

NOTES ON THE NOMENCLATURE OF SOME GRASSES

II

by

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In a former article¹⁾ many new combinations and critical observations were published on various grasses all over the world. New investigations in critical genera together with the study of the existing literature made it necessary to accept various other arrangements in this important family. The old system of Bentham, once the basis for a total review, is now more and more modified and many tribes are purified and more exactly limited. The most recent system we have at the moment, is Hubbard's treatment of this family in the work of Hutchinson: The families of flowering plants. Vol. II. Monocotyledons. The grasses are divided there into 26 tribes. We have here the great advantage that aberrant genera, which are not easy to place into one of the formerly accepted tribes, are given as representatives of distinct new tribes. The curious tropical genus *Streptochaeta* f. i. constitutes the tribe of the *Streptochaeteae*. It is quite acceptable that tribes may consist of but one genus, especially when such a genus is a totally deviating one and cannot be inserted into one of the already existing ones. Such tribes are f. i. the *Nardeae* with the only northern genus *Nardus*, and the Mediterranean tribe of the *Lygeae* with the only genus *Lygeum*, one of the Esparto grasses. It is therefore no wonder that Hubbard creates a new tribe, the *Anomochloae*, for one of the most curious tropical grasses of the world. This tribe is represented by only one species, the *Anomochloa marantoidea* Brongn., with a very curious habit and no evident affinities with any other grass. The same can be said of the aberrant genus *Pariana*, the only member of the tribe of the *Parianeae*. The most valuable advance is the creation

¹⁾ Blumea III, Nr. 3, 1940, 411—480.

by Hubbard of the tribe of the *Thysanolaeneae* with as the only member our well-known tropical and subtropical East-Asiatic genus *Thysanolaena*.

Although this new subdivision of the family of the grasses gives us a great satisfaction, it does not mean that the system is complete and certainly many changes are to be given before we will have a totally correct and acceptable classification of the grasses.

One of the very good ideas in Hubbard's work is the purified tribe of the *Chlorideae*, that mixtum of genera formerly thrown together on account of apparent agreements in the structure of the inflorescences. Such well-known former members of the *Chlorideae* as *Eleusine*, *Dactyloctenium* and *Leptochloa*, are now transferred to the *Eragrosteae* and at the same time the tribe of the *Festuceae* is purified, although the latter is at the moment not yet quite sharply limited.

This tribe of the *Festuceae* has in the future to be reorganized, as is proposed by the Russian taxonomist Nevski. I think that too little attention is given to Nevski's ideas, although they are very good and quite in accordance with my own investigations.

The subtribe of the *Melicinae* of Hubbard becomes therefore a tribe, the *Meliceae*, not only with the genus *Melica*, but including 4 other genera, *Glyceria*, *Pleuropogon*, *Schizachne* and *Anthochloa*. This is a more natural arrangement, very acceptable to all agrostologists familiar with those genera.

The remaining *Festuceae* are now to divide into the actual *Festuceae* and the *Bromeae*, the latter is thus a distinct, equivalent tribe, having a distinct relationship to the *Aveneae*. The many reasons for such an opposition are given in extenso by Nevski. The new tribe of Nevski's *Bromeae* has various members, f. i. the genera *Boissiera* and *Littledalea* and especially the genus *Bromus* in the sense as it is developed, since it was created in the year 1753. If we study this genus in the broad sense, as found in nearly all our manuals, it is always very striking that it is so enormously heterogeneous and consists of the most different elements. It is therefore easily understood that many taxonomists were not content with such a monstrous genus and since Linné described the genus *Bromus*, his successors have now and then given names to groups and proposed such groups as genera. Stapf gave in recent times a very critical review of the whole genus *Bromus* in Kew Bulletin (1928) p. 209.

As to the actual genus *Bromus* we can neglect the Linnean ideas on the genus given in 1737 in the *Flora lapponica*, as our starting point is Linné's *Spec. Plant.* ed. 1, 1753. Here the first described

species is *Bromus secalinus* L. and in the modern typification of the genera this species is accepted as the type of the genus *Bromus*. This gives us at the same time the satisfaction that a great many species of the genus can without any difficulty be placed in this restricted genus *Bromus*. The taxonomic characters of the annual *Bromus secalinus* L. agree with many other annual species of *Bromus* such as *Bromus arvensis* L., *B. brizaeformis* F. et Mey., *B. hordeaceus* L., *B. mollis* L., *B. racemosus* L., *B. commutatus* Schrad., *B. squarrosus* L., *B. japonicus* Thunb., *B. scoparius* L., *B. macrostachys* Desf. and others. At the same time it is consequently necessary to accept the characteristic deviating species as not belonging to this genus *Bromus* s. strict. *Littledalea* Hemsl. is thus not a *Bromus* at all, it has pilose lodiculae and lemmata up to 3 times longer than the paleae and many other deviating taxonomic characters; moreover, the species of this genus are perennials. For the same reasons we cannot insert *Bromus unioloides* H. B. K. in our purified genus *Bromus*, but we accept for it Beauvois's genus *Ceratochloa*, with *C. cathartica* (Vahl) Henr. nov. comb. as type, based on *Bromus catharticus* Vahl. As is known this genus is characterized by the complicate-keeled glumes and lemmata and the deeply furrowed ventral side of the caryopsis. The perennial species formerly placed in the genus *Bromus* are to accept as a distinct genus. Such species are f. i. *Bromus erectus* Huds. and *B. ramosus* Huds. in Europe. They were formerly accepted as a distinct section *Festucaria*. As a genus it was, however, published by Panzer in Denkschr. Ak. München, 1813, p. 296. The type species is to be accepted as *Zerna aspera* Panz. Panzer's figure agrees with this genus *Zerna*. *Bromus asper* Murr. is the perennial species already known as *Bromus ramosus* Huds. (1762). We have thus in the Netherlands 4 species of the genus *Zerna*: *Z. erecta* (Huds.) Panz., *Z. ramosa* (Huds.) Nevski, *Z. Benekeni* (Lge.) Lindm. and *Z. inermis* (Leyss.) Lindm.

In the Asiatic region we have the *Bromus Richardsonii* Link, which becomes *Zerna Richardsonii* (Link) Nevski and a great many other species already treated by Nevski. In Java we have but one species accepted by me as *Zerna insignis* (Buse) Henrard nov. comb. based on *Bromus insignis* Buse. The above mentioned *Bromus Richardsonii* Link is according to American botanists only a form of the widely distributed *Bromus ciliatus* L. The latter is *Zerna ciliata* (L.) Henr. Other species are *Zerna purgans* (L.) Henr. nov. comb. based on *Bromus purgans* L.; *Zerna vulgaris* (Hook.) Henr. nov. comb. based on *Bromus vulgaris* (Hook.) Shear; *Zerna latiglumis* (Shear) Henr. nov. comb.

based on *Bromus purgans latiglumis* Shear, and *Zerna anomala* (Rupr.) Henr. nov. comb. based on *Bromus anomalus* Rupr. ap. Fourn. Mex. Pl. II, p. 126. Allied to the European *Zerna ramosa* (Huds.) Nevski is the Himalayan *Zerna himalaica* (Stapf) Henr. nov. comb. based on *Bromus himalaicus* Stapf. *Zerna Mairei* (Hack.) Henr. nov. comb. is based on *Bromus Mairei* Hack.

On account of the *Bromus ramosus* Hudson described in 1762 the *Bromus ramosus* L. from the year 1767 must have another name. This *Bromus ramosus* L. is a *Brachypodium* and was placed by Roemer and Schultes in 1817 under *Brachypodium ramosum* (L.) R. et S. This is only correct, if there is before the year 1817 no other valid name. In 1798 there was, however, described a *Festuca caespitosa* Desf. Fl. Atl. p. 91, which is Roemer and Schultes's species. Hence we have to make the new combination *Brachypodium caespitosum* (Desf.) Henr. based on *Festuca caespitosa* Desf.

If we combine this species with the *Brachypodium phoenicoides* R. et S. (1817) accepted by Roemer and Schultes as distinct from their *Brachypodium ramosum*, it is evident that *Brachypodium phoenicoides* has priority, because it is based on *Festuca phoenicoides* L. Mantissa. I (1767) p. 33.

The conclusion in this case is that a valid name of a plant depends in many cases on the rank that we attribute to it. We are not yet at the end of our contemplations on the *Bromeae*, because a very natural group of *Bromi* is grouped around the *Bromus sterilis* L. This group is characterized and differentiated from the actual genus *Bromus* by the unequal glumes, the lower 1-nerved, the upper 3-nerved and by the cuneate spikelets, when they are mature. This group, to which belong further our well-known *Bromus tectorum*, *B. madritensis* L., *B. rubens* L., *B. fasciculatus* Presl. and *B. rigens* L., must, accepted as a genus, bear the name of *Anisantha* Koch. All the species are transferred by Nevski to that genus. For reasons of priority he could not accept the *Bromus villosus* Forsk. (1775) non Scop. (1772) or *Bromus maximus* Desf. (1798). Generally *Bromus rigidus* Roth (1790) is accepted as the valid name for this species. Nevski used the name *Bromus rigens* L. (Mantissa, 1767) making the combination in *Anisantha*; at the same time he accepts the *Bromus Gussonii* Parl. as specifically distinct from *Bromus rigidus* Roth.

His critical treatment of this *Bromus Gussonii* is directed against Cugnac and Camus's supposition that this plant should be a hybrid between *B. rigidus* and *B. sterilis*.

Camus and Cugnac based their ideas of the supposed hybrid on the morphological characters, which seem, as they accept, to be deviated from the supposed parents *B. sterilis* and *B. rigidus*, and secondly on the geographical distribution. As to the morphological characters it is evident that these not always indicate a hybridisation especially as the length of the glumes and lemmata of the supposed hybrid are in accordance with *Bromus rigidus* and do not indicate an influence of *B. sterilis*. As to the geographical distribution we agree that this gives us in many cases very important deductions. But in such a case we must know the whole area of the two species and of the supposed hybrid.

Bromus rigens (rigidus) is a species of a more western distribution in the Mediterranean region and is not known from Asia Minor, the Crimea and the Caucasus, where it is replaced by *B. Gussonii*. It is therefore more probable that *B. Gussonii* is the eastern, *B. rigens* the western species and that there, where the two areas overlap, we may find hybridisation. *Bromus rigens*, occurring only in N. Africa and Southern Europe, cannot be one of the parents of *Bromus Gussonii*, as the former does not occur in the large eastern area, where *B. Gussonii* is common. Nevski is thus quite justified in accepting *Bromus Gussonii* as a non-hybrid plant and takes it as a distinct species. Having more sharply limited the genera we have treated here, there remain now a few aberrant species. These are not to incorporate into one of the genera mentioned above and ought to be treated separately.

First of all the very characteristic *Bromus Trinius* Desv. described in Gay, Flora Chil. (1853) p. 441. This species is unique among the *Bromi* by the awn, which is an arista perfecta, consisting of a twisted column and a geniculate subula. Moreover, this species has very minute lodicules only. By these characters we have, morphologically speaking, a very near relationship with the tribe of the *Aveneae* and especially with the genus *Trisetum* (compare also the caryopsis "villous at the apex"). It was therefore very natural that the great Russian agrostologist Trinius described the same species as *Trisetum hirtum* Trin. in Linnaea X (1835). This is the valid name. It is the only species in the new genus *Trisetobromus* Nevski. We are quite satisfied that such a characteristic and deviating plant of the tribe of the *Bromeae* is placed in a distinct genus, which is at the same time quite in accordance with its curious neogaeon distribution.

There remain now but two aberrant grasses of the tribe, e. g. *Bromus gracillimus* Bunge and *Bromus arduennensis*. They are consequently

accepted by Nevski as belonging to two distinct genera. For *B. arduennensis* the genus *Michelaria* Dumort. (1823) is accepted. This genus is certainly much allied to the actual genus *Bromus*. The *Bromus gracillimus* is an Asiatic species with minute 4—5-flowered spikelets, the lemmata are only 4—4½ mm long and the smallest in the tribe. It is an annual plant and so deviating that a new genus for such a plant is justified. This was created by the Russian botanists Kreczetowicz and Vvedensky, who named this genus *Nevskiella* with the only species *N. gracillima* (Bge) K. et Vved. The great advantage of such a division of the tribe of the *Bromeae* is that the genus *Bromus* as accepted by Nevski is not only sharply limited, but at the same time the various species of this genus are better to be classified. We know that Holmberg has given one of the best classifications of this genus in the year 1924. Nevski has proposed some alterations in this group, which make it simpler and more surveyable.

