactylon***
28b. Racemes usually more than 6, upto 10cm long; leaves upto 16cm long; hairs on the lemma clavate……. **7.*Cynodon arcuatus***
29a. Glumes unequal in size, panicle effuse, oblong or pyramidal…. . . 30
29b. Glumes almost equal in size, panicle lax……**17. *Isachne miliacea***
30a. Lower glume oblong, 0.5 mm; upper glume 1 mm……**33.*Sporobolus wallichii***
30b. Lower glume ovate, 0.3 mm; upper glume 0.6 mm……**32.*Sporobolus indicus***
31a. Inflorescence a solitary, or 2 to many digitate or sub digitate spikes……32
31b. Infloresence a panicle……**15. *Eragrostis unioloides***
32a. Spikes digitate, lemmas not aristate; axis of the spikes ending in a spikelet……**14. *Eleusine indica***
32b. Spikes digitate or sub digitate lemmas aristate or awned; axis of the spikes ending in a sharp point……**9. *Dactyloctenium aegyptium***

1. *Alloteropsis cimicina* (L.) Stapf in Prain, Fl. Trop. Afr. 9, 487. 1919; Fischer in Gamble, Fl. Pres. Madr. 1766. 1934 (Repr. ed. 1223. 1957); Hook. f. Fl. Brit. Ind. 7: 64. 1896; Bor, Grass. Bur. Cey. Ind. Pak. 276. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 214. 1991.

Annuals. Culms 15-120cm high. Racemes 3-10, digitate, 5-20cm long. Rachis angular, spikelet broadly elliptic, green with purple margins, pedicelled. Lower floret male, upper floret bisexual. First lemma ovate 2-3 x 1-1.5 mm, 5-nerved. Palea narrowly elliptic, 1-1.5 x 0.5 mm, 2 lobed at apex. Second lemma elliptic, 2-3 x 1 mm, margins ciliate. Palea ovate, 2-3 x 1 mm, 2-keeled.

Flowering and Fruiting: Throughout the year.

Distribution: Throughout Old World tropics

Habitat: Very common along the waste lands, in moist cultivated fields and margins of streams.

Specimen examined: Kerala, Wayanad District, Kallur, 19th October 2012, *Dileep 9189* (SMCH).

2. *Axonopus compressus* (Sw.) P. Beauv. Ess. Agrost. 12; 154. 1812; Bor, Grass. Bur. Cey. Ind. Pak. 278. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 216. 1991.

Perennials. Culms 10-60cm long, creeping, rooting at nodes, erect when flowering. Leaves oblong to linear. Rachis trigonous, winged along the angles. Spikelets oblong-acute, 2-2.5 x 0.5-1 mm, shortly pedicelled, green. Soft hairs along nerves first lemma ovate 2-2.5 x 1 mm, membranous. Second lemma ovate 1.5-2 x 1mm. Palea oblong 1.5-2 x 1mm. Ovary oblong.

Vernacular name: Kaalappullu

***Flowering & Fruiting*:** Throughout the year.

Distribution: In Southern United States, Mexico to Brazil; introduced to India and naturalized.

Habitat: Very common along the banks of back waters, rivers, lakes and canals, usually in wet situations.

Notes: It shows extreme variation in the shape of leaves. This shows gregarious growth and serves as a very good sand binder.

Uses: The plants are used as a permanent cover and turf to moist, low fertility soil, particularly in shaded situations by Kaurichya Tribes. It is a low quality forage grass. It is also used by Paniya tribes to prevent soil erosion.

Specimen examined: Kerala, Wyanad, Panamaram, 13 October 2012, *Dileep 9119,* 11 August 2013*, Dileep 9188* (SMCH)

3. *Brachiaria miliiformis* (J. Presl ex C. Presl) A. Chase in Contrib. U.S. Nat. Herb. 22: 35. 1920; Fischer in Gamble, Fl. Pres. Madr. 1769. 1934 (Repr. ed. 3: 1226. 1957); Hook. f. Fl. Brit. Ind. 7: 37. 1896; Bor, Grass. Bur. Ceyl. Ind. Pak. 283 -284. 1960; Sreek. & V.J. Nair, 220. 1991.

Annuals or perennials. Culms 35-80cm long, creeping. Spikelets elliptic 3.5-4mm. Lower glume obovate 1.5-2 x 1.5-2 mm, 9-11 nerved. Upper glume ovate 3-4 x 1.5-2 mm, acute. Lower floret empty. Upper floret bisexual. First lemma ovate, 5-7 nerved. Second lemma elliptic 2.5–3.5 x 1-1.5 mm, acute. Palea elliptic 2-3 x 1-1.5 mm, 2-keeled, 2-nerved. Stamens 3.

Distribution: Old World tropics.

Flowering and Fruiting: Throughout the year.

Habitat: Very common along bunds of paddy fields and banks of rivers.

Specimen examined: Kerala, Wayanad, Kolavayal, 05th October 2013, *dileep 9201* (SMCH).

4. *Brachiaria ramosa* (Linn.) stapf in Prain, Fl. Trop. Afr. 9: 542. 1919; Hook. f. Fl. Brit. Ind. 7: 36. 1896; Fischer in Gamble, Fl. Pres. Madr. 1770, 1934 (Repr. ed. 3: 1226, 1957); Bor, Grass. Bur. Cey. Ind. Pak. 284. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 223. 1991.

Annuals or perennials. Culms 20-80cm long. Spikelets broadly elliptic, 2.5-3mm. Lower glume ovate, 1-1.5 x 2 mm, 7-nerved. Upper glume ovate 2.5-3 x 1.5-2 mm, 7-nerved. Lower floret empty. Upper floret bisexual. First lemma broadly ovate, 2.5 -3 x 2mm. Palea oblong, 2 x 0.5 mm, delicate, 2-nerved. Second lemma broadly ovate, 2-2.5 x 1.5-2 mm, rugose. Palea ovate 2 x 1 mm, muriculate, stamens 3.

Vernacular name: Vaalan pullu.

