

Taxonomic study of the Carices in the western Honshu of Japan*

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Introduction

Carex is one of the largest living plant genera. At present the number of *Carex* species is estimated at about 2000 in the world and about 200 in Japan. The specific distinction of this group is very difficult because of close mutual resemblance in morphological characters and also because among the group are included many variable species and hybrids. The taxonomic studies of the *Carex* species in Japan have been carried out by many authors. In his excellent monograph of Cyperaceae-Caricoideae, Kükenth (1909) recognized 793 species for the world and about 100 species for Japan, with a very large number of varieties and forms. Akiyama (1955) treated 346 species in "Carices of the Far Eastern Region of Asia". Recently, Ohwi (1956) listed 197 species in "Flora of Japan". Makino (1957) illustrated 120 species in "Flora of Japan". Yoshikawa (1957-1960) studied and illustrated 210 species in "Icones of Japanese *Carex*". Koyama (1954-1959) referred to about 200 Japanese species of *Carex* in his successive papers: "Taxonomic study of Cyperaceae", "Cyperaceae of Dr. Migo's

Central Chinese Collection'', ''Contributio ad Floram Asiaticam Novam-Guineam incluse'', ''An Enumeration of Hayata's Indo-Chinese Collection of Cyperaceae'', etc. In spite of these contributions, however, the *Carex* species in western Honshu of Japan have been studied only a little. As this region is a blank in the Carices study, the need of its local monograph has been keenly felt.

In 1957, on the suggestion of Professor Yoshiwo Horikawa, the author began to study the *Carex* species and intended to provide a taxonomic monograph of the *Carex* species of the western Honshu of Japan. The region investigated geologically consists of various types of acidic igneous rocks, which were formed by the Late Mesozoic igneous activity and among which the granite complex is prevalent. Physiographically the region is divided into San-yo, the southern half, and San-in, the northern half, by the Chugoku Mountains with elevations about 1000 to 1300 m, which extend from east to west.

The present paper deals with the description and distribution of the *Carex* species in the western Honshu. Points usually used as taxonomic characters of the *Carex* species are features of the rhizome and culm; the color and other appearances of the basal sheath; the shape, size and number of the spikelet; the color, shape, size, etc. of the midrib and margin in the scale; the color, shape, size, etc. of the utricle, etc. In previous papers the scale has been treated as a distinguishing character with little importance. But the author paid a deep attention on the scale, because he has found its taxonomic importance. According to the author's observations, the scale is quite useful in distinguishing the species to the extent that most of the species found in the region treated can be classified only by the scale-characters. The author illustrated the scale of all the species treated in this paper. In making the maps, the author employed Horikawa's ''geoquadrate method'' (Horikawa 1952, '54) as stated below:

To indicate the localities of exploration or occurrence of each species, the author used the index map for the topographic maps 1/25,000 compiled by the Geographical Survey Institute of Japan. Thus a unit of geoquadrate, in which localities are indicated by one dot irrespective of their number, is latitude $5' \times$ longitude $7'30''$, covering an area of ca. 9.5×11.6 km in average.

The author has collected and studied about 5000 specimens of Carices in the region treated.

Moreover, specimens of some other herbaria were also used for this study. As a result of the study, 75 species and 5 varieties were recognized and 4 new species and 2 new varieties were found.

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Morphological notes

Herbs of grass-like aspect with fibrous roots and rhizomes. Culms often triangular, usually solid. Leaves normally 3-nerved, with closed sheaths which are in some species greatly reduced or absent. Spikelets usually subtended by a bract, which may be sheathless or sheathing at base, leaf-like or reduced to a sheath only. Flower usually unisexual, each in the axil of a scale, in short and head-like to long and slender spikelets, with perianth, staminate and pistillate either in different parts of the same spikelet, not mingled, or in some dioecious species on different plants. Scales usually spirally imbricate, aggregated in spikelets of essentially uniform size and shape for each species. Utricles lenticular, trigonous, and with nearly round achene. Stigmas 2 or 3.

The main morphological characters observed in classification of the *Carex* species are

summarized as follows:

1) The rhizome densely or sparsely tufts in clumps, has stolons clothed with fibers or has no stolon and is slender or robust. It is nearly impossible to classify the *Carex* species only by the rhizome. But the rhizome is regarded as an important diagnostic character in some species, such as *C. kobomugi*, *C. dispalata* and *C. arenicola*.

2) The culm is obtusely or acutely 3-angled, stiff or stiffish, and scabrous or smooth. The *Carex* species can not be separated only by the culm, which, however, is used as a complementary character in classification.

3) The leaf is mostly green, oblate, thin or thickish, soft or stiffish, 3-nerved and with scabrous margins. The leaf constitutes a useful distinguishing character in some species, such as *C. morrowii*, *C. dispalata*, *C. multifolia*, *C. reinii*, *C. siderosticta*, *C. pachygyna*, *C. ciliato-marginata*, and *C. duvaliana*.

4) The basal sheath splits or not split, fibrous or reticulate, thready-netted or not thready-netted and lustered or lusterless; the color is brown, reddish-brown, yellowish-brown, etc. The basal sheath is an important distinguishing character in most species; for example: *C. blepharicarpa*, *C. lanceolata*, *C. daisenensis*, *C. heterolepis*, *C. otaruensis*, *C. forficula*, etc.

5) Spikelets are usually less than 10 in number, unisexual, monoecious, rarely dioecious (e. g.: *C. kobomugi*), erect or pendulous and with or without a peduncle; the shape is linear, terete, lanceolate, cylindric, etc.; the terminal is usually staminate (rarely androgynous: *C. shimidzensis*, *C. incisa*, etc.); the lateral is usually pistillate (rarely androgynous: *C. dispalata*, *C. confertiflora*, etc.). The spikelet is an important character in classification of most *Carex* species.

6) The bract is sheathed or sheathless, and scaly, setaceous or foliaceous. It is nearly difficult to classify the *Carex* species by the bract. some species lack the bract and can easily be separated from other with the bract. They are *C. rhizopoda*, *C. fulva*, *C. biwensis*, etc.

7) The scale is bearded or beardless; the scale shoulder with serrulate or non-serrulate margins; the midrib mostly greenish, 1 to 3-nerved; the shape is oblong, ovate, obovate, lanceolate, etc.; the color is brown, yellowish-brown, reddish-brown, reddish-purple, purplish-brown, etc.; the nerve reaches or not reach to apex. The scale is more important character that is useful in classifying the *Carex* species.

8) The utricles is nerved or nerveless, glabrous or hairy, beaked or beakless and stiped or sessile; the shape is oval, lanceolate, obovate, cuneate, oblong, etc.; the color is green, glaucous, greenish brown, yellowish-brown, etc.; the mouth is emarginate, truncate, bidentate and membranous. The utricle is also more important character.

9) The achene is 2 or 3-angled; the shape is ovate, narrow-ovate, elliptic, obovate, etc.; the style is mostly short, thickened or not thickened at base. It is nearly difficult to classify the *Carex* species by the achene.

10) The stigma is 2 or 3 and persistent or not persistent. The stigma is used as a complementary character in classification.

Description of Species

Key to the sections

- | | |
|--|----------------|
| 1. Terminal spikelets usually 2-3, staminate | |
| a. Utricles hairy | 28. Hiratae |
| a. Utricles glabrous | 17. Paludosae |
| 1. Terminal spikelet 1, staminate or androgynous | 2 |
| 2. Stigmas 2 | 3 |
| 2. Stigmas 3 | 9 |
| 3. Utricles sessile | 7. Stellulatae |

3. Utricles short-stiped	4
4. Utricles winged	8. Planatae
4. Utricles not winged	5
5. Utricles dentate-beaked	5. Multiflorae
5. Utricles not dentate-beaked	6
6. Bracts absent. Utricles with membranous mouth	4. Foetidae
6. Bracts not absent. Utricles with bidentate mouth	7
7. Utricles sessile	24. Rhomboidales
7. Utricles short-stiped	8
8. Utricles hairy	11. Graciles
8. Utricles glabrous	10. Acutae
9. Bracts absent	10
9. Bracts present	12
10. Utricles hairy	1. Grallatoriae
10. Utricles glabrous	11
11. Utricles long-beaked with membranous mouth	2. Rhizopodae
11. Utricles short-beaked with emarginate or truncate mouth	3. Capitellatae
12. Spikelets dioecious	6. Macrocephalae
12. Spikelets not dioecious	13
13. Utricles winged	9. Gibbae
13. Utricles not winged	14
14. Utricles sessile	15
14. Utricles short-stiped	16
15. Nerves of pistillate scales reaching to apex	16. Confertiflorae
15. Nerves of pistillate scales not reaching to apex	13. Anomalae
16. Utricles nerveless	19. Macroglossae
16. Utricles nerved	17
17. Lateral spikelets androgynous	18
17. Lateral spikelets not androgynous	19
18. Utricles with bidentate mouth	15. Decorae
18. Utricles with truncate mouth	25. Siderostictae
19. Bracts sheathed	20
19. Bracts sheathless	23
20. Utricles short-beaked	21
20. Utricles long-beaked	22
21. Bracts bladeless	26. Digitatae
21. Bracts setaceous or foliaceous	23. Praecoces
22. Scales bearded, serrulate-margined	14. Ferrugineae
22. Scales beardless, mostly not serrulate-margined	18. Debiles
23. Utricles short-beaked	24
23. Utricles long-beaked	25
24. Utricles glabrous	12. Atratae
24. Utricles hairy	27. Montanae
25. Nerves of scales not reaching to apex	21. Physocarpae
25. Nerves of scales reaching to apex	26
26. Basal parts of leaves lateral-nerved	22. Tentaculatae
26. Basal parts of leaves not lateral-nerved	20. Molliculae

Sect. 1. **Grallatoriae** Kükenth., Cyper.-Caric. 88. 1909.

Rhizome densely tufted, stolonless. Culms obtusely 3-angled, the upper scabrous.

Leaves oblate, bristled, scabrous-margined. Basal sheaths lustered, splitting reticulate. Spikelets dioecious or androgynous. Bracts absent. Scales bearded or beardless; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching or not reaching to apex. Utricles hairy, nerveless, short-beaked with truncate mouth, short-stiped. Stigmas 3.

1. **Carex grallatoria** Maxim. in Mél. Biol. 12: 560. 1877. (Map 2, Fig. 1)

Rhizome densely tufted, stolonless. Culms 4-20 cm tall, obtusely 3-angled, the upper scabrous. Leaves oblate, light green, thin, stiffish, 1-1.5 mm wide, bristled, scabrous-margined. Basal sheaths reddish-purple, lustered, splitting-reticulate, slightly thready-netted. Spikelets dioecious, not peduncled; staminate spikelet linear, erect, 1-1.5 cm long, 1 mm thick; pistillate spikelets linear, 5-6 flowers, 1.5-2 cm long, 1.5 mm thick. Bracts absent. Scales: the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; pistillate scales lanceolate, reddish-green, 3-3.5 mm long, 1-1.5 mm wide, the lowest usually bearded; the nerve reaching to apex; staminate scales oblong, reddish, 3-4.5 mm long, 1-1.5 mm wide, whitish membranous-margined, beardless, the nerve not reaching to apex. Utricles elliptic, light yellowish-green, 2.5 mm long, 1 mm thick, slightly hairy, nerveless, recurved short-beaked with truncate mouth at apex, short-stiped at base. Achenes obovate, acutely 3-angled, 2 mm long, about 1 mm wide, short-stiped at base; the style short, erect, not thickened at base; stigmas 3.

Nom. Jap.: Hina-suge.

Hab.: Rocky places, usually along pass-sides; very rare; frequent in sunny places.

Distr.: Japan (Honshu, Shikoku, Kyushu).

Specimens examined. Hiroshima Pref. Saeki-gun: Saeki-cho, Mt. Omine (Apr. 15, 1962, n. 4202, 900 m).

The following all tables (table 1~30) show the characteristic differences among the species closely similar to each other.

Table 1.

Parts	Taxa	
	<i>C. grallatoria</i>	<i>C. grallatoria</i> var. <i>heteroclita</i>
Spikelets	dioecious	androgynous
Pistillate scales	the nerve reaching to apex	the nerve not reaching to apex

Sect. 2. **Rhizopodae** Ohwi, Cyper. Jap. 1: 443. 1963.

Rhizome tufted, stolonless. Culms acutely 3-angled, scabrous. Leaves oblate, thin, scabrous-margined. Basal sheaths lusterless, splitting-reticulate. Spikelet 1, terminal, androgynous. Bracts absent. Scales beardless, serrulate-margined or not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex. Utricles glabrous, nerved, long-beaked with membranous truncate mouth, short-stiped. Stigmas 3.

2. **Carex rhizopoda** Maxim. in Mél. Biol. 12: 561. 1886. (Map 3, Fig. 1)

Rhizome sparsely tufted, stolonless. Culms 20-55 cm tall, acutely 3-angled, stiffish, the upper scabrous. Leaves oblate, dark green, thin, 2-3 mm wide, scabrous-margined. Basal sheaths brown or blackish-purple, lusterless, slightly splitting-reticulate, thready-netted. Spikelet 1, terminal, erect, androgynous (staminate at apex), oblong-terete, 2-2.5 cm long, 4 mm thick. Bracts absent. Scales lanceolate, light brown, beardless; the midrib greenish,

conspicuously 1-nerved; the nerve reaching to apex; pistillate scales 3-3.5 mm long, 1-1.5 mm wide, slightly serrulate-margined; staminate scales 3.5-4 mm long, 1-1.5 mm wide, not serrulate-margined. Utricles ovate-lanceolate, greenish, 5 mm long, 2 mm thick, glabrous, nerved, long-beaked with membranous truncate mouth at apex, short-stiped at base. Achenes obovate, obtusely 3-angled, 2.5 mm long, about 1.5 mm wide, short-stiped at base; the style slender, not thickened at base; stigmas 3.

Nom. Jap.: Shirako-suge.

Hab.: Wet soil, usually near streams; uncommon; frequent in shady places.

Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Specimens examined. Hiroshima Pref. Kamo-gun: Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1287, 1307, 400 m). Aki-gun: Kaita-cho, Mt. Kingatoro (Apr. 20, 1958, n. 407, 50 m). Saeki-gun: Yoshiwa-mura, Mt. Kanmuri (May 25, 1960 n. 2084, 800 m).

Sect. 3. *Capitellatae* Mein. in Act. Hort. Petop. 18: 309. 1901.

Rhizome densely tufted, stolonless. Culms acutely or obtusely 3-angled, scabrous or smooth. Leaves oblate, soft, slightly scabrous-margined. Basal sheaths lusterless, slightly splitting or not splitting-fibrous. Spikelet 1, terminal, erect, androgynous, not peduncled. Bracts absent. Scales bearded or beardless; the scale shoulder slightly serrulate-margined or not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching or not reaching to apex. Utricles oval or ovate, glabrous, nerved or nerveless, short-beaked with emarginate or truncate mouth, short-stiped. Stigmas 3.

Key to the species

- | | |
|---------------------------------|----------------------|
| 1. Culms smooth | <i>C. biwensis</i> |
| 1. Culms usually scabrous | 2 |
| 2. Utricles nerved | <i>C. fulta</i> |
| 2. Utricles nerveless | <i>C. hakonensis</i> |

3. *Carex biwensis* Franch. in Bull. Soc. Philom. Paris 8. sér. 7: 28. 1895. (Map 4, Fig. 2)

Rhizome densely tufted, stolonless. Culms 15-50 cm tall, obtusely 3-angled, smooth. Leaves oblate, dark green, 1-1.5 mm wide, scabrous-margined. Basal sheaths brown, lusterless, not splitting-fibrous. Spikelet 1, terminal, erect, not peduncled, androgynous (staminate at apex), 0.7-1.3 cm long, 1-3 mm thick; the staminate linear 3-7 mm long, 1 mm thick; the pistillate terete, 3-8 mm long, 2-3 mm thick. Bracts absent. Scales ovate-elliptic, reddish-brown, beardless, slightly serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve not reaching to apex; pistillate scales 1.5-2 mm long, 1.5 mm wide; staminate scales 2 mm long, 1.5 mm wide. Utricles oval, greenish, 1.5 mm long, 1 mm thick, glabrous, nerved, purplish-punctulate, short-beaked with emarginate mouth at apex, short-stiped at base. Achenes ovate, obtusely 3-angled, 1.5 mm long, 1 mm wide, truncate-stipitate at base; the style short, not thickened at base; stigmas 3.

Nom. Jap.: Matsuba-suge.

Hab.: Rather wet soil, usually near marshes or streams; common; frequent in sunny places.

Distr.: Japan (Honshu, Shikoku, Kyushu), Korea, Manchuria, Siberia.

Specimens examined. Hiroshima Pref. Mihara Mt. Omine (July 16, 1961, n. 1561, 400 m). Aki-gun: Kumanoato-mura (May 22, 1961, n. 1089, 1094, 170 m); Kaita-cho, Mt. Dosho (May 3, 1962, n. 2802, 460 m). Asa-gun: Kabe-cho, Nabarakyo (Apr. 22, 1962, n. 2707, 2708, 300-400 m); Mt. Kanmuri (Apr. 22, 1962, n. 2739, 2754, 400-500 m). Yamagata-gun: Toyohira-cho, Shirobara (May 28, 1961, n. 1199, 1200, 420 m). Kamo-gun: Hachihon-

matsu-cho, Hara (H. Ando, May 12, 1951, 200 m). Hiba-gun: Saijo-cho, Hirako (Apr. 30, 1961, n. 2268, 2277, 340 m); Tojo-cho, Taishakukyo (S. Tanabe, May 29, 1961, 400 m); Takewatashi (Apr. 30, 1961, n. 1024, 560 m); Shiju (Apr. 30, 1961, n. 1036, 1053, 1056, 480 m).

4. **Carex fulta** Franch. in Bull. Soc. Philom. Paris 8. sér. 7: 28. 1895. (Map 5, Fig. 2)

Rhizome densely tufted, stolonless. Culms 20-54 cm tall, acutely 3-angled, scabrous. Leaves oblate, thin, soft, green, 2-3 mm wide, scabrous-margined. Basal sheaths brown, lusterless, slightly splitting-fibrous. Spikelet 1, terminal, erect, not peduncled, androgynous (staminate at apex), oval, 5 mm long, 2 mm thick. Bracts absent. Scales ovate, light green, usually beardless; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales 1.5 mm long, 1 mm wide, the lowest bearded; staminate scales 1.5 mm long, 1 mm wide. Utricles oval, green, 2 mm long, 1 mm thick, glabrous, nerved, short-beaked with truncate mouth at apex, short-stiped at base. Achenes ovate, obtusely 3-angled, 1.5 mm long, about 1 mm wide, truncate at base; the style short, erect, thickened at base; stigmas 3.

Nom. Jap.: Nikkohari-suge.

Hab.: Very wet soil, usually near marshes; very rare; frequent in shady places.

Distr.: Japan (Honshu).

Specimens examined. Hiroshima Pref. Hiba-gun: Kuchiwa-cho, Mt. Kamamine (July 24, 1961, n. 1933, 480 m).

5. **Carex hakonensis** Franch. et Savat., Enum. Pl. Jap. 2: 123 et 550. 1879.
(Map 6, Fig. 2)

Rhizome densely tufted, short, stolonless. Culms 10-20 cm tall, obtusely 3-angled, slightly scabrous. Leaves oblate, light green, 1 mm wide, slightly scabrous-margined. Basal sheaths yellowish-brown, lusterless, slightly splitting-fibrous. Spikelet 1, terminal, erect, not peduncled, androgynous (staminate at apex), 3-5 mm long, 3.5 mm thick. Bracts absent. Scales elliptic, greenish-brown; the midrib greenish, conspicuously 1-nerved; pistillate scales 1.5 mm long, 1 mm wide, slightly short-bearded, the scale shoulder not serrulate-margined. the nerve reaching to apex; staminate scales 1.5-2 mm long, 1 mm wide, beardless, the scale shoulder slightly serrulate-margined, the nerve not reaching to apex. Utricles ovate, light green, 1.5 mm long, 1 mm thick, glabrous, nerveless, short-beaked with emarginate mouth at apex, short-stiped at base. Achenes broad elliptic, obtusely 3-angled, 1.5 mm long, 1 mm wide, truncate-stipitate at base; the style short, erect or curved, not thickened at base; stigmas 3.

Nom. Jap.: Kohari-suge.

Hab.: Wet soil, usually near marshes; common; frequent in open swales.

Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Okayama Pref. Tomata-gun: Kamisaibara (H. Yokogawa, May 17, 1959, n. 407, 800 m.)

Hiroshima Pref. Saeki-gun: Yoshiwa-mura, Kanmuri-kogen (May 22, 1960, n. 342, 4709, 800 m). Yamagata-gun: Chiyoda-cho, Mt. Ogake (May 24, 1959, n. 357, 4719, 500 m); Geihoku-cho, Mt. Uzuki (June 21, 1960, n. 843, 800 m). Takata-gun: Yachiyo-cho, Mt. Dotoko (June 11, 1961, n. 1384, 620 m); Midori-cho, Mt. Inufushi (July 8, 1961, n. 1664, 600 m); Koda-cho, Mt. Otsuchi (July 1, 1961, n. 1743, 300 m). Kamo-gun: Shiwa-cho, Namitakiji (May 15, 1961, n. 354, 412, 4063, 4706, 400 m); Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1308, 400 m). Toyota-gun: Kawajiri-cho, Mt. Noro (June 4, 1961, n. 1341, 800 m). Sera-gun: Seranishi-cho, Oguni (June 23, 1961, n. 1459, 380 m); Oyamadani (June 23, 1961, n. 1990, 480 m). Jinseki-gun: Jinseki-cho, Fukunaga (S. Tanabe, May 29, 1961, 400 m).

Table 2.

Parts	Taxa	<i>C. biwensis</i>	<i>C. fulva</i>	<i>C. hakonensis</i>
Culms		obtusely 3-angled, smooth	acutely 3-angled, scabrous	obtusely 3-angled, scabrous
Basal sheaths		brown, not splitting-fibrous	brown, slightly splitting-fibrous	yellowish-brown, slightly splitting-fibrous
Pistillate scales		beardless	bearded	bearded
Nerves of staminate scales		not reaching to apex	reaching to apex	reaching to apex
Utricles		nerved, emarginate mouth	nerved, truncate mouth	nerveless, emarginate mouth

Sect. 4. **Foetidae** Tuckerm., Enum. Menth. 10. 1843.

Rhizome tufted, long creeping, stoloniferous. Culms obtusely 3-angled, the upper slightly scabrous. Leaves oblate, stiffish, scabrous-margined. Basal sheaths lusterless, not splitting-fibrous. Spikelets erect, not peduncled, androgynous. Bracts absent. Scales bearded or beardless; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 3-nerved; the nerve reaching to apex. Utricles ovate, glabrous, nerved, long-beaked with scabrous-margined, with membranous mouth, short-stiped. Stigmas 2.

6. **Carex arenicola** Fr. Schm., Reis. Amurl. u. Ins. Sachal. 191. 1868. (Map 7, Fig. 3)

Rhizome sparsely tufted, long-stoloniferous. Culms 10-20 cm tall, obtusely 3-angled, the upper slightly scabrous. Leaves oblate, stiffish, dark green, 2-3 mm wide, slightly scabrous-margined. Basal sheaths brown, lusterless, mostly not splitting-fibrous. Spikelets 6-8, erect, not peduncled, androgynous (staminate at apex), oblong, 5-8 mm long, 3-4 mm thick. Bracts absent. Scales yellowish-brown, bearded or beardless; the scale shoulder not serrulate-margined, whitish membranous-margined; the midrib greenish, conspicuously 3-nerved; the nerve reaching to apex; pistillate scales lanceolate-oblong, 3-4 mm long, 1.5-2 mm wide, bearded; staminate scales lanceolate, 3.5-4 mm long, 1.5 mm wide, slightly bearded or beardless. Utricles ovate, light brown, 3-3.5 mm long, 1-1.5 mm wide, glabrous, nerved, long-beaked with scabrous-margined, with membranous mouth at apex, short-stiped at base. Achenes ovate, 1.5 mm long, about 1 mm wide; the style short, erect, thickened at base; stigmas 2.

Nom. Jap: Kurokawazu-suge.

Hab.: Sand or sandy soil, usually near the coast; rather rare; frequent in sunny places.

Distr.: Japan (Hokkaido, Honshu, Kyushu), Korea, Ussuri, Saghalien, Kuriles,

Specimens examined. Tottori Pref. Tottori: Hamasaka (H. Yokogawa, Apr. 10, 1959); (N. Yano, Apr. 10, 1960); Koyama (Dec. 26, 1960, n. 3140, 10 m).

Shimane Pref. Matsue: Nishikawatsu-cho (June 10, 1956, n. 4051, 2 m).

Sect. 5. **Multiflorae** Kunth, Enum. Pl. 2: 387. 1837.

Rhizome densely tufted, stolonless. Culms obtusely 3-angled, smooth or scabrous. Leaves oblate, scabrous-margined. Basal sheaths lusterless, splitting-fibrous. Spikelets numerous, androgynous (staminate at apex), not peduncled. Scales beardless, not serrulate-margined; the nerve reaching or not reaching to apex. Utricles glabrous, nerved, dentate-beaked with bidentate mouth, short-stiped. Stigmas 2.

7. *Carex nubigena* D. Don, in Trans. Linn. Soc. 14: 326. 1825. (Map 8, Fig. 3)

Rhizome densely tufted, stolonless. Culms 8-30 cm tall, obtusely 3-angled, smooth. Leaves oblate, involute, glaucous, 2-2.5 mm wide, scabrous-margined. Basal sheaths yellowish-brown, lusterless, splitting fibrous. Spikelets 10-13, globose-ovate, androgynous (indistinctly staminate at apex), 5-8 mm long, 2-3 mm thick, not peduncled. Bracts sheathless, scaly or setaceous. Scales ovate, light yellow, not serrulate-margined, whitish membranous-margined, beardless; the midrib greenish, conspicuously 1-nerved; pistillate scales 4 mm long, 3 mm wide, the nerve not reaching to apex; staminate scale 3 mm long, 2 mm wide, the nerve reaching to apex. Utricles oval, greenish, 3-3.5 mm long, 2 mm thick, glabrous, nerved, dentate long-beaked with bidentate mouth at apex, brownish short-stiped at base. Achenes oval, discoid, 1.5 mm long, 1.5 mm wide, truncate at base; the style slender, not thickened at base; stigmas 2.

Nom. Jap.: Tsukushi-minoboro-suge.

Hab.: Damp or moist soil, usually along pass-sides; common; frequent in sunny places.

Distr.: Japan (Honshu, Kyushu).

Specimens examined. Hiroshima Pref. Miyaoshi: Chuo-koen (July 13, 1961, n. 1511, 1512, 180 m). Saeki-gun: Hatsukaichi-cho, Nogaibara (Apr. 26, 1958, n. 4026, 4027, 600 m); Mt. Gokurakuji (June 18, 1961, n. 1441, 1442, 600 m); Yuki-cho, Mt. Togo (May 29, 1960, n. 745, 600 m); Yoshiwa-mura, Kanmuri-kogen (May 22, 1960, n. 341, 4710, 800 m); Mt. Kanumri (May 22, 1960, n. 345, 2079, 900 m). Yamagata-gun: Chiyoda-cho, Mt. Ogake (May 24, 1959, n. 360, 4716, 500 m); Togochi-cho, Sandankyo (May 24, 1958, n. 349, 600 m); Geihoku-cho, Mt. Uzuki (June 21, 1960, n. 819-826, 300 m); Yawata-kogen (Aug. 10, 1959, n. 372, 4760, 800 m); Oasa-cho, Mt. Kanbiki (May 28, 1961, n. 1191, 700 m). Takata-gun: Midori-cho, Mt. Inufushi (July 8, 1961, n. 1665, 600 m); Koda-cho, Mt. Otsuchi (July, 1, 1961, n. 1734, 300 m); Mukaihara-cho, Mt. Hiraune (June 1, 1961, n. 1719, 320 m). Kamo-gun: Fukutomi-cho, Mt. Nishihara (May 30, 1961, n. 1266, 200 m); Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1281, 400 m); Daiwa-cho, Kamikusai (June 2, 1961, n. 1301, 320 m). Sera-gun: Kozan-cho, Otani (June 23, 1961, n. 1470, 1475, 380 m). Futami-gun: Kimita-mura, Kamiizumi (July 24, 1961, n. 1881, 300 m). Hiba-gun: Saijo-cho, Hirako (Apr. 30, 1961, n. 2270, 480 m); Mt. Hiba (Aug. 8, 1961, n. 2301 2302, 700-900 m); Tojo-cho, Takewatashi (Apr. 30, 1961, n. 1028, 560 m); Shiju (Apr. 30, 1961, n. 1029 480 m); Taishakukyo (Aug. 9, 1961, n. 2180, 500 m): Kuchiwa-cho, Mt. Kamamine (July 24, 1961, n. 1912, 480 m); Takano-cho, Mt. Sarumasa (July 28, 1961, n. 1826, 800 m); Mt. Kenashi (July 28, 1961, n. 1856, 600 m); Oka (July 28, 1961, n. 1840, 600 m); Hiwa-cho, Mt. Kuroishi (July 28, 1961, n. 1844, 700 m); Konomura (July 28, 1961, n. 1897, 500 m).

Tottori Pref. Saihaku-gun: Mt. Daisen (Sept. 23, 1960, n. 3172, 800 m).

Shimane Pref. Oda: Mt. Sanbe (June 5, 1960, n. 3079, 3080, 520 m). Iishi-gun: Tonbara-cho, Mt. Kotobiki (July 27, 1960, n. 3014, 700 m). Naka-gun: Kanagi-mura, Yune (June 12, 1960, n. 3054, 500 m).

Table 3.

Parts	Taxa	<i>C. nubigena</i>	<i>C. albatu</i>
Culms		smooth	scabrous
Basal sheaths		yellowish-brown	dark brown or blackish-brown
Staminate scales		the nerve mostly reaching to apex	the nerve not reaching to apex
Utricles		oval	ovate-lanceolate

Sect. 6. **Macrocephalae** Kükenth., Cyper.-Caric. 186. 1909.

Rhizome long creeping, stout, stoloniferous. Culms obtusely 3-angled, stiff, smooth. Leaves oblate, stiff, rough-margined. Spikelets dioecious. Bracts scaly or scabrous. Scales bearded; the midrib 3-nerved or many-nerved. Utricles glabrous, many-nerved, about 10 mm long, dentate long-beaked with bidentate mouth, stiped or sessile. Stigmas 3.

8. **Carex kobomugi** Ohwi in Mem. Coll. Sc. Kyoto Imp. Univ. ser. B, 5: 281. 1930.
(Map 9, Fig. 4)

Rhizome long creeping, stout, clothed with dark brown fibrous. Culms 10-20 cm tall, obtusely 3-angled, smooth. Leaves oblate, stiff, light green, 5-6 mm wide, rough-margined. Basal sheaths brown, lusterless, splitting-fibrous. Spikelets dioecious, erect, not peduncled; the pistillate ovate, 4-4.5 cm long, 1.5-1.8 cm thick; the staminate oblong, 4-5 cm long, 1 cm thick. Bracts sheathless, scaly or setaceous. Scales light brownish-yellow, bearded; the scale shoulder slightly serrulate-margined, membranous-margined; the midrib light brownish-yellow, conspicuously many-nerved; the nerve reaching or not reaching to apex; pistillate scales obovate, 8-10 mm long, 3.5-5 mm wide; staminate scales lanceolate, 8-9 mm long, 2-3.5 mm wide. Utricles ovate-lanceolate, yellowish-green, 10-12 mm long, 3 mm thick, glabrous, brownish nerved, incurved, dentate long-beaked with bidentate mouth at apex, orbicular, sessile at base. Achenes obovate-cylindric, obtusely 3-angled, 8 mm long, 2 mm wide, short-stiped at base; the style short, thickened at base; stigmas 3.

Nom. Jap.: Kobomugi (Fudekusa, Hamamugi).

Hab.: Sand or sandy soil, usually near the coast; common in San-in districts, very rare in San-yo districts; widely distributed in coastal sands of San-in districts; frequent in sunny places.

Distr.: Formosa, China, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea, Manchuria, Ussuri.

Specimens examined. Tottori Pref. Tottori: Hamasaka (H. Yokogawa, Apr. 10, 1959); Koyama (N. Yano, Dec. 26, 1960); Fushino (H. Yokogawa). Iwami-gun: Otani (H. Yokogawa); Uratomi (H. Yokogawa).

Yamaguchi Pref. Hagi: Kikugahama (May 20, 1957, n. 3057, 4033, Apr. 1, 1958, n. 3069-3071, 0-2 m).

Table 4.

Parts	Taxa	<i>C. kobomugi</i>	<i>C. macrocephala</i>
Culms		obtusely 3-angled, smooth	acutely 3-angled, scabrous
Spikelets		usually dioecious	androgynous or dioecious
Scales		many-nerved	usually 3-nerved
Utricles		slightly erect, sessile	conspicuously recurved, short-stiped

Sect. 7. **Stellulata** Kunth, Enum. Pl. 2: 399. 1837.

Rhizome short, densely tufted, stolonless. Culms obtusely 3-angled, scabrous or smooth. Leaves oblate, stiffish, scabrous-margined. Basal sheaths lusterless, not splitting-fibrous. Spikelets androgynous. Bracts sheathless, mostly scaly. Scales not serrulate-margined, whitish membranous-margined; the nerve mostly reaching to apex. Utricles glabrous, curved, long-beaked, mostly sessile. Stigmas 2.

