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# Studies on Grass flora of Savandurga forest from Karnataka India

**Dhatchanamoorthy N✉, Sathya Sangeetha, Ravikumar K, Noorunnissa Begum S**

**ABSTRACT**

The present work study provides an annotated checklist of grass flora in Savandurga forests of Karnataka, India. During the exploration, a total of 140 species belonging to nine sub-families, 13 tribes and 63 genera of Poaceae have been documented.

**Keywords:** Checklist, diversity, grass, Poaceae.

**1. INTRODUCTION**

Grasses belonging to family Poaceae which is one of the most diverse family of angiosperms not only provides great ecosystem services such as terrestrial, water ecosystem and climate regulation in support of agriculture, biogeochemical cycling, fodder, carbon storage but also they form a habitat for variety of aquatic macro-invertebrates and herbivores (White *et al.* 2000). Grasses have wide ecological amplitude and several adaptations in diverse habitat. They are one of the primary producers in wetlands ecosystem (Rawat and Adhikari, 2015). Owing to the high grass diversity of Savandurga forest and no previous work done, the urgent need for assessment and documentation of grass flora was felt which lead to this long term research in order to bring out first complete information on grass flora of this region from the taxonomic perspectives. Grass flora represents a significant portion of plant species diversity and also plays an important role in food chain for natural stability. Grasses, a natural homogenous group of plants belongs to one of the largest family i.e. Poaceae (Gramineae) which undoubtedly forms one of the most extremely ecologically and economically important families of flowering plants with a wide range of species diversity and plays a significant role in the lives of the human beings and animals. Grasses grow in all the conceivable habitats suitable for growth of the grass communities.

The family Poaceae, alternatively Graminae and commonly called as grasses, is represented globally by about 780 genera and 12000 species (Christenhusz and Byng, 2016) for which it is placed in the fifth position of dominance after Asteraceae. Poaceae is one of the largest families in India, represented by 263 genera and 1291 species (Karthikeyan *et al.*, 1989). The grass family has been the subject of two major new classifications Kellogg, 2015, Soreng *et al.*, 2017) based on phylogenetic data. Even before these ap-

peared, molecular phylogenies had resolved circumscription of the subfamilies and there has been general agreement for at least the last 15 years on the monophyletic of the major subfamilies. Nearly all known genera have been firmly assigned to subfamily and a large majority to tribe. In India, considering the vast array of the ecosystem services attributable to the terrestrial grasses, a document on the taxonomic features of the constituent species of the assemblage is essential (Debnath Palit, 2017). The present annotation is an effort to present the diversity of grass species encountered in the Savandurga forest of the concerned geographical area.



**Figure 1.** A. View of Savandurga forest B. Rock crevices habitat occupying several grass species C. Savandurga MPCA (Medicinal Plants Conservation Area) D. Rocky areas with many grass species growing in monsoon period (July to November) E. Semi aquatic and moist vegetation comprising several grasses and herbs growing together on rock puddle during peak monsoon season F. *Melanocenchris monoica* an ephemeral grass growing in rocky habitat having small pebble covered soil G. *Cymbopogon martini* a dominant grass species in forest edges H. *Themida triandra* growing between boulders.



## 2. MATERIALS AND METHODS

### Study area

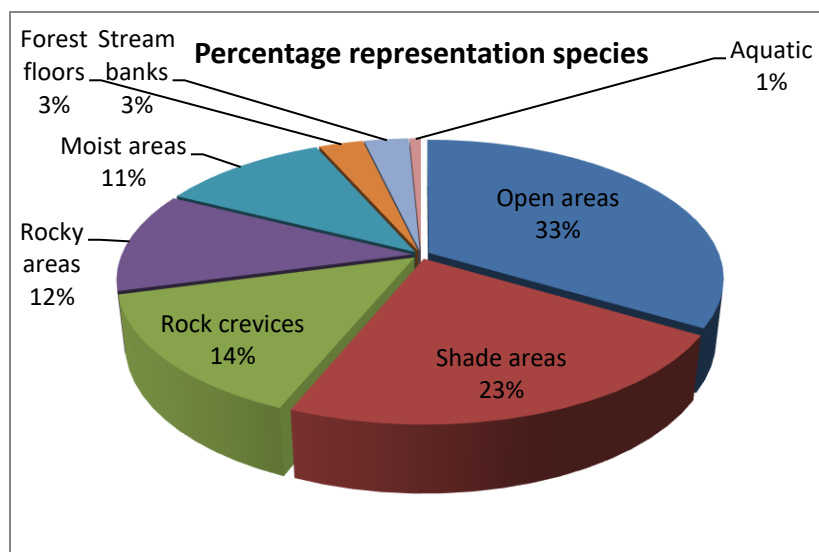
Savandurga forest is situated in Bangalore rural district, remain between latitudes 12°15'N and 12°35'N and longitudes 77°5'E and 78°E, covering an area of 27 Km<sup>2</sup>. Savandurga is having seasonally dry tropical climate. The hot weather season from March to May with low humidity; the Southwest Monsoon from June to September is a moist, cloudy and rainy period; the Northeast Monsoon season from October to December; and the cold winter from December to February. Maximum temperature is 36°C in April, while the minimum temperature is 8° C in December. The major soil type is red gravely sandy loam to red sandy loam and shallow in nature. In some parts of the forest shows alluvial soil found in the downstream portion of the tanks and tank beds.

