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FOLK TAXONOMY OF POACEAE IN MONGOLIA

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Annotation

This article is the English translation of Japanese original text “Mongol ni okeru Ineka no Minzoku bunrui” written by Yuki Konagaya and others published in 2024 in “Japan and Mongolia” (58: 139-157). In this article, the authors clarified the naming characteristics of Poaceae by comparing the Mongolian names and the academic names. While scientific names are hierarchical and do not overlap, folk names can be classified and named by ears or tip, awns, roots, at the same time, therefore multiple plant names can be used as one species.

Key words

Academic knowledge, scientific knowledge, indigenous knowledge.

INTRODUCTION

It is reported that a total of 2239 species in 103 families and 599 genera of plants growing in Mongolia (Grubov, 2001), and not only scientific names but also Mongolian names are now organized. Undarmaa and Yamanaka (2020a; 2020b), one of the latest results, is an illustrated plant photo book (hereinafter abbreviated as "the Encyclopedia") that comprehensively lists major plant species according to grassland types, based on many years of joint research between Japan and Mongolia. It is richly illustrated with photographs, making it easy for non-specialists to identify the plants, and the Mongolian names are included. Shagdarsuren (2009) is a botanical dictionary compiled from a Mongolian linguist and arranged by scientific name (hereinafter abbreviated as "the Dictionary").

Both of the Encyclopedia and the Dictionary have been compiled under the policy that the Mongolian local name corresponds to the plant identified by the scientific name, and therefore, the Mongolian plant name is descripted corresponding to one species of plant. Specifically, it is structured so that the species name is identified by adding an adjectival phrase to the genus name, following the structure of assigning scientific names to plants. In other words, the Mongolian plant name corresponding to the genus name is the word that remains after the adjectival phrase is removed. We will consider this as a Mongolian classifier name and will proceed with the discussion by posing it as a "folk genus name" in the sense that it is the folk term as genus name.

However, this folk genus name (the Mongolian equivalent of the genus name) does not correspond one-to-one with the scientific genus name. For example, different Mongolian words are sometimes given in the Encyclopedia and the Dictionary. Also, the Encyclopedia often lists several names together as aliases and may have different words corresponding to folk genus names rather than multiple adjectival phrases. Furthermore, in some cases, two Mongolian words corresponding to a folk genus name may be used together to refer to a single plant species. Thus, it should be noted that the inconsistency between scientific names and Mongolian names is not small. This inconsistency might be a clear indication of the difference between indigenous knowledge and academic or scientific knowledge.

Mongolian names are one kind of indigenous knowledge that has been maintained by people who have used the steppes as a living area based on their observations since before botanists logically organized all plants according to academic knowledge. Therefore, their discrepancy from academic knowledge will be a valuable clue in elucidating the principles of folk taxonomy that are contained in the living world. How have people observed and named plants?

The study of folk term is one of the important areas of cognitive anthropology in that it reconstructs the natural environment signified by the culture in question through the clarifying of the folk taxonomy behind it. This paper contributes to the contemporary perspective of the contrast between indigenous knowledge and academic knowledge by highlighting the contrast with scientific names in particular.

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Specifically, focusing on the family Poaceae, we will clarify the structural discrepancies between Mongolian names and scientific names and derive the principles of folk taxonomy, while considering the differences between the Mongolian names in the Encyclopedia and the Dictionary mentioned above. In addition, we will also refer to narrative of a Kazakh informant who is familiar with Mongolian plant names that we met in 2018 in Sagsai County, Bayan-Ölgii Province.

In this paper, Mongolian words corresponding to genus names are surrounded by "".

1. Family Poaceae in the Encyclopedia and the Dictionary

The Encyclopedia used for analysis in this paper separated to two volumes; Volume I, Alpine Belt, Forest Steppe, Steppe (Undarmaa and Yamanaka eds. 2020a) and Volume II, Desert Steppe, Desert, Others (Undarmaa and Yamanaka eds. 2020b). In each volume the species according to grassland types are grouped by family and listed in alphabetical order by genus. Following this order, all plants of Poaceae mentioned in the two volumes together are re-arranged alphabetically by genus and species (Table 1). 45 species are listed.

The scientific name of Poaceae is currently normal, but Gramineae is also accepted. Both of the Encyclopedia and the Dictionary use the same Mongolian words, Biyeliegten (biye means body in Mongolian) for Poaceae and Üyeten (üye means node) for Gramineae respectively. However, it is highly possible that these Mongolian words originally meaning the genus or species names are applied scientifically to the family name as broader concept.[1]

In this paper, we will examine the lexicons listed as folk genus name in the Encyclopedia and the Dictionary that show some confusion, such as discrepancies with scientific names (Table 2).

In Table 2, the lightly shaded areas indicate cases in which more than one genus name is recognized, while the darker shaded areas indicate cases in which multiple genera used across genera are found.

1-1. *Agropyron* of the family Poaceae

Two folk genus names, "Yerkhög" and "Khiag" in Mongolian, have been registered for the species that make up the genus *Agropyron*. Are they interchangeable?

