



*Research Paper*

**TAXONOMIC SURVEY AND SPIKELET VARIATION OF GRASSES IN  
VILAVANCODE TALUK OF KANYAKUMARI DISTRICT**

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**Abstract**

Grasses are diverse in taxonomic diversity and exhibit wide range of tolerance against the environmental factors qualifying as a pioneer species of an ecosystem. The Vilavancode taluk of Kanyakumari district is blessed with wide diversity of Grasses due to peculiar topographic and bioclimatic features. The present investigation revealed, the occurrence of 30 species of grass whose spikelet variations were taxonomically studied.

Key words: Diversity, Environmental, Grasses, species, spikelet , Taxonomy.

**INTRODUCTION**

The Poaceae (Gramineae) is a large and nearly ubiquitous family of monocotyledonous flowering plants with major economic and ecological importance. It comprise of about 11,290 species in approximately 707 genera [1]. The most economically important flowering plants, including wheat ( *Triticum aestivum* L. ), bamboos, forage grasses, and lawn grasses. Some of them are highly ornamental, but most of the grasses rarely attract a second glance even though it is difficult to live without them. Many grasses have food value, medicinal value and few were used as fodder. Grasses are good soil binders. They were wall grass, aquatic and waste land grass, grass growing on rocky substratum, religion importance, oil yielding aromatic grass, poisonous grass, grasses of good fodder value, cultivated grass, medicinal grass. Despite of utmost importance of grasses to mankind, the study on grasses continues to be neglected subject especially in India. This is mainly because of a feeling that it is a difficult group for identification, small size of floral organs, special terminology and complicated structure of spikelet and inflorescence.

Many grasses had medicinal value due to their medicinal properties. They find the multiple uses in many aspects of human life. Several species are cultivated for their food value. many of them have a significant medicinal properties and find the mention in ancient Indian medicine literature Recent evidence suggests that grasses had already diversified during the Cretaceous. The evidence came from phytolith analysis , tiny crystals of silica formed in the epidermal cells of leaves or floral bracts of grasses and

other plants. The discovery of grass phytoliths in coprolites of titanosaurid sauropods that lived in India 65 to 71 million years ago [2], suggested that grasses and dinosaurs coevolved [3]. Silica contents very greatly among the angiosperms, with high concentration occurring most commonly in the poaceae and other related monocotyledonous commelinid families [4] and macrophytes [5].

The study area Vilavancode taluk is blessed with wide diversity of ecosystems, species and genetic resources. The peculiar topographic and bioclimatic features favored the high percentage of species diversity in the study area. It harbours plenty of grass diversity and extensive study is made yet. So the present study was undertaken to study the morphological and reproductive features to identify closely related species. To understand the nature of the grass inflorescence, spikelet's were dissected.

## MATERIALS AND METHODS:

### Study area:

The Vilavancode taluk located in Kanyakumari district, Tamilnadu, India. The district has a favorable agro-climatic condition, which is suitable for growing a number of crops. The proximity of equator, its topography and other climate factors favor the growth of various crops. The soil of the study area is red and alluvial. The area experience tropical climate.

### Taxonomic survey:

Grasses were collected from Vilavancode taluk. The collected grasses were identified, described, illustrated and photographed. Plant specimens were identified with the help of Flora of the Presidency of Madras [6]. Spikelets were dissected under compound microscope and photographs have been taken using digital camera.

## RESULTS:

Taxonomically a total of thirty different grass species have been collected, identified, described and illustrated from the Vilavancode Taluk, Kanyakumari district. The recorded plants had medicinal, food, fodder, ornamental values. Out of the thirty grasses, ten plant species were used as food and fodder namely *Oryza sativa*, *Sorghum bicolor*, *Zea mays*, *Setaria viridis*, *Pennisetum glaucum*, *Brachiaria reptans*, *Brachiaria subquadripara*, *Dactyloctenium aegyptium*, *Eleusine indica*, *Eleusine coracana*, fifteen were used for ornamental purposes namely *Melinis repens*, *Oplismenus hirtellus*, *Echinochola colona*, *Axonopus compressus*, *Pennisetum polystachyon*, *Paspalum conjugatum*, *Bambusa vulgaris*, *Eragrostis tenella*, *Chloris barbata*, *Sacciolepis interrupta*, *Themeda triandra*, *Andropogon glomeratus*, *Paspalum distichum*, *Panicum notatum*, *Paspalum scrobiculatum*. and five species were medicinally useful namely *Cymbopogon citratus*, *Apulda mutica*, *Vetiveria zizanioides*, *Tragus roxburghii*, *Cynodon dactylon*. The collected grass species were listed below (Table 1).