### Methodology

Method of collection and herbarium preparation is followed to by standard procedure (Rao and Sharma, 1990). Extensive field surveys were conducted in all four seasons for three consecutive years i.e. 2017-19 to ensure maximum grass species collection. Collected grass specimens were identified with regional floras (Gamble, 1935, Bor, 1960), Saldanha and Nicholson, 1976, Sreekumar and Nair, 1991, Bhat and Nagendran, 2001), Kabeer and Nai, 2009, Ahmed *et al.*, 2009, Vasanthakumari *et al.*, 2010, Ray and Sainkhediya, 2012, Elizabeth *et al.*, 2020) and also by matching herbarium specimens at K and FRLH. The Nomenclature of each species has been updated using recent literature (Elizabeth *et al.*, 2020) (<http://www.plantsoftheworldonline.org>, <https://www.ipni.org>) and the collected specimens were deposited in the FRLH herbaria.

## 3. RESULTS AND DISCUSSION

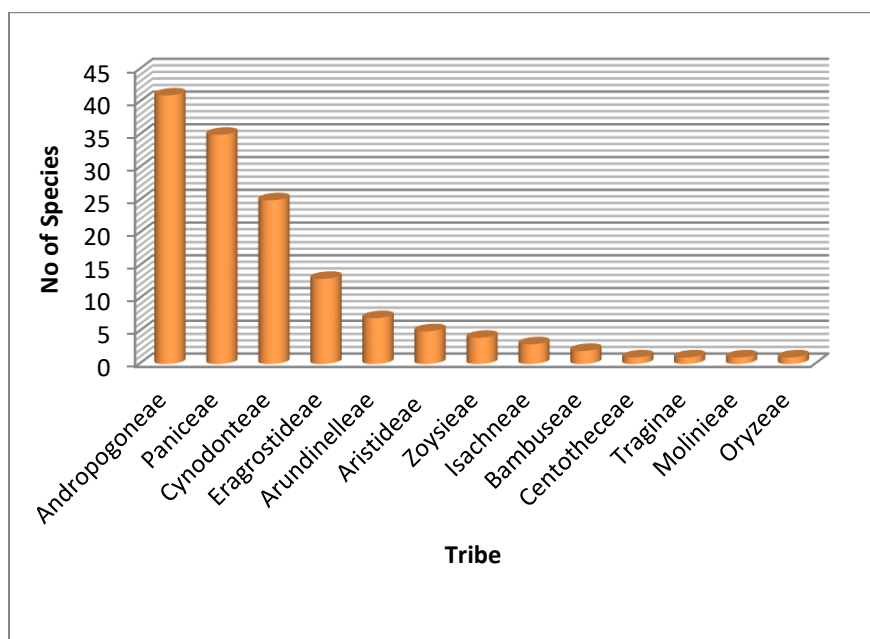
Savandurga is located about 60 km, northeast of Bangalore, which has the various kinds of land cover as well as habitats. A total of 140 species of wild grasses belongs to 63 genera and 13 tribes and nine sub-families were documented in Savandurga reserved forest, Ramanagara district, the tropical dry evergreen and deciduous forests (Table 1). Out of 11 tribes, Andropogoneae, consists highest number of species (40 species of 11 genera), followed by Paniceae (35 species of 10 genera), Cynodonteae (25 species) Eragrostideae (13 species), Arundinelleae (7 species), Aristideae (5 species), Zoysieae (4 species), Isachneae (3 species), Bambuseae (2 species) and the rest of the tribes, Centothecae, Tragineae, Molinieae and Oryzeae represents a single species each (Fig. 3).



**Figure 2.** Habitat distribution of documented species

The subfamily Panicoideae represents highest number of species (84) followed by Chloridoideae (40 species), Aristidoideae (5 species), Chlorideae (3 species), Bambusoideae (2 species), Micrairoideae (2 species). Pooideae, Arundinoideae and Oryzoideae represents one species each. The species rich genera are *Eragrostis* (13 species), *Ischaemum* (7 species) followed by *Aristida* (5 species), *Chrysopogon* (5 species), *Digitaria* (4 species), *Panicum* (4 species), *Paspalum* (4 species), *Sporobolus* (4 species), *Tripogon* (4 species), *Dimeria* (4 species), *Cymbopogon* (4 species), *Arundinella* (4 species), *Chloris* (3 species), *Brachiaria* (3 species), *Cynodon* (2 species), *Dactyloctenium* (2 species), *Garnotia* (2 species), *Glyphochloa* (2 species), *Isachne* (2 species) and *Themida* (2 species) (Fig. 4). *Andropogon*

*pumilus*, *Apluda mutica*, *Bambusa arundinacea*, *Bothriochloa pertusa*, *Capillipedium huegelii*, *Coelachne simpliciuscula*, *Dinebra retroflexa*, *Echinochloa colonum*, *Eleusine indica*, *Elytrophorus spicatus*, *Elytrophorus spicatus*, *Enteropogon monostachyos*, *Eremopogon foveolatus*, *Eulalia trispicata*, *Hackelochloa granularis*, *Heteropogon contortus*, *Imperata cylindrical*, *Indopoa paupercula*, *Indopoa paupercula*, *Leersia hexandra*, *Leptochloa chinensis*, *Melinis repens*, *Perotis indica* and *Urochloa panicoides* are the twenty five single genera recorded during the study area.



