

## THE GRASSES OF KASHMIR

RALPH R. STEWART

*Principal Emeritus, Gordon College, Rawalpindi*

## INTRODUCTION

In preparing a Check List of the grasses of Kashmir the first problem was to decide what area to cover. The western boundary of Kashmir is disputed and the present Cease Fire Line may not be permanent. At the present time Pakistan controls much of the more rugged mountainous parts of the old Kashmir State toward the west. Gilgit, Baltistan, Astor, the Deosai Plains, the lower portions of the Kishenganga and Jhelum River valleys and much of Poonch, Kotli and Mirpur are no longer ruled from Srinagar. As all botanical writers before 1947 cited their specimens with the old boundaries in view I feel that it would be a source of confusion to omit from this list those areas no longer controlled from Srinagar.

Unfortunately many early collectors did not locate their collecting sites with any precision. Many of Thomson's labels merely state "W. Tib." which usually means either Ladak or Rupshu. His localities can, however, often be worked out from his itinerary in his book on his journey of 1847-8 while serving on the Tibetan Boundary Commission. In Hooker's *Flora of British India* he often states merely "Kashmir to Kumaon" or "Kashmir to Sikkim."

It is unfortunate that the early collectors were not more precise. Jacquemont, the first to visit many places in Kashmir is an exception for he gives exact localities but his French way of spelling sometimes makes it hard to decide what he meant. Falconer's labels also present a great deal of difficulty for most of them are in Hindi or an almost illegible Urdu script which is in most cases still undeciphered. If Kashmir had little variation in climate the absence of more accurate labels would not be so important but few areas of equal size can be more varied with lakes and deserts, forests and meadows with some plants growing at an altitude of 1000 ft and others at 19000 ft.

Except for the famous Vale of Kashmir the whole region is mountainous and altitudes range from about 1000 ft. in Mirpur and Jumu to 28000 ft. in the Karakorum. A number of species have been

found growing at 19000 ft. or a little higher. [See "The altitudinal limits of Vascular Plants" by Grady L. Webster in *Ecology* 42(3), July 1961 p. 587-90]. Not only is there tremendous variation in altitude but there is great variation in rainfall. In Ladak there may be as little as four inches of rain in a year while at Srinagar the average is 27 and at Gulmarg or Pahlgam about 40. The main Himalayan range crosses Kashmir and its southern slopes are well watered by the monsoon in July and August so that they are well forested except where the forests have been cut down by man or restricted by over grazing. Behind the great range there is no monsoon and the only sizeable trees are cultivated in the villages where irrigation is possible.

Because of the great variation in altitude and rainfall there are many different climates and habitats so that except for field weeds no Poonch or Jumu plants can be expected in Ladak or Baltistan. Few plants from Astor grow in Ladak and few Astor plants grow in Jumu. Because of these facts it is not good enough to say that a certain plant has been found in Kashmir. In this paper I have used the term Kashmir in two senses, the political unit of the British days and Kashmir Province which may be roughly described as the watershed of the Jhelum River above Uri, including the main valley and the southern slopes of the Himalayan range and the northern slopes of the Pir Panjal Range. In the text, therefore, I only use the word in this sense when giving distribution. Kishtwar, the region on the Chenab, north of Jumu and Badarwah which are both areas in Eastern Kashmir I have left with Kashmir Province when citing specimens. There is not much difference in the plants of this general area. Most of the population, most of the arable land and much of the forest wealth of the country is found in Kashmir Province.

## BOTANICAL REGIONS OF KASHMIR

Kashmir as a whole, from east to west can be divided into three regions. The first begins at the edge of the Punjab Plains and extends to the top of the Pir Panjal Range with a number of peaks rising

to 15000' or a little higher. This region, as might be expected, begins with a sub-tropical foothill zone gradually merging into a temperate zone from about 5000 ft. Above this is a sub-alpine and then an alpine zone above the tree line.

The second region is the Kashmir Province already mentioned. It lies between the Pir Panjal Range and the main Himalayan Range. The famous Vale lies between these two ranges with the valley floor at about 5200 ft. Flowing into the Jhelum Valley from the north at Domel is the Kishenganga river. With a similar climate its flora is similar to that toward the east except that the number of species decreases gradually from east to west as the rainfall gradually decreases. With lakes, canals and waterways the main valley is the only part of the country with many water plants.

The third region is very different. Much of it is desert and there is little forest. It is all drained by the Indus and its tributaries. A little monsoon moisture penetrates into Astor by the Kamri and Burzil Passes from the Upper Kishenganga Valley and some moisture gets through to Gilgit by the Indus Valley so that there are some forests in Astor, and in several valleys of the Gilgit Agency. A number of Punjab xerophytes have followed the Indus and are found in Gilgit, Skardo, Shigar and as far as Leh, Ladak in a few cases. Most of this third zone, however, is treeless and the flora is scanty.

The plants of this third region can again be divided into three main types. First we have the plants of the oases. These are the cultivated plants and the weeds in the fields and the plants along the irrigation ditches and streams. Secondly we have the desert plants, those which are able to survive on a very scanty rainfall. Thirdly we have the high level plants which live on the water from melting snow for although there is very little rain a great deal of snow falls on the high mountains and there are many glaciers in the Karakorum Mts., the great range to the north of the Indus in the western part of the state.

One of the most interesting regions behind the main range is called the Deosai Plains, which lie between Astor on the west and Dras (Purig) to the east. This area is all above the tree line, is covered with snow most of the year and is uninhabited. It is much like Arctic tundra and travellers crossing in the summer are plagued by myriads of mosquitoes. The road which crosses these bleak up-

lands from Kashmir drops down to Skardo on the Indus at about 7800'.

Geographically the region east of Chitral and north of Astor is called the Gilgit Agency. The chief town is Gilgit and deeper in the Karakorum are two small semi independent states with their own rulers. These are Hunza and Nagar. In this almost inaccessible region there are more mountains higher than 25,000 ft. than there are in the Mt. Everest region. The next region with a still more Tibetan climate and flora is Baltistan. In his Guide Dr. Neve says "Baltistan bounds Ladak on the west and extends for 150 miles on either side of the Indus." The scattered villages are on the main Indus or on the Dras river, the Lower Shyok or the Shigar rivers."

Next we come to Ladak. It is a large tract of country, including Nubra on the Upper Shyok, Rupshu, Zenskar and Suru. Suru is really only a part of Zanskar on the Upper Suru river east of Dras. Dr. Neve claims that the Ladak-Rupshu area contains the loftiest inhabited districts in the world. "No part is below 8000' and a large portion of the population live at elevations of from 12 to 15000 ft." The capital of Ladak is Leh which is on the old trade route from Kashmir to Yarkand in Central Asia. Part of Ladak was annexed by China only a year or two ago.

#### THE AUTHOR'S EXPLORATIONS IN KASHMIR

I first visited Kashmir, Ladak proper and Suru in 1912 returning to Srinagar after reentering Kashmir by the Yarungshan Pass, and the Wardwan Valley. In 1913 we returned to Kashmir, travelled to Leh, crossed Rupshu and went to Simla via Lahul and Kulu. In 1917 with my wife, I. D. Stewart, who was also a botanist, I entered Kashmir from Pangi, Chamba State, travelled down the Chenab Valley to the town of Kishtwar and then entered Kashmir proper by the Sinthan Pass. From 1919 on I spent most of my summer vacations collecting in Kashmir, camping in such places as Pahlgam, Sonamarg, Tragbol, Gulmarg, Fras Nag and Khillanmarg and making day trips in all directions.

Twice I made long trips. One was to Astor and the Rupal Nullah at the foot of Nanga Parbat. We ascended the Burzil Nullah crossed the Deosai going eastward, crossed the Marpo La and descended to Dras, returning to Kashmir by the Zoji La. Once we ascended the Upper Kishenganga river from Gurais, crossed the Burzil Pass, the Lesser

and the Great Deosai, descended to Skardo, crossed the Indus, ascended the Shigar river, crossed the Thalle La, descended to the Shyok, ascended the Suru River to the Kashmir Ladak Road, returning to Kashmir by the Zoji. Once we ascended the Kishenganga River from Domel to Gurais (Gurez) and returned to the Kashmir Valley by the Rajdani Pass.

I did not visit Gilgit, Hunza and Nagar until 1954. I began visiting Poonch about 1952 with Prof. E. Nasir of Gordon College and M. Rashid Khan, D.F.O. and his collector Jan Mohammad. Once we went a little further east and collected in Kotli and Mirpur. Most of the early collectors entered Kashmir by the Poonch route but nothing has yet been published on the Poonch flora.

My main collection of about 30,000 numbers is at Gordon College. Many specimens brought to the college by Prof. E. Nasir, Prof. M. A. Siddiqi and A. R. Beg were entered in my number series so that when the number on a Gordon College label reads E. Nasir 26,589, let us say, it does not mean that Prof. Nasir collected that many specimens. In later years these men have maintained their own numbered series. On many of my trips I was accompanied by my wife, Prof. Nasir, A. R. Beg or by students of the college. For many years my second set went to the N. Y. Botanical Garden where I spent my furloughs but of late years the second set has gone to Kew. Smaller sets are at Washington, Michigan and other herbaria.

Since retiring from my work in Rawalpindi in 1960 I have been working in the Herbarium of the Univ. of Michigan and I have spent five summers at Kew with short periods at the British Museum and at Edinburgh. In these herbaria there are hundreds of thousands of specimens from Kashmir and adjacent areas and I have been studying the distribution of Kashmir and West Pakistan plants while making a catalogue of all the plants of the region on a grant from the U. S. National Science Foundation.

The basis for the citations in this Check List of Kashmir grasses is my own collecting and that of various colleagues and students. Secondly it is based on checking through many thousands of specimens stored in various herbaria especially in Kew. Thirdly it is based on citations I have found in the literature. This has no doubt introduced some errors and duplications because of misidentifications and differing conceptions of taxa. I have tried to give the authority for citations which may be doubtful. In a few

cases I have failed to find the authority for a record. Some grasses have been collected hundreds of times and I have not taken the space to detail localities. In cases where there is plenty of material I have noted the various areas from which I have seen specimens citing a few specimens. I have gone into more detail when only a few specimens or a single specimen has been found. I would appreciate hearing from any who may know of species I have omitted or who note errors of fact.

The last word on Kashmir grasses will not be said for a long time but a great step forward was made when Dr. Bor published his revision of Vol. 7 of the Flora of British India. He did not have the space to give much detailed information about distribution. It is hoped that this paper will partially remedy this omission. I owe more to the help of Dr. Bor than to any one else. He has over the years named thousands of specimens for me and answered a very large number of questions. I am very grateful. The first person to encourage me to publish anything on grasses was the Late Mrs. Agnes Chase of the Smithsonian in Washington DC. I owe also a debt of gratitude to the authorities at Kew who have welcomed me so often and to Dr. Sultan Ahmad of the Government College, Lahore, Prof. Nasir and the staff at Gordon College and the students who used to like to go on collecting trips.

#### A NOTE ON THE SPELLING OF PLACE NAMES

There is no official way to spell Kashmir place names. Travellers in their reports have tried to write down names as they heard them but German, French and English botanists have been influenced by their different national traditions. Dr. Neve spells the name of a place in Astor as Chorbat., while the Schlagintweits spelled it Tschorbat. A mountain visible from the Kashmir Valley is called Wastarwan by Neve while Jacquemont, a Frenchman, called it Vestervonne. Some collectors are not consistent and use more than one spelling on their labels. There has also been a gradual evolution in the way names have been spelled. The Deosai region was first called Deotsu. The Astor of today was at first called Hassora which is not the same as Hazara which is just west of Kashmir. In most cases the variant spellings need not cause confusion. The chief exception is the difficulty of recognizing any modern equivalent for quite a few of Jacquemont's locali-

ties. His "Radjourie ad Thonna" is Rajaori to Thana Mandi in Neve, his Sounamergue is Sonamarg. Until recently the British were the arbiters in deciding how Kashmir place names should be spelled but now some of the Kashmiris are beginning to make changes. For example Gurais is now often spelled Gurez. In the following list are a number of place names with more than one spelling. This list is far from complete but I think that it is long enough to show what kind of differences to expect. I have in the text usually used the spelling of the collector's ticket even though I prefer another spelling.

Aliabad = Alibad ; Askole = Ashkoley ; Basohli = Basaoli ; Bhadarwah = Budrawah = Badrawah = Badriwah ; Chorbat = Tschorbat ; Deosai = Deotsu ; Dal Lake = Dhal Lake ; Dras area is called Purig by Koelz ; Gudhai = Godai (not the same as Gorai) ; Hemis = Himis ; Jumu = Jammu = Jummoo = Jammu ; Kargil = Kargyl ; Khel = Kel ; Ladak = Ladakh ; Lidder = Lider = Lidar ; Lidderwat = Lidarwat ; Nala = nullah = nulla (a small valley) ; Naoshera = Naushera = Nowshera ; Naubug = Nowboog ; Naltar = Niltar ; Poshiana = Pooosiana = Pusiana ; Rajdani = Rajdhani = Rajdhiangan Pass ; Rajaori = Radjaori = Radjourie ; Rokshin = Rukshin ; Rungdam = Rangdum ; Satpura = Satpara ; Skardo = Skardu ; Shyok = Shayok ; Spitok = Spitung ; Taulipir = Tolipir ; Tilel = Tilail ; Tragbal = Tragbol ; Wastarwan = Vester-vonne ; Wular = Woolar ; Zanskar = Zaskar.

Suggested abbreviations for the names of the leading collectors whose specimens I have cited. When I have seen only a few specimens I am using the full last name. As this list was made after preparing the text these abbreviations do not always appear but I intend to use them as I continue my work on the distribution of Kashmir plants.

