EVOLUTIONARY TRENDS OF SOME WILD CEREAL FROM IN -DAW -GYI LAKE, MOHNYIN TOWNSHIP, KACHIN STATE*

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Abstract

All grasses belong to the angiosperm's family Poaceae under order Poales. There are more than 13000 species of grasses on the planet, and grass dominated ecosystems. In this research, 16 species of wild cereal grasses collected from In - daw- gyi Lake, Mohnyin Township, Kachin state. The survey area is the largest lake in South East Asia and richness of primitive plant diversity region. The collected species were classified and identified by Halfliger and Scholz's classification (1981) was based upon the detail morphological characters. This research presents the evolutionary affinities of wild cereal grasses that based on grass 's detail taxonomic morphological characters in principles of author' citations and highlights the primitive simplicity to advanced modified complexity of wild cereal grasses changed by their environmental adaptation status in survey region. This result found that the integrations status of primitive and advanced modified characters in individual species of grass's phylogeny. The aim and objectives of this research are supporting the better understanding of wild cereal grass's taxonomy and evolutionary trends in survey area for professional specialists, scientists, all academician and researchers in family Poaceae.

Keywords: Grass's morphology, taxonomy, evolutionary trends

Introduction

Family Poaceae (Gramineae) is generally found in tropical areas to temperate and sufficient rainfall to form grassland. It is important role as a barrier to erosion of soil stabilization. Grass's taxonomy and systematic hierarchy is critical key for affinities among grasses diversity between their relationship evolutionary processes. The evidence from grass's microfossils with their reproductive organs and roots traced with dentition of fossil vertebrate indicated the grasses had stated to form a significance of global vegetation (Phillips.,1995).

Archaeological evidence suggests that grasses in the form of wild cereals were some of the earliest crop to be cultivated and it's estimated that at present they provide up to 52% of the carbohydrates in human diets worldwide (Stebbins,1956). The English word grass probably comes from the Old High German word "gras", generally used to describe any herbage suitable for livestock grazing. All global economic cereal derived from wild cereal grasses according to the adaptation with evolutionary status of environment and human civilization. The habit of grasses is usually herbaceous, reed liked or arborescent culms(stem) in monocotyledons flowering plants. Grass's morphological characters based on units of spikelet's (reproductive organs), aerial and underground parts (vegetative organs) with wind - pollinated. They rank among the top five families of flowering plants and most abundant and in terms of number of species important family of the Earth's flora. In this research, 16 species; 16 genera; 8 tribes in 5 subfamilies of wild cereal grasses from In - daw - gyi Lake, Mohnyin Township, Kachin state were collected during flowering periods. The collected species' identification, classification and evolutionary trends based on classification of (Hafliger and Scholz 1981) and many principles of author' citations. The finding outcomes of results are contributing the science knowledge of difficult and unique modified reproductive and vegetative characters of

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grasses with their evolutionary trends of various environmental adaptation in survey area. According to Hundley and Chit Ko Ko (1987),129 genera and 428 species of grasses reported 134 genera and 577 species of grasses were recorded in Myanmar. The future outcome of this research informs the science record of taxonomy and evolutionary unique characters of grasses for all academician and researchers.

Materials and Methods

Collection Procedure, Classification and Identification

Specimens were collected from In - daw - gyi Lake, Mohnyin Township, Kachin State during from November, 2023 to August, 2024 within the flowering periods. The study area lies between 24° 29′ 09″ and 25° 25 ′ 35″ North latitude and between 95°48 ′ 22″ and 96° 48′ 11″ East longitude and the elevation nearly about 190 to 289 meters (about 948.16 fts). The collected specimens were pressed, dried and prepared for herbarium specimens. The herbarium technique is provided by short Guide to Preparing an Herbarium Specimens by (Nyo Moung, 2003, Plant Collection Techniques and Herbarium Management). Map of collection areas was shown in figures. The classification was used according to Halfliger and Scholz's Classification (1981). The identification and classification collected specimens were made by the using of the vegetative and reproductive characters. The identification was done by using of keys given by Hatchinson (1934); Rhind, (1945): Stebbins, 1956; Bor, (1960); Backer, (1965); Dissanayake, et al (1982).Halfliger, and Scholz (1981); Jacob,(1945); Nasir, and Ali ,(1982); Hundley and Chit Ko Ko, (1987); Willis, and Macelusair, (2002); Simpson, (2006); and Byng *et al*. (APG IV 2016).

The Phylogenetic Position between the 16 Genera of Family Poaceae

The Phylogeny of family Poaceae is accomplished by principles of grass author' citations. In the present study, 13 different characters were chosen which show differences between the genera and based on the morphological specialization of evolutionary trends to establish an evolutionary diagram of genera within the general level of family Poaceae. The nearly related genera are collected in irregular figures. Which represent the relative position of the groups. The distance from a central point is the conception of the distance they have progressed from their hypothetical ancestor for each character studies the value 0,0.5 and 1.0 has been assigned to the specialized advance conditions respectively. Small letters represent the value of 0.5 for and capital letters represent the value of 1.0 for each character. The open cycle (○) and close cycle (●) indicate the continuous divergence values and the end point.

