



**A SYSTEMATIC ACCOUNT OF  
ROADSIDE GRASSES  
IN JORHAT DISTRICT, ASSAM**



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**CERTIFICATE**

This is to certify that the thesis entitled “A Systematic Account of Roadside Grasses in Jorhat District, Assam” submitted to the Assam Science and Technology University, Guwahati, for the award of the degree of Master of Science in Botany is a bonafide research work carried out by the student Miss Monisha Gogoi (Roll No. 202820047013, Reg. No. 449528220) under my guidance and supervision during the period between April to August, 2022 in the Department of Agronomy, Assam Agricultural University, Jorhat. I further certify that no part of this thesis has been submitted anywhere else for the award of any Degree, Diploma, Associate-ship, Fellowship or other similar titles.

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## ABBREVIATION

<b>Abbreviation</b>	<b>Full form</b>
AAU	Assam Agricultural University
AAUWH	Assam Agricultural University Weed Herbarium
(Asm.)	Assam
Brit	British
<u>Ca</u>	About
Et al	and others
Fl	Flora
(H)	Hindi

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## ABSTRACT

Considering the rich diversity of grasses (Family Poaceae) and their various roles in economical and ecological services, the study was conducted to survey the roadside grassy species of Jorhat district, Assam. This systematic account revealed the presence of 26 number of grassy species in the study area under 19 numbers of genera, out of which 13 species were annual & rests were perennial in habit. The phenological observation has shown that *Axonopus compressus*, *Brachiaria ramosa* and *Ischane globosa* used to bloom almost round the year, 8 other species produced their flower & fruit during the rainy season and rest of the species used to bloom in the dry winter season. Almost all the species have been used by local people for their livelihood support in one way or other, which have been discussed along with the morphological description of the taxa. A key for identification constructed based on external morphology of the taxa for field recognition and easy handling by the end users.

# CHAPTER 1

## INTRODUCTION

### 1.1 GENERAL

“Of all plants, the grasses are the most important to man. All our bread stuffs corn, wheat, oats, rye, barley and rice and sugarcane are grasses” (Chase, 1948). The family Poaceae is considered as the most economically important plant family due to fact that they produce the world’s staples including domesticated cereal crops such as maize (corn), wheat, rice, barley, and millets. Which provide more than half of all calories eaten by humans. Cereals constitute the major source of protein. Grasses also serve for important environmental protection including erosion control, nourishing and providing habitat for animals and insects, cooling, water retention and nutrient cycling by the dead litter that is decomposed in the soil.

Roadside grasses play several vital ecological and economical roles. They are often been raised and maintained along the edges of roads, irrespective of Country road, Trunk road or National Highways, mainly for binding of the soil with their tremendously branched stem system and numerous fibrous roots arising from each and every nodes of prostrate portion of the stem. Grasses not only bind the soil particles but also architect exillent ecosystem where many other non-grassy plants can grow in association, as well as shelter innumerable numbers of primary and secondary consumers and their predators. Grasses are also considered as primary food provider in the entire roadside ecosystem, country cattles and several herbivorous are feed upon the road side grasses.

The Poaceae are one of the most successful families of the following plants with reduced flowers that adapted for wind and insect pollination. It is considered to be very advanced group of Angiosperms and evolved from primitive Liliaceous ancestral stocks. Superficially, Poaceae is considered to be resembled with Cyperaceae. In both this families, the flowers are small,

inconspicuous, subtended by bracts and present in the form of spikelet. However Poaceae differs from Cyperaceae by their usually terete, hollow, jointed stems, structure of spikelets etc.

Poaceae (the erstwhile name Gramineae) is the fifth largest family of Monocotyledonous flowering plants commonly known as grasses. This grass family includes over 10,000 species under 600 to 700 genera (Waston and Dallwitz 1992).

The name Poaceae was given by John Hendley Barnhart in 1895, based on the tribe Poaeae described in 1814 by Robart Brown, and the type genus *Poa* described in 1753 by Carl Linnaeus.

In the phylogenetic classification, Poaceae has been considered as the most advanced family of Angiosperms. C.E. Bessey (1845-1915) the American Botanist, classified Angiosperms, based on the natural system of Bentham and Hooker, modified in the light of his 28 dicta and published in *Ann. Mo. Bot. Gard.* under the title "*The phylogenetic taxonomy of flowering plants*" (1915). Bessey also initiated the representation of evolutionary relationship through an evolutionary diagram, a phylogram with primitive group at the base and the most advanced ones at the tips of branches. His diagram, resembling a cactus plant is better known as Besseyan cactus, where he shown Poales as the descended group of plants from Liliales, along with Arales, Arecales and Orchidales (Fig. 1).

Hutchinson's system (1973) postulated monophyletic origin of Angiospermae, where monocots are considered to be more advanced than Dicots, and Graminales (to which the grasses belonged) was placed in the culminating position (Fig. 2). He positioned the family Gramineae (=Poaceae) in family number 411, Order number 111 – Graminales, under the division 2 – Corolliferae, and the Subphylum Monocotyledones. Hutchinson suggested that the grasses were developed parallelly with the sedges from Liliaceous stocks through the Juncaceae complex.

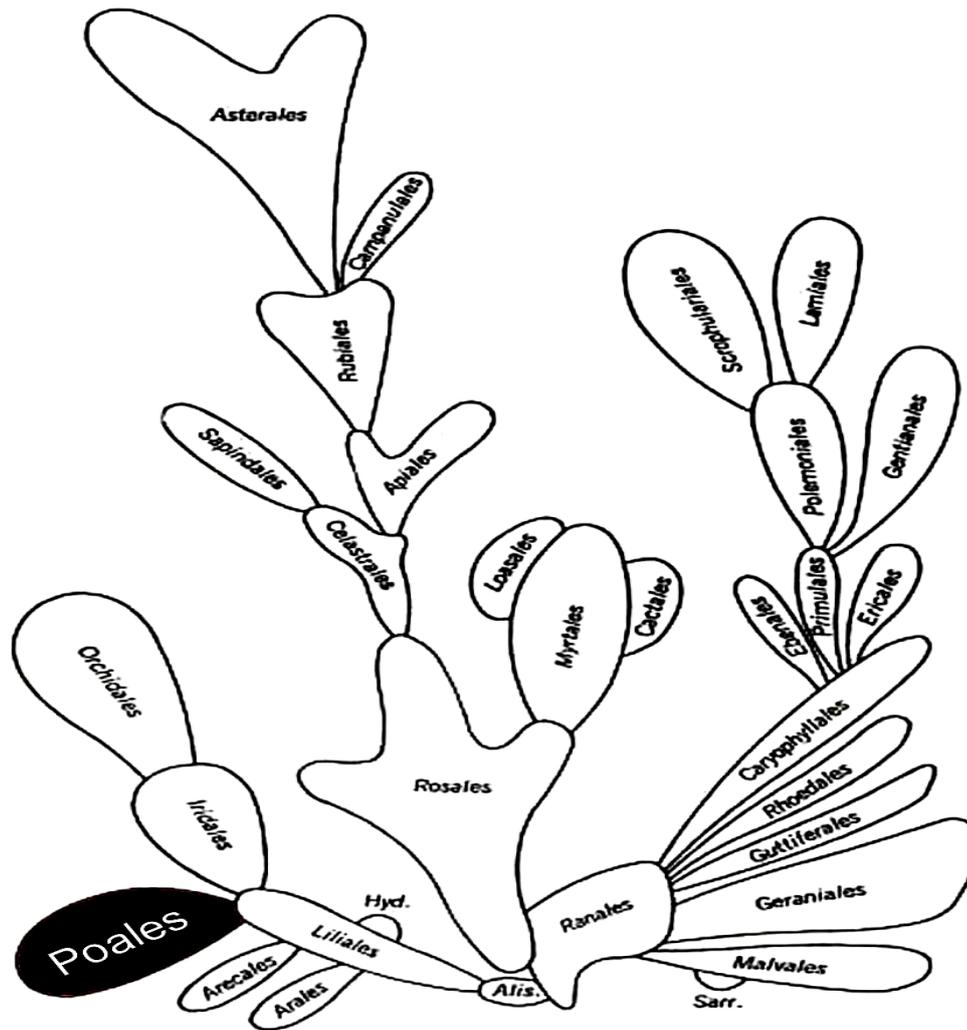
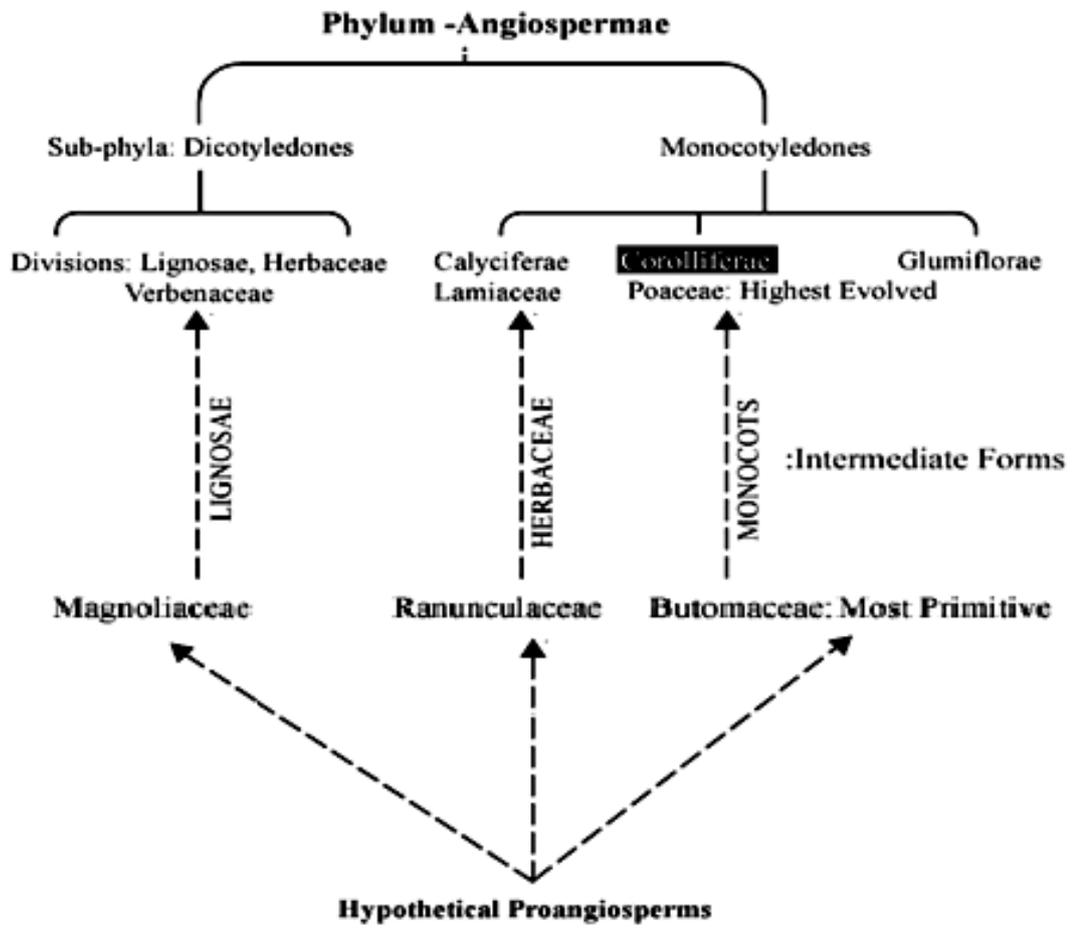


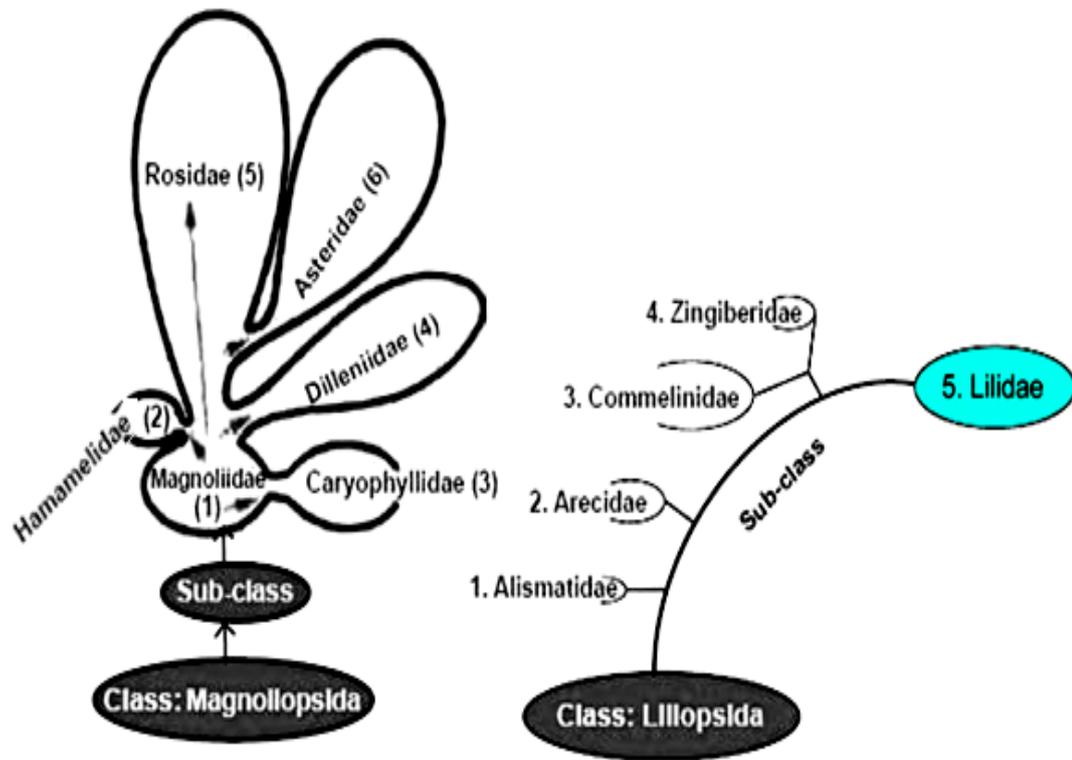
Fig 1: Bessey Cactus (1915) 'Diagram to show the relationship of order.

One of the earliest phylogenetic systems of classification of the plant Kingdom was proposed jointly by two German botanist Adloph Engler (1844-1930) and Karl A Prantl (1849-1893). They published their classification in a monumental work '*Die nature lichen Pflanzen Familien*' in 23 volumes (1887-1915). In this system, the plant kingdom was divided into 13 divisions, wherein the thirteenth division was Embryophyta Siphonogama which included seed plants. They placed the order Glumiflorae (order number 4) under the class Monocotyledoneae, including the families 1. Gramineae and 2.Cyperaceae.



**Fig 2: Hutchinson’s system of Classification (1959 & 1973).**

Arthur Cronquist (1919-1992), an American taxonomist, proposed phylogenetic classification of flowering plants based on a wide range of taxonomic features, including anatomical and phytochemical characters of phylogenetic importance. His classification was published in 1968 in the book entitled “*The evolution and classification of flowering plants*”. Cronquist classified the Angiosperms into two main classes Mangoliopsida (Dicotyledons) and Liliopsida (Monocotyledons). He arranged the Sub class 5- Liliidae, to which the grasses belonged, under the class Liliopsida (Monocotyledons) after the Order 1. Liliales and 2. Orchidales.

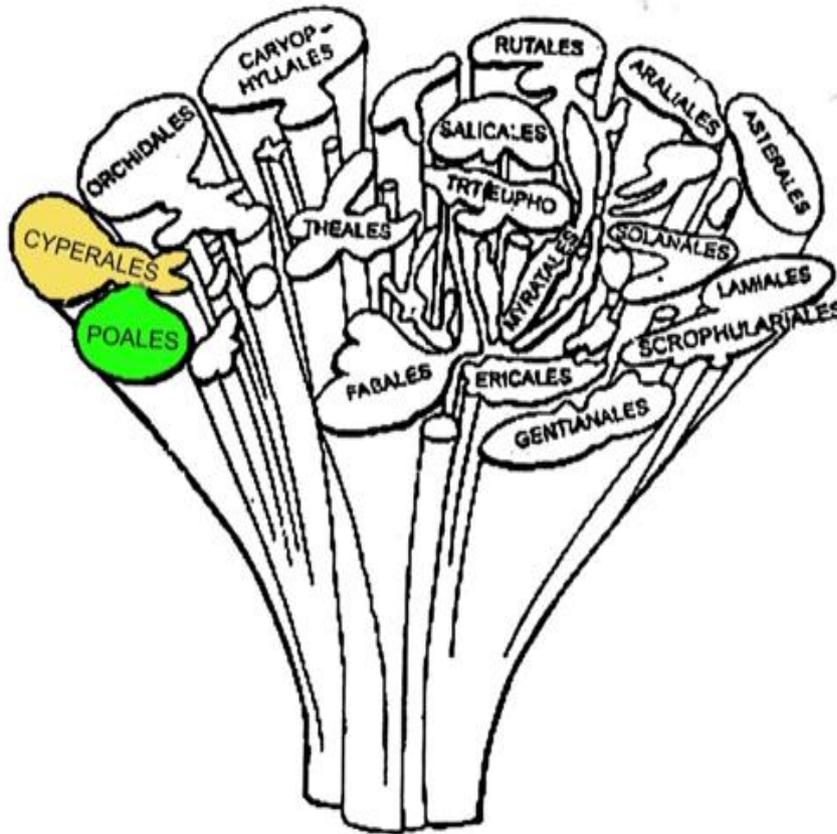


**Fig 3: Diagrammatic representation of the relationship between class Magnoliopsida and Liliopsida.**

Takhtajan introduced a phylogenetic system of Angiosperm classification 1942, and its latest revised versions in 1980. Takhtajan has also postulated monophyletic origin of Angiosperms, where Monocots were derived from primitive Dicots. He kept the family Poaceae under the class- Liliopsida (Monocotyledone), Sub-class B- Liliidae, (including Commelinidae & Zingiberidae) and division of superorder 5- Commelinane under the most advanced order 4-Poales, superorder 7- Poanae, subclass-2 Commelinidae and class Liliopsida ( Monocot).

Rolf Dahlgren, a botanist of Copenhagen, Denmark, published a system of classification of angiosperms in 1975, and thereafter a revised and improved versions in 1980, 1981 & 1983. Dahlgren was in agreement that the discontinuity between Monocotyledons and Dicotyledons is not particularly marked. He was in opinion that the Monocotyledons can be clearly circumscribed on the combination of single cotyledonal embryo and sieve

element. Like Taktajan, Dahlgren also postulated monophyletic origin of Angiosperms and kept Poales at the culminating 5<sup>th</sup> position after Juneales and Cyperales under the subclass Lilidae (Monocotyledoneae) (Fig. 4).



**Fig. 4. Phylogenetic imaginary tree shown by Dahlgren (1975).**

The Thorne's system of plant classification was postulated by the American botanist Robert F. Thorne (1920-2015) in 1968, and he continued to issue revision over many years (1968- 2007). In this classification Thorne arranged grasses under the family Poaceae, where the family was kept under the Class Maanoliopsida, Sub class Liliidae (Monocotyledons), Super order Commelinanae, Order – 7 Poales. The order Poales was divided into 6 families viz, Flagellariaceae, Joinvilleaceae, Restionaceae, Ecdeocoleaceae, Centrolepidaceae and Poaceae at the end.