<i>Ahmad, Dr. Sultan</i>	<i>S. A. or S. Ahmad</i>
<i>Aitchison, Dr. J.E.T.</i>	<i>Aitch.</i>
<i>Alcock, Capt. Alfred William</i>	<i>Alcock</i>
<i>Beg, Dr. Abdur Rahman</i>	<i>Beg</i>
<i>Bosshard, W.</i>	<i>Boss.</i>
<i>Chaudhri, Dr. I. I.</i>	<i>I.I.Ch.</i>
<i>Clarke, C. B.</i>	<i>Cl.</i>
<i>Conway, Sir Wm. Martin</i>	<i>Con.</i>
<i>Coventry, B.O.</i>	<i>Cov.</i>
<i>de Filippi, Dr. Filippo</i>	<i>de F.</i>
<i>Drummond, James Ramsay</i>	<i>Drum.</i>
<i>Duthie, John Firminger</i>	<i>Du.</i>

<i>Falconer, Hugh</i>	<i>Falc.</i>
<i>Gammie, George A.</i>	<i>Gammie</i>
<i>Giles, Dr. G.M.J.</i>	<i>Giles</i>
<i>Hartmann, Dr. Hans</i>	<i>H. H.</i>
<i>Henderson, Dr. George</i>	<i>Hend.</i>
<i>Hunter-Weston, Capt. A. G.</i>	<i>West.</i>
<i>Inayat Khan</i>	<i>Khan (Collected for Duthie)</i>
<i>Jacquemont, Victor</i>	<i>Jacq.</i>
<i>Keshavanand</i>	<i>Kesh.</i>
<i>Koelz, Dr. Walter N.</i>	<i>Kz.</i>
<i>Lambert, W. J.</i>	<i>Lamb.</i>
<i>Levinge, Henry Corbyn</i>	<i>Lev. (Collected for Clarke)</i>
<i>Ludlow, Frank &amp; Sherriff, George</i>	<i>L. &amp; S.</i>
<i>Mc Vean, Dr. Donald N.</i>	<i>Mc. V.</i>
<i>Meebold, Alfred Karl</i>	<i>Mbd.</i>
<i>Nasir, Prof. Eugene</i>	<i>E. N.</i>
<i>Osmaston, B. B.</i>	<i>Osm.</i>
<i>Polunin, O.</i>	<i>O. Pol.</i>
<i>Rich, Col. H. H.</i>	<i>Rich</i>
<i>Schlagintweit Bros., Herman, Adolf and Robert</i>	<i>Schlag.</i>
<i>Schmid, Dr. Ferdinand</i>	<i>F. Schmid</i>
<i>Scott-Russell, R.</i>	<i>RSR</i>
<i>Stewart, Dr. J. Lindsay</i>	<i>JLS</i>
<i>Stewart, Ralph Rundles</i>	<i>RRS</i>
<i>Stewart, R. R. &amp; Mrs. I. D. Stewart</i>	<i>RR &amp; IDS</i>
<i>Stoliczka, Ferdinand</i>	<i>Stol.</i>
<i>Thomson, Thomas</i>	<i>T. T.</i>
<i>Visser-Hooft Mr. &amp; Mrs. J.</i>	<i>Visser</i>
<i>Webster, Dr. Grady L. &amp; E. Nasir</i>	<i>W. &amp; N.</i>
<i>Winterbottom, James Edward</i>	<i>Winter.</i>
<i>Younghusband, Sir Francis</i>	<i>Young.</i>

Most of the collections of the collectors mentioned above are to be found at Kew. Some are both at Kew and at the British Museum of Natural History and others are at Edinburgh as well. My own first collection is at Gordon College, Rawalpindi and second at the New York Botanical Garden though in recent years my second collection went to Kew. The longest suites of the collections of Koelz are in the U.S.A. at Michigan, New York and Washington DC. As this is only a check list, to economise space, I have usually failed to mention the Herbarium or Herbaria in which a specimen may be found unless I felt that in special cases it might be useful as when a Type is in Rawalpindi or a rare specimen is in Michigan.

## ENUMERATION OF KASHMIR GRASSES

- Acrachne racemosa** (Heyne) Ohwi.  
Jhelum Vy. Rd.; Muz., Poonch, Jumu-Kashmir Rd., Kishtwar (RRS 3052, Cl. 31435) plains to c. 5000'.
- Aegilops tauschii** Coss.  
Sambal Nullah (*Gammie*), nr. Srinagar (*Du.* 10845).
- Agropyron canaliculatum** Nevski.  
Gilgit (*F. Schmid*); Deosai (Cl. 28927a); Hunza (*H. H.*); Balti.: Marpu Nullah (*Du.*), Braldo & Biafo Glaciers (*H. H.*), Dras Vy., (*Du.*), Kargia, Zanskar (Kz. 5530); Aliabad, Poonch; Kamri Pass. (*Du.*) etc.
- A. caninum** (L.) P. Beauv.  
Tilail (Cl. 30679); Kishen. Vy. (RRS 17739 etc.) above Gulmarg (RRS 10403), Pahlgam (RRS 5592), 6-11000'.
- A. cognatum** Hack. var. **cognatum**  
Astor (RRS, *Du.*); Gilgit: Nagar-Hopar Glacier (RRS); Naltar Lakes (RRS); Holshal near Nagar (*F. Schmid*); Karakorum (RRS, 1328, 1339).
- A. cognatum** var. **shingoense** Meld.  
Ladak (*T. T.*); Astor (RRS 21791a); Balti.: Shingo Vy. (*Du.* 11895, Type).
- A. dentatum** Hk. f. var. **dentatum**  
Gilgit (*F. S.*: *Du.*); Deosai (RR & IDS); Balti.: Karakorum (Cl. 30186A; RRS); Dras (*Gammie*) Kashmir: Upper Kisheng. River; Minimarg, Burzil Pass etc. (RRS).
- A. dentatum** var. **elatum** Hk. f. ex Meld.  
Dras (*T. T.*); Minimarg, Upper Kishen Vy. (RRS & IDS 19212).
- A. dentatum** var. **kashmiricum** Meld.  
Kashmir (*W. Munro*).
- A. dentatum** var. **scabrum** Nevski.  
Naltar Vy., Gilgit (*Du.* 12423).
- A. ferganense** Drob. [*Elytrigia ferganensis* (Drob.) Nevski].  
Along Biaho Lungma, Karakorum (*Nakao*); Hindu Kush: Panji Bar (*Ogino* 488), Ghizr, Gilgit (*Ogino* 283). See Kitamura Pl. W. Pak. & Afghan. 13.1964.
- A. himalayanum** (Nevski) Meld.  
Marpo La, Balti. (*Du.* 11825); Sukh Nullah, Dras Vy. (*Du.* 11681); Alibad, Poonch (Cl. 29014 A), Upper Lidder Vy.: Har Nag (RRS 9436), Sonsal Nullah (*Du.* 13357) etc.
- A. × interjacens** Meld.  
Ishkuman Gilgit (*F. Schmid* 2430).

- A. intermedium** (Host) P. Beauv.  
Tangola, Purig (Kz. 6078); Above Bragnag, Ladak (Kz. 2797); Zanskar: Padam (Kz. 2996); Kangrah (Kz. 5574), Bardum (Kz. 5574).
- A. jacquemontii** Hk. f.  
Nubra (*T. T.*); Ladak: Tsakzhun Tso (Kz. 24148); Hispar Glacier, Karak. (RSR 1386); Tsomoriri, Rupshu (*Stol.*).
- A. macrolepis** Drob.  
Above Doyen, Astor (*Du.* 12657); Gilgit: Naltar Lakes (RRS 26607), Sunji & Yasin Vys. (*M. Zahur*); Karakorum: Hispar & Sokha Glaciers (RSR 1387; 1669).
- A. mutabile** Drob.  
Hispar Glacier, Karak (RSR 1200).
- A. × nothum** Meld. (? **A. Dentatum** × **A. macrolepis**)  
Hispar Gl. (RSR 1387).
- A. repens** (L.) P. Beauv.  
Shigar, Balti. (*Griff.* 722); Gilgit [Giles teste (FBI)]; Balti.: Braldo Vy. & Biafo Glacier (*H. H.*); Ladak (FBI); Kashmir (Cl. 30080, 30490).
- A. russellii** Meld.  
Hispar & Biafo Glaciers, Karak. Mts. (RSR 1388, 1553 etc.)
- A. schrenkianum** (F. & M.) Drob.  
Old Camp sites, Pamirs (*Alcock*); Biafo Gl., Karak. Mts. (RSR 1829); Hangarang Pass, W. Tib. (*T. T.*).
- A. schuganicum** Nevski.  
Ascent Deosai (i.e. Deotsu) (*Winter.* 879); Sunji Vy., Gilgit (*Zahur*); Biafo Gl. Balti. (*Nakao*, RSR 1094); Sasser Pass. W. Tib. (*T. T.*).
- A. semicostatum** Nees  
Yasin, Gilgit (*Ogino*); Kashmir: Pahlgam (RRS 5751); Sonamarg (RRS 6520), below Gulmarg (RRS 10655); Hajipir-Poonch (RRS 13988), Titwal & Keran, Lower Kishen. Vy. (RRS 17415, 17556); Jhelum Vy. (*JLS*); Ramoo (Cl. 29048 A).
- A. × spurium** Meld.  
Sokha Glacier, Karak. Mts. (RSR 1627).
- A. stewartii** Meld.  
Balti.: Shyok Watershed, Khusomik (RRS 20704); Blaghar, Shyok Vy. (RRS 20844A).
- A. striatum** Nees ex Steud.  
Astor near Rama (RRS 22882); Gilgit field borders (RRS 26610), Kashmir: Bandipur (Cl. 29199), Road to Nil Nag (RRS 23028); Ushkra Forest 5300' (*Mc. V.*).
- A. striatum** var. **validum** Meld.  
Astor: Dudhai Vy. (*Du.* 12186), Rama-Gurikot (RRS 22948); Naltar Vy., Gilgit (RRS 26609); Kash-

mir: Common, Pir Panjal (*JLS*, *Jacq.*); Tilail (*Cl.* 30735); Srinagar (*Cl.* 29116C); Pahlgam (*Cl.* 31119), Tangmarg-Gulmarg, Nil Nag, Badwan-Chorwan etc. (*RRS*).

**Agrostis canina** L.

Very common. Astor, Gilgit, Balti., Dras, Ladak, Zanskar, Kashmir: Burzil Pass, Tilel, Sonamarg, Pahlgam, Kishen Vy. Minimarg etc. 4-11500'.

**A. gigantea** Roth

Balti.: Skardo (*Cl.* 29942 A), Braldo Vy. (*H. H.*), Hushe Vy., (*W. & N.* 6276); Poonch-Poosiana (*Lev.*), Mundi (*Cl.* 28216); Kashmir: Sumbal Nullah (*Gammie*), Kishtwar (*Schlag.*), Tangmarg (*RRS* 10543), Pir Panjal (*Lev.*) at 11500'.

**A. munroana** Aitch. & Hemsl.

Common, 6-13000', Kamri, Burzil, Kishen. Vy., Sonamarg, Gulmarg, Tragbol etc. 6-13000'.

**A. nervosa** Nees (*A. clarkei* Hk. f.)

Common, 6-10500'. Gilgit: Jutial Nullah (*RRS* 26614), Naltar Vy. (*RRS* 26612); Tangola, Purig (*Kz.* 6045); Kashmir: Pahlgam (*RRS* 5702), Sonamarg (*RRS* 6367, 7369); Khillanmarg (*RRS* 10406).

**A. palustris** Huds.

Gilgit: Darkot-Yasin, Pingal-Dahimal (*Honda*); Skardu Airport (*Nakao*). [Not in Bor. Possibly *A. gigantea* of this list].

**A. pilosula** Trin. var. **pilosula**

Deosai (*RRS* 22260a); Kashmir: Pir Panjal (*Cl.* 27436), above Pahlgam (*RRS* 21722a), above Tragbol (*Du.* 12632), Basaoli (*Cl.* 31530A) 7-13000'.

**A. pilosula** var. **ciliata** (Trin.) Bor

Moist places, Pir Panjal Range, (*Jacq.* 97; Type).

**A. pilosula** var. **royleana** (Trin.) Bor.

Deosai (*RRS* 22707a); Astor (*Du.* 12218); Kashmir: Pahlgam (*Cl.* 31070, *RRS* 21712 b); Gulmarg (*Lev.* CC133), Sangam Vy. (*Du.* 13363), Khillanmarg (*RRS* 10626).

**A. semiverticillata** (Forsk.) C. Christ.

See *Polypogon*

**A. stolonifera** L.

Gilgit Dt.: Baltit (*F. S.* 1918), Nagar (*RRS* 26617); Balti.: Skardo, Shigar (*Cl.* 30481); Dras, Poonch (*S. N. & R.* 23858).

**A. subaristata** Aitch. & Hemsl.

Kashmir: Srinagar (*Gammie*, *Cl.* 29059), Shalimar (*RRS* 10613), Vestervonne i.e. Westerwan (*Jacq.* 772), Taobat, Kishen. Vy. (*RRS* 17876 a), Nowgunge (*Cl.* 29188) 5-7000'.

**Aira caryophylla** L.

Rare. Kashmir (*Vicary*, *JLS*); W. Tib. (*Stoliczka*).

**Alloteropsis cinicina** (L.) Stapf

Kashmir: Rajaori (*Jacq.* 1374), Serai ad Naushera, Bhimbar Mts. (*Jacq.* 1382).