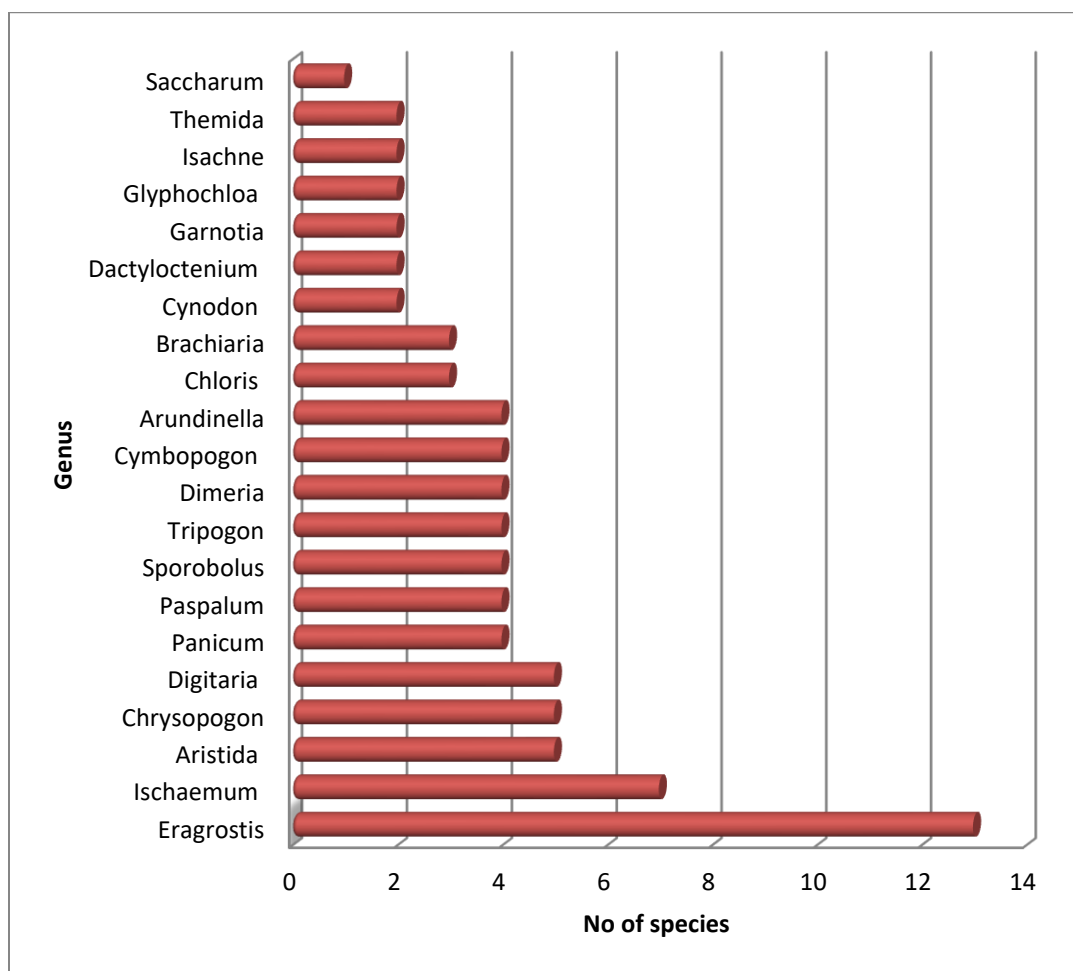
**Figure 3.** Tribes showing number of species

A small geographical area of Savandurga hillock forests owing the rich grass diversity. We could identify the habitat like, open areas, rock crevices, rockery areas, shade areas, moist areas, forest floor, stream banks and water bodies. We analyzed the habitat wise distribution of grasses in Savandurga, 34% of species are present in open lands, 23% of species are present in shade places, 14% of species are present in rock crevices, 12% of species are present in rock surfaces, 11% of species are present in moist places, 3% of species are present on forest floor, 3% of species are present along banks of streams and only 1% of species are present in aquatic lands (Fig. 2).

In this study, we recorded nearly 32 species are used as fodder such as *Alloteropsis cimicina*, *Apluda mutica*, *Aristida adscensionis*, *Arthraxon hispidus*, *A. lancifolius*, *Bothriochloa pertusa*, *B. distachya*, *B. ramosa*, *Capillipedium huegelii*, *Chrysopogon orientalis*, *C. asper*, *Cyanodon dactylon*, *Dactyloctenium aegyptium*, *Digitaria setigera*, *Echinochloa colonum*, *Eragrostiella bifaria*, *E. brachyphylla*, *Eragrostis aspera*, *Eragrostis gangetica*, *E. tenella*, *E. viscosa*, *Ischaemum rugosum*, *Melanocenchris monoica*, *Oplismenus compositus*, *Paspalidium flavidum*, *Pennisetum hohenackeri*, *P. orientale*, *Perotis indica*, *Saccharum spontaneum*, *Tripogon capillatus*, *T. major* and *Tragus mongolorum* (Fig. 7) and similar observation also found in this papers [16, 17]. Besides we recorded 22 species and two varieties such as *Aristida stocksii*, *Arthraxon hispidus* var. *santapau*, *Arundinella ciliata*, *Chrysopogon asper*, *Chrysopogon hackeli*, *Cyrtococcum longipes*, *Dimeria orissae*, *Dimeria ornithopoda*, *Dimeria stapfiana*, *Eragrostiella bifaria* var. *walker*, *Garnotia arundinacea*, *Glyphochloa forficulata*, *Glyphochloa mysorensis*, *Indopoa paupercula*, *Isachne gracilis*, *Ischaemum tumidum*, *Ochlandra scriptoria*, *Oropetium villosulum*, *Panicum fischeri*, *Pommereulla cornucopiae*, *Pseudoraphis spinescens* and *Tripogon major* are endemic to southern India (Fig. 5).