9. **Carex omiana** Franch. et Savat., Enum. Pl. Jap. 2: 126 et 554. 1879. (Map 10, Fig. 5)

Rhizome short, densely tufted, stolonless. Culms 50-70 cm tall obtusely 3-angled, stiff, the upper slightly scabrous. Leaves oblate, stiffish, green, 1.5-2.5 mm wide, scabrous-margined. Basal sheaths yellowish-brown, lusterless, not splitting-fibrous. Spikelets 2-4, androgynous (staminate at apex), 0.7-1.5 cm long, 1.5-5 mm thick. Bracts mostly scaly (the lowest sectaceous). Scales oval, yellowish-brown, not serrulate-margined, whitish membranous-margined; the nerve reaching to apex; the midrib greenish, conspicuously 1-nerved; pistillate scales 3 mm long, 2 mm wide; staminate scales 3 mm long, 2 mm wide. Utricles ovate-lanceolate, greenish-brown, 4-5 mm long, 1.5 mm thick, glabrous, nerved, long-beaked with bidentate mouth at apex, orbicular-thickened at base. Achenes oval, obtusely 2-angled, 2 mm long, about 1 mm wide, truncate at base; the style short, thickened at base; stigmas 2.

Nom. Jap.: Yachikawazu-suge.

Hab.: Wet soil, usually swamps and sphagnum bogs; common, highly variable; frequent in sunny places.

Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Specimens examined. Hiroshima Pref. Mihara: Mt. Omine (July 16, 1961, n. 1569, 300 m). Saeki-gun: Hatsukaichi-cho, Mt. Gokurakuji (June 18, 1961, n. 1428, 1445, 600 m). Yamagata-gun: Chiyo-da-cho, Mt. Ogake (May 24, 1959, n. 358, 4718, 500 m); Geihoku-cho, Yawata highland (Aug. 12, 1958, n. 4193, 800 m); Mt. Uzuki (June 21, 1960, n. 829, 830, 831, 835, 800 m). Kamo-gun: Kurose-cho, Kamijo (May 21, 1961, n. 1005, 300 m); Shiwa-cho, Namitakiji (May 4, 1958, n. 411, 4062, 4703, 400 m); Fukutomi-cho, Mt. Nishihara (June 2, 1961, n. 1271, 400 m); Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1291, 1303, 400 m); Daiwa-cho, Kamikusai (June 2, 1961, n. 1300, 1317, 320 m). Toyota-gun: Kawajiri-cho, Mt. Noro (June 4, 1961, n. 1335, 1346, 1349, 800 m). Sera-gun: Seranishi-cho, Mt. Hatakoya (June 23, 1961, n. 1448, 480 m); Oguni (June 23, 1961, n. 1460, 380 m).

Shimane Pref. Naka-gun: Kanagi-mura, Yune (June 12, 1960, n. 3052, 500 m).

Sect. 8. **Planatae** Akiyama, Caric. Far East. Reg. As. 67. 1955.

Rhizome densely tufted, stolonless. Culms obtusely 3-angled, smooth. Leaves oblate, scabrous-margined. Basal sheaths lusterless, splitting-fibrous. Spikelets erect, not peduncled, androgynous. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales bearded; the scale shoulder not serrulate-margined; the nerve reaching to apex. Utricles glabrous, nerved, winged, short-beaked with bidentate mouth, short-stiped. Stigmas 2.

10. **Carex planata** Franch. et Savat., Enum. Pl. Jap. 2: 126 et 555. 1879. (Map 11, Fig. 5)

Rhizome short, densely tufted, stolonless. Culms 30-60 cm tall, obtusely 3-angled, smooth. Leaves oblate, soft, thin, light green, 1.5-2 mm wide, scabrous-margined. Basal sheaths brown, lusterless, slightly splitting-fibrous. Spikelets 3-5, erect, not peduncled, androgynous (slightly staminate at base), globular-ovate, 5-8 mm long, 4-5 mm thick. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales whitish-green (afterward brownish), bearded; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales ovate, 2-2.5 mm long, 1-1.5 mm wide; staminate scales narrow ovate, 2.5 mm long, 1 mm wide. Utricles oval, light green, 3-3.5 mm long, 1.5-2 mm wide, glabrous, nerved, winged, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes oblong, 1.5 mm long, about 1 mm wide, truncate-stiped at base; the style short, erect, thickened at base; stigmas 2.

Nom. Jap.: Takane-masukusa.

Hab.: Rather wet or moist soil, usually along pass-sides; rare; frequent in shady places.

Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Specimens examined. Hiroshima Pref. Hiba-gun: Tojo-cho, Taishakukyo (Aug. 10, 1961, n. 2188-2191, 2193-2197, 2242, 400-420 m).

Sect. 9. **Gibbae** Kükenth., Cyper.-Caric. 238. 1909.

Rhizome sparsely tufted, stolonless. Culms obtusely 3-angled, smooth. Leaves oblate, scabrous-margined. Basal sheaths lusterless, splitting-fibrous. Spikelets erect, androgynous, not peduncled. Bracts sheathless, the upper setaceous or scaly, the lower foliaceous. Scales serrulate-margined; pistillate scales bearded; staminate scales beardless. Utricles glabrous, nerveless, winged, dentate-margined, short-beaked with bidentate mouth, sessile. Stigmas 3.

11. **Carex gibba** Wahlenb. in Vet. Acad. Nya Handl. Stockh. 24: 148. 1803.
(Map 12, Fig. 6)

Rhizome sparsely tufted, stolonless. Culms 20-50 cm tall, obtusely 3-angled, smooth. Leaves oblate, soft, thin, light green or dark green, 2-4 mm wide, scabrous-margined; the ventral part of the leaf sheath whitish membranous. Basal sheaths grayish-brown, lusterless, splitting-fibrous. Spikelets 5-9, erect, not peduncled, androgynous (staminate at base), oblong, 0.4-1 cm long, 3-4 mm thick. Bracts sheathless, the upper setaceous or scaly, the lower foliaceous. Scales broad oval, serrulate-margined, whitish-green; the midrib greenish, conspicuously 3-nerved; pistillate scales bearded, 1.5-2 mm long, 2 mm wide, the nerve reaching to apex; staminate scales beardless, 2 mm long, 2 mm wide, the nerve not reaching to apex. Utricles oval, light green, 2.5-3 mm long, 2 mm wide, winged, nerveless, glabrous, dentate-margined, short-beaked with bidentate mouth at apex, sessile at base. Achenes ovate, 2 mm long, about 1 mm wide, discoid at apex; the style short, thickened at base; stigmas 3.

Nom. Jap.: Masukusa.

Hab.: Relatively dry or moist soil, usually along road sides or in fields; common; frequent in shady places.

Distr.: China, Japan (Honshu, Shikoku, Kyushu), Manchuria.

Specimens examined. Okayama Pref. Okayama: Mt. Misao (May 14, 1961, n. 3033, 150 m); Tsushima (May 14, 1961, n. 3036, 10 m). Kawakami-gun: Bichu-cho, Iwayadani (May 15, 1961, n. 3029, 3030, 400 m).

Hiroshima Pref. Kure: Tenno-cho, Yakeyama (June 26, 1960, n. 2417, 300 m); Nikokyo (June 25, 1960, n. 860, 200 m). Hiroshima: Motoujina-cho (June 7, 1963, n. 2834, 10 m). Mihara: Mt. Sakura (May 30, 1961, n. 1246, 180 m). Onomichi: Mitsukoshi (July 15, 1961, n. 2054, 20 m). Innoshima: Habu (May 26, 1961, n. 1144, 100 m); Mt. Oku (May 26, 1961, n. 1151, 300 m); Sannosho (May 26, 1961, n. 1147, 120 m); Mukunoura (May 26, 1961, n. 2441, 60 m). Miyoshi: Chuo-koen (June 13, 1961, n. 1508, 1513, 180 m); Ozekiyama-koen (June 5, 1960, n. 899, 901, 150 m). Matsunaga: Higashi-cho (July 16, 1961, n. 2083, 60 m). Shobara: Nanatsukahara (June, 1958, n. 151, 156, 161, 169, 4124-4126, 300 m). Takehara: Mt. Asahi (May 24, 1961, n. 1133, 200 m); Takehara (May 24, 1961, n. 1135, 180 m). Aki-gun: Fuchu-cho, Mikumarikyo (June 27, 1958, n. 172, 183, 50m); Fuchu (June 27, 1958, 2630, 30 m); Funakoshi-cho, Mt. Iwataki (May 5, 1958, n. 103-105, 50 m); Takeura (May 23, 1957, n. 2666, 100 m); Funakoshi-toge (Apr. 1, 1960, n. 2646, 20 m); Kumano-cho, Nakamizo (Apr. 2, 1960, n. 2636, 250 m); Yano-cho (May 26, 1957, n. 2674, 30 m); Saka-cho, Saka (May 26, 1957, n. 4014, 80 m); Yokohama (May 26, 1957, n. 4013, 100 m); Senogawa-cho, Mt. Tengubo (June 15, 1958, n. 386, 200 m); Hataka (Apr. 2, 1958, n. 2650, 100 m); Kaita-cho, Mt. Hinoura (Apr. 5, 1958, n. 2654, 60 m); Kamagari-cho (Apr. 28, 1961, n. 945, 200 m); Shimokamagari-cho (Apr. 28, 1961, n. 966, 220 m); Kumanoato-mura (May 22, 1961, n. 1120, 170 m). Saeki-gun:

Itsukaichi-cho (June 18, 1961, n. 1421, 80 m); Hatsukaichi-cho (June 18, 1961, n. 2353, 80 m); Mt. Gokurakuji (June 18, 1961, n. 1446, 100 m); Miyajima (July 27, 1961, n. 2361, 300 m). Asa-gun: Kabe-cho, Nabarakyo (Apr. 17, 1960, n. 2344, 300 m); Mt. Bizenbo (June 11, 1961, n. 1406, 220 m). Yamagata-gun: Tsutsuga-mura, Nunohara (July 9, 1961, n. 1642, 420 m); Mt. Ichima (July 9, 1961, n. 1627, 500 m). Takata-gun: Yachiyo-cho, Mt. Dotoko (June 11, 1961, n. 1387, 620 m); Sasai (June 11, 1961, n. 1395, 240 m); Koda-cho, Mt. Otsuchi (June 1, 1961, n. 1745, 300 m); Mukaiharacho, Mt. Hiraune (June 1, 1961, n. 1726, 320 m). Kamo-gun: Hachihonmatsu-cho (June 5, 1961, n. 2551, 280 m); Kurose-cho, Kamijo (May 21, 1961, n. 1006, 200 m); Mt. Kota (May 21, 1961, n. 1016, 300 m); Takaya-cho, Inagi (June 2, 1961, n. 2572, 280 m); Fukutomi-cho, Kuba (June 2, 1961, n. 2525, 360 m); Atodani (June 2, 1961, n. 2542, 480 m); Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1294, 1304, 400-500 m); Nakaonchi (June 2, 1961, n. 1295, 400 m). Toyota-gun: Kawajiri-cho, Mt. Noro (June 4, 1961, n. 2114, 200 m); Yasuura-cho (June 4, 1961, n. 1320, 400 m); Akitsu-cho (June 4, 1961, n. 1330, 80 m); Hongo-cho (May 30, 1961, n. 1249, 130 m); Yutaka-cho (May 24, 1961, n. 1131, 160 m); Osaki-cho (May 23, 1961, n. 1122, 200 m); Kinoue-cho, Mt. Kanmine (May 23, 1961, n. 2103, 350 m); Setoda-cho, Mt. Kannon (May 30, 1961, n. 1227, 1228, 300 m). Sera-gun: Kozan-cho, Mt. Shin (June 23, 1961, n. 1472, 420 m); Mt. Une (June 23, 1961, n. 1978, 600 m); Sera-cho, Hongo (June 23, 1961, n. 1977, 480 m); Seranishi-cho, Oguni (June 23, 1961, n. 1455, 380 m); Roppongi (June 23, 1961, n. 1974, 500 m); Otsubo (June 23, 1961, n. 1975, 440 m); Oyamadani (June 23, 1961, n. 1976, 480 m). Numakuma-gun: Utsumi-cho, Mt. Taka (July 2, 1961, n. 1963, 160 m); Yokojima (July 2, 1961, n. 1718, 200 m); Numakuma-cho, Habu (July 2, 1961, n. 1714, 200 m). Ashina-gun: Kyowa-mura, Yokodani (July 14, 1961, n. 2019, 300 m); Fujio-mura, Kawai-dani (Aug. 12, 1961, n. 2008, 200 m); Shinichi-cho, Kamitode (Aug. 13, 1961, n. 2099, 150 m). Jinseki-gun: Sanwa-cho, Inuzuka (Aug. 12, 1961, n. 2065, 400 m); Jiseki-cho, Shinryuko (Aug. 11, 1961, n. 2219, 400 m). Konugun: Joge-cho (July 13, 1961, n. 1952, 500 m). Futami-gun: Sanwa-cho, Itagi (July 1, 1961, n. 1963, 320 m); Kimita-mura, Kamiizumi (July 24, 1961, n. 1883, 300 m); Mirasaka-cho (July 13, 1961, n. 1524, 240 m). Hiba-gun: Saijo-cho, Hirako (Apr. 30, 1961, n. 2292, 340 m); Tojo-cho, Taishakukyo (Aug. 9, 1961, n. 2141, 2138, 2182, 2200, 2206, 2232, 2244, 2254, 2255, 420-500 m); Takewatashi (Apr. 30, 1961, n. 1077, 2297, 650 m); Shiju (Apr. 30, 1961, n. 2298, 480 m); Kuchiwa-cho, Mt. Kamamine (July 24, 1961, n. 1918, 1930, 480 m); Hiwa-cho, Konomura (July 28, 1961, n. 1894, 500 m).

Shimane Pref Matsue: Jozan (May 14, 1960, n. 3135, 20 m).

Yamaguchi Pref Hagi: Mt. Hokusui (Aug. 4, 1962, n. 3382, 3383, 200 m). Kuga-gun: Mikawa-cho, Jotobata (May 3, 1963, n. 3445, 500 m); Watari (May 3, 1963, n. 3464, 100 m); Iwayakannon (May 3, 1963, n. 3519, 3520, 300-400 m).

Table 5.

Parts	Taxa	<i>C. gibba</i>	<i>C. planata</i>
Scales		scale shoulders serrulate-margined, staminate scales beardless	scale shoulders not serrulate-margined, staminate scales bearded
Utricles		sessile	short-stiped
Stigmas		3	2

Sect. 10. *Acutae* Fries, Corp. Fl. Suec. 191. 1835.

Rhizome densely or sparsely tufted, stolonless or stoloniferous. Culms acutely 3-angled, smooth or scabrous. Leaves oblate, thin, stiffish, scarbrous-margined. Basal sheaths lustered

or lusterless, splitting-fibrous or reticulate. Spikelets pendulous or erect, the lower peduncled; terminal spikelet staminate (rarely androgynous); lateral spikelets pistillate (rarely androgynous). Bracts sheathless, the upper setaceous, the lower foliaceous. Scales bearded or beardless; the scale shoulder serrulate-margined, or not serrulate-margined the nerve reaching or not reaching to apex. Utricles glabrous, nerved or nerveless, short-beaked, short-stiped. Stigmas 2.

Key to the subsections

1. Pistillate scales mostly beardless; the nerve not reaching to apex (1) *Thunbergiae*
1. Pistillate scales bearded; the nerve reaching to apex 2
2. Staminate scales beardless (2) *Forficulae*
2. Staminate scales mostly bearded (3) *Plaelongae*

Subsect. 1. ***Thunbergiae*** Akiyama, Caric. Far East. Reg. As. 72. 1955.

Rhizome densely tufted, stoloniferous. Culms slender, acutely 3-angled, mostly smooth. Leaves oblate, thin, stiffish, scabrous-margined. Basal sheaths bladeless, lustered, splitting-reticulate or fibrous. Spikelets erect; terminal spikelet staminate; lateral spikelets pistillate, peduncled. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales beardless, not serrulate-margined, whitish membranous-margined; the nerve not reaching to apex. Utricles glabrous, nerved, short-beaked, short-stiped. Stigmas 2.

12. ***Carex thunbergii*** Steud. in Fl. 29: 23. 1846. (Map 13, Fig. 7)

Rhizome densely tufted (rarely sparsely tufted), stoloniferous. Culms 20-50 cm tall, acutely 3-angled, smooth. Leaves oblate, greenish, 1.5-4 mm wide, stiffish, thin, conspicuously 3-nerved, scabrous-margined. Basal sheaths bladeless, yellowish-, reddish- and purplish-brown, lustered, splitting-reticulate. Spikelets 3-5, erect; terminal spikelet staminate, terete, 2-6 cm long, 2.5-4 mm thick; lateral spikelets pistillate, oblong or terete, 1-4 cm long, 3-4 mm thick, short-peduncled or not peduncled. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales beardless, not serrulate-margined, whitish membranous-margined; the midrib greenish conspicuously 1-nerved; the nerve not reaching to apex; pistillate scales lanceolate-oblong, dark purplish-brown, 2-2.5 mm long, 1.5 mm wide; staminate scales oblong, light purplish-brown, 3.5-4 mm long, 1.5-2 mm wide. Utricles oblong or oval, light green, 2.5-3.5 mm long, 1-1.5 mm wide, glabrous, nerved, purplish or brownish-punctulate, short-beaked with truncate mouth at apex, short-stiped at base. Achenes elliptic, obtusely 2-angled, 2 mm long, 1 mm wide, truncate at base; the style long, not thickened at base; stigmas 2.

Nom. Jap.: Aze-suge.

Hab.: Wet soil, usually near streams or marshes; common, highly variable; frequent in sunny places.

Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu), Kuriles, Saghalien.

Specimens examined. Hiroshima Pref. Aki-gun: Fuchu-cho, Mikaumarikyo (June 27, 1958, n. 2623, 30 m); Kaita-cho, Higashikaita (Apr. 2, 1960, n. 565-567, 10 m); Hatadani (Apr. 2, 1960, n. 547, 130 m); Mt. Kingatoro (Apr. 20, 1958, n. 402, 100 m); Senogawa-cho, Nakano (Mar. 28, 1960, n. 2616, 30 m). Saeki-gun: Hatsukaichi-cho, Nogaibara (Apr. 26, 1958, n. 2614, 600 m); Yoshiwa-mura, Mt. Kanmuri (May 22, 1960, n. 2078, 800 m); Kanmuri-kogen (May 22, 1960, n. 2588, 800 m). Asa-gun: Sato-cho, Midorii (H. Ando, Apr. 26, 1959, 20 m); Numata-cho, Tomo (June 10, 1961, n. 4186, 100 m); Kabe-cho, Mt. Bizenbo (June 11, 1961, n. 1407, 220 m); Mt. Fukuoji (Apr. 17, 1960, n. 2325, 280 m); Nabarakyo (Apr. 17, 1960, n. 598, 607, 300 m). Yamagata-gun: Geihoku-cho, Mt. Uzuki (June 12, 1960, n. 845, 856, 800 m); Toyohira-cho, Shirobara (May 28, 1961, n. 1196, 1206, 420 m); Oasa-cho, Yokogawa (May 28, 1961, n. 2465, 440 m); Tahara (May 28, 1961, n. 2456, 500 m); Kayahara (May 28, 1961, n. 2450, 400 m). Takata-gun: Midori-cho, Mt. Inufushi (July 8, 1961, n. 1666,

600 m). Kamo-gun: Saijo-cho (Apr. 29, 1957, n. 300, 4035, 300 m); Kurose-cho, Kamijo (May 21, 1961, n. 1003, 1018, 200 m); Daiwa-cho, Atodani (June 24, 1961, n. 2554, 360 m); Hachihonmatsu-cho, Hara (H. Ando, May 12, 1961, 200 m); Shiwa-cho, Namitakiji (May 4, 1958, n. 415, 416, 400 m). Sera-gun: Sera-cho, Tsuguchi (June 23, 1961, n. 1988, 420 m); Seranishi-cho, Roppongi (June 23, 1961, n. 1986, 500 m); Oguni (June 23, 1961, n. 1456, 1480, 380 m); Otsubo (June 23, 1961, n. 1987, 440 m). Hiba-gun: Saijo-cho, Hirako (Apr. 30, 1961, n. 2272, 340 m); Tojo-cho, Taishakukyo (Aug. 11, 1961, n. 2251, 420 m); Takewatashi (Apr. 30, 1961, n. 1032, 560 m); Shiju (Apr. 30, 1961, n. 1033, 480 m).

Shimane Pref. Naka-gun: Kanagi-mura, Yune (June 12, 1960, n. 3046, 500 m).

Table 6.

Parts	Taxa	<i>C. thunbergii</i>	<i>C. heterolepis</i>
Culms		smooth	scabrous
Basal sheaths		not thready-netted	thready-netted
Pistillate scales		beardless	bearded
Utricles		light green, nerved, truncate mouth	purplish-brown, nerveless, bidentate mouth

Subsect. 2. **Forficulae** Franch. in Nouv. Arch. Mus. Paris 3. sér. 10: 103 1898.

Rhizome densely tufted, stoloniferous or stolonless. Culms acutely 3-angled, scabrous. Leaves oblate, stiffish, scabrous-margined. Basal sheaths bladeless, lustered, splitting-reticulate, thready-netted. Spikelets erect or pendulous, peduncled; terminal spikelet staminate; lateral spikelets pistillate. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales elliptic or oblong; the scale shoulder serrulate-margined or not serrulate-margined; the midrib greenish, conspicuously 1 or 3-nerved; the nerve reaching or not reaching to apex; pistillate scales bearded; staminate scales beardless. Utricles obovate or ovate, glabrous, nerveless, spotted, short or long-beaked with bidentate or emarginate mouth, short-stiped. Stigmas 2.

Key to the species

1. Rhizome stoloniferous *C. heterolepis*
1. Rhizome stolonless 2
2. Scales serrulate-margined *C. forficular*
2. Scales not serrulate-margined *C. otaruensis*

13. *Carex heterolepis* Bunge in Enum. Pl. Chin. Bor. 69. 1832. (Map 14, Fig. 7)

Rhizome densely tufted in small clump, thick, long-stoloniferous. Culms 20-60 cm tall, acutely 3-angled, stiffish, the upper scabrous. Leaves oblate, stiffish, 3-5 mm wide, conspicuously 3-nerved, glaucous, scabrous-margined; the ventral part of the leaf whitish membranous, lateral-nerved. Basal sheaths bladeless, yellowish-brown, lustered, splitting-reticulate, thready-netted. Spikelets 4-7, erect; terminal spikelet staminate, linear-cylindric, 3.5-5 cm long, 3 mm thick; lateral spikelets pistillate, cylindric, 1.5-4 cm long, 3 mm thick, the lower short-peduncled. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales dark purplishbrown; the scale shoulder not serrulate-margined; the midrib yellowish-green, conspicuously 1-nerved; pistillate scales oblong, 2.5 mm long, 1 mm wide, slightly bearded, the nerve reaching at to apex; staminate scales linear-oblong, 3-4 mm long, 1-1.5 mm wide, beardless, the nerve not reaching to apex. Utricles ovate, purplish-brown, 2-2.5 mm long, 1.5 mm short-stiped at base, wide, glabrous, nerveless, purplish-punctulate, short-beaked with bidentate mouth at apex, Achenes obovate, 2 mm long, 1 mm wide, truncate at base; the style

slender, not thickened at base; stigmas 2.

Nom. Jap.: Yamaaze-suge (Himetekiri-suge, Hirohatanigawa-suge).

Hab.: Very wet soil, usually along streams; common; frequent in sunny places.

Distr.: China, Japan (Hokkaido, Honshu, Kyushu), Korea, Manchuria.

Specimens examined. Okayama Pref. Tomata-gun: Kamisaibara-mura (H. Yokogawa, May 17, 1959, n. 423, 408, 800 m).

Hiroshima Pref. Shobara: Ueno-koen (Aug. 8, 1961, n. 2372, 160 m); Akagawa (Aug. 8, 1961, n. 2378, 300 m); Motomura (Aug. 8, 1961, n. 2382, 300 m); Haruta (Aug. 8, 1961, n. 2384, 300 m). Mihara: Mt. Omine (July 16, 1961, n. 2436, 300 m). Fuchu:

Shimokawabe (July 16, n. 1493, 150 m). Fukuyama: Mt. Hiko (July 31, 1961, n. 1752, 300 m); Kumagamine (July 31, 1961, n. 1704, 200 m). Aki-gun: Fuchu-cho, Mikumari-kyo (May 3, 1960, n. 690, 702, 4749, 50-80 m); Senogawa-cho, Mt. Tengubo (June 9, 1957, n. 318, 390, 100 m); Nakano (June 27, 1958, n. 4151, 30 m); Hataka (Apr. 1, 1958, n. 4170, 100 m); Seno (June 2, 1957, n. 4042, 4062, 80 m, June 21, 1957, n. 309, 313, 314, 150 m); Kumanoato-mura (May 22, 1961, n. 1102-1104, 1107, 170 m). Saeki-gun: Yuki-cho, Mt. Togo (May 29, 1960, n. 2591, 300 m); Yoshiwa-mura, Kanmuri-kogen (May 29, 1960, n. 787, 809, 800 m). Asa-gun: Kabe-cho, Nenotani (June 11, 1961, n. 2341, 240 m); Nabarakyo (Apr. 22, 1962, n. 2724, 300-400 m); Mt. Bizenbo (June 11, 1961, n. 1410, 220 m); Asa-cho, Suzuhari (May 29, 1961, n. 2345, 300 m); Koyo-cho, Mt. Takahachi (Apr. 20, 1958, n. 2346, 400 m). Yamagata-gun: Togochi-cho, Sandankyo (May 24, 1958, n. 221, 248, 249, 4082, 500 m); Chiyoda-cho, Myojin-toge (May 28, 1961, n. 2496, 440 m); Tsutsuga-mura, Nunohara (July 9, 1961, n. 2511, 420 m); Oasa-cho, Kayahara (May 28, 1961, n. 2454, 400 m); Yokogawa (May 28, 1961, n. 2472, 440 m); Tahara (May 28, 1961, n. 2463, 500 m); Toyohira-cho, Shirobara (May 28, 1961, n. 1209, 420 m). Takata-gun: Yoshida-cho, Mt. Kohori (July 8, 1961, n. 1654, 280 m); Yachiyo-cho, Mt. Dotoko (June 11, 1961, n. 2130, 620 m); Sasai (June 11, 1961, n. 2131, 240 m); Midori-cho, Mt. Inufushi (July 8, 1961, n. 1667, 600 m); Yokota (July 8, 1961, n. 1671, 340 m); Takamiya-cho, Harada (July 8, 1961, n. 2132, 300 m); Rokurohara (July 8, 1961, n. 1682, 300 m); Koda-cho, Kotachiekiguchi (July 1, 1961, n. 2133, 280 m). Kamo-gun: Shiwa-cho; Namitakiji (May 15, 1959, n. 4698, 400 m); Takaya-cho, Inagi (June 2, 1961, n. 2571, 280 m); Fukutomi-cho, Kuba (June 2, 1961, n. 2526, 360 m); Atodani (June 2, 1961, n. 2540, 480 m); Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1278, 400 m); Nakaonchi (June 2, 1961, n. 2538, 400 m); Daiwa-cho, Kamikusai (June 2, 1961, n. 1310, 320 m). Mitsuki-gun: Mitsugi-cho, Ichi (July 16, 1961, n. 1502, 120 m); Kui-cho, Egi (July 16, 1961, n. 1940, 40 m); Ishibashiri (July 16, 1961, n. 1519, 320 m). Fukayasu-gun: Kamo-cho, Enmeikyo (July 30, 1961, n. 1788, 240 m). Ashina-gun: Kyowa-mura, Yokodani (July 14, 1961, n. 2016, 300 m); Fujio-mura, Kawaidani (Aug. 12, 1961, n. 2015, 200 m); Ashida-cho, Mitogi (Aug. 13, 1961, n. 2035, 280 m). Jinseki-gun: Sanwa-cho, Iseki (Aug. 12, 1961, n. 2058, 500 m). Futami-gun: Kimita-mura, Kamiizumi (July 24, 1961, n. 1876-1878, 300 m); Funo-mura, Mt. Menkame (July 21, 1961, n. 1604, 1608, 500 m). Hiba-gun: Saijo-cho, Hirako (Apr. 30, 1961, n. 2290, 2291, 340 m); Tojo-cho, Taishakukyo (Aug. 9, 1961, n. 2148, 2174, 2207, 2208, 2250, 420-500 m); Take-watashi (Apr. 30, 1961, n. 1030, 1031, 560 m); Shiju (Apr. 30, 1961, n. 1058, 1070, 1083, 480 m); Kuchiwa-cho, Mt. Kamamine (July 24, 1961, n. 1915, 480 m); Takano-cho, Mt. Kenashi (July 28, 1961, n. 1852, 600 m); Mt. Sarumsa (July 28, 1961, n. 1827, 800 m); Hiwa-cho, Mt. Kuroishi (July 28, 1961, n. 1843, 700 m).

Shimane Pref. Ishi-gun: Akagi-cho, Akana-toge (July 21, 1961, n. 3025, 500 m); Tonbara-cho, Mt. Kotobiki (July 27, 1961, n. 3001, 3004, 700 m).

Yamaguchi Pref. Kuga-gun: Sakaue-mura, Yasakakyo (June 5, 1955, n. 4764, 200 m). Yoshiki-gun: Ogori-cho, Kamagabuchi (Sept. 24, 1961, n. 3230, 20 m). Mine-gun: Akiyoshi-cho, Akiyoshido (Sept. 24, 1961, n. 3226, 100 m). Abu-gun: Kawakami-mura, Chomonkyo (Sept. 23, 1961, n. 3223, 200 m); Ato-cho (Sept. 23, 1961, n. 3182, 3190, 3200, 220 m). Hagi: Mt. Hakusui (Aug. 4, 1962, n. 3387, 200 m).

14. **Carex forficula** Franch. et Savat., Enum. Pl. Jap. 2: 131 et 577. 1879. (Map 15, Fig. 7)

Rhizome densely tufted, stolonless. Culms 30-50 cm tall, acutely 3-angled, scabrous. Leaves oblate, stiffish, glaucous, 3-4 mm wide, conspicuously 3-nerved, scabrous-margined. Basal sheaths bladeless, slightly lustered, reddish-brown, splitting-reticulate, thready-netted. Spikelets 3-5, erect; terminal spikelet staminate, linear, 2-4 cm long, 2-2.5 mm thick; lateral spikelets pistillate, terete, 1-3.5 cm long, 3-4 mm thick, the lower short-peduncled. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales blackish-purple, serrulate-margined; the midrib greenish, conspicuously 3-nerved; pistillate scales elliptic, bearded, 2.5-3 mm long, 1.5 mm wide, the nerve reaching to apex; staminate scales oblong, beardless, 3-3.5 mm long, 1.5 mm wide, the nerve reaching or not reaching to apex. Utricles obovate, green, 3-3.5 mm long, 1-1.5 mm thick, glabrous, nerveless, purplish-punctulate, long-beaked with bidentate mouth at apex, short-stiped at base. Achenes obovate, 2 mm long, 1 mm wide; the style short, not thickened at base; stigmas 2.

Nom. Jap.: Tanigawa-suge.

Hab.: Wet soil, usually along streams or marshes; common; frequent in sunny places.

Distr.: China, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea, Manchuria, Siberia.

Specimens examined. Okayama Pref. Maniwa-gun: Mt. Hiru (H. Yokogawa, May 23, 1959, 500 m).

Hiroshima Pref. Hiroshima: Koi-cho (Apr. 26, 1958, n. 134, 136, 139, 80 m); Mitaki-cho, Makinodani (Apr. 22, 1960, n. 522, 523, 200 m). Kure: Tenno-cho, Yakeyama (June 26, 1960, n. 2416, 300 m); Nikokyo (June 25, 1960, n. 758, 200 m). Mihara: Mt. Omine (July 16, 1961, n. 1567, 300 m). Aki-gun: Fuchu-cho, Mikumarikyo (June 27, 1958, n. 170, 50 m, June 21, 1959, n. 338, 340, 150 m, May 3, 1960, n. 689, 693, 706, 710-712, 50-80 m); Funakoshi-cho, Takeura (Apr. 29, 1958, n. 114, 115, 4118, 30 m); Kaita-cho, Mt. Hinoura (Apr. 5, 1958, n. 4743, 350 m); Yano-cho, Mt. Ege (May 26, 1957, n. 4738, 300 m); Kumano-cho, Akaho-toge (July 12, 1958, n. 22, 26, 42, 160 m); Kumanoato-mura (May 22, 1961, n. 1119, 170 m). Saeki-gun: Itsukaichi-cho (June 18, 1961, n. 2356, 160 m); Nogaibara (Apr. 26, 1958, n. 56, 600 m); Hatsukaichi (June 18, 1961, n. 1418, 50 m); Mt. Gokurakuji (June 18, 1961, n. 1436, 200 m); Yuki-cho, Mt. Togo (May 29, 1960 n. 731, 732, 740, 300 m); Yoshiwa-mura, Kanmuri-kogen (May 22, 1960, n. 794, 795, 800 m). Asa-gun: Mt. Bizenbo (June 11, 1961, n. 1408, 220 m); Nenotani (June 11, 1961, n. 2340, 240 m); Koyo-cho, Mt. Takahachi (Apr. 20, 1958, n. 280, 292, 500 m). Takata-gun: Yachiyo-cho, Mt. Dotoko (June 11, 1961, n. 1381, 620 m). Kamo-gun: Kurose-cho, Kamijo (May 21, 1961, n. 1013, 1017, 200 m); Mt. Kota (May 21, 1961, n. 2580, 300 m). Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1293, 1302, 400 m). Mitsugi-gun: Mitsugi-cho, Ichi (July 16, 1961, n. 1518, 120 m). Ashina-gun: Fujio-mura, Kawaidani (Aug. 12, 1961, n. 2009, 200 m). Jinseki-gun: Yuki-cho, Mt. Gongen (Aug. 12, 1961, n. 2077, 540 m); Sanwa-cho, Inuzuka (Aug. 12, 1961, n. 2064, 400 m). Konu-gun: Joge-cho (July 13, 1961, n. 1953, 500 m). Hiba-gun: Saijo-cho, Hirako (Apr. 30, 1961, n. 2271, 2282, 340 m); Mt. Hiba (Aug. 8, 1961, n. 2316, 700 m); Tojo-cho, Takewatashi (Apr. 30, 1961, n. 1035, 560 m); Shiju (Apr. 30, 1961, n. 1040, 1064, 480 m); Hiwa-cho, Konomura (July 28, 1961, n. 1899, 500 m).