We learned thus in the group mentioned above, how important it is to limit the various genera properly. Only in such a case should monographical studies be prepared. A monographical study of the genus *Koeleria* as given in the magnificent work of Domin (Bibl. Botanica 1907) is from the beginning already denounced, because that author did not realize the differences between the allied genera in this group. Many species of *Koeleria* in Domin's work are simply species of *Trisetum*, f. i. nearly all his species of the *Dorsoaristatae* Dom. *Koeleria*, as it is accepted by Domin, is an unnatural complex of annual and perennial species. *Trisetum* and *Koeleria*, of course, are much allied, there exist even hybrids between them, but quite as in *Lolium* and *Festuca* this is no reason to unite such genera. A more natural arrangement is therefore that *Trisetum* consists only of perennial species and quite the same can be said of the actual genus *Koeleria*. The annual species of *Koeleria* represent the genus *Lophochloa* Reichb. f. and the annual *Trisetum*-species belong to the genus *Trisetaria* Forsk. In the genus *Koeleria* one of the most common and most distributed species bears in our manuals still a wrong name, because Domin did not accept it. But Domin's arguments are not correct and against the principles of taxonomy and nomenclature. The correct name for this grass is *Koeleria cristata* (L.) Persoon.

The type of *Bromus japonicus* Thunb. was a plant with glabrous spikelets. A rather common form is a variety with densely villous or pubescent spikelets, which was named by Ascherson and Graebner var. *velutinus*, based upon *Bromus velutinus* Nocc. et Balb. (1816). There

was, however, already a *Bromus velutinus* Schrader (1806), which belongs to *Bromus secalinus*. Stapf recognized this already and accepted for this variety the name *vestitus* based upon *Bromus vestitus* Schrader (1821). Stapf's variety was, however, given under *Bromus patulus* M. et Koch, which is a synonym of Thunberg's species. Placing Schrader's *Bromus vestitus* under *Bromus japonicus* the correct name of the variety becomes ***Bromus japonicus* Thunb. var. *vestitus* (Schrad.) Henrard nov. comb.** The name *Chiapporianus* De Not. ap. Parlatore given in 1848 and accepted by Penzes is invalid.

The genus *Lasiochloa* was published by Kunth in the second volume of his *Révision des Graminées* in the year 1829, where 3 species are given with very long descriptions and plates with analyses. After the first species *Lasiochloa ciliaris* (Thunb.) Kunth, based upon *Dactylis ciliaris* Thunberg, the genus is characterized on p. 556 and diagnosed versus *Dactylis*. This is a valid publication of a genus, although Kunth described it once more in 1833 in his *Enumeratio*.

Unfortunately Kunth examined only a specimen in the Berlin Herbarium bearing the name *Dactylis ciliaris* Thunb., which was not the type of Thunberg. The real type of *Dactylis ciliaris* Thunb. is a totally different plant and belongs to the genus *Brizopyrum*, compare Stapf in *Flora Capensis* p. 703. Kunth's *Lasiochloa ciliaris* based on the *Dactylis ciliaris* Thunb., but described and figured as a totally different species of *Lasiochloa*, must bear another name in that genus. This *Lasiochloa* is at the same time Thunberg's *Alopecurus echinatus*; the new combination ***Lasiochloa echinata* (Thunb.) Henr.** is here proposed for the only annual species of this genus.

Panicum oligotrichum was published by Figari and De Notaris in *Memorie della Reale Accademia delle Scienze di Torino*, Ser. II, Tom. XIV, in an article *Agrostographiae aegypticae fragmenta. Pars. II. Graminia Aegypti et Nubiae* (exhib. 26 decembris 1852), p. 333, plate X (with analysis). This species is moreover = *Helopus bolbodes* Steudel (1854) = *Panicum bolbodes* (Steud.) Schweinf. = *Urochloa bolbodes* (Steud.) Stapf. The volume XIV of the *Memorie*, mentioned above, bears on the title page the year 1854, but in reality the various papers were issued already in the foregoing years and the name *Panicum oligotrichum* has therefore priority.

Steudel's *Synopsis* bears on the title page 1855, but the first part was published in Jan. 1854. In this part *Helopus bolbodes* was published. I therefore wish to make the new combination ***Urochloa oligotricha* (Fig. et De Not.) Henr.** based upon Figari and De Notaris's species.

Brachiaria paspaloides (Presl) Hubbard var. *tomentosa* Henr. nov. var. — differt a typo praesertim vaginis foliisque dense molliterque villosis, pilis sericeis appressis vel erecto-patentibus; spiculae ut in typo glabrae.

SAMOA ISLANDS: Upolu, Mulifanuaküste, III. 1894 leg. Dr. Reinecke no. 265. Typus in H. L. B. sub no. 908, 92 — 1628.

This plant was named *Panicum prostratum* Lamk. The typical *Brachiaria paspaloides* which was formerly better known as *Panicum ambiguum* Trin. is more glabrous, commonly the sheaths are hairy only along the margins or slightly so on the summit, and the blades are glabrous or very sparsely hairy only. In the variety all the vegetative parts with exception of the internodes are densely tomentose.

There occurs in the New World a characteristic group of perennial species, which is accepted by Hitchcock and Chase in their study on the North American species of *Panicum* as the group of the "diffusa". This group is also represented in South America and in the tropics of the Old World. Their members are not only characterized as perennials, but they all have a very effuse panicle and a densely compact growth.

Members of this group are *Panicum campestre* Nees, *Panicum Bergii* Arechav., *P. pilcomayense* Hack., *P. quadriglume* (Doell) Hitchc., *P. Ghiesbrechtii* Fourn. and a new one, I will describe here.

Panicum diffusum Sw. from the West Indies is the typical species of this group.

The various species mentioned here are often confounded in collections and it is not so easy to separate them. *Panicum campestre* Nees f. i. was given by Balansa as an inhabitant of Indo China. Specimens mentioned by him and seen by me belong, however, to *Panicum trypheron* Schultes, a species given as an annual plant by Hooker and afterwards by Camus, but it is certainly a perennial, as noted by Hitchcock and verified by me. *Panicum trypheron* is the Old World member of the group with glabrous nodes and glabrous internodes, but with solitary panicle branches and it is therefore quite distinct from all the other members of the „diffusa”. To recognize the species of this group we must at first indicate some characters of the panicle. Various species have panicle branches always placed singly along the rhachis and the lower branches of a panicle are not longer than the other ones, so that the panicle is ovoid or oblong in outline. At the same time the axils of the panicle branches are naked, thus devoid of long white hairs. These characters are to be found f. i. in *Panicum diffusum*, *P. quadriglume* and *P. Ghiesbrechtii*. Other species have verticillate

panicle branches, i. e. more than one on each node of the rhachis, the lower ones are nearly as long as the whole panicle and the form of the latter thus becomes much broader than long, whereas the axils are often provided with a beard of long white hairs. To this group belong *Panicum campestre* and *P. Bergii*, and also the *Panicum pilcomayense*, although this character in the latter is not so striking as in the other two species. Hackel's *Panicum pilcomayense* has, moreover, glabrous nodes, the West Indian *Panicum diffusum* with solitary panicle branches has appressedly pubescent nodes only, the hairs very short. The type of *Panicum pilcomayense*, formerly seen by me, is nearly glabrous throughout and misidentified by Hitchcock, who mentions it from British Guiana as collected by Schomburgk. Schomburgk's number 656 is a very hirsute plant with bearded axils of panicle branches and hirsute internodes and belongs to *Panicum campestre* Nees. Hackel and Lindman described a var. *leiophyllum* of *Panicum Bergii*. Lindman gave a good description and a beautiful plate. From this description and the plate the plant is easily recognizable by its solitary panicle branches with glabrous axils and its long bearded ring just above the nodes, the hairs longer than the diameter of the nodes. It is impossible to bring this interesting variety in connection with *Panicum Bergii*, which is at once to distinguish by the very different form of the panicle with bearded axils and by the very long narrowly inrolled leaves. This variety proved to be identical with a new species I had among Balansa's grasses of Paraguay. It is also much allied to *Panicum quadriglume* Hitchc., which is very curious by its two sterile lemmata. *Panicum quadriglume* is probably a teratological species, with its two sterile lemmata, the spikelets thus consist of 4 outer scales and a hermaphrodite flower, whereas there are in *Panicum* as delimited at present, but 3 outer scales, the fourth scale in *Panicum quadriglume* is quite the same as glume III and not a palea of a second flower. If we have here a teratological case, the species without this 4th scale ought to exist and must then unfortunately bear the name of *Panicum quadriglume*. It had been better, if Hitchcock had given another name to the variety *quadriglume* of Doell, when he gave it specific rank. I am therefore obliged to describe Balansa's plant as a new species under the name of

Panicum peladoense Henr. as follows: Perennis, caespitosa; culmi glaberrimi, nodis paucis; pars inferior nodorum glabra, leviter inflata, pars superior corona pilorum praedita; laminae lineares, sensim in apicem angustatae, inferiores 10—15 cm longae, 3—4 mm latae, superiores 7—

8 cm longae, glabrae sed basi pilis paucis longis margine ciliatae; vaginae pilis sparsis, marginibus ciliolatae, ligula perbrevis, minute ciliolata; panicula exserta, ad 10 cm longa, 5—8 cm lata, ramis solitariis, planiusculis, ramulis capillaceis angulatis, scabriusculis, in axillis glabris; spiculae 3 mm longae, sparsae, flavidae vel superne coloratae, lanceolatae vel obovato-lanceolatae, acuminatae, ad maturitatem compressae et hiantes, gluma inferior spiculae circa medium aequans vel paulo superans, 5-nervis, gluma secunda et lemma sterilis ovato-oblongae, plurinerves, lemma fertilis elliptica vel obovato-elliptica, 2 mm circa longa, laevissima, nitidissima, badio-nigra.

PARAGUAY: Cerro-Pelado, prope Paraguari, 3 avril 1883, leg. B. Balansa no. 4357. Typus speciei in Herb. Lugd. Bat. sub no. 908, 93—2087.

Other specimens belonging to this new species are:

PARAGUAY: Pentes rocailleuses et herbeuses du Cerro-Peron près de Paraguari, 29 Oct. 1876, leg. B. Balansa no. 14. This is a very fine specimen, perfectly agreeing with the type.

ARGENTINA: Posadas, Gobernación de Misiones, elemento de las praderas virgines, 4 Feb. 1922, leg. L. R. Parodi no. 4513. These are more depauperate specimens with spikelets only up to 2.8 mm long.

BOLIVIA: Cuesta de los Monos, 1400 m, III. 1911, leg. Th. Herzog no. 1896 j. Formerly mentioned by me in my work on the Bolivian grasses, collected by Herzog as *Panicum Bergii* Arechav. var. *leiophyllum* Hack. and Lindman, which is, as already indicated, conspecific with my new species. These specimens agree with Parodi no. 4513 in having spikelets a trifle smaller than in the type.

Nees described in the year 1829 from Brazil a *Panicum capillare* (Agrost. brasil. p. 198) collected by Sellow at Montevideo. Nees said that his plant was a perennial. A duplicate of this plant in our Herbarium is indeed a perennial plant and belongs to *Panicum Ghiesbrectii* Fourn., having yellow fruits, the blades are smaller and narrower than commonly is the case, the spikelets are, however, 3 mm long.

The Old World species *Panicum trypheron* Schultes belongs as to the characters of the panicle branches and the glabrous axils in the neighbourhood of this *P. Ghiesbrectii* and also to *P. peladoense*. The synonyms of *Panicum trypheron* are as follows: *Panicum trypheron* Schultes Syst. Veg. Mantissa Vol. II (1824) p. 244!, based upon *Panicum tenellum* Roxb. Fl. Ind. ed. Carr. et Wall. I (1820) no. 41, p. 306. The name changed by Schultes on account of the earlier *Panicum tenellum* Lmk. *Panicum Roxburghii* Sprengel Syst. I (1825) p. 320 is based

upon the same *Panicum tenellum* Roxb. *Panicum trypheron* is at once to distinguish from *Panicum campestre* by its solitary branches of the panicle and by its glabrous nodes. It was often identified with the annual *Panicum psilopodium* Trin. The character annual versus perennial in this group is very important for the identification of various species of *Panicum*, as was demonstrated by Hitchcock and Chase.

Key to the species of the group of the diffusa.