Angiosperms Phylogeny Group (or APG) system of classification has been published 1998, 2003, 2009, and 2016 where Angiosperms were classified into three clades viz. Early Angiosperms, Monocots and Eudicots. Early

Angiosperms were classified into 8 orders and 26 families and the Monocots were classified into 11 Orders and 77 families. They analysed Clade Commelinids, under the family Asypogobaceae, and order Arecales, Poales, Commelinales, Zingiberales. Order poales was classified into 16 families, keeping the family Poaceae in the 10<sup>th</sup> position.

The accepted systematic position and the general morphological characters of the family poaceae are as follows:

Systematic position of the family:

Kingdom: Plantae

Division: Magnoliophyta

Class: Monocotyledon

Order: Poales

Family: Poaceae

Annual or perennial herb, rarely shrubs or trees. Stem cylindrical or laterally compressed and several jointed, usually hollow in the internodes and solid at the nodes. Leaves alternate, simple, distichous, exstipulate, sessile; sheath encircles the culm, margins of sheath free and overlapping and more or less connate, swollen at the base; ligule situated at the junction of sheath and blade, membranous or reduced to fringe of hairs; lamina often auricled at base. Inflorescence panicle of simple or compound spikes or racemes; each unit of inflorescence is spikelet. The spikelets are arranged in various ways on the main axis called rachilla. Spikelet consist of two bracts at the base, called glumes, followed by one or more florets. A floret consist of the the flower surrounded by two bracts, one external lemma (derived from bract or bracteole) which may or may not possess awn and one internal palea (derived from two sepals, the third sepal is absent). The perianth is reduced to two scales, called lodicules that expand and contract to spread the lemma and palea at the time of anthesis. Stamens are either 3 or 6. Ovary 1, one-chambered and one ovule; styles usually two, rarely 1 or 3; stigmas feathery. Fruit is caryopsis, with a thin pericarp adnate to the seed; seed endospermic, embryo small.

## **1.2 AIM AND OBJECTIVES**

1. To study the diversity of Road side grasses in the Jorhat district, Assam
2. To carry on a systematic account of the grassy species available in the study area
3. To develop a key for identification of the road side grassy species of Jorhat for their easy field recognition

## CHAPTER 2

### REVIEW OF LITERATURE

Initial work on grasses of India includes that of Griffith (1834), Duthie (1883, 1886, and 1888), Symonds (1886), Coldstream (1889) and Lisboa (1896). The 19th century ended with an account of the Gramineae of India in the Hookers “Flora of British India” (Hooker, 1896). An account of grasses along with other families was provided by Cooke (1901-1908) in his ‘Flora of the Presidency of Bombay’. An illustrated account of Bombay grasses was published by Blatter and Mccann (1935).

The 1<sup>st</sup> comprehensive systematic account of grasses of Assam as well as North East India well compiles by Bor and published as the 5th volume of Flora of Assam 1940. Bor has published another compilation of grasses of entire country and its neiburing regions in 1960 which is also considered as one of most significant contribution to the grassy flora of this entire South East Asia. There are several sporadic publications where grassy species could find a place as depicted by several Ethnobiological, Agrostological and explorational publication.

Some important work on grasses include that a synoptic account of uses and phytogeography of grasses of India is provided by Jain (1986) reporting 266 genera and 1200 species for the country. Brown (1958) studied 72 genera or grasses and on the basis of their tissue arrangement, recognized six main types. However these types could not be segregated into traditional subfamilies, viz., Pooideae and panicoideae. Matcalfe (1960) provided anatomical account for each group of grasses with illustration. Amarsinghe and Waston (1990) studied significance of micro hairs in taxonomy of genus *Eragrostis*.

Mosweu et al. (2013) studied the suitability of roadside grass for use as livestock feed to combat lack of forage resources in Botswana. Fifty grass

species were collected along the roadside in the A1 Highway corridor covering 629 km and analyzed for Ni, Cu, Pb, Zn, and Cd. Therefore, this study supported the use of roadside grasses for production of forage to combat scarcity of livestock feed in the country. However, the study recommended the establishment of an environmental management and monitoring approach to facilitate continued monitoring of the quality of forage produced from roadside grass and ensure protection of human and animal health.

In earlier system of classification mainly external morphological characters especially those flower were used, however, now a days data from various fields viz., anatomy, cytology, palynology , phytochemistry & more recently molecular biology have been profitably utilized in refining taxonomic classification and understanding phylogeny, evolution and interrelationship of various groups.

In 90 tecade some good publications on grasses of tropics and subtropics were published. FAO published tropical grasses in 1990 authored by Skerman and Riveros. A significant contribution on the grasses of North East India was made by Shukla 1996.

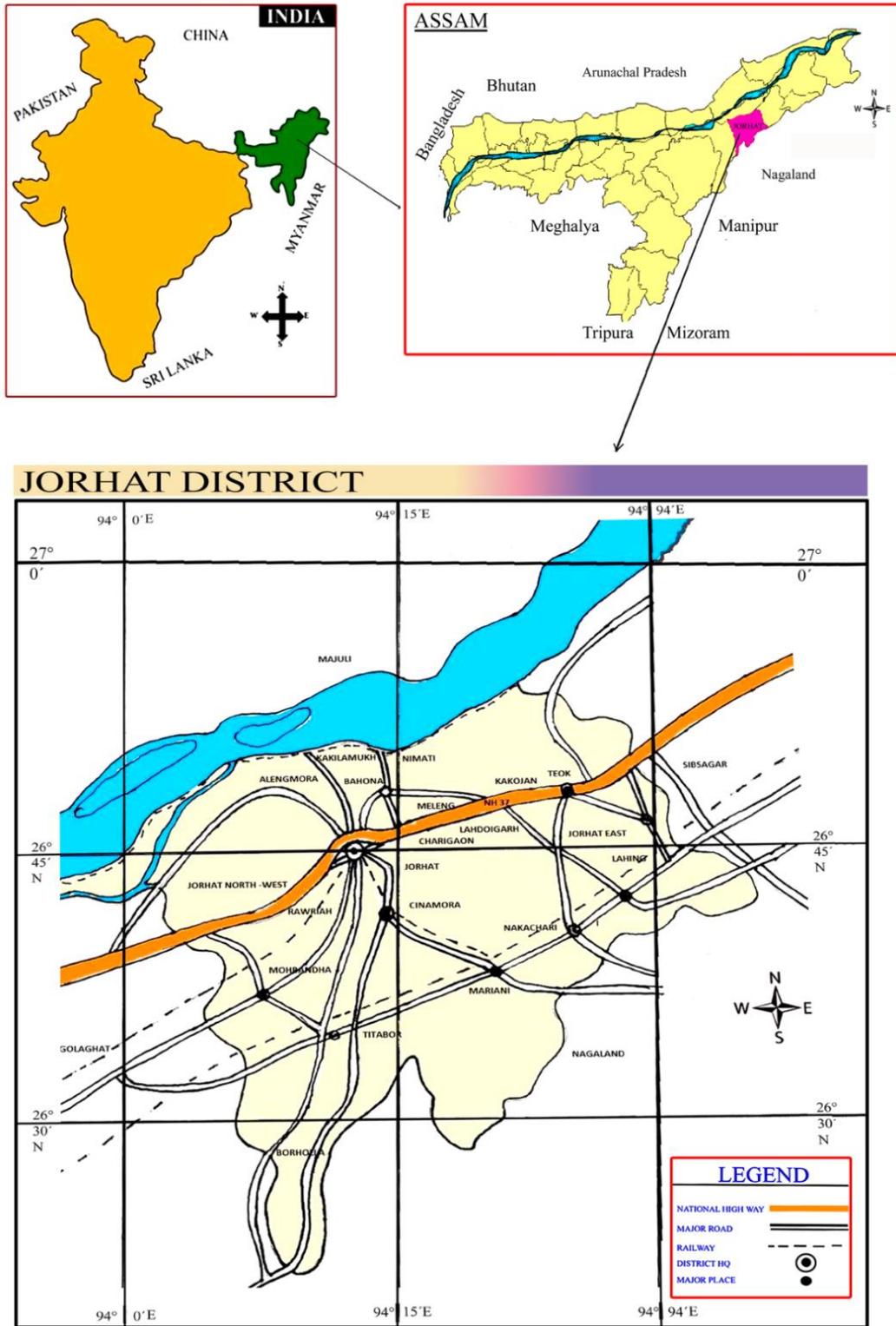
Most recently Chowdhury 2021 enumerated the update plant list of Assam including Poaceae as the largest family of all the angiosperms. However none of the publication exhaustively embraced the roadside grassy species of Assam.

## **CHAPTER 3**

### **MATERIALS AND METHOD**

#### **3.1 THE STUDY AREA**

The study area Jorhat district is located in the Upper Brahmaputra Valley Agro-climatic zone of Assam in between 26°25' N to 26°55' N latitude and 93°56'E to 94°36'E longitude. The total geographical area of present Jorhat district is around 1,757 sq.km. (after raising of Majuli into a new district) and its average elevation is 116 meters from MSL. The district comprises six Community Development Blocks, namely (i) Jorhat, (ii) Jorhat Central, (iii) Jorhat East, (iv) Kaliapani, (v) North-West Jorhat and (vi) Titabar. The study area located along the road networks of the district comprising of National Highway (NH-37, total 85 Km), Assam Trunk Road and other urban and village roads (Map 1).



**Fig 1: Map of the study is Jorhat district**

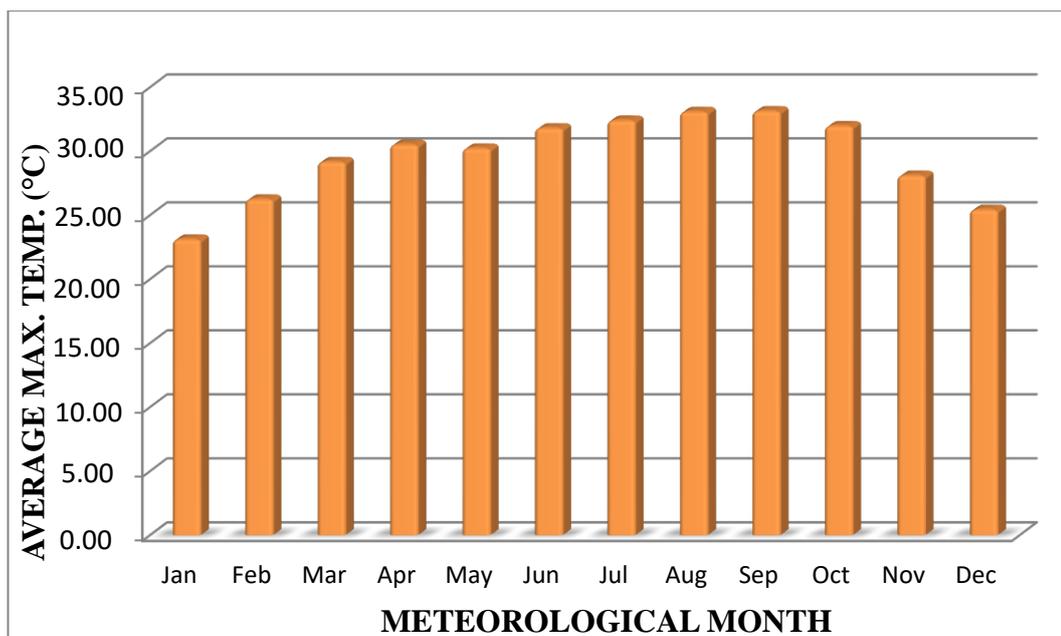
### **3.2 WEATHER IN JORHAT**

The climate of the district is characterized by an average rainfall of 1829 mm per annum and high humidity of more than 80%. The maximum temperature rises up to 33-37°C in summer and minimum falls to 5-6°C in Winter. The average monthly rainfall, maximum & minimum temperature and the Relative humidity of Jorhat district during 2021 & 2022 are shown in -

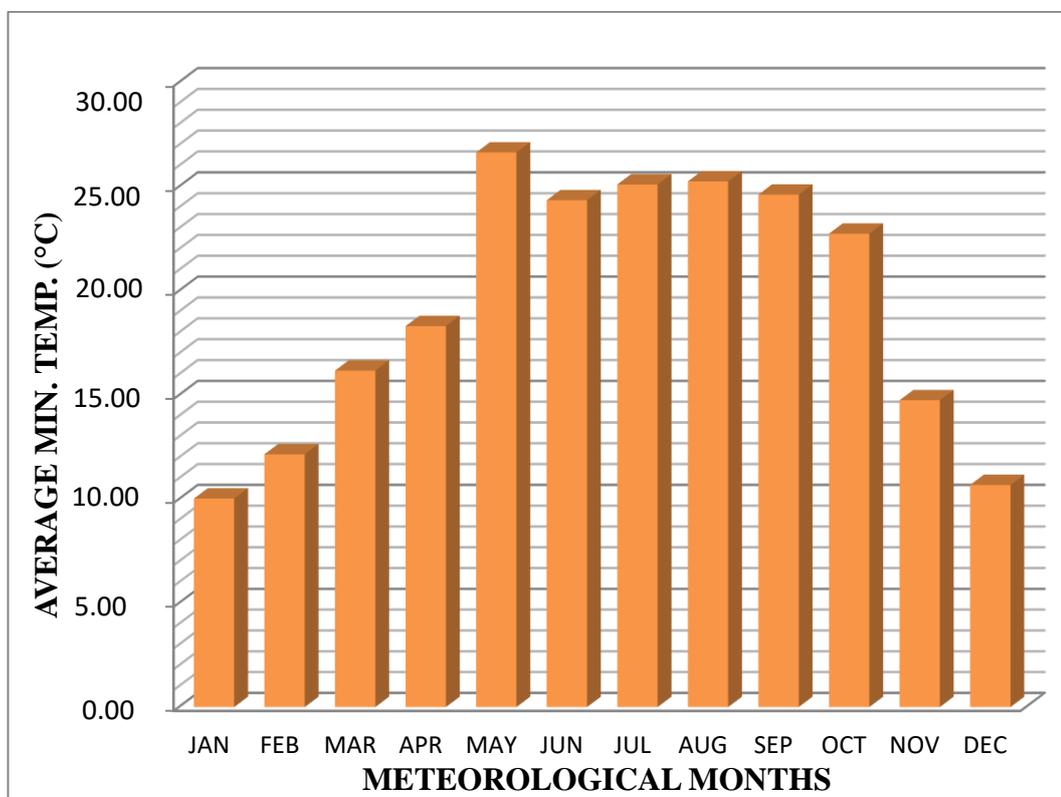
The study area experienced maximum monthly temperature from 23.1°C the month of January to 32.4°C in July & the minimum monthly average temperature 10°C (January to 26.6° C May) during 2020-21. (Fig- 1 & 2).

The relative humidity of the place remain 90 to 98 % throughout the year in the morning which varied from as low as 59% in the evening during the month of January. (In the Fig: 3 & 4).

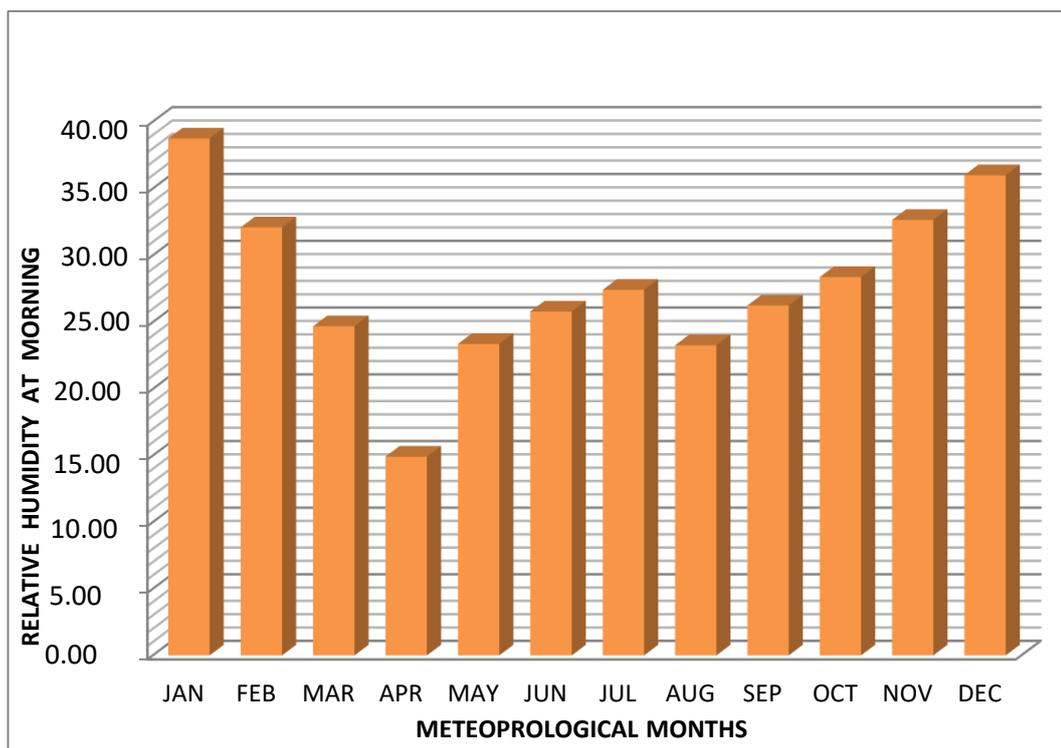
The average annual rainfall study area during 2020-2021 was, which from the month of December and the highest (0.12 mm) and maximum month of June (36.44 mm). (In the fig- 5).