Tottori Pref. Tottori: Mt. Hisamatsu (H. Yokogawa, May 6, 1959, n. 212, 200 m); Tohaku-gun: Mt. Hiru (H. Yokogawa, May 23, 1959, n. 611, 500 m).

Yamaguchi Pref. Kuga-gun: Kuga-cho, Mt. Renge (Dec. 11, 1960, n. 3146, 500 m); Mikawa-cho, Jotobata (May 3, 1963, n. 3454, 500 m); Negasa-Yamanouchi (May 3, 1963, n. 3479, 3480, 100-300 m); Iwayakannon (May 3, 1963, n. 3496, 3497, 300-400 m).

15. **Carex otaruensis** Franch. in Bull. Soc. Philom. Paris 8. sér. 7: 34. 1895. (Map 16, Fig. 8)

Rhizome densely tufted in large clump, stolonless. Culms 50-70 cm tall, acutely 3-angled,

scabrous. Leaves oblate, glaucous, stiffish, 3-7 mm wide, conspicuously 3-nerved, scabrous-margined. Basal sheaths bladeless, reddish-brown, lustered, splitting-reticulate, thready-netted. Spikelets 4-5; terminal spikelet staminate, long-linear, 4-6 cm long, 2.5 mm thick, erect; lateral spikelets pistillate, 3-6 cm long, 3 mm thick, pendulous, long-peduncled; the peduncle rough, thready. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales oblong; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales light green, 2.5 mm long, 1 mm wide, bearded; staminate scales brownish, 3 mm long, 1 mm wide, beardless. Utricles ovate, light green, 1.5-2 mm long, 1 mm thick, glabrous, nerveless, brownish-punctulate, short-beaked with membranous, emarginate mouth at apex, short-stiped at base. Achenes broad obovate, 1.5 mm long, 1 mm wide, truncate at base; the style short, not thickened at base; stigmas 2.

Nom. Jap.: Otaru-suge (Himetekri-Suge, Mito-Suge).

Hab.: Wet soil, usually near marshes or sphagnum bogs; rather common; frequent in sunny places.

Dister.: Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Specimens examined. Hiroshima Pref. Mihara; Mt. Omine (July 16, 1961, n. 1560, 400 m). Fukuyama: Kumagamine (July 31, 1961, n. 1705, 200 m). Aki-gun: Fuchu-cho, Mikumarikyo (June 21, 1959, n. 339, 720, 150 m); Kumano-cho, Akaho-toge (July 12, 1958, n. 437, 450 m); Kurahashi-cho (Apr. 23, 1961, n. 993, 994, 140 m). Saeki-gun: Hatsukaichi-cho, Mt. Gokurakuji (June 18, 1961 n. 1424, 1425, 1432, 1433, 1440, 600 m); Yoshiwa-mura, Kanmuri-kogen (May 22, 1960, n. 788, 798, 812, 800 m); Kuroutsukyo (July 27, 1962, n. 2764, 500 m). Yamagata-gun: Chiyoda-cho, Mt. Ogaka (May 24, 1959, n. 363, 4720, 500 m). Takata-gun: Yachiyo-cho, Mt. Dotoko (June 11, 1961, n. 1376, 620 m); Midroi-cho, Mt. Inufushi (July 8, 1961, n. 1956, 1669, 1970, 600 m). Kamo-gun: Kurose-cho, Kamijo (May 21, 1961, n. 996, 1012, 1015, 1020, 200 m). Toyota-gun: Mt. Noro (June 4, 1961, n. 1354, 1355, 1357, 1358, 1362, 1373, 800 m); Setoda-cho, Mt. Kannon (May 30, 1961, n. 1212, 1223, 1224, 1226, 300 m). Fukayasu-gun: Kamo-cho, Ryuzunotaki (July 30, 1961, n. 1773, 300 m). Konu-gun: Joge-cho (July 13, 1961, n. 1951, 500 m). Futami-gun: Funo-mura, Mt. Menkame (July 21, 1961, n. 1603, 800 m); Sakugi-mura, Okamibuchi (July 21, 1961, n. 1581, 760 m). Hiba-gun: Kuchiwa-cho, Mt. Kamamine (July 24, 1961, n. 1926, 600 m).

Table 7.

Taxa				
Parts		<i>C. forficula</i>	<i>C. heterolepis</i>	<i>C. otaruensis</i>
Rhizome		stolonless	stoloniferous	stolonless
Scales		blackish-purple, the scale shoulder serrulate-margined, 3-nerved, the nerve of the staminate scale reaching or not reaching to apex	dark purplish-brown, the scale shoulder not serrulate-margined, 1-nerved, the nerve of the staminate scale not reaching to apex	light green or brownish, the scale shoulder not serrulate-margined, 1-nerved, the nerve of the staminate scale reaching to apex
Utricles		purplish-punctulate, bidentate mouth	purplish-punctulate, bidentate mouth	brownish-punctulate, emarginate mouth

Subsect. 3. **Plaelongae** Kükenth., Cyper.-Caric. 345. 1909.

Rhizome sparsely or densely tufted, stoloniferous or stolonless. Culms acutely 3-angled, scabrous or smooth. Leaves oblate, mostly conspicuously 3-nerved, scabrous-margined,

Basal sheaths lustered or lusterless, splitting-reticulate or fibrous. Spikelets pendulous or erect, peduncled; terminal spikelet staminate or androgynous; lateral spikelets pistillate (rarely androgynous). Bracts sheathless, the upper setaceous, the lower foliaceous. Scales mostly bearded; the scale shoulder mostly not serrulate-margined; the nerve mostly reaching to apex. Utricles glabrous, mostly nerveless, short-beaked, short-stiped. Stigmas 2.

Key to the species

1. Rhizome stoloniferous
 - Culms smooth *C. incisa*
 - Culms scabrous 2
1. Rhizome stolonless
 - Culms smooth. Utricles nerved *C. flabellata*
 - Culms scabrous. Utricles nerveless 3
2. Staminate scales long-bearded *C. phacota*
2. Staminate scales short-bearded *C. maximowiczii*
3. Basal sheaths lustered, thready-netted *C. kiotensis*
3. Basal sheaths lusterless, not thready-netted 4
4. Staminate scales beardless *C. phacota* var. *gracilispa*
4. Staminate scales bearded 5
5. Scale shoulders slightly serrulate-margined *C. dimorpholepis*
5. Scale shoulders not serrulate-margined *C. shimidzensis*

16. **Carex incisa** Boott in A. Gray, Narr. Exped. Perry 2: 327. 1856. (Map 17, Fig. 8)

Rhizome sparsely tufted in small clump, short-stoloniferous. Culms 20-50 cm tall, slender, acutely 3-angled, smooth. Leaves oblate, soft, green, 3-6 mm wide, conspicuously 3-nerved, scabrous-margined; the leaf sheath reddish-punctulate. Basal sheaths bladeless, reddish-brown, lustered, splitting-fibrous. Spikelets 4-6, erect; terminal spikelet staminate or androgynous (pistillate at apex), 3-4.5 cm long, 2 mm thick; lateral spikelets pistillate, linear-terete, 3-7 cm long, 2.5-3 mm thick, peduncled. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales obovate, light brown, bearded; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales 2 mm long, 1 mm wide, emarginate-hollowed; staminate scales 3 mm long, 1-1.5 mm wide. Utricles ovate, 3 mm long, 1-1.5 mm thick, glabrous, nerveless, dark green, short-beaked with truncate mouth at apex, light yellowish-brown short-stiped at base. Achenes elliptic, discoid, 2 mm long, 1 mm wide, truncate at base; the style slender, erect, thickened at base; stigmas 2.

Nom. Jap.: Kawara-suge.

Hab.: Rather wet or moist soil, usually along pass-sides; rather common; frequent in shady places.

Distr.: Japan (Hokkaido, Honshu).

Specimens examined. Hiroshima Pref. Kamo-gun: Shiwa-cho, Namitakiji (May 15, 1959, n. 2583, 400 m). Toyota-gun: Kawajiri-cho, Mt. Noro (June 4, 1961, n. 1340, 1350, 1364, 800 m); Yasuura-cho (June 4, 1961, n. 1322, 400 m). Ashina-gun: Fujio-mura, Kawaidani (Aug. 12, 1961, n. 2012, 200 m). Jinseki-gun: Sanwa-cho, Inuzuka (Aug. 12, 1961, n. 2063, 400 m); Toyomatsu-mura, Mt. Yonami (Aug. 12, 1961, n. 2068, 600 m). Futami-gun: Kimita-mura, Kamiizumi (July 24, 1961, n. 1869, 1870, 300 m). Hiba-gun: Saijo-cho, Hirako (Apr. 30, 1961, n. 2288, 340 m); Tojo-cho, Takewatashi (Apr. 30, 1961, n. 1038, 560 m); Shiju (Apr. 30, 1961, n. 1075, 1076, 480 m); Taishakukyo (Aug. 9, 1961, n. 2172, 2198, 2202, 2203, 2213, 420-500 m); Kuchiwa-cho, Mt. Kamamine (July 24, 1961, n. 1909, 1920, 480 m); Takano-cho, Mt. Sarumasa (July 28, 1961, n. 1819, 800 m); Mt. Kenashi (July 28, 1961, n. 1857, 1858, 600 m); Oka (July 28, 1961, n. 1839, 600 m); Hiwa-cho, Konomura (July 28, 1961, n. 1893,

500 m).

Tottori Pref. Tohaku-gun: Sekigane-cho (H. Yokogawa, May 23, 1959, n. 720, 600 m).

17. **Carex flabellata** Lév. et Van. in Bull. Acad. Intern. Géogr. Bot. **11**: 111. 1902. (Map 18, Fig. 8).

Rhizome densely tufted, stolonless. Culms 30-75 cm tall, acutely 3-angled, stiff, smooth. Leaves oblate, the surface greenish, the reverse glaucous, lustered, 4-9 mm wide, conspicuously 3-nerved, scabrous-margined, abducent. Basal sheaths bladeless, purplish-brown, lustered, splitting-reticulate, thready-netted. Spikelets 3-5, pendulous, peduncled; terminal spikelet staminate, long-linear, 3.5-6 cm long, 2-2.5 mm thick; lateral spikelets pistillate, terete, 3.5-5.5 cm long, 3 mm thick. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales yellow, bearded; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales oblong-ovate, 2 mm long, 1 mm wide; staminate scales lanceolate-oblong, 4 mm long, 1.5 mm wide. Utricles ovate-elliptic, light green, 2-2.5 mm long, 1.5 mm thick, glabrous, nerved, short-beaked with emarginate mouth at apex, brownish-punctulate, short-stiped at base. Achenes broad obovate-discoïd, 1.5 mm long, 1 mm wide, truncate at base; the style short, not thickened at base; stigmas 2.

Nom. Jap.: Yamatekiri-suge (Nameratekiri-suge).

Hab.: Very wet soil, mostly along streams; rather common; frequent in sunny places.

Distr.: Japan (Hokkaido, Honshu).

Specimens examined. Hiroshima Pref. Saeki-gun: Yuki-cho, Mt. Togo (May 29, 1960, n. 730, 600 m); Ishigayakyo (Apr. 24, 1960, n. 667-670, 400 m); Kuroutsukyo (May 22, 1960, n. 2088, 500 m); Yoshiwa-mura, Kanmuri-kogen (May 22, 1960, n. 784, 802, 800 m); Miyajima (June 27, 1961, n. 1487-1489, 300 m). Asa-gun: Kabe-cho, Mt. Kanmuri (Apr. 22, 1962, n. 2745, 400-500 m). Yamagata-gun: Kake-cho, Takiyamakyo (June 21, 1960, n. 2487, 400 m); Chiyoda-cho, Mt. Ogake (May 24, 1959, n. 362, 4721, 500 m); Oasa-cho, Yokogawa (May 28, 1961, n. 2478, 440 m).

Tottori Pref. Tottori: Mt. Hisamatsu (H. Yokogawa, Apr. 15, May 6, June 25, 1959, n. 221, 234, 801, 1038, 200 m).

18. **Carex phacota** Spreng., Syst. 3: 826. (Map 19, Fig. 9)

Rhizome sparsely tufted, short-stoloniferous. Culms 30-70 tall, acutely 3-angled, scabrous. Leaves oblate, light green, 3-5 mm wide, scabrous-margined; the leaf sheath brownish-punctulate. Basal sheaths bladeless, yellowish-brown, lusterless, not splitting-fibrous. Spikelets 4-5, pendulous; terminal spikelet staminate, linear, 3-6 cm long, 1.5-2 mm thick; lateral spikelets pistillate, linear-terete, 3-5 cm long, 3-4 mm thick, peduncled. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales light green, long-bearded, brownish-punctulate; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales obovate, 2-3 mm long, 1.5 mm wide; staminate scales oblong, 3-4 mm long, 1.5 mm wide. Utricles broad elliptic, glaucous, 2-2.5 mm long, 1.5 mm wide, glabrous, nerveless, papillose, short-beaked with emarginate mouth at apex, short-stiped at base. Achenes orbicular, 2 mm long, about 2 mm wide, truncate-stiped at base; the style erect, slender, not thickened at base; stigmas 2.

Nom. Jap.: Honagahime-goso.

Hab.: Wet or moist soil, usually near marshes; rather rare; frequent in sunny places.

Distr.: Ceylon, India, Himalaya, China, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Hiroshima Pref. Hiroshima: Koi-cho, Koi-toge (June 15, 1958, n. 4116, 200 m). Aki-gun: Fuchu-cho, Mikumarikyo (June 27, 1958, n. 179, 180, 4163, June 21, 1959, n. 4733, 4737, May 3, 1960, n. 716-719, 721-726, 50-80 m); Senogawa-cho, Mt. Tengubo (June 15, 1958, n. 379, 389, 200 m); Kaita-cho, Mt. Dosho (May 3, 1962, n.

2804, 460 m). Toyota-gun: Kawajiri-cho, Mt. Noro (June 4, 1961, n. 1368, 1369, 680 m).

Yamaguchi Pref. Kuga-gun: Mikawa-cho, Watari (May 3, 1963, n. 3462, 3463, 100 m); Negasa-Yamanouchi (May 3, 1963, n. 3487, 100-300 m); Iwayakannon (May 3, 1963, n. 3523 n. 3523, 300-400 m).

19. *Carex maximowiczii* Miq. in Ann. Mus. Bot. Lugd. Bat. 2: 150. 1866.
(Map 20, Fig. 9)

Rhizome sparsely tufted in small clump, short-stoloniferous. Culms 15-70 cm tall, acutely 3-angled, the upper scabrous. Leaves oblate, light green, 2.5-4 mm wide, scabrous-margined; the leaf sheath brownish-punctulate. Basal sheaths bladeless, yellowish-brown, not splitting fibrous. Spikelets 2-3, erect or pendulous, peduncled; terminal spikelet staminate, linear, 2-3.5 cm long, 3 mm thick; lateral spikelets pistillate, terete, 1.5-3 cm long, 6-7 mm thick. Bracts sheathless, the upper scaly or setaceous, the lower foliaceous. Scales brown, bearded, ferruginous-punctulate; the nerve reaching to apex the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 3-nerved; pistillate scales narrow ovate, 3-4 mm long, 1.5-2 mm wide; staminate scales oblong, 3-4 mm long, 1.5-2 mm wide. Utricles ovate or broad elliptic-ovate, glaucous, 3-4.5 mm long, 2.5 mm wide, papillose, nerveless, glabrous, short-beaked with truncate mouth at apex, short-stiped at base. Achenes broad orbicular, 2 mm long, 2 mm wide slightly truncate-stipitate at base; the style erect, thickened at base; stigmas 2.

Nom. Jap.: Goso.

Hab.: Wet soil, usually near marshes, along streams or in bogs; common; frequent in sunny places.

Distr.: China, Ryukyus, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea, Manchuria.

Specimens examined. Okayama Pref. Niimi: Atetsukyo (H. Ando, June 22, 1960, 300 m). Maniwa-gun. Mt. Hiru (H. Yokogawa, May 23, 1959, 500 m).

Hiroshima Pref. Kure: Nikokyo (June 25, 1960, n. 2410, 200 m). Mihara: Mt. Omine (July 16, 1961, n. 1564, 300 m). Shobara: Nanatsukahara (June 1, 1958, n. 150, 159, 162, 166, 300 m). Aki-gun: Fuchu-cho, Mikumarikyo (June 27, 1958, n. 174, 176, 50 m); Senogawa-cho, Mt. Tengubo (June 9, 1957, n. 2651, 150 m); Nakano (Mar. 28, 1960, n. 2618, 30 m); Hataka (Apr. 2, 1958, n. 2647, 100 m); Kumanoato-mura (May 22, 1961, n. 1098, 1111, 170 m). Saeki-gun: Mt. Gokurakuji (June 18, 1961, n. 1431, 1438, 600 m); Saeki-cho, Watanosedamu (Nov. 22, 1959, n. 2596, 280 m); Kuroutsukyo (May 22, 1960, n. 2087, 500 m); Itsukaichi-cho (June 18, 1961, n. 2355, 140 m); Yoshiwa-mura, Kanmuri-kogen (May 22, 1960, n. 773, 778, 780, 800, 804, 808, 800 m); Mt. Kanmuri (May 22, 1960, n. 2080, 900 m). Asa-gun: Asa-cho, Suzuhari (May 29, 1961, n. 2334, 300 m); Kabe-cho, Mt. Bizenbo (June 11, 1961, n. 1405, 220 m). Yamagata-gun: Chiyoda-cho, Mt. Ogake (May 24, 1959, n. 361, 4715, 500 m); Yae (May 28, 1961, n. 2491, 350 m); Myojin-toge (May 28, 1961, n. 2495, 440 m); Tsutsuga-mura, Nunohara (July 9, 1961, n. 2502, 420 m); Togochi-cho, Sandankyo (May 24, 1958, n. 242, 243, 4080, 4102, 500 m); Geihoku-cho, Mt. Uzuki (June 21, 1960, n. 827, 828, 800 m); Oasa-cho, Yokogawa (May 28, 1961, n. 2466, 440 m); Tahara (May, 28, 1961, n. 2457, 500 m); Toyohira-cho, Shirobara (May 28, 1961, n. 1207, 420 m). Takata-gun: Yachiyo-cho, Mt. Dotoko (June 11, 1961, n. 1379, 620 m); Sasai (June 11, 1961, n. 2118, 240 m); Midori-cho, Mt. Inufushi (July 8, 1961, n. 1659, 600 m); Yokota (July 8, 1961, n. 1672, 340 m); Takamiya-cho, Harada (July, 8, 1961, n. 2119 300 m); Rokurohara (July 8, n. 1961, 1677, 300 m); Koda-cho, Mt. Otsuchi (July 1, 1961, n. 1739, 1748, 300 m); Mukaihara-cho, Mt. Hiraune (July 1, 1961, n. 1725, 320 m). Kamo-gun: Hachihonmatsu-cho (June 5, 1961, n. 2550, 280 m); Kurose-cho, Kamijo (May 21, 1961, n. 1019, 200 m); Mt. Kota (May 21, 1961, n. 2579, 300 m); Takaya-cho, Inagi (June 2, 1961, n. 2557, 280 m); Zoka (June 21, 1961, n. 2559, 300 m); Shiwa-cho, Namitakiji (May 15, 1959, n. 353, 414, 4704, 400 m); Kochi-cho, Onishi (June 2, 1961, n. 2533, 400 m); Fukutomi-cho, Mt. Nishihara (June 2, 1961, n. 1262,

1264, 400 m); Kuba (June 2, 1961, n. 2522, 360 m); Matsuzaki (June 2, 1961, n. 2565, 400 m); Komatsu (June 2, 1961, n. 2544, 460 m); Atodani (June 24, 1961, n. 2541, 360 m); Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1305, 400 m); Nakaonchi (June 2, 1961, n. 2543, 400 m); Daiwa-cho, Kamikusai (June 2, 1961, n. 1297, 320 m). Toyota-gun: Kawajiri-cho, Mt. Noro (June 4, 1961, n. 1348, 800 m); Yasuura-cho (June 4, 1961, n. 1323, 400 m); Setoda-cho, Mt. Kannon (May 30, 1961, n. 1235-1238, 300 m). Mitsugi-gun: Kui-cho, Ishibashiri (July 16, 1961, n. 1499, 320 m); Egi (July 16, 1961, n. 1939, 380 m). Sera-gun: Sera-cho, Tsuguchi (June 23, 1961, n. 1999, 420 m); Seranishi-cho, Roppongi (June 23, 1961, n. 5000, 500 m); Oguni (June 23, 1961, n. 1446, 380 m); Mt. Hatakoya (June 23, 1961, n. 1450, 480 m); Iwayadani (June 23, 1961, n. 5002, 420 m); Oyamadani (June 23, 1961, n. 5001, 480 m). Jinseki-gun: Jinseki-cho, Fukunaga (S. Tanabe, May 29, 1961), Konu-gun: Joge-cho (July 13, 1961, n. 1950, 500 m). Futami-gun: Sanwa-cho, Itagi (July 1, 1961, n. 1965, 300 m); Kimita-mura, Kamiizumi (July 24, 1961, n. 1872, 300 m). Hiba-gun: Kuchiwa-cho, Mt. Kamamine (July 24, 1961, n. 1928, 480 m); Takano-cho, Mt. Kenashi (July 28, 1961, n. 1854, 600 m); Oka (July 28, 1961, n. 1838, 600 m); Hiwa-cho, Mt. Kuroishi (July 28, 1961, n. 1842, 700 m).

Tottori Pref. Tohaku-gun: Mt. Hiru (H. Yokogawa, May 23, 1961, n. 612, 500 m). Saihaku-gun: Mt. Daisen (Sept. 23, 1960, n. 3168, 800 m).

Shimane Pref. Matsue: Nishikawatsu-cho (May 14, 1960, n. 3121, 3122, 10 m); Rakusan (May 15, 1955, n. 4689, May 13, 1960, n. 3108, 3117, 20 m). Iishi-gun: Akagi-cho, Akana-toge (July 21, 1961, n. 3024, 500 m); Naka-gun: Kanagi-mura, Yune (June 12, 1960, n. 3053, 500 m).

Yamaguchi Pref. Hagi: Chinto (May 20, 1957, n. 4029, 100 m); Mt. Tatoko (May 20, 1957, n. 3067, 300 m). Kuga-gun: Sakaue-mura, Yasakakyo (H. Suzuki June 5, 1955, 200 m); Mikawa-cho, Jotobata (May 3, 1963, n. 3441, 3442, 500 m); Watari (May 3, 1963, n. 3459-3461, 100 m); Negasa-Yamanouchi (May 3, 1963, n. 3478, 100-300 m). Iwayakannon (May 3, 1963, n. 3521, 3522, 300-400 m).

20. *Carex kiotensis* Franch. et Savat., Enum. Pl. Jap. 2: 128 et 556. 1879. (Map 21, Fig. 9)

Rhizome densely tufted, stolonless; the root robust. Culms 30-60 cm tall, acutely 3-angled, conspicuously scabrous, stiff; the central part bearing a leaf. Leaves oblate, greenish, 4-8 mm wide, conspicuously scabrous-margined. Basal sheaths bladeless, dark brown, lustered, stiff, slightly splitting-reticulate, thready-netted. Spikelets 5-6, pendulous; terminal spikelets 1-2, staminate (rarely androgynous: pistillate at apex), linear, 1-2.5 cm long, 2 mm thick; lateral spikelets pistillate (rarely androgynous: staminate at the central part), linear, 2-6 cm long, 4 mm thick, peduncled. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales brown, short-bearded; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 3-nerved; the nerve reaching to apex; pistillate scales obovate, 1.5 mm long, 0.5-1 mm wide; staminate scales oblong, 2.5-3 mm long, 1 mm wide, the apex emarginate. Utricles oval or ovate-elliptic, greenish-brown, 2-2.5 mm long, 1 mm thick, glabrous, nerveless, brownish-punctulate, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes broad elliptic, 1 mm long, 1 mm wide, truncate at base; the style slender, not thickened at base; stigmas 2.

Nom. Jap.: Tekiri-suge.

Hab.: Rather wet or moist soil, usually near streams or along pass-sides; rather rare; frequent in shady places.

Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Specimens examined. Tottori Pref. Mt. Daisen (Sept. 23, 1960, n. 4182, 800 m).

Hiroshima Pref. Yamagata-gun: Togochi-cho, Sandankyo (May 25, 1958, n. 2444, 500 m); Tsutsuga-mura, Nunohara (July 9, 1961, n. 1637, 1638, 1640, 1641, 420 m); Mt. Ichima (July 9, 1961, n. 1619-1622, 500-700 m). Saeki-gun: Yoshiwa-mura, Mt. Kanmuri (May 22, 1960, n. 2086, 900 m).

21. **Carex phacota** Spreng. var. **gracilisipica** Kükenth., Cyper.-Caric. 352. 1909.
(Map 22, Fig. 10)

Rhizome sparsely tufted, stolonless. Culms 20-40 cm tall, acutely 3-angled, scabrous. Leaves oblate, light green, 3-4 mm wide, scabrous-margined. Basal sheaths bladeless, brown, slightly lustered, not splitting-fibrous. Spikelets 4-5, erect or pendulous; terminal spikelet staminate, linear, 1.5-4 cm long, 1.5 mm thick; lateral spikelets pistillate (rarely androgynous: pistillate at apex), terete, 0.8-5 cm long, 3 mm thick, peduncled. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales brown, brownish-punctulate; the scale shoulder not serrulate-margined, whitish membranous-margined; the midrib greenish, conspicuously 3-nerved; pistillate scales obovate, 2 mm long, 1-1.5 mm wide, bearded, the nerve reaching to apex; staminate scales oblong, 2.5-3 mm long, 1.1-5 mm wide, beardless, the nerve not reaching to apex. Utricles broad elliptic, glaucous, 2.5-3 mm long 2 mm wide, glabrous, nerveless, papillose, short-beaked with emarginate mouth at apex, short-stiped at base. Achenes orbicular-discoid, 1.5 mm long, 1.5 mm wide, truncate at base; the style erect, not thickened at base; stigmas 2.

Nom. Jap.: Hime-goso (Ao-goso).

Hab.: Rather wet or moist soil, usually near marshes; rather rare; frequent in sunny places.

Distr.: India, China, Malaysia, Formosa, Ryukyus, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Hiroshima Pref. Shobara: Nanatsukahara (June 1, 1958, n. 152, 4127, 300 m). Yamagata-gun: Toyohira-cho, Shirobara (May 28, 1961, n. 1198, 1203, 420 m). Kamo-gun: Fukutomi-cho, Mt. Nishihara (June 2, 1961, n. 1267, 400-600 m); Toyosaka-cho, Nakaonchi (June 2, 1961, n. 2530, 400 m).

Tottori Pref. Saihaku-gun: Mt. Daisen (Sept. 23, 1960. n. 4185, 800 m).

22. **Carex dimorpholepis** Steud., Synops. 2: 214. 1855. (Map 23, Fig. 10)

Rhizome densely tufted, stolonless. Culms 30-60 cm tall, acutely 3-angled, the upper scabrous. Leaves oblate, stiffish, yellowish-green, conspicuously 3-nerved, 5-8 mm wide, scabrous-margined. Basal sheaths bladeless, blackish-brown, lustered, slightly splitting-fibrous. Spikelets 5-6, pendulous; terminal spikelet androgynous (pistillate at apex), terete, 4-7.5 cm long, 5 mm thick; lateral spikelets pistillate, terete, 2-6 cm long, 4-5 mm thick, peduncled. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales narrow obovate, bearded; the scale shoulder slightly serrulate-margined, reddish-punctulate; the midrib greenish, conspicuously 3-nerved; the nerve reaching to apex; pistillate scales green, 2-2.5 mm long, 1.5-2 mm wide; staminate scales brownish, 4.4-5 mm long, 1.5-2 mm wide. Utricles oblate, oval, greenish-brown, glabrous, nerveless, 2-3 mm long, 2 mm wide, reddish brownish-punctulate, slightly short-beaked with truncate mouth at apex, short-stiped at base. Achenes oval, oblate, 1.5 mm long, 1 mm wide, truncate at base; the style erect, slender, slightly thickened at base; stigmas 2.

Nom. Jap. Azenaruko.

Hab.: Very wet soil, usually near marshes; rather rare; frequent in open swales.

Distr.: Ceylon, India, Indo-china, Ryukyus, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea, Manchuria.

Specimens examined. Okayama Pref. Okayama: Tsushima (May 14, 1961, n. 3034, 3043, 10 m).

Hiroshima Pref. Yamagata-gun: Togochi-cho, Sandankyo (May 24, 1958, n. 245. 500 m).

23. **Carex shimidzensis** Franch. in Bull. Soc. Philom. Paris 8. sér. 7: 33. 1895.
(Map 24, Fig. 10)

Rhizome sparsely tufted, robust, stolonless. Culms 25-80 cm tall, acutely 3-angled, the

upper scabrous; the upper part bearing 2 leaves. Leaves oblate, greenish, soft, 4-10 mm wide, conspicuously 3-nerved, scabrous-margined; the leaf base wavy. Basal sheaths bladeless, lusterless, yellowish-brown, slightly splitting-fibrous. Spikelets 4-5, pendulous, peduncled; terminal spikelet staminate (rarely androgynous: pistillate at apex), linear, 3-10 cm long, 1-2 mm thick; lateral spikelets pistillate, terete, 3.5-7.5 cm long, 4-5 mm thick. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales light yellowish-brown, bearded, brownish-punctulate; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 3-nerved; the nerve reaching to apex; pistillate scales ovate, 2-2.5 mm long, 1 mm wide; staminate scales oblong, 3.5-4 mm long, 1-1.5 mm wide. Utricles narrow ovate, greenish-brown, 3 mm long, 1-1.5 mm thick, glabrous, nerveless, brownish-punctulate, short-beaked with emarginate mouth at apex, short-stiped at base. Achenes oval, 1.5 mm long, about 1 mm wide, truncate at base; the style slender, not thickened at base; stigmas 2.

Nom. Jap.: Azumanaruko (Miyamanaruko-suge).

Hab.: Wet soil, usually along streams; common; frequent in shady places.

Table 8.

Parts \ Taxa	<i>C. dimorpholepis</i>	<i>C. shimidzensis</i>
Basal sheaths	lustered, blackish-brown	lusterless, yellowish-brown
Scales	reddish-punctulate, the scale shoulder serrulate-margined	brownish-punctulate, the scale shoulder not serrulate-margined
Utricles	truncate mouth	emarginate mouth

Table 9.

Parts \ Taxa	<i>C. flabellata</i>	<i>C. kiotensis</i>	<i>C. otaruensis</i>
Culms	smooth	scabrous	scabrous
Basal sheaths	purplish-brown	dark brown	reddish-brown
Staminate scales	light yellow, bearded, 1-nerved	brown, bearded, 3-nerved	brownish, beardless, 1-nerved
Utricles	light green, nerved, emarginate mouth	greenish-brown, nerveless, bidentate mouth	light green, nerveless, emarginate mouth

Table 10.

Parts \ Taxa	<i>C. maximowiczii</i>	<i>C. phacota</i>	<i>C. phacota</i> var. <i>gracilisipica</i>
Rhizome	stoloniferous	stoloniferous	stolonless
Basal sheaths	yellowish-brown, lusterless	yellowish-brown, lusterless	brown, lustered
Scales	brown, 3-nerved, staminate scales short-bearded; the nerve reaching to apex	light green, 1-nerved, staminate scales long-bearded; the nerve reaching to apex	brown, 3-nerved, staminate scales beardless; the nerve not reaching to apex
Utricles	truncate mouth	emarginate mouth	emarginate mouth

Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu), Kuriles, Korea.

Specimens examined. Hiroshima Pref. Aki-gun: Fuchu-cho, Mikumarikyo (June 27, 1958, n. 171, 173, 4156, 4158, 4161, June 21, 1959, n. 337, 4739, 80 m). Saeki-gun: Yuki-cho, Mt. Togo (May 29, 1960, n. 729, 767, 600 m); Saeki-cho, Kuroutsukyo (July 27, 1962, n. 2760, 2761, 500 m); Hatsukaichi-cho, Mt. Gokurakuji (June 18, 1961, n. 1443, 1444, 600 m); Miyajima (June 27, 1961, n. 2363, 300 m). Asa-gun: Kabe-cho, Nenotani (June 11, 1961, n. 2342, 240 m). Yamagata-gun: Togochi-cho, Sandankyo (May 24, 1958, n. 364, 365, 370, 371, June 17, 1962, n. 2769, 500-600 m); Geihoku-cho, Yawata-kogen (Aug. 10, 1959, n. 376, 800 m); Oasa-cho, Mt. Kanbiki (May 28, 1961, n. 1188, 700 m). Takata-gun: Yachiyo-cho, Kamine-toge (June 11, 1961, n. 2134, 300 m); Midori-cho, Mt. Infuushi (July 8, 1961, n. 1657, 1658, 600 m); Takamiya-cho, Rokurohara (July 8, 1961, n. 1676, 300 m); Koda-cho, Mt. Otsuchi (July 1, 1961, n. 1735, 1737, 1738, 1744, 300 m); Shiraki-cho, Mt. Shiraki (June 19, 1960, n. 886-889, 891, 892, 600 m). Kamo-gun: Fukutomi-cho, Mt. Nishihara (June 2, 1961, n. 1261, 1269, 400-600 m). Futami-gun: Sanwa-cho, Itagi (July 1, 1961, n. 1967, 320 m); Funo-mura, Mt. Menkame (July 21, 1961, n. 1593, 1609, 500 m); Sakugimura, Okamibuchi (July 21, 1961, n. 1577, 760 m).

