Yong No Lee*: Taxonomic studies on the genus Miscanthus (5)
Relationships among the section, subsection and species.
Part. 3 Enumeration of species and varieties

Sect. II. Miscanthus
Subsect. II. Miscanthus
A. First glumes 3 nerved, less than 4 mm long.
B. Main-axis of the inflorescence over two thirds as long as the panicle.
   First glume glabrous, or nearly so on the back.
C. Leaves usually over 2 cm wide, ligule membranaceous, rudimentary
   hairs on the margin. Papillae none on both surfaces of leaf blade......
   ................................................................................. M. floridulus
C. Leaves less than 15 mm wide, ligule membranaceous, hairy. Papillae
   present on the abaxial surface. ..................M. floridulus var. papillatus
B. Main-axis of the inflorescence less than one thirds as long as the panicles.
   First glume pilose on the back. Papillae poorly present on the abaxial
   side. In Islands of Ryukyu..................M. floridulus var. ryukyuensis
   A. First glume of long pedicelled spikelets 4 to 5 nerved, 3.5 mm long.
B. Leaves over 20 mm wide. Spikelets 5 mm long, panicle tufted. ..............
   ................................................................................. M. floridulus var. malayanus
B. Leaves less than 15 mm wide, spikelets less than 4 mm long, panicle not
   tufted.
C. Spikelets 4 mm long, papillae not seen on the abaxial, subsidiary cells
   triangular..........................M. floridulus var. intermedius
C. Spikelets 3.5 mm long, papillae present on the abaxial surface, subsidiary
   cells dome-shaped. ..........................M. floridulus var. taiwanensis

Notes: M. floridulus is distributed over the coastal and oceanic areas of
southeast tropical to warm temperate zones. The species has smallest spikelets
in the genus Miscanthus, which are generally 3 to 3.5 mm long. Brown (1931)
studied the flora of southeastern Polynesia, and described in detail *M. floridulus* based on gross morphology and topographical habitat. The descriptions show that the plants grow in the area of sea-level to 300 m high altitude in Polynesia. Above these coincide with the result of authors review of the specimens which were collected from Formosa, China, and Micronesia. In Phillipines, the plants grow on slopes and along streams at lower and medium altitudes in most of islands and provinces, in Babuyan Islands to Mindanao. Reeder (1948) found the plants from lowlands to the very high altitude of New Guinea. The studies of the habitats may bring a conclusion that a typical form of *M. floridulus* well grow on lowlands and in coastal area instead of high altitude. The floristic and vegetative characters make no great difference by geographical distribution among Micronesia, Polynesia, Formosa, southern China, Phillipines and Pacific coastal zone of Japan. Few varieties were described from Formosan and Malayan specimens in the preceding paper, and suggested that they have been originated by interspecific hybridization.


Habit: Sea side to mountain zone, 2000 m above sea level.


Distribution: Formosa.


Habit: Near seaside of Island of Ryukyu.

Distribution: Islands of Ryukyu.


Malaya: Alt. 2000 m, Camero Highland, M. Togashi No. 6222134, 1962, TI.


Subsect. III. Condensati, Y. Lee. subsect. nov.

A. Callus hairs less than 8.5 mm long. Leaves over 10 mm wide, whitish on the abaxial side. Costal large papillae over the abaxial surface.

B. First glumes 5 to 7 nerved.

C. Leaves 2 to 4 cm wide, costal papillae rounded. Bicellular microhairs 70 μ long. ..............................*M. condensatus*

C. Leaves less than 1.5 cm wide. Costal papillae elongated. Bicellular microhairs 58 μ long.....................*M. condensatus* var. *boninensis*

B. First glumes 3 to 4 nerved. ...............*M. condensatus* var. *intermedius*

A. Callus hairs over 8.5 mm long. Leaves less than 10 mm wide. Costal papillae smaller than the former species......................*M. condensatus* var. *miser*

Notes: *M. condensatus* Hackel resembles *M. sinensis* in the gross morphology.
Makino considered that *M. condensatus* is a variety of *M. sinensis* which grows in the coastal habitat, and many taxonomists followed his taxonomic conception. However, this taxa clearly differs in the anatomical pattern of leaves as pointed out in my previous paper. The gross morphology was reviewed and confirmed the number of veins on the first glume to be 5 to 7 (Fig. 3, 1, 2). The leaf anatomy, the glumes, and the geographical distribution bring a new concept regarding *M. condensatus*. The species is completely independent from *M. sinensis*, and it may be derived from *M. floridulus*. Several varieties are recognized in the areas. *M. condensatus var. intermedius* is known to grow on Islands Sulphur, abundantly and robustly. The plant seems to be an intermediate form of 3-nerved glume's taxa and *M. condensatus*. *M. condensatus* has been cultivated for forage grasses in Bonin and Hachijo for a long time. Such practices have produced many variable forms of *M. condensatus*, and may be some of them have escaped from cultivation, and are growing naturally in suitable area. *M. condensatus var. miser* and var. *boninensis* have narrow leaves and small culms, and their spikelets are similar to those of *M. sinensis*. But the nerves of glume, and the anatomical patterns of leaves are more closely related to those of *M. condensatus*. It is very likely that those varieties have been adapted to different habitat conditions.


1) The habitat of plants is known by Dr. T. Tuyama's kind help.

Distribution: Bonin.