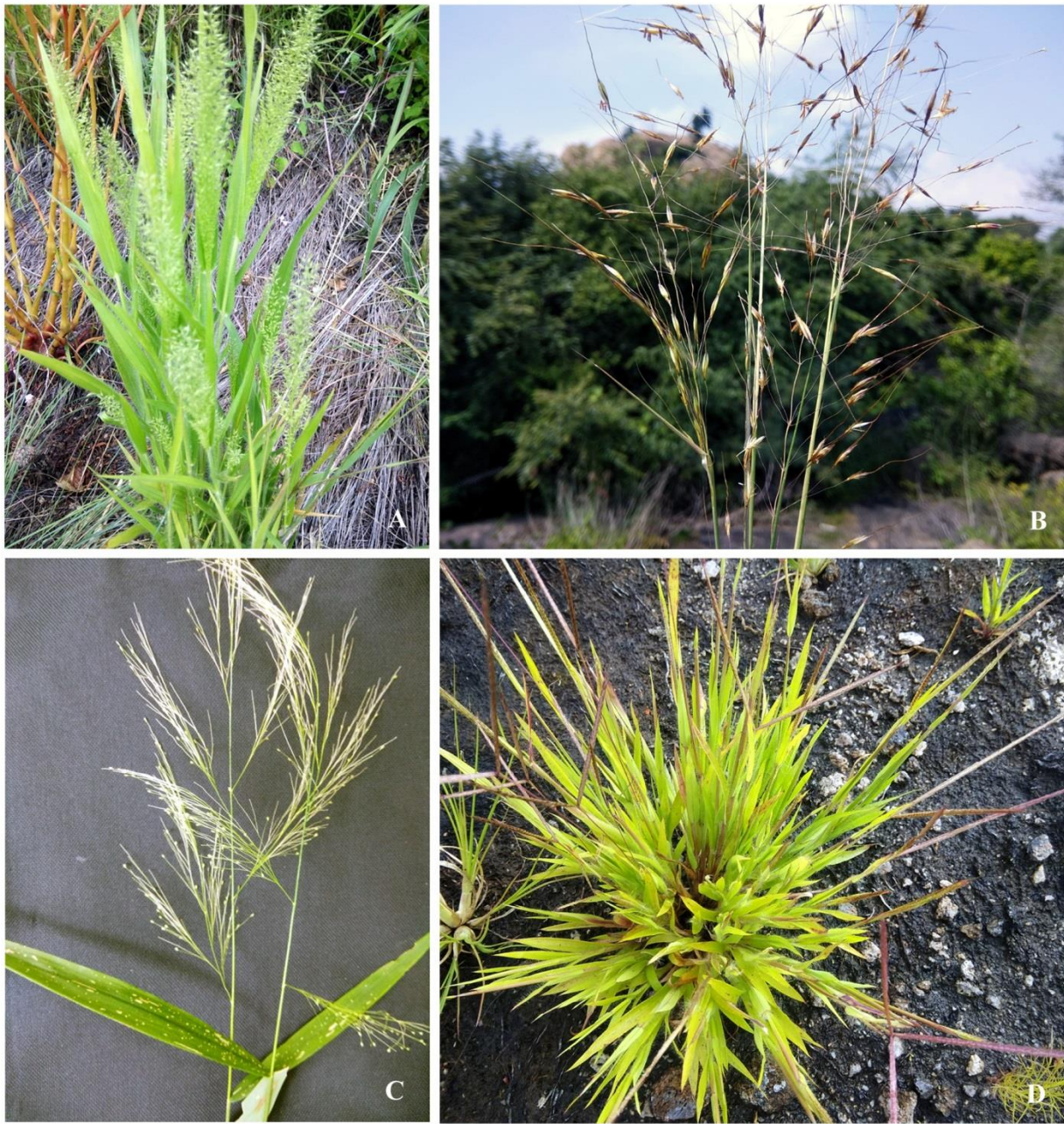
*Aristida setaceae*, *Bambusa arundinacea*, *Cymbopogon flexuosus*, *Cymbopogon martini*, *Cynodon dactylon*, *Eragrostiella bifaria*, *Eragrostis unioides*, *Heteropogon contortus*, *Imperata cylindrical*, *Rottboellia cochinchinensis* *Pennisetum orientale* Rich. and *Saccharum spontaneum* are excellent sand binder in stream banks, bound of paddy fields and fallow lands. The dried culms and straws of *Themida tremula*, *Themida triandra*, *Cymbopogon coloratus* and *Cymbopogon martini* are used as thatching roof material (Fig. 6). Grasses diversity plays a significant role in terrestrial ecosystem, used as fodder and forage by many insect species including Grasshoppers, domesticated animal and soil conservation [18]. Our observation during the extensive field surveys conclude that unsustainable heavy grazing practices, land encroachment and habitat degradation caused by increased anthropogenic activities like polluting land by plastic and non-biodegradable waste and increased human activities to collect medicinal plants and timber wood are the biggest threat to grass diversity in Savandurga forest. Grasses are among most useful plants as they occupy important and integral part in humans

life as food and forage. They are fast vanishing sensitive plants form in their natural habitats. So, there is urgent need of studies and scientifically cataloguing of grass flora of regional, national and global level, before they are destroyed. Some of the threats like heavy influence of hillock covered by land encroachments in surrounding areas and also unsustainable cattle grazing. It is suggested that the Savandurga forests grass vegetation, needs urgent conservation action and protection through sustainable utilization.