***Flowering & Fruiting*:** August -March.

Distribution: In tropics of the Old world.

Habitat: Common along the bunds of paddy fields, and as a weed in cultivated lands.

Specimen examined: Kerala, Wyanad, Meppadi, 29 July 2013, *Dileep 9144, 9* August 2013*, Dileep 9144* (SMCH).

Fig. 2. **a)** *Axonopus compressus*, **b)** *Brachiaria miliiformis*, **c)** *Chrysopogon aciculatus*, **d)** *Cynodon dactylon*, **e)** *Eleusine indica*, **f)** *Digitaria longiflora*, **g)** *Echinochloa crusgalli*, **h)** *Paspalum conjugatum*, **i)** *Eragrostis unioloides*, **j)** *Echinochloa colonum*, **k)** *Dactyloctenium aegyptium*, **l)** *Paspalum distichum*, **m)** *Sporobolus wallichii*

5. *Chrysopogon aciculatus* (Retz.) Trin. Fund. Agrost. 181. 1820; Fischer in Gamble, Fl. Pres. Madr. 1738. 1934 (Repr. ed. 3: 1205. 1957); Hook. F. Fl. Brit. Ind. 7: 188. 1896; Bor, Grass. Bur. Cey. Ind. Pak. 115. 1960; Sreek. & V.J. Nair, 59. 1991.

Perennials, culms 20-70cm long, creeping or decumbent. Leaves lanceolate. Panicles pyramidal, 5-10cm long. Sessile spikelets lanceolate, 3-4 mm long. Lower

glume lanceolate 3-4 x 1mm. Upper glume boat shaped, 3-4 x 1 mm; ciliate. Lower floret empty, upper floret bisexual. First lemma obovate, 2.5-3 x 1 mm, margins ciliate. Second lemma ovate 2.5-3 x 1 mm, aristate. Palea oblong, 1.5-2 x 0.5mm. Pedicelled spikelets lanceolate, 4-5 mm long unawned.

Vernacular name: Asthrapullu.

Flowering & Fruiting: March to October.

Distribution: Widely distributed in the tropics of Asia in hills and plains.

Habitat: Common along the banks of back waters, rivers, streams and canals usually forming dense carpets.

***Uses*:** The plant is used to prevent soil erosion on banks, because it is a vigorous plant that can spread extensively by means of its rhizomes and form a dense ground cover. Rhizome powdered with 3-5 black peppers is made into paste and taken early in the morning on empty stomach for stomach ache and gastric disorders (gastro intestinal uses) by Kurichya tribes of this district.

Specimen examined: Kerala, Wayanad, Kuppadi hill, 19th November 2012, *Dileep 9109*(SMCH).

6. *Coix lacryma-jobi* Linn. Sp. Pl. 972. 1753; Hook. f. Fl. Brit. Ind. 7:100. 1896; Fischer in Gamble, Fl. Pres. Madr. 1705. 1934 (Repr. ed. 3: 1182. 1957); Bor, Grass. Bur. Cey. Ind. Pak. 264. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 207. 1991.

Annuals. Culms 25- 100cm high. Upper glume elliptic-lanceolate, 5-12 x 2-3mm. Lower floret male, upper floret male or barren. First lemma elliptic- lanceolate, acuminate, hyaline. Palea elliptic–lanceolate, 2-keeled. Stamens 3. Second lemma elliptic, delicate, hyaline. Palea oblong-lanceolate, delicate, hyaline. Stamens 3. Female spikelets globose, 5-15 mm long, bony, shining, white or grey.

Vernacular name: Nayikolla, Kakkappalungu, Kattugothampu

Distribution: Native to tropical Asia, now widely distributed throughout tropics.

Habitat: Very common along marshy places, banks of rivers, streams, ponds and in paddy fields and other wetlands.

Flowering and Fruiting: July- March.

***Uses*:** The roots and seeds are used for treating abdominal tumours, fever, diabetes, dysentery, gastro intestinal and lung diseases by Kurichya tribes. Seeds are used for making necklaces and other ornaments by Paniya tribes.

Specimen examined: Kerala, Wayanad, Kallur, 10th March 2013, *Dileep 9125* (SMCH).

7. *Cynodon arcuatus* J. S. Presl ex C.B. Presl, Rel. Haenk. 1:290.1830; Fischer in Gamble, Fl. Pres. Madr.1835.1934 (Repr. ed. 3: 1270. 1957); Bor, Grass. Bur. Cey. Ind. Pak. 469. 1960.

Stoloniferous perennials. Culms creeping and geniculate, 10-20cm high, rooting at nodes. Inflorescence 3-5 digitate or sub digitate racemes, spikelet elliptic. Lower glume lanceolate, 0.5-1 x 0.5 mm, 1- nerved, nerves scabrid. Upper glume lanceolate, 1.5 x 0.5 mm, 1-nerved. Lemma broadly ovate, 1.5-2.5 x 1mm, subcoriaceous, 3-nerved, with long hairs along the margins. Palea oblong- lanceolate, keeled, 2-nerved.

Distribution: South East Asia and Australia.

Habitat: Occasional along the banks of rivers and streams.

Flowering and Fruiting: August - March

Notes: This species is closely allied to and often confused with *C. dactylon* (L) Pers., from which it differs by the absence of rhizomes, broader leaves and lemma with clavate hairs.

Specimen examined: Kerala, Wayanad, Kolavayal, 02th May 2013, *dileep 9203* (SMCH).

8. *Cynodon dactylon* (Linn.) Pers. Syn. Pl. 1: 85. 1805; Fischer in Gamble, Fl. Pres. Madr. 1835. 1934 (Repr. ed. 3: 1270. 1957); Hook. f. Fl. Brit. Ind. 7: 288. 1896; Bor, Grass. Bur. Cey. Ind. Pak. 469. t. 52. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 360. 1991.