Agropyron cristatum as representative species and *Agropyron desertorum* can be called "Yerkhög," but *Agropyron repens* is not. Therefore, it is not substitutable over the entire genus *Agropyron*. Comparing these three species, the differences in the head shape are distinctive.

The *Agropyron cristatum* is described as saman (comb in Mongolian), meaning that the inflorescence is densely packed with the spikelet and look like the teeth of a comb (Photo 1).

This species is also phrased as zurmansüül (tail of mouse in Mongolian) and the phrase might describe the shape of inflorescence. The inflorescence of *Agropyron desertorum* to which the adjective tsöliin (govi's in Mongolian) is added, is not thick, but is packed like an arrow feather. The inflorescence of the last species, however, which is not called "Yerkhög," is not spread out like arrow feather.

Based on the above observation, "Yerkhög" is recognized as some species of the genus *Agropyron*, whose inflorescences are dense throughout and have a shape like an arrow feather (Illustration 1)[2].

[1]Biyeligten will be mentioned in the description of Poa genus.

[2]The illustrations below are presented together in Figure 1.

Photo 1. Agropyron cristatum

Illustlation 1. Yerkhög

In the field survey, "Yerkhög" was also used for different genus *Chloris virgata* that is a short grassy plant distributed in extremely dry area. Both the Encyclopedia and the Dictionary use the folk genus name "Bulgansüül" (sable tail in Mongolian) for this plant. Indeed, it is darker than the aforementioned inflorescence (Photo 1) and looks like a flattened tail, including the beard (Photo 2).

Photo 2. Gobiyerkhög, Chloris virgata

Illustlation 2. Zulmansüül

This folk genus name is added the phrase as goviyerkhög (approximateatsly meaning "Yerkhög" in Govi) in the Encyclopedia and also called in the field as "Yerkhög" in Govi. While reflecting the different major distributions of the grass family in different regions, it is consistent in that grasses with inflorescences that look like arrow feather are called "Yerkhög."

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Many folk terms are named after some kinds of animal's tail, such as this *Chloris virgata*. "Ünegensüül" (fox tail in Mongolian) as *Alopecurus*, "Daagansüül" (two-year-old horse tail) as *Koeleria*, and "Üreensüül" (gelding horse tail) as *Trisetum*[1]. The expressions regarding the shape of the inflorescence are used as the genus names, corresponding to the scientific name. Can we consider them as folk genus names?

Comparing the inflorescence described as two-year-old horse tail with the inflorescence described as gelding horse tail, the latter is more spread out in shape. However, *Alopecurus brachystachys* has named using both "two-year-old horse tail" and "a fox tail," so that it is difficult to consider "two-year-old horse tail" as a folk genus name.

The folk genus name corresponding to *Puccinellia* is "Zurmansüül," which mentioned earlier that it is used as adjective phrase in the typical species of "Yerkhög". Interestingly the shape of the inflorescence of *Puccinellia* is tufted with branches (Illustration 2), quite different from "Yerkhög."

And prefixed to "Zurmansüül" as an adjectival phrase is the "Ölön" which generally refers to *Carex* family. Such an adjective phrase, from the viewpoint of botanical naming rule, may signify the growing environment. The fact that the growing environment is a moist place where "Ölön" grows, and consequently growing with sedges may be a characteristic of "Zurmansüül" as a folk genus name.

"Ogotnynsüül" (wild mouse's tail in Mongolian) in *Enneapogon* is recognized as the folk genus name "Khurgalj."[2] Moreover, "Ulaantolgoi" (red head in Mongolian) as *Agrostis* describes the reddening of the inflorescence.

Thus, throughout the family Poaceae, the naming of species is markedly focused on the shape and color of the inflorescence. In particular, many kinds of animals' names are used in describing the shape. This is universally naming such as horse tail, ponytail, and cat tail. However, it is also confirmed that using such descriptive phrases cannot be accurately distinguished to identify a specific genus or species.

1-2. *Cleistogenes* of the family Poaceae

The Mongolian names "Khazaar övs" and "Khazaargana" exist for the species that make up the genus *Cleistogenes*. Khazaar generally refers to bridle with bit, while övs is a common noun meaning grass. On the other hand, the gana in "Khazaargana" is a suffix often attached to plant names, for example, "Khyalgana" (see below) and "Khargana" in Fabaceae. In Inner Mongolia, *Cleistogenes squarrosa* was simply called Khajar (Konagaya, 2014: 120, 397).

The phenomena that the stalk bends as it dries perhaps evokes the image of a bridle (the bit, reins, and headgear are connected through a ring) (Photo 3). Since Khazaar is a common noun, two naming methods are confirmed: either add övs (grass) or the suffix -gana.

l-3. *Elymus (Leymus)* of the family Poaceae

Agropyron repens, mentioned above, has been classified so far as the genus *Elytrigia repens.* It is corollary that the academic change from the genus to the genus, and the arrangement of the folk genus name as "Khiag" together with "Yerhög". While the species of genus are often named "Yerhög," the "Khiag" is the species whose head is not so cylindrical but sparse and alternating from left to right (Illustration 3).