**Figure 4.** Top twenty-one genera showing maximum number of species





**Figure 5.** Endemic: A. *Arundinella ciliate* close up of habit B. *Chrysopogon asper* close up of inflorescence D. *Cyrtococcum longipes* close up of inflorescence E. *Dimeria orissae* close up of habit.





**Figure 6.** Good sand binder & uses: A. *Aristida setacea* close up of habit B. *Cymbopogon martini* close up of habit C. *Eragrostis unioides* close up of inflorescence D. *Eragrostiella bifaria* close up of habit E. *Heteropogon contortus* close up of habit F. *Pennisetum orientale* close up habit G. *Themida tremula* close up of Florets H. *Themida triandra* close up of Florets





**Figure 7.** A. *Eragrostis aspera* close up of inflorescence B. *Echinochloa colonum* close up of inflorescence C. *Perotis indica* close up of inflorescence D. *Digitaria setigera* close up of inflorescence E. *Melanocenchris monoica* close up of habit with inflorescence F. *Tragus mongolorum* close up of habit with inflorescence

**Table 1. Checklist of documented grasses in Savandurga forest**

S. No	Binomial	Tribe	Subfamily	Habit	Habitat
1	<i>Acroceras munroanum</i> (Balansa) Henr.	Paniceae	Panicoideae	Annual	Open areas
2	<i>Alloteropsis cimicina</i> (L.) Stapf	Paniceae	Panicoideae	Annual	Open areas
3	<i>Andropogon pumilus</i> Roxb.	Andropogoneae	Panicoideae	Annual	Rocky areas



4	<i>Apluda mutica</i> L.	Andropogoneae	Panicoideae	Annual	Shade areas
5	<i>Aristida adscensionis</i> L.	Aristideae	Aristidoideae	Annual	Open areas
6	<i>Aristida funiculata</i> Trin. & Rupr.	Aristideae	Aristidoideae	Annual	Open areas
7	<i>Aristida hystrix</i> L.f.	Aristideae	Aristidoideae	Annual	Open areas
8	<i>Aristida setaceae</i> Retz.	Aristideae	Aristidoideae	Annual	Open areas
9	<i>Aristida stocksii</i> (Hook.f.) Domin	Aristideae	Aristidoideae	Annual	Open areas
10	<i>Arthraxon hispidus</i> (Thunb.) Makino	Andropogoneae	Panicoideae	Annual	Rocky areas
11	<i>Arthraxon hispidus</i> var. <i>santapau</i> (Bor) Welzen	Andropogoneae	Panicoideae	Annual	Rocky areas
12	<i>Arthraxon lanceolatus</i> (Roxb.) Hochst	Andropogoneae	Panicoideae	Annual	Shade areas
13	<i>Arundinella ciliata</i> (Roxb.) Nees ex Miq.	Arundinelleae	Panicoideae	Annual	Rock crevices
14	<i>Arundinella pumila</i> (Hochst. ex A.Rich.) Steud.	Arundinelleae	Panicoideae	Annual	Rock crevices
15	<i>Arundinella purpurea</i> Hochst. ex Steud.	Arundinelleae	Panicoideae	Annual	Rock crevices
16	<i>Arundinella tuberculata</i> Munro ex Lisboa	Arundinelleae	Panicoideae	Annual	Rock crevices
17	<i>Bambusa arundinacea</i> (Retz.) Willd.	Bambuseae	Bambusoideae	Perennial	Stream banks
18	<i>Bothriochloa pertusa</i> (L.) A.Camus	Andropogoneae	Panicoideae	Annual	Open areas
19	<i>Brachiaria distachya</i> (L.) Stapf	Paniceae	Panicoideae	Annual	Open areas
20	<i>Brachiaria ramosa</i> (L.) Stapf	Paniceae	Panicoideae	Annual	Shade areas
21	<i>Brachiaria reptans</i> (L.) CAGardner & CEHubb.	Paniceae	Panicoideae	Annual	Open areas
22	<i>Capillipedium huegelii</i> (Hack.)Stapf	Andropogoneae	Panicoideae	Annual	Shade areas
23	<i>Cenchrus ciliaris</i> L.	Paniceae	Panicoideae	Annual	Open areas
24	<i>Cenchrus pedicellatus</i> (Trin.) Morrone	Paniceae	Panicoideae	Annual	Open areas
25	<i>Centotheca lappacea</i> (L.) Desv.	Centothecae	Panicoideae	Annual	Open areas
26	<i>Chloris barbata</i> Sw.	Cynodonteae	Chlorideae	Annual	Open areas
27	<i>Chloris dolichostachya</i> Lag.	Cynodonteae	Chlorideae	Annual	Shade areas
28	<i>Chloris montana</i> Roxb.	Cynodonteae	Chlorideae	Annual	Open areas
29	<i>Chrysopogon aciculatus</i> (Retz.) Trin.	Andropogoneae	Panicoideae	Annual	Moist area
30	<i>Chrysopogon asper</i> B.Heyne ex Blatt. & McCann	Andropogoneae	Panicoideae	Annual	Rocky areas
31	<i>Chrysopogon fulvus</i> (Spreng.) Chiov.	Andropogoneae	Panicoideae	Annual	Open areas
32	<i>Chrysopogon hackeli</i> (Hook.f.) C.E.C.Fisch.	Andropogoneae	Panicoideae	Annual	Rocky areas
33	<i>Chrysopogon orientalis</i> (Desv.) A.Camus	Andropogoneae	Panicoideae	Annual	Open areas
34	<i>Coelachne simpliciuscula</i> (Wight & Arn. Ex Steud.) Munro ex Benth	Isachneae	Pooideae	Annual	Rocky areas
35	<i>Cymbopogon caesius</i> (Hook. & Arn.) Stapf	Andropogoneae	Panicoideae	Annual	Rock crevices
36	<i>Cymbopogon coloratus</i> (Hook.f.) Stapf	Andropogoneae	Panicoideae	Annual	Rock crevices
37	<i>Cymbopogon flexuosus</i> (Nees ex Steud.) W.Watson	Andropogoneae	Panicoideae	Perennial	Rock crevices
38	<i>Cymbopogon martini</i> (Roxb.) W.Watson	Andropogoneae	Panicoideae	Annual	Rock crevices
39	<i>Cynodon dactylon</i> L.	Cynodonteae	Chloridoideae	Perennial	Open areas
40	<i>Cynodon radiatus</i> Roth ex Roem. & Schult	Cynodonteae	Chloridoideae	Annual	Open areas
41	<i>Cyrtococcum deccanense</i> Bor.	Paniceae	Panicoideae	Annual	Forest floors