**Alopecurus aequalis** Sobol.

Astor, north slope Burzil Pass (*RRS* 22037 c); Deosai in shallow water (*RRS* 19963); Satpura La, Balti. (*RRS* 20179); Kashmir: Common. Pahlgam, Tangmarg, Gund, Yamhar, Banihal, Zoji, 6-14000'.

**A. arundinaceus** Poir.

Common. Nagar, Gilgit (*Biscoe*); Marpo La, Balti. (*RRS* 22309A); Deotsu i.e. Deosai (*Winter.* 228); Purig (*Kz.* 6012); Bok, Zanskar (*Kz.* 2968); Alibad, Poonch (*Cl.* 29010A); Kamri, Burzil, Gadsar, Pahlgam, Gulmarg, 10-16500'.

**A. geniculatus** L.

Water Foxtail. Kashmir-Bhutan, 3-7000' (FBI).

**A. himalaicus** Hk. f.

Common. North slope Burzil, Astor (*RRS* 21995), Marpo La, Balti. top (*RRS* 22269); Deosai (*Du.*); Pensi La, Zanskar (*Kz.* 5843); Suru: Rusi La (*RRS*); Kashmir: Kolahoi, Apharwat, Pahlgam, Sonamarg, Zoji La, Tilel etc. on all high alpine meadows, 10-16500'.

**A. myosuroides** Huds.

Poonch City (*RRS* 12028). Kashmir, 3000' (FBI).

**A. nepalensis** Trin. ex Steud.

Poonch (*RRS* 17293)? Kashmir-Garhwal (*Bor*).

**A. pratensis** L.

Reported from the Zoji La, Kashmir by Henderson. Possibly a misidentification.

**Andropogon tristis** Nees ex Hack.

Badarwah, Kashmir, 8500' (*Cl.* 31477 A), sine loc. (*Falc.*).

**Apluda mutica** L. (incl. *A. aristata* L.)

Abundant along the foothills from 1-6000' (rarely to 8000') Poonch eastward. Jhelum Vy., Jumu etc.

**Aristida adscensionis** L. var. **adscensionis**

Gilgit (*Du.* 12484); Hunza (*RRS* 26,662); Balti.: Skardu Airport (*Nakao*) also (*Cl.* 29,977a); Blaghar-Kuru (*RRS* 20482); Kashmir foothills, J. V. Road (*RRS* 9605), Poonch, Kotli (*RRS*) 0-8000'.

**A. adscensionis** var. **pumila** (Dcne.) Coss.

Gilgit (*Du.* 12485); Skardu (*Schlag.* 677). This taxon has been much confused with *A. depressa* which Bor now considers to be confined to South India. The glumes are distinctly unequal in this variety.

**A. cyanantha** Nees ex Steud.

Gilgit Dt.: Chalt-Namal (*Nakao*), Chalt (*RRS* 26660); Kashmir: J. V. Road and Jumu-Kashmir Rd., Lower Kisheng. River; Kishtwar (*Cl.* 31426 A,

C); Naoshera & Bimbar (*Jacq.*), Batot Pass (RRS 12515). Common to 5000', rarely to 8000'.

**Aristida funiculata** Trin. var. *funiculata*

Domel-Bataki, Muz. Dt. Kashmir. teste?

**A. mutabilis** Trin. & Rupr.

Gilgit teste *S. Ahmad*.

**A. paradisea** Edgew.

Skardo (*Clarke* 30038). Another xerophytic species from the plains found in the Indus watershed.

**A. plumosa** L.

Gilgit (RRS 26665); Skardo (RRS 20875).

**Arthraxon lancifolius** (Trin.) Hochst.

Nomal-Chalt, Gilgit Dt. (RRS 27044); Skardo (*W. & N.* 6576); Poonch, common: Taulipir, Noorgala, Trarkhel, Nawal Nadi (*S. N. & R.*); Jumu-Kashmir Rd. (RRS 10686), 2-8000'.

**A. prionodes** (Steud.) Dandy

Bagh-Raikot, Poonch (RRS 23804a), Chenari, Jhelum Vy. Rd. (RRS 12450); Lower Kisheng. Vy.: Titwal (RRS 17378), Keran (RRS 17690); Kashmir Kangan-Gund (RRS 6940). Banihal Pass (RRS 10672). Usually 2-7000'.

**Arundinaria falcata** Nees

*Nirgal*, a dwarf bamboo is wild from Poonch and Kotli eastward. 4-8000', Aliabad Pass (RRS).

**Arundinella nepalensis** Trin.

Nawal Nadi, Poonch (RRS); Nakial, Mirpur; Kashmir: Jhelum Vy. Rd., 2-3000' (*Clarke*), Jumu-Kashmir Rd. (RRS 12514), Radjaori (*Jacq.* 1340), 2-6000'.

**Arundo donax** L.

The *sarkanda* is widely planted, usually below 5000' but it has been reported from 9000' in Ladak at Spitug (*Kz.*).

**Avena barbata** Pott ex Link

Ladak (Schlagintweit cited by Grisebach).

**A. fatua** L. var. *fatua*

This wild oat and two varieties are common throughout in grain fields up to c. 9000'.

**A. fatua** var. *glabrata* Peterm.

Astor (RRS 22880), Khusomik, Balti. (RRS 20705), W. Tib. (*T. T.*), Poonch; Nakial, Mirpur Dt.

**A. fatua** var. *pilosa* Syme

Balti.: Shigar (*Cl.* 30494), Skardo (*Cl.* 29972); ascent Kamri Pass, Kashmir (RRS 22633). [Many collectors do not mention varieties].

**A. ludoviciana** Dur.

Kotli, Kashmir (*S. N. & R.* 25799a).

**A. sativa** L.

Astor (*Du.*), below Skardo (*Du.*), Marsho, Ladak (*Kz.* 6372); Bagh, Poonch (RRS 23712). Oats.

**A. sativa × sterilis** Bor

(RRS 25799), [Kotli det. Bor, with a?]

**Bambusa bambos** (L.) Voss [*B. arundinacea* (Retz.) Willd.].

Commonly planted in the plains and wild in Billawar and Jumu.

**Bothriochloa glabra** (Roxb.) A. Camus.

Garhi, Jhelum Vy. (RRS 10105); Above Chalt, Nagar, Gilgit Agency, (RRS 26635); Bagh-Raikot, Poonch (RRS 23821).

**B. intermedia** (R. Br.) A. Camus var. *intermedia*

Has been reported from the Jhelum Vy. Rd at Garhi (RRS 10105) and Poonch and is to be expected in Jumu.

**B. intermedia** var. *punctata* (Roxb.) Keng.

Nawal Nadi, Poonch; Garhi, Jhelum Vy. Rd. (RRS 10105); Lower Kishen. Vy. (RRS 17404).

**B. ischaemum** (L.) Keng.

Common from the plains to 11000' in Ladak.

**B. pertusa** (L.) A. Camus

Dhanni to Titwal, Lower Kisenganga Vy. c. 3000' (RRS 17407).

**Brachiaria distachya** (L.) Stapf

Bimbur Mts., Eastern Kashmir (*Jacq.* 1448).

**B. eruciformis** (J. E. Sm.) Griseb.

Srinagar (*Gammie*), Naubug (*Cl.* 31221), Bandipur (RRS 22519a), Nasim Bagh (RRS 19414).

**B. ramosa** (L.) Stapf

Jhelum Vy. Rd. (*Trotter* 139 G); Poonch; Ramban; Jumu-Kashmir Rd. (RRS 10733), Rajaori (*Jacq.* 1365).

**B. reptans** (L.) Gard. & C. E. Hubb.

To be expected in Jumu.

**Brachypodium distachyon** (L.) P. Beauv.

Kohala to Bagh in Poonch (RRS 23710).

**B. pinnatum** (L.) P. Beauv.

Gulmarg (RRS 8732, det Swallen), Kashmir, at 6000' (*Clarke*). See FBI 7:363.

**B. sylvaticum** (Huds.) P. Beauv.

Common on outer hills from 3500-7000'. Gilgit (RRS 26637), Minipin to Chalt in Nagar (RRS 26636), Jhelum Vy. Rd., Lower Kishen. Vy., Shupiy, Pahlgam, Nil Nag, Rembiana, Basaoli, Trarkhel, Poonch etc. This taxon is very variable and Dr. Bor does not think that var. *pseudo-distachyon* Hk. f. from Alibad; "Vestervonne" (*Jacq.*) and the Pir Panjal should be recognized.

**Briza media** L.

Chillam, Astor (RRS 18982), Deosai Pass (RRS 22155), Chatpani Nullah, Balti. (*Du.* 13885); Kash-

mir: Burzil Chowki, Bhagtaur, Sonamarg, Gulmarg (all *RRS*), Vestervonne (*Jacq.* 740).

**Bromus arvensis** L.

Ladak (*Schlag.* 1340, 1487), Shushal (*Kz.* 2446 A); Kargia, Zanskar (*Kz.* 5479 k); Hanle, Rupshu (*Kz.* 2320).

**B. commutatus** Schrader.

Askole, Central Karakorum (*Ogino testø* Kitamura).

**B. gedrosianus** Penzes.

Zanskar Vy. 29-6-1848 (*T. T.*), Nil Nag, Kashmir (*RRS* 23079); Gulmarg (*Du.* 12646).

**B. gracillimus** Bunge.

Killa Panja, Gilgit (*Giles* 117); Hushe Vy., Balti. (*W. & N.* 5962); Dras (*Du.* 11714); Kargil, Ladak Rd. (*T. T.*) Rachogpa, Rupshu (*RRS*); Zanskar: Seni (*Kz.* 5818), Tetha (*Kz.* 5598).

**B. inermis** Leyss. var. *inermis*.

Shankergarh, Astor (*RRS* 18765); Niltar Vy., Gilgit (*Du.*); Balti.: Morungkor (*Kz.* 9757); Braldo Vy. (*H. H.*); Kashmir: Minimarg-Burzil Chowki (*RRS* 19773), ascent Lohan Gali in Tilel (*RRS* 18550), Kel to Taobat, Kishen. Vy. (*RRS* 17872), Sonamarg (*RRS* 22394); Kamri Pass (*Du.* 12505) etc. 9-13000'.

**B. inermis** var. *villosus* Mert. & Koch.

Gilgit (*Giles*), Bualtar Vy. (*Nakao*); Balti. (*Du.* 12505); Dras (*RRS* 7445).

**B. japonicus** Thunb.

Common spring annual. Astor, Gilgit, Balti., Nubra, Ladak, Kashmir. Plains to c. 10000'.

**B. japonicus** Thunb. var. *velutinus* (Nocca & Balbis) Asch. & Graeb.

Pahlgam (*RRS* 5701), Tragbol (*RRS* 4300a).

**B. lanceolatus** Roth (Syn. *B. macrostachys* Desf.)

"To be expected" Bor. Lance reported this from Spiti and I found a doubtful specimen in Rupshu.

**B. mollis** L.

Jhelum Vy. Rd. at 3000' (*Gammie*). Not rare in Murree and so may be expected in Poonch.

**B. oxyodon** Schrenk.

Common in the inner Mts.; Astor, Gilgit, Balti., Dras, Zanskar, Kashmir: Burzil Chowki (*RRS* 19760), Chorwan (*RRS* 19668) Bangla, Pir Panjal Range (*Cl.* 29958). Usually 8500-12000'.

**B. ramosus** Huds.

Gilgit teste?; Tango La, Purig (*Kz.* 6044); Kotli, Poonch, Kashmir: Common, Trunkal, Burzil Chowki, Tilel, Pahlgam, Gulmarg, Vestervonne (*Jacq.*). Usually 7-11000'.

**B. scoparius** L.

Gilgit teste *S. Ahmad*; Jhelum Vy., Pirni, 5-6000' (*Du.* 10890).

**B. stenostachyus** Boiss. [Syn. *B. munroi* Boiss.; *B. inermis* var. *confinis* (Nees ex Steud.) Stapf].

Kurram Vy. (*Aitch.*); Astor; Lohan Gali Tilel (*RRS* 18550); Baltoro Glacier, 3500 m (*Nakao*).

**B. tectorum** L.

Common weed in grain fields and waste places especially in inner valleys. Astor, Gilgit, Balti., Dras, Ladak, Zanskar.

**Calamagrostis decora** Hk. f.

Mushkin forest, Astor, 9-10000' (*Du.* 12660).

**C. emodensis** Griseb.

Hunza (*Visser*); Astor: Rama, Gurikot (*RRS*), Gudhai Vy. (*Du.*), Kashmir: Zoji La, Baltal, Sonamarg (*RRS* 22386), Pahlgam (*RRS* 9914), Rajdani Pass, Badwan; Zur Nar, Lidder Vy. etc. 7-12000'.

**C. emodensis** var. *brevisetata* Hack.

Has not been taken up by Bor. Dolk refers Visser's plant from Hunza to this var.

**C. epigejos** (L.) Roth

Astor (*RRS* 22046); Niltar Vy., Gilgit (*Du.* 12412) Balti.: Near Kartzura, Indus Vy., (*Du.* 12070), W. of Dras (*Du.* 13852); Kashmir: Matayan (*RRS* 9983), Burzil (*RRS* 22046), Minimarg (*Du.* 14068), Kishan. Vy. (*Du.* 14103), 8-12000'.

**C. garhwalensis** C. E. Hubb. & Bor.

Astor: Chillam (*RRS* 18977, 18983), above Doian (*Du.*), Gudhai Vy. (*Du.*); Thalle La, Balti. teste?; Dras (*T. T.*); Kashmir: Dras (*T. T.*); Lohan Gali, Tilel (*RRS*).

**C. munroana & pilosula**

See *Agrostis*

**C. pseudophragmites** (Hall. f.) Koeler.

A large grass which is very common in the dry inner valleys. Astor, Gilgit, Balti., Dras, Ladak, Zanskar, Rupshu, 6-15000'.