**Table:1 List of grasses collected from study area**

NO.	Botanical name	Common name	uses
1.	<i>Oryza sativa</i>	Rice	Food and fodder
2.	<i>Sorghum bicolor</i>	Sorghum	Food and fodder
3.	<i>Zea mays</i>	Corn	Food and fodder
4.	<i>Setaria viridis</i>	Foxtail millet	Food and fodder
5.	<i>Pennisetum glaucum</i>	Pearl millet	Food and fodder
6.	<i>Brachiaria reptans</i>	Creeping panic grass	Food and fodder

7.	<i>Brachiaria subquadriflora</i>	Cori grass	Food and fodder
8.	<i>Dactyloctenium aegyptium</i>	Crowfoot grass	Food and fodder
9.	<i>Eleusine indica</i>	Indian goosegrass	Food and fodder
10.	<i>Eleusine coracana</i>	Finger millet	Food and fodder
11.	<i>Melinis repens</i>	Rose natal grass	Ornamental purpose
12.	<i>Oplismenus hirtellus</i>	Basket grass	Ornamental purpose
13.	<i>Echinochloa colona</i>	Jungle rice	Ornamental purpose
14.	<i>Axonopus compressus</i>	Carpet grass	Ornamental purpose
15.	<i>Pennisetum polystachion</i>	Mission grass	Ornamental purpose
16.	<i>Paspalum conjugatum</i>	Hilograss	Ornamental purpose
17.	<i>Bambusa vulgaris</i>	Bamboo	Ornamental purpose
18.	<i>Eragrostis tenella</i>	Love grass	Ornamental purpose
19.	<i>Chloris barbata</i>	Swollen fingergrass	Ornamental purpose
20.	<i>Sacciolepis interrupta</i>	Cupscale grass	Ornamental purpose
21.	<i>Themeda triandra</i>	Red grass	Ornamental purpose
22.	<i>Andropogon glomeratus</i>	Bushy bluestem	Ornamental purpose
23.	<i>Paspalum distichum</i>	Knot grass	Ornamental purpose
24.	<i>Panicum notatum</i>	Narhali	Ornamental purpose
25.	<i>Paspalum scrobiculatum</i>	Kodomillet	Ornamental purpose
26.	<i>Cymbopogon citratus</i>	Lemon grass	Medicinal
27.	<i>Apulda mutica</i>	Mauritian grass	Medicinal
28.	<i>Vetiveria zizanioides</i>	vetiver	Medicinal
29.	<i>Tragus roxburghii</i>	Indian bur grass	Medicinal
30.	<i>Cynodon dactylon</i>	Bermudagrass	Medicinal

### Spikelet of selected grasses:

The variations in spikelet of nine grasses were taxonomically studied and photographed (Plate:1).

#### *Melinis repens* (Willd.) Zizka :

Inflorescence is branched panicles, 7 cm long, with many conspicuously hairy flower spikelets. These flower spikelets are densely covered with silky hairs, that are initially reddish in colour, pyramidal. Flowering occurs throughout the year. Spikelets 5 mm long, ovate, pedicels 2 mm long, pilose at the tip. Lower glume 1 mm long, oblong. upper glume boat-shaped, lower floret, upper floret bisexual. stamens 3; Stigma feathery like, brownish in colour.

#### *Cymbopogon citratus* (DC.) Stapf :

Inflorescence paniculate. Spikelets comprising 1 basal sterile florets; 1 fertile florets; without rhachilla extension. Spikelets linear, well-developed, 2 in number. Basal sterile spikelet's equalling fertile. Glume dissimilar, exceeding apex of florets. Upper glume lanceolate. anthers 3, stigma feathery dark brown colour ,

#### *Setaria viridis* (L.) P.Beauv :

Spikelets are in very short panicle branches, each spikelet elliptical. The lower glume is one third the length of the spikelet. Lower lemma sterile, like the upper glume, upper lemma fertile. Mature spikelet's fall entire, leaving the bristles only. Glumes dissimilar. Globose like stigma.

***Pennisetum glaucum (L.) R.Br. :***

The inflorescence is a panicle, 30cm long. Anther 3. Anther tip penicillate. Inflorescence is a compound terminal spike called panicle. Inflorescence consists of a central rachis covered with soft short hairs and bears fascicles on rachillae. A spikelet contain 3 flowers. Feathery light yellow coloured stigma.

***Oplismenus hirtellus (L.) P.Beauv.:***

Inflorescence racemes. Spikelets packing contiguous, regular, 2-rowed in pairs. Fertile spikelet's comprising 1 basal sterile florets; 1 fertile florets; without rhachilla extension, lanceolate. Glumes dissimilar; thinner. Lower glume ovate; 1 length of upper glume; 0.5 length of spikelet. Lower glume surface glabrous; upper glume awn 3mm long. Florets basal sterile florets barren; with palea. Lemma margins involute. Anther 3. Stigma feathery like pink in colour.