Stoloniferous, creeping perennials. Culms slender 10-40 cm, high, with rhizomes. Racemes 3-6, digitate 1-6cm long, rachis flat. Spikelet elliptic-lanceolate. Lower glume lanceolate 1.5-2 x 0.25-0.5 mm, 1-nerved. Upper glume lanceolate 1.75-2 x 0.5-0.75 mm, 1-nerved. Lemma boat shaped, 2-3 x 1.5-2 mm keeled, hairs simple.

Vernacular name: Karuka, Balikaruka, Arugam pullu.

***Flowering & Fruiting*:** Through out the year.

Distribution: Through out the warm regions of the world.

Habitat: Common on open wastelands, banks of rivers and streams.
***Uses*:** Kurichya tribes take a paste of *C. dactylon* juice with turmeric powder to cure skin problems such as skin rashes, itches and Leprosy. The regular usage of its juice is good for nervous system.
Specimen examined: Kerala, Wayanad, Kallur, 11th November 2012, *Dileep 9107*(SMCH).

9*. Dactyloctenium aegyptium* (L.) P. Beauv. Ess. Agrost. Expl. Pl. 15. 1812; Fischer in Gamble, Fl. Pres. Madr. 1840. 1934. (Repr. ed. 3: 1273. 1957); Hook. f. Fl. Brit. Ind. 7: 295. 1896; Bor. Grass. Bur. Cey. Ind. Pak. 489. T. 54. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 367. 1991.

Annuals. Culms creeping, 10-50cm high, rooting at nodes. Spikes digitate 1-6, each 1-6cm long. Spikelets ovate 2-4cm long, 2-4 flowered. Lower glume boat shaped, 1.5-2 x 1-1.5 mm keel minutely winged. Upper glume ovate-elliptic 1.5-2 x 1-1.5 mm, aristate, 1-1.5 mm long. Lemma ovate 1-5-2 x 1-1.5 mm, aristate, 1 mm long. Palea ovate-lanceolate 1-1.5 x 1 mm stamens 3. Grain obovate.
Distribution: NE Africa, India.
Habitat: Very common in wet lands and banks of streams.
Flowering and Fruiting: Throughout the year.
Uses: Worm infection and wounds. To relieve kidney pain and healing ulcer.
Specimen examined: Kerala, Wayanad, Kakkavayal, 25th May 2013, D*ileep 9155*(SMCH); Varyad, 16th June 2013, *Dileep 9166* (SMCH).

10. *Digitaria ciliaris* (Retz.) Koel. Deser. Gram. 27. 1802; Fischer in Gamble, Fl. Pres. Madr. 1764. 1934 (Repr. ed. 3: 1222. 1957); Hook F. Fl. Brit. Ind. 7: 15. 1896; Bor, Grass. Bur. Cey. Ind. Pak. 298. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 237. 1991.

Annuals or perennials. Racemes 2-12, digitate or sub-digitate 5-25cm long, rachis winged. Spikelet one sessile and other pedicelled. Lower glume triangular 0.2-0.5 mm long. Upper glume lanceolate 2-2.5 x 0.5 mm lower floret empty, upper floret bisexual. First lemma elliptic 2.5-3.5 x 0.5-0.75 mm, 7-nerved.
Distribution: Commonly seen in wastelands, moist shady places and along river banks.
Flowering and Fruiting: Throughout the year.
Notes: There are much variation seen in the number and length of racemes. Which is used as fodder and cattle feed.
Specimen examined: Kerala, Wayanad, Kolavayal, 27th September 2013, *dileep 9205* (SMCH).

11. *Digitaria longiflora* (Retz.) Pers. Syn. Pl. 1: 85. 1805; Fischer in Gamble, Fl. Pres. Madr. 1765. 1934 (Repr. ed. 3: 1223. 1957), Hook. f. Fl. Brit. Ind. 7: 17. 1896; Bor, Grass. Bur. Cey. Ind. Pak. 302. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 239. 1991.

Annuals or perennials. Culms 10-40cm long, slender, creeping, rooting at nodes. Racemes 2 or 3, rarely 4, digitate 2-10cm long. Spikelet ovate, solitary 1-2 mm long. Lower glume absent, upper glume ovate-elliptic 1-2 x 1 mm, 5-9 nerved. Lower floret empty. Upper floret bisexual. First lemma similar to upper glume, second lemma ovate, 1-1.5 x 1 mm, yellow to brownish in fruits. Palea broadly elliptic.
Distribution: Old World tropics.
Habitat: Common in open grasslands and weed of cultivated lands.
Flowering and Fruiting: Throughout the year.
Specimen examined: Kerala, Wayanad, Varyad, 11th May 2013, *dileep 9212* (SMCH).

12. *Echinochloa colonum* (L.) Link, Hort. Berol. 2: 209. 1833; Fischer in Gamble, Fl. Pres. Madr. 1766. 1934 (Repr. ed. 3: 1230. 1957); Hook. f. Fl. Brit. Ind. 7: 32. 1896; Bor, Grass. Bur. Cey. Ind. Pak.308. t. 34. 1960; Sreek. & V.J. Nair, 245. 1991.

Annuals, culms 10-90cm high, erect, nodes glabrous. Leaves lanceolate. Panicles linear 2-15cm long, racemes 4-12, each 0.5–3cm long. Spikelet ovate, greenish-yellow. Lower glume ovate, 1-2 x 1-1.5 mm, 5-nerved, hispid. Upper glume boat shaped 2-4 x 1.5-2 mm, hispid. Lower floret barren. Upper floret bisexual.
Vernacular name: Adipul
***Flowering & Fruiting*:** June-November.
Distribution: Widely spread in the tropics of Asia and Africa.

Habitat: Common in the paddy fields, wastelands and along the bunds of paddy fields.
***Uses*:** Food in times of scarcity. This is a very good fodder grasses before flowering. The shoots are eaten as vegetable by Paniya tribes.
Specimen examined: Kerala, Wayanad, Panamaram, 20th December 2012, *Dileep, 9113*(SMCH).