[1]Mongolian names of animal and the tail may be written consecutively as one word or as two separate words, but we treat them uniformly as one word for the sake of convenience in considering them as folk genus name in this paper.

[2]Khurgalj will be mentioned in the description of the genus Phalaris.

Photo 3. Khazaargana, Cleistogenes

Illustlation 3. Khiag

The adjective mölkhöö, attached to the Mongolian name of *Agropyron repens,* means crawling and is a translation of *repens.* During the fieldwork, it was called "Khiag"of river in order to describe its habitat.

"Khiag" is also used for the genus *Elymus*. And also, the folk genus name for *Elymus chinensis* is arranged in the Encyclopedia as "Suli." The folk genus name "Suli" is used for different genus in the Dictionary. The Dictionary lists only one species, *Psammochloa villosa* (not *Elymus*), as a black "Suli," while the Encyclopedia classifies *Elymus* as a white "Suli" and lists four species with adjectives attached to it.

The four species; nangiad (Han people in Mongolian), daguur (Dahur people in Mongolian), tsatsaglalt (tufted in Mongolian), and sibiri (Siberian in Mongolian) are all translated respectively from their scientific names. For example, the species described as nangiad is *Elymus chinensis,* which is described as Chinese in its scientific name (Photo 4).

Photo 4. Khiag, Elymus chinensis

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In the field survey, the informant called these grasses nangiad "Khiag," kheerin (plains in Mongolian) "Khiag," and shar (yellow) "Khiag." Therefore, we can understand similarity between "Suli" and "Khiag," and also "Khiag" is used more often than "Suli" in indigenous knowledge.

Tadao Umesao, who surveyed the Xilingol grassland in present-day Inner Mongolia, China from 1944 to 1945, intensively interviewed people about hay and wrote a paper on the subject (Umesao 1955<1990>). According to him, the target of hay cutting was exclusively "Khiag," and if not available, they cut "Suli" (Umesao, 1990: 444). The scientific names are expressed as *Aneurolepidium chinensis* and *Aneurolepidium dasystachys*, respectively (Umesao 1990:445). The genus name *Aneurolepidium* is a synonym of *Elymus* (*Leymus)*, which was once used. The Dictionary also separates *Elymus* and *Leymus* as another genera. These changes of names reflect the difficulty of classifying this genus within the Poaceae family.

A romanized card transcribed and organized by Umesao from his field notes says, "Of course Khiag is good for hay, but it depends on the year. If the grass on the mountain side grows well, there is less Khiag" (Konagaya, 2014: 118), and "We cut the Suli. There is no Khiag here," he recorded (Konagaya, 2014: 84).

Thus, "Khiag" and "Suli" are clearly distinguished among the people, and "Suli" is a substitute for "Khiag" in response to the variable nature of vegetation. Considering that only "Khiag" is found mixed with "Yerkhög" as mentioned earlier, it can be inferred that the head or inflorescence of "Suli" has distinctly different characteristics from that of "Yerkhög."

Notably, one species of the four white "Suli" *Elymus racemosus* (Photo 5) and *Psammochloa villosa* (Photo 6) which is considered a black "Suli," have one thing in common: they are edible.

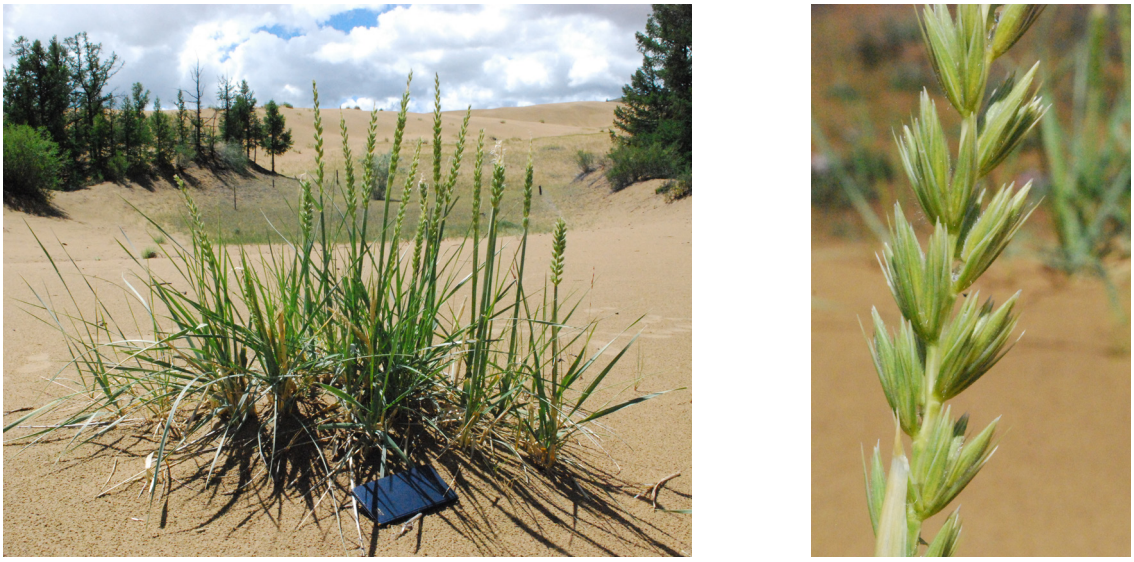

Photo 5. WhiteSuli, Elymus racemosus

Each small flower of the ear that make up the inflorescence is conspicuous, and this is precisely what makes them edible. It is likely that the species identified as having a form that is easily accessible as food is classified as a "Suli" (Illustration 4).