- 1a. Second glume and sterile lemma not elongated, only slightly longer than the fruit 2
- b. Second glume and sterile lemma elongated, at least three times as long as the fruit *P. capillarioides* Vasey
- 2a. Spikelets less than 4 mm long 3
- b. Spikelets long, at least 4 mm long or even longer *P. lepidulum* Hitchc. et Ch.
- 3a. Blades not over 1 cm wide, or mostly narrower; plants not so very robust; panicle diffuse and open 4
- b. Blades 2 cm or more wide, plant very robust, panicle narrow and compact *P. hirsutum* Sw.
- 4a. Lower panicle-branches geminate or verticillate, the lower ones nearly as long as the whole panicle, the latter thus nearly as long as broad . . . 5
- b. Panicle-branches solitary, or if sometimes with an additional second branch, always much shorter than the whole panicle, the latter thus ovate-oblong in outline, axils of branches always glabrous or with a minute very short pubescence 7
- 5a. Axils of panicle-branches with a tuft of long white hairs, the upper ones sometimes glabrescent, nodes bearded, plants very hirsute 6
- b. Axils of panicle-branches glabrous, no long white hairs, nodes glabrous, plant nearly glabrous throughout *P. pilcomayense* Hack.
- 6a. Blades narrow, inrolled or at least with inrolled margins, rather long *P. Bergii* Arechav.
- b. Blades broader, quite flat, internodes, sheaths and peduncles very hirsute by tubercle-based hairs *P. campestre* Nees
- 7a. Nodes adpressedly pubescent or bearded with spreading hairs 8
- b. Nodes quite glabrous, panicles rather long with distant ascending branches *P. trypheron* Schultes
- 8a. Nodes densely hirsute or with a ring of hairs longer than the diameter of the node 9
- b. Nodes adpressed-pubescent only, the hairs very short 11
- 9a. Spikelets with 2 sterile lemmata *P. quadriglume* Hitchc.
- b. Spikelets with only 1 sterile lemma 10
- 10a. Blades very hirsute, nodes bearded or hirsute all over, fertile lemma yellowish *P. Ghiesbrechtii* Fourn.
- b. Blades very sparingly hirsute or with some long hairs only along the margins, fertile lemma dark brown at maturity *P. peladoense* Henr.

- 11a. Plants erect, blades broader than 3 mm, mostly up to 5 mm wide, plants very glaucous 12
- b. Plants spreading or ascending, blades very narrow, filiform or up to 3 mm wide, plants not glaucous P. diffusum Sw.
- 12a. Spikelets 3—3½ mm long, rarely longer, blades shorter than the plants, panicles much exceeding the leaves P. Hallii Vasey
- b. Spikelets 2—2.6 mm long, blades as long as the plant or longer, panicles usually exceeded by the uppermost blade P. filipes Scribn.

Another very difficult genus is *Axonopus*. In the course of a preparation of a monographical work on *Digitaria*, I had also to identify Sprengel's *Digitaria aurea*, which belongs, however, to the allied genus *Axonopus*, as it is understood in modern times. The name *aureus* goes back to Beauvois and since *Axonopus aureus* was mentioned by him in the year 1812, there is an enormous contradiction in the literature as to what plant Beauvois had in mind. Beauvois himself was not quite sure of his new genus *Axonopus*, being as we know in reality a mixture of various things. In recent times, *Milium compressum* Sw. being accepted as the type of the genus *Axonopus*, the question is settled. In Beauvois's work we find a note by him, telling us that through the generosity of Mr de Lessert, he received a plant, which ought to belong to his genus *Axonopus*. This *Axonopus aureus* Beauv. is accepted by American agrostologists as published and they identify this plant with the plant figured by Trinius in his *Icones* in the year 1828. There are now two objections against this American concept of the plant of Beauvois.

The type of Beauvois is lost, a specimen so named by him could not be found in the Delessert Herbarium. Moreover, we cannot accept that *Axonopus aureus* Beauv. was validly published, because no botanical description was given in the year 1812. Chase noted that the author's observation, that the spikelets are provided below with an involucre of short golden hairs, points conclusively to one of the species with a cluster of golden hairs subtending the spikelets and she adds that following Trinius in his *Icones*, the common species with the smaller and glabrous spikelets is taken as the true *Axonopus aureus* Beauv.

This method propagated by the American author is quite arbitrary, as in absence of a type specimen, the informal observation of Beauvois points to a number of species, each having such a cluster of golden hairs, subtending the spikelets. It is therefore impossible to recognize Beauvois's plant and the name is nothing else but a *nomen nudum*. If we describe a plant, we have to give at least a few characters, no

general observations are to be mentioned, which apply to all the members of a group.

The question became more difficult, because in the year 1815 in the *Nova Genera* by Humboldt, Bonpland and Kunth a *Paspalum aureum* was described. A very good and accurate description was given and a plate from which this *Paspalum aureum* it at once recognizable as an *Axonopus* with golden hairs and spikelets sunken into hollows of the rhachis and at the same time it is the species accepted by Chase as *Axonopus chrysolepharis* (Lagasca) Chase. Unfortunately the authors of the *Nova Genera* mentioned *Axonopus* (misspelled *Axinopus*) *aureus* Beauv. as a synonym and therefore Chase accepted that *Paspalum aureum* H. B. K. was based on *Axonopus aureus* Beauv. I do not agree with this opinion. Years ago I had a discussion on the same subject with Prof. Hackel, who refused to accept the point of view of American authors on the same reasons, because in the *Nova Genera* the name *Axinopus aureus* Beauv. is given accidentally, because it was found in the literature, and being a nomen ambiguum could not have been the basis of the *Paspalum aureum*. It was thus not a transfer by Humboldt, Bonpland and Kunth, although they had better done to omit this name of Beauvois. Whatever it may be, *Paspalum aureum* H. B. K., exactly described and figured, is the first valid publication of a member of the genus *Axonopus* with golden hairs, a publication of the year 1815, which, transmitted to the genus *Axonopus* becomes *Axonopus aureus* (H. B. K.) Beauv. ap. Roem. et Schult. Syst. Veg. II (1817) p. 318. *Digitaria aurea* Sprengel Syst. I (1825) p. 272 is based on *Paspalum aureum* H. B. K. and belongs thus to the true *Axonopus aureus* (H. B. K.) Beauv. as accepted by Roemer and Schultes.

It may be once more strongly emphasized that in such cases of nomenclature a transfer to another genus goes only with the oldest name, if this name is validly published; if it is a nomen nudum or ambiguum, however, it must be neglected. If *Axonopus aureus* Beauv. had been described in reality in 1812 and had been recognized from an existing type, a later combination *Axonopus aureus* (H. B. K.) Beauv. ap. R. et Schult. would have been of course invalid.

There is, however, another difficulty as to these species of *Axonopus* with golden hairs. *Paspalum aureum* H. B. K. is accepted as a perennial species, but there exists a different annual, although allied species, which was already mentioned in 1917 as *Axonopus appendiculatus* Hitchcock based on *Paspalum appendiculatum* Presl. We find this plant in Hitchcock's work on the Grasses of West India. Hitchcock probably saw

Presl's type and indicates it as an annual, although Presl gives it as a perennial. Hitchcock overlooked the *Paspalum immersum* Nees published a year earlier. This *Paspalum immersum* is given by Chase as a synonym under *Axonopus chrysoblepharis* (Lag.) Chase, which is accepted as a perennial species. The type of Nees was formerly examined by Chase, but nothing is said by her about its basal parts.

The description by Nees, however, is very clear and he says that it is an annual plant. All the other characters given by Nees apply to the annual plant. Nees himself gave to his *Paspalus immersus* formerly in herbaria the name of *Paspalus exasperatus*, but what he described and published in the year 1829 as *Paspalus exasperatus* is another species and different from his annual *Paspalus immersus*.

The annual *Axonopus* allied to *A. aureus* (H. B. K.) Beauv. with spikelets sunken into the rhachis has been named *Axonopus immersus* (Nees) Kuhl. This name is more correct, because it is based upon an earlier name. We must, however, call attention to the fact that the true *Paspalus immersus* Nees was already known to Trinius, who described the *Paspalum excavatum* Nees in Mart. Fl. Bras. ined. in the year 1826 in his *Dissertatio botanica altera* on p. 88. That this is a species of *Axonopus* with spikelets sunken into the rhachis is proved by his data: "spiculis minimis in scrobiculis biserialibus". The "folia lineari-lanceolata, spithamaea, margine hirtula" point to the annual plant. We do not know, why Nees afterwards gave it another name, when he published in 1829 his *Agr. Brasil. Paspalum excavatum* Nees ap. Trinius is, however, the same as *P. immersus* Nees from 1829, and has priority above Nees's *P. immersum*. This is proved by Trinius's own statement in 1834 in his *Panicearum Genera* p. 197, where he treated *Paspalum immersum* N. ab Es. *Agr. bras.* p. 82 with a point of exclamation giving *Paspalum excavatum* Trin. Dis. II p. 88 as a synonym. We do not know what were the reasons of Trinius and Nees to change the names. I therefore prefer to accept the annual species as ***Axonopus excavatus*** (Nees) *Henr. nov. comb.* based on the species as described already in 1826.

There is another annual very beautiful species, where the spikelets are not sunken into the rhachis. It was described by Trinius as *Paspalum holochrysum*, upon which the new combination ***Axonopus holochrysus*** (Trin.) *Henr.* is based.

All other members of the section *Cabrera* are perennials. A beautiful species with white hairs instead of golden ones is ***Axonopus canescens*** (Doell) *Henr. nov. comb.* from Guiana, based on *Paspalum senescens* Doell.

A species intermediate between the section *Cabrera* with long golden, yellowish or white hairs and the *Axonopus*-group proper is *Paspalum suffultum* Mikan, upon which the new combination ***Axonopus suffultus*** (Mikan) **Henr.** is based. At the moment many species of *Axonopus* without hairs below the spikelets are not yet fully known and a monographical work on this difficult genus ought to be prepared on the type basis method. I saw various types of *Paspalum*, which belong to the genus *Axonopus*. These specimens are mentioned here as follows: ***Axonopus flexilis*** (Mez) **Henr. nov. comb.** based on Mez's type of *Paspalum flexile* (Ule 8020); ***Axonopus caulescens*** (Mez) **Henr. nov. comb.** = *Paspalum caulescens* Mez (type Ule 8533); ***Axonopus Fockei*** (Mez) **Henr. nov. comb.** based on *Paspalum Fockei* Mez from Guiana. The type is Focke (without number), which I did not see: Ule no. 8022 belongs, however, to this species with its very characteristic summit of the blades, its flabellate growth and its many racemes. Curious are the blades, which are quasi articulate with the sheaths and the ceriferous white indumentum of the lower parts of the plant. ***Axonopus iridaceus*** (Mez) **Henr.** based on *Paspalum iridaceum* is a species allied to *Axonopus suffultus* (Mikan) **Henr.** having short hairs below the spikelets.

A beautiful *Axonopus* with golden hairs was mentioned by Doell as var. *pilosum* under *Paspalum immersum* Nees. The type is Burchell no. 6875—2. This is a perennial plant with characteristic innovations and belongs thus to Humboldt's *Pasp. aureum*. It is named here by me ***Axonopus aureus*** (H. B. K.) **Beauv. var. pilosus** (Doell) **Henr. nov. comb.**

The genus *Otachyrium* was described by Nees in 1829 with but one species *O. junceum* Nees. This plant was already known to Trinius, who described it as *Panicum Pterygodium*, mentioned by Nees with the name of Trin. in Monogr. ined. Trinius described his species, however, already in Dissertatio II (1826) p. 227. Being transferred to the genus *Otachyrium* its name is therefore *O. Pterygodium* (Trin.) Pilger with *O. junceum* Nees as a synonym. It is very curious that Nees did not recognize that in the same year he described also a *Panicum truncatum*, which as to its striking characters evidently belongs to his genus *Otachyrium*. Now that the genus *Otachyrium* is distinguished as distinct from *Panicum*, we have to accept *Panicum truncatum* Nees as a member of the genus *Otachyrium*. *Panicum truncatum* Nees is, however, invalid on account of the earlier *Panicum truncatum* Trin. from the year 1826 and figured by Trinius afterwards in 1829 in the Icones II. pl. 168. This is the well-known *Panicum geminatum* Forsk. Doell was thus quite justified

to give another name to the species of Nees. He named it *Panicum versicolor* Doell. Hence the correct name under *Otachyrium* becomes *Otachyrium versicolor* (Doell) Henr. nov. comb.

In *Paspalum*, more sharply defined, since Chase worked out her beautiful treatment of this genus, there are still a great many difficulties as to the valid names we have to accept. Parodi's *Paspalum epilis* (sic) described in *Physis* is invalid, because there was already a *Paspalum* so named earlier by Nash. Parodi's species is allied to *Paspalum planum* Hackel. I had a specimen received from Parodi under the name of *Paspalum epilis* L. R. Parodi nov. spec. tipo! from Santa Inés-Posadas (Misionis). For this species I propose the name **Paspalum Parodianum** Henr. nom. nov. based upon *P. epile* Parodi non Nash.

A few other *Paspali* are described here for the incorporation in our collections as follows:

Paspalum limbatum Henr. nov. spec.