Shimane Pref. Iishi-gun: Akagi-cho, Akana-toge (July 21, 1961, n. 3023, 500 m).

Sect. 11. **Graciles** Tuckerm. Enum. Menth. 10. 1843.

Rhizome tufted, stolonless. Culms obtusely or acutely 3-angled, smooth or scabrous. Leaves oblate, scabrous-margined. Basal sheaths bladeless, lustered, splitting-reticulate or fibrous. Spikelets erect, peduncled; terminal spikelet staminate or androgynous; lateral spikelets androgynous. Bracts sheathed, the upper setaceous, the lower foliaceous. Scales serrulate-margined, bearded or beardless; the midrib greenish, conspicuously 1-nerved; the nerve reaching or not reaching to apex. Utricles hairy, nerved, short-beaked with bidentate mouth, short-stiped. Stigmas 2.

Key to the species

- | | |
|--|-------------------------|
| 1. Terminal spikelet staminate | <i>C. autumnalis</i> |
| 1. Terminal spikelet androgynous | 2 |
| 2. Scales bearded | <i>C. scabriculumis</i> |
| 2. Scales beardless | <i>C. nakiri</i> |

24. **Carex autumnalis** Ohwi in Mem. Coll. Sc. Kyoto Imp. Univ. ser. B, 5: 251. 1930.
(Map 25, Fig. 11)

Rhizome sparsely tufted, stolonless. Culms 60-80 cm tall, obtusely 3-angled, smooth. Leaves oblate, green, stiff, 2.5-3 mm wide, scabrous-margined. Basal sheaths bladeless, dark brown, lustered, splitting-reticulate or fibrous. Spikelets 7-8, erect, peduncled, bearing 1 in the bract sheath; terminal spikelet staminate, narrow linear, 1.5-3 cm long, 1 mm thick; lateral spikelets androgynous (staminate at apex), narrow terete, 1-4.3 cm long, 2-3 mm thick. Bracts long-sheathed, the upper setaceous, the lower foliaceous. Scales brown, beardless, serrulate-margined, whitish membranous-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales oval, 1.5-2 mm long, 1.5 mm wide; staminate scales oblong, 4 mm long, 1-1.5 mm wide. Utricles oval-discoïd, light green, 2.5-3 mm long, 1-1.5 mm wide, slightly hairy, nerved, short-beaked with bristly bidentate mouth at apex, short cuneate-stiped at base. Achenes elliptic, obtusely 2-angled, 2 mm long, 1 mm wide, truncate at base; the style short, thickened at base; stigmas 2.

Nom. Jap.: Oonakiri-suge.

Hab.: Rather dry or moist soil, usually along pass-sides; rather rare; frequent in shady places.

Distr.: Ryukyus, Japan (Honshu, Shikoku).

Specimens examined. Hiroshima Pref. Fukayasugun: Kamo-cho, Ryuzunotaki (July 30, 1961, n. 1776, 300 m); Enmeikyo (July 30, 1961, n. 1787, 240 m). Jinseki-gun: Sanwa-cho, Kulumi (July 30, 1961, n. 1811, 420 m); Jinseki-cho, Shinryuko (Aug. 11, 1961, n. 2221, 400 m). Hiba-gun: Tojo-cho, Taishakukyo (Aug. 11, 1961, n. 2225, 2228, 2236, 2248, 2265, 400 m).

25. **Carex scabriculumis** Ohwi in Act. Phytotax. et Geobot. 2: 27. 1933. (Map 26, Fig. 11)

Rhizome densely tufted, stolonless. Culms 30-60 cm tall, acutely 3-angled, scabrous. Leaves oblate, light green, stiffish, 2-3.5 mm wide, scabrous-margined. Basal sheaths dark brown, lustered, splitting reticulate or fibrous. Spikelets 8-17, androgynous (staminate at apex), erect, peduncled, usually bearing 2-3 in the bract sheath, linear-cylindric, 0.5-2.5 cm long 1.5-2 mm thick. Bracts sheathed, the upper setaceous, the lower foliaceous. Scales oblong, ferruginous-brown, bearded, serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales 4 mm long, 1-1.5 mm wide; staminate scales 4 mm long, 1 mm wide. Utricles elliptic, light green (afterward brownish), 3.5-4 mm long, 1-1.5 mm wide, hairy, nerved, long-beaked with bidentate mouth at apex, short-stiped at base. Achenes narrow ovate, obtusely 2-angled, truncate at base; the style short thickened at base; stigmas 2, slender, 6-7 mm long, persistent.

Nom. Jap.: Fusanakiri-suge.

Hab.: Very wet soil, usually near streams; rather common; frequent in shady places.

Distr.: Japan (Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Hiroshima Pref. Mihara: Butsuji (K. Okudomi, Oct. 18, 1953, 160 m). Aki-gun: Yano-cho, Egedani (Nov. 15, 1960, n. 2675, 4742, 200 m). Yamagata-gun: Togochi-cho, Sandankyo (Nov. 7, 1958, n. 4175, 500 m). Fukayasu-gun: Kamo-cho, Enmeikyo (July 30, 1961, n. 1789, 1790, 240 m). Jinseki-gun: Yuki-cho, Ueno (July 30, 1961, n. 1794, 400 m); Sanwa-cho, Kurumi (July 30, 1961, n. 1816, 1817, 420 m). Hiba-gun: Tojo-cho, Taishakukyo (Aug. 9, 1961, n. 2147, 2156, 2157, Oct. 23, 1962, n. 2833, 400 m).

Shimane Pref. Kanoashi-gun: Nichihara-cho (Oct. 5, 1960, n. 4168, 200 m).

Yamaguchi Pref. Tsuno-gun: Tsuno-cho, Hirase-Kindake (Apr. 22, 1962, n. 3289, 3290, 300-400 m). Mine-gun: Akiyoshi-cho, Akiyoshido (Sept. 24, 1961, n. 3227, 100 m). Abugun: Kawakami-mura, Chomonkyo (Sept. 23, 1961, n. 3204, 3210, 200 m); Ato-cho (Sept. 23, 1961, n. 3178, 3196, 220 m).

26. **Carex nakiri** Ohwi in Act. Phytotax. et Geobot. 5: 64. 1936. (Map 27, Fig. 11)

Rhizome densely tufted, stolonless. Culms 30-80 cm tall, acutely 3-angled, the upper scabrous. Leaves oblate, green, stiff, 2-3 mm wide, scabrous-margined. Basal sheaths dark brown or brown, lustered, splitting-fibrous or reticulate. Spikelets 7-10, erect peduncled (not peduncled at apex), androgynous (staminate at apex), narrow terete, 1-2 cm long, 2-4 mm thick, usually bearing 1-2 in the bract sheath. Bracts sheathed, the upper setaceous, the lower foliaceous; the apex of the bract sheath brown. Scales ovate, yellowish-brown, beardless, serrulate-margined, slightly whitish membranous-margined; the midrib greenish, conspicuously 1-nerved; the nerve not reaching to apex; pistillate scales 3 mm long, 1.5 mm wide; staminate scales 3-3.5 mm long, 1.5 mm wide. Utricles ovate-discooid, greenish, 2.5-3 mm long, 1.5 mm wide, hairy, nerved, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes ovate, obtusely 2-angled, 1.5-2 mm long, 1 mm wide, truncate-stipitate at base; the style short, thickened at base; stigmas 2.

Nom. Jap.: Nakiri-suge.

Hab.: Dry or moist soil, usually along pass-sides or in forests; common; frequent in shady places.

Distr.: China, Japan (Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Okayama Pref. Niimi: Bichukojiro (Sept. 24, 1960, n. 3100-3102, 300 m).

Hiroshima Pref. Hiroshima: Mitaki-cho (Sept. 13, 1958, n. 320, 100 m); Yamate-cho (Oct. 25, 1958, n. 4196, 150 m); Ushida-cho (Apr. 30, 1960, n. 4197, 100 m); Mt. Futaba (Apr. 30, 1960, n. 2388, 100 m). Kure: Nikokyo (June 25, 1960, n. 862, 200 m); Aga-cho (Apr. 29, 1961, n. 2424, 180 m); Tenno-cho, Yakeyama (June 26, 1960, n. 2409, 300 m); Nigata-cho (Apr. 29, 1961, n. 2419, 200 m). Mihara: Sasakijima (May 30, 1961, n. 2433, 200 m); Mihara (Y. Sasaki, Sept. 17, 1954, 250 m). Onomichi (K. Okudomi, Sept. 17, 1954, 120 m. July 15, 1961, n. 2052, 170 m). Innoshima: Habu (May 26, 1961, n. 1166, 100 m); Mt. Oku (May 26, 1961, n. 2438, 300 m). Miyoshi: Chuo-koen (July 13, 1961, n. 2429, 180 m). Takehara: Mt. Asahi (May 24, 1961, n. 1138, 200 m); Takehara (May 24, 1961, n. 1139, 180 m). Shobara: Ueno-koen (Aug. 8, 1961, n. 2373, 160 m); Shobara (Aug. 8, 1961, n. 2370, 160 m). Aki-gun: Aki-cho, Umagi (Sept. 20, 1958, n. 460, 100 m); Mt. Takao (Oct. 27, 1957, n. 326, 4008, 4025, 250 m); Fuchu-cho, Fuchu (Sept. 23, 1958, n. 457, 30 m); Mikumari-cho (Sept. 20, 1958, n. 323, 60 m); Funakoshi-cho, Mt. Iwataki (Sept. 23, 1958, n. 324, 30 m); Takeura (Sept. 25, 1958, n. 467, 20 m); Nishi (Apr. 1, 1960, n. 497, 30 m); Funakoshi-toge (Sept. 23, 1957, n. 462, 37 m); Kaita-cho, Mt. Hinoura (Sept. 24, 1958, n. 471, 150 m); Furu-toge (Apr. 2, 1960, n. 483, 300 m); Mt. Kingatoro (Apr. 20, 1958, n. 466, 350 m); Kumano-cho, Akaho-toge (July 12, 1958, n. 459, 450 m); Mt. Jo (Apr. 2, 1960, n. 461, 350 m); Nakamizo (Apr. 2, 1958, n. 2635, 250 m). Yano-cho, Age (Sept. 25, 1958, n. 465, 50 m); Egedani (Sept. 25, 1959, n. 464, 300 m); Saka-cho (Sept. 25, 1958, n. 470, 50 m); Senogawa-cho, Mt. Tengubo (Sept. 19, 1958, n. 322, 400 m); Mt. Chausu (Sept. 14, 1958, n. 321, 200 m); Mt. Dosho (June 9, 1957, n. 4166, 400 m); Hataka (Sept. 11, 1958, n. 325, 100 m); Mt. Hebiwa (Sept. 24, 1958, n. 463, 250 m); Kumanoato-mura (May 22, 1961, n. 2684, 170 m); Kamagari-cho (Apr. 28, 1961, n. 936, 938, Sept. 25, 1962, n. 2827-2830, 200 m); Shimokamagari-cho (Sept. 28, 1961, n. 960, 220 m). Saeki-gun: Itsukaichi-cho (June 18, 1961, n. 2360, 140 m); Hatsukaichi-cho (June 18, 1961, n. 2351, 80 m); Mt. Gokurakuji (June 18, 1961, n. 1427, 600 m); Yuki-cho, Mt. Togo (May 29, 1960, n. 2592, 300 m); Yuki (Apr. 24, 1960, n. 2603, 380 m); Go (Apr. 24, 1960, n. 2608, 340 m); Saeki-cho, Watanosedamu (Nov. 22, 1959, n. 2599, 280 m); Miyajima (Dec. 21, 1958, n. 468, 50 m); Nomi-cho (Apr. 16, 1961, n. 2610, 100 m); Okimi-cho (Dec. 20, 1959, n. 432, 150 m); Oogaki-cho (Apr. 16, 1961, n. 2621, 40 m). Asa-gun: Gion-cho (K. Takeuchi, Sept. 3, 1959); Yasufuruichi-cho (June 11, 1961, n. 2329, 150 m); Kabe-cho, Mt. Bizenbo (June 11, 1961, n. 1397, 220 m); Nabarakyō (Apr. 17, 1961, n. 2343, Apr. 22, 1962, n. 2706, 300 m); Mt. Kanmuri (Apr. 22, 1962, n. 2738, 400-500 m). Yamagata-gun: Kake-cho, Takiyamakyo (June 12, 1960, n. 2484, 400 m); Kawanoboridani (May 18, 1958, n. 2703, 350 m); Chiyoda-cho, Maruoshi (May 28, 1961, n. 2499, 420 m); Tsutsuga-mura, Mt. Ichima (July 9, 1961, n. 2505, 600 m); Togochi-cho, Sandankyo (Nov. 12, 1959, n. 469, 500 m); Geihoku-cho, Odomari (June 21, 1960, n. 2475, 640 m); Yawata-kogen (Aug. 10, 1959, n. 375, 800 m). Takata-gun: Yachiyo-cho, Mt. Dotoko (June 11, 1961, n. 1383, 620 m); Kamine-toge (June 11, 1961, n. 2122, 300 m); Koda-cho, Mt. Otsuchi (June 11, 1961, n. 2124, 300 m); Kotachiekiguchi (July 1, 1961, n. 2126, 280 m); Mukaihara-cho, Mt. Hiraune (July 1, 1961, n. 2131, 320 m). Kamo-gun: Saijo-cho (Apr. 29, 1957, n. 2583, 300 m); Kurose-cho, Kamijo (May 21, 1961, n. 1956, 200 m); Mt. Kota (May 21, 1961, n. 1957, 300 m); Takaya-cho, Inagi (June 2, 1961, n. 2574, 280 m). Toyota-gun: Kawajiri-cho, Mt. Noro (June 4, 1961, n. 1334, 300 m); Yasuura-cho (June 4, 1961, n. 2110, 400 m); Toyohama-mura (May 24, 1961, n. 1132, 200 m); Osaki-cho (May 23, 1961, n. 2097, 200 m); Higashino-mura (May 23, 1961, n. 2107, 150 m); Kinoe-cho, Mt. Kamine (May 23, 1961, n. 2100, 350 m). Sera-gun: Seranishi-cho, Iwayadani (June 23, 1961, n. 1985, 420 m). Ashina-gun: Fujio-mura, Kawaidani (Aug. 12, 1961, n. 2006, 200 m); Shinichi-cho, Kamitode (Aug. 13, 1961, n. 2030, 150 m). Jinseki-gun: Yuki-cho, Mt. Gongen (Aug. 12, 1961, n. 2075, 540 m); Sanwa-cho, Inuzuka (Aug. 12, 1961, n. 2059, 500 m); Toyomatsu-mura, Mt. Yonami

(Aug. 12, 1961, n. 2070, 600 m); Jihseki-cho, Fukunaga (S. Tanabe, Aug. 11, 1961, 400 m). Konu-gun: Joge-cho (July 13, 1961, n. 1944, 500 m); Soryo-cho, Mt. Ko (July 13, 1961, n. 1548, 400 m); Konu-cho, Mt. Kobo (July 13, 1961, n. 1552, 500 m). Futami-gun: Sanwa-cho, Itagi (July 1, 1961, 320 m); Kisa-cho, Yasuda (July 13, 1961, n. 1539, 360 m); Mirasaka-cho (July 13, 1961, n. 1527, 240 m). Hiba-gun: Saijo-cho, Hirako (Apr. 30, 1961, n. 2293, 340 m); Tojo-cho, Takewatashi (Apr. 30, 1961, n. 2294, 560 m); Shiju (Apr. 30, 1961, n. 2296, 480 m); Taishakukyo (Aug. 9, 1961, n. 2154, Oct. 23, 1962, n. 2831, 2832, 500 m); Mt. Dogo (Sept. 25, 1960, n. 873, 900 m).

Tottori Pref. Tottori: Mt. Hisamatsu (H. Yokogawa, May 6, 1959); Hamasaka (N. Yano). Iwamigun: Mochigase-cho (H. Yokogawa, Oct. 25, 1959, n. 1920, 650 m). Saihaku-gun: Mt. Daisen (Sept. 23, 1960, n. 3169, 900 m); Mt. Goen (Sept. 23, 1960, n. 3173, 850 m).

Shimane Pref. Matsue: Jozan (May 14, 1960, n. 3132, 10 m). Oda: Mt. Sanbe (June 5, 1960, n. 3098, 500 m). Hirata city: Gakuenji (K. Okudomi, May 17, 1960, 140 m).

Yamaguchi Pref. Yamaguchi: Miyano (Sept. 23, 1961, n. 3236, 60 m). Hagi: Mt. Kasa (Aug. 16, 1960, n. 3084, 100 m). Kuga-gun: Kuga-cho, Mt. Renge (Dec. 11, 1960, n. 3145, 3147, 3148, 500 m); Mikawa-cho, Jotobata (May 3, 1963, n. 3453, 500 m); Watari (May 3, 1963, n. 3469, 100 m); Iwayakannon (May 3, 1963, n. 3518, 300-400 m). Yoshi-gun: Ogori-cho, Kamagabuchi (Sept. 25, 1961, n. 3232, 20 m). Mine-gun: Akiyoshi-cho, Akiyoshidai (Sept. 24, 1961, n. 3225, 220 m); Akiyoshido (Sept. 24, 1961, n. 3228, 100 m). Abu-gun: Kawakami-mura, Chomonkyo (Sept. 23, 1961, n. 3214, 3221, 200 m); Ato-cho (Sept. 24, 1961, n. 3179, 3197, 220 m).

Table 11.

Parts	Taxa	<i>C. autumnalis</i>	<i>C. scabriculumis</i>	<i>C. nakiri</i>
Culms		smooth	scabrous	scabrous
Spikelets		bearing 1 in the bract sheath, terminal spikelet staminate	bearing 2-3 in the bract sheath, terminal spikelet androgynous	bearing 1-2 in the bract sheath, terminal spikelet androgynous
Scales		brown, beardless	ferruginous-brown, bearded	yellowish-brown, beardless
Utricles		oval, light green	elliptic, light green	ovate, greenish
Stigmas		not persistent	persistent	not persistent

Sect. 12. *Atratae* Kunth, Enum. Pl. 2: 431, 1837.

Rhizome densely tufted, stoloniferous. Culms slender, obtusely 3-angled, smooth or scabrous. Leaves oblate, scabrous-margined. Basal sheaths bladeless, splitting-fibrous or reticulate. Spikelets pendulous or erect; terminal spikelet staminate; lateral spikelets pistillate. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales bearded or beardless; the scale glabrous, beaked, short-stiped. Stigmas 3.

27. *Carex curvicollis* Franch. et Savat., Enum. Pl. Jap. 2: 579. 1879. (Map 28, Fig. 12)

Rhizome densely tufted, short-stoloniferous. Culms 15-30 cm tall, soft, slender, obtusely 3-angled, smooth. Leaves oblate, soft, thin, green, 2-3.5 mm wide, conspicuously 3-nerved, scabrous-margined. Basal sheaths bladeless, brown or dark reddish-brown, lustered, slightly

splitting-fibrous. Spikelets 3-5; terminal spikelet staminate, linear-terete, 1.5-2 cm long, 1.5-2 mm thick; lateral spikelets pistillate, terete, 1-3.5 cm long, 2-4 mm thick, the upper not peduncled or short-peduncled, the lower long-peduncled, pendulous. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales blackish-brown; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales ovate, 2.5 mm long, 1-1.5 mm wide, slightly bearded; staminate scales oblong, 3 mm long, 1-1.5 mm wide, beardless. Utricles ovate-lanceolate, light green, 4-5 mm long, 1 mm thick, glabrous, nerved, purplish-punctulate, long-beaked with truncate mouth at apex, short-stiped at base. Achenes elliptic, obtusely 3-angled, 1.5 mm long, 1 mm wide, truncate at base; the style erect, slender, not thickened at base; stigmas 3.

Nom. Jap.: Naruko-suge (Yamanaruko, Mizunaruko).

Hab.: Very wet soil, usually along streams; common; frequent in the gorge.

Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Specimens examined. Okayama Pref. Tomata-gun: Kamisaibara-mura (H. Yokogawa, May 17, 1959, n. 477, 800 m).

Hiroshima Pref. Saeki-gun: Yuki-cho, Mt. Togo (May 29, 1960, n. 746, 759, 300 m); Ishigayakyo (Apr. 24, 1960, n. 661, 662, 400 m); Saeki-cho, Kuroutsukyo (May 22, 1960, n. 2090, 2091, 500 m); Yoshiwa-mura, Kanmuri-kogen (May 22, 1960, n. 814, 800 m). Asa-gun: Asa-cho, Sasahara (May 25, 1961, n. 2336, 300 m); Suzuhari (May 25, 1961, n. 2335, 300 m); Kabe-cho, Mt. Bizenbo (June 11, 1961, n. 1399, 220 m); Nenotani (June 11, 1961, n. 1415, 1417, 240 m). Yamagata-gun: Kake-cho, Takiyamakyo (June 12, 1960, n. 2482, 400 m); Kawanoboridani (May 18, 1958, n. 61, 69, 75, 77, 4701, 280 m); Chiyoda-cho, Maruoshi (May 28, 1961, n. 2500, 2501, 420 m); Myojin-toge (May 28, 1961, n. 2497, 440 m); Tsutsugamura, Nunohara (July 9, 1961, n. 1646, 420 m); Mt. Ichima (July 9, 1961, n. 1618, 500 m); Togochi-cho, Sandankyo (May 24, 1958, n. 199, 223, 4083, 500 m); Geihoku-cho, Yawata-kogen (Aug. 10, 1959, n. 377, 800 m); Mt. Tenguishi (Y. Sasaki, Nov. 7, 1960, 800 m); Oasa-cho, Sakai (May 28, 1961, n. 2490, 400 m); Yokogawa (May 28, 1961, n. 2469, 440 m); Kayahara (May 28, 1961, n. 2460, 500 m); Otsuka (May 28, 1961, n. 1173, 440 m); Toyohira-cho, Shirobara (May 28, 1961, n. 1204, 420 m). Takata-gun: Yachiyo-cho, Sasai (June 11, 1961, n. 1396, 240 m). Fukayasu-gun: Kamo-cho, Ryuzunotaki (July 30, 1961, n. 1769, 300 m); Enmeikyo (July 30, 1961, n. 1778, 240 m). Jinseki-gun: Yuki-cho, Ueno (July 30, 1961, n. 1814, 400 m); Sanwa-cho, Kurumi (July 30, 1961, n. 1805, 420 m). Futami-gun: Kimitamura, Kamiizumi (July 24, 1961, n. 1874, 300 m); Funo-mura, Mt. Menkame (July 21, 1961, n. 1583, 1589, 1595, 500 m); Sakugi-mura, Okamibuchi (July 21, 1961, n. 1580, 750 m). Hiba-gun: Saijo-cho, Mt. Hiba (Aug. 8, 1961, n. 2317, 700 m); Hirako (Apr. 30, 1961, n. 2282, 340 m); Tojo-cho, Taishakukyo (Aug. 9, 1961, n. 2142, 2155, 2170, 2211, 400 m); Shiju (Apr. 30, 1960, n. 1069, 1068, 480 m); Kuchiwa-cho, Mt. Kamamine (July 24, 1961, n. 1913, 480 m); Takano-cho, Oka (July 28, 1961, n. 1837, 600 m); Mt. Kenashi (July 28, 1961, n. 1865, 600 m); Mt. Sarumasa (July 28, 1961, n. 1822, 800 m); Hiwa-cho, Konomura (July 28, 1961, n. 1884, 500 m).

Tottori Pref. Tohaku-gun: Ningyosen (Y. Sasaki, 400 m). Saihaku-gun: Mt. Daisen (Sept. 23, 1960, n. 4184, 800 m).

Shimane Pref. Iishi-gun: Akagi-cho, Akana-toge (July 21, 1961, n. 3017, 500 m); Tonbara-cho, Mt. Kotobiki (July 27, 1961, n. 3003, 700 m).

Sect. 13. *Anomalae* Carey in Gray, Man. ed. 1: 577. 1848.

Rhizome sparsely tufted, stolonless. Culms obtusely 3-angled, smooth. Leaves oblate, wholly smooth-margined. Basal sheaths lusterless, splitting reticulate. Spikelets erect; terminal spikelet staminate; lateral spikelets pistillate, peduncled. Bracts sheathed foliaceous. Scales beardless, not serrulate-margined; the nerve not reaching to apex. Utricles glabrous,

nerved, short-beaked, sessile. Stigmas 3.

28. **Carex maculata** Boott in Trans. Linn. Soc. **20**: 128. 1846. (Map 29, Fig. 12)

Rhizome sparsely tufted in small clump, stolonless. Culms 20-60 cm tall, obtusely 3-angled, smooth. Leaves oblate, glaucous, stiffish, 3-5 mm wide, conspicuously 3-nerved, smooth-margined; leaf sheaths ferruginous-punctulate, lateral-nerved. Basal sheaths light brown, splitting-reticulate, thready-netted. Spikelets 3-4, erect; terminal spikelet staminate, linear, 1-3 cm long 1.5-2 mm thick, not peduncled or short-peduncled; lateral spikelets pistillate, short-terete, 1-3.5 cm long, 3-3.5 mm thick, the lower long-peduncled. Bracts sheathed, foliaceous. Scales light brown, beardless, not serrulate-margined, ferruginous-punctulate; the midrib greenish, conspicuously 3-nerved; the nerve not reaching to apex; pistillate scales narrow ovate, 2 mm long, 1 mm wide; staminate scales linear-oblong, 4 mm long, 1 mm wide. Utricles oval, glaucous (After dry blackish-brown), 2-2.5 mm long, 1-1.5 mm thick, glabrous, nerved, papillose, ferruginous-punctulate, short-beaked with ferruginous membranous truncate mouth at apex, round contracted at base. Achenes obovate, obtusely 3-angled, 1.5 mm long, 1 mm wide, truncate-stipitate at base; the style short, not thickened at base; stigmas 3.

Nom. Jap.: Tachi-suge.

Hab.: Wet soil, usually near marshes; common; frequent in shady places.

Distr.: Ceylon, India, Sumatra, Formosa, China, Japan (Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Hiroshima Pref. Kure: Nikokyo (June 25, 1960, n. 863, 864, 200 m); Tenno-cho, Yakeyama (June 26, 1960, n. 2409, 300 m). Mihara: Mt. Omine (July 16, 1961, n. 1563, 300 m). Miyoshi: Ozekiyama-koen (June 5, 1960, n. 900, 150 m). Shobara: Nanatsukahara (June 1, 1958, n. 155, 164, 167, 168, 4128, 300 m). Aki-gun: Fuchucho, Mikumarikyo (May 3, 1960, n. 177, 181, 683, 709, 4164, 50-80 m); Kumanoato-mura (May 22, 1961, n. 1113, 1118, 170 m). Saeki-gun: Itsukaichi-cho (June 18, 1961, n. 2357, 140 m); Hatsukaichi-cho, Hatsukaichi (June 18, 1961, n. 1419, 50 m); Mt. Gokurakuji (June 18, 1961, n. 1430, 1434, 600 m); Yoshiwa-mura, Kanmuri-kogen (May 22, 1960, n. 2590, 800 m). Asa-gun: Kabe-cho, Mt. Bizenbo (June 11, 1961, n. 1404, 220 m). Yamagata-gun: Chiyoda-cho, Yae (May 28, 1961, n. 2493, 350 m); Mt. Ogake (May 24, 1959, n. 359, 4717, 500 m); Oasa-cho, Kayahara (May 28, 1961, n. 2452, 400 m); Yokogawa (May 28, 1961, n. 2468, 440 m); Tahara (May 28, 1961, n. 2459, 500 m); Toyohira-cho, Shirobara (May 28, 1961, n. 2509, 420 m). Takata-gun: Yoshida-cho, Mt. Kohori (July 8, 1961, n. 1652, 280 m); Yachiyo-cho, Mt. Dotoko (June 11, 1961, n. 1378, 620 m); Sasai (June 11, 1961, n. 1390, 240 m); Midori-cho, Mt. Inufushi (July 8, 1961, n. 1661, 600 m); Takamiya-cho, Rokurohara (July 8, 1961, n. 1683, 300 m); Koda-cho, Mt. Otsuchi (July 1, 1961, n. 1747, 300 m); Mukaiharacho, Mt. Hiraune (July 1, 1961, n. 2121, 320 m); Shiraki-cho, Mt. Shiraki (June 19, 1960, n. 883, 839, 600 m). Kamo-gun: Kurose-cho, Mt. Kota (May 21, 1961, n. 1022, 300 m). Kamijo (May 21, 1961, n. 1010, 200 m); Takaya-cho, Inagi (June 2, 1961, n. 2575, 280 m); Zoka (June 2, 1961, n. 2560, 300 m); Kochi-cho, Onishi (June 2, 1961, n. 2535, 400 m); Fukutomi-cho, Mt. Nishihara (June 2, 1961, n. 1260, 400 m); Kuba (June 2, 1961, n. 2524, 360 m); Komatsu (June 2, 1961, n. 2545, 460 m); Matsuzaki (June 2, 1961, n. 2566, 400 m); Atodani (June 24, 1961, n. 2539, 360 m); Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1311, 400 m); Nakaonchi (June 2, 1961, n. 2527, 400 m); Daiwa-cho, Kamikusai (June 2, 1961, n. 1298, 320 m). Toyota-gun: Kawajiri-cho, Mt. Noro (June 4, 1961, n. 1343, 1347, 500 m); Yasuura-cho (June 4, 1961, n. 1324, 400 m); Setoda-cho, Mt. Kannon (May 30, 1961, n. 1213, 300 m). Mitsugi-gun: Kui-cho, Ishibashiri (July 16, 1961, n. 1503, 320 m) Sera-gun: Sera-cho, Tsuguchi (June 23, 1961, n. 5005, 420 m); Seranishi-cho, Oyamadani (June 23, 1961, n. 5003, 480 m); Iwayadani (June 23, 1961, n. 5004, 420 m); Otsubo (June 23, 1961, n. 5006, 440 m); Oguni (June 23, 1961, n. 1465, 380 m); Roppongi (June 23, 1961, n. 5007, 500 m); Mt. Hatakoya (June 23, 1961, n. 1449, 480 m). Futami-gun: Sanwa-cho, Itagi (July 1, 1961, n. 1968, 320 m); Funo-mura, Mt. Men-

kame (July 21, 1961, n. 1607, 500 m).

Yamaguchi Pref. Hagi: Chinto (May 20, 1957, n. 4015, 100 m); Mt. Tatoko (May 20, 1957, n. 3063, 300 m).

Sect. 14. **Ferrugineae** Tuckerm., Enum. Meth. 12. 1843.

Rhizome tufted, stoloniferous or stolonless. Culms obtusely 3-angled, scabrous or smooth. Leaves oblate, scabrous-margined. Basal sheaths lustered, splitting-fibrous. Spikelets erect or pendulous; terminal spikelet staminate; lateral spikelets pistillate. Bracts sheathed, the upper setaceous, the lower foliaceous. Scales bearded, serrulate-margined; the nerve reaching to apex. Utricles hairy or glabrous, nerved or nerveless, short or long-beaked, short-stiped. Stigmas 3.

29. **Carex blepharicarpa** Franch. in Bull. Soc. Philom. Paris 8. sér. 7: 46. 1895.
(Map 30, Fig. 13-14)

Rhizome densely tufted, stolonless. Culms 10-50 cm tall, obtusely 3-angled, scabrous. Leaves oblate, green or yellowish-green, 2-4 mm wide (rarely 6 mm wide), stiffish scabrous-margined; the dead leaf blackish-punctulate. Basal sheaths brown, lustered, splitting-fibrous. Spikelets 3-4, erect; terminal spikelet staminate, clavate, 1-3.5 cm long, 3-5 mm thick; lateral spikelets pistillate, oblong, 1-3 cm long, 2-4 mm thick, the lower long-peduncled. Bracts sheathed, 1-3 cm long, the upper setaceous, the lower foliaceous. Scales bearded, whitish membranous-margined, slightly serrulate-margined; the midrib light yellowish-green, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales broad obovate, chestnut, 3-5 mm long, 2-2.5 mm wide, the apex of the margin rotundate or emarginate; staminate scales oblong, yellowish-brown, 5-8 mm long, 2-2.5 mm wide, the apex of the margin obtuse or retuse. Utricles oblong, light green, 3.5-4 mm long, 1-1.5 mm thick, hairy, nerveless, short-beaked with brownish bidentate mouth at apex, short-stiped at base. Achenes oblong, about 3 mm long, 1 mm wide, slightly obtusely 3-angled acute-, oblate-stipitate at base; the style short, thickened at base; stigmas 3.

Nom. Jap.: Shojo-suge.

Hab.: Wet or moist soil, usually along streams or in grasslands; common; frequent in sunny places.

Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Specimens examined. Hiroshima Pref. Mihara: Mt. Omine (July 16, 1961, n. 1566, 300 m). Saeki-gun: Hatsukaichi-cho, Hara (H. Ando, July 3, 1951, 200 m); Yuki-cho, Mt. Togo (May 29, 1960, n. 728, 765, 600 m); Ishigayakyo (Apr. 24, 1960, n. 637, 641-644, 650, 651, 656-660, 666, 400 m); Miyajima (Mar. 29, 1960, n. 482-492, 400 m). Asa-gun: Kabe-cho, Nabarakyo (Apr. 17, 1960, n. 575, 300 m). Yamagata-gun: Kake-cho, Kawanobori-dani (May 18, 1958, n. 2517, 400 m); Togochi-cho, Sandankyo (May 24, 1958, n. 189, 192, 195, 206, 210, 212-214, 231, 235-237, 246, 247, 366-368, 448-450, 4084, 4098, 4101, 500-600 m); Geihoku-cho, Mt. Uzuki (June 12, 1960, n. 832, 836, 837, 844, 846, 852, 800-900 m); Yawata highland (Aug. 12, 1958, n. 374, 800 m); Mt. Tenguishi (Y. Sasaki, Nov. 7, 1960, 900 m); Oasa-cho, Otsuka (May 28, 1961, n. 1175, 1177, 440 m); Sakai (May 28, 1961, n. 2489, 400 m); Chiyoda-cho, Yae (May 28, 1961, n. 2492, 350 m); Toyohira-cho, Shirobara (May 28, 1961, n. 1205, 420 m). Takata-gun: Midori-cho, Mt. Inufushi (July 8, 1961, n. 1663, 600 m); Yokota (July 8, 1961, n. 1675, 340 m); Takamiya-cho, Rokurohara (July 8, 1961, n. 1680, m); Koda-cho Mt. Otsuchi (July 1, 1961, n. 1713, 1736, 300 m). Futami-gun: Funomura, Mt. Menkame (July 21, 1961, n. 1584, 1594, 1601, 500-600 m); Sakugi-mura, Okami-buchi (July 21, 1961, n. 1572, 760 m); Sanwa-cho, Itagi (July 1, 1961, n. 1959, 320 m). Fukayasu-gun: Ryuzunotaki (July 30, 1961, n. 1772, 300 m); Enmeikyo (July 30, 1961, n. 1719, 240 m). Jinseki-gun: Jinseki-cho, Shinryuko (Aug. 11, 1961, n. 2218, 400 m); Sanwa-cho, Kurumi

(July 30, 1961, n. 1818, 420 m); Iseki (Aug. 12, 1961, n. 2057, 500 m). Hiba-gun: Saijo-cho, Mt. Hiba (Aug. 8, 1961, n. 2305, 2306, 2311, 2312, 700-1000 m); Tojo-cho, Shiju (Apr. 30, 1961, n. 1061, 1065, 480 m); Takewatashi (Apr. 30, 1961, n. 1060, 560 m); Taishakukyo (Aug. 11, 1961, n. 2144, 2159, 2162, 2184, 2205, 2227, 2231, 2235, 2243, 2256, 420-500 m); Mt. Dogo (Sept. 25, 1960, n. 872, 800-1200 m); Kuchiwa-cho, Mt. Kamamine (June 24, 1961, n. 1932, 480-600 m).

Tottori Pref. Tottori: Mt. Hisamatsu (H. Yokogawa, Apr. 6, 1959, n. 957, 200 m). Kurayoshi: Mt. Uchibuki (K. Okudomi, Aug. 25, 1960, 160 m); Kamii (K. Okudomi, Aug. 31, 1960, 20 m). Yonago: Shiroyama (K. Okudomi, Aug. 29, 1960, 80 m). Iwami-gun: Ajiro (H. Yokogawa, Apr. 26, 1959, n. 285, 100 m). Tohaku-gun: Mt. Mitoku (Y. Sasaki, Nov. 3, 1957, 800 m). Saihaku-gun: Mt. Daisen (Sept. 23, 1960, n. 3103, 3237, 1700 m); Mt. Goen (Sept. 23, 1960, n. 3175, 800 m).

Shimane Pref. Oda: Mt. Sanbe (June 5, 1960, n. 3097, 1100 m). Naka-gun: Kanagimura, Yune (June 12, 1960, n. 3051, 500 m). Kanoashi-gun: Nichihara-cho (Oct. 5, 1960, n. 4168, 200 m).

Yamaguchi Pref. Tsuno-gun: Tsuno-cho, Hirase-Kindake (Apr. 22, 1962, n. 3296, 3297, 300-400 m). Yoshiki-gun: Ogori-cho, Kamagabuchi (Sept. 24, 1961, n. 3233, 20 m). Abugun: Kawakami-mura; Chomonkyo (Sept. 23, 1961, n. 3212, 200 m); Ato-cho (Sept. 23, 1961, n. 3187, 220 m).

Sect. 15. *Decorae* Kükenth., Cyper.-Caric. 541. 1909.

Rhizome sparsely tufted, stoloniferous. Culms slender, obtusely 3-angled, smooth. Leaves oblate, stiff, scabrous-margined. Basal sheaths lusterless, splitting-fibrous. Spikelets erect, peduncled; terminal spikelet staminate; lateral spikelets androgynous. Bracts sheathed, foliaceous. Scales beardless, serrulate-margined; the nerve not reaching to apex. Utricles hairy, nerved, short-beaked, short-stiped. Stigmas 3.

30. *Carex reinii* Franch. et Savat., Enum Pl. Jap. 2: 133 et 559. 1879. (Map 31, Fig. 15)

Rhizome sparsely tufted, horizontal creeping, stoloniferous. Culms 20-30 cm tall, obtusely 3-angled, smooth. Leaves oblate, dark green, stiff, 3-5 mm wide, scabrous-margined. Basal sheaths brown, lusterless splitting-fibrous. Spikelets 4-7, erect, peduncled; terminal spikelet staminate. clavate, 2-3.5 cm long, 2.5-3 mm thick; lateral spikelets androgynous (staminate at apex), 1-2.5 cm long, 2-2.5 mm thick, long-peduncled. Bracts long-sheathed, foliaceous. Scales reddish-brown, beardless, serrulate-margined, whitish membranous-margined; the midrib light brown, conspicuously 1-nerved; the nerve not reaching to apex; pistillate scales oval, 3 mm long, 2-2.5 mm wide; staminate scales oblong, 4-4.5 mm long, 2-2.5 mm wide. Utricles obovate-fusiform, light yellowish-green, 4-4.5 mm long, 1-1.5 mm thick, hairy, nerved, short-beaked with brownish bidentate mouth at apex, short-stiped at base. Achenes oval-elliptic, obtusely 3-angled, 3 mm long, about 1 mm wide, small discoid-beaked at apex, short-stiped at base; the style short, thickened at base; stigmas 3.

Nom. Jap.: Kokan-suge (Nanbu-suge).

Hab.: Moist soil, usually in forests; common; frequent in shady places.

Distr.: Japan (Honshu, Shikoku, Kyushu).

Specimens examined. Okayama Pref. Maniwa-gun: Yuhara-cho, Mt. Amakoi (Y. Sasaki, Sept. 15, 1961, 510 m).

Hiroshima Pref. Saeki-gun: Yuki-cho, Mt. Togo (May 29, 1960, n. 736, 737, 761, 600 m); Ishigayakyo (Apr. 24, 1960, n. 636, 638, 639, 646, 664, 400 m). Asa-gun: Kabe-cho, Nabarakyo (Apr. 17, 1960, n. 576, 590, 597, 618, Apr. 22, 1962, n. 2710, 300-400 m); Mt. Kanmuri (Apr. 22, 1962, n. 2734, 2735, 2740-2742, 2755, 400-500 m). Yamagata-gun: Kake-cho,

Takiyamakyo (June 12, 1960, n. 2478, 400-500 m); Kawanoboridani (May 18, 1958, n. 65, 400 m); Tsutsuga-mura, Mt. Ichima (July 9, 1961, n. 1610, 1612, 1613, 1628, 500-800 m); Togochi-cho, Sandankyo (May 24, 1958, n. 208, 220, 252, 255-257, 446, 474, 4096, June 17, 1962, n. 2777, 500-800 m); Geihoku-cho, Odomaridamu (June 12, 1960, n. 2473, 640 m). Takata-gun: Shiraki-cho, Mt. Shiraki (June 19, 1960, n. 894, 600 m). Fukayasu-gun: Kamo-cho, Ryuzunotaki (July 30, 1961, n. 1803, 300 m); Enmeikyo (July 30, 1961, n. 1781, 240 m). Futami-gun: Funo-mura, Mt. Menkame (July 21, 1961, n. 1597, 600-700 m); Sakugi-mura, Okamibuchi (July 21, 1961, n. 1572, 760 m). Hiba-gun: Tojo-cho, Taishakukyo (Aug. 9, 1961, n. 2169, 2177, 2185-2187, 2240, 400 m).

Shimane Pref. Iishi-gun: Akagi-cho, Akana-toge (July 21, 1961, n. 3022, 500 m).

Yamaguchi Pref. Saba-gun: Tokuji-cho (K. Okudomi, Aug. 7, 1960, 460 m). Tsuno-gun: Tsuno-cho, Hirase-Kindake (Apr. 22, 1962, n. 3274, 3283, 300-400 m). Kuga-gun: Mikawa-cho, Jotobata (May 3, 1963, n. 3435, 3436 500 m); Watari-Negasa (May, 3, 1963, n. 3489, 3490, 300 m); Yuwayakannon (May 3, 1963, n. 3511-3513, 300-400 m). Abu-gun: Kawakami-mura, Chomonkyo (Sept. 23, 1960, n. 3206, 3215, 200 m); Ato-cho, (Sept. 23, 1960, n. 3181, 3183, 3188, 3195, 220 m).

Sect. 16. **Confertiflorae** Franch. in Nouv. Arch. Mus. Paris 3. sér. **10**: 106. 1898.

Rhizome tufted, stoloniferous or stolonless. Culms acutely or obtusely 3-angled, stiff, scabrous or smooth. Leaves oblate, scabrous-margined. Basal sheaths lustered or lusterless, splitting-reticulate or fibrous. Spikelets erects splitting reticulate or fibrous. Spikelets erects; terminal spikelet staminate; lateral spikelets pistillate (rarely androgynous), the lower peduncled. Bracts sheathed or sheathless, mostly foliaceous. Scales mostly 3-nerved; pistillate scales mostly bearded. Utricles nerved, glabrous, short or long-beaked, sessile. Stigmas 3.

Key to the species

1. Basal sheaths lusterless. Staminate spikelets 2-3 *C. confertiflora*
1. Basal sheaths lustered. Staminate spikelet 1 2
2. Staminate scales bearded
 - Scale shoulders slightly serrulate-margined *C. nipposinica*
 - Scale shoulders not serrulate-margined *C. transversa*
2. Staminate scales beardless 3
3. Pistillate scales bearded
 - Scale shoulders serrulate-margined *C. dispalata* var. *takeuchii*
 - Scale shoulders not serrulate-margined *C. dispalata*
3. Pistillate scales beardless; scale shoulders serrulate-margined *C. ischnostachya*

31. **Carex confertiflora** Boott in Proc. Linn. soc. **1**: 286. 1845. (Map 32, Fig. 18)

Rhizome sparsely tufted, stoloniferous. Culms 30-80 cm tall, acutely 3-angled, the upper scabrous; the central part bearing 1-2 leaves. Leaves oblate, thick, conspicuously 3-nerved, 5-8 mm wide, the surface greenish, the reverse glaucous, scabrous-margined. Basal sheaths brown, lusterless, not splitting-fibrous. Spikelets 4-8, erect, the lower peduncled; terminal spikelets 2-3, staminate, 2-5.5 cm long, 2-4 mm thick; lateral spikelets 2-5, pistillate (rarely androgynous: staminate at apex), 4-7 cm long, 5 mm thick. Bracts sheathless, foliaceous. Scales brownish, whitish membranous-margined; the midrib greenish, conspicuously 3-nerved; pistillate scales lanceolate-oblong, 2-2.5 mm long, 1-1.5 mm wide, bearded, the scale shoulder not serrulate-margined, the nerve reaching to apex; staminate scales oblong, 4.5-5 mm long, 1.5 mm wide, beardless, the scale shoulder slightly serrulate-margined, the nerve not reaching to apex. Utricles broad obovate, light brown (after dry blackish-brown),

3.5-4 mm long, 1-1.5 mm thick, glabrous, nerved, short-beaked with membranous mouth (afterward bidentate mouth) at apex, sessile at base. Achenes obovate, obtusely 3-angled, 2 mm long, 1 mm wide, truncate at base; the style short, thickened at base; stigmas 3.

Nom. Jap.: Miyamashira-suge.

Hab.: Wet or moist soil, usually near marshes; rather rare; frequent in shady places.

Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Specimens examined. Hiroshima Pref. Yuki-cho, Go (Apr. 24, 1960, n. 4687, 300 m); Yoshiwa-mura, Kanmuri-kogen (May 22, 1960, n. 766, 779, 789, 792, 793, 805, 4743, 800 m).

32. **Carex nipposinica** Ohwi in Act. Phytotax. et Geobot. **11**: 255. 1942. (Map 33, Fig. 16)

Rhizome sparsely tufted, stolonless. Culms 30-40 cm tall, acutely 3-angled, the upper scabrous; the central part bearing a leaf. Leaves oblate, stiffish, dark green, 3-5 mm wide, scabrous-margined. Basal sheaths bladeless, reddish-purple or blackish-purple, slightly lustered, slightly splitting-fibrous. Spikelets 2-3, erect, peduncled; terminal spikelet staminate, linear, 1.5-2.5 cm long, 2 mm thick; lateral spikelets pistillate, terete, 1.5-2.5 cm long, 5 mm thick. Bracts foliaceous; the upper sheathless; the lower long-sheathed (1.5-4 cm long). Scales brownish, long-bearded; the scale shoulder slightly serrulate-margined; the midrib greenish, conspicuously 3-nerved; the nerve reaching to apex; pistillate scales elliptic, 2 mm long, 1 mm wide; staminate scales oblong, 3.5-4 mm long, 1.5 mm wide. Utricles oval, brownish-green (after dry blackish-brown), 3 mm long, 1.5-2 mm thick, glabrous, nerved, short-beaked with whitish membranous, bidentate mouth at apex, sessile at base. Achenes obovate, obtusely 3-angled, 1.5-2 mm long, 1 mm wide, truncate at base; the style short, thickened at base; stigmas 3.

Nom. Jap.: Awabo-suge.

Hab.: Moist soil, usually along pass-sides; rather rare; frequent in shady places.

Distr.: China, Formosa, Ryukyus, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Hiroshima Pref. Toyota-gun: Setoda-cho, Mt. Kannon (May 30, 1961, n. 1211, 300 m).

33. **Carex transversa** Boott ex A. Gray, Narr. Exped. Perry **2**: 324. 1857; (Map 34, Fig. 16)

Rhizome densely tufted, stolonless. Culms 20-40 cm tall, slightly obtusely 3-angled, smooth; the central part bearing a leaf. Leaves oblate, stiffish, greenish, 3-4 mm wide, scabrous-margined. Basal sheaths reddish-purple, lustered, splitting slightly-fibrous or reticulate. Spikelets 3-4, erect, peduncled; terminal spikelet staminate, linear, 1.5-3 cm long, 1.5-2 mm thick; lateral spikelets pistillate, terete, 1.3-3 cm long, 5 mm thick. Bracts foliaceous, the lower sheathed. Scales brownish, long-bearded; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales ovate, 1.5-2 mm long, 1-1.5 mm wide, conspicuously long-bearded (2.5-5 mm long); staminate scales lanceolate, 3.5-4 mm long, 1-1.5 mm wide. Utricles oblong, greenish (after dry blackish-green), 5 mm long, 1-1.5 mm thick, glabrous, nerved, long-beaked (2.5-3 mm long) with membranous, bidentate mouth at apex, sessile at base. Achenes oval, 1.5 mm long, about 1 mm thick, obtusely 3-angled, truncate-stipitate at base; the style short, thickened at base; stigmas 3.

Nom. Jap.: Yawara-suge.

Hab.: Rather wet or moist soil, usually along pass-sides; rather common; frequent in sunny places.

Distr.: China, Ryukyus, Japan (Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Okayama Pref. Okayama: Tsushima (May 14, 1961, n. 3035, 10 m). Niimi: Atetsukyo (June 22, 1960, n. 4753, 300 m); Ikura (H. Ando, May 21, 1960,

200 m).

Hiroshima Pref. Innoshima: Habu (May 26, 1961, n. 1154, 100 m); Mt. Oku (May 26, 1961, n. 1150, 300 m). Aki-gun; Kamagari-cho (Apr. 28, 1961, n. 946, 200 m); Kumanoatomura (May 22, 1961, n. 1115, 1116, 170 m). Takata-gun: Yachiyo-cho, Sasai (June 11, 1961, n. 1392, 240 m). Toyota-gun: Setoda-cho, Mt. Kannon (May 30, 1961, n. 1216, 1225, 1231, 1239, 300 m).

34. **Carex dispalata** Boott var. **takeuchii** Ohwi in Act. Phytotax. et Geobot. **11**: 256. 1942. (Map 35, Fig. 17)

Rhizome densely tufted, stoloniferous. Culms 30-60 cm tall, acutely 3-angled, the upper scabrous. Leaves oblate, dark green, stiffish, 5-8 mm wide conspicuously 3-nerved, scabrous-margined; the leaf sheath brownish-punctulate; the basal part of the leaf lateral-nerved. Basal sheaths bladeless, purplish-brown, lustered, splitting-reticulate, thready-netted. Spikelets 6-8, erect, the upper not peduncled, the lower peduncled; terminal spikelet staminate, linear-terete, 4-5.5 cm long, 3-4 mm thick; lateral spikelets pistillate or androgynous (staminate at apex), terete, 1-7 cm long, 3-5 mm thick. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales reddish-purple, whitish membranous-margined; the scale shoulder serrulate-margined; the midrib greenish, conspicuously 3-nerved; pistillate scales lanceolate-oblong, 3-3.5 mm long, 1.5 mm wide, the nerve reaching to apex; staminate scales oblong, 4 mm long, 1.5 mm wide, the nerve not reaching to apex. Utricles obovate, yellowish-green, 3 mm long, 1-1.5 mm thick, glabrous, nerved, long-beaked with whitish membranous mouth at apex, short-stiped at base. Achenes obovate, obtusely 3-angled, 1.5 mm long, 1 mm wide, truncate at base; the style slender, not thickened at base; stigmas 3, persistent.

Nom. Jap.: Kinkikasa-suge.

Hab.: Very wet soil, usually along streams; common; frequent in sunny places.

Distr.: Japan (Honshu).

Specimens examined. Hiroshima Pref. Hiroshima: Mitaki-cho (May 24, 1959, n. 4199, 100 m). Kure: Tenno-cho, Yakeyama (June 26, 1960, n. 2415, 300 m). Miyoshi: Awaya (H. Suzuki, May 12, 1960, 220 m). Aki-gun: Fuchu-cho, Mikumarikyo (June 27, 1958, n. 4147, 50 m); Funakoshi-cho, Mt. Iwataki (May 23, 1957, n. 4017, 4018, 100 m); Takeura (Apr. 29, 1958, n. 116, 4117, 30 m. Apr. 1, 1960, n. 493-496, 50 m); Kaita-cho, Higashikaita, Nishitani (Apr. 1, 1958, n. 4176, 80 m); Senogawa-cho, Hataka, Mizutani (Apr. 1, 1960, n. 528, 536, 140 m); Hataka (Apr. 24, 1959, n. 4707, 120 m); Mt. Chausu (Apr. 15, 1958, n. 20, 24, 36, 38, 150-200 m). Asa-gun: Sato-cho, Midorii (H. Ando, May 10, 1959); Kabe-cho, Nabarakyo (Apr. 17, 1960, n. 587, 608, 613, 623, 300 m); Mt. Fukuoji (May 17, 1960, n. 2326, 280 m). Yamagata-gun: Kake-cho, Kawanoboridani (May 18, 1958, n. 72, 79, 280 m); Oasa-cho, Otsuka (May 28, 1961, n. 1171, 1182-1184, 440 m).

Tottori Pref. Tohaku-gun: Sekigane-cho (H. Yokogawa, May 23, 1959, n. 566, 500 m).

35. **Carex dispalata** Boott ex A. Gray, Narr. Exped. Perry **2**: 325. 1857. (Map 36, Fig. 17)

Rhizome tough, densely tufted, stoloniferous. Culms 30-100 cm tall, acutely 3-angled, the upper scabrous. Leaves oblate, dark green, stiffish, 0.7-1 cm wide, conspicuously 3-nerved, scabrous-margined; the basal parts conspicuously lateral-nerved. Basal sheaths bladeless, lustered, purplish-brown, splitting-reticulate, thready-netted. Spikelets 4-6, erect, the upper not peduncled, the lower peduncled; terminal spikelet staminate, linear-terete, 8-11 cm long, 3-5 mm thick; lateral spikelets pistillate or androgynous (staminate at apex), terete, 3.5-10 cm long, 4-8 mm thick. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales reddish-purple, whitish membranous-margined; the midrib greenish, conspicuously 3-nerved; pistillate scales lanceolate-oblong, bearded, the scale shoulder not serrulate-margined, 3.5-4 mm long, 1.5-2 mm wide; staminate scales linear-oblong, beardless, 5-7 mm long, 1.5-2 mm

wide, the scale shoulder serrulate-margined. Utlicles ovate-elliptic, dark brownish-green, 2.5-4 mm long, 1.5-2 mm thick, glabrous, nerved, recurved, spreading, slightly long-beaked with whitish membranous mouth at apex, short-stiped at base. Achenes narrow ovate, obtusely 3-angled, 2 mm long, 1 mm wide, truncate at base; the style slender, not thickened at base; stigmas 3.

Nom. Jap.: Kasa-suge.

Hab.: Very wet soil, usually along streams or near marshes: common; frequent in sunny places.

Distr.: China, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea, Manchuria, Ussuri, Saghalien, Kuriles.

Specimens examined. Okayama Pref. Tomata-gun: Kamisaibara-mura (H. Yokogawa, May 17, 1959, n. 421, 800 m).

Hiroshima Pref. Shobara: Nanatsukahara (June 1, 1958, n. 163, 165, 4165, 300 m); Akagawa (Aug. 8, 1961, n. 2377, 300 m); Motomura (Aug. 8, 1961, n. 2380, 300 m). Aki-gun: Fuchu-cho, Yamada (June 27, 1958, n. 2628, 30 m); Mikumarikyo (June 27, 1958, n. 175, 178, 50 m, May 3, 1960, n. 691, 692, 703, 705, 707, 50-80 m); Funakoshi-cho, Funakoshi-toge (Apr. 1960, n. 2644, 20 m); Yano-cho, Egedani (May 26, 1957, n. 2669, 300 m); kaita-cho, Mt. Kingatoro (Apr. 20, 1958, n. 403, 404, 350 m); Kurasaki-cho (Apr. 23, 1961, n. 982-992, 40 m). Saeki-gun: Yuki-cho, Mt. Togo (May 29, 1960, n. 747, 748, 762, 763, 770, 300 m); Yuki (Apr. 24, 1960, n. 2601, 380 m); Ishigayakyo (Apr. 24, 1960, n. 2606, 400 m); Saeki-cho, Kuroutsukyo (May 22, 1960, n. 2089, 500 m); Yoshiwa-mura, Kanmuri-kogen (May 22, 1960, n. 777, 783, 791, 806, 800 m). Asa-gun: Asa-cho, Suzuhari (May 29, 1961, n. 2332, 300 m); Sasahara (May 29, 1961, n. 2333, 300 m); Kamieboshi (May 29, 1961, n. 2339, 160 m). Yamagata-gun: Kake-cho, Takiyamakyo (June 12, 1960, n. 2479, 400 m); Chiyoda-cho, Mt. Ogake (May 24, 1959, n. 2510, 500 m); Maruoshi (May 28, 1961, n. 2498, 420 m); Tsutsuga-mura, Mt. Ichima (July 9, 1961, n. 1611, 500 m); Nunohara (July 9, 1961, n. 2503, 420 m); Togochi-cho, Sandankyo (May 24, 1958, n. 225, 4103, 500 m); Geihoku-cho, Mt. Uzuki (June 21, 1960, n. 833, 800 m); Oasa-cho, Kayahara (May 28, 1961, n. 2451, 400 m); Sakai (May 28, 1961, n. 2488, 400 m); Yokogawa (May 28, 1961, n. 2467, 440 m); Tahara (May 28, 1961, n. 2457, 500 m); Otsuka (May 28, 1961, n. 1185, 440 m); Toyohira-cho, Shirobara (May 28, 1961, n. 1201, 1208, 420 m). Takata-gun: Yachiyo-cho, Sasai (June 11, 1961, n. 2120, 240 m). Kamo-gun: Hachihonmatsu-cho (June 5, 1961, n. 2548, 280 m); Takaya-cho, Zoka (June 2, 1961, n. 2558, 300 m); Inagi (June 2, 1961, n. 2576, 280m); Kinehara (June 2, 1961, n. 2585, 280 m); Fukutomi-cho, Kuba (June 2, 1961, n. 2523, 360 m); Matsuzaki (June 2, 1961, n. 2568, 400 m); Toyosaka-cho, Nakaonchi (June 2, 1961, n. 2564, 400 m); Mt. Itanabe (June 2, 1961, n. 1286, 1288, 400 m); Kochi-cho, Onishi (June 2, 1961, n. 2534, 400 m); Daiwa-cho, Kamikusai (June 2, 1961, n. 1296, 1312, 320 m); Atodani (June 24, 1961, n. 2555, 360 m). Sera-gun: Seranishi-cho, Oguni (June 23, 1961, n. 1458, 1478, 380 m); Roppongi (June 23, 1961, n. 1989, 500 m). Futami-gun: Funo-mura, Mt. Menkame (July 21, 1961, n. 1602, 500 m); Sakugi-mura, Okamibuchi (July 21, 1961, n. 1576, 760 m). Hiba-gun: Takano-cho, Oka (July 28, 1961, n. 1830, 600 m); Mt. Kenashi (July 28, 1961, n. 1859, 600 m).

Yamaguchi Pref. Abu-gun: Ato-cho (Sept. 23, 1961, n. 3202, 3203, 220 m). Tsuno-gun: Tsuno-cho, Hirase-Kindake (Apr. 22, 1962, n. 3293-3295, 300-400 m). Kuga-gun: Mikawa-cho, Jotobata (May 3, 1963, n. 3450, 500 m); Negasa-Yamanouchi (May 3, 1963, n. 3484, 100-300 m); Iwayakannon (May 3, 1963, n. 3516, 3517, 300-400 m).

36. *Carex ischnostachya* Steud. Synops. 2: 222. 1855. (Map 37, Fig. 18)

Rhizome densely tufted, stolonless. Culms 20-60 cm tall, acutely 3-angled, smooth. Leaves oblate, soft, dark green, 4-10 cm wide, conspicuously 3-nerved, scabrous-margined. Basal sheaths bladeless, reddish purplish-brown or blackish-purple, lustered, splitting-fibrous. Spikelets 3-5, erect; terminal spikelet staminate, 2-3 cm long, 1 mm thick; lateral spikelets

pistillate, 2.5-7 cm long, 3-4 mm thick, peduncled. Bracts foliaceous, long-sheathed. Scales yellowish-green, serrulate-margined, whitish membranous-margined, beardless; the midrib greenish, conspicuously 1-nerved; the nerve not reaching to apex; pistillate scales oval, 1.5 mm long, 1.5 mm wide; staminate scales oblong, 2.5-3 mm long, 1 mm wide. Utricles narrow ovate, greenish-brown (after dry blackish), 3.5-5 mm long, 1-1.5 mm thick, glabrous, nerved, long-beaked with membranous truncate mouth at apex, contracted, sessile at base. Achenes obovate, obtusely 3-angled, 2 mm long, 1 mm wide, short-stiped at base; the style short, erect, thickened at base; stigmas 3.

Nom. Jap.: Juzu-suge.

Hab.: Moist soil, usually along pass-sides or in forests; common; frequent in shady places.

Distr.: China, Ryukyus, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Hiroshima Pref. Hiroshima: Ushida-cho (H. Ando, May 30, 1959, 200 m); Motoujina-cho (Apr. 17, 1959, n. 128-130, 430, 4086, 4087, 4092, 4093, 10 m). Aki-gun: Fuchu-cho, Mikumari-kyo (June 27, 1958, n. 2624, 30 m); Kamagari-cho (Apr. 28, 1961, n. 927, 935, 947, 200 m). Yamagata-gun: Tsutsuga-mura, Mt. Ichima (July 9, 1961, n. 1623, 1630, 500 m); Nunohara (July 9, 1961, n. 1647, 420 m). Kamo-gun: Mt. Itanabe (June 2, 1961, n. 1285, 400 m). Konu-gun: Joge-cho (July 13, 1961, n. 1954, 500 m); Soryo-cho, Mt. Ko (July 13, 1961, n. 1550, 500 m). Futami-gun: Funo-mura, Mt. Menkame (July 21, 1961, n. 1596, 500 m); Sakugi-mura, Okamibuchi (July 21, 1961, n. 1570, 760 m); Kisa-cho, Kisa (July 13, 1961, n. 1541, 1544, 240 m); Yasuda (July 13, 1961, n. 1531-1533, 1540, 360 m); Mirasaka-cho (July 13, 1961, n. 1528, 1529, 240 m). Hiba-gun: Saijo-cho, Mt. Hiba (Aug. 8, 1961, n. 2303, 700 m); Tojo-cho, Taishakukyo (Aug. 9, 1961, n. 2151, 2153, 500 m); Kuchiwa-cho, Mt. Kamamine (July 24, 1961, n. 1921, 480 m); Hiwa-cho, Konomura (July 28, 1961, n. 1890, 1892, 500 m).

Shimane Pref. Matsue: Rakusan (May 25, 1956, n. 4722, June 6, 1958, n. 3126-3129, 4109, May 13, 1960, n. 3112-3114, 3120, 20 m); Jozan (May 14, 1960, n. 3130, 3131, 3139, 20 m). Yatsuka-gun: Yatsuka-mura, Moriyama (June 13, 1955, n. 4690, 100 m).

Table 12.

Parts	Taxa	<i>C. dispalata</i>	<i>C. dispalata</i> var. <i>takeuchii</i>
Pistillate scale		scale shoulders not serrulate-margined	scale shoulders serrulate-margined
Utricles		ovate-elliptic, dark brownish-green, recurved	ovate, yellowish-green, incurved
Stigmas		not persistent	persistent

Table 13.

Parts	Taxa	<i>C. nipposinica</i>	<i>C. transversa</i>
Culms		scabrous	smooth
Scale shoulders		slightly serrulate-margined	not serrulate-margined
Utricles		brownish-green, short-beaked	greenish, long-beaked

Sect. 17. **Paludosae** Fries, Corp. Fl. Suec. 190. 1835.

Rhizome stoloniferous. Culms obtusely 3-angled, smooth or scabrous. Leaves oblate, stiffish, scabrous-margined. Basal sheaths bladeless, lusterless, splitting-reticulate. Spikelets: terminal spikelets 1-3, staminate; lateral spikelets pistillate. Bracts sheathed or sheathless, mostly foliaceous. Scales bearded or beardless; the scale shoulder not serrulate-margined; the nerve mostly reaching to apex. Utricles glabrous, nerved, short-beaked with bidentate mouth, short-stiped. Stigmas 3.

Key to the species.

1. Culms scabrous. Bracts sheathless. *C. scabrifolia*
 1. Culms smooth. Bracts sheathed. *C. pumila*

37. **Carex scabrifolia** Steud., Synops. 2: 237. 1855. (Map 38, Fig. 19)

Rhizome densely tufted, stoloniferous. Culms 30-60 cm tall, obtusely 3-angled, scabrous. Leaves oblate, 1.5-4 mm wide, stiffish, scabrous-margined.

Basal sheaths bladeless, reddish-purple, lusterless, splitting-reticulate, thready-netted. Spikelets 3-5, erect; terminal spikelets 2-3, staminate, linear, 1-3 cm long, 2-3 mm wide, not peduncled; lateral spikelets 1-2, pistillate, cylindric-oblong, 2-5.5 cm long, 7-8 mm wide, peduncled or not peduncled. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales: the scale shoulder not serrulate-margined; the midrib greenish; pistillate scales obovate, ferruginous, 4-5 mm long, 2 mm wide, bearded, conspicuously 3-nerved, the nerve reaching to apex; staminate scales oblong, reddish-purple, 5-6 mm long, 2-2.5 mm wide, beardless or slightly bearded, whitish membranous-margined, conspicuously 1-nerved, the nerve reaching or not reaching to apex. Utricles oblong, yellowish-brown, 8 mm long, 2.5-3 mm thick, glabrous, nerved, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes elliptic, obtusely 3-angled, 2.5 mm long, 1 mm wide, truncate at base; the style short, erect, thickened at base; stigmas 3.

Nom. Jap.: Shiokugu (Hamakugu).

Hab.: Very wet soil, usually in brackish marshes near the coast; rather rare; frequent in sunny places.

Distr.: China, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea, Manchuria, Ussuri.

Specimens examined. Hiroshima Pref. Saeki-gun: Miyajima (June 27, 1961, n. 2366, 0 m).

38. **Carex pumila** Thunb., Fl. Jap. 39. 1784. (Map 39, Fig. 20)

Rhizome sparsely tufted, long-stoloniferous. Culms 8-20 cm tall, obtusely 3-angled, stiff, smooth. Leaves oblate, stiff, 2-4 mm wide, green, scabrous-margined; the basal part of the leaf conspicuously lateral-nerved. Basal sheaths bladeless, reddish-brown, lusterless, splitting-reticulate, slightly thready-netted. Spikelets 4-5, erect; the upper spikelets 1-2, staminate, linear, 1.5-4 cm long, 2-3 mm thick, short-peduncled or not peduncled; the lower spikelets 1-2, pistillate, terete, 1.5-2.5 cm long, 7-9 mm thick, peduncled. Bracts short-sheathed, foliaceous. Scales bearded, whitish membranous-margined; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 3-nerved; the nerve reaching to apex; pistillate scales ovate, reddish-brown, 5 mm long, 2.5-3 mm wide; staminate scales oblong, reddish-purple, 7-9 mm long, 2.5-3 mm wide. Utricles ovate-elliptic, greenish-brown, 5-6 mm long, 2 mm thick, glabrous, nerved, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes ovate, obtusely 3-angled, 3 mm long, about 1 mm wide, truncate-stiped at base; the style erect, slightly thickened at base; stigmas 3.