Photo 6. Black Suli, Psammochloa villosa

Illustlation 4. Suli

Illustlation 5. Ölöngo

In the Dictionary, all species of *Elymus* are organized under the folk genus name "Ölöngö," while in the Encyclopedia only *Elymus dahuricus* and *Elymus sibiricus* are registered using the folk genus name "Ölöngö." These two species have a conspicuous beard among *Elymus* species, and the latter has especially drooping head. This name may correspond to the morphological characteristics of the beard (Illustration 5).

The glumes of grasses pierce the skins of livestock and therefore these plants are more suitable to hay rather than to be grazed in autumn. This would match with the usual dictionary's explanation that "Ölöngö" is suitable for horse feed.

In addition, the Encyclopedia also lists "Khiag Tünge" as the species name of the *Elymus chinensis*. If "Tünge" is a folk genus name, is it possible to have a joint name with two folk genus names "Khiag" and "Tünge"? The word "Tünge" also appears in the name of

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Elymus racemosus as white "Tünge." And during our research in Alashan, Inner Mongolia, China, since 2002 to 2009 the local people pointed out the situation where the grass of *Elymus secalinus*[1] grows in a cylindrical shape as "Tünge." It may be recognized that the grass grows in clusters or in cylindrical shape.

1-4. *Poa* of the family Poaceae

Like the genus *Cleistogenes,* the Encyclopedia uses övs (grass in Mongolian) in the folk genus name, but the word preceding it is not a common noun. It is "Biyelig," which has been adopted both in the Encyclopedia and the Dictionary as the family term for the Poaceae. The word might originally refer to the genus *Poa,* and while it is borrowed refering to the entire Poaceae, it migtht be added the subordinate word övs (grass), to organize the academic knowledge.

All plants of *Poa* genera in both the Encyclopedia and Dictionary are "Biyelig," which is characterized by the node shape of the head or inflorescence (Illustration 6).

Illustlation 6. Biyelig

1-5. *Phalaris* of the family Poaceae

The Dictionary lists only one species, *Phalaris arundinacea,* and its Mongolian name, "Ats türüü" (two-tipped tip in Mongolian), may refer to the shape of each small flower in the head. The orkhiu in "Orkhiu övs," which is listed as an alias, suggests, according to the Dictionary, that it refers to the orkhiul (a pinching ornament). Both are common nouns. The only plant name is "Nishinge", which is prefixed as an adjectival phrase in nishingedüü.

The common dictionaries explain "Nishinge" as sugarcane and as a plant growing in Mongolia, we will assume it as millet in general. The word "Nishinge" also appears in the genus *Phragmites,* and another Mongolian word "Shagshuurga" is also mentioned. The difference between the two words is not clear.

Equally obscure of difference is the relationship between *Enneapogon* and *Eragrostis*: *Enneapogon borealis* is "büdnür Khurgalj" and *Eragrostis minor* is "khurgalj Büdnür."

[1]See Konagaya et al. 2007 for the names of plants that appear in the oral histories in the project in Inner Mongolia.

Both of them use two Mongolian words equivalent to folk genus names, and in a different order. While their morphologies are quite different, both are annual herbs and grow after precipitation in the desert steppe. Even if they originally had different names according to their morphology, they may be confused because they exist together.

1-6. *Stipa* of the family Poaceae

The genus *Stipa* corresponds to the Mongolian word "Khyalgana," and there is no confusion as seen in the genus *Agropyron*.

According to the informant, it was called mongol övs (Mongolian grass) across a number of species. The Encyclopedia would have eliminated such universal naming. However, in considering Mongolian perception of plants, we cannot overlook the fact that they are given names that seem to carry a national identity. "Khyalgana" is significant as a universal grass representing Mongolia.

There are six species in the Encyclopedia, and among the adjectives listed are morin (of horse in Mongolian), chonyn (of wolf), shiveet (with shivee), and kharbuul (a shooting implement). The adjective Mongolian word horse for plant generally means large, as well as another adjective, tom (large). On the other hand, the species *Stipa klemenzii*, described as a wolf, has a hairy, silvery, conspicuous beard (Photo 7), and the species *Stipa sibirica,* described as a shooting tool, has a short beard (Photo 8). *Stipa krylovii,* described as with "sivee" has a long, prominent beard (Photo 9). Since *Stipa krylovii* is described as "Khyalgana with shivee," it is assumed that the word shivee refers to the beard.