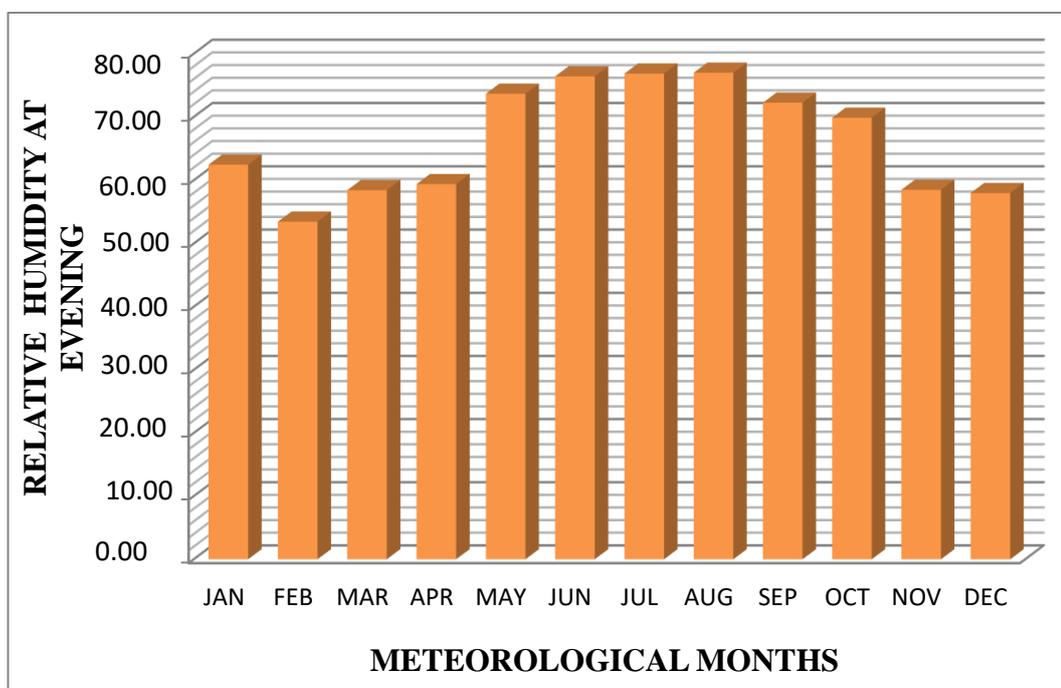
**Fig 1: Average maximum temperature in Jorhat (mean of 2020 & 2021)**



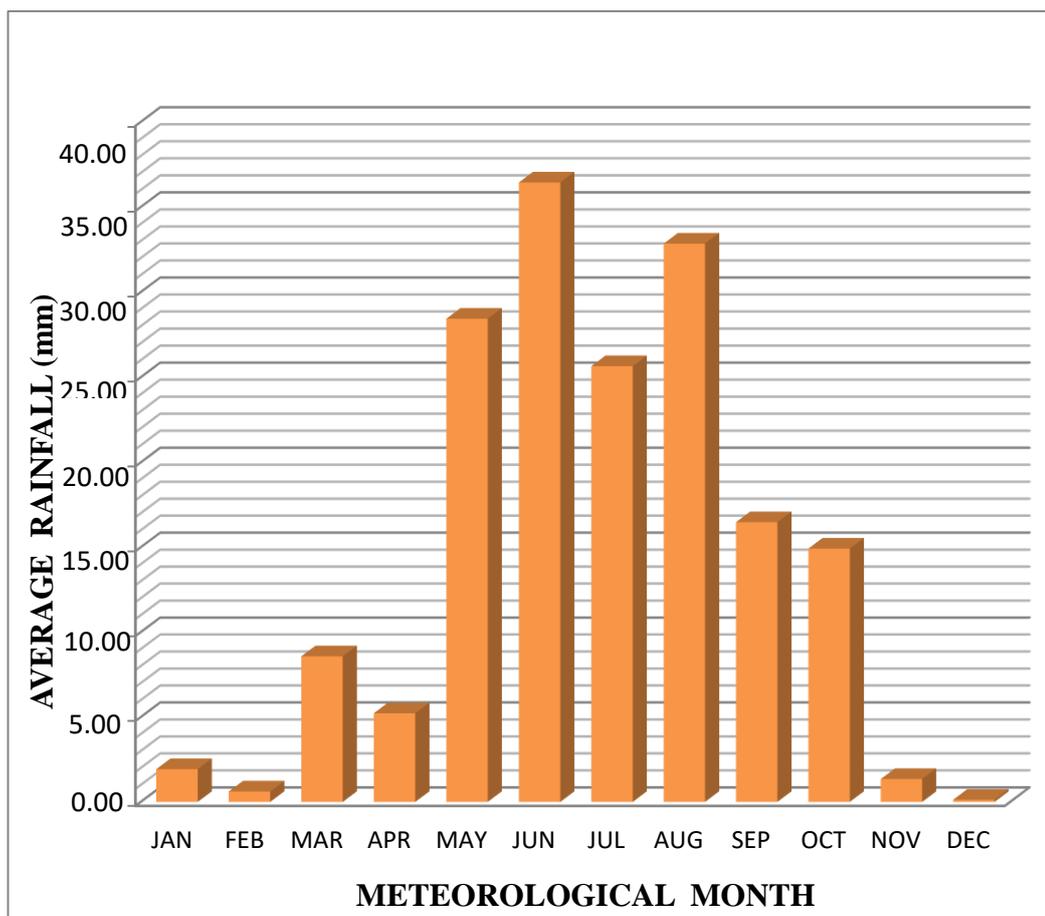
**Fig 2: Average minimum temperature in Jorhat (mean of 2020 & 2021)**



**Fig 3: Relative humidity at Morning in Jorhat (mean of 2020 & 2021)**



**Fig 4: Relative humidity at Evening in Jorhat (mean of 2020 & 2021)**



**Fig 5: Average rainfall in Jorhat (mean of 2020 & 2021)**

### 1.3 EXPLORATION

1. Different types of roads were visited repeatedly during 2022 and the plant sample and their photographs were collected.
2. Most of the collected plant sample were processed for herbarium preparation by following a standard method of (Alexey Shipunov, (2019). How to make herbarium, 20 pp). Handmade mounting boards of approximately 42 cm × 28 cm size, collected from the local handmade paper industry situated at Chinamara, Jorhat, were used for herbarium preparation. Favical was uses as adhesive to fix the dry plant materials on the mounting board.
3. Some of the specimens, either in fresh condition or treating with 70% ethyl alcohol, were brought to laboratory for microscopic study.
4. Each species was characterized *in situ* and at laboratory of the Department of Agronomy, Assam Agricultural University, Jorhat.
5. Ligule, Auricle, Nodes and Spikelet details were studied under the Stereo Zoom microscope with image analyzing software connecting to PC at AAU, Jorhat.
6. Free-hand illustrations of most of the species were done.
7. Plants were identified by comparing the characters generated through field and laboratory studies with that of described in floristic literature and finally by matching with the existing herbarium specimens available at the “Weed Herbarium” of Assam Agricultural University, Jorhat.
8. A dichotomous key is prepared by using the data generated during the study for easy field recognition of the taxa suitable for end users.

9. The voucher specimens are deposited in the Weed Herbarium of Assam Agricultural University, Jorhat, and the corresponding Accession Numbers are reported in this compilation along with the species description.

#### **1.4 COMPILATION**

1. Dissertation is compiled by strictly following the rules and norms of Silapathar Science College, PG Department of Botany Under Assam Science and Technology University.
2. The genera and the species were described morphologically by using telegraphic English as done in taxonomic literature internationally.
3. A taxonomic citation is provided for each taxon depicting the accepted name and synonyms citing their original publication reference as well as references of regional Flora.
4. The key for identification is synthesized based on the available morphological characters.

## CHAPTER 4

### RESULT AND DISCUSSION

The systematic study revealed an enumeration of as many as 26 numbers of species under 19 numbers of genera belonging to grassy family Poaceae growing along road sides in Jorhat district. This enumeration has also revealed a presence of 13 numbers of annual species out of the total grassy flora, indicating the prevalence of perennial grasses. Out of the total 26 number of species only *Chrysopogon aciculatus* posed more or less serious weedy feature by means of its sticking spikelet's and the *Sporobolous indicus* with its stiff and tufted erect culms. Almost all the 26 numbers (Table-1) of grassy species possess more or less fodder value, as observed during the field study and interactions with local farmers.

**Table -1. The checklist of the grassy species available along the roadsides of Jorhat district**

SI. No	Species	Vernacular name	Flowering & Fruiting time
1	<i>Axonopous compressus</i>	Dolichabon (Asm.)	Almost throughout the year
2	<i>Brachiaria ramosa</i>	Tupa-soli (Asm.)	Almost throughout the year
3	<i>Brachiaria mutica</i>		February-June
4	<i>Chrysopogon aciculatus</i>	Bonguti (Asm.)	June-October
5	<i>Cynodon dactylon</i>	Dubori (Asm.)	March-September
6	<i>Cyrtococcum accrescens</i>		August-March
7	<i>Cyrtococcum patens</i>		May-June
8	<i>Dactyloctenium aegyptium</i>	Madana (H)	May-August
9	<i>Digitaria ciliaris</i>	Sirabon (Asm.)	May-December
10	<i>Digitaria setigera</i>	Sirabon (Asm.)	February-June
11	<i>Echinochloa colonum</i>	Binoi-bon (Asm.)	July-September
12	<i>Eleusine indica</i>	Bobosa bon (Asm.)	July-October
13	<i>Eragrostis japonica</i>		June-November
14	<i>Eragrostis tenella</i>	Bharbhusi (H)	March-September
15	<i>Eragrostis uniolooides</i>		August-October
16	<i>Imperata cylindrica</i>	Ulubon (Asm.)	March-May
17	<i>Ischaemum rugosum</i>	Maronda (H)	October-December
18	<i>Ischane globosa</i>		Almost throughout the year
19	<i>Leersia hexandra</i>	Eralibon (Asm.)	March-June
20	<i>Panicum maximum</i>	Gobra ghas, Kutki (H)	November-July
21	<i>Panicum repens</i>	Para ghas (H)	May-November
22	<i>Paspalum conjugatum</i>	Lokusabon (Asm.)	August-February
23	<i>Paspalum distichum</i>	Besak (H)	August-February
24	<i>Sacciolepis myosuroides</i>	Hil-tauta (Asm.)	August-December
25	<i>Setaria pumila</i>	Bisabon, (Asm.)	August-October
26	<i>Sporobolus diander</i>	Tupasoli (Asm.)	March-September

#### 4.1 KEY FOR IDENTIFICATION OF SPECIES

- 1a. Spikelets in open *panicle*..... (2)
- 1b. Spikelets in spikes or *racemes* ..... (13)
- 2a. Spikelets strictly one flowered ..... (3)
- 2b. Spikelets more than one flowered ..... (4)
- 3a. Inflorescence of digitate spikes, node as thick as internode, stoloniferous  
low herb ..... *Cynodon dactylon*
- 3b. Inflorescence geniculate, node drum shaped, distinctly thicker than  
internode, erect tufted herb ..... *Sporobolous diander*
- 4a. Spikelets with solitary fertile floret, rests reduced to rudimentary glumes.  
Stamens 6 ..... *Leerisa hexendra*
- 4b. Spikelets with more than one fertile floret. Stamens 3 ..... (5)
- 5a. Ligule absent, represented by a thick band of slightly raised .....  
..... *Echinocloa colona*
- 5b. Ligule present, either membranous or ciliate..... (6)
- 6a. Ligule eciliate membrane ..... (7)
- 6b. Ligule membrano-ciliate or a rim of hairs..... (10)
- 7a. Inflorescence digitate spikes ..... *Eleusine indica*
- 7b. Inflorescence open panicle never digitate ..... (8)
- 8a. Spikelets disarticulating above glumes..... *Ischane globosa*
- 8b. Spikelets falling entire at maturity..... (9)
- 9a. Lower glume acute, spikelets 2.2.5 mm long ..... *Cyrtococcum patens*
- 9b. Lower glume obtuse, spikelets ca 1.5 mm long.....  
..... *Cyrtococcum accrescens*

- 10a. Inflorescence with very dense silvery silky long hairs. Nodes thicker than inter node ..... ***Imperata cylindrica***
- 10b. Inflorescence never silky hairy. Nodes usually as thick as internode ... (11)
- 11a. Spikelets laterally compressed more than 2 flowered, all floret hermaphrodite ..... (12)
- 11b. Spikelets not compressed, two flowered, usually upper floret reduced male or sterile ..... (14)
- 12a. Spikelets 20-50 flowered. Lemma falling from the base upwards .....  
..... ***Eragrostis unioloids***
- 12b. Spikelets 3 to 10 flowered. Lemma falling from above downwards.... (13)
- 13a. Lamina hardly up to 12 cm long, palea not ciliate..... ***Eragrostis japonica***
- 13b. Lamina up to 20 cm long, palea ciliate along the keels... ***Eragrostis tenella***
- 14a. Ligule eciliate membranous..... (15)
- 14b. Ligule membranociliate or rim of hairs ..... (19)
- 15a. Spikelets spirally arranged on the inflorescence axis .....  
.....***Sacciolepis myosuroides***
- 15b. Spikelets arranged in one sided rows on the axis ..... (16)
- 16a. Inflorescence a panicle of 2-10 digitate or sub-digitate spicate racemes (17)
- 16b. Inflorescence a panicle of 2 spicate racemes ..... (18)
- 17a. Racemes 10-15 cm long ..... ***Digitaria setigera***
- 17b. Racemes 5-10 cm long ..... ***Digitaria ciliaris***
- 18a. Lamina 6-12 mm wide, spikelets ca 1.5 mm long ... ***Paspalum conjugatum***
- 18b. Lamina 2-6 mm wide, spikelets 2.5-3.5 mm long ..... ***Paspalum distichum***
- 19a. Culm strongly laterally compressed, nodes hairy ..... (20)

- 19b. Culm not or slightly compressed, nodes glabrous ..... (21)
- 20a. Spikelets with awn develop from upper lemma, lamina acuminate at apex ...  
..... *Ischaemum rugosum*
- 20b. Spikelets awnless, lamina obtuse or broadly acute at apex .....  
..... *Axonopus compressus*
- 21a. Inflorescence open and loose panicle ..... (22)
- 21b. Inflorescence spicate ..... (24)
- 22a. Spikelets paired one sessile and one pedicelled ..... *Chrysopogon aciculatus*
- 22b. Spikelets solitary or paired, all alike ..... (23)
- 23a. Tall herb 1 to 2 m tall. Node hairy. Rhizomes short and thick, not  
differentiated. Nerves of upper glume and lower lemma obscure .....  
..... *Panicum maximum*
- 23b. Short herb 30 to 100 cm tall. Node glabrous. Rhizomes differentiated into  
thick bulbous and Stolonyferous structures. Nerves of upper glume and  
lower lemma dominant ..... *Panicum repens*
- 24a. Inflorescence spike like panicle with reddish brown bristle, never digitate  
..... *Setaria pumila*
- 24b. Inflorescence terminal digitate of 2-6 spikes, never with bristles ..... (25)
- 25a. Spikes radiating from the terminal tip of axis .....  
..... *Dactyloctenium aegyptium*
- 25b. Spikes not radiating, but arranged in raumose manner ..... (26)
- 26a. Sheath densely silky hairy, lamina often drooping amphibious perennials ...  
..... *Brachiaria mutica*
- 26b. Sheath glabrous or sparsely hairy, lamina erect, upland annuals .....  
..... *Brachiaria ramosa*

## 4.2 ENUMERATION AND PLANT DESCRIPTION

**4.2.1 *Axonopous compressus*** (Sw.) P. Beauv, Ess. Agrost. 12; 154. 1812; Bor., Fl. Assam 5: 269. 1940; Shukla. Gr. NEI. 310. 1996. *Millium compressum* Sw; Prodr. Veg. Occ. 24. 1788.

**Common name:** Carpet grass, Lawn grass

**Vernacular name:** Dolichabon (Asm.)

**Habit:** Perennial, herb with vigorous creeping stolones.

**Culm:** Tufted, geniculately ascending, strongly compressed, 15-75 cm long, 1-2 mm diam; internodes elliptical in section; nodes tomentose with long silky hairs.

**Leaves:** Lamina ascending; 3-5 cm long, 5-8 mm wide, pilose, obtuse at apex; mostly basal, **sheaths** 4-20 cm long; **ligule** a ciliate membrane; 0.3-0.4 mm long.

**Inflorescence:** Spike like racemes, 2-5, digitately arranged, each 3-10 cm long, with glabrous rachis.

**Spikelets:** Oblong-lanceolate to elliptic, 2-2.5 mm long, pilose or glabrous, apex acute, upper glume and lower lemma 2-4 veined, mid vein absent; upper lemma oblong- elliptic, shorter than spikelet, obtuse with an apical tuft of hairs.

**Flowering and Fruiting Time:** Throughout the year.

**Note:** The plant grown well in moderately drained sandy loam soil, also adapted in light clays and peat soil.

**Uses:**

- A very useful fodder
- Controls surface soil erosion
- Useful for dune stabilization
- Monkey feed

**Specimens examined:** Monisha 21 (12.03.2022) Morioni [AAUWH: 5433]

**4.2.2 *Brachiaria ramosa* (L.) Stapf**, in Prain, Fl. Trop. Afr. 9: 542. 1919; Bor, Fl. Assam 5: 277. 1940; Shukla, Gr. NEI. 313. 1996. *Panicum ramosum* L., Mant. Pl. 1: 29. 1769; Hook. f., Fl. Brit. India 7: 36. 1896.

**Common Name:** Browntop millet

**Vernacular name:** Tupa-soli (Asm.); Makra (H)

**Habit:** Semi erect, annual herb, up to 60 cm high.

**Culm:** Fasciculated, slender, geniculate, semi erect from a prostrate and rooting base, terete, branched, glabrous.

**Leaves:** Lamina narrow, 5 to 12.5 cm long, glabrous, acuminate at apex, margins sharply scarbrid; **sheath** thin, loose below, finely striate, **ligule** a line of short white hairs.

**Inflorescence:** Panicle narrowly oblong, 5-15 cm long, of 5 many racemes, glabrous,.Racemes 3-5 cm long, upper gradually shorter, straight or slightly flexuous, simple or the , terminating in a spikelet compound, rachis triquetrous, slightly wavy to straight, scabrid or glabrous on the angles, pedicels paired or fascicled or upwards solitary.

**Spikelets:** Ovoid, sub acute or aciculate, somewhat turgid, 3 mm long, greenish, at length pale, or straw coloured. Glumes unequal; glabrous, 7 nerved . Lower floret neuter. Upper floret hermaphrodite, slightly shorter than the lower, ovate in outline, sub-acute, pale brown when mature, lemma and palea crustaceous transversely rugose.

**Flowering and Fruiting Time:** Throughout the year.

**Note:** Common in dry and rocky situation, especially in ill managed road sides.

**Uses:**

- Young leaves possess fodder value
- Grains provide food to several local wild birds.

**Specimens examined:** Monisha 20 (12-3-2022) Mariani [AAUWH: 5432]

**4.2.3 *Brachiaria mutica*** (Forssk.) Stapf in Prain, Fl. Trop. Afr. 9: 526. 1919; Bor, Fl. Assam 5. 272. 1940. Shukla, Gr. NEI. 312. 1996. *Panicum muticum* Forssk. Fl. Aegypt. Arab. 20. 1775; Hook, f., Fl. Brit. India 34. 1896.

**Common Name:** Para grass

**Habit:** Perennial with well developed root.

**Culms:** 0.6 to 2.4 m rooting, branchy, robust, geniculate at the base, then ascending, slender and bare at the top, compressed, striate, glabrous; nodes covered with long white hairs.

**Leaves:** Leaves spreading, linear or linear lanceolate, acuminate, sub cordate at the base, flat, glabrous or slightly hairy on the under-surface, scaberulous, 15 to 25 cm long, 1.25 to 1.6 cm wide, margins hispid. **Sheath** compressed, glabrous or hairy at the throat.

**Inflorescence:** A panicle made up of 8 to 20 false spikes or racemes, simple or compound at the base, erect or somewhat spreading, alternate, distant, robust, lower 5-10 cm, the upper shorter; principal axis almost rounded, angular at the summit, almost straight, glabrous. Pedicels short, paired, solitary.

**Spikelet:** Green or violet, crowded, ovate-acute, 2.5-3 mm; glabrous, lower glume 0.6 to 1 mm, membranous, concave, ovate-acute 5 nerved. Lower floret male or occasionally neuter; lemma 2.4-2.7 mm long, almost the same as the upper glume but flatter and not so definitely nerved; palea 2.2-2.7 mm long, narrower than the lemma, hyaline, 1 nerved. Stamens shorter than the lemma, filaments very short, anthers purple. Upper floret hermaphrodite 2- 2.5 mm long, sub- sessile lemma pale, convex depressed on the back, sub coriaceous, oblong or elliptic, obtuse, pitted; macro almost absent; margins hardly incurved; palea sub coriaceous, back flat, pitted elliptic, obtuse, margins in turned.

**Flowering and Fruiting Time:** February- June

**Note:** Water flow and erosion control. Sediment conditions were also reported to smother benthic species and thus reduce the biodiversity of wetlands.

**Uses:** Its mainly cultivated to feed livestock as its makes a high quality forage for ruminant animal.

**Specimens examined:** Monisha 23 (12-3-2022) Marioni [AAUWH: 5435]

**4.2.4 *Chrysopogon aciculatus* (Retz.) Trin., Fund, Agrost. 188. 1820; Bor, Fl. As. 5. 357. 1940; Shukla, Gr. NE India. 70. 1996. *Andropogon aciculatus* Retz., Obs. Bot. 5: 22. 1789; Hook. f., Fl. Brit. India. 7: 188. 1896.**

**Common Name:** Love grass

**Vernacular Name:** Bonguti (Asm.)

**Habit:** Perennial, stoloniferous, spreading herb; 20 to 40 cm tall.

**Culm:** Creeping and decumbent, much branched with close nodes and short internodes, glabrous, purple, always rooting at nodes; nodes *ca.* 1.5 mm long and *ca.* 1mm in diam., glabrous, green.