**C. turkestanica** Hack. [Syn. *C. pseudophragmites* var. *tatarica* (Hk. f.) Bor].

Deosai (*H. H.*); Ishkuman Vy., Gilgit (*H. H.*); Balti. (*H. H.*); Kangi, Ladak (*Kz.* 2826); Kargia, Zanskar (*Kz.* 5585); Da-Hanle, Rupshu (*Kz.* 2287), Zanskar 10-15000'.

**C. stoliczkai** Hk. f.

Chaprot, Gilgit (*Winter.* 964); Balti. Pass above Barsho (*Winter.* 825), Urdokas (*Takamura*), Pensi La, Zanskar (*Stoliczka*).

**C. tianshanica** Rupr.

See *Deyeuxia holciformis*, 1170i C.



**Capillipedium assimile** (Steud.) A. Camus.

Jhelum Vy. Rd. at 3000' (*Lev.*); Nawal Nadi, Poonch (RRS), Kashmir: (*Jacq.* 310), 3-5000'.

**C. filiculme** (Hk. f.) Stapf

There seems to be an error here in Bor, p. 111 as in the FBI 7:181. *Jacq.* 310 is stated to come from Poonch in the Deccan, S. India not from Kashmir.

**C. parviflorum** (R. Br.) Stapf

Chalt in Nagar, Gilgit Agency (RRS 26638); Kotli and Poonch (*Rashid*); Kashmir: Muz. (RRS 17287 a), Chenari, Jhelum Vy. (RRS 12428), Wangat (RRS 18084) edges of rice fields; Kishtwar (*Cl.* 31343). Usually 3-6000'.

**Catabrosa aquatica** (L.) P. Beauv. var. **aquatica**

Leh, Ladak (*Kz.* 2602); Tsokar, Rupshu (*Kz.* 6581, 6596, Mich.).

**C. aquatica** var. **angusta** Stapf

Leh, Ladak (*Meebold*); Lanak Pass, Rupshu (*T.T.*); Padam Zanskar (*Kz.* 5760) at 12000'.

**C. sikkimensis** Stapf

Along stream, Tsakzhun Tso, Ladak (*Kz.* 24141) at 17500'.

**Cenchrus ciliaris** L.

Rajorie, Kashmir (*JLS* 858). A plains species.

**Chionachne koenigii** (Spreng.) Thunb.

Poonch (*A. Rashid, Raw.*); near Rajorie, Jumu Province (*Jacq.* 1295).

**Chloris dolichostachya** Lagasca

Naoshera near Bimbar (*Jacq.* 1436).

**C. virgata** Sw.

Leh, Ladak at 12000' (*T. T.*).

**Chrysopogon echinulatus** (Steud. non Nees) Watson

Astor: Gurikot (*Giles* 56); Katzura, Balti. (*Du.* 12103); Poonch (*Cl.* 28799A); Kashmir: common, Tangmarg, Nil Nag, Tilel Vy., Pahlgam-Aru, Baltal, Vestervonne (*Jacq.* 720) etc., usually 6-10000'.

**C. fulvus** (Spreng.) Chiov.

Muzaffarabad to Dhanni, Kishen. Vy. c. 2500' (*RR & IDS* 17353).

**C. gryllus** (L.) Trin.

Close to *C. echinulatus* and the specimens I previously referred here seem all to be in that cover at Kew.

**C. serrulatus** Trin.

Domel, Jhelum Vy. Rd. (RRS 10110), near Dhanni Lower Kishen. Rd. (RRS 17322, 17353); Poonch: Raikot, Serimang, Kotli, Udhampur (RRS 12520), Thanna to Rajorie (*Jacq.* 1302).

**Cleistogenes gatacrei** (Stapf) Bor

Himis, Ladak, c. 10000' (*Kz.* 6383, Mich.).

**Coix lacryma-jobi** L.

Tawi Valley, Jumu (*Gammie*; *Drum.* 21070).

**Colpodium himalaicum** (Hk. f.) Bor

Tarshing in Astor (*Troll*), Deosai (*Winter.* 878); Lal Pir (*Kz.* 9522); Balti.: Hushe Vy. region (*W. & N.* 6223), Biafo Gl. & Skoro La (*H.H.*), Burji La (*Cl.* 29851), Kashmir: Sonamarg, Kolohoi, Harnag. Upper Lidder Vy., Apharwat, Pir Panjal Range, (RRS 8855), alpine zone, 11-16000'.

**C. nutans** Griseb.

Astor, near Kalapani (RRS 12547), Deosai (RRS 19967), common at high alts. Burzil Pass, Musjid Vy., Baltal, Sonamarg, Gadsar, Pahlgam, Yamhar Pass etc. 10-14000'.

**C. thomsoni** Hk. f.

See *Poa infirma*

**C. n. sp.**

*O. Polunin* 6120 from Ghareisa Glacier, east of Nagar at 15,580' seems to be new.

**Crypsis schoenoides** (L.) Lamk.

Balti.: Skardo (*T. T. and W. & N.* 6579), Kunis (*Fuller*); Baramulla, Kashmir, banks of Jhelum (*Jacq.* 1120).

**Cymbopogon distans** (Nees) Wats.

Jutial, Gilgit (RRS 26647), Nagar (RRS 26648), Poonch. Kashmir, common, Lower Kishen. Vy., Pahlgam, Srinagar, Banihal Pass, 4-8000'.

**C. jwarancusa** (Jones) Schult.

W. Tib. (FBI 7:203); Astor & Nagar teste?; Khalotse-Nurla, Indus Vy. (*T. T.*), Nimo to Leh (*T.T.*), Plains to 9000' in desert areas.

**C. martinii** (Roxb.) Wats.

Kashmir: Lower Kishen. Vy. (RRS 17305); Jhelum Vy. Rd. (*Lev.*, *Cl.* 27378); Kotli & Nawal Nadi, Poonch; Udhampur, Jumu-Kashmir Rd. (*Janaki Ammal* 11034).

**C. olivieri** (Boiss.) Bor (Syn. *C. schoenanthus* auct. non L.).

Astor Vy. (*Du.* 12301); Skardo (*W. & N.* 5865); near Skardo (*Du.* 12045); Naltar Vy., Gilgit (*Du.* 12335); Chalt-Nomal (*Nakao*); Baltit, Hunza (*F.S.*); Saspora, Ladak (*Kz.* 6270). Plains to 9000'.

**C. parkeri** Stapf

Takht i Suleiman, Srinagar, Kashmir (*Pinfold*).

**C. × stracheyi** (Hk. f.) Raizada & Jain

Naltar Vy., Gilgit (*Du.* 12328), Nagar-Minipin (RRS 26648), Jutial Nullah (RRS 26647); Poonch; Kashmir: Pahlgam (RRS 9259). Jumu (*Falc.*), near Srinagar (*Gollan*).

**Cynodon dactylon** (L.) Pers.

This excellent fodder grass is common from the plains to 8000' and even to 12000'.

**Dactylis glomerata** L.

Cockspar or Orchard Grass. One of the common-grasses in the mts. and very variable. Chitral eastwards, 6-12000'.

**Dactyloctenium aegyptium** (L.) P. Beauv.

Kohala to Garhi, Jhelum Vy. Rd.; Nawal Nadi, Poonch; Kotli; Jumu-Kashmir Rd. (RRS 13465) Plains to c. 3000'.

**Danthonia cachemyriana** Jaub. & Spach (*D. exilis* Hk. f.)

Naltar, Gilgit on rocks (*Sh. Ali*); Ulter Nullah, Hunza (RRS 26633); Braldo & Biafo Glaciers (*H. H.*); Kashmir: Matayan, Zoji La, Sonamarg, Baltal, Burzil Pass, Ferozepur Nullah etc. 8-13000'.

**D. schneideri** Pilger var. **glabrata** Conert (Syn. *D. jacquemontii* Bor)

Is based on my 24401 from Mt. Ilam, Swat; Musa ka Musalla, Siran Range, Haz. (*Inayat*), Agharwat, Kashmir (RRS 10474).

**D. schneideri** var. **minor** (Hk. f.) Conert (Syn. *D. jacquemontii* Bor var.?)

My Agharwat, 10474 seems also to be cited here so it will be necessary to check again. (*Dr. Bor* p. 479 refers the number here).

**Dendrocalamus strictus** (Roxb.) Nees

Grows in the foothill zone from Rawalpindi Dt. eastwards both wild and cult. to c. 3000'.

**Deschampsia caespitosa** (L.) P. Beauv.

Deosai (*Du.* 14047, RRS 22151); Dras Vy., (*Du.* 13710); Balti.: Rongdo (*Winter* 303), Marpo La top (RRS 22297); Ladak, Rupshu, Zanskar; Kashmir: Minimarg (RRS 19825, 22139), Badwan (RRS 22610), Burzil Chowki (RRS 19749) etc. 10-17000'.

**D. koelerioides** Regel.

Pamirs (*Alcock*); Astor: Das Kirim to Sardar kothi, Deosai (*Du.* 14047 & RRS 20040); Balti.: Burji La (RRS 20014), Thalle La (RRS 20737), Marpo La (RRS 22989), W. of Dras (*Du.* 13861), Burzil Pass (*Cl.* 29706), 12-16000'.

**Desmostachya bipinnata** (L.) Stapf

Gilgit Vy. (*Du.*); Mirpur (RRS).

**Deyeuxia arundinacea** (L.) P. Beauv.

Burzil Vy. (*Du.*) near Minimarg, Upper Kishan. Vy., 10-11000' (*Du.* 14071);? (RRS 19071).

**D. holciformis** (J. & S.) Bor

Nubra (*T. T.*); Takalang La, Ladak (*Kz.* 6464), Kargia, Zanskar (*Kz.* 5503, 5518), Debring, Rupshu: (*Kz.* 6537, Mich.), Rukchin (*Lance*).

**D. kashmeriana** Bor

Astor Vy., above Doian (*Du.* 12454) Type, Mushkin Forest (*Du.* 12660), 9-12000'.

**D. scabrescens** (Griseb.) Munro.

Gudhai Vy.; Astor (*Du.* 12220); Deosai Pass (RRS 22169); Balti.: Hushe Vy. (*W. & N.*), Shingo Vy., near Gulteri (RRS 22244), Leh, Ladak & E. Kangi (*Meebold*), Kashmir: Pahlgam (RRS 5452, 7997), Sonamarg (RRS 9815, cited by Bor), Lidder Vy. (*Du.* 13349).

**Dichanthium annulatum** (Forsk.) Stapf

Outer Kashmir foothills, Bagh in Poonch (RRS 23792), Muz. Dt. (RRS 17321); Tawi Vy. (*Gammie*). An excellent fodder.

**Digitaria ciliaris** (Retz.) Koel. Descr. Grass. 27.1802 [Syn. *D. adscendens* (H.B.K.) Henr.]

Teste Bor 1966.

**D. ciliaris** ssp. **marginata** (Link) Bor

Common. Jhelum Vy., Poonch, Kishtwar (*Cl.* 31400 A).

**D. ciliaris** ssp. **marginata** var. **criniformis** Henr.

Dal Lake (RRS 23074).

**D. ciliaris** × **cruciata** Chenari.

Jhelum Vy.; Lun Bagla (*S. Ahmad* in 1955, Kew).

**D. cruciata** (Nees) A. Camus

Balti.: Skardo (*T. T.*), Olding (RRS); Kashmir, common, rice fields (*Jacq.* 1054), Badarwar (*Cl.*), Kishtwar (*Schlag*: 2953), Pahlgam (RRS 21546, 21776), Lower Sind Vy. (RRS); Gilgit (RRS 26653, 26654), 4-9000'.

**D. granularis** (Trin.) Henr.

Lower Kishan. Vy., Muzaffarabad (RRS 17320).

**D. ischaemum** (Schreb.) Schreb.

Gilgit (RRS), Skardo (*W. & N.* 6576a), Shigar (RRS 20536, cited by Bor), W. Tib. (*T. T.*), Kashmir (*JLS* 850).

**D. longiflora** (Retz.) Pers.

Kashmir eastward (FBI).

**D. nodosa** Parl.

Mirpur (*Jacq.* 173, Kew). A xerophytic plains species.

**D. sanguinalis** (L.) Scop. ssp. **aegyptiaca** var. **frumentacea** Henr.

Ramghat Camping Ground, Astor (*Du.* 28-7-1892).

**D. stewartiana** Bor

Chunagund, Ladak Rd. near Kargil, c. 9000' (RRS 21047, Type); Kargyl (*T. T.* 23-9-1848).

**Digitaria stricta** Roth ex Roem. & Schult.  
Muz., Jhelum Vy. Rd., Trarkhel & Kotli (RRS); Ramban, Jumu-Kashmir Rd., ascending to 7000' (FBI).

**D. stricta** var. **denudata** (Link) Henr.

Basaohli (Cl. 31575a).

**D. violascens** Link

Gilgit (RRS 26652), Shigar (RRS 20536), Lower Kishen. Vy., Titwal-Surkhala; Kangan to Wangat, Sind Vy. (RRS 18098).

**Duthiea bromoides** Hack.

Bedori, Poonch (RRS), Sarsangar Pass, Deosai (Du.); Agharwat above Gulmarg (RRS 8847), Pir Panjal (Jacq. 537); Upper Lidder Vy. (Du. 13155, co-type, Kew), Upper Sind Vy. (Cl. 31040A); Kishtwar (T.T.).

**Echinochloa colonum** (L.) Link

Common in the lower hills to 4500'. Jhelum Vy. Rd., Poonch, Lower Kishen. Vy., (RRS 8475) etc.