13. *Echinochloa crusgalli* (L.) P. Beauv. Ess. Agrost. 53: 161. 1812; Fischer in Gamble, Fl. Pres. Madr. 1777. 193 (Repr. ed. 3: 1231. 1937); Hook. f. Fl. Brit. Ind. 7: 31. 1896; Bor, Grass. Bur. Cey. Ind. Pak. 311. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 246. 1991.

Tufted annuals. Culms 40-80cm high. Leaves lanceolate. Ligules absent. Panicle lanceolate to pyramidal, open, racemes 9 - 22, each 1-6cm long. Spikelets ovate, awned 4-6 mm long, hispid. Lower glume ovate 1.5-1.8 x 1.3 mm, 3 - 5-nerved. Upper glume broadly ovate 5-6 x 2-3 mm, 7-9 nerved. Florets 2; lower floret male, upper floret bisexual. First lemma ovate, awned, 7-nerved.
Distribution: South East Asia, Nepal, Sri Lanka, Africa and Australia.
Habitat: Common along wet lands, paddy fields and other semi aquatic places.
Flowering and Fruiting: March-September.
Notes: It is a common weed in paddy fields.
Specimen examined: Kerala, Wayanad District, Kallur, 15th March 2013 *dileep 9207* (SMCH).

14. *Eleusine indica* (Linn.) Gaertn. Fruct. 1: 8. 1789; Fiscehr in Gamble, Fl. Pres. Madr. 1829. 1934 (Repr. ed. 3: 1273. 1957); Hook. f. Fl. Brit. Ind. 7: 293 1896; Bor, Grass. Bur. Cey. Ind. Pak. 493. 1960; Sreek. & V.J. Nair. Fl. Kerl. Grass. 371. 1991.

Annuals. Culms tufted, erect 7-60cm long. Leaves lanceolate. Spikelets ovate, 3-6 flowered. Lower glume oblong 1.5-2 x 0.5-1 mm, 3-nerved. Upper glume oblong 2-3 x 1-1.5 mm keeled, 5 nerved, lemmas ovate-oblong 2-3 x 1.5-2 mm, 3 nerved. Palea oblong-elliptic 2-2.5 x 0.5-1 mm, delicate, 2-keeled, 2-nerved.
Vernacular name: Kattu thina, Njandu pullu.
***Flowering & Fruiting*:** Throughout the year.
Distribution: Tropical and subtropical regions.
Habitat: Common in wastelands, margins of streams and as a weed in cultivated fields.
Notes: 'Crab Grass' or Crawfoot Grass' is characterized by loosely packed subdigitate spike and unexposed grains (Sreekumar & V.J. Nair, 1991).
***Uses*:** Stems are employed for mats, hats and baskets by Paniya tribes. They also use the leaf extract for reducing blood sugar level. It is used as a cereal and vegetable by Paniya.
Specimen examined: Kerala, Wayanad, Kaattikulam, 27th November 2013, *Dileep 9192*(SMCH).

Fig. 3. **a)** *Sacciolepis interrupta*, **b)** *Ischaemum indicum* , **c)** *Isachne miliacea*, **d)** *Imperata cylindrica* , **e)** *Oryza rufipogon*, **f)** *Leersia hexandra*, **g)** *Pennisetum hohoenac* **h)** *Brachiaria ramosa*, **i)** *Sporobolus indicus*, **j)** *Paspalidium flavidum*, **k)** *Setaria pumula*, **l)** *Panicum repens*

15. *Eragrostis unioloides* (Retz.) Nees ex Steud. Syn. Pl. Glum. 1: 264. 1854; Fischer in Gamble, Fl. Pres. Madr. 1826. 1934 (Repr. ed. 3: 1264. 1957); Stapf in Hook. f., Fl. Brit. Ind. 7: 317. 1896; Bor, Grass. Bur. Cey. Ind. Pak. 515. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 392. 1991.

Annuals or perennials. Culms tufted 5-70cm high, erect, nodes glabrous. Leaves lanceolate, ligules narrow rim. Panicles narrowly oblong 2-30cm long lax. Spikelets ovate-oblong, 2-4 mm wide, 6-40 flowered, green or purplish. Lower glume 1-1.5 x 0.5 mm 1-nerved. Upper glume 1-2 x 0.5–0.75 mm, 1-nerved. Lemma broadly ovate, 1-2.5 x 0.75–1.5 mm, 3-nerved. Palea elliptic 1-2 x 1mm.

Vernacular name: Karayam pullu

Distribution: Widespread in tropical Asia, Africa, Myanmar, Nepal, Sri Lanka and India.

Habitat: Very common in roadsides, paddy fields and cultivated fields.

Flowering and Fruiting: Throughout the year.

Notes: The plant shows much variation in habit, colour, size and shape of spikelets and number of floret. But the plant is recognized easily by its lax, purplish panicles and ovate spikelets (Sreekumar & V.J. Nair, 1991).

Specimen examined: Kerala, Wayanad, Varyad, 14th January 2013, *Dileep 9177*(SMCH).

16*. Imperata cylindrica* (L.) Raeusch. Nom. Bot. ed. 3: 10. 1797; Cope in Nasir & Ali, Fl. Pak. 143: 252. 1982; Bor, Grass. Burma. Ceylon. India. Pakistan: 211. 1960; Sreekumar & V.J. Nair, Fl. Kerala Grass. 114. 1991.

Perennials. Culms 25-170cm high, rhizomatous. Spikelets similar, pedicelled, lanceolate or ovate-lanceolate, 2.5-4.5 mm long, awnless, enveloped in long silky hairs from callus and glumes. Florets 2, lower floret empty, upper floret bisexual; Lower lemma oblong-lanceolate, 1.5-2 x 1 mm; slightly 3-lobed at apex. Lower palea absent. Upper lemma elliptic-lanceolate, 1 - 1.7 x 1 mm, slightly 3-lobed, hyaline, margins ciliate at apex. Upper palea obovate.

Distribution: Warm and temperate parts of Asia, extending to Australia and Africa.

Habitat & Ecology: Banks of backwaters and as a weed in cultivated fields.