Perennis, caespitosa, striete erecta; culmi simplices, paucinodes, glabri ut tota planta, nodis nigricantibus; folia basalia cum vaginis saltem ad 15 cm longa, caulina ad 10 cm longa, 2 mm lata, plana, sensim acuminata, ligula fuscata, glabra, brevis; inflorescentia exserta, racemi in apice culmi 3—5, alterni, basi in axillis barbata, ceterum glabra, inferiores circa 3 cm longi, superiores decrescentes, circa 1 cm longi, spiculae obovatae vel obovato-ellipticae, glabrae, 1.5—1.7 mm longae, antice planae, postice gibbo-convexae, brunneae, gluma superior spicula paullo brevior, convexa circa 3—5-nervis, nervis pallidioribus, margini valde approximatis, gluma sterilis (III) spiculam magnitudine et forma aequans, plana, brunnea, marginibus latiuscule subincrassato-limbata, limbo flavido, interne minute crenulato; gluma IV (fertilis) convexa, gibba, fusca nitida vel minute punctulata.

PARAGUAY: Villa Rica, in campis humidis, 10. X. 1874. leg. B. Balansa no. 107. Typus speciei in H. L. B. sub no. 908,93—1213.

Belonging to Chase's group of the *Plicatula* with dark olivaceous spikelets and dark brown shining fruits, this new *Paspalum* is at once distinguishable from other members of the group by its very small spikelets, short racemes and marginated flat glume III, the paler rather broad and slightly thickened margins sharply contrasting with the brownish other part of the glume. It may be that this species is to be found among the different varieties mentioned by Doell under *Paspalum plicatum* Michx., although Doell gives the length of the spikelets as sublineales vel lineales vel plus minus ultra-sesquilineales, the spikelets are in *Paspalum limbatum*, however, still much smaller.

Another allied species is described by Nees as *Paspalum riparium* and mentioned by Doell as an annual species with spikelets, which do not reach a line. Doell says even: *fortasse Paspali plicatuli varietas microcarpa*. This *Paspalum riparium* being an annual species should not be brought into connection with our new species. Our new species is most related to *Paspalum centrale* Chase from Central America, compare the figure 133 in Chase's work, but the spikelets are longer (2—2.3 mm) and devoid of the thickened margins of the flat glume.

The other extreme of *Paspalum plicatum* with the very large spikelets on long racemes is *Paspalum guenoarum* Arechavaleta. From this species I saw a beautiful form, which I mention here as

Paspalum guenoarum Arechav. var. *vestitum* Henr. nov. var. Differt a typo praesertim vaginis, foliisque omnino dense hirsuto-pilosis, pilis saepe adpressis.

PARAGUAY: Guarapi, in pratis, feb. 1881, leg. B. Balansa n. 2950. Typus in H. L. B. sub no. 908, 93—423.

Paspalum eburneum Henr. nov. spec. — Perennis, subcaespitosa, et ut videtur, breviter stolonifera; culmi stricte erecti, elongati, simplices, glaberrimi ut fere tota planta, nodis paucis distantibus, cum inflorescentia circa $\frac{3}{4}$ m alti, pro ratione plantae graciles; laminae longissimae, saltem ad 20 cm longae, complicatae, vi expansae vix 3 mm latae, sensim setaceo-acuminatae, supra praesertim inferne longe villosae, ore barbatae; inflorescentia longe exserta, e spicis 2 conjugatis composita, interdum spicae 3 adsunt, quorum una breviter pedunculata, basi pilis albis instructae, racemi erecto-patuli, 7—8 cm longi, rhachi undulata, depresso-trigona, anguste marginata; spiculae biserialae, subimbricatae, breviter pedicellatae, glabrae, eburneae, ovato-oblongae, acutae, 2—2.2 mm longae, antice planae, postice convexae, glumae II et III aequales, spiculam magnitudine et forma aequantes, gluma III plana, 3-nervis, nervis margini valde approximatis, gluma II convexa, 5-nervis, nervis lateralibus sibi valde approximatis, gluma IV fertilis flavida, sublaevis vix nitida.

PARAGUAY: Villa Rica, Oct. 1874. leg. B. Balansa no. 75. Typus in H. L. B. sub no. 908, 93—278.

Also in Brazil near Pará, Marajo Island, open savannas, Estate "Cavinho" leg. André Gouldi, V. 1918 no. 182 (cotypus in H. L. B. sub no. 924,329—995 et 924,329—879).

This is a species of another difficult group, the "*notata*" consisting of perennial species, leafy only at the base, with conjugated racemes, mostly 2 (rarely a third one is present) and solitary spikelets. This group is represented in N. America by but a few species and Chase

observed already, when she treated the most common species *Paspalum notatum* Fluegge, that from the largest spikelets of this form to the smallest of *Paspalum minus* there is an almost unbroken series. In South America 4 more species occur and this group is here also a very difficult one. The new species proposed here by me is most allied to *Paspalum maculosum* Trin. described in the year 1826. Trinius mentioned already that his new species was allied to *P. notatum*, but easy to distinguish from that species by the narrow blades and the villous axils of the racemes. These characters occur also in *P. eburneum*, which is certainly most allied to *P. maculosum*, but the latter has reddish brown spikelets with yellowish spots.

Paspalum trichophyllum Henr. nov. spec. — Perennis, dense caespitosa, culmi erecti, ad $\frac{1}{2}$ m alti, simplices, haud robusti, paucinodes, glaberrimi, nodis glabris nigricantibus; vaginae stramineo-fuscae, compressae, inferne villosae, superne glabrescentes, laminae angustissimae, filiformes, flaccidae vel flexuosae, involutae vel subplanae, sensim longe setaceo-acuminatae, vix 1 mm latae, cum vaginis ad 20 cm longae, superne decrescentes, glaberrimae, ligula abbreviata vix conspicua; inflorescentia exserta e racemis aequidistantibus circa 5 composita, axis communis filiformis, subplana vel subtrigona; racemi erecto-patuli, sessiles, a basi nudi, inferiores 2— $2\frac{1}{2}$ cm longi, superiores sensim decrescentes, 1— $1\frac{1}{2}$ cm longi, rhachi spiculis multo angustiore subtrigona glabra; spiculae brevissime pedicellatae, inordinate quadriseriales sed seriebus 2 intermediis plus minus confluentibus, glabrae, 2 mm longae, 1.2 mm latae, ellipticae, glumae apice rotundatae sed distincte, nervo mediano excurrente, acutatae, 3-nerves, virides, nervis margini valde approximatis, gluma IV fertilis pallida, obtusa, coriacea, convexa, punctis seriatis scaberula.

BRASILIA: Estado do Pará, Ilha de Marajó, Fazenda Gavinho, leg. André Gouldi, Jan. 1918, no. 165. Typus speciei in H. L. B. sub no. 924,321—190.

Belonging to the group of the "*livida*" as this is given by Chase, but which is scarcely a natural one, as she remarks. Its nearest allies are probably *Paspalum lividum* and *Paspalum denticulatum* both described by Trinius. The former is stouter, has much broader not filiform leaves, racemes with long delicate hairs in the axils, their rhachises are $1\frac{1}{2}$ —2 mm wide and the spikelets mostly larger. The latter is also more robust, according to the plate 123 by Trinius in the Icones it has about 10 racemes, broader leaves, broader rhachis of racemes and larger spikelets with distinctly denticulate margins of the glumes. Nearly all the species

of the group of the *livida* have racemes with long white hairs at the axils, with exception of *Paspalum denticulatum*. By these wanting hairs *Paspalum trichophyllum* agrees more with *Paspalum denticulatum*, from which it is, however, at once to distinguish by the quite different habit with the filiform blades.

Forskahl described a *Saccharum hirsutum*, which does not belong to this genus. Since it was described it was placed by taxonomists in various genera such as *Rottboellia*, *Ischaemum*, *Elyonurus* and *Coelorrhachis*, which proves how difficult it was to find its correct place among the *Andropogoneae*. It was therefore understandable that Boissier accepted this plant as a distinct new genus under the name of *Lasiurus*. This genus was accepted also by the modern agrostologists Stapf and Hubbard, because the plant cannot be placed without difficulty in one of the already known old genera and Boissier's opinion is thus fully accepted. Hackel in his Monograph on the *Andropogoneae* placed this plant in the subgenus *Coelorrhachis* of the genus *Rottboellia*, but observed already that it might belong to a distinct subgenus *Lasiurus*. The genus of Boissier was during a long time quite monotypic. Recently Hubbard described a second species from East Africa. The long known species *Lasiurus hirsutus* (Forsk.) Boissier has a rather wide distribution from Arabia to British India. Going over the material from the various localities, it is striking that the species is uniform in its western area. Hackel noted already that Arabian specimens have smaller spikelets and says that plants from India and Afghanistan have pubescent nodes and culms being puberulous upwards. Such specimens are not found in its western range, but only in British India and these plants from Scind are accepted by me as a distinct species:

Lasiurus scindicus Henr. nov. spec. with the diagnostic character: Internodia et pedunculi sub paniculam villosopubescentes.

BRITISH INDIA: Scind, leg. Stocks. Herb. Ind. Or. Hook. fil. et Thomson. Typus in H. L. B. sub no. 908,87—853.

I have had already often the opportunity to call attention to the fact that the indumentum of the internodes is an important taxonomical character versus glabrous ones. We find the same phenomenon f.i. in the genera *Digitaria*, *Aristida*, *Elyonurus* and *Capillipedium*. *Lasiurus* is certainly not congeneric with *Coelorrhachis*, the latter is also accepted by the modern British agrostologists, but not in Pilger's new treatment of the *Andropogoneae*, where *Coelorrhachis* (and also *Lasiurus*) are but sections of the genus *Rottboellia*, a method which is certainly not an improvement. *Coelorrhachis* is to be accepted as a distinct genus versus

Rottboellia. Some characteristic species of *Coelorhachis* are: *C. aurita* (Steud.) *Henr. nov. comb.* based on *Rottboellia aurita* Steudel; *Coelorhachis Selloana* (Hack.) *Henr. nov. comb.* based on *Rottboellia Selloana* Hack.; *Coelorhachis Balansae* (Hack.) *Henr. nov. comb.* based on *Rottboellia Balansae* Hack.; another species was formerly received from Prof. Parodi as a species of *Manisuris*, which is, however, a new *Coelorhachis*, described here as:

Coelorhachis Parodiana *Henr. nov. spec.* — Perennis, culmi stricte erecti, elati ad 1.5 m alti, plurinodes, e nodis fere omnibus adpresse ramosi, glaberrimi ut tota planta, vaginae carinatae, compressae, strictae, marginibus hyalinis, ligula albido-fusca, scariosa, glabra, circa 2 mm longa; laminae 20 cm vel plus longae, planae, circa 5 mm latae, multinervosae, scaberulae, sensim acuminatae; inflorescentiae ex omnibus nodis enatae, subcylindræae, circa 10—12 cm longae, subtenaces, flavo-virides, articuli ad 6 mm longi, dorso convexo glabri facie plani; spiculae sessiles circa 6 mm longae, callo brevissimo a reliqua gluma impressione separato, gluma prima coriacea, acuta, leviter bifida, longitudinaliter striata, superne marginata vel anguste alata, gluma II da uninervis, lanceolata, spicula paulo brevior, dorso carinato-alata, carina laevis, gl. III et IV hyalinae, enerves; spiculae pedicellatae sessilibus conformes sed parum breviores, pedicelli cum articulis haud connati, valde inaequi-longi, ei in parte inferiore fere sessiles, superne sensim longiores.

ARGENTINA: Gobernación de Formosa; Las Lomitas (bosques y sabanas subtropicales), in 1928 leg. L. R. Parodi no. 8410. *Typus speciei* in H. L. B. sub no. 928,150—39.

This species is most allied to *Coelorhachis Balansae* (Hack.) *Henr.* from Paraguay. Balansa's beautiful type material no. 291 was at my disposal. The new species differs in the leaves, being not scabrous as in *C. Balansae* and in the much striate surface of the lower glumes, which are smooth in *C. Balansae*. A most striking character of *C. Parodiana* was already observed by Parodi on his label, the nearly sessile pedicelled spikelets, so that at first sight each internode of the rhachis bears 2 quite conform spikelets, each nearly sessile and separated from the callus by a linear impression. If we study, however, the whole raceme, we find this character only in the lower half of the spike, gradually upwards the second spikelets become more and more pedicelled and at the top of the spikes the pedicels are quite developed as in other allied species. This phenomenon is found in all the spikes of the plant and represents a distinct character to recognize the species.