**E. crusgalli** (L.) P. Beauv. [Syn. *E. crusgalli* var. *longisetum* (Doell.) Neill.]

Common from the plains to c. 7000'.

**E. crusgalli** (L.) P. Beauv. var. **breviseta** (Doell.) Neill.

Common with the same range as the other variety (Dr. Bor informs me that the type specimen is long awned).

**E. frumentacea** Link [Syn. *E. crusgalli* var. *frumentacea* (Link) W. F. Wight].

Cult. in the plains and up to c. 7000' in Poonch on the Jumu-Kashmir Rd., Tangmarg Rd., etc.

**Eccoilopus cotulifer** (Thunb.) A. Camus

Jhelum Vy. (JLS 892); Naubug, 6000' (Cl. 31219A); Kishtwar (Cl. 31338). Wet soil.

**Eleusine compressa** (Forsk.) Aschers. & Schwein.

Mirpur and probably in Jumu. A plains species.

**E. corocana** (L.) Gaertn.

*Kodra, ragi*, African Millet, is cult. in the plains and sometimes to 8000'. Nawal Nadi and Nakial, Poonch; Kishtwar (RRS 3064), Jhelum Vy. Rd.; Chenab Vy.: Chatru-Sinthan Pass at 8000' (RRS).

**E. indica** (L.) Gaertn.

A common plant of the sub-tropical zone. Jhelum Vy. Rd. and no doubt on the Jumu-Kashmir Rd. as well.

**E. racemosa**

See *Acrachne*

**Elymus dahuricus** Turcz. var. **dahuricus**

Common on the inner ranges, Astor (RRS 22948a); Gilgit (RRS, F. Schmid; Nakao); Karakorum (T.T.); Nubra (T.T.); Skardo (Cl. 29939B);

Ladak: Nurla (Kz. 6260), Spitug (Kz. 6319), Sapi La, Suru (RRS); Kashmir Prov. Kangan, Sind Vy. (Gammie), Tilel (RRS 18500a), Kunzlwani (Cl. 29389) etc. 7-15000'.

**E. dahuricus** var. **micranthus** Meld.

Shyok Vy. (T.T.), Bulhan, Karak. Mts. (Sh. Ali), Yasin, Gilgit (M. Zahur).

**E. dasystachys** Trin!

Distribution as in the last. 8-15000'. Common.

**E. nutans** Griseb. (*E. sibiricus* of Hk. f. non L.)

Very common with the distribution of the first two species.

**Elytrigia ferganensis** (Drob.) Nevski

See *Agropyron ferganense*

**Enneapogon persicus** Boiss.

Gilgit Agency: Baltit, Hunza (Schmid, 1917), Niltar Vy. (Du. 12316), Skardo (RRS, Cl.), Shigar (RRS 20580), etc.

**Eragrostis cilianensis** (All.) Vig.-Lutati

Jumu (T. T.), Kishtwar (Cl. 31, 412B), Plains to c. 5000'.

**E. gangetica** (Roxb.) Steud.

To be expected. My 3640 from Kangan, Sind Vy., Kashmir and a specimen from Padar may belong here.

**E. japonica** (Thunb.) Trin.

Nawal Nadi, Poonch (RRS), Basaoli (Cl. 25, 158B).

**E. pilosa** (L.) P. Beauv.

Common. Astor (Du. 12307); Gilgit: (Giles 247, RRS 26684); Nubra (T.T.); Poonch (RRS), Rajaori-Rattanpir in Poonch (JLS), Lower Kishen. Vy. (RRS 17238) etc. Plains to 5000'.

**E. poaeoides** P. Beauv.

Common throughout from plains to 9000' in Ladak.

**E. tenella** (L.) P. Beauv.

Mirpur (RRS), Jumu (T. T.). A plains species

**E. uniolooides** (Retz.) Nees ex Steud.

Kashmir (Du. Kew).

**E. viscosa** (Retz.) Trin.

Jumu (RRS 10702).

**Eremopoa persica** (Trin.) Roshev. var. **persica**

Common at high altitudes on inner ranges Astor, Gilgit, Deosai, Balti., Kashmir Province: Chorwan, Matayan, Zoji Pass, Burzil Pass, 8-14500'.

**E. persica** var. **songarica** (Schrenk) Bor

Common, and distribution as in the previous taxon.

**Eremopogon foveolatus** (Del.) Stapf

Mirpur (RRS 25801). To be expected in Jumu. A common plains and foothill species. A good fodder plant.

**Erianthus filifolius** Nees ex Steud.

Gilgit: Naltar-Nomal (RRS 26609), Lower Kishen. Vy. (RRS), Jhelum Vy. Rd. (RRS), Poonch, common: Uri-Aliabad, Dhuli, Trarkhel Badriwah (T. T.) etc. 2-8000'.

**E. griffithii** (Munro) Hk. f.

Very common on arid slopes and banks, Gilgit: Nomal (RRS 26668), Jutial Nullah (RRS 26673), Astor (RRS 22829); Rondu, Balti. (T. T.); below Mirpur, 1-8000'.

**E. macrathorus** Pilger

Indus Vy. near Nanga Parbat (Troll), Mushkin, Astor Dt. (I. I. Ch.), Gilgit (S. Ahmad 25147; Neotype of Dr. Bor); Troll's type was destroyed in the war.

**E. ravennae** (L.) P. Beauv.

Gurikot, Astor (RRS 18893); Gilgit Agency: Gupis-Gakuch (Honda), Nagar-Minipin (RRS 26670); Skardo (Falc.), Kashmir: Gurais Vy. (Du. 13992), Sonamarg (Du. 13613), Naubug (Cl. 31250), 0-8000'.

**E. rufipilus** (Steud.) Griseb.

Batot Pass, Jumu-Kashmir Rd. (RRS 12430). ? Above Nomal, Gilgit & Baltit, Hunza (F. Schmid); Kashmir: Dachigam (Stokoe), Sind Vy. (Jacq. 1060).

**Eulalia mollis** (Griseb.) O. Ktze.

Kashmir-Sikkim (FBI 7: 111), Rajaori, Eastern Kashmir (JLS teste ?), usually 5-8000'.

**E. trispicata** (Schult.) Henr. (*Pollinia argentea* Trin.)

Bangran, near Poonch (A. Rashid, Herb. Raw.).

**Eulaliopsis binata** (Retz.) C. E. Hubb.

Bhabbar Grass. Fairly common in Poonch, Bagh, Kotli, Nakial (RRS), 1-5000'.

**Festuca alatavica** (Hack.) Roshev.

Nanga Parbat, Astor Dt. (Troll), Central Karakorum: Gense, Mango, Skoro La, 3700-4510 m (Hartmann).

**F. altaica** Trin.

Jutial Nullah, Gilgit (RRS 26688); Balti.: Baltoro Gl. (Nakao), Satpura La (RRS 20180), Thalle La (RRS 20739), Hushe Vy. (W. & N. 6246), Karpuchu Vy. (Du. 11968) etc., Dras (Du. 13790), 11-16000'.

**F. cumminsii** Stapf

Balti, Thalle La-Bagmaharal (Schlag. 5914, Kew); Zanskar: Pensi La (Kz. 5905), Shakkar (Kz. 5951, det Swallen, Herb. Mich.).

**F. gigantea** (L.) Vill.

Hunza (RRS 26690); Kashmir: Gulmarg (10640), Sonamarg (Cl. 30886B), Pahlgam (RRS 21629), Aru (RRS 21648), 5-9500'.

**F. kashmiriana** Stapf

Deosai (Du. 14049, Winter. 880), Ulter Nullah, Hunza; Skoro La Balti. (H. H.), Dras (Du. 11604); Gya, Ladak (Kz. 6427); Shakkar, Zanskar (Kz. 5951, Mich.); Poonch, Kashmir, 8-14000'. Common. This is a variable taxon and I have omitted vars. *debilis* and *ligulata* of Stapf, both of which are found in Kashmir.

**F. levingei** Stapf

Kashmir (Lev. 27394 in Clarke's number series, Aug. 1875) is the only collection.

**F. lucida** Stapf

Ladak: Himis (Kz. 2561 a), above Chortren Chen (Kz. 2659), Tog (Kz. 2636); Pensi La, Zanskar (Kz. 5924); Masjid Gali near Tilel, Upper Kisheng. Vy. (RRS 18365), 9-17000'.

**F. modesta** Steud. (*F. asthenica* Hk. f.)

Poonch.: Dhuli (RRS 23772), Nakial (RRS 25805); Pahlgam (Du. 13469, Type of *F. asthenica*, RRS 7957), Kunzlwani (Cl. 29468), Hirpoor (Cl. 28672), Nowgunge (Cl. 29183), 6-9000'. Considered harmful to grazing animals.

**F. myuros** L.

See *Vulpia*

**F. nitidula** Stapf

Nubra & Puga, Rupshu (T. T.); Ladak-Rupshu border (Kz. 6493), Kargiag, Zanskar (Kz. 5504, 5515, Mich.), 13500-17000'.

**F. ovina** L. sp. aggr. incl. **F. valesiaca** Schleich.

Very common and very variable, usually 10-16000', Gilgit, Balti., Ladak, Poonch and Kashmir Province. St. Yves has proposed a number of subspecies which are mentioned in Bor p. 541 and Markgraf-Dannenberg has recently described a new var. *hartmanni* for some specimens from the Central Karakorum.

**F. polycolea** Stapf

Rupal Nullah, Astor (RRS 22851); Gumbar, Zoji La, Upper Sind Vy., Kashmir (Jacq. 1022).

**F. rubra** L. var. **rubra**

Gilgit.: Naltar Vy. (Du. 2394), Karakorum Mts. (Cl. 30335 A, p. p.), Badwan, Kisheng. Vy. (RRS.

21602), Aliabad, Poonch, (*Cl.* 29002 A); Gurais (*Cl.* 29505 A).

**Festuca rubra** var. *villosa* Mert. & Koch.

Even more common, Astor, Balti., Ladak, Rupshu, Zanskar, Poonch, Kashmir Prov., 9-16000'.

See *Nardurus*

**F. tenuiflora**

**Glyceria tonglensis** C. B. Clarke

Kashmir: Tangmarg (*RRS* 10589), Pahlgam (*Du.* 13092, Type; *RRS* 21649, 21779), Fras Nag (*RRS* 23094), Gulmarg (*RRS* 10497), 7-9000'.

**Hackelochloa granularis** (L.) O. Ktze.

Lower Jhelum Vy.; Kotli, Nakial in Mirpur and Rajaori to Sara in Jumu (*Jacq.* 1373).

**Helictotrichon pratense** (L.) Pilger

Common at high alts. in inner valleys, Astor, Deosai, Gilgit, Balti., Zanskar, Poonch, Kashmir: Banihal Pass (*RRS* 12112), Agharwat (*RRS* 8895), Minimarg (*RRS* 19207) etc.

**H. virescens** (Nees ex Steud.) Henr.

Poosiana, Poonch (*Lev.*); Banihal (*RRS* 10722), Pahlgam (*RRS* 21678), Tragbal (*RRS* 4762, 4917), above Gulmarg (*RRS* 8764, 10350), Rajdani Pass (*RRS* 19293), 5-12000'.

**Hemarthria compressa** (L. f.) R. Br.

Muldara, Poonch (*A. Rashid*); Kashmir: Lower Kishen. Vy. (*RRS* 17303), Ganderbal (*RRS* 7496 a), Anchar Lake (*RRS* 8097), Rajaori (*JLS*), rice fields and wet places to c. 5500'.

**Heteropogon contortus** (L.) P. Beauv. ex R. & S.

Very common from plains to c. 6000'. A fine fodder when immature but the mature awns are harmful to sheep.

**Hierochloe laxa** R. Br.

Very common on alpine meadows. Astor (*Winter.*), Alampi La, Deosai (*Du.*); Dras (*Du.*); Rimochagma Nala, Balti. (*Du.*); Badori, Poonch (*RRS* 23944); Amarnath (*RRS* 449 a), Burzil Pass, Yamhar Pass, Sonamarg etc. 10-15000'.

**Hordeum aegiceras** Nees ex Royle

Kashmir-Sikkim (FBI); W. Tib. 11,500' (*T. T.*).

**H. bogdanii** Wilensky

Baltistan (*Schlag.* 5750). A hybrid with an *Agropyron*?

**H. brevisubulatum** (Trin.) Link

Ladak: Gya (*Kz.* 6435); Zanskar: Kargia (*Kz.* 5538), Seni (*Kz.* 5812). Too close to *H. turkestanicum*?

**H. glaucum** Steud.

Nishat Bagh, Kashmir (*RRS* 27071 det. Bor).

**H. leporinum** Link

Kashmir: Srinagar (*Mc Donell*), Sambal Nullah (*Gammie*), below Srinagar (*Drum.* 14347), Ramoo (*Cl.* 28549) etc. 2-6000'.

**H. murinum** L.

A weed of grain fields. Some specimens I had referred here have been referred by Dr. Bor to *H. leporinum* and *H. glaucum* and I must see the Kew material again before citing specimens which should remain in *H. murinum*.

**H. turkestanicum** Nevski

Common in alkaline spots. Gilgit (*Honda, Ogi-no, Zahur, Schmid* etc.); Shigar (*RRS, Cl.* 30073 a); Ladak (*T. T., Kz.*); Zanskar (*Kz.*); Salt Lake, Rupshu (*T. T., Kz.* 6602), 7-15000'.

**H. vulgare** L.

Barley is cultivated throughout from the plains to 14000' in Ladak and Hanle, Rupshu. Several types are used.

**Imperata cylindrica** (L.) P. Beauv.

Cotton Grass is found everywhere from the plains to c. 6000' in damp or waterlogged soil.