Nom. Jap.: Koboshiba.

Hab.: Sand or sandy soil, usually near the coast; common; frequent in sunny places.

Distr.: Australia, China, Formosa, Ryukyus, Japan (Hokkaido, Honshu, Shikoku, Kyushu),

Korea, Kuriles, Saghalien.

Specimens examined. Hiroshima Pref. Hiroshima: Yoshijima-cho (Y. Sasaki, May 2, 1956, 5 m); Yamate-cho (Y. Sasaki, May 3, 1959, 3 m). Saeki-gun: Miyajima (Dec. 21, 1958, n. 472, 1485, 0 m).

Tottori Pref. Tottori: Hamasaka (H. Yokogawa, Apr. 10, 1959, n. 342); Koyama (N. Yano, Dec. 26, 1960).

Shimane Pref. Yatsuka-gun: Kitaura (June 20, 1955, n. 4688, 1 m).

Yamaguchi Pref. Hagi; Kikugahama (May 20, 1957, n. 4031, 0-3 m); Tamaeura (May 20, 1957, n. 3072, 2-3 m).

Sect. 18, **Debiles** Carey in A. Gray, Man. ed. 1: 558. 1848.

Rhizome tufted, stolonless. Culms obtusely 3-angled, smooth. Leaves oblate, soft or stiffish, scabrous-margined. Basal sheaths lusterless, splitting-fibrous. Spikelets erect, peduncled. Bracts sheathed setaceous or foliaceous. Scales bearded or beardless; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching or not reaching to apex. Utricles glabrous, nerved, long-beaked with whitish membranous (afterward bidentate mouth), short-stiped. Stigmas 3.

Key to the species

1. Spikelets unisexual *C. bostrychostigma*
 1. Spikelets androgynous *C. dissitiflora*

39. **Carex bostrychostigma** Maxim. in Mém. Biol. 12: 568. 1887. (Map 40, Fig. 21)

Rhizome sparsely tufted, short creeping, clothed with dark brown fibers, stolonless. Culms 10-50 cm tall, obtusely 3-angled, smooth. Leaves oblate, soft, light green, 2-4 mm wide, brownish-punctulate, scabrous-margined; the leaf sheaths brownish-punctulate. Basal sheaths yellowish-brown, lusterless, splitting-fibrous. Spikelets 6-7, erect; terminal spikelet staminate, linear-lanceolate, 2-2.5 cm long, 1.5-2 mm thick; lateral spikelets pistillate, 2-4 cm long, 2 mm thick, peduncled. Bracts sheathed, the upper setaceous, the lower foliaceous. Scales lanceolate-ovate, yellowish-brown, whitish membranous-margined; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve not reaching to apex; pistillate scales 4 mm long, 1.5 mm wide, acute at apex; staminate scales 4.5 mm long, 1.5-2 mm wide, obtuse at apex. Utricles lanceolate, light green, 4-5 mm long, 1 mm thick, glabrous, nerved, long-beaked with whitish membranous mouth (afterward bidentate mouth) at apex, cuneate-stiped at base. Achenes terete-oblong, acutely 3-angled, 3.5 mm long, 1 mm wide, small beaked at apex, truncate-stiped at base; the style slender, erect, thickened at base; stigmas 3, slender, 5-6 mm long, persistent.

Nom. Jap.: Yamaji-suge.

Hab.: Rather wet or moist soil, usually along pass-sides; rather rare; frequent in shady places.

Distr.: Japan (Honshu, Shikoku, Kyushu), Korea, Manchuria, Ussuri.

Specimens examined. Hiroshima Pref. Aki-gun: Senogawa-cho, Mt. Dosho (May 3, 1962, n. 2816, 400 m). Toyota-gun: Kawajiri-cho, Mt. Noro (June 4, 1961, n. 1332, 1367, 1370, 800 m). Futami-gun: Funomura, Mt. Menkame (July 21, 1961, n. 1591, 600 m). Hiba-gun: Takano-cho, Mt. Kenashi (July 28, 1961, n. 1851, 600 m).

40. **Carex dissitiflora** Franch. in Bull. Soc. Philom. Paris 8. sér. 7: 32. 1895. (Map 41, Fig. 21)

Rhizome densely tufted, stolonless. Culms 20-30 cm tall, obtusely 3-angled, smooth.

Leaves oblate, light green, stiffish, thin, 3-5 mm wide, conspicuously 3-nerved, scabrous-margined. Basal sheaths reddish-brown, lusterless, splitting-fibrous. Spikelets 5-7, erect, peduncled, androgynous (staminate at apex), linear-cylindric, 3-5 cm long, 2 mm thick. Bracts sheathed (1-3 cm long), foliaceous. Scales lanceolate, brownish, whitish membranous-margined; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; pistillate scales bearded, 4-4.5 mm long, 1-1.5 mm wide, the nerve reaching to apex; staminate scales beardless, 4-5 mm long, 1-1.5 mm wide, the nerve not reaching to apex. Utricles narrow lanceolate, light green, 5-6 mm long, 1 mm thick, glabrous, nerved, long-beaked with whitish membranous mouth (afterward bidentate mouth), short-stiped at base. Achenes elliptical, acutely 3-angled, 3 mm long, 1 mm wide, short-stiped at base; the style erect, slender, not thickened at base; stigmas 3.

Nom. Jap.: Miyamajuzu-suge.

Hab.: Rather wet or moist soil, usually along pass-sides or in forests; rather rare; frequent in shady places.

Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu), South Kuriles.

Specimens examined. Hiroshima Pref. Yamagata-gun: Tsutsuga-mura, Nunohara (July 9, 1961, n. 1633, 420 m).

Sect. 19. **Macroglossae** Akiyama, Caric. Far East. Reg. As. 157. 1955.

Rhizomé tufted, stolonless. Culms acutely 3-angled, soft, smooth. Leaves oblate, thin, soft, scabrous-margined. Basal sheaths lusterless, splitting-fibrous. Spikelets erect or pendulous, peduncled or not peduncled; terminal spikelet staminate; lateral apikelets pistillate. Bracts sheathed, foliaceous. Scales ovate-oblong, not serrulate-margined; the midrib greenish, conspicuously 1-3-nerved. Utricles glabrous, nerved, long-beaked with whitish membranous mouth (afterward bidentate mouth), short-stiped. Stigmas 3.

41. **Carex macroglossa** Fanch. et Savat., Enum. Pl. Jap. 2: 148 et 576. 1879.
(Map 42, Fig. 22)

Rhizome densely tufted, stolonless. Culms 10-60 cm tall, acutely 3-angled, soft, smooth. Leaves oblate, light green, thin, 3-9 mm wide, conspicuously 3-nerved, scabrous-margined. Basal sheaths yellowish-brown, lusterless, splitting-fibrous. Spikelets 3-4, erect, peduncled; terminal spikelet staminate, linear, 0.8-1.5 cm long, 1 mm thick; lateral spikelets pistillate, oblong, 0.6-1.5 cm long, 3-3.5 mm thick. Bracts sheathed, foliaceous. Scales lanceolate-oblong, light green, beardless, not serrulate-margined, whitish membranous-margined; the midrib greenish, conspicuously 1-nerved; the nerve not reaching to apex; pistillate scales 4-4.5 mm long, 2 mm wide; staminate scales 4-4.5 mm long, 2 mm wide. Utricles ovate-fusiform, dark green, 4.5-6 mm long, 1.5-2 mm thick, glabrous, nerved, long-beaked with membranous mouth (afterward bidentate mouth) at apex, short truncate-stiped at base. Achenes broad obovate, obtusely 3-angled, 2 mm long, 1.5 mm wide, truncate-stiped at base; the style short, not thickened at base; stigmas 3.

Nom. Jap.: Kojuzu-suge.

Hab.: Rather wet or moist soil, usually along road sides or near marshes; rather common; frequent in sunny places.

Distr.: Japan (Hokkaido, Honshu, Kyushu), Korea.

Specimens examined. Hiroshima Pref. Aki-gun: Kumanoato-mura (May 22, 1961, n. 1850, 170 m); Kaita-cho, Mt. Dosho (May 3, 1962, n. 2822, 460 m). Saeki-gun: Yoshiwamura, Kanmuri-kogen (May 22, 1960, n. 797, 800 m). Kamo-gun: Kurose-cho, Kamijo (May 21, 1961, n. 1007, 200 m); Shiwa-cho, Namitakiji (May 15, 1959, n. 413, 4064, 400 m); Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1289, 400 m). Jinseki-gun: Jinseki-cho, Fukunaga (S. Tanabe, May 18, 1961, 400 m). Hiba-gun: Saijo-cho, Hirako (Apr. 30, 1961, n. 2276,

340 m); Tojo-cho, Takewatashi (Apr. 30, 1961, n. 1038, 560 m); Shiju (Apr. 30, 1961, n. 1050 480 m). Sera-gun: Seranishi-cho, Oguni (June 23, 1961, n. 1467, 380 m).

Tottori Pref. Iwami-gun: Amedaki (H. Yokogawa, May 10, 1959, n. 1974, 300 m).

Table 14.

Parts	Taxa	<i>C. macroglossa</i>	<i>C. parciflora</i>
Scales		pistillate scales beardless, the nerve not reaching to apex	pistillate scales bearded, the nerve reaching to apex

Sect. 20. **Molliculae** Ohwi, Cyper. Jap. 1: 450. 1936.

Rhizome slender, stoloniferous. Culms acutely 3-angled, scabrous. Leaves oblate, conspicuously 3-nerved, scabrous-margined. Basal sheaths lusterless, splitting-fibrous. Spikelets erect or pendulous, peduncled or not peduncled; terminal spikelet staminate; lateral spikelets pistillate. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales bearded or beardless; the scale shoulder serrulate-margined or not serrulate-margined; the nerve reaching or not reaching to apex. Utricles glabrous, nerved, mostly long-beaked with bidentate mouth, short-stiped or sessile. Stigmas 3.

Key to the species

- 1. Spikelets not peduncled *C. aphanolepis*
- 1. Spikelets peduncled
 - Staminate scales slightly bearded *C. japonica*
 - Staminate scales long-bearded *C. doniana*
 - Staminate scales beardless *C. mollicula*

42. **Carex aphanolepis** Franch. et Savat., Enum. Pl. Jap. 2: 152 et 580. 1879.
(Map 43, Fig. 23)

Rhizome densely tufted, slender, stoloniferous. Culms 20-30 cm tall, acutely 3-angled, scabrous. Leaves oblate, soft, thin, dark green, 2.5-3 mm wide, conspicuously 3-nerved, scabrous-margined. Basal sheaths light brown, lusterless, splitting-fibrous. Spikelets 3-4, erect, not peduncled; terminal spikelet staminate, linear, 1.5-2 cm long, 1 mm thick; lateral spikelets pistillate, oblong, 0.8-1.3 cm long, 4 mm thick. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales: the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales ovate, light green, bearded, 2 mm long, about 1 mm wide; staminate scales oblong, brownish, 3.5 mm long, 1 mm wide, beardless. Utricles ovate-elliptic, light green, 2-2.5 mm long, 1 mm thick, glabrous, nerved, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes ovate, 1 mm long, 1 mm wide, obtusely 3-angled; the style short, not thickened at base; stigmas 3, persistent.

Nom. Jap.: Enashihigokusa (Sawa-suge).

Hab.: Wet soil, usually along pass-sides; rather rare; frequent in shady places.

Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Hiroshima Pref. Hiba-gun: Tojo-cho, Taishakukyo (Aug. 11, 1961, n. 2234, 2252, 500 m).

43. **Carex japonica** Thunb. Fl. Jap. 38. 1784. (Map 44, Fig. 23)

Rhizome sparsely tufted, stoloniferous. Culms 20-35 cm tall, acutely 3-angled, scabrous; the central part of the culm bearing a leaf. Leaves oblate, dark green, 3-5 mm wide, slightly

3-nerved, scabrous-margined; the leaf sheath brownish-punctulate. Basal sheaths yellowish-brown, lusterless, slightly splitting-fibrous. Spikelets 3-4, erect, peduncled; terminal spikelet staminate, linear, 2.5-4 cm long, 1-1.5 mm thick; lateral spikelets pistillate, short-cylindric, 0.8-2 cm long, 5-6 mm thick. Bract sheathless, the upper setaceous, the lower foliaceous. Scales light green, slightly bearded; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 3-nerved; the nerve reaching to apex; pistillate scales narrow ovate, 2-2.5 mm long, 1-1.5 mm wide; staminate scales lanceolate-oblong, 3.5-4 mm long, 1-1.5 mm wide, brownish-spotted. Utricles ovate, light green, 3-3.5 mm long, 1 mm thick, glabrous, nerved, long-beaked with bidentate mouth at apex, short-stiped at base. Achenes oval, obtusely 3-angled, truncate at base; the style erect, thickened at base; stigmas 3, slender, persistent.

Nom. Jap.: Higokusa.

Hab.: Moist soil, usually along pass-sides or in forests; common; frequent in shady places.

Distr.: China, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea, Manchuria.

Specimens examined. Hiroshima Pref. Hiroshima: Mitaki-cho (Apr. 26, 1958, n. 135, 137, 148, 80 m); Koi-cho, Yuzukidani (Apr. 29, 1958, n. 4069, 200 m). Aki-gun: Kaita-cho, Higashikaita-Nishitani (Apr. 2, 1960, n. 2664, 50 m); Yano-cho, Mt. Ege (May 26, 1957, n. 180, 200 m); Senogawa-cho, Mt. Tengubo (June 15, 1958, n. 383, 384, 4110, 200 m); Saeki-gun: Itsukaichi-cho (June 18, 1961, n. 2359, 140 m); Hatsukaichi-cho, Mt. Gokurakuji (June 18, 1961, n. 1423, 1435, 400 m); Nogaibara (Apr. 26, 1958, n. 4041, 600 m); Yuki-cho, Mt. Togo (May 29, 1960, n. 734, 300 m); Kuroutsukyo (July 27, 1962, n. 2763, 500 m). Yamagata-gun: Kake-cho, Kawanoboridani (May 18, 1958, n. 95, 350 m); Tsutsuga-mura, Mt. Ichima (July 9, 1961, n. 1626, 600 m). Kamo-gun: Saijo-cho (Apr. 29, 1957, n. 302, 300 m). Toyota-gun: Setoda-cho, Mt. Kannon (May 30, 1961, n. 1222, 1232, 300 m). Fukayasu-gun: Kamo-cho, Ryuzunotaki (July 30, 1961, n. 1764, 300 m); Enmeikyo (July 30, 1961, n. 1768, 240 m). Jinseki-gun: Yuki-cho, Ueno (July 30, 1961, n. 1798, 400 m); Sanwa-cho, Kurumi (July 30, 1961, n. 1812, 420 m). Hiba-gun: Tojo-cho, Taishakukyo (Aug. 9, 1961, n. 2163, 2229, 420 m); Mt. Dogo (H. Ando, July 8, 1958).

Tottori Pref. Saihaku-gun: Mt. Daisen (Sept. 23, 1960, n. 3167, 800 m).

Yamaguchi Pref. Iwakuni (K. Okudomi, Nov. 17, 1952, 60 m).

44. *Carex doniana* Spreng., Syst. 3: 825. 1826. (Map 45, Fig. 23)

Rhizome sparsely tufted, slender stoloniferous. Culms 30-70 cm tall, acutely 3-angled, the upper scabrous: the central part bearing a leaf. Leaves oblate, stiffish, glaucous, 5-10 mm wide (rarely 1.2-2 cm wide), conspicuously 3-nerved, scabrous-margined. Basal sheaths light yellowish-brown, lusterless, slightly splitting-fibrous. Spikelets 4-6, erect or pendulous; terminal spikelet staminate, linear-cylindric, 3-6 cm long, 2 mm thick; lateral spikelets pistillate, terete, 3-6 cm long, 5-7 mm thick, the upper not peduncled, the lower short-peduncled. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales narrow ovate, light green, bearded; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales 2-2.5 mm long, 1-1.5 mm wide; staminate scales 3-4 mm long, 1 mm wide. Utricles narrow ovate, light green, 3 mm long, 1-1.5 mm thick, glabrous, nerved, long-beaked with bidentate mouth at apex, short-stiped at base. Achenes ovate, 1-1.5 mm long, about 1 mm wide, obtusely 3-angled, slightly short-stiped at base; the style short, thickened at base; stigmas 3, slender, persistent.

Nom. Jap.: Shira-suge.

Hab.: Rather wet or moist soil, usually near streams or pass-sides; common; frequent in sunny places.

Distr.: India, China, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Okayama Pref. Niimi: Ikura (H. Ando, May 21, 1960, 200 m).

Hiroshima Pref. Hiroshima: Motoujina-cho (Apr. 17, 1959, n. 119, 131, 453, 455,

4088, 4089, 10 m). Aki-gun: Kaita-cho, Mt. Kingatoro (Apr. 20, 1958, n. 405, 406, 4134, 350 m); Fuchu-cho, Mikumarikyo (June 27, 1958, n. 2625, 30 m); Senogawa-cho, Mt. Tengubo (June 1958, 15, n. 380-382, 385, 387, 4111-4113, 200m); Kamagari-cho (Apr. 28, 1961, n. 926, 948-952, Sept. 25, 1962, n. 2826, 200 m). Saeki-gun: Hatsukaichi-cho, Nogaibara (Apr. 26, 1958, n. 45, 600 m). Toyota-gun: Kawajiri-cho, Mt. Noro (June 4, 1961, n. 1336, 1337, 1352, 600 m). Yamagata-gun: Tsutusga-mura, Nunohara (July 9, 1961, n. 1645, 420 m); Mt. Ichima (July 9, 1961, n. 1625, 600 m). Ashina-gun: Fujiomura, Kawaidani (Aug. 12, 1961, n. 2013, 200 m). Jinseki-gun: Yuki-cho, Mt. Gongen (Aug. 12, 1961, n. 2073, 540 m). Hiba-gun: Saijo-cho, Mt. Hiba (Aug. 8, 1961, n. 2320, 700 m); Tojo-cho, Taishakukyo (Aug. 11, 1961, n. 2167, 2226, 2230, 2237, 2257, 420-500 m); Takano-cho, Oka (July 28, 1961, n. 1833, 600 m); Mt. Kenashi (July 28, 1961, n. 1867, 1868, 600 m). Kuchiwa-cho, Mt. Kamamine (July 24, 1961, n. 1919, 480-600 m).

Tottori Pref. Tottori: Mt. Hisamatsu (H. Yokogawa, May 6, 1959, 200 m).

Shimane Pref. Oda: Mt. Sanbe (June 5, 1960, n. 3085, 1100 m). Iishi-gun: Tonbara-cho, Mt. Kotobiki (July 21, 1961, n. 3005, 500 m).

Yamaguchi Pref. Hagi: Mt. Kasa (Aug. 16, 1960, n. 3073, 3074, 100 m); Mt. Hakusui (Aug. 4, 1962, n. 3384, 3386, 3390, 3391, 200 m). Oshima-gun: Oshima-cho, Mt. Kano (Y. Sasaki, Dec. 15, 1957, 500 m). Kuga-gun: Mikawa-cho, Jotobata (May 3, 1963, n. 3443, 3444, 500 m); Negasa-Yamanouchi (May 3, 1963, n. 3488, 100-300 m); Iwayakannon (May, 3, 1963, n. 3498, 3499, 300-400 m).

45. **Carex mollicula** Boott, Illustr. 4: 192. 1867. (Map 46, Fig. 23)

Rhizome sparsely tufted, stoloniferous. Culms 15-20 cm tall, acutely 3-angled, scabrous; the central part of the culm bearing a leaf. Leaves oblate, greenish, soft, thin, 3-7 mm wide, scabrous-margined. Basal sheaths light yellowish-brown, splitting-fibrous. Spikelets 3-4, erect, the lower short-peduncled; terminal spikelet staminate (rarely androgynous: pistillate at apex), linear, 1-2 cm long, 1.5-2 mm thick; lateral spikelets pistillate, terete, 1.5-2.5 cm long, 4 mm thick. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales light green, beardless; the scale shoulder serrulate-margined; the midrib greenish, conspicuously 1-nerved; pistillate scales narrow ovate, acute, 2.5 mm long, 1.5 mm wide, the nerve reaching to apex; staminate scales oblong, 4-4.5 mm long, 1.5 mm wide, the nerve not reaching to apex. Utricles

Table 15.

Parts	Taxa	<i>C. aphanolepis</i>	<i>C. japonica</i>
Basal sheaths		light brown	yellowish-brown
Leaf sheaths		not brownish-punctulate	brownish-punctulate
Scales		1-nerved, the scale shoulder serrulate- margined	3-nerved, the scale shoulder not serrulate-margined
Utricles		short-beaked	long-beaked

Table 16.

Parts	Taxa	<i>C. doniana</i>	<i>C. mollicula</i>
Scales		bearded, the scale shoulder not serrulate-margined	beardless, the scale shoulder serrulate- margined
Utricles		short-stiped	sessile

narrow ovate, light green 3 mm long, 1.5 mm thick, glabrous, nerved, slightly lustered, brownish-punctulate, long-beaked with bidentate mouth at apex, orbicular, sessile at base. Achenes oval, 1.5 mm long, 1 mm wide, obtusely 3-angled, short-stiped at base; the style slender, erect or curved, not thickened at base; stigmas 3.

Nom. Jap.: Himeshira-suge.

Hab.: Wet soil, usually at the edge of forests; rather rare; frequent in shady places.

Distr.: China, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea, Saghalien, Kuriles.

Specimens examined. Hiroshima Pref. Asa-gun: Sato-cho, Midorii (H. Ando, Apr. 26, 1959); Asa-cho, Mt. Aratani (H. Ando, Apr. 26, 1959). Takata-gun: Shiraki-cho, Mt. Shiraki (June 19, 1960, n. 890, 600 m).

Yamaguchi Pref. Kuga-gun: Sakue-mura, Yasakakyo (H. Suzuki, June 5, 1955).

Sect. 21. **Physocarpae** Drejer, Symbol. Caric. 10. 1844.

Rhizome tough, densely tufted, stoloniferous. Culms stiff, acutely or obtusely 3-angled, scabrous. Leaves oblate, lateral-nerved, scabrous-margined. Basal sheaths bladeless, splitting-reticulate. Spikelets: terminal spikelets 1-3, staminate; lateral spikelets pistillate. Bracts sheathless, mostly foliaceous. Scales whitish membranous-margined; the scale shoulder not serrulate-margined. Utricles glabrous, nerved, long-beaked with bidentate mouth, short-stiped. Stigmas 3.

46. **Carex vesicaria** Linn. Sp. Pl. 979. 1753. (Map 47, Fig. 24)

Rhizome densely tufted, long stoloniferous. Culms 30-100 cm tall, stiff, acutely 3-angled, scabrous. Leaves oblate, green, 3-6 mm wide, conspicuously lateral-nerved, scabrous-margined. Basal sheaths bladeless, purplish-red, lustered, splitting-reticulate, thready-netted. Spikelets 5-6; terminal spikelets 2-3, staminate, broad linear, 1-3 cm long, 2-3 mm thick, erect, not peduncled; lateral spikelets pistillate, terete, 1.5-4 cm long, 5-8 mm thick, erect, peduncled. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales reddish-brown, whitish membranous-margined; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 3-nerved; pistillate scales lanceolate-ovate, 5-6 mm long, 1.5-3 mm wide, the nerve reaching to apex; staminate scales oblong, 6-7 mm long, 2.5-3 mm wide, bearded or beardless, the nerve reaching or not reaching to apex. Utricles ovate-conic, light yellowish-green, 4-5 mm long, 2 mm thick, nerved, glabrous, short-beaked with bidentate mouth at apex, slightly short-stiped at base. Achenes obovate, obtusely 3-angled, 2.5 mm long, 1 mm thick, truncate at base; the style long, curved, thickened at base; stigmas 3.

Nom. Jap.: Oninaruko-suge.

Hab.: Very wet soil, usually near marshes; rather rare; frequent in sunny places.

Distr.: Japan (Hokkaido, Honshu, Kyushu), Korea, Kuriles, Saghalien.

Specimens examined. Hiroshima Pref. Saeki-gun: Yoshiwa-mura, Kanmuri-kogen (May 22, 1960, n. 816-818, 4177, 800 m).

Sect. 22. **Tentaculatae** Tuckerm., Enum. Meth. 13. 1843.

Rhizome sparsely tufted, stoloniferous. Culms acutely 3-angled, scabrous. Leaves oblate, stiffish, lateral-nerved, scabrous-margined. Basal sheaths slightly splitting-fibrous. Spikelets: terminal spikelet staminate; lateral spikelets pistillate. Bracts sheathless foliaceous. Scales: the nerve reaching to apex; pistillate scales bearded, the scale shoulder not serrulate-margined; staminate scales beardless, the scale shoulder serrulate-margined. Utricles glabrous, nerved, long-beaked, short-stiped. Stigmas 3.

47. **Carex dickinsii** Franch. et Savat., Enum. Pl. Jap. 2: 153 et 581. 1879. (Map 48, Fig. 25)

Rhizome sparsely tufted, stoloniferous. Culms 20-50 cm tall, acutely 3-angled, the upper scabrous. Leaves oblate, greenish, stiffish, 3-5 mm wide, conspicuously lateral-nerved, scabrous-margined. Basal sheaths bladeless, yellowish-brown or blackish-brown, slightly splitting-fibrous. Spikelets 3-4, erect, not peduncled; terminal spikelet staminate, linear, 2-3 cm long, 2.5-3 mm thick, yellowish-brown; lateral spikelets pistillate, elliptic, 1.5-2 cm long, 1-1.5 cm thick. Bracts sheathless, foliaceous, exceeding the culms. Scales narrow ovate, light green; the midrib greenish, conspicuously 3-nerved; the nerve reaching to apex; pistillate scales 6 mm long, 2 mm wide, bearded, the scale shoulder not serrulate-margined; staminate scales 6 mm long, 3 mm wide, beardless, serrulate-margined. Utricles oval-conic, greenish, 7-8 mm long, 2.5-3 mm thick, glabrous, nerved, long-beaked with bidentate mouth at apex, short-stiped at base. Achenes ovate-rhombic, obtusely 3-angled, 4 mm long, 2 mm wide, truncate at base; the style slender, curved, thickened at base; stigmas 3.

Nom. Jap.: Oni-suge.

Hab.: Very wet soil, usually near marshes; rather common; frequent in sunny places.

Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Hiroshima Pref. Mihara: Mt. Omine (June 16, 1961, n. 1558, 1568, 300 m). Kamo-gun: Shiwa-cho, Namitakiji (May 15, 1959, n. 2004, 400 m). Yamagata-gun: Geihoku-cho, Yawata-kogen (N. Yano, Aug. 24, 1957, 750 m). Saeki-gun: Kuroutukyo (July 27, 1962, n. 2757, 2762, 500 m). Toyota-gun: Kawajiri-cho, Mt. Noro (June 4, 1961, n. 1340, 1350, 1364, 800 m); Yasuura-cho (June 4, 1961, n. 1322, 400 m). Sera-gun: Seranishi-cho, Oguni (June 23, 1961, n. 1457, 380 m). Hiba-gun: Takano-cho, Oka (July 28, 1961, n. 1834, 600 m); Mt. Kenashi (July 28, 1961, n. 1853, 600 m).

Sect. 23. **Praecoces** Christ in Bull. Soc. Bot. Belgique 24: 2, 14. 1885.

Rhizome tufted, stoloniferous or stolonless. Culms obtusely 3-angled, mostly slender, scabrous or smooth. Leaves oblate, stiff or stiffish, scabrous-margined. Basal sheaths lustered or lusterless, mostly splitting-fibrous. Spikelets erect, peduncled or not peduncled; terminal spikelet staminate; lateral spikelets pistillate. Bracts sheathed, setaceous or foliaceous. Scales bearded or beardless; the scale shoulder serrulate-margined or not serrulate-margined; the midrib greenish, conspicuously 1 or 3-nerved; the nerve reaching or not reaching to apex. Utricles hairy or glabrous, nerved, short-beaked, short-stiped. Stigmas 3.

Key to the subsections.

1. Staminate scales beardless (1) Nervatae
1. Staminate scales bearded 2
2. Staminate scales usually long-bearded (2) Leucochlorae
2. Staminate scales usually short-bearded 3
3. Culms smooth. Leaves broad, stiff (3) Foliosissimae
3. Culms smooth or scabrous. Leaves narrow, stiffish (4) Pisiformes

Subsect. 1. **Nervatae** Akiyama, Caric, Far East. Reg. As. 179. 1955.

Rhizome densely tufted, stoloniferous or stolonless. Culms obtusely 3-angled, scabrous or smooth. Leaves oblate, stiffish, scabrous-margined. Basal sheaths lustered or lusterless, splitting-fibrous. Spikelets erect, peduncled or not peduncled; terminal spikelet staminate; lateral spikelets pistillate. Bracts sheathed, the upper setaceous, the lower foliaceous. Scales bearded or beardless; the scale shoulder serrulate-margined or not serrulate-margined; the midrib greenish conspicuously 1-nerved; the nerve reaching or not reaching to apex. Utricles hairy, nerved, short-beaked, short-stiped. Stigmas 3.

Key to the species

1. Rhizome stoloniferous *C. nervata*
1. Rhizome stolonless 2
2. Pistillate scales long-bearded. Utricles truncate mouth *C. mitrata* var. *aristata*
2. Pistillate scales short-bearded. Utricles bidentate mouth *C. mitrata* var. *bingoensis*

48. **Carex nervata** Franch. et Savat., Enum. Pl. 2: 141 et 566. 1879. (Map 49. Fig. 26)

Rhizome densely tufted, long-stoloniferous. Culms 10-30 cm tall (rarely 47-50 cm tall), obtusely 3-angled, smooth. Leaves oblate, greenish, 2-3 mm wide, scabrous-margined. Basal sheaths brown, lusterless, splitting-fibrous. Spikelets 2-4, erect; terminal spikelet staminate, cylindric, yellowish-brown, 1-1.4 cm long, 2 mm thick; lateral spikelets pistillate, oblong, 4-12 mm long, 4-5 mm thick, short-peduncled. Bracts short-sheathed, setaceous. Scales: the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales obovate, light yellowish-brown, 2-2.5 mm long, 1-1.5 mm wide, bearded; staminate scales oblong, yellowish-brown, 3-3.5 mm long, 1-1.5 mm wide, beardless. Utricles obovate, light green, 2.5-3.5 mm long, 1 mm thick, hairy, nerved, short-beaked with emarginate mouth at apex, short-stiped at base. Achenes obovate, obtusely 3-angled, 1.5 mm long, 1 mm wide, small discoid-beaked at apex, truncate at base; the style short, thickened at base; stigmas 3.

Nom. Jap.: Shiba-suge.

Hab.: Rather wet or moist soil, usually in grasslands; common; frequent in sunny places.

Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea, Manchuria, Siberia.

Specimens examined. Hiroshima Pref. Shobara: Nanatsukahara (June 1, 1958, n. 2375, 300 m). Aki-gun: Senogawa-cho, Nakano (Apr. 4, 1961, n. 902, 50 m). Saeki-gun: Nogaibara (Apr. 26, 1958, n. 51, 4115, 600 m); Yoshiwa-mura, Kanmuri-kogen (May 22, 1960, n. 2587, 800 m). Yamagata-gun: Togochi-cho, Sandankyo (Aug. 10, 1959, n. 2443, 700 m); Geihoku-cho, Mt. Uzuki (June 12, 1960, n. 2515, 4205, 800 m); Sayoto (June 10, 1958, n. 2513, 800 m); Oasa-cho, Mt. Kanbiki (May 28, 1961, n. 1195, 500 m). Kamo-gun: Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1290, 1309, 400 m). Sera-gun: Sera-cho, Hongo (June 23, 1961, n. 1477, 420 m). Hiba-gun: Tojo-cho, Shiju (Apr. 30, 1961, n. 1073, 480 m); Mt. Dogo (Sept. 25, 1960, n. 869, 900 m).

Tottori Pref. Saihaku-gun: Mt. Daisen (Sept. 23, 1960, n. 3105, 800 m); Mt. Goen (Sept. 23, 1960, n. 3175, 800 m).

Shimane Pref. Oda: Mt. Sanbe (June 5, 1960, n. 3078, 3095, 4741, 520 m).

49. **Carex mitrata** Franch. var. **aristata** Ohwi in Mem. Coll. Sc. Kyoto Imp. Univ. ser. B, 5: 269. 1930. (Map 50, Fig. 26)

Rhizome densely tufted, stolonless. Culms 10-25 cm tall, obtusely 3-angled, smooth. Leaves oblate, stiffish, green, 1-2 mm wide, scabrous-margined. Basal sheaths brown, slightly lustered, slightly splitting-fibrous. Spikelets 3-4, erect; terminal spikelet staminate, linear, 5-8 mm long, 1 mm thick; lateral spikelets pistillate, cylindric, 7-15 mm long, 2 mm thick, peduncled. Bracts sheathed, the upper setaceous, the lower foliaceous. Scales light green, whitish membranous-margined; the scale shoulder serrulate-margined; the midrib greenish, conspicuously 1-nerved; pistillate scales obovate, 1.5-2 mm long, 1-1.5 mm wide, bearded, the nerve reaching to apex; staminate scales oblong, 2.5-3 mm long, 1.5 mm wide, beardless, the nerve not reaching to apex. Utricles ovate-fusiform, light green, slightly hairy, nerved, 1.5-2 mm long, 1 mm thick, short-beaked with truncate mouth at apex, short-stiped at base. Achenes ovate, obtusely 3-angled, 1 mm long, 1 mm wide, discoid-beaked at apex, truncate-stiped at base; the style short, thickened at base; stigmas 3.

Nom. Jap.: Nogenuka-suge.

Hab.: Rather dry or moist soil, usually along pass-sides; common: frequent in sunny places.