Coelorhachis was described as a genus by Brongniart in 1829. He

gave a long description and a plate of his *C. muricata*. This description is quite valid for the genus. He mentioned the pedicelled spikelets with two glumes and the pedicels being free from the rhachis. This agrees with the modern concept and segregation from *Rottboellia*, where these pedicels are fused to the rhachis. In an observation Brongniart says that his genus is intermediate between *Ischaemum* and *Rottboellia*, but that it is nearer to the latter and does not differ "que par le pedicelle de l'épillet stérile qui n'est pas soudé au rachis". Brongniart published the species he had at hand as *C. muricata*, giving a good description and a beautiful plate. Unfortunately he based his *C. muricata* on *Aegilops muricata* Retz. Obs. II. p. 27 (1781) and *Rottboellia muricata* Retz. Obs. III. p. 12 (1783), which was based on the earlier *Aegilops muricata* Retz. This plant of Retzius was not studied by Brongniart, for he says: "outre l'espèce suivante qui ne paraît convenir en même temps à la description que Retzius donne de son *Rottboellia muricata* et au caractère attribué par M. R. Brown à son *Ischaemum Rottboellioides*, on doit rapporter à ce genre le *Rottboellia Coelorachis* de Forster etc."

Our conclusion is therefore that *Coelorhachis* is to be accepted as a validly published genus being readily recognizable but that the name *C. muricata* (Retz.) Brongn. is not valid being based on a plant, which belongs to a different genus. Brongniart himself did not compare his plant with Retzius's type, he says only "cette plante convient bien à la description fort incomplète que Retzius en a donné". The description by Retzius is indeed very meagre and gives us no sufficient characters to recognize the plant immediately.

Steudel placed in the year 1854 Retzius's plant under *Ischaemum pectinatum* Trin. (1832), a plant which certainly is not a *Rottboellia* or an *Ischaemum*, but belongs to Buse's genus *Eremochloa*. In the year 1856 Buse sharply opposed against Steudel's synonymy in de Vriese's *Plantae Ind. Bat. orient.*, when he accepted the name *Rottboellia muricata* Retzius for the javanese plant, known as *Coelorhachis muricata* Brongn. Buse described at the same time his var. *bandanensis* with pubescent lower glumes. Buse, however, compared only Retzius's description and now there were two opposite opinions on Retzius's species. Hackel studied this question too and we find in his Monograph a treatment quite different to Buse's opinion. *Aegilops muricata* is recognized by him as an *Eremochloa* and the valid combination *E. muricata* (Retz.) Hack. is given. *Coelorhachis muricata* Brongn., however, is given as a synonym under *Rottboellia glandulosa* Trin. (1832), which perfectly agrees with Brongniart's plant and the good plate given by

him. Hackel, however, gave no further information that he has compared the type of *Retzius*. Recently Pilger accepted Hackel's opinion on this question. Without inspection of the type of *Retzius* a decision is difficult to make. We know, however, that *Retzius* mentioned his *Aegilops muricata* as received from India orientalis by the missionary Koenig (his residence was Tranquebar). We know that *Eremochloa muricata* is found in British India (mentioned in the Flora of the Presidency of Madras by Fischer), where Brongniart's plant is not observed. The geographical distribution proves that Hackel's opinion is acceptable and the name of the *Coelorhachis* we are treating here is not valid, being based on a wrong synonym and a totally different species of the genus *Eremochloa*. The correct name of Brongniart's plant becomes therefore *Coelorhachis glandulosa* (Trin.) Stapf ex Ridley Fl. Mal. Penins. V (1925) p. 204.

In the typical plant the lower glume is glabrous. Buse's var. *bandanensis* collected by Reinwardt in the Banda Islands has pubescent lower glumes, but such specimens are also given by Dr. Backer as occurring in Java. Only Buse's type material was studied and is named by me *Coelorhachis glandulosa* (Trin.) Stapf var. *bandanensis* (Buse) Henr. nov. comb.

I must remark that commonly the epithet *glandulosa* is used in various manuals, which is understandable, because Hackel's monograph is accepted. Hooker uses the same name, but he mentions a pedicel adnate to the joint of the rachis, a character present only in the true *Rottboellias*. Hooker, however, is wrong; I found the pedicel to be free. Properly speaking the genus *Coelorhachis* of Brongniart is destitute of a basis, because the described and figured species does not belong to the *Aegilops muricata* Retz.

We see from this example to what difficulties the strict application of the American type basis concept may lead, difficulties already demonstrated by me under *Paspalum aureum* H. B. K. The difficulties in *Coelorhachis* are still greater, because *Aegilops muricata* Retz. was validly published and has, in connection with an actual type, always priority. Stapf has accepted the genus *Coelorhachis* Brongn. in his Fl. Trop. Afr. IX p. 78 and I also wish to accept it.

If we wish to have a type basis for the genus *Coelorhachis*, we can select a type among other species of *Rottboellia* mentioned by Brongniart, *Ischaemum rottboellioides* R. Br. or *Rottboellia Coelorhachis* Forst. The latter is acceptable on account of Forster's specific name, which has induced Brongniart to give his genus the name of *Coelorhachis*.

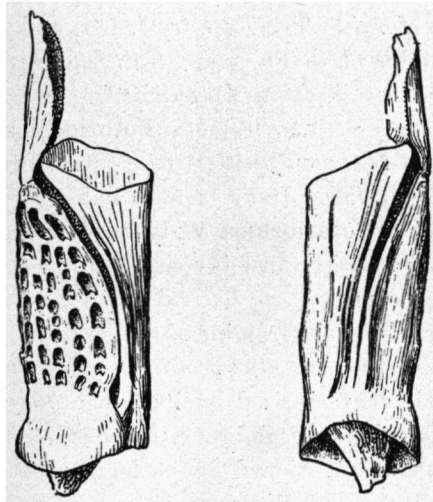
Both species, so far as I saw material, have free pedicels. As to Forster's species we know that Hackel placed it in the group with connate pedicels next to *Rottboellia exaltata*. It may, however, be that Hackel did not see the true *Rottboellia Coelorhachis* Forster, which was described in Labillardière's *Sertum austro-caledonicum* p. 15, t. 20. Hackel mentioned in his monograph only the Tanna Island (leg. Forster) and the other localities from the literature. Balansa's beautiful material from New Caledonia has free pedicels and agrees with Labillardière's plate. From the Tanna Island (Hackel's specimen) I had a few articulations of the rhachis; here are indeed the pedicels quite connate. It is very probable that this specimen in the Vienna herb., which is not the type of Forster, belongs to another species. For *Rottboellia Coelorhachis* Forst., transmitted to the genus *Coelorhachis* I propose the name **Coelorhachis Forsteriana** *Henr. nom. nov.*

Rottboellia pratensis Balansa was accurately described by him; he mentioned that the pedicellate spikelets were totally fused with the rhachis and therefore his species is a true *Rottboellia*. The combination *Coelorhachis pratensis* (Bal.) Camus is, therefore, not acceptable. *Coelorhachis striata* (Nees) Camus, however, belongs to the genus as accepted by Brongniart and Stapf.

It is clear why Miss Camus made this combination. She modified Brongniart's genus and neglected the principal character. She accepted both *Rottboellia* and *Coelorhachis* but differentiated them only on the pedicelled spikelets, being very different from the sessile ones in *Rottboellia* and but slightly different from the sessile ones in *Coelorhachis*. We know, however, that in both genera the pedicelled spikelets are always reduced and therefore much deviate from the sessile ones. Camus's concept of the two genera is, therefore, not acceptable. Her genus *Coelorhachis* is divided into two groups, one with fused and the other with connate pedicels (see *Fl. Gén. Ind. Chine*, VII, 1922, p. 210 and p. 382). *Coelorhachis muricata* is treated by her on p. 383 but in the key to the 3 species she mentioned the species as *C. glandulosa* without author. I did not accept this as a valid combination but took up that of Stapf in *Ridley's Flora*. It is noteworthy that a quite correct limitation of the genera *Coelorhachis* and *Rottboellia* was given by Blatter and McCann in *Journ. Bombay Nat. Hist. Soc.* Vol. XXXIV no. 1 (1930) p. 14.

Other interesting species of *Coelorhachis* are **C. Helferi** (Hook. f.) *Henr. nov. comb.* based on *Rottboellia Helferi* Hook. f. from Tenasserim; *Rottboellia ophiurioides* Bentham belongs to the genus *Coelorhachis*, its

correct name becomes *Coelorhachis rottboellioides* (R. Br.) Henr. nov. comb. based on *Ischaemum rottboellioides* R. Br. from Australia and the Philippines. A variety *commutata* (Hack.) Henr. nov. comb. occurs also in New Guinea; this variety differs from the typical species by the presence of some verrucae near the base of the first glume. *Coelorhachis striata* (Nees) Camus is restricted to British India, a variety var. *pubescens* (Hack.) Henr. nov. comb. is found in the Khasia mountains, where occurs another distinct species *Coelorhachis Khasiana* (Hack.) Henr. nov. comb. based on Hackel's subspecies of that name. The species from Tonkin, which is the *Rottboellia striata* Balansa non Nees, is distinct from the true *C. striata* (Nees) Camus. It is



Coelorhachis clathrata Henr. From type specimen. $\times 10$.

therefore named by me *Coelorhachis clathrata* Henr. nom. nov. This new name is based on the *Coelorhachis striata* (Nees) Camus, as this is described by Miss Camus in Fl. Gén. de l'Indo-Chine VII (1922) p. 383. The beautiful type material collected by Balansa was at my disposal.

Allied to *Coelorhachis* is the genus *Ophiuros* Gaertn. f. The species *O. corymbosus* (L. f.) Gaertn., which must bear the name of *O. exaltatus* (L.) O. K., was limited by Stapf, who separated from it his *O. megaphyllus*. This species occurs in Java, whereas *O. exaltatus* is a species from the Asiatic continent. Stapf described his species in the year 1924 in Haines Bot. Bihar and Orissa. A long description is also to be found in Blatter's Revision of the Flora of the Bombay Presidency

(1927) p. 32. Stapf's species was also described by Elmer as *Rottboellia Tongcalingii* in the year 1915 and this name has priority. The species is therefore to be inserted among our javanese grasses as **Ophiuros Tongcalingii** (Elmer) *Henr. nov. comb.* based on Elmer's species.

The group to which belongs *Andropogon saccharoides* Sw. is in recent times transmitted to the genus *Bothriochloa*. *Andropogon barbinodis* Lag. and *A. leucopogon* Nees both placed by Nash in *Amphilophis* belong to the same species, which becomes **Bothriochloa barbinodis** (Lag.) *Henr. nov. comb.* *Andropogon saccharoides* var. *submuticus* Vasey (vide Hack. Mon. p. 495) is accepted as a distinct species, named *Amphilophis exaristatus* Nash or *Andropogon exaristatus* (Nash) Hitchc. It becomes **Bothriochloa exaristata** (Nash) *Henr. nov. comb.*

Andropogon perforatus Trin. ap. Fournier and *Andropogon emersus* Fourn. both published in the same year belong to the same species and were both placed by Nash in *Amphilophis*. *A. emersus* has priority of place and the species thus becomes **Bothriochloa emersa** (Fourn.) *Henr. nov. comb.* *Andropogon altus* Hitchc. described in 1913 becomes **Bothriochloa alta** (Hitchc.) *Henr. nov. comb.* *Amphilophis Wrightii* (Hack.) Nash becomes **Bothriochloa Wrightii** (Hack) *Henr. nov. comb.* *Andropogon Schlumbergeri* Fourn. becomes **Bothriochloa Schlumbergeri** (Fourn.) *Henr. nov. comb.*

In Notes on Philippine Gramineae (Dep. Bureau of Government Laboratories No. 35, 1905, p. 79) *Pollinia argentea* (Brongn.) Trin. var. *lagopus* Hack. is characterized by its tomentose sheaths at the base of the culms, whereas they are glabrous in the typical *Pollinia argentea*. This plant was earlier mentioned by Pilger in Perkins Fragm. Fl. Philip. (1904) p. 138 as *Pollinia speciosa* and the identification as *Pollinia speciosa* (Deb.) Hack. was certainly given on account of the densely tomentose base of our plant. *Pollinia speciosa* is, however, a different species from the Asiatic continent and Hackel's variety is indeed more allied to the *Pollinia argentea* (Brongn.) Trin. Because the character of the tomentose base in *Pollinia* is a good and important character to recognize various species, I prefer to accept the endemic plant of the Philippines as a distinct species under the name of **Eulalia lagopus** (Hack.) *Henr. nov. comb.* based on *Pollinia argentea* var. *lagopus* Hackel.

Pollinia articulata Trinius which is the same as *Eulalia contorta* (Brongn.) O. K. is placed by Camus in a distinct genus *Pseudopogonatherum*. Hackel's *Pollinia articulata* subsp. *fragilis* var. *setifolia* based on *Pollinia setifolia* Nees in Hook. Kew. Gard. Misc. 2. p. 88

(1850) is accepted by Camus as a different species named by her *Pseudopogonatherum setifolium* (Nees) Camus. Recently, Pilger placed this species in *Eulalia*, making Camus's genus a section of *Eulalia*. There exists, however, an earlier name for this species, viz. *Andropogon koretrostachys* Trin. (1832). The type was from Manila. Placed in *Eulalia* this species becomes *E. koretrostachys* (Trin.) Henr. nov. comb. I am, however, more satisfied with Camus's opinion that *Pseudopogonatherum* is a distinct genus and I prefer to have the species named *Pseudopogonatherum koretrostachys* (Trin.) Henr. nov. comb.