**Leaves:** Close; slightly shorter than the internodes in length, surface glabrous, margins with long silky and lax cilia towards its top, turning brown and scaly with age. Lamina linear-lanceolate 2 to 10 cm long and 3 to 6 mm broad, glabrous, while with few long and silky cilia along auricular region, apex broadly acute; **ligule** a thick band, with short fuzzy and silky hairs.

**Inflorescence:** Terminal raceme like open panicle of spikelets, 5 to 10 cm long , 1.5 to 3.5 cm in diam, purple to brown; branches in whorls, tipped by a single triad of one sessile and two stalked spikelets, callus acicular, at joints of the triad and along branchlet of rachilla 4 to 6 mm long, bearded with short golden hairs.

**Spikelets:** 3 to 4 mm long, sessile spikelet hermaphrodite, pediceled spikelet staminate or sterile; glumes acuminate, with strigose hairs, upper lemma entire, awned; awns straight, scabrid, 4 to 7 mm long. Stamens 3, anthers yellow. Styles two, feathery and silky. The fruit is an oblong caryopsis, *ca* 2 mm long.

**Flowering and Fruiting Time:** Almost throughout the year, especially during rainy season.

**Notes:** An extensively creeping grass with much branched stoloniferous stems and is a good binder of surface soil, strigose awns and glumes and callus hairs help in dispersal of seeds by embedding in animal fur and human cloths.

**Uses:**

- A surface of soil binder
- A good fodder plant
- Use as animal food
- Use as medicine , example - Ayurveda, Folk medicine are used
- In Indonesia plant used as poison antidote.
- In Bangladesh root used for juice liver pain.
- Philippines decoction root used for diarrhea.

**Specimens examined:** Monisha 17 (12-3-2022) Marioni [AAUWH: 5429]

**4.2.5 *Cynodon dactylon*** (L) Pers., Syn. PI. 1: 85.1805. Hook, f., F1, Brit. India 7: 288, 1896; Bor, F1. Assam 5: 125. 1940; Shukla, Gr. NEI. 244. 1996. *Panicum dactylon* L. Sp. P1 (ed.1): 58: 1753.

**Common Name:** Durva grass, Bermuda grass

**Vernacular name:** Dubori (Asm.)

**Habit:** Perennial extensively creeping stoloniferous grass; stolones laterally compressed or cylindrical.

**Culm:** Ascending up to 30 cm tall, slender, glabrous smooth, cylindrical. Node glabrous, simple, as thick as internode.

**Leaves:** Leaves conspicuously distichous on erect shoots and the lower part of the culms; lamina linear, acute, 2-15 cm long, up to 3 mm wide , rigid, glabrous , smooth ; **sheath** smooth, **ligule** a conspicuous rim of short silky hairs, 0.2- 0.5 mm long.

**Inflorescence:** Terminal, 4-5 fascicled spikes, 1.5-5 cm long, rachis pubescent at the base.

**Spikelets:** Light green or purplish in colour, 2.2 to 8 mm long, scabrid along keels; rachilla often, lemma firm, obliquely oblong to semi ovate, sub-obtuse, ciliate, palea scaberulous along ridges. Anthers oblong.

**Flowering and Fruiting Time:** March- September

**Note:** A very fast growing, extensively, branched stoloniferous grass, can grow in moist as well as dry soil. An early colonizer in winter season crop fields.

**Uses:**

- Antibacterial
- Used in several traditional medicines
- Surface soil binder, very effective in sandy soils
- A very good fodder plant
- A holy plant for Hindus

**Specimens examined:** Monisha 12 (14-4-2022) Mahbondha [AAUWH: 5424]

**4.2.6 *Cyrtococcum accrescens*** (Trin.) Stapf in W. Hooker, Ic. Pl. sub tab. 3096. 1922; Bor, Fl. Assam 5: 241. 1940; Shukla, Gr. NEI. 315. 1996. *Panicum accrescens* Trin., Sp. Gram. lc.1. t. 88, 1828, Hook. f., Fl. Brit. India 7: 57. 1896 prepare.

**Common name:** Bow grass

**Habit:** Perennial, creeping herb.

**Culm:** Decumbent, terete, often branching at the lower nodes, leafy to the top, nodes glabrous, simple.

**Leaves:** Lamina linear- lanciolate, ovate-lanciolate, 2.5 to 10 cm long , 4-5 mm broad contracted at the base, tapering to a sharp point , smooth, margins scarcely thicken , with a few hairs at the base, **sheath** close glabrous and smooth ,or hairy , margins usually ciliate with gland based cilia, **ligule** a membranous flap, eciliate, ca 0.6 mm long.

**Inflorescence:** A very lax panicle, up to 25 cm long, 15 cm broad; branches and branchlets capillary, straight or flexuous, smooth and glabrous.

**Spikelets:** Up to 8 mm long, slightly swollen and cup shaped at the tips. Lower glume ovate – acute, 75 mm long, 3 nerved; upper glume deeply boat- shaped, 5 nerved; palea shorter than the lemma. Upper lemma 1.2-5 mm long, yellowish or white; lower lemma ovate oblong, 5 nerved,

**Flowering and Fruiting Time:** August-March

**Note:** Common in relatively dry and partially shaded places.

**Uses:** A good surface soil binder and a good fodder plant.

**Specimens examined:** Monisha 11 (11-4-2022) Mahbondha [AAUWH: 5423]

**4.2.7 *Cyrotococcum patens* (L.) A. campus** in Bull. Hist. Nat. Paris 27: 118, 1921; Bor, Fl., Assam 5: 240. 1940. Shukla, Gr. NEI. 316. 1996. *Panicum patens* L., Sp. P1. (ed.1): 58, 1753; Hook, f., Fl. Brit. India 7: 57. 1896 proparte.

**Common Name:** Bow grass

**Habit:** Perennial, ascending herb.

**Culm:** Branchy 30-60 cm long, rooting at the base, slender, delicately striate; nodes glabrous, somewhat geniculate, the lower emitting very long and solitary roots.

**Leaves:** Lamina narrow, spreading flat, from broadly ovate to linear lanciolate, 3-15 cm long 6-8 mm wide, finely acuminate, glabrous or ciliate below, with tubercle-based hairs, 6-8 mm wide, margins hispid, hair from tubercular bases; **ligule** membranous, less than 0.5 mm long.

**Inflorescence:** A lax panicle, often nodding, spreading or contracted; branches spreading, long, flexuous, the lower verticillate, the upper solitary or in pairs; branchlets very long, distant, often spreading; pedicels capillary, often long glabrous

**Spikelets:** Almost round, green, reddish or brown, 1-8 mm long; glumes herbaceous, membranous; lower glume, cordate, ovate, acute, 3-5 nerved; upper glume elliptic-oblong, 3 nerved, glabrous. Lower floret; lemma 1-8 mm long, sub elliptic, obtuse or somewhat acute, 3 nerved, glabrous; palea short. Upper floret hermaphrodite; lemma 1-8 mm long, coriaceous, cartilaginous, whitish, semi rounded , acute; palea 1-8 mm long , 2 nerved, mucronulate. Lodicules quadrangular, shorter than the ovary.

**Flowering and Fruiting Time:** May- June

**Note:** The plant found forming dense colony in relatively dry and open areas.

**Uses:** A good surface soil binder and a good fodder plant.

**Specimens examined:** Monisha 10 (11-4-2022) Mahbondha [AAUWH: 5422]

**4.2.8 *Dactyloctenium aegyptium* (L.) Willd., Enum. Hort. Berol. 1029. 1809; Bor, F1. Assam 5: 110. 1940; Shukla, Gr. NE India. 316. 1996. *Eleusine aegyptiaca* (L.) Desf., Fl. Atlant. 1: 85. 1798; Hook. f., F1, Brit. India 7; 295. 1896. *Cynosurus aegyptius* L., Sp. Pl. (ed.1): 72. 1753.**

**Common name:** Crow foot grass

**Vernacular name:** Madana (H)

**Habit:** Annual, herb, 12 to 50 cm tall.

**Culm:** Erect or usually ascending from a prostrate base, rooting at the nodes, slender to moderately stout, glabrous and smooth; nodes glabrous, as thick as internode.

**Leaves:** Lamina linear, acute, 2.5 to 20 cm long, 2.5 mm wide, flat, loosely or densely ciliate on the margins and sometimes sparsely hairy on the surface or glabrous; **sheath** shorter than the internodes, glabrous, lower surface whitish and keeled, **ligule** membranous, densely ciliate, ca 1 mm long.

**Inflorescence:** Terminal digitate 2-6 spikes; spikes 1-5 cm long, light or dark olive grey, with spikelets right to the base. Rachis keeled, pubescent at the base.

**Spikelets:** 3 to 4 mm long; Lower glumes 1.5 to 2.5 mm long; upper glume 2 mm long. Lemmas 2.5 to 3 mm long, mucronate or very short awned; palea 2 keeled, keels narrowly or broadly winged, ciliate. Anthers 1.5 mm long.

**Flowering and Fruiting Time:** May-August.

**Note:** Occasionally appearance of the grass was noticed in road sides, especially in sandy areas.

**Uses:** *Dactyloctenium aegyptium* is still a traditional food plant used as a famine food in Africa, this little-known grain has potential to improve nutrition, boost food security, foster rural development and support sustainable landcare. It has excellent fodder.

**Specimens examined:** Monisha 24 (12-3-2022) Mariani [AAUWH: 5436]

**4.2.9 *Digitaria ciliaris*** (Retz.) Koel., Descr. Gram. 27. 1802; Shukla, Gr. NEI. 318.1996. *D. adscendens* (H.B.K.) Henr. in Blumea 1 : 92 . 1934; Bor, Fl. Assam 5: 204. 1940. *Panicum ciliare* Retz., Obs. 4: 16. 1786.

**Common name:** Crabgrass

**Vernacular name:** Sirabon (Asm.); Suruwari (H)

**Habit:** Small erect annual herb, up to 30 cm tall, deep rooted.

**Culm:** Decumbent, cylindric and glabrous, tufted; nodes simple and glabrous, slightly thicken than internode.

**Leaves:** Simple, alternate linear lanceolate or linear, 3 to 12 cm long 3 to 8 mm breadth; glabrous or sparsely hairy, margins thickened and scabrous. **Sheath** more or less pilose hairy, **ligule** membranous and eciliate, 1 to 2 mm long. Auricle inconspicuous.

**Inflorescence:** A terminal panicle of 2 to 9 digitate or sub digitate erect racemes; the axis up to 5 cm in length; racemes 6 to 20 cm long, rachis narrowly winged;

**Spikelet:** Binate, unequally pedicelled, lanciolate, dorsally compressed, acute or acuminate, 2 to 3 mm long; basal one sterile; lower glume very small and triangular, upper glume lanceolate, usually 2/3 of the spike in length, 3 nerved, pilose; lower lemma 7 nerved, acuminate at apex, yellowish green to pale brown, glabrous or pilose, each spikelet comprised of one basal sterile floret and one fertile floret; cartilaginous. Anthers 3.

**Flowering and Fruiting Time:** Almost throughout the year.

**Note:** A partially-shed loving grass, can survive both in marshy situation as well as in drought condition. Common along with other grasses in the road sides, in orchards, in upland rice field, as well as in marshy wet places. The species is very often confused with *Digitaria setigera* and *Digitaria violascena*. However, the presence of binate spikelet makes *Digitaria ciliaris* distinct from *violascena* and the presence of distinct lower glume, is the identifying key character of the species from *Digitaria setigera*.

**Uses:** An excellent fodder.

**Specimens examined:** Monisha 19 (12-3-2022) Mariani [AAUWH: 5431]

**4.2.10 *Digitaria setigera*** Roth in Roem. & Schult., Syst. Veg. 2 : 474. 1817. Shukla, Gr. NEI. 321. 1996. *D. pruriens* Buse in Miq., Pl. Jungh. 379. 1854; Bor, Fl, Assam 5: 205. 1940. *Paspalum sanguinale* Hook. f., Fl. Brit. India 7: 16. 1896 pro parte non Lamk.

**Common Name:** Crabgrass

**Vernacular name:** Sirabon (Asm.)

**Habit:** Semi erect, annual herb, moderately deep rooted.

**Culm:** Much branched, decumbent, cylindrical, glabrous; nodes simple, green, glabrous 2 to 3 mm long and 1 to 1.5 mm in diam, slightly thickened than internode.

**Leaves:** Simple, alternate. **Sheath** slightly more than half of the internodes in length, often pilose hairy; lamina linear, lanceolate, 5 to 15 cm long, sometimes rather longer, 4 to 10 mm broad, scabrous and undulate on margins; **ligule** membranous, eciliate, 2 to 4 mm long, margins emarginated.

**Inflorescence:** A terminal panicle of 3 to 11 digitate or sub digitate racemes. Racemes up to 15 cm long; rachis winged; wings serrated or scabrous on the margins.

**Spikelets:** Binate, homomorphous, lanceolate, 2.5 -to 3.5 mm long, acute; lower glumes absent or minute; upper glumes up to 1/3 of the spikelet length, 1

or 3 nerved, margins and apex with addressed and silky hairs; lower lemma ca 3 mm long, 5 or 7 nerved, often scabrous, silky-ciliate along margins and lateral intercostals region, acute at apex. Upper lemma similar, acuminate. Palea cartilaginous.

**Flowering and Fruiting Time:** Feb-June

**Note:** A highly frequent weedy grass, preferably in fertile soils. Rather common in road sides near crop fields.

**Uses:** Use as animal food.

**Specimens examined:** Monisha 18 (12-3-2022) Mariani [AAUWH: 5430]

**4.2.11 *Echinochloa colonum* (L.) Link, Hor. Berol.2: 209. 1833; Bor, Fl. Assam 5: 323. 1940. Shukla, Gr. NEI. 323.1996. *Panicum colonum* L., syst. Nat.2 (ed.10): 870; Hook. f., F1. Brit. India 32. 1896.**

**Common Name:** Jungle rice

**Vernacular name:** Binoi-bon (Asm.)

**Habit:** A tufted annual up to 60 mm high with geniculate culms, moderately deep rooted.

**Culm:** Stout, usually reddish-purple, erect, ascending or decumbent, more or less; nodes sometimes laterally compressed; conspicuously swollen and usually geniculate, compressed, lower internodes often exposed.

**Leaves:** Compressed and keeled; lamina linear, flat, 3–20 × 0.3–0.7 cm, glabrous, light green sometimes with transverse purple bands, margins slightly scabrous, apex acute; **sheath** 3-7 cm long, compressed, keeled, glabrous, **ligule** absent; represented by a thick and whitish collar.

**Inflorescence:** A terminal panicle of racemes, borne along a central axis; ascending (rarely), or appressed; unilateral; 0.5-3 cm long; simple. Rachis angular.

**Spikelets:** Green tinged with purple, crowded, arranged in 4 rows, about 3 mm long, first glume, 1.2-1.5 mm long, 3-nerved, nearly half as long as the spikelet; second glume, 2.5-3 mm long, 7-nerved; the first lemma is similar to the second glume, first palea ovate, ca 2 mm long, glabrous; second lemma, broadly ovate, ca 2 mm long, glossy. Caryopsis whitish, broadly ovate, 1.7- 2 mm long, flat on one side, convex on the other.

**Flowering & Fruiting Time:** July- September.

**Note:** A facultative weed of upland and marshland rice, while occasionally grass an roadside grass, especially in foothill regions of Assam.

**Uses:**

- A good fodder.
- Grain are good feed of pet birds.

**Specimens examined:** Monisha 22 (12-3-2022) Mariani [AAUWH: 5434]

**4.2.12 *Eleusine indica* (L.) Gaertn., Feuct. 1: 8. 1788; Hook. f., Fl. Brit. India 7: 293. 1896; Bor, Fl. Assam 5: 108. 1940; Shukla, Gr. NEI. 251. 1996. *Cynosurus indicus* L., Sp. P1. (ed.1): 72. 1753.**

**Common name:** Crab grass

**Vernacular name:** Bobosa bon (Asm.); Mandla (H)

**Habit:** Tufted annual herb, deep rooted.

**Culm:** Loosely to densely tufted or solitary, erect or slightly geniculate, 10-75 cm high, slender to stout, compressed, simple or branched, laterally, compressed; nodes glabrous and smooth, slightly than internode.

**Leaves:** Usually crowded at the base; lamina linear, acute 10 to 35 cm long, 2-5 mm wide, flat or folded, erect, thin to rigid, glabrous and smooth; **ligule** very short, membranous, eciliate; **sheath** more or less ciliate along the margins.

**Inflorescence:** Digitate spikes, occasionally with one or more below it, straight, slender to stout, 2 to 15 cm long, usually with spikelet right to the base, rachis pubescent to villous at the base.

**Spikelets:** Glabrous, ovate or oblong, green, 3 to 7 mm long. 3 to 8 flowered; glumes lanciolate, acute or slightly, obtuse; lower glumes 2 to 3 mm long; upper ones 3 to 4 mm long. Palea about two third the length of the lemmas. Grain oblong.

**Flowering and Fruiting Time:** July - October

**Note:** A highly frequent in upland crops grows equally well in waste places and road sides.

**Uses:**

- A good fodder; young plants are rather palatable to livestock.
- Very good soil binder; rather suitable to use as soil binder in village roads. Tillers remain spreading horizontally in radiating manner while people walk over *Eleusine indica*.

**Specimens examined:** Monisha 15 (12-03-2022) Mariani [AAUWH: 5427]

**4.2.13 *Eragrostis japonica*** (Thunb) Trin. In. Mem. Acad. Sci. Petersb. ser. 6. 1: 405. 1831; Bor, F1. Assam 5: 97. 1940; Shukla, Gr. NEI. 256. 1996. *Poa Japonica* Thunb., F1.Jap. 51. 1784.

**Common Name:** Japanese love grass

**Habit:** A tufted habit, perennial grass.

**Culm:** Erect or geniculate at the base, slender to stout, 15 to 70 cm high, simple or branched; nodes glabrous and smooth, as thick as internode.

**Leaves:** Glabrous and smooth; lamina linear- lanciolate, acute, 2-20 cm long, flat or concave; **ligule** reduced to a ciliolate rim, 5 to 7 mm long, thinly membranous.

**Inflorescence:** Open and loose or contracted panicles, 6 to 25 cm long; rachis glabrous, smooth below and scaberulous towards the apex; branches spreading, in whorls or clusters or solitary, very slender but rigid, 5 to 8 cm long.

**Spikelets:** Linear compressed, 2 to 5 mm long, 1 mm wide, 6 to 10 flowered; glumes acute or obtuse, hyaline, 1 nerved, lower lanceolate to ovate, 6 to 8 mm long; upper ovate to oblong, 8 to 1 mm long. Paleas 2 keeled, nearly as long as the lemmas; anthers 2.2 mm long. Grain ovoid to ellipsoid, 3 to 5 mm long.

**Flowering and Fruiting Time:** June - November

**Note:** Usually occurs near crop fields, in relatively fertile soil.

**Uses:**

- Infusion of fresh leaves administered externally as a poultice for headaches.
- In Korea, whole plant is use on wounds and as analgesic.
- Used to induce lactogene in cows
- Studies have suggested antioxidant, neuroprotective, and mild antimicrobial activities crop fields, in relatively fertile soil.