Flowering & Fruiting: Throughout the year.

Uses: This grass is excellent for thatching and paper industry; a good soil binder.

Specimen examined: Kerala, Wayanad Dist, Meppadi, 30th November 2012, *Dileep 9210*(SMCH).

17. *Isachne miliacea* Roth ex Roem. & Schult. Syst. Veg. 2: 476. 1817; Fischer in Gamble, Fl. Pres. Madr. 1797. 1934 (Repr. ed. 3: 1244. 1957); Hook. f. Fl. Brit. Ind. 7: 25. 1896; Bor, Grass. Bur. Cey. Ind. Pak. 582. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 424. 1991.

Annuals or perennials, culms erect, 10-40cm high, nodes bearded. Leaves ovate-lanceolate. Sheaths ciliate along the margins. Panicles lax, 1-10cm long. Spikelets obovoid, 1.5-2 mm long. Lower glume oblong 1.5-2 x 1 mm many nerved. First lemma ovate-oblong, 1-5-2 x 1 mm palea oblong, 1.5 x 1 mm, delicate. Second lemma ovate.

Vernacular name: Chama pullu

Flowering & Fruiting: June-December.

Distribution: Through out India and South East Asia, extending to China.

Habitat: Very common marshy plant, frequent in paddy fields, on river fringes.

Specimen examined: Kerala, Wayanad, Kallur, 19th October 2012, *Dileep 9136*(SMCH).

18. *Ischaemum indicum* (Houtt) Merrill var. ***indicum*** sub-var. ***indicum***. Hook.f. Fl. Brit. Ind.134.1896; Sreek. & V.J.Nair, Fl. Kerl. Grass.137. 1991.

Annuals. Culms 20-80cm long. Racemes usually 2, densely villose. Sessile spikelets ovate 4-5 x 1.5-2 mm, awned, lower glume oblong 4-5 x 1-1.5 mm notched and accuminate at apex, broadly winged, wings ear-shaped. Upper glume boat shaped, 4-5 x 1.5-2 mm, aristate, ciliate along the keels. Lower floret male; upper floret bisexual. Pedicelled spikelets ovate, 4-5 mm long, acute, awned.

Distribution: Very common along the bunds of paddy fields, usually in moist places

Flowering and Fruiting: January-September.

Specimen examined: Kerala, Wayanad District, kallur, 11th January 2013, *dileep 9214* (SMCH).

19. *Ischaemum timorense* Kunth, Rev. Gram.1: 369. t. 98. 1830; Hook. f. Fl. Brit. Ind. 7:136. 1896: Fischer in Gamble, Fl. Pres. Madr. 1722. 1934 (Repr. ed. 3: 1193. 1957); Bor, Grass. Bur. Cey. Ind. Pak. 185. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass.164. 1991.

Perennials, culms 20-100cm long. Sessile spikelets ovate- lanceolate, 3-4 mm long awned. Lower glume ovate-lanceolate 3-4 x 1.5-2 mm, 7-9 nerved. Upper glume lanceolate 3-4 x 1 mm, shortly bifid at apex, arista 2-3 mm, hairy on the upper half. Lower floret male and upper floret bisexual. First lemma oblong, palea lanceolate.

Distribution: Myanmar, Pakistan and Malayan Islands.

Habitat: Usually creeping and trailing on sandy soil and in damp places.

Flowering and Fruiting: September-December.

Specimen examined: Kerala, Wayanad District, Varyad, 20th May 2013, *dileep 9223* (SMCH).

20. *Leersia hexandra* Sw. Prodr. Veg. Ind. Occ. 21. 1788; Hook. f. Fl. Brit. Ind. 7: 94. 1896; Fischer in Gamble, Fl. Pres. Madr. 1845. 1934 (Repr. ed. 3: 1276. 1957); Bor, Grass. Bur. Cey. Ind. Pak. 599. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 430. 1991.

Perennials. Culms 50-150cm long, erect or trailing; elegant. Leaves linear-lanceolate; ligules ovate, membranous. Panicle lax, 3-10cm long. Spikelets oblong, 3-4 mm long, compressed. Glumes reduced to a rim. Lemma oblong, 3-4 x 1-2 mm, 5-nerved, laterally compressed, spinulose along the keels. Palea linear, oblong, 2-3 x 1mm, 3-nerved, ciliate along the keels.

Distribution: Pantropical, extending into temperate areas.

Habitat: Aquatic grass, also at times a weed in paddy fields.

Flowering and Fruiting: August- June.

Specimen examined: Kerala, Wayanad District, Mathamangalam, 17th April 2013, *dileep 9221* (SMCH).

21. *Oryza rufipogon* Griff., Not. Pl. Asiat. 3: 5. 1851. Hook. f. Fl. Brit. Ind. 7: 92. 1896; Bor, Grass. Bur. Cey. Ind. Pak. 605. 1960. Sreek. & V.J. Nair, Fl. Kerl. Grass. 432. 1991.

Tufted annuals or perennials. Culms up to 80cm long. Leaves elliptic-lanceolate; ligules ovate. Panicle compact when young. Spikelets oblong, 8 x 3-4 mm long, awned, compressed. Lower glumes reduced to a rim. Upper glume absent. Sterile lemmas two, similar, lanceolate. Fertile lemma oblong, boat shaped. Palea acute, 1-nerved.

Distribution: Myanmar, Nepal and India.

Habitat: Very common along the streams, backwaters and canals.

Flowering and Fruiting: August- June.

Specimen examined: Kerala, Wayanad District, Kaatticulam, 17th April 2012, *dileep 9220* (SMCH).

22. *Panicum psilopodium* Trin. Gram. Panic. 217. 1826; Hook. f. Fl. Brit. Ind. 7: 47. 1896; Bor, Grass. Bur. Cey. Ind. Pak. 330. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 271. 1991.