Photo 7. Wolf Khialgana, Stipa klemenzii

This can be further confirmed by the local usage of these words. In the above-mentioned romanized card, Umesao recorded the narrative of Mongolian, "Shivee is inflorescence. Khyalgana is the stem" (Konagaya, 2014:120), and the same informant said, "Ui chagan is not the name of a single plant. It is the inflorescence that grows long at the top of grass. Therefore, ui chagan can also be applied to the inflorescence of the *Stipa*. The stick[1] that is at the end of the inflorescence is the shubei(shivee). The leaves below are the khiag" (Konagaya, 2014: 121), he also explains.

[1]In the Umesao's field notes the Chinese character 芒 was record, and in the romanized cards just only the pronunciation bo is recorded.

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Photo 8. Shooting tool Khialgana, Stipa sibirica

Photo 9. With shivee Khialgana, Stipa krylovii

The interpreter for Umesao further explained, "Both hime-hanegaya[1] and noge-naga-hanegaya[2] are called by the name khyalgana. The hime-hanegaya is well elongated and becomes noge-naga-hanegaya" (Konagaya, 2014:120), while also explaining that "khyalgana is hime-hanegaya and nohoi shuvei is noge-naga-hanegaya" (Konagaya, 2014: 121). Although the information from the same informant seems confusing at first glance, the contradiction is eliminated if we understand that "Khyalgana" is used for multiple species of *Stipa*, and when the awn is more pronounced, it is called "Shivee."

As described above, it is understood that "Khyalgana" is simply called "Shivee" during the awn season, resulting in two folk genus names.

[1]It means princess *stipa* in Japanese.
[2]It means bear long *stipa* in Japanese.

Among grasses, in particular "Khyalgana" is not suitable for grazing in the fall because its beard or awn sticks to the bodies of livestock. Naming with attention to the awn reflect the people's cautioning against grazing in the fall. Rather than grazing, it would be more appropriate to cut the grass and use it for hay. The use of grassland is thus a management practice that includes seasonal non-grazing use, and the folk vocabulary is a reflection of this.

The folk genus names of *Ptilagrostis*, which has a long and bushy beard similar to *Stipa,* is "Shivelz," that seems to emphasize the beard "Shivee." Conversely, the genus "Sogoovor" of the genus *Bromus* is noted for its lack of a beard. In the Dictionary, it is described as sorgüi (without a tip in Mongolian) as an adjective phrase, and furthermore "Sogoovor" itself refers to something that has inflorescence with inconspicuous glaives.

2. Poaceae from the Mongolian folk genus name.

The above discussion has focused on names that do not correspond to scientific names and folk genus names. In order to verify the validity of this examination, let us rearrange the table based on the Mongolian names (Table 3). 29 words are shown as folk vocabulary.

Of these, "Ölön" is a folk genus name indicating the sedge family, not the grass family, and is an example of an adjective used across families, such as *Puccinellia tenuiflora,* due to the environment in which it is located.

Of the remaining 28 words, 6 are common Mongolian expressions: five kinds of tails and one red head. These words tend to be used across genera. In this regard, they cannot be called folk genus names. In this paper, we make assumption of "folk genus names," but only three of the six words, fox tail, gelding horse tail, and red head, have a clear correspondence with the genus name.

Of the remaining 22 words, 6 words, "Ders," "Khazaargana," "Botuuli," "Biyelig," "Shivelz," and "," are used across species and not across genus, which corresponds to the genus name.

Of the remaining 16 words, 9 are not used across species and correspond to a single species: "Dürvaalig" or "Durvaalig," "Sogoovor," "Sorvoo," "Sornoi," "Arvai," "Khonog," "Ats türüü," "Shagshuurga," and "Büdnür."

Of these 9 words, "Arvai" and "Khonog" are barley and millet respectively and are used for cultivated species. As for the remaining 7 words, it is not possible to determine the exclusive and inclusive relationship between them to be considered as a folk genus name based on only one species, so we will check with a comprehensive commentary on forage plants from all over Mongolia (Jigjidsuren & Johnson, 2003) and found that they are registered across species and not across genus. The names that are used across species and not across genus are 5 names "Dürvaalig," "Sogoovor," "Sorvoo," "Sornoi," and "Büdnür (Büdnüür)." "Atsu türüü" is not found, and "Shagshuurga" is used across genus.

As described above, of the 28 words related to Poaceae, 16 are folk genus names that are consistent with the scientific genus names, and 12 words are not.

For example, while "Yerkhög" is restricted to species in the genus *Agropyron*, whose inflorescence is shaped like arrow feather, it is also used across genus for the genus *Chloris*.

Also, for example, there are 4 Mongolian words used for the genus *Elymus*: "Khiag," "Suli," "Ölöngö," and "Tünge." Therfore none of which can be considered a folk genus name. The boundaries between these 4 Mongolian names are not clear. What differences

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do they encompass? As mentioned above, "Khiag" is more common in native knowledge, and "Suli," "Tünge," and "Ölöngö" seem to be clarified for the inflorescence, density (root) of the species, and beared respectively. Let's check with a commentary book (Jigjidsuren & Johnson 2003) that deals with more species (Table 4).