Figure 1. Collection procedure in study area

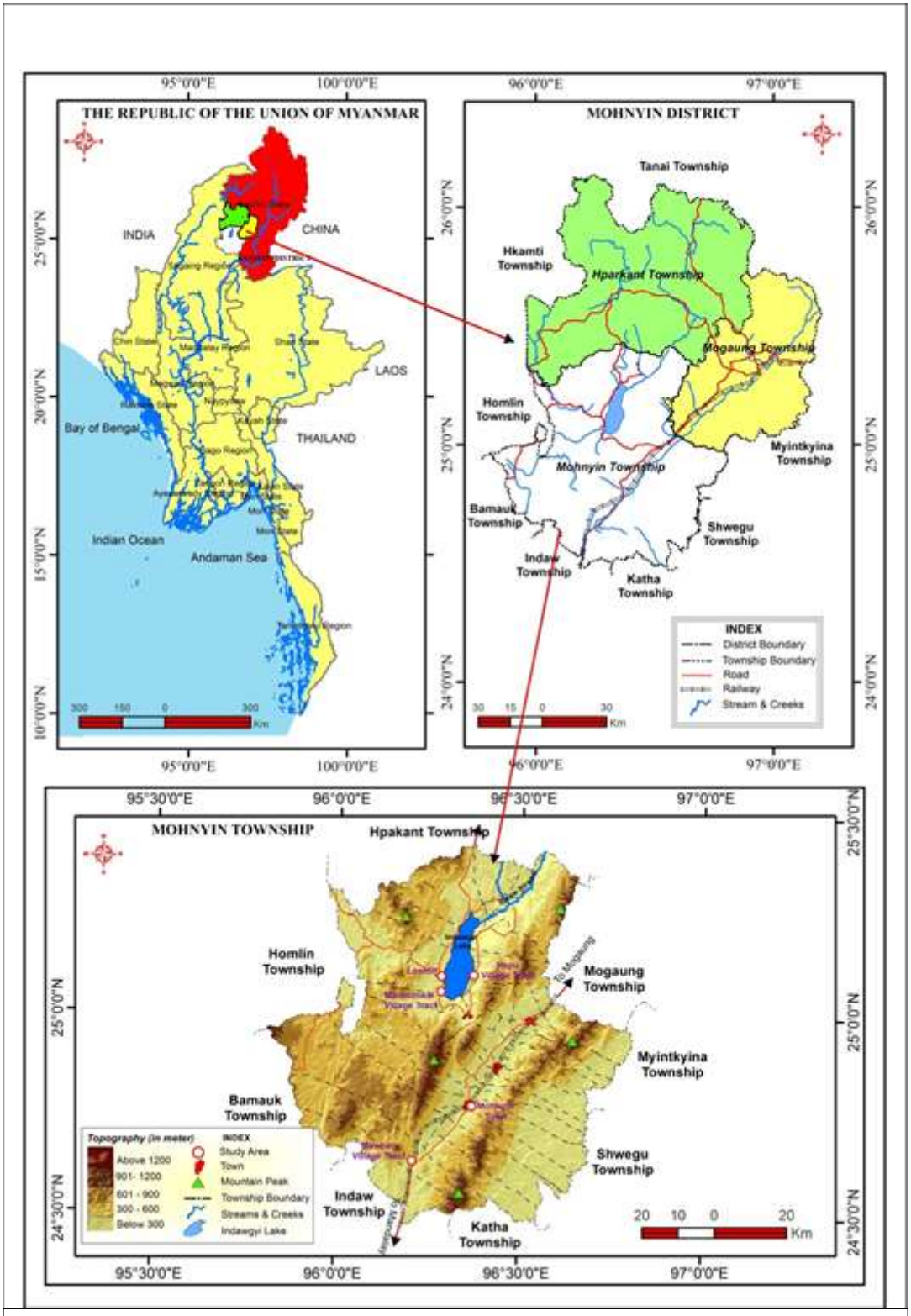


Figure 2 Location map of the study area
Source: Department of Geology, Mohnyin University, Kachin State

Results

Basic unit and key characters for identification, classification and evolutionary structure of grass's spikelet

Grass's morphological characters based on units of spikelet (reproductive organs), with modified aerial and underground parts (vegetative organs). The various features of grasses morphological units are unique and critical important for grasses identification, classification and evolution trends. spikelet is the unit of inflorescences. It can be differentiated into 1 to 2 flowered or 1 to many flowered spikelet's with articulation(joint). The spikelet may be terete, flattened, gibbus and rounded shape. Spikelet comprises glumes. The basally outer 2 glumes are lower empty glume and upper empty glumes. The flowering glumes are outer lemma and inner palea arranged above of empty glumes and this joint portion of empty glumes and flowering glumes called rachilla. All vegetative and reproductive glumes characters may be various modified characters etc. perfect, texture, silky hairs, bristles and awns.