**Specimens examined:** Monisha 5 (17-03-2022) Titabar [AAUWH: 5417]

**4.2.14 *Eragrostis tenella* (L) P. Beauv. ex Roem. & Schult., Syst. Veg. 2 : 756. 1817., Hook. f., Fl. Brit. India 7: 315.1896. Bor, Fl. Assam 5; 96. 1940; Shukla, Gr. NEI. 257. 1996. *Poa tenella* L., Sp. Pl. (ed.1): 69. 1753.**

**Common name:** Love grass

**Vernacular Name:** Bharbhushi (H)

**Habit:** Loosely tufted annual herb, 15-50 cm tall.

**Culm:** Erect or geniculately ascending, slender, cylindrical. Node glabrous or smooth, as thick as internode.

**Leaves:** Lamina narrowly linear, tapering to a fine point, 2 to 12 cm long and 1 to 3 mm broad, flat, soft, spreading, glabrous and smooth margins ciliate; **sheath** shorter than the internodes, glabrous and smooth; **ligule** reduced to a fringe of short hairs, usually less than 1 mm long.

**Inflorescence:** Loose and open panicle, 5 to 13 cm long, 1.5 – 3.5 cm wide, straw coloured, green or purplish, rachis usually with spreading hairs at the nodes; branches very fine, glabrous; pedicel 1.5 mm long.

**Spikelets:** Oblong, 1-4 mm long, 3-9 flowered; rachilla articulated; glumes ovate-oblong to oblong, obtuse or slightly acute, 1 nerved, lower glume 5-1 mm long, upper glume 7.1 to 3 mm long, paleas long as the lemmas; anthers very minute.

**Flowering & Fruiting Time:** March-September.

**Note:** Found growing in road sides nearer to waste places, lawn, walls and hill slopes.

**Uses:** *Eragrostis tenella* is grown as a drought tolerant ornamental grass in gardens.

**Specimens examined:** Monisha 6 (17-03-2022) Titabar [AAUWH: 5418]

**4.2.15 *Eragrostis unioloides* (Retz.) Nees ex Steud., Syn. Pl. 1 : 264. 1854; Bor, Fl. Assam 5: 99. 1940; Shukla, Gr. NEI. 258. 1996. *E.amabilis* sensu Hook, f., Fl. Brit. India 7 : 317. 1896. *Poa unioloides* Retz; Obs. Bot. 5 : 19. 1789.**

**Common name:** Chinese love grass

**Vernacular Name:** Motadubori (Asm.)

**Habit:** Annual, tufted, semi- erect herb.

**Culm:** Loosely tufted or solitary, geniculately ascending, 14-45 cm high, slender, node glabrous and smooth.

**Leaves:** Lamina linear tapering from an abruptly contracted base to a fine point, 3 to 10 cm long, 2-5 mm wide, flat, thin, glabrous or with a few scattered hairs above except for the margins; **sheath** longer or slightly shorter than the internodes, glabrous except for a few hairs at the mouth, smooth; **ligule** reduced to a very narrow rim.

**Inflorescence:** Open panicle lanciolate, ovate or oblong in outline, 5-14 cm long., 3.3 to 5 cm, green or reddish purple, becoming straw coloured.

**Spikelets:** Strongly compressed, 20-50 flowered, rachilla straight, persistent. Glumes lanceolate to ovate, acute, sub-equal, up to 2 mm long, 1 nerved, membranous. Lemmas closely imbricate, ovate or, elliptic, obtuse or slightly acute, 2 mm long, membranous, minutely granular, palea almost as long as the lemmas and falling with them at maturity. Anthers minute.

**Flowering and Fruiting Time:** August- October

**Note:** *Eragrostis unioloides* can grow from sea-level up to 1250 m altitude, in open or moderately shaded areas, in swampy or paddy fields, roadsides and cultivated land.

**Uses:**

- An excellent fodder plant.
- Good binder of surface soil, especially along rice bunds, and roadsides area rice fields.

**Specimens examined:** Monisha 2 (20-03-2022) Titabar [AAUWH: 5414]

**4.2.16 *Imperata cylindrica*** (Linn.) P. Beauv, Ess. Agrost. 165. 1812; Hook. f., F1. Brit. India 7 : 106. 1896; Bor, F1. Assam 5 : 310. 1940; Shukla, Gr. NEI. 101. 1996. *Lagurus cylindricus* Linn., Syst. Nat. (ed.10) : 878. 1759.

**Common Name:** Cogon Grass

**Vernacular Name:** Ulubon (Asm.)

**Habit:** A perennial rhizomatous grass, very variable in size, 30 cm to 1.5 m tall.

**Culm:** Solid, glabrous, fistular at the base; nodes slightly swollen, bearded with erect white hairs, green.

**Leaves:** Lamina linear, up to 1.5 m long, 0.5-2.0 mm broad, tapering to an acuminate tip, scabrid on the margins, covered with white villae at the base; **sheaths** rather loose, hairy or glabrous; **ligule** membranous, ciliate, dorsally silky, erose or cleft, ca 1 mm long.

**Inflorescence:** A spike like panicle with very dense silvery silky long hairs, 3-30 cm long, cylindric; pedicel very slender, swollen at the tips, covered with long fine hairs.

**Spikelets:** Binate both spikelets of each pair similar, lanciolate, ca 3 mm long; callus with 12-16 mm long soft hairs. Glume lanciolate, membranous, hyaline at the apex, 3-9 nerved; back with long silky hairs; upper glume keeled. Lower floret empty, upper floret hermaphrodite. Lemma lanciolate, nerveless, hyaline, acute, ciliate. Anthers 2.5-3 mm long. Stigmas 2, purple in colour.

**Flowering and Fruiting Time:** May – Dec; occasionally almost round the year.

**Note:** Roadside plants are usually short, 30 to 60 cm tall, with stout upright leaves. Runners are deep penetrating in the soil and hence, are very difficult to uproot of the plants.

**Uses:**

- A good soil binder.
- Rhizomes are sweet in taste and anthelonic.

**Specimens examined:** Monisha 3 (20-03-2022) Titabar [AAUWH: 5415]

**4.2.17 *Ischaemum rugosum*** Salisb., Icon. Stirp. Rar. 1 : 7. 1. 1791; Hook. f., Fl. Brit. India 7: 127. 1896; Bor, Fl. Assam 5: 423, 1940; Shukla, Gr. NEI. 105. 1996.

**Common Name:** Saramolla grass

**Vernacular Name:** Maronda (H)

**Habit:** Annual semi erect herb.

**Culm:** Slender, ascending, 15 to 80 cm tall, laterally compressed, glabrous; node pubescent .

**Leaves:** Glabrous; lamina linear or narrowly lanceolate; 5-15 cm long, 5-10 mm broad, soft, base rounded, apex acuminate margins scabrid; **sheath** scaberulous or glabrous, ciliate along margins; **ligule** membranous, glabrous or ciliate, obtuse, 2-3 mm long.

**Inflorescence:** Spiciform racemes, 2, terminal, divergent, each 3-5 cm long.

**Spikelets:** Paired, one sessile, other pedicelled, awned, 2- flowered. Lower glume 5-6 ridged, upper glume membranous, keeled. Lower floret usually male; upper floret hermaphrodite. Lemma hyaline or membranous, usually, bifixed, awned or mucronate; palea hyaline. Stamens 3. Stigma oblong or linear.

**Flowering & Fruiting Time:** Oct-Dec.

**Note:** Very Common in moist areas, usually along the roads near rice fields.

**Uses:** A good surface soil binder and a good fodder plant.

**Specimens examined:** Monisha 25 (18-3-2022) Jail road [AAUWH: 5437]

**4.2.18 *Ischane globosa*** (Thunb.) O. Ktze., Rev. Gen. Pl. 2 : 778. 1891; Bor, 580. 1960; Mitra, 184, 1958; Prakash & Jain, (l.c.) 24. 1984. Shukla, Gr. NEI. 285. 1996 . *I. australis* R.Br. Prodr. 196. 1810; Hooker, 24. 1896. *Milium globosum* Thunb, Fl. Jap. 49. 1784.

**Habit:** Perennial.

**Culm:** Slender to moderately robust, erect or decumbent and rooting at lower nodes, up to 80 cm tall. Node glabrous with glandular ring.

**Leaf:** Leaf **sheath** shorter than internode, glabrous except for ciliate outer margin, leaf blade narrowly lanceolate, glabrous, scarified, base rounded, apex acute; **ligule** 1 to 2 mm long, ciliate membrane.

**Inflorescence:** Panicle open, ovet in outline, 4 to 11 cm, glandular, branches and pedicels filifrom, flexuous, pedicel variable in length, shorter or longer then spikelet.

**Spikelets:** Elliptic globose, 1.5 to 2 mm , greenish or purplish brown, lower floret male, upper floret female, glumes sub equal, as long as or shorter then florets, broadly elliptic, 5 to 7 vained , usually glabrous, rearly hispidulous, lower lemma oblong, shallowly convex, smooth, glabrous; upper lemma crustaceous , shorter and more convex.. Anthers 0.8 to 1.3 mm.

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

**Note:** Usually along the roads near rice fields.

**Uses:** A good soil binder.

**Specimens examined:** Monisha 26 (18-3-2022) Jail road, Jorhat [AAUWH: 5438]

**4.2.19 *Leersia hexandra* Sw., Prodr. Veg. Ind. Occ. 21. 1788; Hook, f., Fl. Brit. India 7: 94. 1896; Bor, Fl. Assam 5: 173. 1940; Shukla, Gr. NEI. 299. 1996.**

**Common name:** Swamp rice grass; Cutgrass.

**Vernacular name:** Eralibon (Asm.)

**Habit:** An aquatic perennial grass, like annual in distmbed land situation.

**Culm:** Forming dense masses at the margins of swamps or lacks, 60-120 cm long, slender, smooth, striate, somewhat compressed, simple or branched; nodes slightly swollen, drum shaped, pubescent with silky hairs.

**Leaves:** Lamina erect, flat, rigid, glaucous in colour; linear, acuminate, 7-20 cm long, 4-10 mm broad, strongly scabrid on the margins; **sheath** scaberulous or smooth, glabrous apart from the nodes; **ligule** membranous, eciliate, ca 2 mm long.

**Inflorescence:** Erect, terminal open panicle, slender, contracted, 5-10 cm long, of few branches, axis and branches flexuous; branches 2-3 cm long, erect, pedicels very short.

**Spikelets:** Closely imbricate, oblong, compressed, 3-4 mm long, concave-convex in profile. Glumes reduced to a rim at the apex of pedicel. Lemma 3-4 mm long, 5 nerved, the lateral nerves forming a thick border, compressed laterally; palea hardly shorter, linear- oblong, 3- nerved. Stamens 6. Ovary glabrous.

**Flowering and Fruiting Time:** August- September

**Note:** Rather common along marshy roadsides near rice fields. Sharply scabrid lamina margins often create problem during manual harvesting.

**Uses:** A good fodder grass.

**Specimens examined:** Monisha 7 (17-03-2022) Titabar [AAUWH: 5419]

**4.2.20 *Panicum maximum*** Jacq., Collect. Bot. 1: 76. 1786; Hooker, Fl. Brit. India 7 : 49. 1896; Bor, Fl. Assam 5 : 224. 1940. Shukla, Gr. NEI. 339. 1996.

**Common Name:** Guinea grass

**Vernacular name:** Gobra ghas, Kutki (H)

**Habit:** Rhizomatous coespitose herb, 1 to 2 m tall, usually perennial, occasionally annual.

**Root:** Advantageous or fibrous and deep rotate. Rhizome thick and stalk.

**Culm:** Large robust clumps, often geniculate at the lower nodes; nodes 4 to 5 mm long, 5 to 7 mm in diam hairy and pale green.

**Leaves:** Alternate from each node, lamina linear, 60-200 cm long, 3-3.5 cm broad; **sheath** usually shorter and sometimes longer than the internode, minutely hirsute or nearly glabrous, margins glabrous, sheath apex at collar region densely

silky hairy; **ligule** membranous, ciliate, membranous portion *ca* 2 mm long ciliate portion 4 to 5 mm long, cilia simple and silky. Auricle narrow and with few silky cilia.

**Inflorescence:** An open erect panicle sometimes nodding , 15 to 40 cm long, braches up to 15 cm long, spreiding and whorled.

**Spikelets:** Oblong, obtuse or acute, 3 to 4 mm long, green or greenish brown. Lower glume obtuse, about 1/3 as long as the spikelet. Upper glume 5 to 7 nerved; lower floret usually male, upper floret hermaphrodite. Lemma 5 to 7 nerved, transversely rugose, linear lanciolate, acuminate at apex, rounded or constricted at base, 30 to 60 cm long, 5 to 20 mm broad glabrous or sparsely hairy, margins strongly scabrous; palea as long as or slightly longer then lemma. Anthers 1.5 to 2 mm long. Caryopsis fusiform sometimes flattened on 1 side, 3 mm long and 1 mm in diam.

**Flowering & Fruiting Time:** Nov- July

**Note:** A very first growing weed of fertile, bundhs and crop fields, often extended to adjoining waste lands. A good fodder crop. A deep rooted tufted grass.

**Uses:**

- It is most valuable fodder plant.
- It is use in the treatment of heartburn and tympanitis, headache.

**Specimens examined:** Monisha 4 (20-03-2022) Titabar [AAUWH: 5416]

**4.2.21 *Panicum repens* L.,** Sp. Pl. (ed.2) : 87. 1762; Hook. f., Fl. Brit. India. 7; 49. 1896; Bor, Fl. Assam 5: 230. 1940. Shukla, Gr. NEI. 341. 1996.

**Common Name:** Torpedo grass

**Vernacular name:** Para ghas (H)

**Habit:** Rhizomatous perennial, vivacious herb, 30 to 100 cm tall.

**Roots:** Advantageous or fibrous and deep rotate. Rhizomes are 3 types.

- **Stolonyferous rhizome** cylindric with elongated internodes and short nodes and scale leaves, whiteish in colour, 3 to 5 mm in diam.
- **Suchers**, similar to stolones, arising from up to 30 cm depth.
- **Zinger** like thick, bulbous moniliform, pale brownish in colour, 1 to 2 cm in diam

**Culm:** Erect and slender with many nodes and internodes; nodes 1 to 2 mm long and 2 to 3 mm in diam, glabrous, green to purplish brown.

**Leaves:** Lamina are linear lanciolate, acuminate 5 to 15 cm long, glabrous and sometimes slidely glaucous, margins minutely scabrous, **sheath** equaling or slightly shorter than the internodes in length, usually glabrous, 6 to 8 mm broad, margins ciliate; **ligule** a ring of short hairs *ca* 1 mm long; auricle inconspicuous and represented by few silky cilia.

**Inflorescence:** An open erect panicle, 7 to 20 cm long, irregularly branched.

**Spikelets:** Solitary or paired, oblong- lanciolate, acute, 2.5 to 3.5 mm long, dull white. Lower glume broadly ovate, with obtuse or shortly acute apex, nearly 1/3 of the length of spikelets; upper glume as long as the spikelet, ovate, with acute apex and 7 to 9 projecting ribs. Lower floret male and upper one hermaphrodite; lemma quite similar to upper glume, 9 veined; palea as long as lemma, with 2 kills. Stamens 3; anthers yellow.

**Flowering & Fruiting Time:** May- November

**Note:** A deep rooted grass an invasive weed of both fertile upland and shallow water bodies. A highly problematic ‘environmental weed’ and responsible for elimination of native and resident herbaceous flora in the place of its infestation.

**Uses:**

- A very good soil binder
- A low quality fodder

**Specimens examined:** Monisha 14 (14-04-2022) Mohbondha [AAUWH: 5426]

**4.2.22 *Paspalum conjugatum*** Berg in Act. Helv. Phys. Math. 7 : 129. t. 8. 1772; Hook. f., Fl. Brit. India 7: 11. 1896; Bor, Fl. Assam 5: 255. 1940. Shukla, Gr. NEI. 345. 1996.

**Common name:** Buffalo grass

**Vernacular name:** Lokusabon (Asm.)

**Habit:** Perennial prostrate herb, moderately deep rooted.

**Culms:** 20-60 cm long, creeping and stoloniferous; stolons laterally compressed, strong, rooting at the nodes; culms often erect, cylindrical, striate, glabrous.

**Leaves:** Lamina 5-20 cm long by 6-12 mm wide, linear-lanceolate, acute, soft, covered with scattered hairs especially on the upper surface, margins densely ciliate, particularly at the base; **sheath** very broad, lax, compressed, open to the base, glabrous, ciliate on the margins, towards the summit and on the throat; **ligule** reduced to a narrow, eciliate membrane with emarginated margins.

**Inflorescence:** 2 false spikes, rarely 3, 7.5 to 12 cm long, very slender, erect, very shortly pedicelled; rachis narrower than the spikelet, straight or slightly flexuous, 3 nerved and convex on the back, strongly keeled, margins almost smooth; pedicels alternate, short, glabrous.

**Spikelets:** 2 seriate, deciduous, 1.4-1.5 mm long, very imbricate, aciculate, lenticular, compressed, pale greenish yellow or whitish; lower glume absent, upper glume slightly convex, membranous, ovate, slightly acute, hairs white, very thin. Lower floret barren; upper floret hermaphrodite. Lemma slightly convex; palea similar to the lemma.

**Flowering & Fruiting Time:** August- February

**Note:** A problematic facultative weed of upland and marshy land crops. Commonly occurred in marshy roadside forming a complex association with other roadside grasses.

**Uses:** It is an excellent forage plant, very resistant to grazing and can produce hay of very good quality. The cooked leaves are used in the treatment of heart diseases. The decoction is used as a compress to treat bruises. It is also a good surface of soil binder.

**Specimens examined:** Monisha 18 (11-04-2022) Mohbondha [AAUWH: 5420]

**4.2.23 *Paspalum distichum*** L., Syst. Nat. ed. 10(2): 855. 1759. Bor, Fl. Assam 5 : 255.1940. Shukla, Gr. NEI. 347, 1996.

**Common name:** Knot grass

**Vernacular name:** Besak (H)

**Habit:** A widely creeping perennial grass, 30-70 cm tall, moderately deep rooted.

**Culm:** Sub compressed, and slender, creeping portion extensively stoloniferous, often forming loose mats; nodes glabrous sometimes with a few ascending hairs, dark brown, slightly narrower than internode.

**Leaves:** Lamina flat, ascending, 3-12 cm long, 2-6 mm wide, base rounded and ciliate, apex, tapering to an acuminate; **sheath** loose, keeled, commonly pilose on the margins towards the apex; **ligule** membranous about 3 mm long.

**Inflorescence:** 2 racemes, rarely as many as four, erect to reflexed, commonly incurved, 1.5 to 7 cm long, rarely longer; rachis slightly pedunculate in one or sometimes in both racemes, with usually a few long white hairs in the axils, 1 to 1.5 mm rarely 2 mm wide, triquetrous, minutely scaberulous on the margins.

**Spikelets:** Solitary, rarely in pairs in the middle of racemes, imbricate, 2.5-3.5 mm long, elliptic, pale green. Lower glume occasionally developed. Upper glume and sterile lemma equal, 3-5 nerved, elliptic.

**Flowering & Fruiting Time:** August- February

**Note:** Common in wet or marshy roadsides, forming more or less dense colony. A facultative weed of rice and summer vegetables.

**Uses:**

- A good fodder.
- Grains are preferred by several native birds.

**Specimens examined:** Monisha 13 (14-04-2022) Mohbondha [AAUWH: 5425]

**4.2.24 *Sacciolepis myosuroides*** (R.Br.) A. campus in Lecomte, Fl. Gen. de l' Indo-Chine 7 : 460. 1922; Bor, Fl. Assam 5: 217. 1940. Shukla, Gr. NEI. 357. 1996. *Panicum myosuroides* R. Br., Prodr. 189. 1810; Hook, f. Fl. Brit. India 7: 42. 1896.