Among our javanese grasses the genus *Coelachne* is represented by one species mentioned by Backer in his Handboek as *C. pulchella* R. Br. This is a rather common grass in Western and Central Java. If we compare our specimens, abundantly represented from that island, with Australian material known as *C. pulchella* R. Br., we see at once that the javanese plants do not belong to the Australian species. To demonstrate this we must at first know with certainty, what is *Coelachne pulchella* R. Br. Although Brown's type was not seen by me, we know that Kunth received *Coelachne pulchella* from Brown and gave in his Révision des Graminées Tom. II. Tab. 143 a long description and a coloured plate. The Australian specimens of *C. pulchella* I have at my disposal perfectly agree with Kunth's description and plate. Such specimens, however, do not occur in Java. Some striking characters of the Australian species are the subequal glumes both much shorter than the obtuse lemmas and the spikelets on elegant, filiform pedicels. The javanese plants have more unequal glumes and much longer, narrower, acute lemmas. The panicle branches are stiff with shorter, more rigid pedicels.

The javanese grass was afterwards described by Buse as *Coelachne infirma* in the year 1854 and this is the valid name for our javanese species. My opinion that the javanese grass does not belong to *C. pulchella* R. Br. is quite in accordance with that of Stapf, who wrote in 1903 on a plant communicated to him by Koorders: "*Coelachne pulchella* ex O. Kuntze sed vix" and Koorders determined a month later the plant as *C. infirma* Buse = *C. pulchella* Kuntze non R. Br. Koorders saw Buse's type material at Leiden. It is, however, curious that Koorders determined the same species in 1908 as *Isachne Kunthiana* Wight (*Plantae Junghuhnianae ineditae* no. 117). Hooker concluded that there is but one known species of this genus. If there are two, the other one would be *C. perpusilla* Thwaites. I saw the latter from Ceylon, it is certainly a very different species with very long and very acuminate

spikelets, especially characterized by its long glumes. Other names found in the literature are *Panicum simpliciusculum* Wight et Arn. ex Steudel, Synopsis (1854) p. 96. This is *Coelachne simpliciuscula* Munro, a species from Ceylon based on Wight no. 2044. This is placed as a variety under *C. pulchella* R. Br. by Miss Camus, the typical *C. pulchella* not being represented in Indo-China. So far as I have seen specimens collected by Balansa, these plants differ by their erect spiciform panicles with tightly adpressed denser racemes. It is also a distinct species, different from the species described by Buse. At the moment Buse's name is therefore quite acceptable.

The genus *Coelachne* was placed commonly in the tribe of the *Aveneae*. Recently Pilger placed it in the *Paniceae* near *Isachne*. Although in habit much agreeing with *Isachne*, the genus *Coelachne* is very well characterized by its short glumes, the long rhachilla between the two flowers and the base of the lower floret, bearing short hairs, the latter character not being found in other *Paniceae*. Its best place is therefore in the tribe of the *Aveneae*.

In the genus *Themeda* there occurs in Java a well-known annual species, which was accepted by Hackel as *Themeda arguens* (L.) Hack., in the supposition that it was the *Stipa arguens* of Linné, as published in the second edition of the Species Plantarum in 1762, mentioning Gramen arguens of Rumphius, tab. 6, f. 1, which is a rough sketch. There is no type of Rumphius, but Linné gave a description of his own from the specimen in his herbarium, giving the locality as India only. A reexamination of this type by Merrill proved that the plant of Linné was not the javanese species as described by Hackel, but the same as *Anthistiria ciliata* L. f., a grass from British India, Bourbon and Mauritius. Hence the javanese grass had to bear another name and it actually being the *Anthistiria frondosa* R. Br., Merrill gave it the name of *Themeda frondosa* (R. Br.) Merr. The true *Stipa arguens* L. does not occur in Java. It is now a curious fact that the name *Themeda arguens* (L.) Hack. is the valid one for the British Indian annual grass, commonly known as *Themeda ciliata* (L. f.) Hack., which was named by Kuntze as *Themeda quadrivalvis* (L.) O. K. The most important synonymy of *Stipa arguens* L. is, therefore, as follows:

Themeda arguens (L.) Hack. in D. C. Monogr. (1889) as to the combination not as to the description by Hackel, which applies to the annual *Themeda frondosa* (R. Br.) Merr.

= *Stipa arguens* L. Sp. Plant. ed. II (1762) p. 117.

= *Andropogon quadrivalvis* L. Syst. Veg. ed. XIII (1774) p. 758.

- = *Themeda quadrivalvis* (L.) O. K. (1891).
- = *Anthistiria ciliata* L. f. Supplem. Plant. (1781) p. 113.
- = *Themeda ciliata* (L. f.) Hack. Monogr. (1889) p. 664.
- = *Andropogon nutans* L. Mantissa Plant. II (1771) p. 303 non Linné
Spec. Plant. (1753) p. 1045.
- = *Andropogon scandens* Roxb. Fl. Ind. (1832) p. 248.
- = *Andropogon semiberbis* Nees Fl. Afr. austr. (1841) p. 125.

The three genera *Lophopogon*, *Sclerandrium* and *Apocopis* are recently more sharply defined by Hubbard. The first two genera are not represented within our region. The genus *Apocopis*, however, mainly found on the Asiatic continent too, has a species from Borneo, described by Ridley as *Apocopis borneensis*. The type was collected by Winkler (no. 3392). This species of Ridley is however the same as *Apocopis collina* Balansa, described already in 1890 (Type is Godefroy 389 from Cochinchina). It is a perennial species. I received a short time ago from Dr. Backer interesting material of an *Apocopis* found in Sumatra. The occurrence of a species of *Apocopis* in Sumatra is important because the genus is not known from Malaya. The Sumatran *Apocopis* was collected in the province Atjeh near Blang Rakal, which is a very sterile open grassy plain at an altitude of about 600 m. Mr. Jochems collected the plant in the year 1924. According to the collector, there were but few specimens growing together with *Arundinella*, *Pollinia*, *Andropogon*, *Themeda*, *Imperata* and *Rhynchospora*. Another sample from the same locality indicated as "along the Gajoeroad near milestone 33" is according to Mr. Jochems but 400 m above sealevel. These plants were collected by J. C. v. d. Meer Mohr, no. 3247. Both collections were named by Dr. Backer as *Apocopis Wightii* Nees. Compared with Hackel's treatment of this species I could unfortunately not verify this, the species not being represented in our collections. It is said by Hackel, Hooker and Camus to be an annual. The plants collected by v. d. Meer Mohr, however, are in my opinion perennials. Hackel's subspecies *mangalorensis* was seen by me from Maisur and Carnatic (Hooker's *Apocopis* no. 4). This plant represents a distinct species *Apocopis mangalorensis* (Hochst.) Henr. nov. comb. based on *Amblyachyrum mangalorensis* Hochst. in Flora, Vol. 39 (1856) p. 26.

Apocopis was described by Nees in 1841 with one species *A. Royleanus* Nees as the type. This species has to bear the name of *A. paleaceus* (Trin.) Hochr. Watson made the combination *Apocopis himalayensis* (Steud.) Watson in 1882, based on Steudel's *Andropogon himalayensis* from the year 1854. Steudel gave however *Apocopis Royle-*

anus Nees as a synonym of this species, so that Watson's combination is invalid. At the same time Steudel, who accepted *Apocopis* Nees as a section of *Andropogon*, described an *Andropogon courtallumensis* indicating it as a perennial and giving *Apocopis Wightii* Nees MS. as a synonym. This name, although accepted by Hackel is invalid and the species must bear Steudel's name which was accompanied by a description. Hence the correct name of this species becomes **Apocopis courtallumensis** (Steud.) *Henr. nov. comb.* based on Steudel's *Andropogon* under this name.

Another genus abundantly represented in Java is *Arthraxon* P. B. As it is treated by Hackel, it consists of 8 species. One of them, *A. jubatus* Hack. is a very curious one only known to me from the type locality. The other species are in the course of time often variously interpreted. There are now more than 20 species; one was described in 1784 as *Phalaris hispida* Thunberg. Makino made the new combination under *Arthraxon* for the Japanese plant and afterwards Merrill did the same for the plant from the Philippines. Both plants as accepted by Makino and Merrill are, however, not the same. According to Hackel, *Phalaris hispida* Thunb. is the *A. ciliaris* subsp. *Langsdorfii* (Trin.) Hack. fide specim. in H. Havn., which is *Pleuroplitis Langsdorfii* Trin. or *Arthraxon Langsdorffiana* (Steud.) Hochst. The same species of Trinius was also the *Arthraxon ciliaris* P. B. If we compare the material in herbaria, we find that the true *Arthraxon hispidus* (Thunb.) Makino does not occur in Java, but is an inhabitant of Japan and China, whereas the *A. ciliaris* P. B. has a wide range. The differences are that in the true *A. hispida* the awns are what we call "imperfect", that is short, not differentiated into a column and a subula, whereas in *A. ciliaris* P. B. the awn is perfect, with a distinctly twisted column, a bend and a long subula. Synonyms of *A. hispida* (Thunb.) Makino are *Pleuroplitis Langsdorfii* var. *submutica* Regel and Hackel's var. *cryptatherus*. This one was found introduced in N. America.

Honda treated Beauvois's species in Journ. Fac. of Science, Tokyo, Vol. III (1930) p. 328. He states that *Ischaemum ciliare* Retz. is a synonym of Beauvois's name, which is totally wrong. It is incomprehensible, how Honda came to this conclusion. Beauvois gives in his Essay on p. 111 a description of his genus *Arthraxon* and mentioned one species *A. ciliare* also figured by him. Beauvois tells us that the species was communicated to him by Richard and was only represented in Richard's herbarium, being formerly cultivated by Richard's uncle at Trianon. Beauvois says further only: "Elle me paraît avoir des rap-

prochements avec l'*Ischaemum ciliare* des auteurs, mais elle ne peut rester dans le même genre puisqu'elle a des caractères opposés". We therefore may doubt, whether Honda has understood this sentence? Beauvois figured his species with perfect awns and with quite glabrous articulations of the rachis. His species is quite identical with *Pleuroplitis Langsdorfii* Trin.; Trinius mentions the arista tortilis, his figure gives the articulations as glabrous too.

Miquel's *A. japonicus* described in 1867 is a mixture, partly belonging to *A. hispidus* (Thunb.) Makino, partly to *A. ciliaris* P. B. According to our investigations *A. ciliaris* and *A. Langsdorfii* have both perfect awns and glabrous articulations and therefore the latter is only a synonym. Our javanese species is therefore *Arthraxon ciliaris* P. B. The other allied species with hairy articulations and perfect awns is *A. Quartinianus* (Richard) Nash, a species accepted also by Stapf. A subspecies of *A. Quartinianus* is ssp. *Vriesii* (Buse) **Henr. nov. comb.** based on *Lucaea Vriesii* Buse. It is only found in Java.

The javanese annual *Arthraxon* with small spikelets (3—3½ mm) must bear the name *A. lancifolius* (Trin.) Hochst. All other javanese species of *Arthraxon* have larger spikelets (4—7 mm) and are perennials. Their discrimination offers no further difficulties. Two new species were recently acquired. I describe them here as follows:

Arthraxon linifolius **Henr. nov. spec.** — Probabiliter annua, culmi erecti vel adscendentes elegantes, simplices vel a basi ramosi, multinodes, glaberrimi, usque ad apicem foliati; vaginae arctae, internodiis multo breviores, nodis barbatis, patento-pilosi, pilis basi tuberculatis, marginibus ciliatis; laminae conformes, anguste lineares vel lineari-lanceolatae, 1—2 cm longae, 2 mm latae, superne setaceo-acuminatae, inferne rotundatae vel leviter auriculatae, pilosae, marginibus ciliatis pilis tuberculatis, ligula albo-scariosa; paniculae depauperatae breviter exsertae, terminales vel hinc inde laterales, circa 2 cm longae, inconspicuae, e 10—12 spiculis compositae; spiculae sessiles bene evolutae, pedicellatae ad pedicellam brevissimam, vel circa 1—1½ mm longam, haud ciliatam, inferne tantum appresse puberulam redactae, rhachis articuli leviter curvati, scaberuli vel inferne minute appresse puberuli; spiculae anguste lineares, 4 mm longae, vix ½ mm latae, inferne stramineae, enerves, superne pallide virides multi-nervosae, callo minute pubescente, a latere subcompressae, glabrae vel superne ad margines scaberulae vel leviter ciliolatae, gluma prima acuta, apice hyalino integra, carinis ciliiferis, secunda acuminata aequilonga, quarta aristata, arista 7 mm longa, perfecta, columna circa 4 mm longa inclusa vel

vix exserta, valde torta, brunnea, subula 3—5 mm longa, exserens, pallida, stigmata prope basin spicula emergentia.