Distr.: Formosa, Japan (Honshu, Kyushu).

Specimens examined. Hiroshima Pref. Aki-gun: Funakoshi-cho, Mt. Iwataki (Apr. 28, 1960, n. 672, 678, 130 m); Saka-cho, Yokohama (May 26, 1957, n. 304, 50 m); Etajima-cho, Kirikushi (Apr. 19, 1959, n. 2700, 2701, 200 m); Kumandake (Apr. 19, 1959, n. 330, 4730, 300 m); Kaita-cho, Mt. Kingatoro (Apr. 20, 1958, n. 393, 401, 350 m); Higashikaita-Hatadani (Apr. 2, 1960, n. 543, 546, 130 m); Furu-toge (Apr. 2, 1960, n. 552, 300 m); Mt. Jo (Apr. 2, 1960, n. 558, 400 m); Senogawa-cho, Mt. Chaus (Apr. 15, 1958, n. 43, 150 m); Kamagari-cho (Apr. 28, 1961, n. 929, 200 m); Kurahashi-cho (Apr. 23, 1961, n. 977, 979, 981, 984, 140 m). Saeki-gun: Hatsukaichi-cho, Nogaibara (Apr. 26, 1958, n. 52, 55, 5759, 600 m); Yuki-cho, Ishigayakyo (Apr. 24, 1960, n. 645, 400 m); Nomi-cho (Apr. 16, 1961, n. 904, 100 m); Okimi-cho (Apr. 16, 1961, n. 905, 300 m); Ogake-cho (Apr. 16, 1961, n. 908, 40 m). Asa-gun: Koyo-cho, Mt. Takahachi (Apr. 4, 1958, n. 294, 400 m); Kabe-cho, Nabarakyo (Apr. 17, 1960, n. 606, 621, 300 m); Sato-cho, Mt. Abu (Apr. 21, 1957, n. 4004, 4007, 200 m). Yamagata-gun: Chiyoda-cho, Mt. Ogake (May 24, 1959, n. 2697, 2698, 500 m). Kamo-gun: Shiwa-cho, Namitakiji (May 15, 1959, n. 2699, 400 m). Hiba-gun: Tojo-cho, Takewatashi (Apr. 30, 1961, n. 1086, 560 m).

Yamaguchi Pref. Hagi: Chinto (May 20, 1957, n. 4039, 100 m).

50. *Carex mitrata* Franch. var. *bingoensis* K. Okamoto var. nov. (Map 51, Fig. 26, 42)

Rhizoma dense caespitosum. Culmus 5-15 cm altus obtuse triqueter laevis. Folia 1.5-2 mm lata plana mollia viridia marginibus scabris. Vaginae basilares luteo-brunneae lucidae fibrillosae. Spiculae 3-4 erectae; terminalis mascula linearis 0.6-0.8 cm longa 1 mm crassa; laterales femineae breve cylindricae 0.4-1.5 cm longae 2 mm crassae breve pedunculatae. Bractae vaginata setaceae. Squama brunneae marginibus serrulatis membranaceis; dorso virides uninerviae; squamae femineae obovatae 2-2.5 mm longae 1.5 mm latae breve aristatae; squamae masculae oblongae 2.5-3 mm longae 2 mm latae. Utriculi squamas superantes ovato-fusiformes virides 2 mm longi 1 mm lati hispidi plurinervi, basi in stipitem attenuati, apice in rostrum bidentati. Nux obovata obtuse triqueter 1 mm longa 1 mm lata, basi stipitata, apice dilatato-annulata; styli erecti basi incrassati; stigmata 3.

Typus: Japan, Honshu, Hiroshima Pref., Hiba-gun, Tojo-cho, Taishakukyo, 400 m, moist soil along roadsides (Apr. 30, 1961, Leg. K. Okamoto, HIRO-Ok. no. 4203).

Nom. Jap.: Bingonuka-suge. nov.

Hab.: Rather wet or moist soil, usually along roadsides or pass-sides; rather rare; frequent in sunny places.

Distr.: Japan (Honshu).

Other specimens Hiroshima Pref. Hiba-gun: Tojo-cho, Taishakukyo (Apr. 30, 1961, n. 1034, 400 m); Shiju (Apr. 30, 1961, n. 1085, 1088, 480 m).

This species is closely related to *C. mitrata* var. *aristata*, but can be separated from the latter by the utricle with a bidentate mouth.

Table 17.

Parts	Taxa	<i>C. mitrata</i> var. <i>aristata</i>	<i>C. mitrata</i> var. <i>bingoensis</i>
Basal sheaths		brown	yellowish-brown
Pistillate scales		long-bearded	short-bearded
Utricles		truncate mouth	bidentate mouth

Table 18.

Parts \ Taxa	<i>C. leucochlora</i>	<i>C. nervata</i>
Rhizome	stolonless	stoloniferous
Culms	scabrous	smooth
Basal sheaths	dark brown	brown
Staminate scales	bearded	beardless
Utricles	bidentate mouth	emarginate mouth

Table 19.

Parts \ Taxa	<i>C. mitrata</i> var. <i>aristata</i>	<i>C. nervata</i>
Rhizome	stolonless	stoloniferous
Basal sheaths	lustered	lusterless
Scale shoulders	serrulate-margined	not serrulate-margined
Utricles	truncate mouth	emarginate mouth

Table 20.

Parts \ Taxa	<i>C. leucochlora</i>	<i>C. mitrata</i> var. <i>aristata</i>
Culms	scabrous	smooth
Basal sheaths	dark brown, mostly lusterless	brown, lustered
Scale shoulders	not serrulate-margined	serrulate-margined
Utricles	bidentate mouth	truncate mouth

Subsect. 2. **Leucochlorae** Akiyama, Caric. Far East. Reg. As. 184. 1955.

Rhizome tufted, stoloniferous or stolonless. Culms obtusely 3-angled, scabrous or smooth. Leaves oblate, stiffish, scabrous-margined. Basal sheaths lustered or lusterless, splitting fibrous. Spikelets erect, peduncled or not peduncled; terminal spikelet staminate; lateral spikelets pistillate. Bracts sheathed, the upper scaly or setaceous, the lower foliaceous. Scales bearded; the scale shoulder serrulate-margined or not serrulate-margined; the nerve reaching to apex. Utricles hairy or glabrous, nerved, short-beaked, short-stiped. Stigmas 3.

Key to the species

1. Rhizome stoloniferous 2
1. Rhizome stolonless 5
2. Utricles glabrous, hollowed *C. rugata*
2. Utricles hairy, not hollowed 3
3. Pistillate scale shoulders not serrulate-margined *C. geihokuensis*
3. Pistillate scale shoulders serrulate-margined 4
4. Basal sheaths lustered. Spikelets not peduncled *C. discoidea*
4. Basal sheaths lusterless. Spikelets peduncled *C. fibrillosa*
5. Culms scabrous 6

- 5. Culms smooth 7
- 6. Basal sheaths lustered. Utricles truncate mouth *C. akiensis*
- 6. Basal sheaths mostly lusterless. Utricles bidentate mouth *C. leucochlora*
- 7. Culms long, conspicuously slender *C. horikawae*
- 7. Culms short, slightly thick *C. leucochlora* var. *setouchiensis*

51. **Carex rugata** Ohwi in Act. Phytotax. et Geobot. 1: 76. 1932. (Map 52, Fig. 27)

Rhizome sparsely tufted, short-stoloniferous. Culms 10-30 cm tall, slender, obtusely 3-angled, smooth. Leaves oblate, thin, stiffish, glaucous (after dry blackish), 2-3 mm wide, scabrous-margined. Basal sheaths brown, lusterless, splitting-fibrous. Spikelets 3-4, erect; terminal spikelet staminate, narrow cylindric, 3-8 mm long, 1 mm thick; lateral spikelets pistillate, oblong, 0.5-1 cm long, 2 mm thick, peduncled. Bracts sheathed, the upper setaceous, the lower foliaceous. Scales light green, bearded; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales narrow obovate, 2 mm long, 1-1.5 mm wide; staminate scales oblong, 2.5-3 mm long, 1.5 mm wide. Utricles ovate, light green, 2.5-3 mm long, 1 mm thick, glabrous, nerved, short-beaked with emarginate mouth at apex, short-stiped at base; the intermediate part hollowed. Achenes obovate, obtusely 3-angled, 1.5 mm long, 1 mm wide, small discoid-beaked at apex, short-stiped at base; the intermediate part hollowed; the style short, thickened at base; stigmas 3.

Nom. Jap.: Kusa-suge.

Hab.: Moist soil, usually along pass-sides; common; frequent in shady places.

Distr.: Japan (Hokkaido, Honshu, Kyushu).

Specimens examined. Hiroshima Pref. Hiroshima: Mitaki-cho (Apr. 26, 1958, n. 140-147, 149, 80 m); Makinodani (Apr. 22, 1960, n. 524-527, 200 m); Motoujina-cho (Apr. 17, 1958, n. 4068, 4091, 40 m); Yamate-cho (H. Ando, May 3, 1959, 100 m). Kure: Nikokyo (June 25, 1960, n. 2403, 200 m). Aki-gun: Fuchu-cho, Mikumarikyo (June 27, 1958, n. 184, 50 m, May 3, 1960, n. 679, 684, 685, 688, 689, 699, 714, 80 m); Funakoshi-cho, Mt. Iwataki (Apr. 15, 1958, n. 36, 80 m); Kaita-cho, Mt. Hinoura (Apr. 5, 1958, n. 2656, 150 m); Yano-cho, Mt. Ege (H. Ando, Nov. 6, 1958, 50 m); Etajima-cho, Kumandake (Apr. 19, 1959, n. 2682, 300 m); Kumano-cho, Mt. Jo (Apr. 2, 1960, n. 2620, 350 m); Kumanoatomura (May 22, 1961, n. 1096, 1099, 1100, 170 m). Saeki-gun: Hatsukaichi-cho, Hara (H. Ando, July 3, 1961, 200 m); Nogaibara (Apr. 26, 1958, n. 53, 4049, 600 m); Yuki-cho, Mt. Togo (May 29, 1960 n. 739, 742, 743, 300 m); Miyajima (June 27, 1961, n. 1483, 1484, 100 m). Asa-gun: Sato-cho, Mt. Abu (Apr. 21, 1957, n. 2322, 200 m); Koyo-cho, Mt. Takahachi (Apr. 20, 1958, n. 293, 400 m). Yamagata-gun: Tsutsuga-mura, Nunohara (July 9, 1961, n. 1635, 420 m); Togochi-cho, Sandankyo (May 24, 1958, n. 239, 4104, 500 m). Kamo-gun: Saijo-cho (Apr. 29, 1957, n. 301, 300 m); Kurose-cho, Kamijo (May 21, 1961, n. 1009, 200 m); Mt. Kota (May 21, 1961, n. 2508, 300 m); Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1283, 400 m). Toyota-gun: Kawajiri-cho, Mt. Noro (June 4, 1961, n. 1344, 1345, 1366, 200 m).

52. **Carex geihokuensis** K. Okamoto sp. nov. (Map 53, Fig. 28, 41)

Rhizoma caespitosum stoloniferum. Culms 10-30 cm altus gracilis obtuse triqueter laevis. Folia 1-2 mm lata plana mollia viridia marginibus scabris. Vaginae basilares luteo-brunneae lucidae fibrillosae. Spiculae 3-4 erectae; terminalis mascula linearis 0.5-0.8 cm longa 1 mm crassa; laterales femineae breve cylindricae 0.3-1 cm longae 2 mm crassae breve pedunculatae. Bractae vaginatae, superiores setaceae, inferiores foliaceae. Squamae brunneo-glaucae vel glauco-virides breve aristatae; dorso virides uninerviae; squamae femineae obovatae 2 mm longae 1.5 mm latae; squamae masculae oblongae 2.5-3 mm longae 1.5 mm latae marginibus serrulatis. Utriculi squamas superantes obovati virides 2 mm longi 1 mm lati hispidi plurinervi, basi

in stipitem attenuati, apice in rostrum breve truncati. Nux obovata obtuse triqueter 1.5 mm longa 1 mm lata, basi stipitata, apice dilatato-annulata; styli erecti basis incrassati; stigmata 3.

Typus: Japan, Honshu, Hiroshima Pref., Yamagata-gun, Togochi-cho, Sandankyo, 500 m, moist soil in forests (May 24, 1958, Leg. K. Okamoto, HIRO-Ok. no. 4099).

Nom. Jap.: Geihoku-suge. nov.

Hab.: Moist soil, usually in forests; rather rare; frequent in shady places.

Distr.: Japan (Honshu).

Other specimens. Hiroshima Pref. Saeki-gun: Mt. Togo (May 29, 1960, n. 744, 750, 751, 769, 799, 600 m). Yamagata-gun: Togochi-cho, Sandankyo (May 24, 1958, n. 187, 219-201, 203, 205, 230; June 17, 1962, n. 2785-2788, 500 m).

This species is closely related to *C. horikavae*, but can be separated from the latter by the rhizome with stolones.

53. **Carex discoidea** Boott in A. Gray, Bot. Jap. 419. 1859. (Map 54, Fig. 28)

Rhizome sparsely tufted, stoloniferous. Culms 4-20 cm tall, obtusely 3-angled, smooth. Leaves oblate, thin, stiffish, light green, 1-1.5 mm wide, scabrous-margined. Basal sheaths brown, lustered, splitting-fibrous. Spikelets 2-4, erect, not peduncled; terminal spikelet staminate, linear, 4-5 mm long, 1 mm thick; lateral spikelets pistillate, globular, 5-8 mm long, 2 mm thick. Bracts slightly sheathed, the upper scaly or setaceous, the lower foliaceous. Scales bearded; the scale shoulder serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales oblong, glaucous, 1.5-2 mm long, 1 mm wide; staminate scales linear-oblong, light brownish-green, 2-2.5 mm long, 1 mm wide. Utricles ovate-fusiform, light green, 1.5-2 mm long, about 1 mm thick, hairy, nerved, short-beaked with emarginate mouth at apex, short-stiped at base. Achenes ovate, obtusely 3-angled, 1 mm long, 0.5 mm wide, discoid-beaked at apex, truncate at base; the style short, thickened at base; stigmas 3.

Nom. Jap.: Himeao-suge.

Hab.: Rather dry or moist soil, usually along pass-sides; rather rare; frequent in sunny places.

Distr.: Ryukyus, Japan (Honshu, Kyushu).

Specimens examined. Hiroshima Pref. Aki-gun: Aki-cho, Umagi (May 4, 1957, n. 296, 4010, 400 m); Funakoshi-cho, Mt. Iwataki (May 23, 1957, n. 2665, 100 m); Kaita-cho, Mt. Hinoura (Apr. 5, 1957, n. 2655, 150 m); Etajima-cho, Kirikushi (Apr. 19, 1959, n. 2683, 100 m); Kumandake (Apr. 19, 1959, n. 4727, 300 m); Senogawa-cho, Mt. Chaus (Apr. 15, 1958, n. 27, 4129, 150 m); Seno (Mar. 28, 1960, n. 480, 481, 200 m); Hataka (Apr. 2, 1958, n. 7-9, 130 m); Mt. Hebiwa (Apr. 3, 1960, n. 2632, 150 m). Saeki-gun: Miyajima (June 27, 1961, n. 1482, 4711, 100 m). Asa-gun: Koyo-cho, Mt. Takahachi (Apr. 20, 1958, n. 287, 500 m).

54. **Carex fibrillosa** Franch. et Savat., Enum. Pl. Jap. 2. 137 et 564. 1879. (Map 55, Fig. 27)

Rhizome sparsely tufted, long-stoloniferous. Culms 4-15 cm tall, obtusely 3-angled, smooth. Leaves oblate, stiffish, greenish, 2-3.5 mm wide, scabrous-margined. Basal sheaths yellowish-brown, lusterless, conspicuously splitting-fibrous. Spikelets 3-4, erect; terminal spikelet staminate, oblong, 0.5-1 cm long, 3 mm thick; lateral spikelets pistillate, cylindric-elliptic, 0.8-1.5 cm long, 3-4 mm thick. Bracts slightly sheathed, the upper setaceous, the lower foliaceous. Scales obovate, glaucous, long-bearded: the scale shoulder serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales 3 mm long, 1.5 mm wide; staminate scales 3-3.5 mm long, 1.5-2 mm wide. Utricles obovate, light green, 2.5-3 mm long, 1 mm thick, hairy, nerved, short-beaked with emarginate

mouth at apex, short-stiped at base. Achenes ovate, obtusely 3-angled, 2.5 mm long, 1 mm wide, discoid-beaked at apex, truncate at base; the style short, thickened at base; stigmas 3.

Nom. Jap.: Hamaao-suge (Suna-suge).

Hab.: Sand or sandy soil, usually near the coast; common; frequent in sunny places.

Distr.: China, Formosa, Ryukyus, Japan (Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Hiroshima Pref. Hiroshima: Motoujina-cho (Apr. 17, 1959, n. 124, 132, 456, 4090, 4 m). Aki-gun: Kurahashi-cho, Katsuragahama (Apr. 23, 1961, n. 968, 2 m).

Tottori Pref. Tottori: Koyama (Dec. 26, 1960, n. 3141, 5 m); Hamasaka (H. Yokogawa, Apr. 10, 1959, 6 m).

Shimane Pref. Masuda: Todakohama (June 7, 1960, n. 4750, 5 m).

Yamaguchi Pref. Hagi: Kikugahama (May 20, 1957, n. 3056, 4050, 1 m); Tamaeura (May 20, 1957, n. 3055, 3 m).

55. **Carex akiensis** K. Okamoto sp. nov. (Map 56, Fig. 29, 43)

Rhizoma dense caespitosum. Culms 12-30 cm altus gracilis triqueter scabris. Folia 1-2.5 mm lata plana mollia viridia marginibus scabris. Vaginae basilares brunneae lucidae fibrillosae. Spiculae 3-4 erectae; terminalis mascula linearis 0.4-0.6 cm longa 1 mm crassa; laterales femineae breve cylindricae 0.3-0.6 cm longae 2-3 mm crassae breve pedunculatae. Bractae breve vaginata, superiores setaceae, inferiores foliaceae. Squamae glaucovirides breve aristatae; dorso virides; squamae femineae obovatae 2 mm longae 1.5 mm latae trinerviae; squamae masculae oblongae 2.5-3 mm longae 1.5-2 mm latae uninerviae. Utriculi squamas superantes obovati subvirides 2 mm longi 1 mm lati hispidi plurinervi, basi in stipitem attenuati, apice in rostrum breve truncati. Nux obovata obtuse triqueter 1.5 mm longa 1 mm lata, basi stipitata, apice dilatato-annulata; styli erecti breve basis incrassati; stigmata 3.

Typus: Japan, Honshu, Hiroshima Pref., Takehara Oishi, 180 m. moist soil along roadsides May 24, 1961, Leg. K. Okamoto, HIRO-Ok. no. 4201).

Nom. Jap.: Akiao-suge. nov.

Hab.: Moist soil, usually along roadsides; rather rare; frequent in shady places.

Distr.: Japan (Honshu).

Other specimens. Hiroshima Pref. Takehara: Oishi (May 24, 1961, n. 4206, 180 m).

This species is closely related to *C. leucochlora* but can be separated from the latter by the utricle with a truncate mouth.

56. **Carex leucochlora** Bunge, Enum. Pl. Chin. Bor. 68. 1831. (Map 57, Fig. 29)

Rhizome densely tufted, stolonless. Culms 5-45 cm tall, obtusely 3-angled, the upper scabrous. Leaves oblate, light green or green, stiffish, 1-3 mm wide, scabrous-margined. Basal sheaths dark brown, lusterless, splitting-fibrous. Spikelets 3-6, erect, peduncled or not peduncled; terminal spikelet staminate, clavate, 0.5-1.5 cm long, 2-3 mm thick; lateral spikelets pistillate, short-terete, 0.8-2 cm long, 3-4 mm thick. Bracts sheathed, the upper scaly or setaceous, the lower foliaceous. Scales glaucous, bearded; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales oval, 2.5-3 mm long, 1.5 mm wide; staminate scales oblong, 3.5-4 mm long, 1.5 mm wide. Utricles obovate, light green, 2-2.5 mm long, 1 mm thick, hairy, nerved, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes obovate, obtusely 3-angled, 1-2 mm long, 1 mm wide, discoid-beaked at apex, truncate at base; the style short, thickened at base; stigma 3.

Nom. Jap.: Ao-suge.

Hab.: Dry or moist soil, usually along roadsides or in grasslands; common; frequent in sunny places.

Distr.: Himalaya, China, Formosa, Ryukyus, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea, Manchuria.

Specimens examined. Okayama Pref. Okayama: Mt. Misao (May 13, 1961, n. 3032, 150 m); Tsushima (May 14, 1961, n. 3037, 10 m); Mt. Kyo (May 14, 1961, n. 3038, 80 m). Kasaoka (May 15, 1961, n. 3042, 100 m).

Hiroshima Pref. Hiroshima: Mitaki-cho (May 25, 1957, n. 2385, 100 m); Koi-cho, Yuzukidani (June 22, 1957, n. 266, 100 m); Motoujina-cho (Apr. 17, 1959, n. 117, 118, 126, 127, 133, 4085, 10 m); Yamate-cho (May 3, 1959, n. 4187, 100 m); Ninoshima (May 26, 1961, n. 2398, 100 m); Mt. Futaba (Apr. 30, 1960, n. 2387, 100 m). Kure: Nikokyo (June 25, 1960, n. 2402, 200 m); Tenno-cho, Yakeyama (June 26, 1960, n. 2407, 300 m); Aga-cho (Apr. 29, 1961, n. 2423, 180 m); Yoshiura-cho (June 25, 1960, n. 2404, 200 m); Nigata-cho (Apr. 29, 1961, n. 2418, 200 m). Mihara: Mt. Sakura (May 30, 1961, n. 1248, 180 m); Sasakijima (May 30, 1961, n. 2432, 200 m); Onomichi: Mitsukoshi (July 15, 1961, n. 2401, 120 m); Onomichi (July 15, 1961, n. 2053, 170 m); Momoshima (July 15, 1961, n. 2049, 50 m). Fukuyama: Kumagamine (July 31, 1961, n. 1706, 200 m); Daimon-cho (July 30, 1961, n. 1758, 60 m). Innoshima: Habu (May 26, 1961, n. 1142, 100 m); Mt. Oku (May 26, 1961, n. 1160, 300 m); Sannosho (May 26, 1961, n. 1165, 120 m); Mukunoura (May 26, 1961, n. 2437, 60 m). Miyoshi: Ozekiyama-koen (June 5, 1960, n. 2428, 150 m); Awaya (May 12, 1960, n. 4188, 220 m). Matsunaga: Hagashi-cho (July 16, 1961, n. 2039, 60 m). Shobara: Nanatsukahara (June 1, 1958, n. 2374, 300 m); Shobara (Aug. 8, 1961, n. 2367, 160 m). Otake: Ogata-cho (May 26, 1961, n. 2399, 100 m). Takehara: Mt. Asahi (May 24, 1961, n. 1136, 200 m); Takehara (May 24, 1961, n. 1137, 180 m). Aki-gun: Aki-cho (May 4, 1957, n. 2679, 200 m); Fuchu-cho, Mikumarikyo (May 3, 1960, n. 680, 682, 701, 50-80 m); Yamada (June 27, 1958, n. 2628, 30 m); Fuchu (June 27, 1958, n. 2627, 30 m); Funakoshi-cho, Mt. Iwataki (May 5, 1958, n. 99, 100, 50 m, May 23, 1957, n. 261, 262, 264, 265, 40 m); Takeura (Apr. 29, 1958, n. 107-109, 111, 112, 30 m); Nishi (Apr. 1, 1960, n. 499, 30 m); Funakoshi-toge (Apr. 1, 1960, n. 2643, 20 m); Kaita-cho, Kaitaichi (May 17, 1957, n. 303, 4021, 10 m); Mt. Hinoura (Apr. 5, 1958, n. 274, 150 m); Mt. Kingatoro (Apr. 20, 1958, n. 394, 408, 350 m); Higashikaita-Nishitani (Apr. 5, 1958, n. 4141, 50 m); Higashikaita-Hatadani (Apr. 2, 1960, n. 2657, 130 m); Higashikaita (Apr. 2, 1960, n. 2660, 60 m); Kumano-cho, Mt. Jo (Apr. 2, 1960, n. 2619, 350 m); Nakamizo (Apr. 2, 1960, n. 2642, 250 m); Mt. Ege (May 26, 1957, n. 2670, 300 m); Yano-cho (May 26, 1957, n. 2668, 300 m); Oi (May 26, 1957, n. 2680, 300 m); Age (Apr. 1, 1958, n. 4173, 50 m); Saka-cho, Yokohama (May 26, 1957, n. 4085, 80 m); Saka (May 26, 1957, n. 2681, 10 m); Etajima-cho, Kirikushi (Apr. 19, 1957, n. 335, 4731, 40 m); Kumandake (Apr. 19, 1959, n. 328, 4726, 300 m); Senogawa-cho, Mt. Tengubo (Apr. 1, 1958, n. 4170, 150 m); Nakano (Mar. 28, 1960, n. 2615, 30 m); Sasa pass (Apr. 1, 1960, n. 504, 300 m); Mt. Chausu (Apr. 15, 1958, n. 32, 46, 50, 512, 150-200 m); Hataka (Apr. 2, 1959, n. 11, 18, 140 m); Mt. Hebiwa (Apr. 15, 1958, n. 4144, 150 m); Mizutani (Apr. 2, 1958, n. 530, 150 m); Seno (June 21, 1957, n. 308, 310, 311, 479, 150 m); Kamagari-cho (Apr. 28, 1961, n. 953, 965, 957, 200 m); Ondo-cho (Apr. 23, 1961, n. 973, 200 m); Kurahashi-cho (Apr. 23, 1961, n. 971, 974, 130 m); Shimokamagari-cho (Apr. 28, 1961, n. 964, 965, 958, 959, 220 m); Kumanoato-mura (May 22, 1961, n. 1117, 170 m). Saeki-gun: Itsukaichi-cho (June 18, 1961, n. 23, 54, 140 m); Hatsukaichi-cho (June 18, 1961, n. 2349, 2350, 80 m); Ono-cho (Apr. 26, 1958, n. 2595, 100 m); Yuki-cho, Mt. Togo (May 29, 1960, n. 2611, 300 m); Go (Apr. 28, 1960, n. 2607, 340 m); Yoshiwa-mura, Kanmuri-kogen (May 22, 1960, n. 2589, 800 m); Miyajima (June 27, 1961, n. 4681, 300 m); Nomi-cho (Apr. 16, 1961, n. 906, 907, 100 m); Okimi-cho (Apr. 16, 1961, n. 903, 300 m); Ogaki-cho (Apr. 16, 1961, n. 923, 924, 40 m). Asa-gun: Gion-cho, Mt. Takeda (June 10, 1961, n. 4190, 200 m); Yasufuruichi-cho (June 11, 1961, n. 2329, 150 m); Sato-cho, Mt. Abu (Apr. 21, 1957, n. 2321, 200 m); Numata-cho, Tomo (June 10, 1961, n. 4189, 100 m); Asa-cho, Suzuhari (May 29, 1961, n. 2331, 300 m); Kabe-cho, Nabarakyō (Apr. 17, 1960, n. 592, 594, 622, 200 m); Mt. Bizenbo (June 11, 1961

n. 1411, 220 m); Mt. Fukuoji (Apr. 17, 1960, n. 2324, 280 m); Koyo-cho, Mt. Takahachi (Apr. 20, 1958, n. 290, 400 m). Yamagata-gun: Kake-cho, Kawanoboridani (May 18, 1958, n. 66, 73, 400 m); Kisuien (June 12, 1959, n. 2446, 200 m); Togochi-cho, Sandankyo (Aug. 10, 1959, n. 2442, 700 m); Oasa-cho, Otsuka (May 28, 1961, n. 1172, 440 m); Tahara (May 28, 1961, n. 2455, 500 m); Yokogawa (May 28, 1961, n. 2464, 440 m); Kayahara (May 28, 1961, n. 2449, 400 m); Toyohira-cho, Shirobara (May 28, 1961, n. 1203, 420 m). Takata-gun: Yoshida-cho, Mt. Kohori (July 8, 1961, n. 1648, 280 m); Yoshida (July 8, 1961, n. 2115, 240 m); Yachiyo-cho, Sasai (June 11, 1961, n. 1389, 240 m); Kamine-toge (June 11, 1961, n. 2116, 300 m); Midori-cho, Mt. Inufushi (July 8, 1961, n. 1668, 600 m); Takamiya-cho, Harada (July 8, 1961, n. 2117, 300 m); Koda-cho, Mt. Otsuchi (July 1, 1961, n. 1733, 300 m); Mukaiharu-cho, Mt. Hiraune (July 1, 1961, n. 1722, 1724, 320 m). Kamo-gun: Saijo-cho (Apr. 29, 1957, n. 299, 4003, 300 m); Hachihonmatsu-cho (June 5, 1961, n. 2547, 280 m); Kurose-cho, Kamijo (May 21, 1961, n. 1004, 1014, 200 m); Fukutomi-cho, Kuba (June 2, 1961, n. 2521, 360 m); Matsuzaki (June 2, 1961, n. 2570, 400 m); Mt. Nishihara (June 2, 1961, n. 1272, 400 m); Takaya-cho, Zoka (June 2, 1961, n. 2563, 300 m); Inagi (June 2, 1961, n. 2578, 280 m); Nishitakaya (May 30, 1961, n. 1257, 1259, 200 m); Kochi-cho, Onishi (June 2, 1961, n. 2532, 400 m); Nyuno (May 30, 1961, n. 4191, 180 m); Daiwa-cho, Kamikusai (June 2, 1961, n. 2586, 380 m); Atodani (June 24, 1961, n. 2526, 360 m). Toyota-gun: Kawajiri-cho, Mt. Noro (June 4, 1961, n. 1339, 1375, 200 m); Yasuura-cho (June 4, 1961, n. 1325, 400 m); Akitsu-cho (June 4, 1961, n. 1328, 80 m); Hongo-cho (May 30, 1961, n. 1252, 1253, 120 m); Toyohama-mura (May 24, 1961, n. 1125, 200 m); Osaki-cho (May 23, 1961, n. 1126, 200 m); Higashino-mura (May 23, 1961, n. 2016, 150 m); Kinoe-cho, Mt. Kanmine (May 23, 1961, n. 2101, 350 m); Setoda-cho, Mt. Kannon (May 30, 1961, n. 1218, 1220, 300 m). Mitsugi-gun: Mukaijima-cho, Mt. Takami (June 2, 1961, n. 1684, 140 m); Enooku (July 2, 1961, n. 1935, 40 m); Mukaihigashi-cho (July 2, 1961, n. 1707, 40 m); Kuchiwa-cho, Egi (July 16, 1961, n. 1942, 380 m). Sera-gun: Kozan-cho, Mt. Shin (June 23, 1961, n. 1467, 420 m); Imaichi (June 23, 1961, n. 1983, 400 m); Otani (June 23, 1961, n. 1982, 380 m); Seranishi-cho, Roppongi (June 23, 1961, n. 1979, 500 m); Oguni (June 23, 1961, n. 1462, 380 m); Sera-cho, Tsuguni (June 23, 1961, n. 1980, 420 m); Hongo (June 23, 1961, n. 1981, 480 m). Numakuma-gun: Utsumi-cho, Mt. Taka (July 2, 1961, n. 1691, 1692, 1698, 160 m); Yokojima (July 2, 1961, n. 1716, 200 m); Numakuma-cho, Habu (July 2, 1961, n. 1712, 160 m). Ashina-gun: Ekiya-cho, Nakagumi (Aug. 13, 1961, n. 2026, 80 m); Ashida-cho, Mitogi (Aug. 13, 1961, n. 2032, 280 m). Jinseki-gun: Jinseki-cho, Shinryuko (Aug. 11, 1961, n. 2224, 400 m). Konugun: Joge-cho (July 13, 1961, n. 1946, 500 m); Soryo-cho, Mt. Ko (July 13, 1961, n. 1479, 500 m). Futami-gun: Sanwa-cho, Itagi (July 1, 1961, n. 1964, 320 m); Kimita-mura, Kamiizumi (July 24, 1961, n. 1873, 300 m). Hiba-gun: Saijo-cho, Hirako (Apr. 30, 1961, n. 2295, 340 m); Tojo-cho, Shiju (Apr. 30, 1961, n. 1074, 2299, 480 m); Take-watashi (Apr. 30, 1961, n. 2300, 560 m); Kuchiwa-cho, Mt. Kamamine (July 24, 1961, n. 1924, 480 m).

Tottori Pref. Tottori: Tachikawa (H. Yokogawa, Apr. 10, 1959, n. 335, 100 m). Saihaku-gun: Mt. Daisen (May 23, 1955, n. 4181, 800 m).

Shimane Pref. Matsue: Nishikawatsu (May 14, 1960, n. 3123, 3124, 10 m); Rakusan (June 6, 1958, n. 3125, 10 m, May 13, 1960, n. 3109, 3119, 20 m); Jozan (May 14, 1960, n. 3134, 3136, 3137, 20 m). Oda: Mt. Sanbe (June 5, 1960, n. 3099, 500 m).

Yamaguchi Pref. Hagi: Chito (May 20, 1957, n. 3062, 4052, 4055, 100 m); Mt. Kasa (Aug. 16, 1960, n. 3081, 100 m); Mt. Tatoko (May 20, 1957, n. 3036, 3061, 200 m). Oshima-gun: Oshima-cho, Mt. Kano (Dec. 15, 1957, n. 4192, 200 m). Tsuno-gun: Tsuno-cho, Hirase-Kindake (Apr. 22, 1962, n. 3282, 3287, 3288, 3300, 300-400 m). Kuga-gun: Mikawa-cho, Jotobata (May 3, 1963, n. 3437, 3438, 500 m); Watari (May 3, 1963, n. 3457, 3458, 100 m); Negasa-Yamanouchi (May, 3, 1963, n. 3476, 100-300 m); Iwayakannon (May 3, 1963, n. 3514, 3515, 300-400 m).