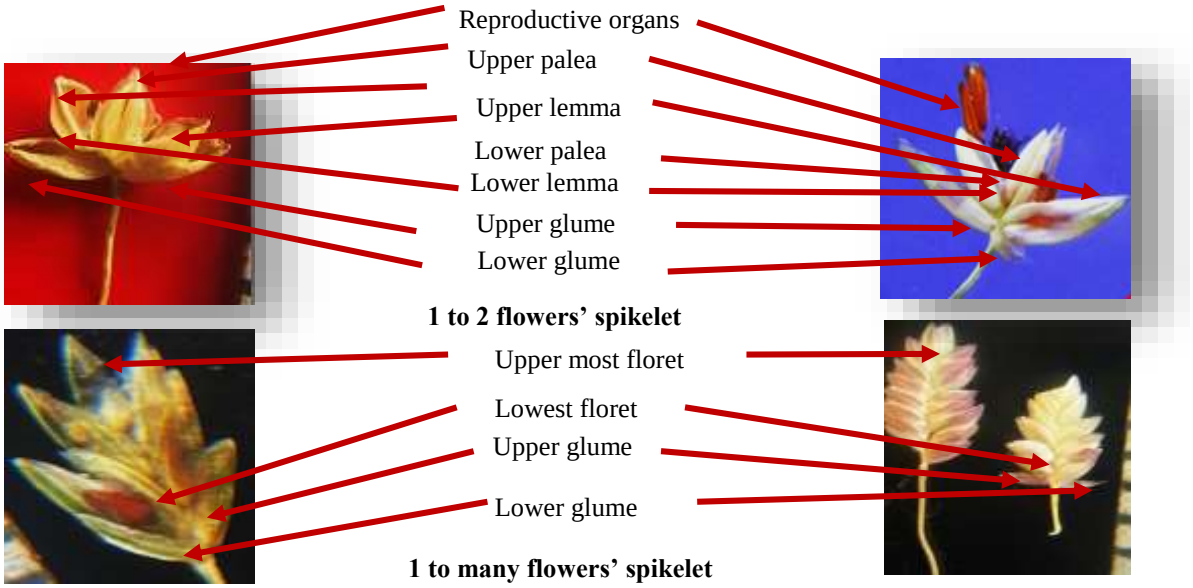


Figure 3 Structure of spikelet

I. Subfamily I. Bambusoideae Luerss. (Tribe. Bambusee Nees) (1893).

1. *Cephalostachyum pergracile* Munro.(Myanmar name - Tin - wa)

Perennial, culms up to 120 - meter high, scandent. 4 -10 branching system. The dropping culm possess strongly underground sympodial rhizomes systems, the persistent and strongly thick texture of culm sheath and culm blade with falcate shape auricle which curved deeply folded dense curved hairs. The outer surface of culm sheath and blade with densely scabrous persistent hairs, culm blade reflexed and arranged many equally horizontal branchlets.

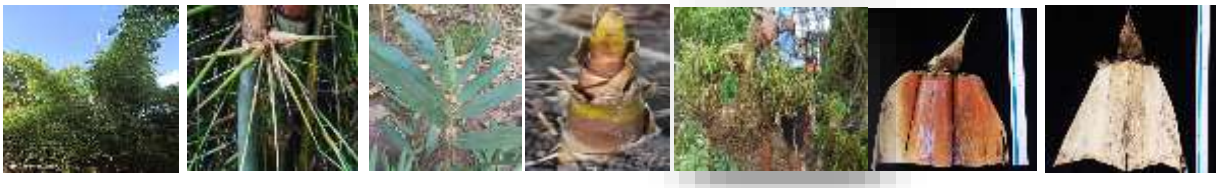


Figure 4 Habit, Branching, Leaves, Young shoot, Rhizome, (Dorsal and ventral Culm blade, sheath

2.*Chimonobambusa communis* (Hsuch & T.P.Yi) T.H.Wen & Ohrnb.(1999).

(Myanmar name - Thike - wa)

Perennials, tufted, shrubby to arborescent, sympodial rhizomes, distinctly rooting system. Culm up to 60 - meter or more with underground sympodial rhizome. The culm sheath and blade deciduous and thin texture. 1 - 3 nearly equally branching systems. The deciduous culm sheath and blade with caducous softly hairs. The falcate auricle with softly ciliate ad usually persistent on culm blade.

Figure 5 Habit, Branching, Leaves, Rhizome, Young shoot, (Dorsal and Ventral view) Culm blade and sheath

II.Subfamily Oryzoideae Kunth ex Beilschm (Tribe. Oryzeae. Dumort.(1824).

3.*Oryza rufipogon* Griffith, Not.Pl. Asiat.3:5.1851. (Myanmar name-Nat-sa-ba)

Annuals, erect, aquatic, tufted, rooting to stoloniferous rhizome. Culm 60 - meter high. It possesses distinct empty glumes. Flowering glume thick with crustaceous texture and six stamens with 1 fertile floret. The ligule very long and up to 10. 0 -15.0 cm. Awn of lemma up to 30 – 45 cm long. Lemma and palea with pectinate scabrous hairs.