**Isachne himalaica** Hk. f.

Sudan, Poonch (*A. Rashid*); Thantha ad Rajaori (*Jacq.* 1296).

**Ischaemum rugosum** Salisb.

Is to be expected in Jumu.

**Isilema prostratum** (L.) Anders.

Plains below Jumu (*T. T.*). This specimen may have come from the Punjab but it probably grows in Jumu and possibly in Poonch as well.

**Koeleria argentea** Griseb.

Nubra & Leh, Ladak (*Schlag.* 951, Type); Ladak: Fotu La (*T. T.*), Gya (*Kz.* 6431), Kishtwar (FBI).

**K. gracilis** Pers. (Syn. *K. cristata* auct.)

Common, Astor, Deosai, Gilgit, Balti., Ladak, Zanskar, Poonch, Kashmir, 5-14500'. See Shinnars in *Rhodora* 58: 94, 1956 for a discussion of the synonymy.

**Lagurus ovatus** L.

There is a specimen of this Mediterranean grass at Kew collected by Dharm Pal Bhandari at Pahlgam. Is there an error here?

**Leersia hackellii** Keng.

Kashmir: (*T. T., Falc.*), Shalimar (*RRS* 22426), Dal Lake (*RRS* 10612). Ditches and rice fields.

**Leptochloa panicea** (Retz.) Ohwi.

Is to be expected in Poonch & Jumu.

**Leucopoa albida** (Turcz.) Krecz. & Bobr. (Sometimes confused with *Festuca lucida*).

Karakorum (Cl.), Nubra (T. T.), Gilgit, (Zahur); Balti.: Satpura Nala (RRS 20340), Hushe region (W. & N. 6062, 6150, 6197), Ladak (T. T., Schlag. 6536), 13-15000'.

**L. olgae** V. Kr. & Bobr.

Liligo along Baltoro Gl., 3600 m, Central Karakorum Mts. Is it really distinct from the last?

**Lolium perenne** L.

W. Tib. (*Stoliczka*), Nakial, Mirpur Dt., Karakorum (Cl. 30501 D); Nasim Bagh, Kashmir Vy. (RRS 10619).

**L. persicum** Boiss. & Hoh. ex Boiss.

Karakorum, Gilgit (*Nakao* 1500 m) Srinagar; Kashmir (Du. 10846).

**L. temulentum** L.

Nakial, Mirpur (RRS 25798); Rawalakot (RRS 24897); Nishat Bagh (RRS 23068a). Common in grain fields.

**L. temulentum** L. var. **arvense** Lilj.

Poonch City (RRS 12029).

**Lophochloa cavanillesii**

See *Trisetaria*

**L. clarkeana** (Domin) Bor

Naoshera, Kashmir, 1800' (Cl. 28155), only collection.

**L. phleoides** (Vill.) Reichenb.

Jhelum Vy. Rd.; Poonch, Kotli; Takht, Srinagar, Kashmir (*Stokoe, Trotter*), Srinagar (*Gammie*), Bandipur (RRS).

**L. pumila** (Desf.) Bor

Kohala-Domel, Lower Jhelum Vy. Rd.; Bandipur (RRS 21514). This often has not been separated from the previous species. Should be watched for. Usually below 3000'.

**Lygeum spartium** Loeffl.

Is reported from Pahlgam, Kashmir by Bhandari. Not a native. Is it an error or a casual introduction?

**Melica canescens** (Regel) Lavrenko.

Rama, Astor Dt. (RRS 22926); Balti.: Hushe Vy. (W. & N. 6044), Skardo (*Schlag.*, Cl. 29959), Braldo Vy. & Biafo Gl. (H. H.); Zanskar: Karsha (Kz. 5780, *Seni* 5764), Matayan, Zoji Pass (Du. 11726).

**M. hohenackeri** Boiss.

Shankergadh, Kamri Nala, Kashmir (*Inayat* 25755).

**M. inaequiglumis** Boiss.

Anesarbar, Gilgit (*F. Schmid*).

**M. jacquemontii** Dcne.

Minipin Glacier, Nagar, Gilgit Agency (*Nakao*); Marpo La, Balti. (RRS 22323), near Dras (RRS 22230), Shingo Vy. (Du.); Upshi, Ladak (Kz. 6405).

**M. nutans** L.

Kishen. Vy.: Keran (RRS 17521), Kunzalwan (Du. 15012); Pahlgam (RRS 5328, 7981, Du. 25776a); Hirpoor (Cl. 28668A), Ferozepur Nullah (RRS 14790), Gulmarg (Du. 11394). Usually 5-8000 ft.

**M. onoei** Franch.

Kishtwar (Cl. 31381 at 6000').

**M. persica** Kunth

Karsha, Zanskar at 12000' (Kz. 5780 det. Bor). Balti.: Thalle La (RRS)? & Satpura lake? The west Himalayan specimens seem too close to *M. canescens* and should be studied again.

**M. scaberrima** (Nees) Hk. f.

Above Dhuli, Poonch (RRS); Kishtwar (Cl. 31381), 6-10000'.

**M. secunda** Regel.

Cliff on Zoji Pass, c. 9500' (RRS 22372). Rare. New for Kashmir.

**Microstegium ciliatum** (Trin.) A. Camus

Rajaori ad Serai, East Kashmir (*Jacq.* 1335).

**M. nudum** (Trin.) A. Camus.

Domel, Jhelum Vy. (RRS 10111) c. 2500'; (*Lev.* 11037a) at 5000'. Serimang, Poonch (RRS); Rampur (RRS 5113), Jumu-Kashmir Rd. (RRS 10680), 4-8000'. Usually in shade.

**Milium effusum** L.

Chillam, Astor Dt. (RRS 22017); Kamri Pass (RRS 18681). Tragbol (RRS 4764), Pahlgam (RRS 5326, 5809), above Gulmarg, (RRS 10351), Keran Nullah (RRS 17531), Burzil (RRS); Khillanmarg. Fras Nag etc. Common in shade 6-10000'.

**Miscanthus nepalensis** (Trin.) Hack.

Serimang, Poonch (*A. Rashid, Raw* 21082 B); Basaoli, Kashmir (Cl. 31591A).

**Mnesithea laevis** (Retz.) Kunth

To be expected in Poonch and Jumu.

**Muehlenbergia duthieana** Hack.

Raikot-Aliabad. Poonch (RRS 28236), Pechanna (i.e. Poosiana) ad Thounna (*Jacq.* 1280).

**M. himalayensis** Hack. ex Hk. f.

Kashmir Vy. (*Lev.* at 5500'), Ramban, Jumu-Kashmir Rd. (RRS 10676). To be expected in Poonch.

**M. huegelii** Trin.

Gilgit (*Sidd. & Beg*); Balti.: Parkutta (RRS 20900), Tolti-Bagicha (RRS 20973), above Chalt in Nagar, Gilgit Agency; Bhedi, Poonch (RRS 24065).

Nil Nag (*Drum.* 15048), Lidderwat (*Du.* 13471), Jumu-Kashmir Rd. (*RRS*) etc. 4-9000'.

**Nardurus maritimus** (L.) Murbeck.

Near Srinagar, Kashmir, 5-6000' (*Du.* 10811; also *Pinfold & Stokoe*).

**Neyraudia arundinacea** (L.) Henr.

Jhelum Vy. (*Cl.* 31394 A), Garhi (*RRS* 10084), Jumu (*T.T.*), Kotli; Kishtwar (*Cl.* 31324A), Basaoli (*Cl.* 31646A), 1-5000'.

**Oplismenus compositus** (L.) P. Beauv.

Kashmir to Upper Assam (*FBI* 7:66).

**O. undulatifolius** (Ard.) P. Beauv.

Poonch: Trarkhel, Taulipir and Dhirkot (*RRS*), Chenari, Jhelum Vy. Rd. (*RRS* 12431) eastward, 3-8000'.

**Orinus thoroldii** (Stapf) Bor

Tsaka, Ladak, 4700 m, dry sand (*Kz.* 2365).

**Oryza sativa** L.

Rice is cult. to c. 6000' wherever water is available. It is the most important crop in the Kashmir valley.

**Oryzopsis aequilumis** Du.

Pahlgam (*Du.* 13473), Skardo (*T.T.*), Kashmir (*T. T.*; *Jacq.* 1107), 5-10000'.

**O. brachyclada** Pilger

Nanga Parbat (*Troll*, type lost), Stock ("Stog"), Ladak (*Kz.* 2612, Neotype of Bor), Lamayuru; Ladak (*Kz.* 2738), Yasin, Gilgit (*Honda*).

**O. fasciculata** Hack.

Kargah Vy., Balti. (*Du.* 13936), Upper Astor Vy., Kamri Vy., Kashmir (*Du.* 12644, 12656, co types); Tilail (*Cl.* 30707 A, B), Pensi La; Zanskar (*Kz.* 5915, Mich.).

**O. gracilis** (Méz.) Pilger

Nagar, Gilgit Agency (*Nakao*), Satpura La, Balti. (*Du.* 12031); Leh, Ladak (*T.T.*, Neotype); Bok Zanskar (*Kz.* 5881).

**O. lateralis** (Regel) Stapf

Most widespread of our species and often the commonest. Astor, Balti., Dras, Ladak, Zanskar, Bedori, Poonch, (*RRS* 23922), Pahlgam, Sonamarg etc. 5-15000'.

**O. microcarpa** Pilger [Syn. *O. coerulascens* (Desf.) Hack. var. *microcarpa* (Pilger) Bor]

*Troll's* type from the Astor Vy. c. 2400 m was lost in the war. A specimen of mine from Swat is the neotype. F. Schmid's no. 10 from Baltit, Hunza seems to be the same.

**O. molinoides** (Boiss.) Hack.

Gyama Tongdzc. Purig (*Kz.* 6898 det. Bor);

Hiniskut, Ladak (*Kz.* 6231, Mich.); Bok, Zanskar (*Kz.* 5884, Mich.).

**O. munroi** Stapf

Very common, Astor, Gilgit, Balti., Nubra, Ladak, Zanskar, Kashmir: Banihal, Sonamarg, Tangmarg, Jhelum Vy. Rd., Takht, Kishtwar, Pahlgam etc. 4500-10000'.

**O. pubiflora** Hack. (Syn. *O. lateralis* var. *effusa* Hk. f.)

Jutial Nullah, Gilgit (*RRS* 26696, Kew) seems to belong here.

**Panicum antidotale** Retz.

Bhimbar (*Cl.* 28122), Jumu (*T.T.*). Plains to c. 3000'.

**P. atrosanguineum** Hochst.

Plains below Jumu (*T.T.*).

**P. miliaceum** L.

*Cheena*, *cheeni* is planted in the plains and up to c. 11000' in Baltistan and Ladak. Gilgit (*Winter.* 980), Skardo (*Schlag.*), Karakorum (*Takamura*), Ladak (*T.T.*) etc.

**Paspalidium flavidum** (Retz.) A Camus

Kotli (*RRS*), Tawi Vy. (*Gammie*). In marshy places usually below 3000'.

**Paspalum distichum** L.

Kotli (*RRS*) and no doubt in Jumu. Marshy places.

**P. scrobiculatum** L.

To be expected as a hot weather crop in Jumu.

**Pennisetum divisum** (Gmel.) Henr.

This desert plant of the plains was found in Gilgit by Duthie.

**P. flaccidum** Griseb.

Very common. Astor, Gilgit, Balti., Dras, Ladak, Zanskar, Rupshu, Poonch, Jhelum Vy. Rd., Jumu Hills etc. 4-14000'.

**P. lanatum** Klotzsch.

Very common. Astor, Gilgit, Balti., Dras, Ladak, Zanskar, Rupshu, Kisheng. Vy., Ferozepur Nullah, Pahlgam, Sonamarg, Tilail etc. 5-11000'.

**P. orientale** L. C. Rich.

Gilgit (*Du.* 12313, *RRS* 26658), Balti.: Kiris (*W. & N.* 5893); Skardo (*W. & N.* 6563); Jhelum Vy. Rd. common in Poonch (*RRS*), Takht, Srinagar etc. 0-8000'.

**P. orientale** var. **triflorum** Stapf

Ramban, Jumu-Kashmir Rd. (*RRS* 10727); Garhi (*RRS* 10095); Jhelum Vy. Rd. (*Lev.* 27449) at 3000' (In Clarke's no. series).

**Pennisetum typhoides** (Burm. f.) Stapf

Bajra, the Bulrush or Pearl Millet is no doubt cult. in Jumu. Dr. Bor points out on p. 351 that the correct name for this plant may be *P. americanum* (L.) K. Schum.

**Phacelurus speciosus** (Hack.) C. E. Hubb.

Gilgit: Naltar Vy. (*Sh. Ali* 300, Raw.); Mahtantir Gah (*F. Schmid*), Kashmir, common, Pahlgam (RRS 5311, 8303), Sonamarg (RRS 6766, 7311), Titwal-Surkhala, Kishen. Vy. (RRS 17461), Hajipir Pass, Poonch (RRS 13984), 5500-11000'.

**Phalaris arundinacea** L.

Kargah Vy., W. of Dras (*Du.* 13933); Sind River marshes (*Drum.* 14363), Wular Lake (*Cl.* 29146, *Falc.*), Srinagar (*Gammie*).

**P. minor** Retz.

Poonch: Palandari (RRS 12026), Pattan (RRS 12034). Kashmir to Nepal (FBI. 7:221).

**Phleum alpinum** L.

Very common from 10-16000' on every alpine meadow.

**P. graecum** Boiss. & Heldr. (Syn. *P. himalaicum* Mez., *P. arenarium* Hk. f. non L.)

Jutial Nullah, Gilgit (RRS 26698); Bagh, Poonch (RRS 23715), Kotli (RRS 25810); Kishen. Vy.: Titwal (RRS 17460), Keran (RRS 17656), Takht, Srinagar (*Winter.*), Kishtwar (FBI). Usually 2-7000'.