Annuals or perennials, culms 15-40cm high, erect, nodes glabrous. Leaves lanceolate, ligules membraneous. Panicles open, widely spreding. Spikelets ovate 2-3 mm, greenish, deciduous. Lower glume ovate 1 x 1.5mm. Upper glume ovate-lanceolate 3 x 1.5 mm, 11-nerved. Lower floret barren, upper floret bisexual.

Distribution: Tropical Asia.

Habitat: Very rare, in wetlandsand as a weed in cultivated fields.

Flowering and Fruiting: August.

Specimen examined: Kerala, Wayanad District, Varyad, 15th March 2013, *dileep 9215* (SMCH).

23. *Panicum repens* Linn. Sp. Pl. ed. 2: 87. 1762; Fischer in Gamble, Fl. Pres. Madr. 1783. 1934. (Repr. ed. 3: 1235. 1957); Hook. f. Fl. Brit. Ind. 7: 49. 1896; Bor, Grass. Bur. Cey. Ind. Pak. 330. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 271. 1991.

Perennials, culms 30-100cm long, erect or trailing, stoloniferous, rooting at lower nodes. Panicles oblong 7-20cm long, branches 4-10cm long. Pedicels angular. Spikelets ovate 2.5-3 mm, greenish. Lower glume broadly ovate 0.75 x 1.75mm. Upper glume ovate 2.5-3 x 1.25–1.5 mm, acute, 5-9 nerved. Lower floret male, upper floret bisexual.

Vernacular name: Bhathala pullu

Distribution: Tropics and subtropics.

Habitat: Commonly seen in bunds of paddy fields, banks of streams and rivers.

Flowering and Fruiting: January-December.

***Uses*:** Seeds are used as a poultry feed by Kurumas. Fresh rhizome of *P. repens* along with black peppers is crushed in to paste to cure stomach ache by Kurichya tribe.

Specimen examined: Kerala, Wayanad, Varyad, 28th November 2012, *Dileep 9143* (SMCH).

24. *Paspalidium flavidum* (Retz.) A.Camus in Laconte, Fl. Gen. Indo-China 7: 419. 1922; Fischer in Gamble, Fl. Pres. Madras 1774. 1934 (Repr. ed. 3: 1229. 1957); Manilal & Sivar., Fl. Calicut 343. 1982; Sreek. & V.J. Nair, Fl. Kerala Grass 278. 1991.

Annuals or perennials. Culms 10-70cm long. Ligule annular. Inflorescence 5-30cm long, spiciform; Spikes 3-10 in number, alternate, each 0.5-2cm long, distant by 2-4 times of their length. Spikelets ovate, 1-3 mm long. Lower glume ovate or orbicular, 1-1.5 x 0.5-1 mm, chartaceous, 3-nerved. Upper glume ovate, 2-3 x 1.5-2 mm, chartaceous, 3-9 nerved. Lower floret barren; upper floret bisexual.

Vernacular name: Arisi pullu.

Flowering & Fruiting : July-December.

Ditribution: Tropical Asia and Africa.

Habitat: Common in wet localities, paddy fields, ditches and banks of streams.

***Uses*:** Grains are edible. Seeds are boiled and eaten as a substitute for rice by Kattunaicka and Paniya tribes.

Specimen examined: Kerala, Wayanad, Kallur, 19th October 2012, *Dileep 9163*(SMCH).

25. *Paspalum conjugatum* Berg. In Act. Helv. Phys. Math. 7: 129. T. 8. 1772; Hook. f. Fl. Brit. Ind. 7: 11. 1896; Fischer in Gamble, Fl. Pres. Madr. 1772. 1934 (Repr. ed. 3: 1228. 1957); Bor, Grass. Bur. Cey. Ind. Pak. 336. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 285. 1991.

Perennials. Culms 30-80cm long, creeping, rooting at nodes. Leaves lanceolate. Sheaths compressed, racemes 2, conjugate. Spikelets broadly elliptic, greenish yellow. Lower glume absent. Upper glume ovate, 1-1.5 x 1 mm, long ciliate along margins. Lower floret barren. Upper floret bisexual. First lemma ovate 1-1.5 x 1 mm, membraneous. Second lemma ovate, 1-1.25 x 1mm.

Distribution: Pantropical.

Habitat: Commonly seen along banks of rivers and streams.

Flowering and Fruiting: Throughout the year.

Specimen examined: Kerala, Wayanad, Kallur, 04th May 2012, *dileep 9231* (SMCH).

26. *Paspalum distichum* Linn. Syst. Nat. ed. 10. 2: 855 1759; Hook. f. Fl. Brit. Ind. 7: 12. 1896; Bor, Grass. Bur. Cey. Ind. Pak. 338. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 286. 1991.

Annuals or perennials, culms 10-80cm long, erect or creeping, and rooting at nodes. Racemes usually 2, rarely 3, 1-8cm long. Spikelets ovate-elliptic, 2, 5-4 mm long. Lower glume absent. Upper glume ovate, 5-9 nerved. Lower floret barren. Upper floret bisexual. First lemma ovate-acute, 7-nerved. Palea ovate-oblong 2-2.5 x 1-1.5mm, crustaceous.

Distribution: Tropical and subtropical parts of the world.

Habitat: Commonly seen in banks of backwaters, as a weed in paddy fields.

Flowering and Fruiting: May-December.

Specimen examined: Kerala, Wayanad District, Varyad, 28th May 2013, *dileep 9229* (SMCH).

27. *Paspalum scrobiculatum* Linn. Mant. Pl. 1: 29. 1767; Hook. f. Fl. Brit. Ind. 7: 10. 1896; Fischer in Gamble, Fl. Pres. Madr. 1772. 1934 (Repr. ed. 3: 1227, 1957); Bor, Grass. Bur. Cey. Ind. Pak. 340. 1960; Manilal & Sivaraj. Fl. Calic. 337. 1982; Sreek. & V.J. Nair, Fl. Kerl. Grass. 287. 1991.