PAPUA: Boridi, open places, 3800 feet, 21. X. 1935 leg. C. E. Carr no. 14643. Typus speciei in H. L. B. sub no. 936,267—460.

This new species has a very characteristic habit, there are probably but 2 small anthers.

Arthraxon pallidus Henr. nov. spec. — Planta tota pallide glaucoviridis, culmi glaberrimi, multinodes, vaginae striatae, arctae, glabrae, marginibus ciliatis, nodis pubescentibus; laminae ovato-lanceolatae, glabrae, amplexicaules, 2—2½ cm, interdum 4 cm longae, ad 7 mm latae, marginibus superne scaberulis, inferne pilis basi tuberculatis remote ciliatis, apice cuspidato-acuminatae; panicula longe exserta, pedunculo tenuissimo compresso glabro, spicae spuriae 2—4-nae, breviter pedicellatae vel subsessiles, raro solitariae, 4—5 cm longae; articuli filiformes glabri vel inferne pilis perpaucis praediti, spiculae pedicellatae vix evolutae, stipitiformes, glabrae vel inferne pilis paucis suffultae, spiculae sessiles, 4—4.5 mm longae, angustae, callo breviuscule barbulate, stramineae, gluma prima inferne glabra, superne secus nervos, praesertim marginibus echinulata. Arista perfecta circa 9 mm longa, columna torta brunnea vix vel parum e glumis exserta subulam pallidam subaequante.

NOVA GUINEA: Morobe, Sattelberg, hills about mission houses, 3000 ft. Nov. 20, 1935, sine no. leg. J. et M. S. Clemens.

A distinct *Arthraxon* at once striking by its pale glaucous colour, allied to members of the *Arthraxon ciliaris* group. It may be that this species is the same as Bentham's *A. ciliaris* var. *australis* Benth. (Fl. Austral. III, p. 524). Bentham's description pretty well agrees with my plants. Bentham's Australian type of his variety from New South Wales was not seen by me.

When Stapf treated *Arthraxon Quartinianus* (Rich.) Nash in the Fl. of Trop. Africa, he excluded the varieties *Hookeri* and *glabrescens* of Hackel. The var. *Hookeri*, described from the Sikkim and collected by Hooker was named *Bathratherum echinatum* Nees. I could verify this var. *Hookeri*, which belongs to a distinct species **Arthraxon Hookeri** (Hack.) Henr. nov. comb. It is not allied to *A. Quartinianus* Nash, having small anthers about ½ mm long, 1 mm long sterile pedicels, 11-nerved lower glumes and longer spikelets. The var. *glabrescens* was not seen by me.

A very interesting question as to the distribution of allied species is the case of *Panicum trichoides* Swartz. This is a well-known tropical

American species found from Mexico to Brazil. Being an annual weed it is no wonder that it is introduced elsewhere and observed also in tropical regions of the Old World. This species has in the New World always sparingly, very characteristically hirsute spikelets. There is an allied species with glabrous spikelets, which occurs only in the tropics of the Old World (the Malayan region). At the time that this species (a small one too) was observed, no taxonomist brought this plant in connection with a New World one. This rather rare species was found in Christmas Island (south of Java) and described as *Panicum Andrewsii* Rendle. It has quite glabrous spikelets and Rendle had therefore no reason to look for his species among New-World ones. The species was published in Christmas Island Monograph (1900) p. 192 with a plate (pl. XVIII). When now the New World species becomes introduced as a weed in Java, the student of the javanese grasses meets two different things, one as a native, and another, the introduced one, but since they agree so very much in habit and most of the other characters he does not recognize them as two distinct species and is inclined to accept them as but one somewhat variable species. In such a case it is to understand that in a local flora as f. i. Backer's Handboek we meet *Panicum trichoides* Sw. indicated from tropical America, and subsontaneous or introduced in many other tropical regions. The description (l. c.) in this case mentions f. i. glumes and sterile lemmas sparingly hairy or glabrous, in contradiction to the true *P. trichoides* Sw., which has in its native country always hirsute spikelets. The true situation becomes therefore confused and two acceptable, distinct, although very much allied species are not recognized and in the case of the javanese grasses, the endemic one becomes classified among a species from a different region. The geographical distribution of all the species of a group, however, helps us greatly to disentangle such difficult questions and it is a fact that in such a case the geographical distribution induces us to study minute differences more exactly; these minute differences are present in such a case even to a greater extent. The true *Panicum trichoides* Sw. f. i. has the axis of the panicle sparsely pilose, the spikelet always sparsely hirsute, the lower glume $\frac{1}{2}$ as long as the spikelet and 1-nerved, the second and third glume 3-nerved, the spikelets 1.2—1.3 mm long, the immature fruit minutely papillose. The endemic species *P. Andrewsii* Rendle, which has at first sight quite the same habit, has usually a glabrous panicle axis; the second and third glume are mostly 5-nerved, the spikelets perfectly glabrous and slightly larger viz. 1.75 mm long. There is often

an empty palea $\frac{1}{2}$ the length of glume III, such a palea is often wanting in the American species, but it is not a constant character. Although the differences between the two species are small, we are justified in accepting here two distinct species, *Panicum Andrewsii* Rendle and *P. trichoides* Sw. Further field studies may prove, how variable both are and what are the absolutely constant characters to recognize them always. For the time being the best character is the absence or presence of the hairs on the spikelets. This is a good character for discrimination, as *P. trichoides* from the New World is never observed with glabrous spikelets.

Panicum Andrewsii Rendle was collected by Dr. C. A. Backer at Soerabaja near Grisee in 1925 (Backer n. 37536 in H. L. B.). It was collected in the same year also by the Soemba Expedition near Laora by the native collector Iboet (no. 339). This specimen much resembles *Panicum brevifolium* L. in habit, which is a perennial with a lower glume about as long as the spikelet. *Panicum trichoides* Sw. from the New World is introduced into the Asiatic continent (abundantly seen in Balansa's collections). From Java I saw specimens collected near Pasoeroean (Backer no. 36934) and Kraksaän (Backer no. 13083). The same species was already collected by R. Brown near Koepang on Timor in 1803 (ex herb. British Museum).

Balansa's *Panicum amoenum* was hitherto only known from the Asiatic continent (Tonkin and Cochinchina). I could study Balansa's own beautiful material. This species is now also found in Celebes. It was found already in the year 1840 along roads near Tondano by Forsten. I found it to be Balansa's species, when I tried to identify the specimens. Other localities were detected in British North Borneo on Mount Kinabalu by J. and M. S. Clemens during the years 1931—1933. I saw 3 numbers (Clemens 28275, 28275A and 51562), all collected at medium altitudes. I accepted them as *Panicum perakense* (Hook. f.) Merr. based on Hooker's variety *perakense* of *Panicum humidorum* (see Ridley Fl. Mal. Penins. Vol. V. p. 226). I found the species to be Balansa's *P. amoenum*. Although Hooker's variety has priority, it must, accepted as a species, bear Balansa's name.

Ichnanthus P. B. is a universally accepted genus in all our manuals and although formerly various species were described under *Panicum* by Nees and Trinius, the genus was never seriously criticized. The typical species of the genus such as *I. panicoides* P. B. and *I. leiocarpus* (Spreng.) Kunth are sharply defined on account of the flap-like appendage of the fertile lemmata. These species constitute

the group of the *Appendiculata* Pilger. In the other section, the *Foveolata* Pilger appendages are lacking. In their place we find characteristic scars at the base of the fertile lemma. *Ichnanthus* was intensively treated by Chase in her study on the *Paniceae*.

There are, however, a great many species of *Panicum* with more or less distinct scars at the fruits, and such species of *Panicum* were never brought in connection with the genus *Ichnanthus*. We have but to compare the various figures in Hitchcock and Chase's work on *Panicum*. I mention this question, because there is an interesting grass in South America, which is so variously treated and so misunderstood even by competent agrostologists. Doell described in 1877 this species as *Ichnanthus breviscrops* on account of the scar. Afterwards it was found in British Guiana by Hitchcock and described by him in 1922 as a new species *Panicum magnum*. This species was also found in Dutch Guiana and Hitchcock, when he treated the grasses of the High Andes, identified his *Panicum magnum* with *Ichnanthus breviscrops* Doell, which occurs also in Bolivia. Recently Pilger accepted Doell's species as a *Panicum* and made the combination *P. breviscrops* (Doell) Pilger. We see from these observations, how difficult it was to find the correct place of the species, which depends on the value we give to the scar at the base of the lemma. Yet the question was not settled, since Pilger placed this *Panicum breviscrops* not only in *Panicum* but in a subgenus *Acroceras*, which is accepted in modern times as a distinct and characteristic genus. Even if we accept *Acroceras* only as a subgenus of *Panicum*, we cannot place *Panicum breviscrops* in this subgenus, because Doell's species has scars at the base of the lemmas. Moreover, if we study Doell's species and Hitchcock's *Panicum magnum*, we find that the summit of the fertile lemma does not agree with the characters of *Acroceras*. It is quite evident that Doell's plant is not an *Acroceras*, it has the scar of *Ichnanthus* and further no other characters of *Acroceras*, no crest neither at the top of the lemmata, nor on the glumes. Further studies may prove, whether Doell's species is to be placed in *Panicum* or in *Ichnanthus*. A new combination in the genus *Acroceras* is not acceptable. In this matter I call attention to a former treatment of the genus *Acroceras* in Blumea.

The genus *Prionachne* was published by Nees in 1836 in Lindley's Nat. Syst. of Botany p. 447 with one species *P. Ecklonii*. In 1841 Nees changed the name of the genus and substituted for it *Chondrolaena* in Agrost. Cap. p. 133 with a synonymy which is applicable to his *P. Ecklonii*. Desvaux described the same genus however in his Opusc. p. 64. tab.

IV—f. 3 in 1831 as *Prionanthium* with *P. rigidum* Desv. as the type. He gave the locality as Ind. Orientalis. This generic description has priority and *Prionanthium* is accepted in modern times by Stapf and others. The *Phalaris dentata* L. f. Suppl. p. 106 (1781) and the same one in Thunberg's Prodomus (1794) and Flora capensis is however a member of the genus *Prionanthium*. *Phalaris dentata* L. f. was misunderstood by Nees, Trinius, Steudel and others and identified with Nees's *P. Ecklonii*. Thunberg's species is however a rare species and different from Nees's one. Thunberg's name has however priority and the rare species has to bear the name of *Prionanthium dentatum* (L. f.) *Henr. nov. comb.* based on *Phalaris dentata* L. f.

In my former article I did not mention Steudel's *Panicum rhabdinum* (Synops. p. 96) which was given with the synonym *Isachne virgata* Nees MS. Steudel, who did not accept the genus *Isachne* could not use the specific name *virgatum* on account of the existing *Panicum virgatum* L. He named the species *Panicum rhabdinum*. If this is a distinct species it must be named *Isachne rhabdina* (Steud.) *Henr. nov. comb.* If we accept the plant as a var. of *Isachne pangerangensis* Z. et M. I propose for the javanese plant the name *I. pangerangensis* Z. et M. var. *rhabdina* (Steud.) *Henr. nov. comb.*

The genus *Ottochloa* is very characteristic and all its members are, as to the structure of the spikelets rather uniform. I quite agree with Dandy's treatment of the four species. Recently another very characteristic species was described from Queensland by Hubbard. Through his kindness I received beautiful material of this Australian species so that all the members of *Ottochloa* hitherto known are represented in the material at my disposal. On account of the structure of the spikelet, being so much the same, in the different species, the various members are segregated on vegetative differences and arrangements of the spikelets in the inflorescences. A key for the determination of the existant species was never prepared and I therefore wish to give such a key from the material at hand for the benefit of those who have to identify the plants of this genus.

Key to the species of *Ottochloa*.