**P. paniculatum** Huds.

Kohala, Jhelum Vy. Rd. (RRS 27549), Domel (RRS 12037); Kotli, Bagh; Srinagar (*Du.*), 2-6000'.

**Phragmites communis** Trin.

Very common in shallow water, borders of streams etc. Gilgit, Astor; Balti., Nubra, Ladak, Kashmir, 4-10000'.

**P. communis** var. *stenophylla* Boiss.

This is the more xerophytic form with narrow leaves, pungent tips and rolled not flat leaves. Nubra (*T. T.*); Leh, Ladak (*Schlag.*), W. Tibet (*T. T.*). Is this more than an ecological form?

**P. karka** (Retz.) Trin.

Thonna ad Radjourie (*Jacq.* 1286). Plains to c. 3000', swamps on Mirpur Rd.

**Poa alpina** L.

Very common. Astor, Gilgit, Deosai, Balti., Nubra, Dras, Zanskar, Rupshu, Kashmir: Sonamarg, Kolahoi, Kamri Pass, Burzil Pass, Zoji La etc. etc. 10-16000'.

**P. angustifolia** L.

Astor (RRS 22752), Balti.: Braldo (*H.H.*), Skardo (*Kz.* 9633), Gilgit: Naltar Vy. (RRS 26618, 26623); Bedori, Poonch (RRS 24019); Kashmir: Gulmarg

(RRS 11267), Srinagar (RRS 10850). Lidder Vy. (RRS 21524) etc. 6-12000'.

**P. annua** L.

Leh, Ladak (*T. T.*), Gya (*Kz.* 6449), Yarungshan La, Suru (RRS), Poonch: Serimang-Taulipir (RRS 25609), Poosiana (*Cl.* 27409), Dhuli (RRS 24744), Shish Nag, Kashmir (*Trotter* 150G), 0-13000'.

**P. araratica** Trautv.

Very common. Astor, Deosai, Gilgit, Balti., Ladak, Zanskar, Poonch, Kashmir: Shish Nag, Burzil, Kolahoi etc. 5-15000'.

**P. bactriana** Roshev.

Balti.; Shigar Vy. (*H. H.*), Hushe Vy. (*W. & N.* 6095), Zanskar & Ladak (*T. T.*).

**P. bulbosa** L. (incl. var. *vivipara* Koel.)

Shigar Vy. (*H. H.*); Zanskar: Bok, Pensi La, Rangdum etc. (*Kz.*, Mich.); Kashmir: Common, Kamri (RRS 22636), Matayan-Dras (*Gammie*), Bangla, Pir Panjal Range (*Cl.* 29556), Takht (*Winter.* 287), near Srinagar (*Du.* 10818), 5-14500'.

**P. calliopsis** Litw.

Pamirs (*Alcock*), Sasser, Upper Shyok (*T. T.*), Ladak-Tibet border (*T. T.*), Tsokar Lake, Rupshu (*Kz.* 6612), also Rupshu (*Kz.* 2246a, cited by Bor).

**P. falconeri** Hk. f.

Pahlgam, Kashmir (RRS 8789, cited by Bor).

**P. glabriflora** Roshev. (*P. zaprijagajevi* Ovcz?)

Ladak (*T. T.*, cited by Bor).

**P. infirma** H. B. K. (Syn. *Catabrosa thomsoni* Stapf) Nubra (*T. T.*).**P. jaunsarensis** Bor

Ascent Lanak Pass (*T. T.*), above Doyen, Astor (*Du.* 12460), Naltar Vy., Gilgit (RRS 26621, *Du.* 12392); Hushe Vy., Balti. (*W. & N.*) vel aff.; Leh, Ladak (*T. T.*), below Burzil Chowki, Kashmir (RRS 19837).

**P. koelzii** Bor

Tsakzhun Tso, Ladak (*Kz.* 2385, Type, 2389); Khyang Tso, Rupshu (*Kz.* 2274); Lahul (*Bor*), 15-17000'.

**P. lahulensis** Bor

Rimochogma Nullah, Balti. (*Du.* 12151), Nubra (*T. T.*), Bod Kharbu, Ladak (*Kz.* 6478); Lagong, Zanskar (*Kz.* 5393); Rupshu: Debring (*Kz.* 6567), Hanle River (*T. T.*); Kashmir: Bungas, Muz. (*Inayat* 22700), Shish Nag (*Du.* 13329).

**P. litwinowiana** Ovcz.

Zanskar: Pensi La (*Kz.* 5825); Kangra La (*Kz.* 5498). (These have not been seen by Dr. Bor and I am not certain).



**Poa nemoralis** L.

Naltar Lakes, Gilgit (RRS 26626, 26705), Biafo Gl., Balti. (H.H.), Poosiana, Poonch (Cl. 28439); Kashmir: Kamri (Du. 12526), Minimarg (Du. 14067), Frasnag (RRS 23152 a), Rampur (RRS 12153), Aliabad (RRS 23870) etc. (47-15000'.

**P. nepalensis** Wall. ex Du.

Poonch: Trarkhel (RRS 24900), Taulipir, (RRS 25612).

**P. pagophila** Bor

Yamhar Pass (RRS 12506); Tragbol (RRS 9206); Sonamarg (RRS 6821, 7376), Pahlgam (RRS 7856), Harnag, Gulmarg, etc. 10-17000'.

**P. palustris** L.

Frasnag, Pir Panjal Range c. 9000' by streamlet, (RRS 23152, Kew). New to Kashmir.

**P. polycolca** Stapf

Urdokas, Baltoro Gl, Balti. (Takamura); Kashmir: Masjid Vy. (Du. 13262), Lidder Vy. at 12000' (Du. 13128).

**P. pratensis** L.

Very common. Astor, Deosai, Gilgit, Balti., Ladak, Zanskar (T.T.), Poonch: Rattanpir (Cl. 28378), Bedori (RRS 24872), Kashmir: Gulmarg, Frasnag, Srinagar etc. 5-15000'.

**P. sikkimensis** Bor

Ladak (T.T.).

**P. sinaica** Steud.

Hushe Vy., Balti. (W. & N. 6095).

**P. stapfiana** Bor

Leh, Ladak (T. T., Schlag. 980); Kashmir: common, Kamri, Burzil, Pahlgam, Khillanmarg, Rajdani Pass, Sonamarg, 8-15000'.

**P. stapfiana** Bor var. **micranthera** (Stapf) Bor

Kashmir (Cl. 31057), Pahlgam (Cl. 31061 & 31057) at 13000', Tilail (Cl. 30667).

**P. sterilis** M. Bieb.

Gilgit, Astor, Deosai, Balti., Shyok Vy. (T. T.), Dras, Ladak, Poonch, Rattanpir (Cl. 28285), Alibad (Cl. 28992A), Kashmir: Pahlgam, Kamri Pass, Zoji La, Pirni, Jhelum Vy. etc. 6-15000'.

**P. stewartiana** Bor

Bedori, Poonch (RRS 24871), Gulmarg (RRS 8675), Pahlgam (RRS 21496); Tragbol (Cl. 29244 B), 6-11000'.

**P. supina** Schrad.

Gilgit: Naltar Lakes (RRS 26624), Deosai (RRS 19968, 20094); Balti.: Skardo (W. & N. 5760); Bedori, Poonch (RRS 23754, 24870); Kashmir: Bado-war (T. T.), Gulmarg (Du. 13032), Baltal (Du.

11599), Pir Panjal (Cl. 27410), Lidderwat, Lidder Vy. (Du. 25778 b) etc. 5-12000'.

**P. tibetica** Munro ex Stapf

Wandla to Kalatse, Ladak on Indus (T. T.), Tiamak, Takalang La (Kz. 6470), Shushal (Kz. 2446b); Leh (Kz. 2597a); Hanle, Rupshu (Kz. 2305 f, 2317), 9-17000'. Many specimens of Kz. in Mich.

**P. trivialis** L. var. **glabra** Doell.

Poonch: Serimang (RRS); Shalimar, Kashmir (RRS 23006), Kishtwar (T. T.).

**Pogonatherum paniceum** (Lamk.) Hack.

Mirpur: Nakial (RRS 25800), Jhelum, Ramban, Jumu-Kashmir Rd., Indus Vy., below Nanga Parbat (Troll), Basaoli (Cl. 31576). On damp banks or below springs, 1-6000'.

**Polypogon fugax** Nees

Skardo (T. T.); Mundi, Poonch (Cl. 28254B), Bagh-Raikot (RRS 23811a); Kashmir: Kishen. Vy., Nasim Bagh (RRS 13478), Valley, 5300' (Gammie), Shalimar (RRS 23005), Pahlgam (RRS 21769), Kajci, Padar (RRS 2945), 1-8000'.

**P. monspeliensis** (L.) Desf.

Balti.: Parkutta-Tolti (RRS 20945), Skardo (RRS 20356); Ladak: Leh (Schlag. 1721, Kz. 2598); Bagh, Poonch (RRS 23755a); Gulmarg. Plains to 11000'.

**P. semiverticillatus** (Forsk.) Hylander' (Syn. *Agrostis* in FBI and Bor)

Bagh to Raikot, Poonch (RRS 23811), K. Valley, 5200' teste?; Chittapani Vy., 7500' (Lev. 27437), 2-7500'.

**Puccinellia distans** (L.) Parl.

Pangong Lake, Ladak (Bossard det. E. Schmid).

**P. himalaica** Tzvel.

Ladak: Tsomorari Peldo (Kz. 2216, Type); Tsakzhun Tso (Kz. 2387), Tiamak, 17000' (Kz. 6467); Padam, Zanskar (Kz. 5760), Tsokar, Rupshu (6577, 6580). See Herb. Mich. for Kz. specimens.

**P. gigantea** (Grossh.) Grossh.

Zuetta, Baluch (Norris 49); Lace 3508 as *Pod.*

**P. kashmiriana** Bor.

Kamri Vy., Kashmir, 11-12000' (Du. 12543, Type), Sonamarg (RRS 6890) may belong here; Tsokar, Rupshu (Kz. 6604, 5, 6) Mich.

**P. minuta** Bor ex P. Wend.

Mt. Tirich Mir, Chitral; cf. Tsokar, Rupshu (Kz. 6591) (det. *Catabrosa sikkimensis* by Swallen.)

**P. pamirica** V. Krecz.

Ravine below, Lanak Pass, Ladak-Tibet border (T. T. 149-1847).

**Puccinellia sevagensis** Grossh.

Shebo, Baluchistan (*Wingate*, Kew).

**P. stapfiana** R. R. S.

Salt Lake, Rupshu (*T.T.*), 15, 500'; Parang River to Parang Pass, Ladak-Tibet border (*T.T.*).

**P. tenuiflora** (Griseb.) Scribn. & Merr.

Valley below Hanle, Rupshu (*T.T.*, 17-9-1847).

**P. thomsonii** (Stapf) R. R. S.

Ladak: Leh (*Meebold*), Nima Mud (*Kz.*, 2329), Puga, Rupshu (*T.T.* & *Kz.* 2176) at mineral spring; E. Kangi La bet. Ladak & Zanskar (*Meebold*).

**Saccharum bengalense** Retz.

Gilgit teste? To be expected in Jumu.

**S. officinarum** L.

Sugar Cane is no doubt cult. in Jumu.

**S. spontaneum** L.

Gregarious along streams and on islands throughout our area and ascending to Gilgit, Astor and Balti. Plains to c. 6000'. *Kans.*

**S. filifolium, ravennae & rufipilum**

See *Erianthus*

**Schismus arabicus** Nees

Nomal, Gilgit (*RRS* 26697); Balti.: Skardo (*Cl.* 30006B), below Olding (*RRS* 20999), Blaghar-Kuru (*RRS* 20861); Nubra (*T.T.*); Dras (*T.T.*); Ladak: Rabi La (*Kz.* 6167); Khalotse-Nurla (*T.T.*) 1-9000'.

**S. barbatus** (L.) Thell.

Gilgit (Nakao). Was it the previous species? There is none at Kew from this area.

**Schizachyrium impressum** (Hack.) A. Camus

Kishtwar, Kashmir (*Cl.* 31433). Type and only collection.

**Sclerochloa dura** (L.) P. Beauv.

Uri, Jhelum Vy. (*RRS* 12031), Avantipur (*T.T.*), 1-5000'. Not common.

**Scleropoa rigida** (L.) Griseb. [*Catapodium rigidum* (L.) C. E. Hubb.]

Gilgit (*I.I. Ch.*), Kashmir (*Cl.* 31057).

**Secale afghanicum** (Vav.) Roshev.

Nomal-Naltar, Gilgit (*RRS* 26701). Weed in grain fields.

**S. cereale** L.

Leh, Ladak. Planted by Moravian missionaries. I do not know why this cereal has not come into use in Kashmir.

**Setaria glauca** (L.) P. Beauv.

Common throughout to c. 8000'.

**S. italica** (L.) P. Beauv.

Italian Millet or Foxtail is widely cultivated, especially in the hills. It may be found up to 11000' in Baltistan and Ladak.

**S. pallide-fusca** (Schum.) Stapf & C. E. Hubb.

Nakial in Mirpur. (*M. A. Siddiqi* 27672, Kew, Raw.).

**S. tomentosa** (Roxb.) Kunth

Nakial in Mirpur (*RRS*), 0-4000'.

**S. verticillata** (L.) P. Beauv.

Dal Lake, Kashmir teste?; Khat, Balti. (*Winter.* 6/914, Kew). This last locality seems strange as this is a shade plant usually found in warm climates.