Figure 6 Habit, Leaves, Inflorescences, Versatile anthers, Spikelet, Awned floret, Ligule, Rhizomes

4. *Leersia hexandra* SW., Prod.Veg.Ind.Occ.21.1788. (Myanmar name -Thaman – myet)

Perennials, aquatic, erect, strongly rooting to stoloniferous rhizome, creeping rhizomes. Culm20.0.- 35.0 meter high, slender. Inflorescence raceme; spikelet without empty glume and 1 fertile floret perfect with pectinate lemma and palea. Fertile stamens six.

Figure 7 Habit t, Leaves, Inflorescences, Ligule, Spikelet, Spike, Floret, Rhizomes

III.Subfamily Pooideae Benth. (Tribe. Arundinellae Stapf in Benth.)

5. *Arundinella nepalensis* Trin. (Myanmar name - Yaman – myet)

Perennial or annual, culm up to 50 - meter high and strongly scaly rhizomatous system. Inflorescences simple raceme liked primary branches with modified raceme to advanced open panicle and densely silky hair spikelet. Spikelet possess 1 - 2 florets, lower floret staminate and upper floret bisexual, densely silkily hair, long awned with upper lemma; awn 1.5 - 3.5 mm long, awned scabrous and based on hairy. The lowest floret bisexual and uppermost floret reduced sterile structure.

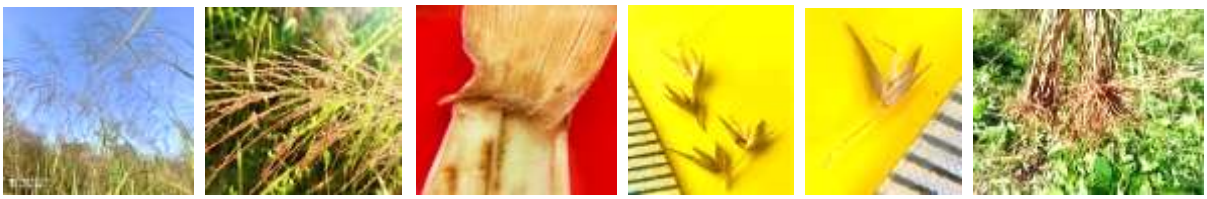


Figure 8 Habit, Leaves, Inflorescences with loosely panicles, Ligule, Spikelet, Floret, scaly

6. Subfamily Pooideae Benth. (Tribe. Arundineae Dumort.)
***Phragmites karka* (Retz.) Steud. (Myanmar name - Kaing)**

Annuals or perennials, erect, strongly rhizomatous, reed liked arborescent, tufted. Culm 160 - meter high. The inflorescence dense open panicle, very densely persistent silkily hairs until at flower maturity. Spikelet pedicellate and sub-sessile; florets 5 - 6, the lowest floret sterile; the second to the fourth florets are neuter. The fifth lowest floret bisexual.

Figure 9 Habit, Leaves-Leaf sheath and blade, Inflorescences, Ligule, Spikelet, Floret, Rhizomes

IV. Subfamily Chloroidoideae Duvall *et al.*,1994. (Tribe. Eragrosteae Stapf.)

7. *Dactyloctenium aegyptium* (L.) Willd. (Myanmar name - Myet - lay - gwa)

Annuals or perennials, tufted, rhizomatous. Culm up to 1.5- meter high. Inflorescences is 4 - fork digitately arranged spike with 3 - 4 florets. the lowest bisexual perfect floret and the middle and upper most florets are staminate and middle nerve of lemmas with modified awned

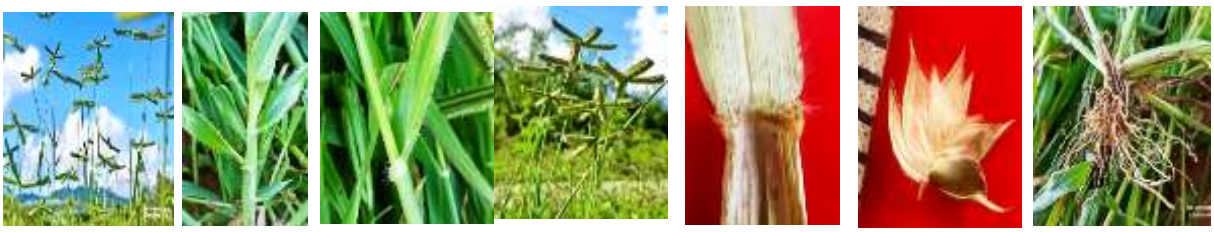


Figure 10 Habit, Leave, Tubercle based hairs leaf blade, Inflorescences, Ligule, Spikelet, Rhizome

8.*Eleusine indica* (L.) Gaertn.Fruct.Sem.Pl.1:8.1788. (Myanmar name - Sinngo - myet)

Perennial, erect, tufted, flattened. Culm up to 1.0 - meter high and very strongly rooting system. Inflorescences 5 - 6 digitately arranged racemes. Spikelet possess 4 -5 florets with the lowest floret bisexual and the upper most florets reduced.

Figure 11 Habit, Leaves, Inflorescences, Ligule, Spikelet, Floret, Roots

9. *Eragrostis atrovirens* (Desf.) Trin.ex Steud., Nom.Bot.ed.2.1:562.1840. (Myanmar name- unknown)

Annual, erect, tufted, rhizomatous. Culm up to 1.5- meter high and possess racemose arranged panicle. Spikelet comprises 14 - 34 advanced fertile florets number and all of florets fertile structures which fall down above the empty glumes at maturity.