The list of 16 species in the same list includes 5 species called "Tünge," 6 species called "Ölöngö", and 7 species called "Khiag". What are the criteria of classification, i.e. mutually exclusive and common characteristics of each? As mentioned above, "Khiag" is focusing on inflorescence as well as "Suli", "Tünge" is focusing on a root, and "Ölöngö" is focusing on beard, we assumed. If they are named from different perspectives, it is reasonable to allow for overlap. It would not be unreasonable to have "Khiag" and "Tünge" or "Khiag" and "Ölöngö, in the same time.

As described above, the folk vocabulary is structured in such a way that while main criterion is based on the shape of the inflorescence, other forms are also focused on at the same time and can be used in overlapping ways. In other words, the criteria are not hierarchical as scientific classification, but are layered in order to be distinguished at the same time, such that A is according to the criterion of A and B according to the criterion of B simultaneously.

Only when a name given to a species that is representative in terms of A's criteria is also used for other species with similar characteristics, does it become a term as indigenous knowledge, rather than a mere noun. Furthermore, since the predominant species differ from region to region, a wide-area botanical survey will discover the application of the name to different species with similar characteristics. Thus, the folk vocabulary based on the taxonomic criteria of indigenous knowledge no longer corresponds to the scientific genus name by academic knowledge. It is understood why the categorical concept "folk genus names" which we have posited in this paper to analyze the difference from academic knowledge, is not valid. Folk taxonomy is structurally different from the classification of families, genera, and species in botany.

CONCLUSION

From the Mongolian plant names in the Encyclopedia and the Dictionary, we have examined the family Poaceae, the main herbaceous species of the steppe, focusing on the cases where the folk genus name is inconsistent with the scientific name, that is, where multiple folk genus names exist within the same genus and where the same folk genus name is used across genus, to provide an overview and illustration of the Mongolian taxonomy of plants by head or inflorescence shape (Figure 1).

Figure 1. Morphological recognition by Mongolian names

Illustlation 1. Yerkhög
Illustlation 2. Zulmansüül
Illustlation 3. Khiag
Illustlation 4. Suli
Illustlation 5. Ölöngo
Illustlation 6. Biyelig

In botany, the inflorescence is also a meaningful aspect, and seems to be common to Mongolian taxonomy. However, the Mongolian taxonomy and the botanical classification of inflorescences are different. This is because the various points of interest that greatly affect the reality of the inflorescence, such as the presence or absence of florets and glumes, are selected hierarchically in botany, while those who use grasses through livestock distinguish between these multiple indicators simultaneously. In actual use, the names given by multiple indicators can be used in a multilayered manner.

In arid regions, where the quantitative composition of each species varies greatly depending on precipitation, if naming and understanding one species in a fixed manner is not sufficient, another species must be used. It is more practical to represent several species by one name. It is also suitable to use multiple names for one species depending on the season. We have been able to show, even partially, the principle of the classificatory name as a practical user of such a system.

However, indigenous knowledge is not constituted by a single discipline of botany, but is interdisciplinary and includes, among other things, the knowledge on animal behavior how domestic animals eat and what happens to them when they eat. For example, "A camel does not need to be fed soda if it has bottargan. If there is no bottargan, they must eat soda," Umesao's hearing data (Konagaya, 2014: 21) shows the relationship between soda and plant in the genus Chenopodiaceae *Salsola*, which is locally called "Budargana." International Congress of Botany in 2017, it was argued that soda-containing species should be placed in other genus based on DNA analysis. Indigenous knowledge on the plants from the view point of using with livestock might preceded academic knowledge.

In the future, it will be necessary to consider the use of plants through livestock. Specifically, we would like to organize the names of important species such as sedges and leeks in addition to grasses, and then understand how grasslands, which are made up of a combination of multiple plants, are used in a more realistic manner.