42	<i>Cyrtococcum longipes</i> (Wight & Arn. ex Hook.f.) A.Camus	Paniceae	Panicoideae	Annual	Forest floors
43	<i>Cyrtococcum oxyphyllum</i> (Steud.) Stapf	Paniceae	Panicoideae	Annual	Shade areas
44	<i>Dactyloctenium aegyptium</i> (L.) Willd.	Cynodonteae	Chloridoideae	Annual	Moist areas
45	<i>Dichanthium annulatum</i> (Forssk.) Stapf	Andropogoneae	Panicoideae	Annual	Shade areas
46	<i>Dichanthium caricosum</i> (L.) A.Camus	Andropogoneae	Panicoideae	Annual	Open areas
47	<i>Digitaria bicornis</i> (Lam.) Roem. & Schult.	Paniceae	Panicoideae	Annual	Open areas
48	<i>Digitaria ciliaris</i> (Retz.) Koeler	Paniceae	Panicoideae	Annual	Open areas
49	<i>Digitaria longiflora</i> (Retz.) Pers.	Paniceae	Panicoideae	Annual	Open areas
50	<i>Digitaria radicata</i> (J.Prisl.) Miq.	Paniceae	Panicoideae	Annual	Shade areas
51	<i>Digitaria setigera</i> Roth	Paniceae	Panicoideae	Annual	Open areas
52	<i>Dimeria lawsonii</i> (Hook.f.) C.E.C.Fisch.	Andropogoneae	Panicoideae	Annual	Shade areas
53	<i>Dimeria orissae</i> Bor	Andropogoneae	Panicoideae	Annual	Rock crevices
54	<i>Dimeria ornithopoda</i> Trin.	Andropogoneae	Panicoideae	Annual	Rock crevices
55	<i>Dimeria stapfiana</i> C.E.Hubb. ex Pilger	Andropogoneae	Panicoideae	Annual	Rock crevices
56	<i>Dinebra retroflexa</i> (Vahl) Panz.	Cynodonteae	Chloridoideae	Annual	Moist areas
57	<i>Echinochloa colonum</i> (L.) Link	Paniceae	Panicoideae	Annual	Moist areas
58	<i>Eleusine indica</i> (L.) Gaertn.	Cynodonteae	Chloridoideae	Annual	Open areas
59	<i>Elytrophorus spicatus</i> (Willd.) A. Camus	Molinieae	Arundinoideae	Annual	Open areas
60	<i>Enteropogon monostachyos</i> (Vahl) K. Schum	Cynodonteae	Chloridoideae	Annual	Shade areas
61	<i>Eragrostiella bifaria</i> (Vahl) Bor	Cynodonteae	Chloridoideae	Perennial	Rocky areas
62	<i>Eragrostiella bifaria</i> var. <i>walkeri</i> (Stapf) Lazarides	Cynodonteae	Chloridoideae	Perennial	Rocky areas
63	<i>Eragrostiella brachyphylla</i> (Stapf) Bor.	Cynodonteae	Chloridoideae	Perennial	Rocky areas
64	<i>Eragrostis aspera</i> (Jacq.) Nees	Eragrostideae	Chloridoideae	Annual	Open areas
65	<i>Eragrostis atrovirens</i> (Desf.) Trin. ex Steud.	Eragrostideae	Chloridoideae	Annual	Shade areas
66	<i>Eragrostis gangetica</i> (Roxb.) Steud.	Eragrostideae	Chloridoideae	Annual	Moist areas
67	<i>Eragrostis japonica</i> (Thunb.) Trin.	Eragrostideae	Chloridoideae	Annual	Moist areas
68	<i>Eragrostis minor</i> Host	Eragrostideae	Chloridoideae	Annual	Open areas
69	<i>Eragrostis nutans</i> (Retz.) Nees ex Steud.	Eragrostideae	Chloridoideae	Annual	Shade areas
70	<i>Eragrostis pilosa</i> (L.) P.Beauv.	Eragrostideae	Chloridoideae	Annual	Open areas
71	<i>Eragrostis riparia</i> (Willd.) Nees	Eragrostideae	Chloridoideae	Annual	Open areas
72	<i>Eragrostis tenella</i> (L.) P.Beauv. ex Roem. & Schult.	Eragrostideae	Chloridoideae	Annual	Open areas
73	<i>Eragrostis tenuifolia</i> (A. Rich.) Hochst. ex Steud.	Eragrostideae	Chloridoideae	Annual	Shade areas
74	<i>Eragrostis tremula</i> Hochst.	Eragrostideae	Chloridoideae	Perennial	Rock crevices
75	<i>Eragrostis unioloides</i> (Retz.) Nees ex Steud.	Eragrostideae	Chloridoideae	Annual	Moist areas
76	<i>Eragrostis viscosa</i> (Retz.) Trin.	Eragrostideae	Chloridoideae	Annual	Open areas
77	<i>Eremopogon foveolatus</i> (Delile) Stapf	Andropogoneae	Panicoideae	Annual	Forest floors
78	<i>Eulalia trispicata</i> (Schult.) Henrard	Andropogoneae	Panicoideae	Annual	Shade areas
79	<i>Garnotia arundinacea</i> Hook.f.	Arundinelleae	Panicoideae	Perennial	Shade areas
80	<i>Garnotia tenella</i> (Arn. ex Miq.) Janowski	Arundinelleae	Panicoideae	Perennial	Shade areas
81	<i>Glyphochloa forficulata</i> (C.E.C.Fisch.)	Andropogoneae	Panicoideae	Annual	Rock crevices