Figure 12 Habit, Leaves, Ligule, Inflorescences with open panicles, Spikelet, Floret, Roots

Subfamily Chloroidoideae Duvall *et al.*,1994(Tribe. Cynodoneae Dumort.)

10.*Cynodon dactylon* (L.) Pers., Syn.Pl.1:85.1805. (Myanmar name - Myesa - myet)

Perennials, tufted, rhizomatous to stoloniferous. Culm up to1.0 - meter high, inflorescences3 - 4 digitately arranged raceme and flattened spikelet with only 1 fertile floret.

Figure 13 Habit, Leaves, Inflorescences with digitate raceme, Ligule, Spikelet, Floret, Rhizomes

V.Subfamily Panicoideae Bouchena; Khelladi *et al*. (2008).(Tribe.Andropogoneae Dumort.)

11.*Themeda villosa* (Poir.) A. Camus (Myanmar name - Thekke - min)

Annuals or perennials, erect, strongly rhizomatous, reed liked arborescent, tufted. Culm up to 125.0 - meter high with basal portion flattened. Inflorescence provide branching racemes embraced by sheathing spatheoles, single or little branches on flexuous peduncles, gathered into a leafy false panicle; raceme compressing 2 homogamous pairs of spikelets forming a sort involucre bract, 1 - 4 sessile spikelet surrounded by 8 - 9 pedicellate spikelet. The bract with strongly scabrous to long bristles and coriaceous texture of upper lemma.

Figure 14 Habit, Leaves, Inflorescences, raceme with involucre, Ligule, Spikelet, rhizome

12.*Ischaemum timorense* Kunth.

Annual, creeping or erect, stoloniferous, reddish - brown color, glabrous. Culm up to 2. 0 -meter high and strongly stoloniferous. Inflorescences is 2 - 3 digitately arranged spike-liked raceme with paired similar spikelet. Both of sessile and pedicellate spikelet perfect; lower floret staminate and upper bisexual. The cleft awn of upper lemma occurs in both spikelets. The upper floret in sessile spikelet and lower glume in pedicellate spikelet boat shape.

Figure 15 Habit, Leaves, Inflorescences, Node with ciliate, Ligule, Spike, Spikelet, Stolon

Subfamily Panicoideae Bouchenak - Khelladi *et al*. (2008). (Tribe. Paniceae R. Br.)

13.*Oplismenus undulatifolius* (Ard.) P. Beauv.

Perennials, erect, tufted, strongly the strongly rosette liked stoloniferous. Culm up to 0.5 m high and culm. The lower glume with modified awned up to 7.0 mm long. The awn of upper glume up to 5.0 mm long. lower floret neuter and upper floret bisexual and lower lemma provided to scabrous awned.

Figure 16 Habit, Leaves, Inflorescences, Ligule, Spike, Spikelet, floret, Stolon

14.*Panicum atrosanguineum* Hochst. ex A. Rich.

Annual, aquatic, tufted, strongly rhizomatous to stoloniferous, reddish colored. culm up to 1.5 - meter high and. Inflorescences possess racemose to loosely arranged open panicle and leave blade distinctly narrowly linear shape. Spikelet composed 2 - flowered; persistent at maturity, the lower reduced or staminate florets and upper bisexual perfect floret. The texture of flowering glumes chartaceous.

Figure 17 Habit, Leaves, Ligule, Inflorescences, Spikelet, Floret, Stolon

15.*Setaria pumila* (Poir.) Roem. & Schult.

Annuals, erect, tufted, fibrous roots. Culm 1.5 - meter high, flattened. Inflorescence narrowly cylindrical spike - liked racemes. Spikelet paired. Lower floret staminate and upper bisexual. All of flowering glumes crustaceous and upper lemma strongly rugose with densely involucre bristles.

Figure 18 Habit, Leaves, Ligule, Inflorescences with mature densely bristles, Spikelet, Roots

16. *Axonopus compressus* (Sw.) P.Beauv., Ess.Agrostogr.12,154.1812. Myanmar nam: Hngetdaw - mi

Perennial, erect to prostate, strongly stoloniferous, tufted, slender. Culm up to 1.0 meter high. Inflorescences 2-3 digitately arranged raceme, rachis wavy, spikelet secund and imbricate arranged on wavy rachis, digitately arranged raceme Spikelet borne single or pairs in rows on a narrowly flattened winged rachis winged, dorsally compressed to flat. The lower floret neuter and upper floret bisexual.