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Table 1

Mongolian names of Poaceae spieces

Scientific names			Mongolian names			note
family	genus	species	The Encyclopedia	additional in the Encyclopedia	The Dictionary	
Gramineae (Poaceae)	*Achnatherum*	*inebrians*	sogtoongi **Ders**	khoron **Ders**	khoron **Ders**	as *Elytrigia* in the Dictionary
		splendens	gyalgar **Ders**	tsagaan **Ders**	tsagaan **Ders**	
	Agropyron	*cristatum*	saman **Khiag**	zurmansüül **Yerkhög**	zurmansüül **Yerkhög**	
		desertorum	tsöliin **Khiag**	tsöliin **Yerkhög**	tsöliin **Yerkhög**	
		repens	mölkhöö **Khiag**	golyn **Khiag**	golyn **Khiag**	
	Agrostis	*mongholica*	mongol **Ulaan tolgoi**	mongol **Ulaantolgoi**	mongol **Ulaantolgoi**	
		trinii	triniusyn **Ulaan tolgoi**	sort **Ulaantolgoi**	sort **Ulaantolgoi**	
	Alopecurus	*aequalis*	tegsh **Ünegen süül**	zovlogo **Ünegenstüül**	tegsh **Ünegenstüül**	
		alpinus	tagiin **Ünegen süül**	tagiin **Ünegenstüül**	tagiin **Ünegenstüül**	
		arundinaceus	nishingedüü **Ünegen süül**	khulslig **Ünegenstüül**	nishingedüü **Ünegenstüül**	
		brachystachys	akhar türüüt **Ünegen süül**	daagansüül **Ünegenstüül**	daagansüül **Ünegenstüül**	
	Bromus	*inermis*	sorgüi **Sogoovor**	---	**Sogoovor**	as genus name in the Encyclopedia
	Calamagrostis	*purpurea*	ulbalzuur **Sorvoo**	sög **Sorvo**	**Sorvo**	
	Chloris	*virgata*	savaan **Bulgan süül**	goviyerkhög **Bulgansüül**	savaan **Bulgansüül**	
	Cleistogenes	*squarrosa*	derveen **Khazaar** övs	shirtüün **Khazaargana**	shirtüün **Khazaargana**	
		songorica	züüngaryn **Khazaar** övs	govi **Khazaargana**	govi **Khazaargana**	
	Elymus	*chinensis*	nangiad tsagaan **Suli**	**Khiag Tünge**	**Khiag Tünge**	as *Leymus* in the Dictionary
		dahuricus	daguur tsagaan **Suli**	shar **Ölöngö**	shar **Ölöngö**	
		racemosus	tsatsaglagt tsagaan **Suli**	tsagaan **Tünge**	---	
		sibiricus	sibiri tsagaan **Suli**	yavgan **Ölöngö**	yavgan **Ölöngö**	
	Enneapogon	*borealis*	umardyn **Ogotnyn süül**	büdnür **Khurgalj**	büdnür **Khurgalj**	
	Eragrostis	*minor*	baga **Khurgalj**	khurgalj **Büdnür**	khurgalj **Büdnür**	
	Festuca	*lenensis*	leni **Botuuli**	morin **Botuul**	moriny **Botuul**	
		sibirica	sibiri **Botuuli**	buur **Botuul**	buur **Botuul**	

Gramineae (Poaceae)	*Hierochloe*	*glabra*	nütsgen **Sornoi**	---	nütsgen **Sornoi**	
	Hordeum	*brevisubulatum*	akharsort **Arvai**	dürvaa **Arvai**	dürvaa **Arvai**	
	Koeleria	*macrantha*	tom tsetseg **Daagan süül**	tashuur **Daagansüül**	tashuur **Daagansüül**	
	Phalaris	*arundinacea*	nishingedüü **Ats türüü**	nishingedüü **Orkhiu** övs	nishingedüü **Ats türüü**	Orkhiul övs as genus name in the Dictionary
	Phleum	*phleoides*	talyn **Durvaalig**	daagansüül **Dürvaalig**	daagansüül **Dürvaa**	
	Phragmites	*communis*	egel **Nishinge**	övsönkhuls **Shagshuurga**	övgönkhuls **Shagshuurga**	övsön might be övgön
	Poa	*attenuata*	sunagar **Biyelig** övs	sunagar **Biyelig**	sunagar **Biyelig**	
		pratensis	nugyn **Biyelig** övs	sunagar **Biyelig**	sunagar **Biyelig**	
		subfastigiata	derger **Biyelig** övs	derger **Biyelig**	derger **Biyelig**	
	Ptilagrostis	*mongholica*	mongol **Shivelz**	---	mongol **Shivelz**	
		pelliotii	pyeliotyn **Shivelz**	---	üyet **Shivelz**	
	Puccinellia	*tenuiflora*	turikhan tsetsegt **Zurman süül**	ölön **Zurmansüül**	ölön **Zurmansüül**	
	Setaria	*viridis*	nogoon **Khonog budaa**	nogoon **Khonogbudaa**	nogoon **Khonog**	
	Stipa	*glareosa*	sairyn **Khyalgana**	mongol **Khyalgana**	mongol **Khyalgana**	
		gobica	goviin **Khyalgana**	tsagaalj **Khyalgana**	tsagaalj **Khyalgana**	
		grandis	tom **Khyalgana**	morin **Khyalgana**	morin **Khyalgana**	
		klemenzii	klementsiin **Khyalgana**	chonyn **Khyalgana**	chonyn **Khyalgana**	
		krylovii	krylovyn **Khyalgana**	shiveet **Khyalgana**	shiveet **Khyalgana**	
		sibirica	sibiri **Khyalgana**	kharvuul **Khyalgana**	kharvuul **Khyalgana**	
	Trisetum	*altaicum*	altain **Üreen süül**	altain **Üreensüül**	altain **Üreensüül**	
		sibiricum	sibiri **Üreen süül**	sorlig **Üreensüül**	sorlig **Üreensüül**	