- 1a. Spikelets small, only 2 mm long, branches of panicle very thin and elegant 2
- b. Spikelets longer, more than 2 mm long, branches of panicle stouter, more stiff and rigid 3
- 2a. Panicle branches undivided, solitary, short, up to 3.5 cm long, forming together a rather small exserted panicle, 3—5 cm (rarely up to 9 cm) long;

- leaves light green on both surfaces, small, 2—5 cm long, scarcely 5 mm broad *O. gracillima* Hubb.
 Range: Queensland. Endemic. Specimens seen: Hubbard 2144, 2341, 2807, 8070, 8666. See Hubbard in Kew Bulletin 1934, p. 445.
- b. Panicle branches often divided near the base, solitary and binate or verticillate, long, 10—12 cm long, leaves dark on upper surfaces, pale beneath, long, up to 9 cm long and 8 mm broad *O. malabarica* (L.) Dandy
 Range: Indo China and China. Specimens seen: Types of Balansa's *Panicum nodosum* var. *micranthum*, Balansa 480, 1609, 1610.
- 3a. Branches of inflorescence reiterately branched, forming an open panicle with scattered pedicelled spikelets which are only somewhat congested at the end of the branches *O. nodosa* (Kunth) Dandy
 Range: Indo China, Borneo, Philippines. Specimens seen: Tonkin: Type of Balansa's *P. ouombiense*; Balansa 451, 478, 1613, 1614, 1615 — Borneo, Kinabalu: Clemens 30274, 51222 — Philippines: Bureau of Science, Ramos et Edano 44043.
- b. Branches of inflorescence single, the branchlets if present very short, the spikelets densely clustered or crowded along their whole length, forming false spike-like racemes 4
- 4a. Panicle branches very long and naked at their base, the clusters of spikelets very remote, with long internodes, spikelets broadly ovate, greenish, hairy or glabrous *O. Arnottiana* (Nees) Dandy
 Range: widely distributed from British India and Ceylon to Tonkin, Java, Borneo, Philippines and New Guinea.
 Specimens seen: East Himalaya: Griffith 6489 — Ceylon: Balansa — Tonkin: Balansa 450, 479, 1611, 1612 — Java, very abundant: Koorders 40705, 41150, 42249; Bakhuizen van den Brink 5008, 5164, 5414; Backer 10044, 18704, 18818, 18892, 22144; near Buitenzorg, common, Balansa, Kurz, Backer; Schiffner 1539, 1582; Hallier 611 a—c, 622; Junghuhn (type of *Digitaria urochloides* Buse); Mousset 87 — Brit. N. Borneo: Ramos 1133 — Philippines: species Blancoanae Merrill 944; Merrill 4182, 9378, 9581, 11600; Ramos 12040, 21713 (depauperate specimens); Ramos et Edaño 44235; Kneucker exc. Merrill 817; Elmer 16496 — Papua: Carr 11832.
- b. Panicle branches long, not naked at their base or only slightly so, clusters of spikelets very densely crowded, not or scarcely remote, but very slightly interrupted, spikelets brownish, glabrous *O. fusca* (Ridley) Dandy
 Range: Malaya, Sumatra, Borneo, Philippines.
 Specimens seen: Malaya: Yapp 238 (Kelantan Kwala Aring) — Sumatra: Lörzing 6873 — Borneo: Amdjah 424; Winkler 3464, 3247 — Philippines: Ramos et Edano 43890 — Papua: Carr 11622.

One of the rather difficult genera is also the genus *Chrysopogon* and especially the polymorphic species *C. Gryllus* (L.) Trin. The five subspecies of Hackel are at present accepted as distinct species. Beside *Chrysopogon Gryllus* we have *Chrysopogon echinulatus* (Nees) Watson, *Chrysopogon pallidus* (R. Br.) Trin., *Chrysopogon glabratus* Trin. and *Chrysopogon calcaratus* (Hack.) Henr. nov. comb. based on Hackel's subspecies of this name. The latter is characterized by the

very long callus of the hermaphrodite flower and also by the long scar after the spikelets have fallen off. *Chrysopogon glabratus* Trin. differs from all the other members of this group in the only about 1 mm long awn of gl. II of the sessile spikelet. According to Hubbard Bentham's *Chrysopogon Gryllus* is a distinct species. Hackel had already some doubts about Bentham's species when he said "fortasse aliae varietates" and Pilger said recently "mit mehreren Varietäten vielleicht Arten". Hubbard, when he treated a new species from Queensland in Hooker's *Icones* Tab. 3365, gave an account of Bentham's species of *Chrysopogon*. Hubbard says that the species which Bentham named *C. Gryllus* represents an undescribed species, whilst *C. Gryllus* var. *pallidus* (R. Br.) Benth. is also quite distinct.

Bentham's *Chrysopogon Gryllus*, being described, we can give it another name: ***Chrysopogon Benthamianus*** Henr. nom. nov. See Bentham *Fl. Australiensis* Vol. VII (1878) p. 537.

Andropogon Gryllus was also recorded from the Philippines by Villar. As the species ranges eastward only to Northern British India and is not found in Indo China, it is probable that plants, from more eastern and southeastern localities, belong to different species. Merrill described an *Andropogon Gryllus* L. var. *philippinensis* from Panay. He saw already that the typical *A. Gryllus* did not occur in the Archipelago. Having seen the cited number of Merrill's variety, I accepted this as a distinct species under the name of ***Chrysopogon philippinensis*** (Merr.) Henr. nov. comb. This is a robust species with many noded culms and long leaves. It can at once be distinguished by the much smaller spikelets. Hitherto only seen from the type locality (Ramos et Edano no. 30964).

A species of *Chrysopogon* was also detected in Malaysia already in the year 1925 by the Soemba expedition. It is certainly allied to other members of the *Gryllus* group and characterized by its thin and elegant few-noded culms and its still smaller spikelets. I describe it here as a new species.

Chrysopogon tenuiculmis Henr. nov. spec. — Perennis, caespitosa; culmi erecti vel leviter geniculati, glabri, binodes, tenues, $\frac{1}{2}$ — $\frac{3}{4}$ mm diametro, eum panicula usque ad 40 cm longi; folia ad basin culmorum congesta, vaginae carinato-compressae, valde nervosae, praesertim marginibus pilosae, laminae lineares, usque ad 10 cm longae, ad $2\frac{1}{2}$ mm latae, superne parum angustatae, subobtusae acuminatae, marginatae, planae sed subcanaliculatae, pilis sparsis albis conspersae, ligula brevissima, ciliolata, auriculae distinctae; laminae culmeae breviores, reductae;

inflorescentia abbreviata, circa 5 cm longa, subcontracta vel subeffusa, rhachi sublaevi, subangulata, ramis subverticillatis paucis, usque ad 2 cm longis, in axillis glabris, superne dilatatis vel cupulatis; racemi omnes pedunculati, ad spiculam hermaphroditam unam duasque masculinas vel neutras redacti, interdum in singulis ramulis pauciarticulati, spiculae sessiles hermaphroditae anguste lanceolatae, circa 5 mm longae, luteae, callus acutus 1 mm longus, pilis flavescensibus 2 mm longis barbatus; gluma inferior convexa, apice bifida, in setas duas 3 mm longas terminata, cartilaginea, glaberrima et superne prope margines aculeolis paucis praedita, gluma superior cartilaginea apice subacuta, gluma III hyalina, gluma IV aristata, arista ad 22 mm longa, bis geniculata, columna scabra brunnea ad 10 mm longa, in setulam subaequilongam abiens; spiculae pedicellatae steriles vel masculinae, lineari-lanceolatae, purpureae, acutae, 5 mm circa longae, pedicelli lineares, plano-convexi spicula brevior, laeves, gluma inferior acuminata aristata, arista 3—4 mm longa, caduca, 3—5-nervis supra medium asperula, gluma superior subbrevior, acuta haud aristata, gluma III hyalina vel nulla.

SOEMBA: prope Kendara, 29. III. 1925, leg. Iboet no. 151. Typus speciei in H. L. B. sub no. 927,344—414.

In *Chrysopogon* the lower glume of the sessile spikelet is commonly unawned, whereas the second one is distinctly awned, in *C. tenuiculmis* we find the inverse position, the lower glume is bifid with two long setae, the upper one is unawned. The javanese *Chrysopogon subtilis* (Steudel) Miquel has still smaller spikelets, the sessile ones with the normal position as in other species of *Chrysopogon*.

Another species of *Chrysopogon*, found in Borneo, is a member of a different group which is characterized by the densely bearded lateral pedicels of the male spikelets. Hitherto no species of this section was found in our Archipelago. In Hackel's Monograph six species of this group are treated. Their synonymy is rather intricate. Hackel's first species of this group is *Andropogon nodulibarbis* Hochst. According to the synonymy this was described by Steudel thrice in his Synopsis, viz. as *Andropogon peninsulae* Steud. (with *Chrysopogon Arnottianus* Nees as a synonym), based on Wallich cat. no. 8785A, further as *Andropogon nodulibarbis* Hochst. with as type Hohenacker's no. 934 from the Nilgeri Hills and finally as *Andropogon zeylanicus* Nees MS. sub *Rhaphis* from Ceylon. The absolute priority of place has *Andropogon peninsulae* Steudel no. 422 on p. 396; Steudel's no. 423 is *Andropogon nodulibarbis* and Steudel's no. 426 on pag. 397 is *Andropogon zeylanicus* Nees which name was accepted as *Chrysopogon zeylanicus* (Nees) Thwaites in 1864

in the Enumeratio Plant. Zeylaniae p. 366. I saw Perrottet's number 1323 also mentioned by Hackel which is incorporated in our herbarium as *Chrysopogon nodulibarbis* (Hochst.) Henr. nov. comb. Other authentic specimens were not seen and thus I could not exactly identify Steudel's *Andropogon peninsulae*. In the recent literature the name *Chrysopogon zeylanicus* (Steud.) Thwaites is accepted f. i. by Trimen in his Supplement and by Fischer in Gamble's Flora of the Presidency of Madras, part X (1934) p. 1737—1738. Hackel's second species is *Andropogon verticillatus* Roxb. = *Chrysopogon verticillatus* Trin. This species is a robust plant with often bearded nodes and long leaves. Another species is *Andropogon aristulatus* Hochst., a nomen nudum changed by Steudel to *A. breviaristatus* (probably a misprint for *breviaristatus* as given in his Index). Type is Hohenacker 1285. The correct name for this species is *Chrysopogon orientalis* (Desv.) Camus. I could compare this species abundantly. Another species of this group, but not treated by Hackel, is *Andropogon asper* Heyne ex Hook. f. Fl. Br. Ind. VII (1897) p. 189. Placed in *Chrysopogon*, it becomes *C. asper* (Heyne) Blatter et McCann.

This is according to Fischer (in Fl. of Madras) doubtfully distinct from *C. orientalis*. All the species treated here are robust plants with large spikelets and long pedicelled male or neuter spikelets, these pedicels are longer than $\frac{1}{2}$ the length of the sessile spikelets, mostly they are $\frac{1}{4}$ shorter than the sessile ones. There remain now six species, three are mentioned by Hackel, three others are described by Hooker. All have the pedicels of the lateral spikelets less than half as long as the sessile ones. It is in this group that the species from Borneo mentioned above has to be placed but none of them agree with the material or the descriptions in the literature. *Chrysopogon collinus* Ridley insufficiently described was not available for comparison. I am therefore obliged to accept the species from Borneo as a new one:

Chrysopogon borneensis Henr. nov. spec. Perennis, caespitosa, culmi floriferi et steriles edentes, sine paniculis ad 20 cm alti, multinodi, singuli vel e basi ramosi, nodis obtectis; vaginae internodiis longiores, compressae, carinatae, valde nervosae, glabrae, marginibus hyalinis, ligula valde abbreviata, minute ciliolata, auriculae leviter productae; laminae complicatae, glabrae sed inferne ad margines pilis nonnullis albis longis praeditae, 4—6 cm longae, statu complicato 1 mm latae, anguste lineares, superne aequilatae, haud acuminatae, obtusae sed subeucullatae; inflorescentia parva pedunculo gracillimo, 3—4 cm longa, subcontracta vel subpatens, racemis verticillatis capillaribus,

glabris, in axillis minute puberulis vel glabris, superne leviter incrassatis vel cupulatis, rami paniculae cum spicula fertili, in singulo ramulo, singula, oblique articulati, cicatricem minute rufociliatam exhibentes; spiculae pallidae hermaphroditae sessiles sine arista calloque 1 mm longo, 3—5 mm longae, callo lateraliter fuscobarbato, gluma prima inferne laevis, superne striata vel nervata, subotusa, marginibus glabris haud ciliatis, gluma secunda in setam pallidam 4 mm longam abiens, gluma IV aristata, columna torta, brunnea, bisgeniculata, 10 mm longa, in setam pallidam 10 mm longam producta; spiculae laterales masculinae 5 mm longae, glabrae, pedicellis 2—3½ mm longis lateraliter fusco-barbatis, superne sub spiculam longe rufo-barbatis, gluma prima acuminata vel leviter aristulata, aristula vix 1 mm longa, gluma II brevior, aristulata.

BORNEO: West-Koetai, alt. 100 m. leg. Endert no. 5271. Typus in H. L. B. sub no. 940,101—29.

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