Figure 19 Habit, Leaves, Ligule, Digitate inflorescences, Spike, Spikelet, Floret, Rhizome

The Phylogenetic Position between the 16 genera of family Poaceae

The diagram is made by circular form with sections corresponding to the 16 genera of grasses. Within these sections are placed the genera at the distance from the central point indicating their relative evolutionary specialization. In this diagram, the concerning characters are given for each genus. Total divergence values of each genus are determined by each character. The relative characteristics between the genera are plotted on a concentric chart. A common hypothetical ancestor group is plotted at a point where divergence in character combination occurs. The diagram shown that a probable evolutionary trend for the genera of the Poaceae family. 13 morphological characters were used for the primitive and advanced characters of grass's evolutionary trends. The following morphological features were used for phylogeny. (**A**- Root and Rhizome System, **B**- Leaf sheath, **C**- Inflorescences, **D**- Rachilla, **E**- Glumes, **F**- Glumes with awned, **G**- Lemma, **H**- Palea, **I**- Lodicule, **J**- Stamens, **K**- Seed, **L**- Dispersal by Special devices (bristles, ciliate ,silkily hairs),**M**- Members of fertile florets.). (a,c,h) are used as the common based ancestral character in this evolutionary trends of species.

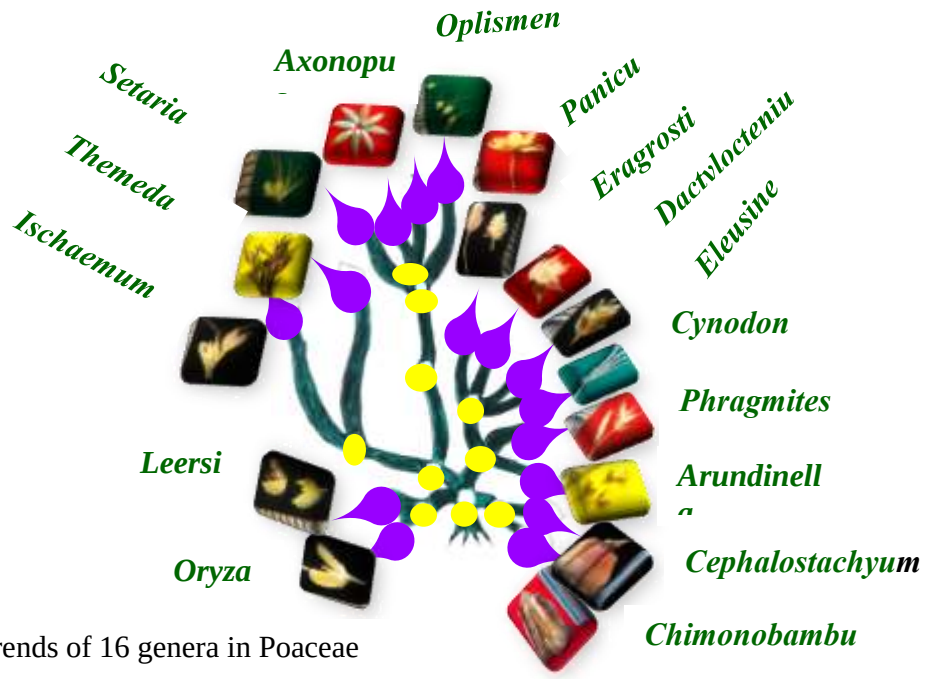
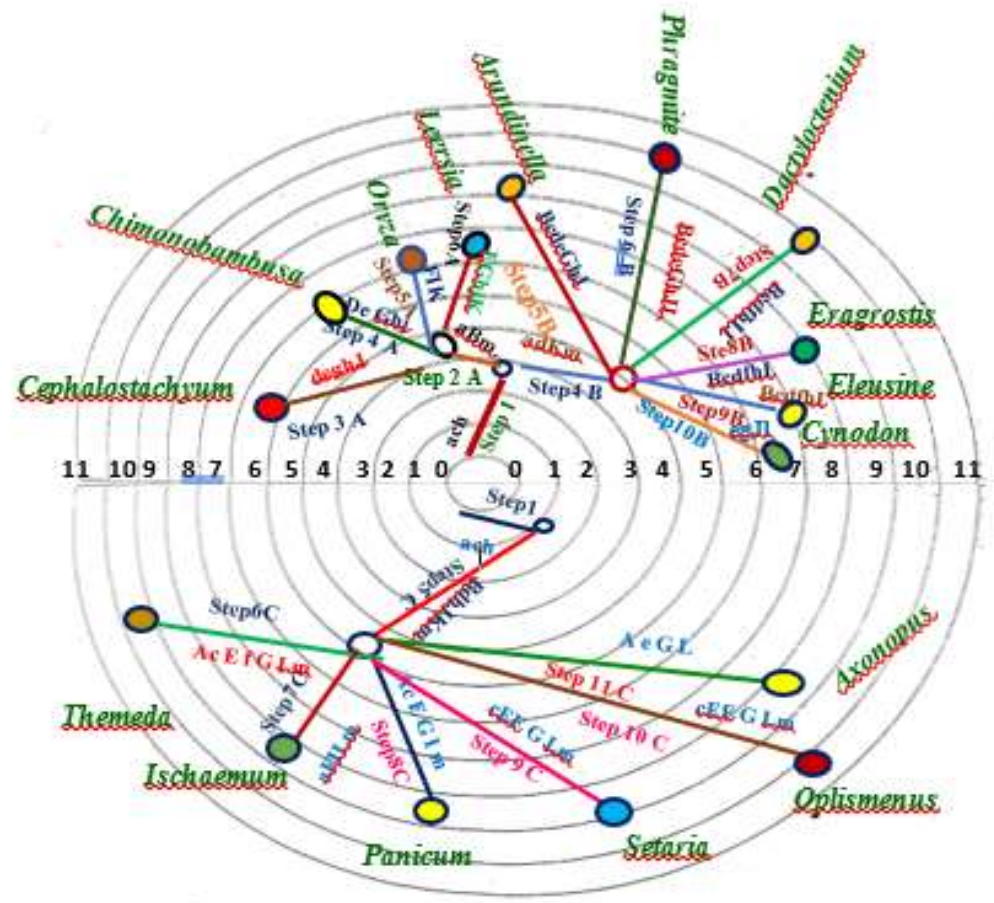