**S. viridis** (L.) P. Beauv.

Common everywhere except in Sind and it is found up to 11000' in Ladak.

**Sorghum durra** (Forsk.) Stapf.

Jowar, Chari, is widely cultivated in the plains and lower hills. Jhelum Vy. Road.

**S. halepense** (L.) Pers.

Common as a weed in maize and sorghum fields ascending to c. 7000'. It may be poisonous to stock in times of drought or frost.

**S. miliaceum** (Roxb.) Snowden.

Gilgit (*Winter.* 976), Srinagar (*Gammie*), Kashmir Vy. 5500' (*Cl.*).

**S. nitidum** (Vahl) Pers.

Thonna ad Rajaori, Eastern Kashmir (*Jacq.* 1287); Poonch (*A. Rashid*, Raw.). Below 3000'.

**Spodiopogon dubius** Hack.

Kashmir to Garhwal, 6-8000' (*FBI* 7:252).

**Sporobolus coromandelianus** (Retz.) Kunth

Is to be expected in Poonch and Jumu as it grows in Hazara and Rawalpindi.

**S. diander** (Retz.) P. Beauv.

Thonna ad Radjaori (*Jacq.* 1316). Also to be expected in Poonch and Mirpur.

**S. piliferus** (Trin.) Kunth

Kashmir to Nepal, 3-8000' (*FBI* 7:251).

**Stipa basiplumosa** Munro

Nubra (*T.T.*); Tsakzhun Tso, Ladak (*Kz.* 2386); Debring, Rupshu (*Kz.* 6566); Tsokar. (*Kz.* 6613), Lanak Pass, Tibet border (*T.T.* 13-9-1847, 14-9-47, Types).

**S. breviflora** Griseb.

Satpura Nala, Balti. (*Du.*), Ladak (*Lance* 320 & *T.T.* 20-7-1848); Hindu Kush & Karak. Mts. (*Nakao*, *Takamura*, *Ogino* etc.).

**S. capillata** L.

Chaprot, Gilgit (*Winter.* 962), Shingo Vy., Balti. (*Du.* 11904, 11927), Dras Vy. (*Du.* 13714), Kharbu-Dras (*RRS* 21127), Ladak: (*Kashyap*, Lahore); Kashmir: Zoji La (*Stoliczka*), Sonamarg (*Jacq.* 980), Tilail (*Cl.* 30723), Bangla, Pir Panjal Range (*Cl.* 29560), 9-11000'.

**Stipa caucasica** Schmalh. (Syn. *S. bella* Drob.)

Ladak (*S. R. Kashyap*, Lahore).

**S. concinna** Hk. f.

Kashmir: Agharwat, above Gulmarg (RRS 8848, 10372). Khillanmarg, below Agharwat (RRS 14808a, 14812).

**S. consanguinea** Trin. & Rupr. (Syn. *S. koelzii* RRS)

Gya, Ladak (Kz. 6432); Spiti (Kz. 7141) in Herb. Mich.

**S. duthiei** Hk. f.

Above Gulmarg, Kashmir, 12000' (RRS 8788, Raw., Calc.).

**S. himalaica** Roshev.

Upper Shingo Vy., Deosai (RRS 22201); descent Deotsu (i.e. *Deosai*) (Winter. 890, 893); Balti.: Chatpani Nullah (Du. 13857). Braldo, Biafo (H.H.), Tschorbat Pass (Schlag. 6067); Purig (Kz. 6046), Ladak (Schlag. 1337), Tankse (Kz. 2458), 9-13000'.

**S. jacquemontii** Jaub. & Spach.

Astor (Du. 12595, 12617); Tog, Ladak (Kz. 2638); Kashmir: common, Tilail (Cl. 30733B), Badwan-Kamri (RRS & IDS 22616); Noonch; Pahlgam (9262). Tragbol (RRS 4338), Zoji (RRS 7527) etc. 8-15000'.

**S. mongolica** Turcz.

Gya, Ladak (Kz. 6425, Mich.), vel aff.; W. Tib. [probably Rupshu] salt grassy plain (T.T.), at 13000' (Lance 321), Lahul (Bor), 9-15000'.

**S. orientalis** Trin.

Pamirs (*Alcock*); Naltar, Gilgit (RRS 26692), Balti.: Satpura Nala (Du.), Ashkoley (Cl. 30311C), Blaghar-Kuru, Shyok Vy. (RRS 20864); Ladak (Schlag., T.T., Kz.); Salt Lake, Rupshu (RRS 442a); Kargiag, Zanskar (Kz. 5529), 8-15000'.

**S. purpurea** Griseb.

Gnari Khorsum, Tib. (Schlag.), near Salt Lake, Rupshu (T.T., Lance 322, T.T.), 15-17000'.

**S. regeliana** Hack.

Tsakzhun Tso, Ladak [as *S. mongolica*] (Kz. 2386); Agharwat, Kashmir (RRS 10454), 13-14000'.

**S. roylei** (Nees) Mez. (Syn. *Stipa orthoraphium* Steud.)

Kashmir-Sikkim (FBI 7:233).

**S. sibirica** (L.) Lamk.

Chalt, Gilgit Agency (RRS 26693), Dras (*Henderson*). Poonch (RRS); Kashmir: very common in meadows and forest openings and very harmful for grazing animals, (3500), 7-10000'.

**S. splendens** Trin.

Nubra Vy. (T.T.); Balti.: Skardo (Cl. 29944B), Shigar (Cl. 30496A), Braldo Vy. (H.H.), Hushe Vy. (W. & N. 6278), Baltoro Gl. (*Nakao*); Gilgit Exped.

(*Giles* 416); Ladak: Leh, Himis Shupka, Spituk; Nurla etc., Abring, Zanskar (Kz. 30001a), 8-12000'.

**S. splendens** var. **gracilis** Bor

Karak. Mts. (Cl. 30097); below Satpara La, Balti (W. & N. 6330).

**S. szowitsiana** Trin. ex Hohen.

Astor Exped. (*Giles* 417); Astor-Bunji (*Schmid*); Balti.: Shingo Vy. (Du. 11927), Ashkoley (Cl. 30311A), Braldo (H.H.), Hushe (*Schlag.* 5656); Matayan-Dras (*Gammie*) 5-10000'.

**Tetrapogon villosus** Desf.

Indus Vy. (*Troll*), Gilgit: Nomal, Baltit, Hunza (*Schmid* 1924); Balti.: Kiris (W. & N. 5898); Kuru-Kiris & Kuru-Doghoni; Kolti and no doubt in Jumu. Plains to c. 7000'.

**Themeda anathera** (Nees) Hack. s.l. incl. vars.

Kashmir Province: Tangmarg (RRS 10545), Ramban, Jumu-Kashmir Rd. (RRS 10740), Rajaori (*Jacq.* 1370), Vestervonne (*Westerwan*) *Jacq.*, Sind Vy. (Cl. 39037A), Kajei Padar (RRS 2945a) etc. 2-7000'. A fine fodder.

**Thysanolaena maxima** (Roxb.) O. Ktze.

Kotli, east of Poonch, cliff, 2-3000' (RRS). Near the western limit of its range.

**Tragus biflorus** Schult.

Kashmir: Jhelum Vy. Rd. (*Lev.* 27448), Tawi Vy. (*Gammie*), Jumu-Kashmir Rd. (RRS 12499), tenth mile. Plains to c. 3000'.

**Trikeria hookeri** (Stapf) Bor

Nubra (T. T.); Rupshu: Kuzzil, in sand (Kz. 2328k), Hanle (T. T.), 9-14000'.

**Tripogon filiformis** Nees ex Steud.

Taulipir, Poonch, dwarf annual (*A. Rashid*), Jumu-Kashmir Rd. (RRS 10697), usually 4-8000'.

**T. purpurascens** Du. (Syn. *T. hookerianus* Bor)

Kashmir Prov.: Ferozepur Nulla (RRS 14798), Naranag (RRS 18131), Sind Vy. at 7000' (*Lev.* 27397 in *Clarkes* nos.), Pahlgam (RRS 21625), Poonch, Mirpur, 2-8000'.

**Trisetum aeneum** (Hk. f.) RRS

Astor Vy. above Rattu (RRS 18470), Deosai (Du.), Tilel Dt.: Kun Patthar & Lahan Gali (RRS), Kamri Pass (RRS 18694, 18700) Badwan (RRS 19254), Tajwas Nala above Sonamarg (Du. 13646), Tulain above Phalgam (RRS 21829), above Gulmarg (RRS 10635), common on alpine meadows, 8-13000'.

**T. clarkei** (Hk. f.) RRS

Astor Dt.: Rama (RRS 2290a), above Rattu (RRS 18739); Kashmir Prov.: Fras Nag (RRS 23198), Budrawur (Cl. 31514), Pahlgam (RRS 21516, 21717), Gulmarg (RRS 10602a) etc. 8-12000'.

**Trisetum spicatum** (L.) Richt.

Very common at high altitudes, Deosai, Gilgit, Balti., Ladak, Zaskar and throughout Kashmir Province, 3-6000 m.

**Triticum aestivum** L.

Wheat is cultivated throughout, from the plains to 12000' in the inner Mts. Several types are used.

**Urochloa panicoides** P. Beauv. var. **panicoides**

Common monsoon grass in the plains and up to c. 5000'; Nawal Nadi in Poonch (RRS); Rajaorie, Jumu Province (JLS).

**U. panicoides** var. **pubescens** (Kunth) Bor

Similar to the above variety. Distribution: Jhelum Vy. Rd. (RRS 10078) at Garhi.

**Vetiveria zizanioides** (L.) Nash.

Domel, Jhelum Vy. Rd. at c. 2300'. This is a plains species growing in wet soil.

**Vulpia myuros** (L.) Gmel.

Trarkhel, Poonch (RRS 24896); Titwal, Lower Kishen. Vy. (RRS 17741), Rampur Jhelum Vy. (RRS 12127); below Gurais (RRS 4297), Sonamarg (RRS 13623), Srinagar (Du. 10844), Kangan (RRS 9689), a weed in grain fields, 3-9000'.

**Zea mays** L.

Maize is one of the most valuable crops in our area and in some places the chief crop. Plains to c. 8000'.

## DUBIAE

**Elymus chinensis** (Trin.) Keng.

Tankse, Shyok Vy., 4275 m (Hend. & Hume).

**E. giganteus** Vahl

Symbol. Bot. 3:10, 1794. Central Karak. Mts., Askole 3100 m (Nakao), Paiju, 3300 m (Nakao), det. Ohwi.

**Poa attenuata** Trin.

This taxon is omitted in Bor's Grasses but Williams of the B. M. refers two specimens from the Baltoro Glacier, Central Karakorum collected by Desio to this taxon. [*P. attenuata* of the FBI seems to be scattered among several species in Bor].

**Stipa basi-plumosa** var. **long-aristata** Munro in Hk. f. FBI 7:299.

W. Tib. (T.T.) & Toche Phirche, Justice Douglas in Wash. DC. Teste N. L. Bor is much closer to *S. purpurea* than to *S. basi-plumosa*.

**S. munroana** Bor

"Covers the Pamirs" (Alcock) and to be expected in Ladak.

**S. richteriana** Kar. & Kir. var. **effusa** Hausskn. & Born.

Upper Yarkhun Vy., Chitral (F. Schmid 24), Shingo Vy., Balti. (Du. 22201).

**S. subeffusa** Ohwi.

Minipin-Chalt, Nagar, Gilgit Agency (Nakao, Type); Hindu Kush, Nazbar Vy. (Honda); Yasin (Ogino), Dawalgan (Ogino). No specimen has been sent to Kew for comparison.

## KASHMIR GENERA WITH THE MOST TAXA

*Agropyron* 25, *Agrostis* 11, *Alopecurus* 7, *Aristida* 7, *Bothriochloa* 5, *Bromus* 15, *Calamagrostis* 8, *Cymbopogon* 6, *Digitaria* 14, *Eragrostis* 8, *Erianthus* 5, *Festuca* 13, *Hordeum* 8, *Lolium* 7, *Melica* 8, *Oryzopsis* 9, *Pennisetum* 6, *Poa* 29, *Puccinellia* 8, *Setaria* 6 and *Stipa* 19.

## SUMMARY

Adding up the number of taxa listed here the total comes to 396. As a number of varieties and a few hybrids are included in the total the number of species is about 360. I presume however that a number of species have been overlooked and it may well be that when the area is thoroughly known that it will be shown to have about 400 species. The number of genera is large, 121, being known so far. In making my totals I was surprised to find that no less than sixty genera are represented by a single species. The grasses found in Kashmir are a mixed lot. A few as far as known at present are endemic and some are cosmopolitan. There are tropical grasses, temperate Himalayan grasses, alpine species, Mediterranean species, Central Asian and Tibetan.

## REFERENCES

- BOR N. L. *The Grasses of Burma, Ceylon, India and Pakistan*. Pergamon Press, London, 1960.
- AND A. MELDERIS. *Gramineae in Symbolae Afghanicae* 6: 36-94, 1965 (Does not list Kashmir plants but there are some name changes affecting grasses of Kashmir).
- HARTMANN HANS. Beiträge zur Kenntnis der Flora des Karakorum. *Bot. Jahrb.* 85(2): 259-328, 1966.
- Kitamura, S. Plants of West Pakistan and Afganistan, Kyoto University. *Results of expedition to the Karakorum and Hindu Kush*, 1955, 1964.
- STEWART, R. R. The Flora of the Deosai Plains. *J. Pak. For.* 11(3): 225-295, 1961.
- WEBSTER GRADY L. AND EUGENE NASIR. The Vegetation and Flora of the Hushe Valley [Karakorum Mts.]. *Ibid.* 15(3): 201-234, 1965.