**Vernacular name:** Hil-tauta (Asm.)

**Habit:** Annual, tufted or spreading, low herb, 20 to 40 cm tall, shallow rooted.

**Culm:** Decumbent or geniculately ascending, slender, cylindrical and glabrous. Nodes simple, glabrous 1 to 1.5 mm long, slightly thicker than internode, ca 2 mm in diam; internodes usually pale green and tinged with purple.

**Leaf:** Simple, alternate, spirocyclic solitary from each node. Lamina linear lanceolate, finely acute, glabrous, 3 to 25 cm long, 1 to 4 cm broad, margins scaberulous. **Sheath** glabrous 5 to 10 cm long, shorter than internodes. **Ligule** membranous, eciliate 0.5 to 1.0 mm long; auricle inconspicuous.

**Inflorescence:** A solitary spiciform panicle, 2 to 12 cm long, 3 to 5 mm in diam. Rachilla longitudinally ribbed. Spikelets awnless, simple, ovoid, green.

**Flower and Fruit:** August- December

**Note:** It is a very common roadside grasses. It is often found in seasonally inundated places, marshes, along water courses and in rice fields. It can be seen in aquatic or water logged areas like marshy places and paddy fields.

**Uses:**

- A common fodder.

**Specimens examined:** Monisha 9 (11-04-2022) Mohbondha [AAUWH: 5421]

**4.2.25 *Setaria pumila*** (Poir.) Roem. & Schult., Syst. Veg. 2: 891. 1817. Shukla, Gr. 361. 1996. *S.pallide-fusca* (Schum.) Stapf & C.E.Hubb. in Kew Bull. 1930: 259. 1930; Bor, Fl. Assam 5: 291. 1940. *Panicum pallidi-fuscum* Schum.,

Beskr. Guin. Pl. 58. 1827.; *Panicum pumilum* Poir., Encycl. Meth. Bot. Suppl. 4: 273. 1896.

**Common name:** Mongoose grass.

**Vernacular name:** Bisabon, Hialnesiabon (Asm.); Banari (H)

**Habit:** An erect, annual, tufted herb, 30 to 60 cm tall;

**Culm:** Slightly geniculate, slightly laterally compressed, glabrous, slender, or stout. Nodes glabrous, greenish to brown in colour, as thick as internode, 1-1.5 mm long; Internodes usually purplish in colour.

**Leaves:** Lamina linear, sharply acute at apex, flat, upright, 3 to 30 cm long, 2 to 10 mm broad, usually glabrous, sometimes with few scattered hair near the base, margins finely scabrous, **ligule** membranociliate, 1 to 1.5 mm long, cilia silky and dense; auricle inconspicuous.

**Inflorescence:** Terminal, spike-like, panicle with reddish brown bristles, green. Flowers paired. Lower floret male or sterile, upper floret hermaphrodite. Bristles minutely scabrid, reddish brown, 3 to 5 mm long. Glumes membranous, ovate very unequal, the lower glume smallest, lemma strongly keeled, awnless, more or less rugose, very convex on its back 2 to 3 mm long, green to yellowish green. Palea keeled, almost as long as lemma, smooth. Caryopsis ovoid, 1 to 1.5 mm long, included in lemma and palea of upper floret.

**Flower and Fruit:** Almost throughout the year.

**Note:** A facultative weed of upland and marchland crop situation also grows luxuriantly in crop-fallow and waste lands, road side and along railway tracts, sometimes grows as industrial weed over buildings and concrete floor.

**Uses:**

**1/ Edible part**—It can be eaten cooked as a sweet or savoury food in all the ways that rice is used, or ground into a powder and made into porridge, cakes, puddings etc. The seed contains about 11.5% protein, 6% fat, 40.7% carbohydrate, 8.2% fat. A dust from the fungal infection of plants is eaten.

**Specimens examined:** Monisha 1 (20-03-2022) Mohbondha [AAUWH: 5413]

**4.2.26 *Sporobolus diander*** (Retz.) P. Beauv., *ess. Agrost.* 26 : 147, 178. 1812; Hook. f., *Fl. Brit. India* 7: 247. 1896; Bor, *Fl. Assam* 5: 117. 1940; Shukla, Gr. NEI. 369. 1996. *Agrostis diander* Retz, *Obs. Bot.* 5: 19. 1789.

**Common name:** Lesser dropseed

**Vernacular Name:** Tupasoli (Asm.)

**Habit:** A slender, perennial grass with tufted stems, deep rooted.

**Culm:** Erect 25 to 80 cm high, smooth, glabrous, cylindrical, stout; node drum shaped, distinctly thicker than internode, glabrous, green.

**Leaves:** Narrow, up to 25 cm long 2 to 3 mm broad, glabrous, entire flat, gradually tapering to a point; **sheath** smooth, ribbed; **ligule** a short ciliate membrane, ca 0.2 mm long, cilia very short.

**Inflorescence:** Pyramidal panicle, with spreading or sub erect, solitary branches, often without spikelet at the base.

**Spikelets:** Minute, spindle shaped, 1.5 mm long or less. Lower glume ovate, nerveless, less than 5 mm long, upper glume ovate lanciolate, sometime erose up to 1 mm long, nerveless. Lemma 1.5 mm long, ovate, palea equally long, lodicules 2. Stamens 2 or 3, ovaryless then 5 mm long, glabrous, stigmas spreading plumose.

**Flowering & Fruiting Time:** March- September

**Note:** Very common in ill managed road sides, especially in dry areas. A problematic roadside weed due to its stout erect culms.

**Use:** Good soil binder.

**Specimens examined:** Monisha 16 (12-03-2022) Mohbondha [AAUWH: 5428]

## CHAPTER 5

### SUMMERY & CONCLUSION

Considering the rich diversity of grasses (Family Poaceae) and their various roles in economical and ecological services, the study was conducted to survey the roadside grassy species of Jorhat district , Assam. This systematic account revealed the presence of 26 number of grassy species in the study area under 19 numbers of genera, out of which 13 species were annual and rest were perennial in habit. The phenological observation has shown that *Axonopus compressus* , *Brachiaria ramosa* and *Ischane globosa* used to bloom almost round the year, 8 other species produced their flower & fruit during February- March to July-August ( during rainy season) and rest of the species used to bloom in the latter part of the year, means in the dry winter season. Most of the grasses of roadside situation recorded during the study possessed weedy nature , out of which few e.g *Chrysopogon aciculatus* , *Degitaria setigera*, *Eleusine indica* , *Imperata cylindrica* & *Setaria pumila*, have often been considered as very troublesome species. However, almost all the species have been used by the local people for their livelihood support in one way or other, which have been discussed along with the morphological description of the species. All the grassy species have been played vital ecological role in soil binding and erosion control, as well as providing food for the entire ecosystem too. A key for identification constructed based on external morphology of the taxa for field recognition & easy handling by the end users. Obviously, the study has opened up the prospect and need of wider expansion of the work to the state and the reason or better conservation of the species and their appropriate management for sustainable maintenance of the roadside ecosystem.

## CHAPTER 6

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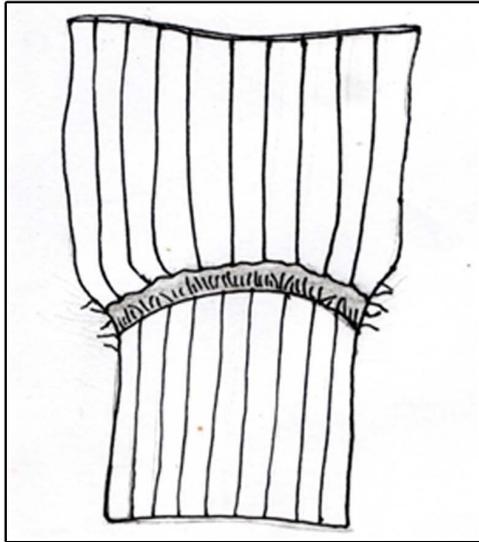
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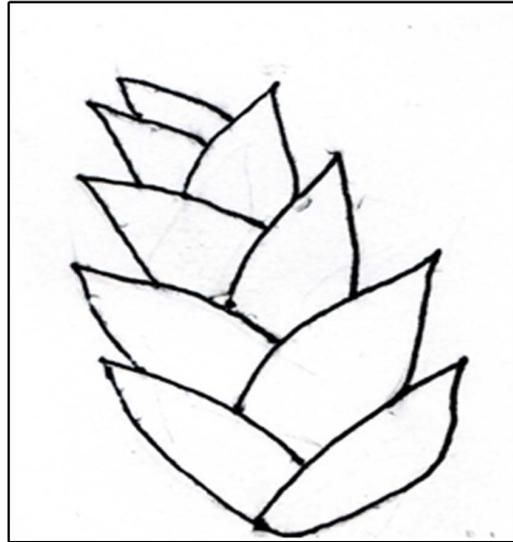
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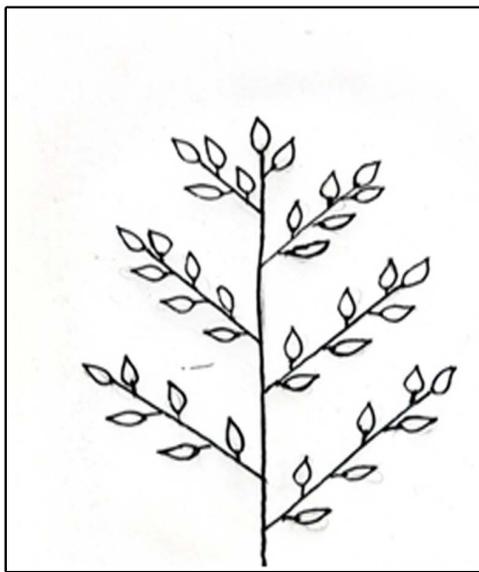


**Ligule of *Eleusine indica***

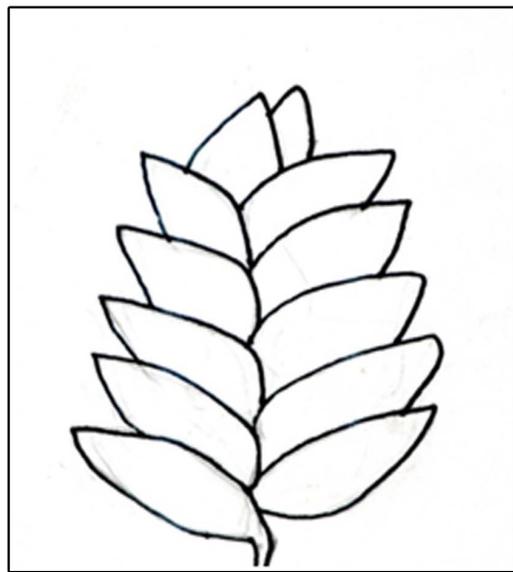


**A Spikelet of *Eleusine indica***

(A)



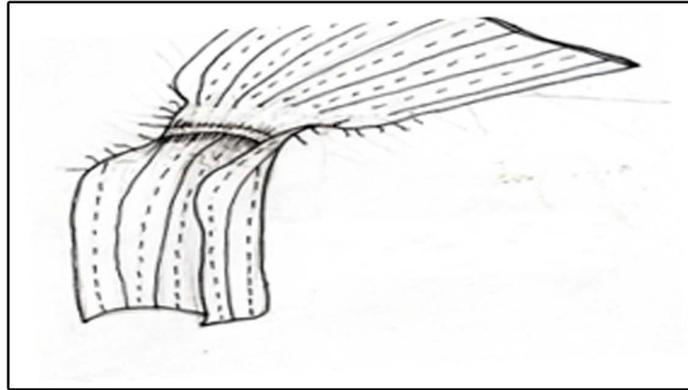
**Layout of an Inflorescence of  
an *Eragrostis unioides***



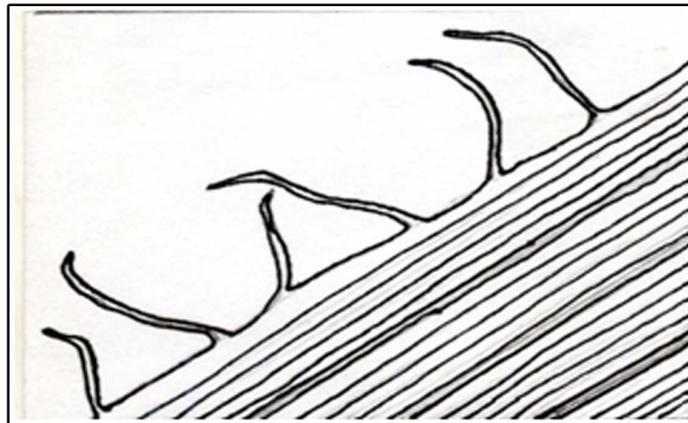
**A Spikelet of an  
*Eragrostis unioides*.**

(B)

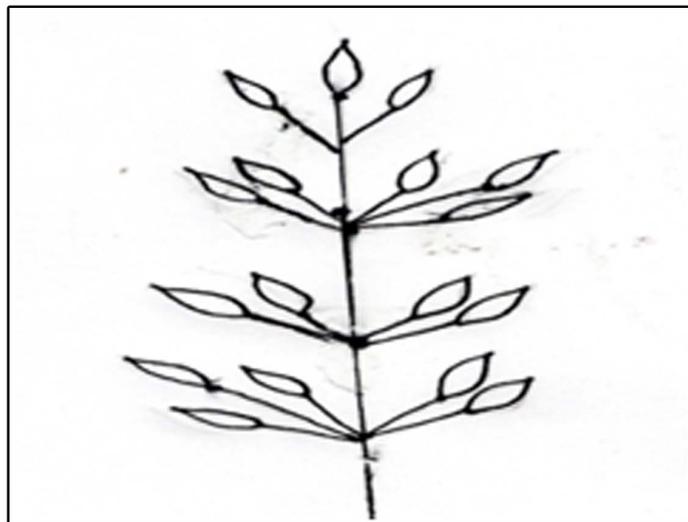
**Plate 1: (A) Illustration on *Eleusine indica* (L.) Gaertn and  
(B) *Eragrostis unioides* (Retz.) Nees ex Steud**



**Ligule**

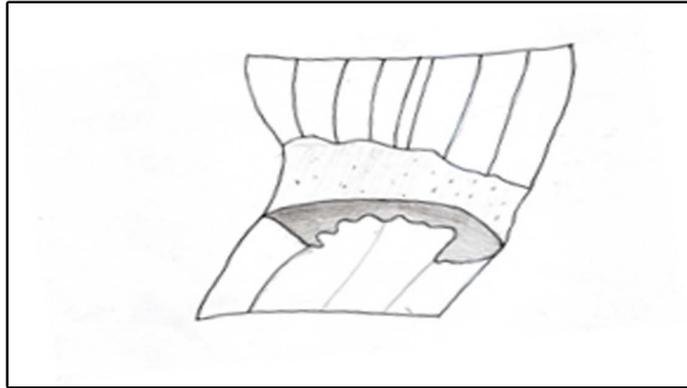


**Margine of hairs**

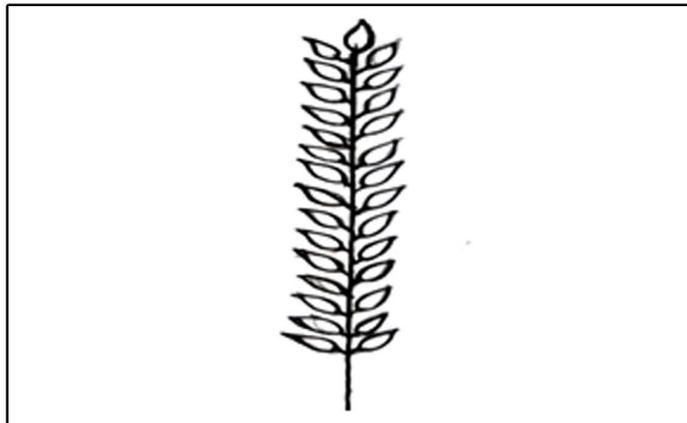


**Layout of an inflorescence**

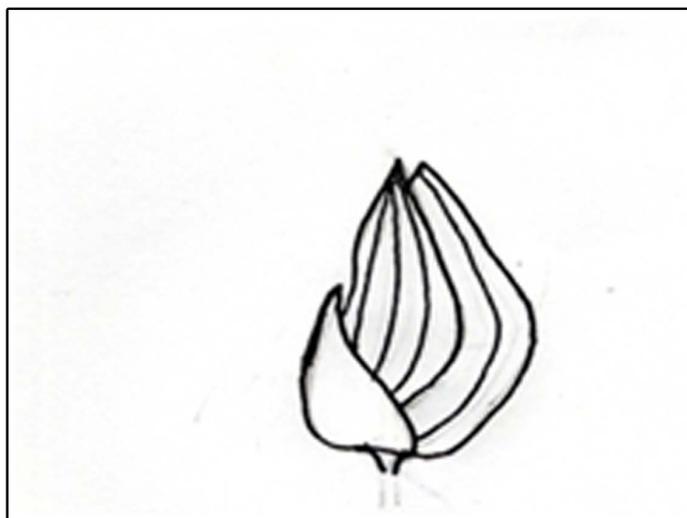
**Plate 2: Illustration on *Chrysopogon aciculatus* (Retz.) Trin**



**Ligule**

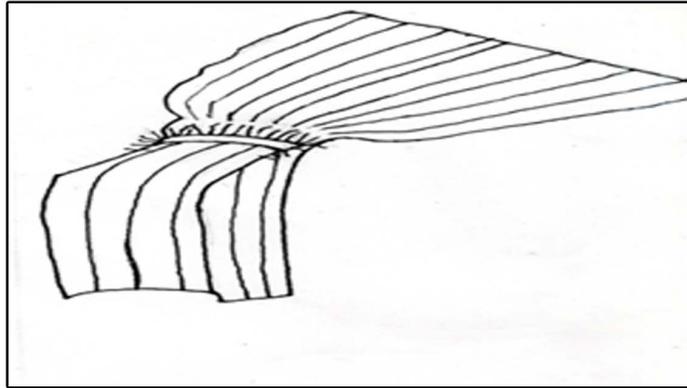


**Inflorescence**

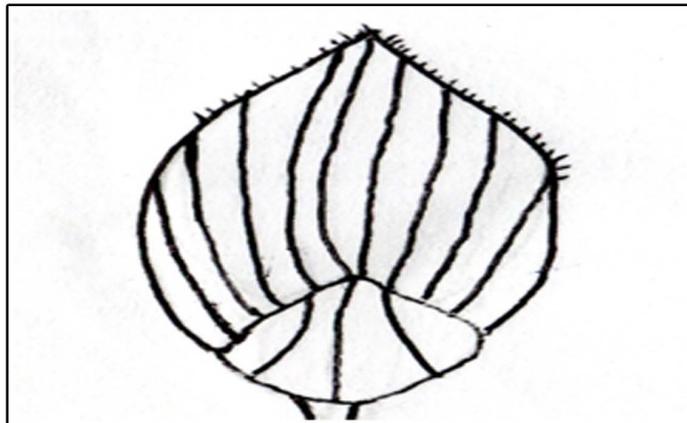


**Spikelet**

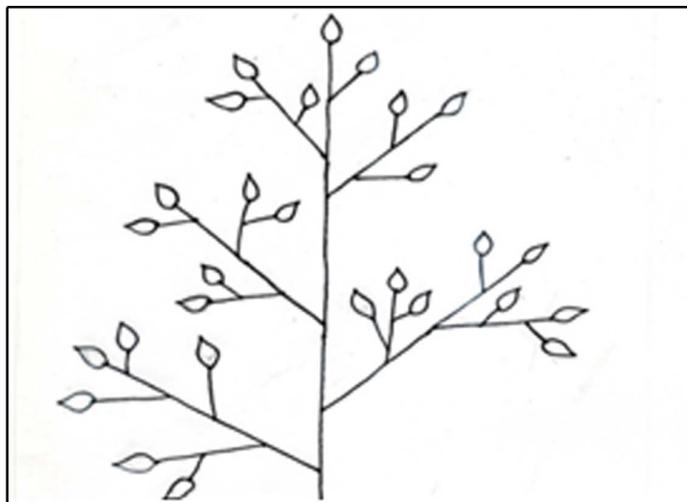
**Plate 3: Illustration on *Sacciolepis myosuroides* (R. Br.) A.  
Campus in Lecomte.**