Figure 20 Evolutionary Trends of 16 genera in Poaceae



Common based ancestral characters is (a,c,h)

Figure 21 Cladistics Diagram of 16 Genera' Evolutionary Trends in Family Poaceae

Discussion and Conclusion

Grass belongs to graminoid clade of monocotyledonous and closely relationship with commelinid's clade. The traditional name of Gramineae is permitted by the International Code of Botanical Nomenclature, which also provided for use as family Poaceae, based upon the type of genus *Poa* L. under order Poales (Cope,1982)).In this research, 16 species, 16 genera, 8 tribes and 5 subfamilies of family Poaceae were recorded in In- daw -gyi Lake, Mohnyin Township, Kachin State, during from November ,2023, to August, 2024, within flowering time.

In this research, Poaceae was classified into 5 subfamilies according to Halfliger and Scholz's classification (1981). Namely of 5 subfamilies are Bambusoideae, Oryzoideae, Pooideae, Chloridoideae and Panicoideae

. Bamboo is the giant grass and the flowering time of subfamily Bambusoideae are not usually annual and after it's flower opening; the plant died. Thus, bamboo's identification is usually based on deeply used by modified vegetative features. Bamboo florets number are many and fertile florets with six stamen numbers. These stamens characters are primitive features of flower sexual status in grass's phylogeny, but they possess modified vegetative culm, underground rhizomes, node, branching system and various characters of culm sheath and culm blade. Subfamily Bambusoideae is the most primitive family by their arborescent vegetative habit characters in grasses taxonomy and evolution than those of the followed by 4 subfamilies.

In tribe Bambuseae of subfamily Bambusoideae; genus *Chimonobambusa communis* (Hsueh & T. P Yi) T.H.Wen & Ohrnb possess distinctly rooting system of lower nodes of culm deciduous and thin texture of culm sheath and blade with curved auricle with softly ciliate hairs and loosely arranged 1-3 nearly equally branching systems. Genus *Cephalostachyum pergracile* Munro. K.N comprises modified advance features of strongly underground rhizomes systems, the persistent and thick texture and dense scabrous persistent hairs on the outer surface of culm sheath and culm blade with curved strongly folded densely curved hairs auricle and many equally horizontal branching systems. These features of *Cephalostachyum pergracile* Munro. K. N is more advanced modified vegetative structure than genus *Chimonobambusa communis* (Hsueh & T.P.Yi) T.H.Wen & Ohrnb in bamboo's evolution. These characters agree with Tzvelev, (1989).

Subfamily Oryzoideae is closely relative to subfamily Bambusoideae by similar six stamen numbers. This point shown that primitive structures of many stamens number characters in subfamily Oryzoideae. Thus, subfamily Oryzoideae is the second primitive evolutionary status than other than the rest of 3 subfamilies. The genus *Oryza rufipogon* Griffith. possess empty glumes. Genus *Leersia hexandra* Sw. stands without these features but strongly grow adaptation on survey area. This characters of *Leersia* (Soland.) Sw. are more advanced modified characters than genus of *Oryza* L. in tribe Oryzeae of subfamily Oryzoideae. These features agree with Moore, A.C. (1960).

In subfamily Pooideae are provided by rhizomatous underground systems, inflorescences with modified raceme to advanced open panicle and densely silky hairs spikelet. These characters are great advanced distribution mechanisms for grasses evolution. But the only the lowest floret bisexual and uppermost floret reduced sterile structure are primitive features. So, subfamily Pooideae is the third most primitive evolutionary stands other than the rest of 2 subfamilies. Genus *Arundinella nepalensis* Trin. in tribe Arundinelleae possess 1 - 2 florets, the upper floret bisexuals with long awned modified advanced characters. Genus *Phragmites karka* (Retz) Stead.in tribe Arundineae of subfamily Pooideae are advanced distinctly dense persistent silky hairs of distribution mechanisms structures than genus *Arundinella* of tribe Arundinellae Stapf in Benth. of subfamily Pooideae. This phylogeny point of view agreements with Bor, N.L, (1960).