	Clayton				
82	<i>Glyphochloa mysorensis</i> (S.K.Jain & Hemadri) Clayton	Andropogoneae	Panicoideae	Annual	Shade areas
83	<i>Hackelochloa granularis</i> (L.) Kuntze	Andropogoneae	Panicoideae	Annual	Rock crevices
84	<i>Heteropogon contortus</i> (L.) P.Beauv. ex Roem. & Schult.	Andropogoneae	Panicoideae	Annual	Open areas
85	<i>Imperata cylindrica</i> (L.) Raeusch.	Andropogoneae	Panicoideae	Perennial	Shade areas
86	<i>Indopoa paupercula</i> (Stapf) Bor	Cynodonteae	Chloridoideae	Annual	Shade areas
87	<i>Isachne globosa</i> (Thunb.) Kuntze	Isachneae	Micrairoideae	Annual	Shade areas
88	<i>Isachne gracilis</i> C.E.Hubb.	Isachneae	Micrairoideae	Annual	Open areas
89	<i>Ischaemum commutatum</i> Hack.	Andropogoneae	Panicoideae	Annual	Open areas
90	<i>Ischaemum indicum</i> (Houtt.) Merr.	Andropogoneae	Panicoideae	Annual	Open areas
91	<i>Ischaemum rugosum</i> Salisb.	Andropogoneae	Panicoideae	Annual	Moist areas
92	<i>Ischaemum semisagittatum</i> Roxb.	Andropogoneae	Panicoideae	Annual	Shade areas
93	<i>Ischaemum timorense</i> Kunth	Andropogoneae	Panicoideae	Annual	Shade areas
94	<i>Ischaemum tumidum</i> Stapf ex Bor	Andropogoneae	Panicoideae	Annual	Shade areas
95	<i>Ischaemum zeylanicum</i> Bor.	Andropogoneae	Panicoideae	Annual	Open areas
96	<i>Iseilema prostratum</i> (L.) Andersson	Andropogoneae	Panicoideae	Annual	Moist areas
97	<i>Jansenella griffithiana</i> (Mull. Stuttg.) Bor	Arundinelleae	Panicoideae	Annual	Shade areas
98	<i>Leersia hexandra</i> Sw.	Oryzeae	Oryzoideae	Perennial	Aquatic
99	<i>Leptochloa chinensis</i> (L.) Nees	Cynodonteae	Chloridoideae	Annual	Moist areas
100	<i>Melanocenchris jacquemontii</i> Jaub. & Spach	Cynodonteae	Chloridoideae	Annual	Open areas
101	<i>Melanocenchris monoica</i> (Rottler) C.E.C.Fisch.	Cynodonteae	Chloridoideae	Annual	Open areas
102	<i>Melinis repens</i> (Willd.) Zizka	Paniceae	Panicoideae	Annual	Rock crevices
103	<i>Ochlandra</i> sp.	Bambuseae	Bambusoideae	Perennial	Stream banks
104	<i>Oplismenus compositus</i> (L.) P.Beauv.	Paniceae	Panicoideae	Annual	Forest floors
105	<i>Oropetium roxburghianum</i> (Schult.) S.M.Phillips	Cynodonteae	Chloridoideae	Annual	Rocky areas
106	<i>Oropetium thomaeum</i> (L.f.) Trin.	Cynodonteae	Chloridoideae	Annual	Rocky areas
107	<i>Oropetium villosulum</i> Stapf ex Bor	Cynodonteae	Chloridoideae	Annual	Rock crevices
108	<i>Panicum curviflorum</i> Hornem.	Paniceae	Panicoideae	Annual	Shade areas
109	<i>Panicum fischeri</i> Bor	Paniceae	Panicoideae	Annual	Shade areas
110	<i>Panicum psilopodium</i> Trin.	Paniceae	Panicoideae	Annual	Shade areas
111	<i>Panicum repens</i> L.	Paniceae	Panicoideae	Perennial	Rocky areas
112	<i>Paspalidium flavidum</i> (Retz.) A.Camus	Paniceae	Panicoideae	Annual	Moist areas
113	<i>Paspalum canarae</i> var. <i>canarae</i>	Paniceae	Panicoideae	Annual	Moist areas
114	<i>Paspalum canarae</i> var. <i>fimbriatum</i> (Bor) Veldkamp	Paniceae	Panicoideae	Annual	Moist areas
115	<i>Paspalum conjugatum</i> P.J.Bergius	Paniceae	Panicoideae	Perennial	Moist areas
116	<i>Paspalum scrobiculatum</i> L.	Paniceae	Panicoideae	Annual	Moist areas
117	<i>Pennisetum hohenackeri</i> Hochst. ex Steud	Paniceae	Panicoideae	Annual	Open areas
118	<i>Pennisetum orientale</i> Rich.	Paniceae	Panicoideae	Annual	Open areas and stream banks