**Ligule**

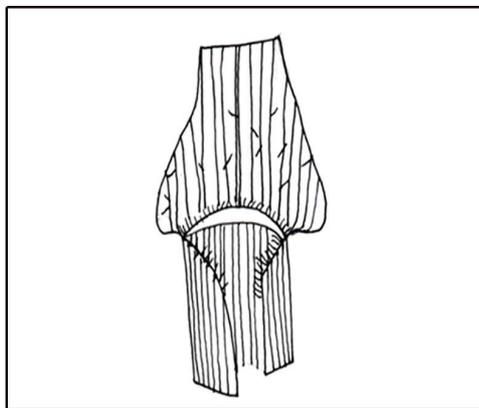


**Spikelet**

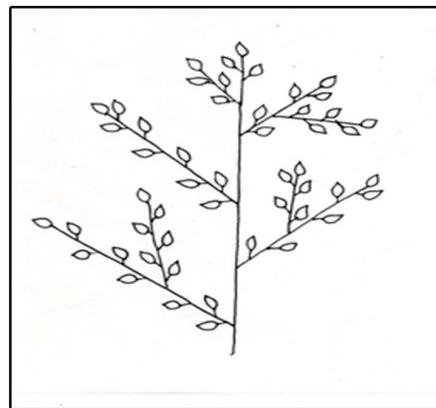


**Layout of an inflorescence**

**Plate 4: Illustration on *Panicum maximum* (Jacq.)**



**Ligule**



**Layout of an inflorescence**

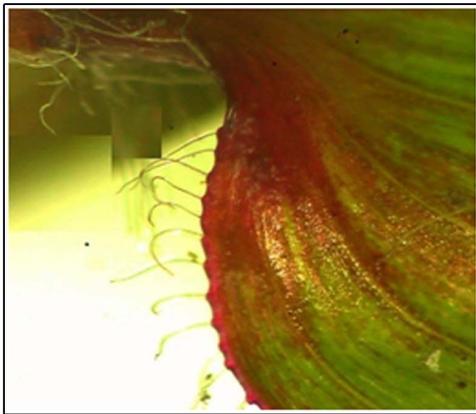
**Plate 5: Illustration on *Panicum repens* (L.)**



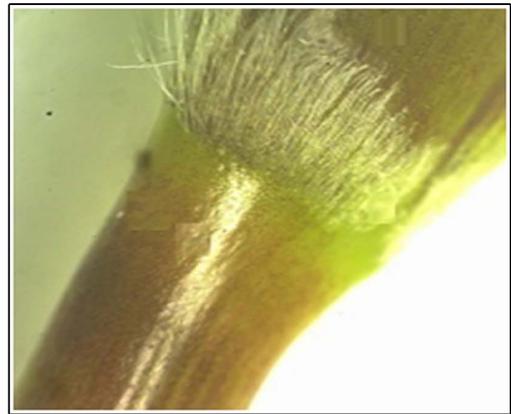
**Habit**



**Ligule**



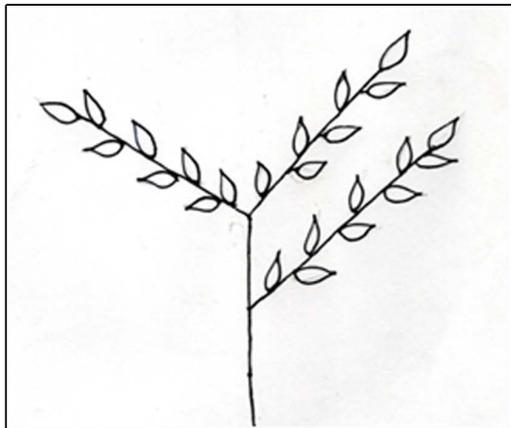
**Sheath margin**



**Node**



**Spikelet**



**Lay out of an Inflorescence**

**Plate 6: *Axonopus compressus* (Sw.) P. Beauv**



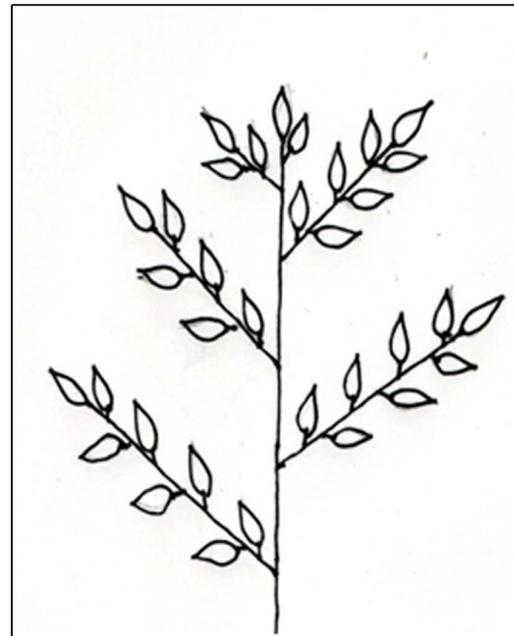
**Ligule**



**Node**

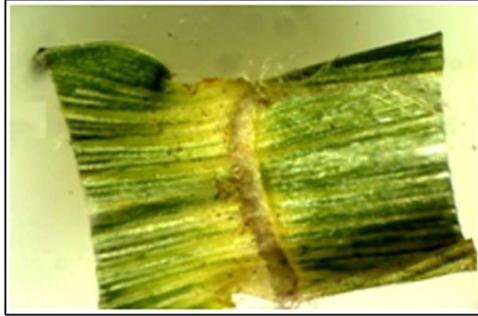


**Spikelet**

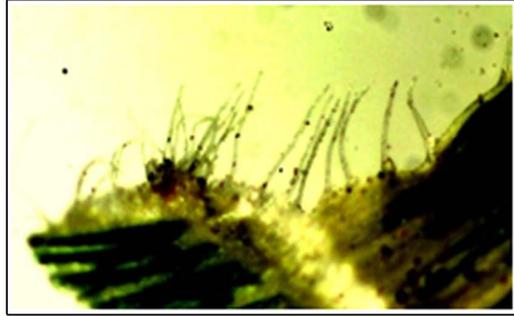


**Lay out of Inflorescence**

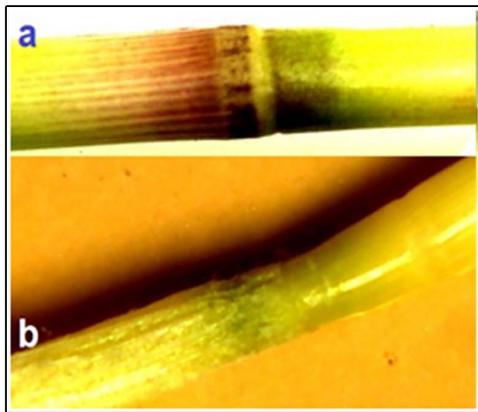
**Plate 7: *Brachiaria ramosa* (L.) Staf in Prain**



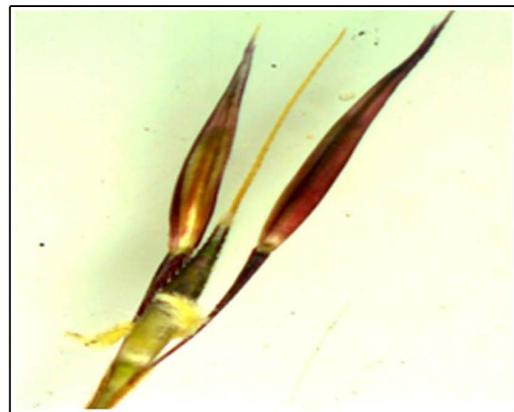
**Ligule**



**Cilia of auricle and sheath apex**



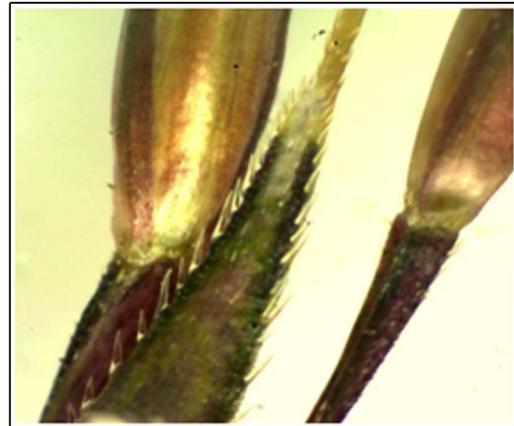
**a/ Node With sheath b/Node without sheath**



**A triad of spikelet showing the callus**

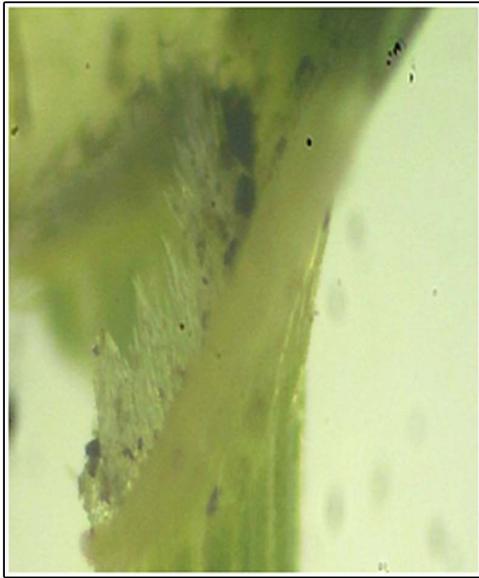


**Anther**

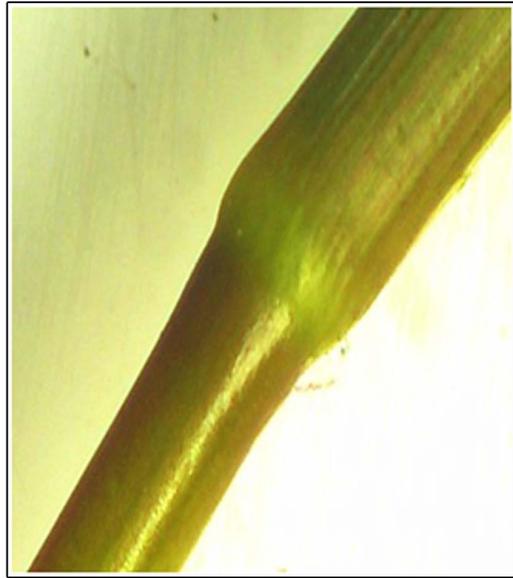


**Sessile spikelet showing strigose keels and stigma**

**Plate 8: *Chrysopogon aciculatus* (Retz.) Trin**



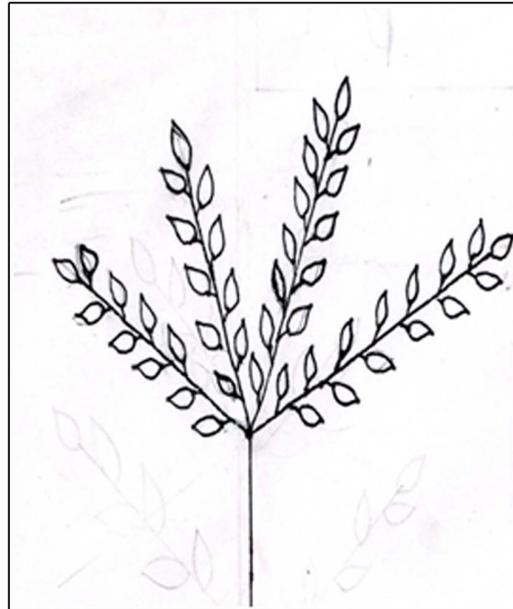
**Ligule**



**Node**



**Spikelet at blooming state**



**Layout of an Inflorescence**

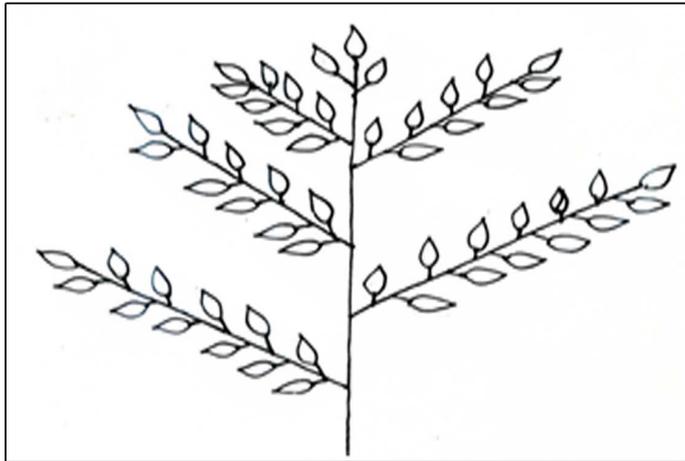
**Plate 9: *Cynodon dactylon* (L.) Pers**



**Ligule**



**Spikelet**

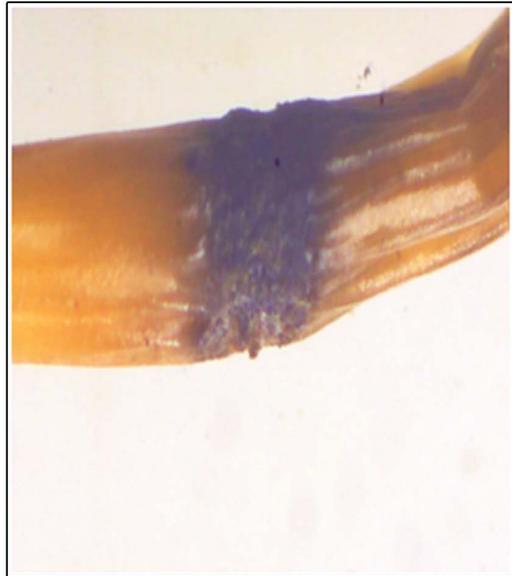


**Layout of an Inflorescence**

**Plate 10: *Cyrtococcum accrescens* (Trin.) Staf in W.Hooker**



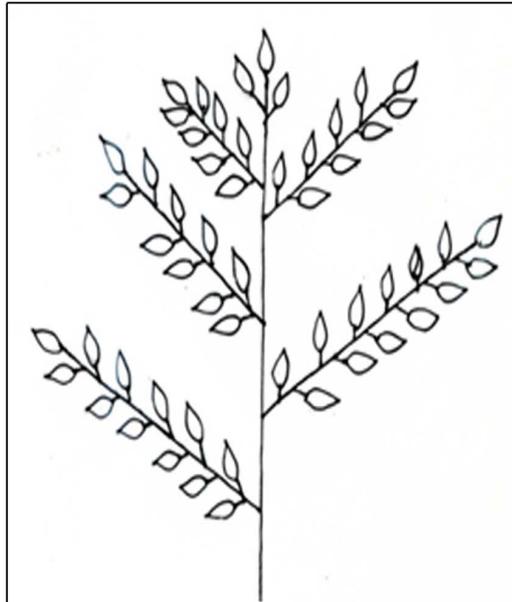
**Ligule**



**Node**



**Spikelet**



**Layout of an Inflorescence**

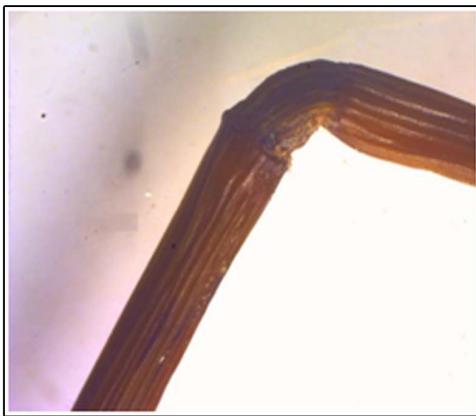
**Plate 11: *Cyrtococcum patens* (L.) A. campus in Bull**



**Inflorescence**



**Ligule**



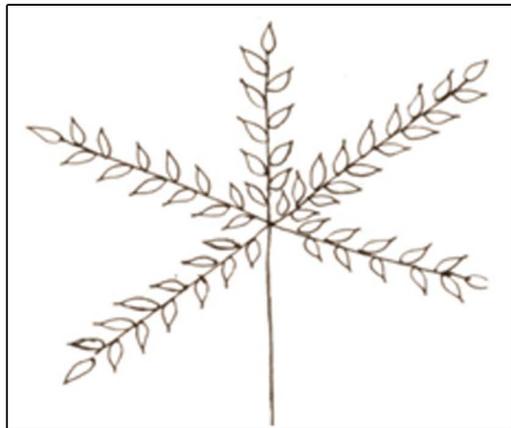
**Node**



**A Spikelet**



**Spikeletes on rachis**



**Layout of an inflorescence**

**Plate 12: *Dactyloctenium aegyptium* (L.) Willd**



**Habit**



**Ligule**



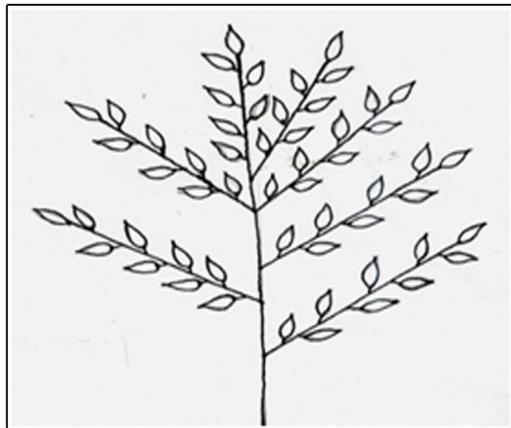
**Node**



**Spikelets on rachis**



**A Spikelet**



**Layout of Inflorescence**

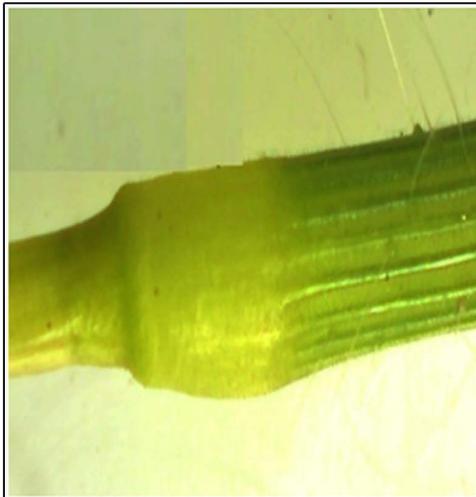
**Plate 13: *Digitaria ciliaris f. intercedens* Beck**