Subfamily Chloridoideae possess inflorescences racemose features and digitately modified inflorescences characters with 2-34 fertile florets. Their many fertile florets structure with completely covered by flowering glumes. This character is more advanced morphological status than the previous recorded 3 subfamilies. In tribe Eragrosteae; genus *Dactyloctenium aegyptium* (Desf.) Beauv. is digitately spike with 3-4 florets. The lowest bisexual perfect floret, above florets are usually reduced and the uppermost florets are staminate and middle nerve of lemmas with modified awned. Genus *Elusine indica* (L.) Gaertn. possess 4 -5 florets with the lowest florets' bisexual and the upper most florets reduced. The reproductive and vegetative characters of genus *Elusine indica* (L.) Gaertn.is the same evolutionary stand with genus *Dactyloctenium aegyptium*(L.) Willd. Genus *Eragrostis* Wolf. possess racemose arranged panicle inflorescences and usually all of florets with 14 -34 advanced fertile florets number. Many fertile florets number of genus *Eargrostis* Wolf. is the most advanced evolutionary florets structure than genera of *Dactyloctenium aegyptium*(L.) Willd and *Elusine indica* (L.) Gaertn.in tribe Eragrosteae. Genus *Cynodon dactylon* (L.) Pres. in tribe Cynodoneae is rhizomatous to stoloniferous culm and only possess 1 fertile floret structure. Therefore, genus *Cynodon* Rich. are

the most primitive florets feature characters than all genera from tribe Eragrosteae in subfamily Chloridoideae.These evolutionary trends characters agreements with Moore, A.C. (1960).

Subfamily Panicoideae comprises tribe Andropogoneae and tribe Paniceae. Tribe Andropogoneae are usually provided by fragile paired sessile and pedicellate spikelets. Both of spilelets are usually awned or awn less; similar or dissimilar in texture and structure. Tribe Andropogoneae included 2 genera; Genus *Themeda villosa* (Poir.) A. Camus. is composed of strongly rhizomatous culm, branching racemose inflorescence which embraced by sheathing spathae's modified involucre bract and flexuous peduncles. Its sessile spikelet possesses 1 - 4 fertile florets were surrounded by 8-9 sterile pedicellate spikelet. The bract with strongly scabrous with long bristles. Their coriaceous texture of upper lemma is advanced grass's taxonomy in phylogeny. Genus *Ischaemum timorense* Kunth. is 2 - 3 digitately arranged spike-liked raceme with paired similar spikelet. Both of sessile and pedicellate spikelet with perfect of lower floret staminate and upper bisexual. The cleft awn of upper lemma in both spikelet and boat shape of upper floret in sessile spikelet and lower glume in pedicellate spikelet features are modified adaptation dispersal mechanisms of grass's taxonomy. Genus *Themeda villosa* (Poir.) A.Camus comprises more modified advanced evolutionary features than genus *Ischaemum timorense* Kunth.by their reproductive and vegetative characters . Moreover, these 2 genera of tribe Andropogoneae in subfamily Panicoideae possess respectively individual modified advanced characters.

4 genera in tribe Paniceae of subfamily Panicoideae possess usually stoloniferous, rhizomatous, pedicellate or subsessile spikelet's awned or awn less, dorsally compress or terete spikelet. The strongly rosette liked stoloniferous culm of genus *Oplismenus undulatifolius* (Ard.) P. Beauv. is up to 20.5 cm high and lower glume with modified awned up to 7.00 mm long. The awn of upper glume up to 5.0 mm long. Its lower lemma provided with scabrous awned. These awn characters are advanced complexity adaptation for species distribution for grass's phylogeny. Genus *Setaria pumila* (Poir.) Roem. & Schult is cylindrical panicle inflorescence, modified advanced densely persistent bristles and lower floret staminate and upper bisexual. The upper lemma rugose structure is advanced texture of covering for sexual organs. Genus *Panicum atrosanguineum* Hochst. ex A. Rich. possesses racemose to loosely arranged open panicle possess strongly rhizomatous to stoloniferous culm. It possesses lower reduced or staminate florets and upper bisexual provide the adaptation for distribution mechanisms of modified advanced reproductive and vegetative features. Genus *Axonopus compressus* (Sw.) P.Beauv**.,** is stoloniferous culm, 2-3 digitately arranged raceme, spikelet flattened and borne singly or pairs in rows on a narrowly flattened winged rachis . Genera of *Panicum* L. and *Oplismenus* P.Beauv. are the most advanced modified characters than the 2 genera in tribe Paniceae of subfamily Panicoideae.

As the conclusion, tribe Paniceae is modified complexity advanced morphological characters than tribe Andropogoneae of subfamily Panicoideae in grass's evolution. These among 5 subfamilies; the subfamily Panicoideae possess the most advance modified vegetative and reproductive characters than the rest of previous 4 subfamilies. These evolutionary status agreements with the Nasir, E. and S. I. Ali (1982). The cladistic diagram with open cycle (○) (continuous divergence) and close cycle (●) (end point). The primitive, intermediate and advance level of evolutionary values are (0, 0.5, 1.0) respectively. The features of collected species found that the most primitive simplicity characteristics leading to the advanced complexities modified

character in collected species from survey area. Moreover, the primitive and advanced modified characters are integrations status occur in individual species of grass's phylogeny. This research highlights the modified taxonomy and evolutionary trends and informs the better understanding of wild cereal data for professional specialists, scientists, all academician and researchers in family Poaceae from In -daw -gyi Lake, Mohnyin Township, Kachin State, Myanmar.

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