Annuals or perennials, culms 12-80cm high. Racemes usually 2, rarely 3 or 4, 1-10cm long, rachis flat. Spikelets ovate 2-3 mm long. Lower glume absent. Upper glume ovate 2-3 x 1.5-2 mm, 3-5 nerved. Lower floret barren. Upper floret bisexual. First lemma ovate 2-3 x 1.5-2 mm, 3-nerved. Palea ovate 1.5-2 x 1-1.5 mm, inflexed.

Vernacular name: Varaku.

Flowering & Fruiting: Through out the year.

Distribution: Old World tropics, Through out India.

Habitat: Very common along bunds of fields, wet lands and other water-logged areas.

Uses: Plants are used by Kurichya tribe to cure diabetes, and wound healing. Grains are boiled and eaten by Kattunaicka, Kurichya, Kuruma and Paniya tribes.

Specimen examined: Kerala, Wayanad, Muthanga, 20th October 2012, *Dileep 9171*(SMCH).

28. *Pennisetum hohoenackeri* Hochst. ex Steud. Syn. Pl. Glum. 1: 102. 1854; Fischer in Gamble, Fl. Pres. Madr. 1792. 1934 (Repr. ed. 3: 1241. 1957); Hook. f. Fl. Brit. Ind. 7: 84. 1896; Bor, Grass. Bur. Cey. Ind. Pak. 344. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 289. 1991.

Perennials. Culms 50-150cm high, erect, nodes glabrous. Leaves narrowly linear, 10-60 x 0.2-0.8 cm. Sheaths keeled, distichous. Panicles spiciform. Spikelets elliptic-lanceolate, 6-8 mm long. Lower glume ovate, 1-1.5 x 1 mm, 5-7 nerved. Lower floret male, upper floret bisexual. First lemma ovate, 6-8 x 2-3 mm, 9-13 nerved. Second lemma ovate 6-8 x 1-1.5 mm, 2-nerved. Stamens 3, yellow, ovary oblong.

Vernacular name: Maani pullu

Distribution: Tropical East Africa; introduced in many countries, India.

Habitat: Occasionally seen along the banks of streams and other water courses.

Flowering and Fruiting: February-August.

Uses: Plant is used for making brooms by Kattunaicka, Paniya and Kuruma tribes. *Notes:* This is uncommon and differs from other *Pennisetum* species by its peculiar tough culms and almost glabrous involucral bristles (Sreekumar & V.J. Nair, 1991).

Specimen examined: Kerala, Wayanad, Kaattikulam, 19th March 2013, *dileep 9191*(SMCH).

29. *Saccharum spontaneum* L. Mant. Pl. 2: 183. 1771; Hook. f. Fl. Brit. India 7 : 118. 1896; C. E .C. Fisch. in Gamble, Fl. Madras 3: 1708. 1934; Bor, Grass. Burma. Ceylon. India. Pakistan: 214. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 185. 1991.

Tufted, rhizomatous perennials. Culms up to 1.6 m high. Panicle ample, silver colored; Peduncle 12-28 cm, white villous hairy up to 6 cm. Racemes 6- 9 cm. Spikelets paired, one sessile and other pedicelled, both more or less similar. Sessile spikelet ovate-lanceolate. Lower glume ovate to linear-lanceolate, 3.2-4.2 x 1.2mm. Upper glume ovate-lanceolate, 3.2-4.2 x ca. 1.2 mm, acuminate, membranous to chartaceous. Florets 2, both epaleate; lower barren, upper bisexual.

Vernacular name: Kaattukarimbu.

Flowering and Fruiting: July-April.

Distribution: Old world tropics, most parts of India.

Habitat: Common in wet localities, paddy fields, ditches and banks of streams.

*Uses***:** The Paniya tribes take the decoction of roots and rhizome of *S. spontaneum* to increase the milk in breast feeding mothers (galactogogue).

Specimen examined: Kerala, Wayanad District, Punchavayal, 10th April 2013, *dileep 9203* (SMCH).

30. *Sacciolepis interrupta* (Willd.) Stapf in Prain, Fl. Trop. Afr. 9: 757. 1920; Fischer in Gamble, Fl. Pres. Madr. 1787. 1934. (Repr. ed. 3: 1238. 1957); Hook. f. Fl. Brit. Ind. 7: 40. 1896; Bor, Grass. Bur. Cey. Ind. Pak. 358. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 299. 1991.

Annuals or perennials. Culms 10-90cm long, creeping rarely erect, rooting or floating spongy root stick, nodes glabrous. Panicles spiciform, 3-35cm long. Spikelets elliptic, 3-5 mm long. Lower glume ovate-oblong. Spikelets elliptic, 3-5 mm long. Lower glume ovate-oblong, 1-1.5 x 0.5-1 mm, 3-5 nerved. Upper glume ovate-lanceolate, 3-5 x 1-2mm. Lower floret male or barren. Upper floret bisexual.

Vernacular name: Varinellu.

Distribution: Tropics of SE Asia.

Habitat: Common in wetlands and stagnant waters and a weed in paddy fields.

Flowering and Fruiting: Throughout the year.

Specimen examined: Kerala, Wayanad, Kolavayal, 28th August 2013, *Dileep 9205*(SMCH).

31. *Setaria pumila* (Poir.) Roem. & Schult. Syst. Veg. 2: 891. 1817; Hook. f. Fl. Brit. Ind. 7: 78. 1896; Fischer in Gamble, Fl. Pres. Madr. 1789. 1934 (Repr. ed. 3: 1239. 1957); Bor, Grass. Bur. Cey. Ind. Pak. 363. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 309. 1991.

Annuals, culms 15-125cm high. Panicles spiciform, 0.5-15cm long, yellowish. Bristles numerous, scabrid. Spikelets ovate, 1.5-2.5 x 1-1.5mm. Lower glume ovate 1-1.5 mm, 3-5 nerved. Upper glume ovate, 1-2 x 1-1.5 mm, 5 nerved. Lower floret male or barren. Upper floret bisexual.

Distribution: Old World tropics.