119	<i>Perotis indica</i> (L.) Kuntze	Cynodonteae	Chloridoideae	Annual	Rocky areas
120	<i>Pommereulla cornucopiae</i> L.f.	Cynodonteae	Chloridoideae	Annual	Open areas
121	<i>Pseudechinolaena polystachya</i> (Humb., Bonpl. & Kunth) Stapf	Paniceae	Panicoideae	Annual	Shade areas
122	<i>Pseudechinolaena polystachya</i> (Kunth) Stapf	Paniceae	Panicoideae	Annual	Shade areas
123	<i>Pseudoraphis spinescens</i> (R.Br.)	Paniceae	Panicoideae	Annual	Shade areas
124	<i>Rottboellia cochinchinensis</i> (Lour.) Clayton	Andropogoneae	Panicoideae	Perennial	Stream banks
125	<i>Saccharum spontaneum</i> L.	Andropogoneae	Panicoideae	Perennial	Stream banks
126	<i>Sacciolepis indica</i> (L.) Chase	Paniceae	Panicoideae	Annual	Moist areas
127	<i>Setaria intermedia</i> Roem. & Schult.	Paniceae	Panicoideae	Annual	Shade areas
128	<i>Setaria pumila</i> (Poir.) Roem & Schult.	Paniceae	Panicoideae	Annual	Open areas
129	<i>Sporobolus coromandelianus</i> (Retz.) Kunth	Zoysieae	Chloridoideae	Annual	Open areas
130	<i>Sporobolus diandrus</i> (Retz.) P.Beauv.	Zoysieae	Chloridoideae	Annual	Rocky areas
131	<i>Sporobolus fertilis</i> (Steud.) Clayton	Zoysieae	Chloridoideae	Annual	Shade areas
132	<i>Sporobolus piliferus</i> (Trin.) Kunth	Zoysieae	Chloridoideae	Annual	Shade areas
133	<i>Themida tremula</i> (Nees ex Steud.) Hack	Andropogoneae	Panicoideae	Annual	Rocky areas
134	<i>Themida triandra</i> Forssk.	Andropogoneae	Panicoideae	Annual	Rocky areas
135	<i>Tragus mongolorum</i> Ohwi	Traginae	Chloridoideae	Annual	Open areas
136	<i>Tripogon bromoides</i> Roem. & Schult.	Cynodonteae	Chloridoideae	Perennial	Rock crevices
137	<i>Tripogon capillatus</i> Jaub. & Spach	Cynodonteae	Chloridoideae	Perennial	Rock crevices
138	<i>Tripogon lisboae</i> Stapf	Cynodonteae	Chloridoideae	Annual	Rock crevices
139	<i>Tripogon major</i> Hook.f.	Cynodonteae	Chloridoideae	Annual	Rock crevices
140	<i>Urochloa panicoides</i> P.Beauv.	Paniceae	Panicoideae	Annual	Rocky areas

#### 4. CONCLUSION

Diversity of grass flora of Savandurga reserved forest, Ramanagara district, in the tropical dry evergreen and deciduous forests. Extensive field surveys were conducted in all four seasons for three consecutive years i.e. 2017-19. A total of 140 species of wild grasses belongs to 63 genera and 13 tribes and nine sub-families were documented. The present study will help in identifying the grass species for further investigation. It is suggested that the Savandurga forests grass vegetation, needs urgent conservation action and protection through sustainable utilization.

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#### Ethical approval

The ethical guidelines for plants & plant materials are followed in the study for species collection & identification.

#### Authors Contribution

All authors have contributed equally to manuscript.

#### Conflicts of Interest

All authors have no any conflict of interest to declare.



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**Data and materials availability**

All data associated with this study are present in the paper.

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