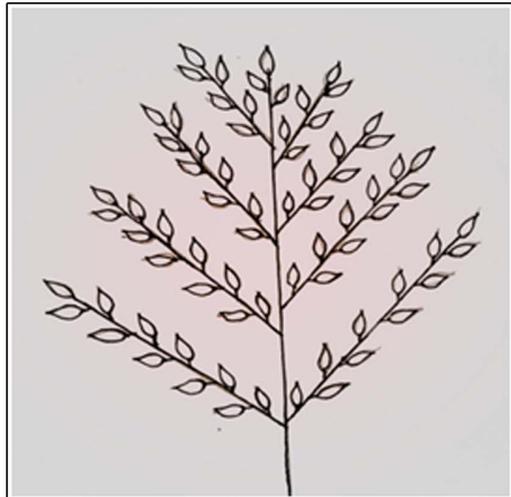
**Habit**



**Ligule**



**Node**



**Layout of an Inflorescence**

**Plate 14: *Digitaria setigera* Roth in Roem. & Schult**



**Habit**



**Ligule**



**Inflorescence**

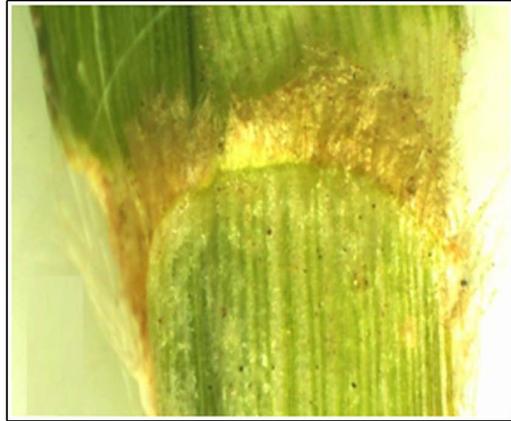


**Layout of an inflorescence**

**Plate15: *Echinocloa colona* (L.)**



**Habit**



**Ligule**



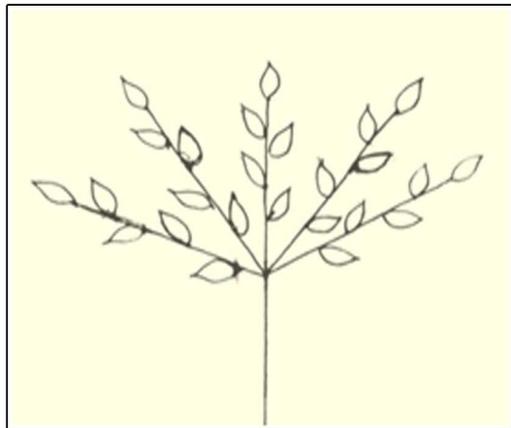
**Node with sheath and  
without sheath**



**Spikelet**



**Spikelet (illustrated)**

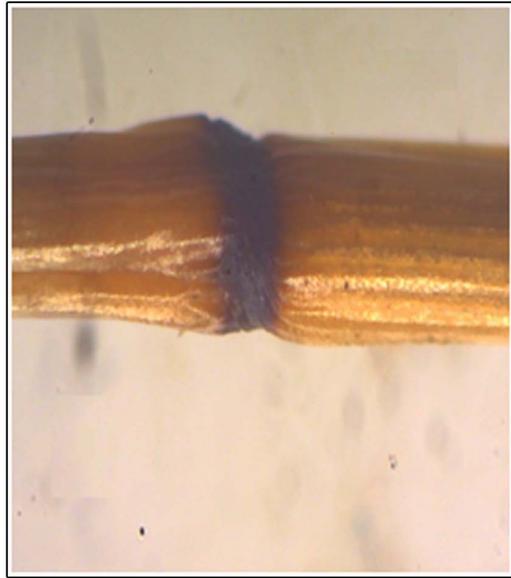


**Layout of an inflorescence**

**Fig 16: *Eleusine indica* (L.)**



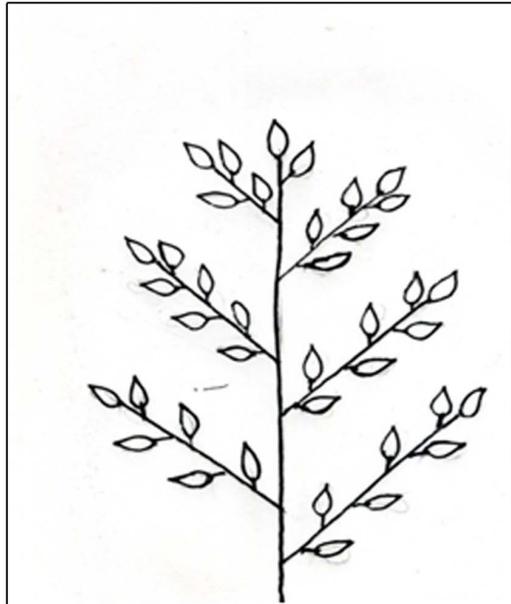
**Ligule**



**Node**



**Spikelet**

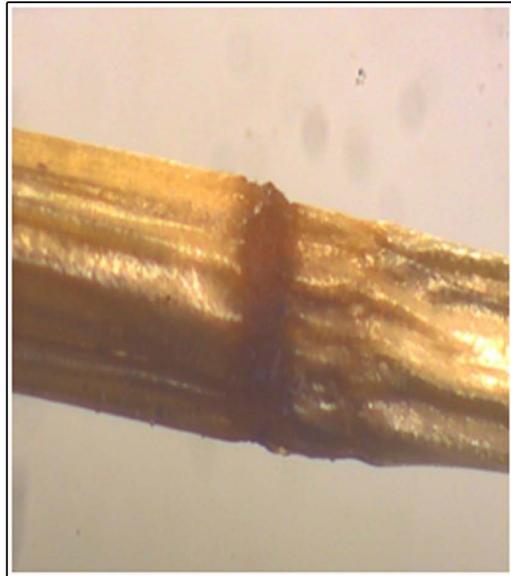


**Layout of an Inflorescence**

**Plate 17: *Eragrostis japonica* (Thunb.)**



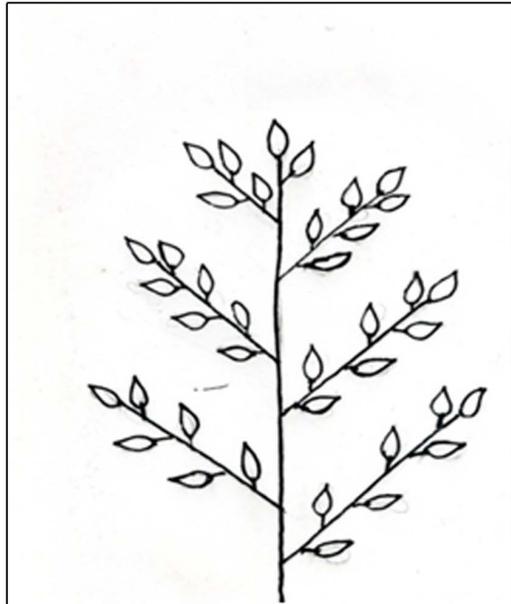
**Ligule**



**Node**



**Spikelet**

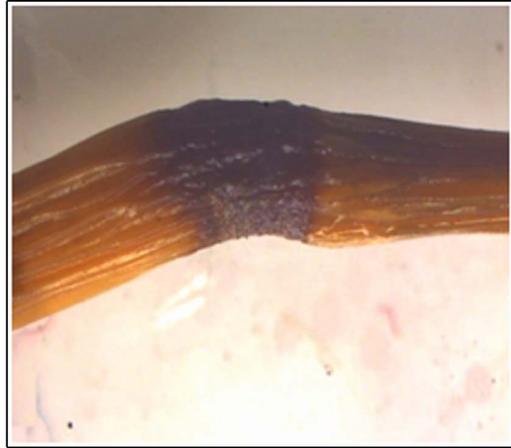


**Layout of an Inflorescence**

**Plate 18: *Eragrostis tenella* (L.) P.Beauv. ex Roem. & Schult**



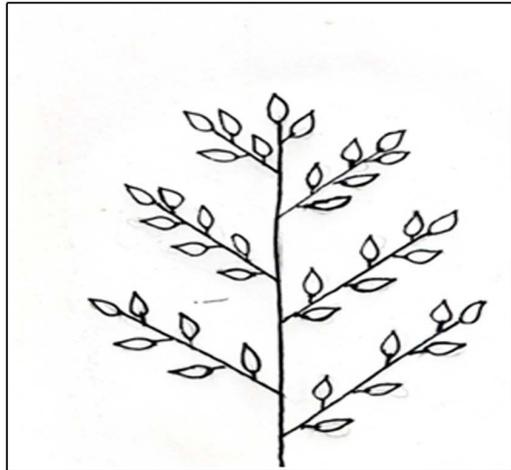
**Ligule**



**Node**



**Spikelet**

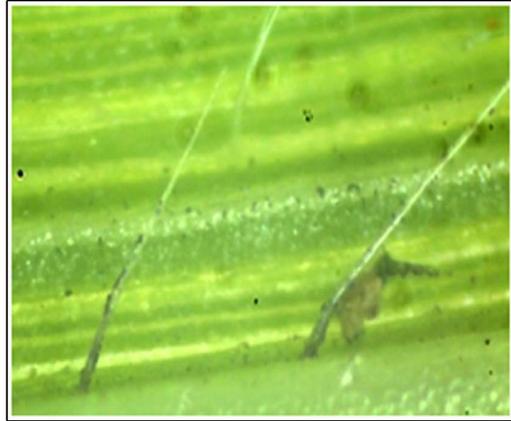


**Layout of an Inflorescence**

**Plate 19: *Eragrostis unioloids* (Retz.) Nees ex Steud**



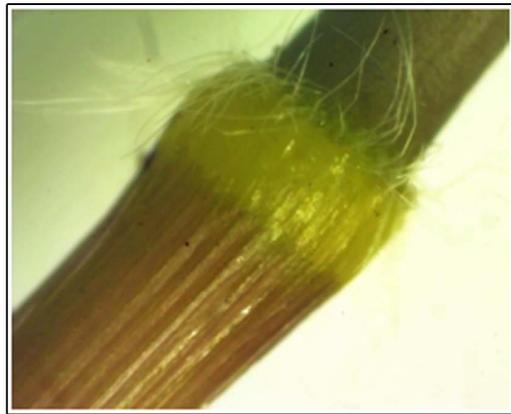
**Habit**



**Laminar hairs**



**Ligule**



**Node**



**A Spikelet with callus hairs**



**Layout of an Inflorescence**

**Plate 20: *Imperata cylindrica* (Linn.) P. Beauv**



**Node**



**Ligule**

**Plate 21: *Ischane globosa* (Thunb.) O. Ktze.**



**Ligule**



**Spikelet**

**Plate 22: *Paspalum conjugatum* Berg in Act**



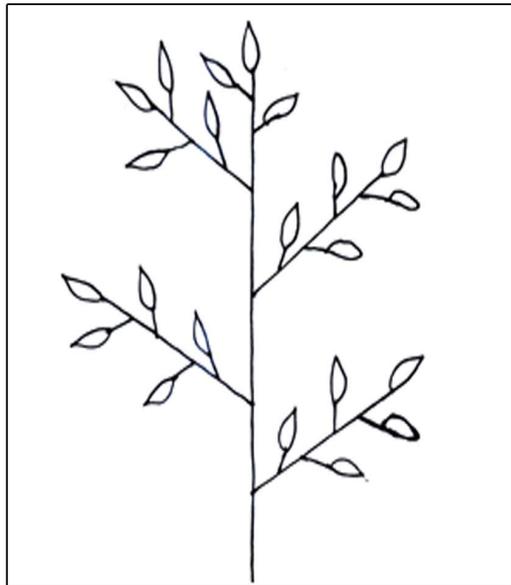
**Ligule**



**Hairy node**



**Spikelet**

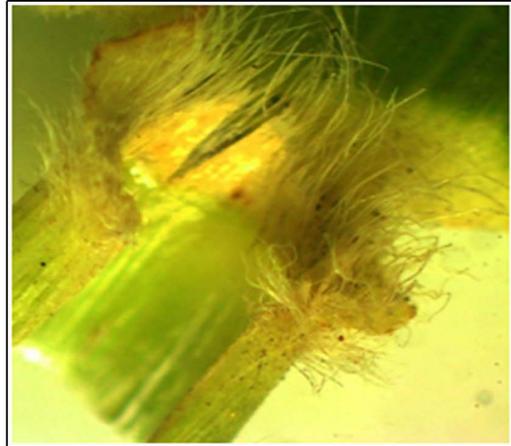


**Layout of Inflorescence**

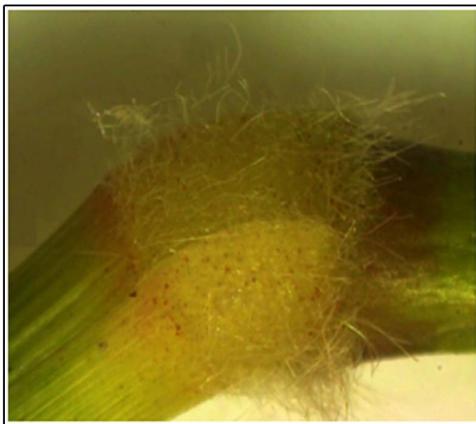
**Plate 23: *Leerisa hexandra* (Sw.)**



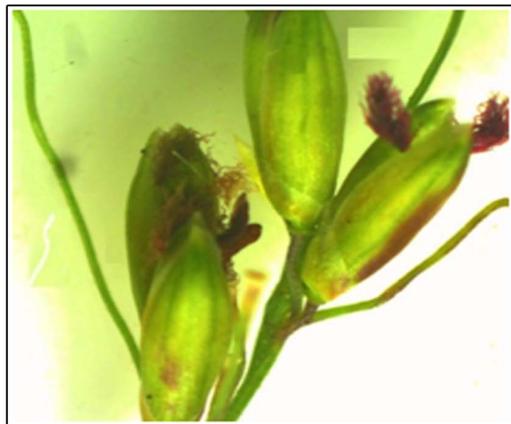
**Habit**



**Ligule**



**Spikelet**

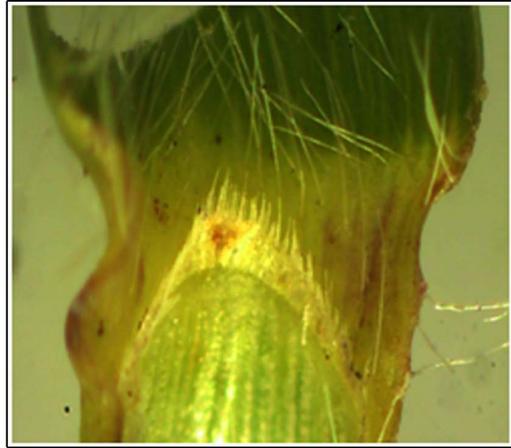


**Without sheath**

**Plate 24: *Panicum maximum* (Jacq.)**



**Habit**



**Ligule**



**Node**



**Spikelet**

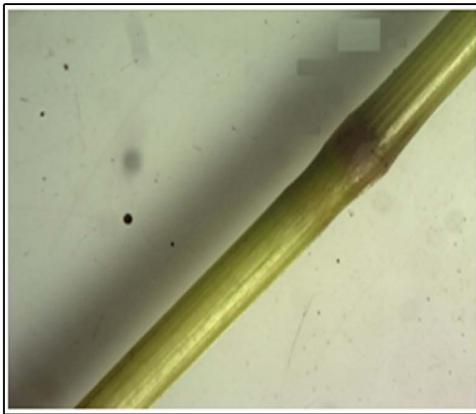
**Plate 25: *Panicum repens* (L.)**



**Inflorescence**



**Ligule**



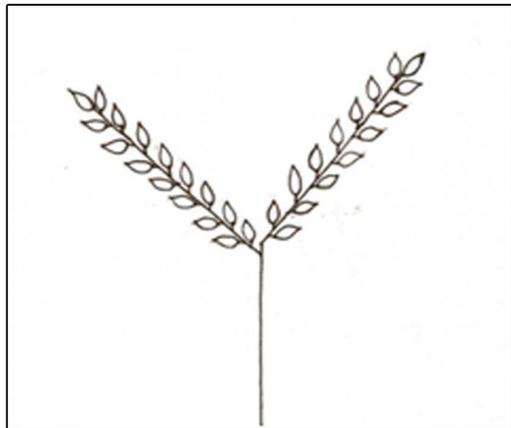
**Node with sheath**



**Node without sheath**



**Spikelet**



**Layout of Inflorescence**

**Plate 26: *Paspalum distichum* (Linn.)**



**Habit**



**Node With sheath & without sheath**

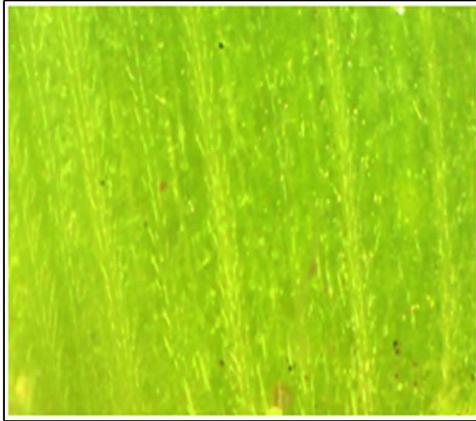


**Ligule**



**Caryopsis and Husk**

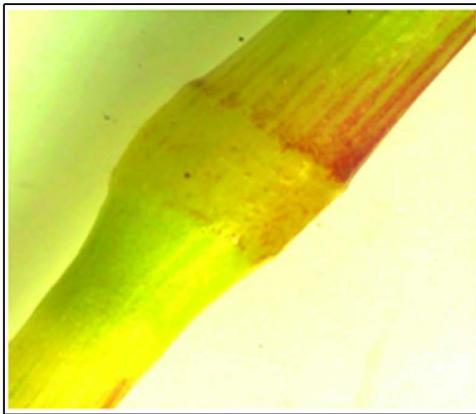
**Plate 27: *Sacciolepis myosuroides* (R.Br.)**



**Lamina**



**Ligule**



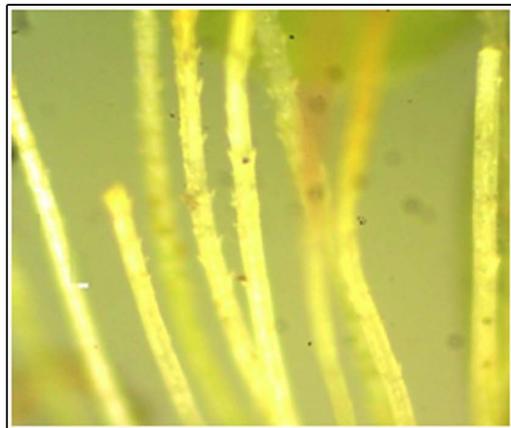
**Node with sheath**



**Node without sheath**



**Spikelet**

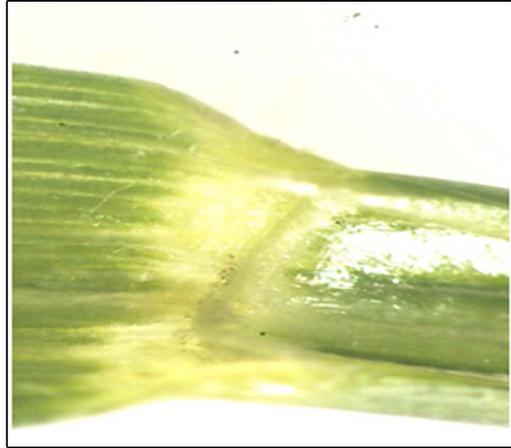


**Hair of Spikelet**

**Plate 28: *Setaria pumila* (Poir.) Roem. & Schult**



**Habit**



**Ligule**



**Node**



**Spikelet**

**Plate 29: *Sporobolus diander* (Retz.) P. Beauv**



**Laboratory work**



**Field work**



**Specimen measurement**



**Illustration**

**Plate 30: Photos depicting my work**