Habitat: Very common in wetlands, bunds of paddy fields, open grasslands.
Flowering and Fruiting: May-December.
Specimen examined: Kerala, Wayanad District, Kaattikulam, 15th May 2013, *dileep 9027* (SMCH).

32. *Sporobolus indicus* (L.) R. Br. var. ***diander*** (Retz.) Jovet & Guedes in Taxon 22: 163. 1973; Hook. f. Fl. Brit. Ind. 7: 247. 1896; Fischer in Gamble, Fl. Pres. Madr. 1817. 1934 (Repr. ed. 3: 258. 1957); Bor, Grass. Bur. Cey. Ind. Pak. 629. 1960; Sreek. & V.J. Nair, Fl. Kerl. Grass. 437. 1991.

Perennials, culms tufted, erect, 20-80cm high, nodes glabrous. Leaves linear–lanceolate, ligules membraneous. Panicles 5-40cm long, dark-grey coloured, spikelets 1.5-2 mm long, grayish. Lower glume oblong 0.2-0.5 mm long, upper glume ovate 0.5-1 mm long, 1 nerved. Lemma ovate, 1.5-2 mm long, 1 nerved. Palea elliptic, 1-1.5 mm long, 2-nerved. Stamens 2. Grain oblong 0.5-1 mm long.

Distribution: Throughout South East Asia.
Habitat: Commonly seen in open grasslands, waste lands banks of back waters.
Flowering and Fruiting: March-September.
Specimen examined: Kerala, Wayanad District, Kolavayal, 15th March 2013, *dileep 9226* (SMCH).

33. *Sporobolus wallichii* Munro ex Trin. J. Bot. 27:171. 1889; Hook. f. Fl. Brit. Ind. 7:248. 1896; Fischer in Gamble, Fl. Pres. Madr. 3:1817 (1258). 1934; Bor, Grass. Bur. Cey. Ind. Pak. 629. 1960; Mathew, Mat. Fl. Tamilnadu Carnatic 401. 1981. Kabeer & V.J.Nair, Fl. Tamilnadu. Grass 176. 2009.

Annual, or perennial, 90–120cm long. Panicle open; 25–45cm long; 10–20cm wide. Spikelets solitary, or in pairs. Fertile spikelets pedicelled. Pedicels 3–8 mm long. Spikelet with 1 fertile florets. Spikelets lanceolate; 2 mm long; breaking up at maturity. Glumes deciduous; lower glume elliptic, or oblong; 0.5–0.75 mm long; upper glume 0.5–0.75; membranous; veins absent. Lower glume margins are ciliolate. Upper glume elliptic; 1 mm long; membranous.

Vernacular name: Uppuruthanam pullu
Distribution: Asia-temperate: China. Asia-tropical: India and Indo-China.

The occurrence of *Sporobolus wallichii* Munro ex Trin. has reported first time from Kerala (Nair *et al*., 2014).
Habitat: Along foot hills and steep slopes of scrubby forest.
Flowering and fruting: August to March.
Specimen examined: Kerala, Wayanad, Kakkavayal, 20th May 2013, *Dileep 9183*(SMCH); Varyad, 21st October 2010, *Dileep 9045*(SMCH).

Discussion

The present study revealed the occurrence of 33 species of grasses belonging to 24 genera in the study area. They belong to two subfamilies such as Pooideae and Panicoideae. Panicoideae is the largest subfamily with 3 tribes and 16 genera. Pooideae is represented with 5 tribes and 8 genera. Paniceae is the largest tribe with 11 genera.

Out of 33 species 17 grasses are common weeds, such as Panicum *repens, Leersia hexandra, Echinochloa crussgali, Oryza rufipogon, Eragrostis unioloides, Digitaria ciliaris, Sacciolepis interrupta*, *Setaria pumila, Isachne miliaceae, Digitaria longiflora, Echinochloa colonum, Panicum psilopodium, Eleusine Indica* and *Ischaemum indicum.* 6 species used for grain such as *Paspalidium flavidum*, *Paspalum scrobiculatum, Paspalum distichum, Coix lacryma-jobi, Echinochloa colonum* and *Panicum psilopodium.* 7 of them are used in ethnomedicine (*Chrysopogon aciculatus, Cynodon dactylon, Saccharum spontaneum, Eleusine indica, Dactyloctenium aegyptium, Panicum repens* and *Coix lacryma-jobi.)* Some of them are good soil binders (*Axonopus compressus, Cynodon dactylon* and *Chrysopogon aciculatus*), some are used for making brushes and brooms (*Pennisetum hohoenackeri* and *Sporobolus wallichii*) and also in paper industry (*Imperata cylindrica)*. The occurrence of *Sporobolus wallichii* Munro ex Trin. has not been reported earlier from Kerala. Further studies should be conducted on this species.

Panicum psilopodium, Pennisetum hohoenackeri, Sacciolepis interrupta, Cynodon arcuatus are rare grasses in Kerala. The wet land fields in the study area are dominated by *Panicum psilopodium, Panicum repens, Isachne miliaceae, Echinochloa crussgali, Paspalum distichium* and *Sacciolepis interrupta*. The field with annual and biennial

crops is dominated by *Brachiaria milliformis, Panicum repens, Cynodon dactylon, Eleusine indica* and *Eragrostis unioloides*. And the lands where perennial crops are cultivated, grasses like *Axonopus compressus, Digitaria ciliaris, Panicum repens* and *Paspalum conjugatum* are seen in large numbers. The present study finds that *Panicum repens* dominates different types of land masses. And this is the only plant that shows much variation in habitat in the present study area.

To conclude, though there are grasses(17) as weeds abounding in the paddy fields, many of the other grasses (16 species) are of economic utility as plants yielding grains, ethnomedicine, sand binders, brushes and brooms and paper. They are of multiple uses if managed properly. Though grasses are considered as inconsequential by the layman, this highly evolved family of plants, of universal occurrence now, has tremendous economic potential. We should be able to carry this germplasm of utility into our future for the betterment of man. The rare grasses mentioned herein need further research and investigation to unearth their economic and ethnobotanical potential.

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