**Miscanthus condensatus** var. **miser** Y. Lee var. nov.—*Miscanthus miser* Nakai in sched. Herb. Univ. Tokyo.

- Pilis callis plus 8.5 mm longis, folia angusta minus 10 mm lata; papilla costa humilior.


A. Awns over 5 mm long. Second glumae 3 nerved. Bicellular microhairs over 63 μ long.

B. Callus hairs usually 8.5 to 9 mm long, silky, bicellular microhairs 77 μ long. ................................. *M. oligostachyus* var. **sinanoensis**

B. Callus hairs less than 7 mm long, not silky, bicellular microhairs less than 70 μ long.

C. Awns 12 mm long, callus hairs 5 to 6 mm long, first glumes 7 mm long. Leaves 8 to 13 mm wide, 20 to 40 cm long. Stomata 25 μ long, 15 μ wide. ................................. *M. oligostachyus*

C. Awns 5 mm long, callus hairs 5 to 7 mm long. First glumes 6.5 mm long. Leaves 12 to 25 mm wide, 40 to 50 cm long. Stomata 32 μ long, 19 μ wide. ................................. *M. oligostachyus* var. **intermedius**
A. Awns less than 5 mm long. Second glumes 5 to 7 nerved. Bicellular micro-
hairs 45 to 49 μ long.
B. Awns excerted from spikelets 4 mm long. Callus hairs 6 mm long. First
glumes 5 mm long, 5 to 7 nerved. Leaves 6 to 7 mm wide, glabrous on
the both surfaces. ......................................................... M. Changii
B. Awns not excerted from the spikelets, 1.5 mm long. Callus hairs 3.5 mm
long. First glumes 5 to 6 mm long, 5 to 7 nerved. Leaves 10 to 15 mm
wide, 30 to 45 cm long. Callus hairs none on the abaxial surface. .......
................................................................. M. tinctorius

Notes: M. oligostachyus grows on mountains from Kyushu to Kanto of Japan
facing the Pacific Ocean, while M. tinctorius is distributed to Kinki, middle
Honshu and southern Tohoku facing the Japan Sea. M. oligostachyus var.
intermedius is found in northern Honshu of Japan and South Korea. M. Changii
is newly reported from Kapyong of Korea. All the species above mentioned are
much alike to each other in their gross morphology and leaf anatomy. Hirayoshi
suggested that the M. oligostachyus var. intermedius might be derived from an
amphiploidal hybrid between M. oligostachyus and M. tinctorius. M. oligosta-
chyus var. intermedius show intermediate characters in awns and leaves, but it
presents polyploidal bigger characters of M. oligostachyus. The author examined
the nerves of glumes in Kariyasua and recognized 3 in number on the second
glume of M. oligostachyus and M. oligostachyus var. intermedius, but 5 nerves
were counted on the second glume of M. tinctorius and M. Changii. The
karyotype is slightly different between M. tinctorius and M. oligostachyus.
While M. oligostachyus var. intermedius showed the karyotype not basically
different from M. oligostachyus except the auto-polyploidal phenomena. The
number of nerves on second glumes and the karyotype suggests that M. oligosta-
chyus var. intermedius might be derived from M. oligostachyus instead of an
amphiploidal hybrid origin. The gross morphology also suggests that M. tin-
ctorius is presumably more advanced than M. oligostachyus.

**Miscanthus oligostachyus** Stapf. in Bull. Misc. Inform. Kew 227 (1898),
150 (1942). —Miscanthus Matsumurae Hackel in Bull. Boiss. 7: 640 (1899) et 2:
552 (1904). —Miscanthus tinctorius Hackel var. aristata Makino ex Honda, in
Monogr. Poac. Jap. 390 (1930) pro syn. —Miscanthus oligostachyus Stapf forma
Habit: Mountain foot to mountain meadow.

Distribution: Kyushu, Shikoku, and Honshu facing to Pacific Ocean.


**Miscanthus oligostachyus** Stapf var. **intermedius** (Honda) Y. Lee comb. nov.


Distribution: Honshu area facing to Japan Sea in Japan and Korea.


Kirigamine, Shinano, Japan, H. Tobita No. 60, 1936.


Distribution: Kapyong, Korea.

Specimens. Mt. Tenma foot, Kapyong, Korea, Chang Heungdu, No. 272, 1947, TNS.


Habit: Area about 1000 to 1500 m above sea level of mountain.

Distribution: Honshu area facing to Japan Sea in Japan.


A. Callus hairs yellow brown, 10 mm long. Spikelets 2 to 2.5 mm long. ........
........................................................................................................................................M. nepalensis

A. Callus hairs less than 5 mm long.
B. First glume 7 to 9 nerved, and second glume 5 nerved.......M. eulaliodes
B. First glume 5 to 7 nerved.
C. Spikelets 4 to 4.5 mm long.

D. Second glume one nerved. .................................................M. szechuanensis
D. Second glume 5 nerved, first glume 5 to 6 nerved.......M. brevipilus
C. Spikelets 5 to 5.5 mm long, callus hairs 2 to 3 mm long.......M. nudipes

Notes: The gloss morphology of Diandra is based mostly on Keng's description in 1959 (Fig. 3. 3).

Miscanthus nepalensis (Trin.) Hack. in DC., Monogr. Phan. 6: 104 (1889)

Habit: Open places in hill.

Distribution: Himalayas, Burma, and western China.


Miscanthus nudipes (Giseb.) Hackel in C. de Condolle Monogr. Phan. 6: 109 (1889).

Miscanthus taylorii Bor in Kew Bull. 273 (1953).

Cited literature