***Echinochola colona (L.) Link:***

Inflorescence branches raceme. Spikelet length 2mm, the glume has no awn. Spikelets green tinged with purple, crowded, arranged alternately, about 3 mm long. Rarely with a short point up to 1mm long. First glume, 1.2 mm long, 3-nerved, nearly half as long as the spikelet; second glume, 2.5 mm, the first lemma is similar to the second glume, first palea ovate, glabrous, second lemma, broadly ovate. 3 anther. Feathery brown small stigma

***Oryza sativa L.:***

Inflorescence a panicle. Primary branches ascending, angular. Spikelets solitary. Fertile spikelets. The seeds grow on branch-like spikes which arch over. Inflorescence an erect panicle, spikelet about 7mm long, flat, one-flowered, with awns of varying length. Fertile spikelet's comprising 2 basal sterile florets, elliptic; laterally compressed. Anther 5. Feathery white coloured stigma.

***Sorghum bicolor (L.) Moench :***

Inflorescence a panicle, straight, ovate. Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets obovate. Companion sterile spikelet lemmas enclosed by glumes. Glumes dissimilar with lower wider than upper, parallel to lemmas. Without significant palea. The hairy on the spiral. Palea present. Anther 3. Feathery yellow coloured stigma.

***Zea mays L.:***

Inflorescence panicle. Each spikelet has one fertile floret and one infertile floret; the pistillate spikelet has short fleshy glumes, a short membranous lemma, a short palea, and an ovary with a pair of styles. The two styles are fused together, except near their tips; they are long, silky and filamentous. The filamentous styles are exerted from tip of the pistillate inflorescence and stigmatic along their sides. 3 long anther.

Plate: 1 Dissected spikelet of selected Grasses

1. *Melinis repens*



2. *Cymbopogon citratus*



3. *Setaria viridis*



4. *Pennisetum glaucum*

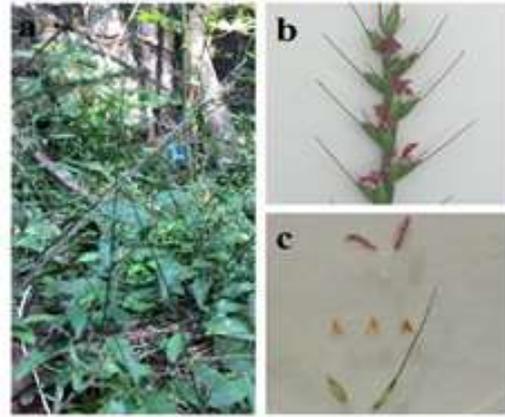


(a) Entire grass (b) Portion of spike enlarged (c) Dissected spikelet's

5. *Echinochola colona*



6. *Oplismenus hirtellus*



7. *Zea mays*



8. *Oryza sativa*



9. *Sorghum bicolor*



(a) Entire grass (b) Portion of spike enlarged (c) Dissected spikelet's

#### DISCUSSIONS:

Grasses are the most advanced family of flowering plants. And they show enormous specialization in their external morphology, anatomy and phytochemistry. During intensive survey and collection of grasses of Vilavancode Taluk, 30 different

grasses were recorded. Similarly investigation carried in Radhapuram taluk, reported 49 grass species [7].

Taxonomic study of grass species with their ethonobotanical use are documented [8]. Most of the grass species recorded were used as fodder by people in the study area. Homeopathic remedy prepared from *Cynodon dactylon* grass is used in treating almost all ailments that trouble the urinary tract. The remedy is also useful in treating nosebleed, blood vomiting and hypoglycemic effects [9]. Root decoction of *Cynodon dactylon* is given to cattle for respiratory diseases in different localities of Vilavancode Taluk. Similarly the leaves of *Cynodon dactylon* with coconut oil are used to cure skin diseases in Kanyakumari district[10].

The essential oil extracted from is *Cymbopogon citratus* is fragrant and are used in the manufacture of perfumes, soaps, detergents and creams [11, 12]. It has also been used to inhibit platelet aggregation [13], treat diabetes [14], dyslipidemia, gastrointestinal disturbances [15], anxiety [16], malaria [17], flu fever, and pneumonia [18], as well as in aromatherapy.

#### CONCLUSION:

The present work on family Poaceae resulted in recording grass species used for various purposes such as fodder, medicine, roof thatching, fuel etc. Among the 30 species collected, 10 were used for medicinal purposes in the study area for fever, stomach problems, respiratory tract infections, high blood pressure etc., some for roof thatching and animal living places, chicks, brooms, baskets, ladders stabilization. Grasses are mainly used as a fodder for cattle. The dissected grass species enabled the researcher to know more about the morphological and reproductive features to identify closely related species.

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