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Table 2

Mongolian names as Poaceae genus

Scientific names		Mongolian names			
family	genus	folk term			
Gramineae(Poaceae)	*Achnatherum*	**Ders**			
	Agropyron	**Khiag**	**Yerkhög**		
	Agrostis	**Ulaantolgoi**			
	Alopecurus	**Ünegensüül**			
	Bromus	**Sogoovor**			
	Calamagrostis	**Sorvo(o)**			
	Chloris	**Bulgansüül**			
	Cleistogenes	**Khazaar** övs	**Khazaargana**		
	Elymus	**Suli**	**Khiag**	**Ölöngö**	**Tünge**
	Enneapogon	**Ogotnyn süül**	**Khurgalj**		
	Eragrostis	**Khurgalj**	**Büdnür**		
	Festuca	**Botuul(i)**			
	Hierochloe	**Sornoi**			
	Hordeum	**Arvai**			
	Koeleria	**Daagansüül**			
	Phalaris	**Ats türüü**	Orkhiu(l) övs		
	Phleum	**Du(/ü)rvaa(lig)**			
	Phragmites	**Nishinge**	**Shagshuurga**		
	Poa	Biyelig (övs)			
	Ptilagrostis	**Shivelz**			
	Puccinellia	**Zurmansüül**			
	Setaria	**Khonog**			
	Stipa	**Khyalgana**			
	Trisetum	**Üreensüül**			

Table 3

Comparison of Mongolian and Scientific names of Poaceae family

Mongolian name	alternative	Scientific name	
		Genus	Species
Ders		*Achnatherum*	*inebrians*
		Achnatherum	*splendens*
Ölön	Zurmansüül	*Puccinellia*	*tenuiflora*
Yerkhög		*Agropyron*	*cristatum*
		Agropyron	*desertorum*
	Bulgansüül	*Chloris*	*virgata*
Khiag		*Agropyron*	*repens*
	Tünge	*Elymus*	*chinensis*
Suli		*Elymus*	*racemosus*
Ölöngö		*Elymus*	*dahuricus*
		Elymus	*sibiricus*
Ulaantolgoi		*Agrostis*	*mongholica*
		Agrostis	*trinii*

Ünegensüül		*Alopecurus*	*aequalis*
		Alopecurus	*alpinus*
		Alopecurus	*arundinaceus*
	Daagansüül	*Alopecurus*	*brachystachys*
		Koeleria	*macrantha*
Dürvaalig		*Phleum*	*phleoides*
Sogoovor		*Bromus*	*inermis*
Sorvoo		*Calamagrostis*	*purpurea*
Khazaargana		*Cleistogenes*	*squarrosa*
		Cleistogenes	*songorica*
Khurgalj		*Enneapogon*	*borealis*
	Büdnür	*Eragrostis*	*minor*
Botuuli		*Festuca*	*lenensis*
		Festuca	*sibirica*
Sornoi		*Hierochloe*	*glabra*
Arvai		*Hordeum*	*brevisubulatum*
Ats türüü	Nishinge	*Phalaris*	*arundinacea*
Shagshuurga		*Phragmites*	*communis*
Biyelig		*Poa*	*attenuata*
		Poa	*pratensis*
		Poa	*subfastigiata*
Shivelz		*Ptilagrostis*	*mongholica*
		Ptilagrostis	*pelliotii*
Khonog		*Setaria*	*viridis*
Khyalgana		*Stipa*	*glareosa*
		Stipa	*gobica*
		Stipa	*grandis*
		Stipa	*klemenzii*
		Stipa	*krylovii*
		Stipa	*sibirica*
Üreensüül		*Trisetum*	*altaicum*
		Trisetum	*sibiricum*

Table 4

Duplication of Mongolian names in the Poaceae Elymus

Scientific names		Mongolian names					
family	genus	adjectives for species	family	alternative1	alternative2	alternative3	another
Elymus			Tsagaan Suli				
Elymus	*angustus*	thin	Tsagaan Suli	Tünge			Ders
Elymus	*brachypodioides*	short awn	Tsagaan Suli				
Elymus	*chinensis*	Chinese	Tsagaan Suli	Tünge		Khiag	
Elymus	*confusus*	mixed	Tsagaan Suli		Ölöngö	Khiag	

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Elymus	*dahuricus*	Daguur	Tsagaan Suli		Ölöngö	Khiag	
Elymus	*excelsus*	tall	Tsagaan Suli			Khiag	
Elymus	*gmelinii*	(personal name)	Tsagaan Suli		Ölöngö	Khiag	
Elymus	*komarovii*	(personal name)	Tsagaan Suli		Ölöngö		
Elymus	*mutabilis*	sandwiched?	Tsagaan Suli				
Elymus	*nutans*	all	Tsagaan Suli		Ölöngö		
Elymus	*ovatus*	egg	Tsagaan Suli				
Elymus	*paboanus*	(personal name)	Tsagaan Suli	Tünge			
Elymus	*racemosus*	long limbs	Tsagaan Suli	Tünge			
Elymus	*secalinus*	like oats	Tsagaan Suli	Tünge		Khiag	
Elymus	*sibiricus*	Siberian	Tsagaan Suli		Ölöngö	Khiag	
Elymus	*transbaicalensis*	South baikal	Tsagaan Suli				