57. *Carex horikawae* K. Okamoto sp. nov. (Map 58, Fig. 28, 44)

Rhizoma dense caespitosum. Culmus 10-30 cm altus gracilis obtuse triqueter laevis. Folia 1.5-2 mm lata plana mollia viridia marginibus scabris. Vaginae basilares brunneae saepe fibrillosae. Spiculae 3-4 erectae; terminalis mascula linearis 1-1.3 cm longa 1 mm crassa; laterales femineae breve cylindricae 0.3-1 cm longae 2 mm crassae pedunculatae. Bractae vaginata setaceae. Squamae albio-virides breve aristatae marginibus serrulatis; dorso virides uninerviae; squamae femineae obovatae 2-2.5 mm longae 1-1.5 mm latae; squamae masculae oblongae 3-3.5 mm longae 1.5-2 mm latae. Utriculi squamas superantes obovati stramineo-virides 2-2.5 mm longi 1 mm lati plurinervi apicem hispidi, basi in stipitem attenuati, apice in rostrum breve truncati. Nux obovata obtuse triqueter 1.5-2 mm longa 1 mm lata, basi truncata, apice dilatato-annulata; styli basis incrassati; stigmata 3.

Typus: Japan, Honshu, Hiroshima-Pref, Saeki-gun, Miyajima, 300 m, moist soil in forests (Apr. 26, 1959, Leg. K. Okamoto, HIRO-Ok. no. 4712).

Nom. Jap.: Misenao-suge. nov.

Hab.: Moist soil, usually along pass-sides or in forests; rather rare; frequent in shady places.

Distr.: Japan (Honshu).

Other specimens. Hiroshima Pref. Hiroshima: Mitaki-cho (June 6, 1961, n. 4200, 200 m). Aki-gun: Fuchu-cho, Mikumari-kyo (May 3, 1960, n. 713, 50 m); Funakoshi-cho, Takeura (Apr. 29, 1958, n. 110, 4119, 30 m); Kaita-cho, Mt. Dosho (May 3, 1962, n. 2808, 2809, 460 m); Senogawa-cho, Seno (June 21, 1957, n. 311, 150 m); Kurahashi-cho (Apr. 23, 1961, n. 972, 976, 200 m). Saeki-gun: Miyajima (Apr. 26, 1959, n. 346, 347, 300 m); Hatsukaichi-cho, Hara (May 5, 1962, n. 2789-2792, 2801, 300 m). Toyota-gun: Osaki-cho (May 23, 1961, n. 1130, 200 m). Asa-gun: Kabe-cho, Nabarakyō (Apr. 22, 1962, n. 2713-2733, 300-400 m).

This species is closely related to *C. leucochlora* but can be separated from the latter by the scale shoulder with serrulate margins.

58. *Carex leucochlora* Bunge var. *setouchiensis* K. Okamoto var. nov. (Map 59, Fig. 27, 46)

Rhizoma dense caespitosum. Culmus 10-25 cm altus subgracilis obtuse triqueter laevis. Folia 2-2.5 mm lata plana mollia subviridia marginibus scabris. Vaginae basilares subbrunneae vel brunneae fibrillosae. Spiculae 2-3 erectae; terminalis mascula lineari-oblonga 0.8-1.3 cm longa 1.5-2 mm crassa; laterales femineae breve cylindricae 0.4-1 cm longae 2 mm crassae pedunculatae. Bractae vaginata setaceae. Squamae albio-virides breve aristatae marginibus serrulatis; dorso virides uninerviae squama femineae obovatae 2-2.5 mm longae 1.5-2 mm latae; squamae masculae oblongae 3.5-4 mm longae 1.5-2 mm latae. Utriculi squamas superantes obovati subvirides 2-3 mm longi 2 mm lati plurinervi apicem hispidi, basi in stipitem attenuati, apice in rostrum brevia truncati. Nux obovata obtuse triqueter 1.5-2 mm longa 1 mm lata, basi truncata, apice dilatato-annulata; styli basis brevis incrassati; stigmata 3.

Typus: Japan, Honshu, Hiroshima-Pref., Aki-gun, Funakoshi-cho, Mt. Iwataki, 100 m, moist soil along pass-sides (Apr. 1, 1958, Leg. K. Okamoto, HIRO-Ok. no. 4149).

Nom. Jap.: Setouchikoao-suge. nov.

Hab.: Rather dry or moist soil, usually along pass-sides; rather rare; frequent in sunny places.

Distr.: Japan (Honshu).

Other specimens. Hiroshima Pref. Aki-gun: Funakoshi-cho, Mt. Iwataki (Apr. 1, 1958, n. 420, 421, 424-426, 4170, 100 m); Kaita-cho, Higashikaita (Apr. 2, 1960, n. 514, 551, 572, 120-300 m); Senogawa-cho, Mt. Chausu (Apr. 15, 1958, n. 17, 40, 200 m). Asa-gun: Kabe-cho, Nabarakyō (Apr. 17, 1960, n. 574, 300 m); Koyo-cho, Mt. Takahachi (Apr. 20,

Table 21.

Parts	Taxa	<i>C. discoidea</i>	<i>C. fibrillosa</i>	<i>C. leucochlora</i>	<i>C. rugata</i>
Rhizome		stoloniferous	stoloniferous	stolonless	stoloniferous
Culms		smooth	smooth	scabrous	smooth
Basal sheaths		brown, lustered	yellowish-brown, lusterless	dark brown, lusterless	brown, lusterless
Scale shoulders		serrulate-margined	serrulate-margined	not serrulate-margined	not serrulate-margined
Utricles		hairy, not hollowed, bidentate mouth	hairy, not hollowed, emarginate mouth	hairy, not hollowed, bidentate mouth	glabrous, hollowed, emarginate mouth

Table 22.

Parts	Taxa	<i>C. horikawae</i>	<i>C. geihokuensis</i>
Rhizome		stolonless	stoloniferous
Basal sheaths		brown, lusterless	yellowish-brown, lustered
Pistillate scale shoulders		serrulate-margined	not serrulate-margined

Table 23.

Parts	Taxa	<i>C. akiensis</i>	<i>C. leucochlora</i>
Basal sheaths		brown	dark brown
Utricles		truncate mouth	bidentate mouth

Table 24.

Parts	Taxa	<i>C. leucochlora</i>	<i>C. horikawae</i>
Culms		slender, scabrous	conspicuously slender, smooth
Basal sheaths		dark brown	brown
Scale shoulders		not serrulate-margined	serrulate-margined
Utricles		bidentate mouth	truncate mouth

Table 25.

Parts	Taxa	<i>C. leucochlora</i>	<i>C. leucochlora</i> var. <i>setouchiensis</i>
Culms		scabrous	smooth
Basal sheaths		dark brown	light brown or brown
Scale shoulders		not serrulate-margined	serrulate-margined
Utricles		bidentate mouth	truncate mouth

1958, n. 284, 287, 400 m).

This species is quite similar to *C. leucochlora* but differs from it in the scale shoulder with serrulate margins.

Subsect. 3. **Pisiformes** Akiyama, Caric. Far East. Reg. As. 191, 1955.

Rhizome tufted, stoloniferous or stolonless. Culms obtusely 3-angled, smooth or scabrous. Leaves oblate, stiffish, scabrous-margined. Basal sheaths mostly lusterless, splitting-fibrous. Spikelets erect, peduncled; terminal spikelets staminate; lateral spikelets pistillate. Bracts sheathed, setaceous or foliaceous. Scales bearded or beardless; the scale shoulder serrulate-margined or not serrulate-margined; the nerve reaching to apex. Utricles hairy or glabrous, nerved, short-beaked with bidentate mouth, short-stiped. Stigmas 3.

Key to the species

1. Rhizome stoloniferous 2
1. Rhizome stolonless 3
2. Basal sheaths lustered
 - Basal sheaths reddish-purple. Scale shoulders serrulate-margined *C. sikokiana*
 - Basal sheaths light yellowish-brown. Scale shoulders not serrulate-margined *C. fernaldiana*
2. Basal sheaths lusterless
 - Basal sheaths light yellowish-brown. Scale shoulders serrulate-margined *C. alterniflora*
 - Basal sheaths light brown. Scale shoulders not serrulate-margined *C. duvaliana*
 - Basal sheaths brown. Scale shoulders not serrulate-margined *C. pisiformis*
3. Basal sheaths lustered
 - Basal sheaths dark reddish-purple. Scale shoulders not serrulate-margined *C. multifolia*
 - Basal sheaths brown or yellowish-brown. Scale shoulders serrulate-margined *C. kamagariensis*
3. Basal sheaths lusterless
 - Basal sheaths blackish-brown, conspicuously splitting fibrous. Staminate scales beardless *C. daisenensis*
 - Basal sheaths brown. Staminate scales short-cylindric *C. pocilliformis*
 - Basal sheaths dark brown. Scale shoulders not serrulate-margined .. *C. stenostachys*
 - Basal sheaths yellowish-brown. Scale shoulders serrulate-margined *C. tashiroana*

59. **Carex sikokiana** Franch. et Savat., Enum. Pl. Jap. 2: 573. 1879. (Map 60, Fig. 30)

Rhizome sparsely tufted, stoloniferous. Culms 20-30 cm tall, obtusely 3-angled, smooth. Leaves oblate, stiffish, green, 2-3 mm wide, scabrous-margined. Basal sheaths reddish-purple, lustered, not splitting-fibrous. Spikelets 3-4, erect; terminal spikelet staminate, linear, 2-3 cm long, 1.5-2 mm thick; lateral spikelets pistillate, narrow cylindric, 1-3 cm long, 2 mm thick, peduncled. Bract sheathed (0.5-3 cm long), the upper scaly or setaceous, the lower foliaceous. Scales reddish-brown, whitish membranous-margined; the scale shoulder serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales obovate, 2-2.5 mm long, 1.5-2 mm wide, bearded; staminate scales oblong, 4.5-5 mm long, 1.5-2 mm wide, beardless. Utricles oblong, nerved, glabrous, 2.5-3 mm long, 1.5-2 mm thick, green, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes obovate, obtusely 3-angled, 2 mm long, 1 mm wide, discoid-beaked at apex, truncate-stiped at base; the style short,

thickened at base; stigmas 3.

Nom. Jap.: Beniito-suge (Kansaioito-suge).

Hab.: Rather wet or moist soil, usually in forests; rather common; frequent in shady places.

Distr.: Japan (Honshu, Shikoku, Kyushu).

Specimens examined. Hiroshima Pref. Aki-gun: Kumanoato-mura (May 22, 1961, n. 1095, 170 m). Saeki-gun: Yuki-cho, Mt. Togo (May 29, 1960, n. 754, 4744, 600 m). Yamagata-gun: Togochi-cho, Sandankyo (May 24, 1958, n. 193, 207, 227, 4097, 500-600 m). Fukayasu-gun: Kamo-cho, Ryuzunotaki (July 30, 1961, n. 1777, 300 m); Enmeikyo (July 30, 1961, n. 1784, 240 m). Jinseki-gun: Sanwa-cho, Kurumi (July 30, 1961, n. 1814, 1815, 420 m); Jinseki-cho, Shinryuko (Aug. 11, 1961, n. 2222, 400 m). Hiba-gun: Saijo-cho, Mt. Hiba (Aug. 8, 1961, n. 2318, 700 m); Hirako (Apr. 30, 1961, n. 2279, 320 m); Tojo-cho, Taishakukyo (Aug. 9, 1961, n. 2140, 2173, 2199, 2201, 420-500 m); Takewatashi (Apr. 30, 1961, n. 1073, 1078, 1079, 560 m); Shiju (Apr. 30, 1961, n. 1080-1082, 480 m).

Yamaguchi Pref. Abu-gun: Kawakami-mura, Chomonkyo (Sept. 23, 1961, n. 3211, 3222, 200 m); Ato-cho (Sept. 23, 1961, n. 3199, 220 m).

60. *Carex fernaldiana* Lév. et Van. in Bull. Acad. Intern. Géogr. Bot. **10**: 276. 1901. (Map 61, Fig. 30)

Rhizome sparsely tufted, slender, stoloniferous. Culms 15-30 cm tall, obtusely 3-angled, smooth. Leaves oblate, soft, light green, 0.3-1 mm wide, scabrous-margined. Basal sheaths light yellowish-brown, lustered, slightly splitting-fibrous. Spikelets 2-3, erect; terminal spikelet staminate, linear, 1-1.6 cm long, 1 mm thick; lateral spikelets pistillate, short-terete, 5-15 mm long, 1.5-2 mm thick, peduncled. Bracts sheathed, short foliaceous. Scales: the scale shoulder not serrulate-margined; the midrib greenish, 1-nerved; the nerve reaching to apex; pistillate scales obovate, greenish or brownish, 2 mm long, 1-1.5 mm wide, bearded; staminate scales oblong, brownish, 4-4.5 mm long, 2 mm wide, beardless. Utricles obovate, yellowish-green, glabrous, nerved, 2.5-3 mm long, 1 mm thick, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes obovate, obtusely 3-angled, 1.5-2 mm long, about 1 mm wide, truncate-stiped at base; the style short, thickened at base; stigmas 3.

Nom. Jap.: Ito-suge.

Hab.: Rather wet or moist soil, usually in forests or cliffy places; rather common; frequent in shady places.

Distr.: China, Formosa, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Hiroshima Pref. Saiki-gun: Yuki-cho, Mt. Togo (May 29, 1960, n. 729, 600 m). Yamagata-gun: Togochi-cho, Sandankyo (Nov. 7, 1958, n. 4740, June 17, 1962, n. 2270, 2778, 2779, 500-600 m); Geihoku-cho, Yawata -kogen (Aug. 10, 1958, n. 4754, 800 m); Kake-cho, Kawanoboridani (May 18, 1958, n. 82, 4075, 400 m). Fukayasu-gun: Kamo-cho, Ryuzunotaki (July 30, 1961, n. 1762, 300, m); Enmeikyo (July 30, 1961, n. 1780, 240 m). Jinseki-gun: Yuki-cho, Ueno (July 30, 1961, n. 1792, 400 m); Sanwa-cho, Kurumi (July 30, 1961, n. 1807, 420 m).

Yamaguchi Pref. Kuga-gun: Mikawa-cho, Iwaya (May 3, 1963, n. 3503-3505, 300-400 m).

61. *Carex alterniflora* Franch. in Bull. Soc. Philom. Paris 8. sér. 7: 51. 1895. (Map 62, Fig. 30)

Rhizome sparsely tufted, stoloniferous. Culms 10-30 cm tall, obtusely 3-angled, smooth. Leaves oblate, light green, stiffish, 1.5-2.5 mm wide, scabrous-margined. Basal sheaths light yellowish-brown, splitting-fibrous. Spikelets 3-4, erect; terminal spikelet staminate, linear, 1.5-3.5 cm long, 1.5-2 mm thick; lateral spikelets pistillate, linear-cylindric, 1-3 cm long, 1.5-2 mm thick, peduncled in bract sheaths. Bracts sheathed, the upper setaceous, the lower foliaceous. Scales light green, bearded, slightly whitish membranous-margined; the midrib

greenish, conspicuously 1-nerved; the nerve reaching to apex; the scale shoulder serrulate-margined; pistillate scales obovate, 2-2.5 mm long, 1-1.5 mm wide; staminate scales oblong, 4-4.5 mm long, 1-1.5 mm wide. Utricles obovate, light green, 2-3 mm long, 1-1.5 mm thick, slightly hairy, nerved, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes obovate, obtusely 3-angled, about 2 mm long, 1 mm wide, discoid-beaked at apex; the style short, thickened at base; stigmas 3.

Nom. Jap.: Ooito-suge.

Hab.: Rather wet or moist soil, usually near forests; rather common; frequent in sunny places.

Distr.: Formosa, Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Specimens examined. Hiroshima Pref. Innoshima: Mt. Oku (May 26, 1961, n. 1146, 1161, 300 m). Aki-gun: Etajima-cho, Kirikushi (Apr. 19, 1959, n. 4724, 40 m); Kumandake (Apr. 19, 1959, n. 4725, 300 m). Saeki-gun: Yuki-cho, Mt. Togo (May 29, 1960, n. 752, 753, 755, 757, 758, 600 m); Ishigayakyo (Apr. 24, 1960, n. 647, 648, 653, 655, 671, 400 m). Asa-gun: Kabe-cho, Nabarakyo (Apr. 17, 1960, n. 626, 628, 4172, Apr. 22, 1962, n. 2711, 2714, 2725, 300-400 m). Takata-gun: Shiraki-cho, Mt. Shiraki (June 19, 1960, n. 896, 600 m).

62. **Carex duvaliana** Franch. et Savat., Enum. Pl. Jap. 2. 568. 1879. (Map 63, Fig. 33)

Rhizome sparsely tufted, short-stoloniferous. Culms 30-55 cm tall, slenderly, obtusely 3-angled, downy. Leaves oblate, dark green, hairy, 1.5-2.5 mm wide, scabrous-margined. Basal sheaths light brown, bladeless, hairy, splitting-fibrous. Spikelets 3-4, erect; terminal spikelet staminate, linear, 2-2.5 cm long, 1.5-2 mm thick; lateral spikelets pistillate, terete, 2.3-3 cm long, 1.2 mm thick, peduncled. Bracts foliaceous, hairy, the lower long-sheathed. Scales light brown; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales obovate, bearded, 2.5 mm long, 1-1.5 mm wide; staminate scales oblong, short bearded, 5 mm long, 1-1.5 mm wide. Utricles ovate-fusiform, dark green, 2.5-3 mm long, 1 mm thick, hairy, nerved, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes obovate, obtusely 3-angled, 2 mm long, 1 mm wide, discoid-beaked at apex, truncate-stipitate at base; the style short, thickened at base; stigmas 3.

Nom. Jap.: Ke-suge.

Hab.: Rather dry or moist soil, usually in forest or cliffy places; very rare; mostly frequent on limestone in shady places.

Distr.: Japan (Honshu, Shikoku, Kyushu).

Specimens examined. Hiroshima Pref. Aki-gun: Kamagari-cho (Apr. 28, 1961, n. 928, 200 m). Numakuma-gun: Utsumi-cho, Mt. Taka (July 2, 1961, n. 1695, 1696, 160 m); Numakuma-cho (July 2, 1961, n. 2697, 120 m). Fukuyama: Kumagamine (July 31, 1961, n. 1699, 1700, 1753, 1754, 200 m). Hiba-gun: Tojo-cho, Taishakukyo (Aug. 9, 1961, n. 2169; 2177, 2185-2187, 2240, 400-500 m). Innoshima: (May 26, 1961, n. 1152, 300 m).

63. **Carex pisiformis** Boott in A. Gray, Narr. Exped. Perry 2: 324. 1857. (Map 64, Fig. 31)

Rhizome sparsely tufted, short-stoloniferous. Culms 15-30 cm tall, obtusely 3-angled, smooth. Leaves oblate, greenish, 2-3 mm wide, stiffish, scabrous-margined. Basal sheaths brownish, lusterless, splitting-fibrous. Spikelets 3 (rarely 4), erect; terminal spikelet staminate, linear, light yellowish-brown, 1.5-3 cm long, 1.5-2 mm thick; lateral spikelets pistillate, terete, 1.5-2.5 cm long, 2 mm thick, peduncled. Bracts long-sheathed, foliaceous. Scales bearded, whitish membranous-margined; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales obovate, light yellowish-green, 2-3 mm long, 1-1.5 mm wide, short bearded; staminate scales oblong, 4-5 mm long, 1.5-

2 mm wide, slightly bearded. Utricles obovate-elliptic, greenish, 3 mm long, 1.5 mm thick, hairy, nerved, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes obovate, 1.5 mm long, about 1 mm wide, obtusely 3-angled, small discoid-beaked at apex, truncate-stipitate at base; the style erect, short, conic at base; stigmas 3.

Nom. Jap.: Honmonji-suge.

Hab.: Rather wet or moist soil, usually in forests or in fields; rather rare; frequent in shady places.

Distr.: Japan (Honshu).

Specimens examined. Hiroshima Pref. Saeki-gun: Yoshiwa-mura, Kanmuri-kogen (May 22, 1960, n. 785, 800 m). Yamagata-gun: Togochi-cho, Sandankyo (May 24, 1958, n. 4094, 4174, 500 m). Takata-gun: Shiraki-cho, Mt. Shiraki (June 19, 1960, n. 884, 885, 600 m).

64. *Carex multifolia* Ohwi in Mem. Coll. Sc. Kyoto Imp. Univ. ser. B, 5: 264. 1930. (Map 65, Fig. 31)

Rhizome densely tufted with tough roots, stolonless. Culms 20-40 cm tall, slender, obtusely 3-angled, smooth. Leaves oblate, stiff, dark green, 0.5-1 cm wide, conspicuously 1-nerved, scabrous-margined. Basal sheaths dark reddish-purple, lustered, slightly splitting-fibrous. Spikelets 4-5, erect; terminal spikelet staminate, linear-cylindric, 3-5.4 cm long, 2-3 mm thick; lateral spikelets pistillate, linear-terete, 1.5-3 cm long, 2 mm thick, peduncled. Bracts setaceous, long-sheathed, light purplish-brown, 2-4 cm long. Scale purplish-brown, bearded; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales obovate, 2.5-3 mm long, 1.5-2 mm wide; staminate scales oblong, 4-8 mm long, 1.5-2 mm wide. Utricles obovate-oblong, dark green, 3-4 mm long, 1 mm thick, hairy, nerved, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes oblong, obtusely 3-angled, 2 mm long, 1 mm wide, small discoid-beaked at apex, truncate-stipitate: the style short, thickened at base; stigmas 3.

Nom. Jap.: Miyamakan-suge.

Hab.: Wet or moist soil, usually in forests or along pass-sides; common; frequent in shady places.

Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Specimens examined. Hiroshima Pref. Saeki-gun: Yuki-cho, Mt. Togo (May 29, 1960, n. 733, 756, 766, 300 m); Ishigayakyo (Apr. 24, 1960, n. 640, 649, 654, 400 m); Saeki-cho, Kuroutakyo (May 22, 1960, n. 2092, 500 m); Yoshiwa-mura, Mt. Kanmuri (May 22, 1960, n. 2082, 2085, 900 m). Asa-gun: Kabe-cho, Mt. Bizenbo (June 11, 1961, n. 1402, 220 m); Nenotani (June 11, 1961, n. 1413, 240 m); Nabarakyo (Apr. 17, 1960, n. 578-581, 593, 300 m). Yamagata-gun: Kake-cho, Kawanoboridani (May 18, 1958, n. 62, 63, 71, 80, 90, 94, 4072, 4073, 4076, 4078, 280-400 m); Takiyamakyo (June 12, 1960, n. 2436, 400 m); Tsutsuga-mura, Mt. Ichima (July 9, 1961, n. 1616, 1617, 500-800 m); Nunohara (July 9, 1961, n. 1632, 420 m); Togochi-cho, Sandankyo (May 24, 1958, n. 188, 191, 198, 202, 215-217, 224, 232, 240, 241, 250, 254, 445, 4095, 500-600 m); Geihoku-cho, Yawata-kogen (Aug. 10, 1959, n. 373, 800 m); Mt. Uzuki (June 21, 1960, n. 840-842, 851, 800-900 m); Odomaridamu (June 21, 1960, n. 2477, 640 m). Takata-gun: Yachiyo-cho, Mt. Dotoko (June 11, 1961, n. 1385, 620 m); Shiraki-cho, Mt. Shiraki (June 19, 1960, n. 876, 877, 600 m); Kamo-gun: Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1276, 400-500 m). Fukayasu-gun: Kamo-cho, Ryuzunotaki (July 30, 1961, n. 1770, 300 m); Enmeikyo (July 30, 1961, n. 1783, 240 m); Yamanokyo (K. Okudomi, Aug. 2, 1960, 290 m). Jinseki-gun: Yuki-cho, Ueno (July 30, 1961, n. 1793, 400 m); Sanwa-cho, Kurumi (July 30, 1961, n. 1809, 420 m); Jinseki-cho, Shinryuko (Aug. 11, 1961, n. 2223, 400 m). Futami-gun: Mt. Menkame (July 21, 1961, n. 1587, 1588, 500 m). Hiba-gun: Saijo-cho, Hirako (Apr. 30, 1961, n. 2274, 340 m); Mt. Hiba (Aug. 8, 1961, n. 2307, 2308, 700-1000 m); Tojo-cho, Taishakukyo (Aug. 9, 1961, n. 2147, 2150, 2152, 2158, 2253, 420-500 m); Takewatashi

(Apr. 30, 1961, n. 1027, 560 m); Shiju (Apr. 30, 1961, n. 1067, 1084, 480 m); Mt. Dogo (Sept. 25, 1960, n. 870, 1200 m); Takano-cho, Oka (July 28, 1961, n. 1835, 600 m); Mt. Kenashi (July 28, 1961, n. 1861, 600 m); Mt. Sarumasa (July 28, 1961, n. 1824, 700 m); Hiwa-cho, Mt. Kuroishi (July 28, 1961, n. 1891, 1900, 1901, 500 m).

Tottori Pref. Tottori: Mt. Hisamatsu (H. Yokogawa, Apr. 15, 1959, n. 816, 200 m). Yazu-gun: Mochigase-cho (H. Yokogawa, Apr. 7, 1959, n. 865, 650 m); Wakasa-cho, Kadotani (H. Yokogawa, Apr. 7, 1960, n. 865, 400 m). Saihaku-gun: Mt. Daisen (Sept. 23, 1960, n. 3106, 1200 m).

Shimane Pref. Iishi-gun: Akagi-cho, Akana-toge (July 21, 1961, n. 3015, 500 m); Tonbara-cho, Mt. Kotobiki (July 27, 1961, n. 3001, 3004, 700 m). Naka-gun: Kanagi-mura, Yune (June 12, 1960, n. 3048, 500 m). Suki-gun: Nakamura (K. Okudomi, Aug. 20, 1960, 220 m).

Yamaguchi Pref. Saba-gun: Tokuji-cho (K. Okudomi, Aug. 7, 1960, 420 m). Tsuno-gun: Tsuno-cho, Kanadake-Hirase (Apr. 22, 1962, n. 3275-3279, 3299, 300-400 m). Kuga-gun: Mikawa-cho, Jotobata (May 3, 1963, n. 3451, 3452, 500 m); Negasa-Yamanouchi (May 3, 1963, n. 3482, 3483, 100-300 m); Iwayakannon (May 3, 1963, n. 3509, 3510, 300-400 m). Abu-gun: Ato-cho, (Sept. 23, 1961, n. 3192, 3193, 3201, 220 m); Kawakami-mura, Chomonkyo (Sept. 23, 1961, n. 3216-3218, 200 m).

65. **Carex daisenensis** Nakai in Bot. Mag. Tokyo 33: 41. 1919. (Map 66, Fig. 32)

Rhizome densely tufted, stolonless, clothed with blackish-brown fibers. Culms 30-40 cm tall, obtusely 3-angled, scabrous. Leaves oblate, stiffish, greenish, 3-5 mm wide, scabrous-margined. Basal sheaths blackish-brown, lusterless, conspicuously splitting-fibrous. Spikelets 3-4, erect; terminal spikelet staminate, linear, 2.5-3.5 cm long, 1.5-2 mm thick; lateral spikelets pistillate, linear-cylindric, 1.5-2.5 cm long, 2-2.5 mm thick, short-peduncled. Bracts sheathed, the upper setaceous, the lower foliaceous. Scales: the scale shoulder serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales obovate, light green, 1.5-3 mm long, 1-1.5 mm wide, bearded; staminate scales oblong, light brownish, 2-5 mm long, 1-2 mm wide, beardless. Utricles oblong, light green, 3-3.5 mm long, 1-1.5 mm thick, hairy, nerved, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes elliptic, obtusely 3-angled, 2 mm long, 1 mm wide, discoid-beaked at apex, truncate-stiped at base; the style short, erect, thickened at base; stigmas 3.

Nom. Jap.: Daisen-suge.

Hab.: Rather wet or moist soil, usually in forests; rather rare; frequent in shady places.

Distr.: Japan (Honshu, Kyushu).

Specimens examined. Hiroshima Pref. Yamagata-gun: Oasa-cho, Otsuka (May 28, 1961, n. 1169, 1178, 1181, 440 m); Toyohira-cho, Shirobara (May 28, 1961, n. 1210, 420 m).

Tottori Pref. Saihaku-gun: Mt. Daisen (Sept. 23, 1960, n. 4183, 800 m).

Shimane Pref. Hirata: Ichibata (K. Okudomi, May 15, 1960, 240 m).

66. **Carex pocilliformis** Boott, Illustr. 4: 175, t. 593. 1867. (Map 67, Fig. 32)

Rhizome densely tufted, stolonless. Culms 10-40 cm tall, obtusely 3-angled, smooth. Leaves oblate, stiffish, green, 5.1-4 mm wide, scabrous-margined. Basal sheaths brown, lusterless, splitting-fibrous. Spikelets 3-4, erect or pendulous; terminal spikelet staminate, linear, slender, 1-5.2 cm long, 1 mm thick; lateral spikelets pistillate, narrow cylindric, 1.5-2.5 cm long, 2 mm thick, peduncled. Bracts sheathed, the upper setaceous, the lower foliaceous. Scales ovate, light brownish-green, whitish membranous; the scale shoulder serrulate-margined; the midrib greenish, conspicuously 1-nerved; pistillate scales bearded, 1-2 mm long, 1-1.5 mm wide, the nerve reaching to apex; staminate scales beardless, 1-2 mm long, 1-1.5 mm wide, short-cylindric, the nerve not reaching to apex. Utricles oblong-fusiform, green, 2-2.5 mm long, 1-1.5 mm thick, hairy, nerved, short-beaked with slightly bidentate mouth at apex, short-stiped at base. Achenes ovate, obtusely 3-angled, 1.5 mm long, 1 mm wide, discoid-beaked at apex,

truncate-stiped at base; the style short, thickened at base; stigmas 3.

Nom. Jap.: Himemoegi-suge (Koppumoegi-suge).

Hab.: Rather dry or moist soil, usually along pass-sides or in forests; common; frequent in sunny places.

Distr.: China, Formosa, Ryukyus, Japan (Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Okayama Pref. Okayama: Mt. Kyo (May 14, 1961, n. 3039, 80 m); Mt. Misao (May 14, 1961, n. 3031, 150 m). Kasaoka (May 15, 1961, n. 3041, 100 m.)

Hiroshima Pref. Hiroshima: Mitaki-cho (May 25, 1957, n. 2386, 100 m); Motoujina-cho (Apr. 17, 1959, n. 120-122, 451, 452, 10 m); Ninoshima (July 29, 1957, n. 2396, 50 m); Koi-cho, Yuzukidani (June 22, 1957, n. 4178, 200 m); Ushida-cho (Apr. 30, 1960, n. 2392, 100 m); Mt. Futaba (Apr. 30, 1960, n. 2390, 100 m). Kure: Nikkokyo (June 25, 1960, n. 859, 200 m); Nikyukyo (Apr. 19, 1960, n. 516, 518, 519, 300 m); Nigata-cho (Apr. 29, 1961, n. 2422, 200 m); Tenno-cho, Yakeyama (June 26, 1960, n. 2414, 300 m). Mihara: Mt. Sakura (May 30, 1961, n. 1240, 1244, 1247, 180 m); Sasakijima (May 30, 1961, n. 2434, 200 m). Onomichi: Mitsukoshi (July 15, 1961, n. 2049, 120 m); Onomichi (July 15, 1961, n. 2056, 170 m). Fukuyama: Akasaka (June 16, 1961, n. 1496, 80 m); Mt. Hiko (July 31, 1961, n. 1750, 300 m). Kumagamine (July 31, 1961, n. 1701, 200 m); Daimon-cho (July 31, 1961, n. 1756, 60 m). Innoshima: Habu (May 26, 1961, n. 1143, 100 m); Mt. Oku (May 26, 1961, n. 1162, 300 m); Mukunoura (May 26, 1961, n. 1156, 60 m). Miyoshi: Chuo-koen (July 13, 1961, n. 1509, 1510, 180 m). Matsunaga: Higashi-cho (July 16, 1961, n. 2038, 60 m). Fuchu: Shimokawabe (July 16, 1961, n. 1492, 150 m). Otake: Ogata-cho (May 26, 1961, n. 2401, 100 m). Takehara: Mt. Asahi (May 24, 1961, n. 1141, 200 m); Takehara (May 24, 1961, n. 1971, 180 m). Aki-gun: Fuchu-cho, Mikumarikyo (June 21, 1959, n. 336, May 3, 1960, n. 681, 686, 700, 715, 50-150m); Fuchu (June 21, 1959, n. 4723, 40 m); Funakoshi-cho, Mt. Iwataki (May 5, 1958, n. 97, 101, 102, 50 m, Apr. 1, 1958, n. 419, 427, 100 m); Takeura (Apr. 1, 1958, n. 4150, 60 m); Nishi (May 23, 1957, n. 2677, 100 m); Funakoshi-toge (Apr. 1, 1960, n. 2645, 20 m); Kaita-cho, Kaitaichi (Apr. 2, 1960, n. 2695, 40 m); Higashikaita (Apr. 2, 1960, n. 2622, 2659, 100 m); Higashikaita-Nishitani (Apr. 2, 1960, n. 2663, 50 m); Higashikaita-Terasako (Apr. 2, 1960, n. 2694, 40 m); Mt. Kingatoro (Apr. 20, 1958, n. 395, 410, 350 m); Mt. Dosho (May 3, 1962, n. 2806, 2807, 460 m); Kumano-cho, Akaho-toge (July 12, 1958, n. 2696, 400 m); Nakamizo (Apr. 2, 1960, n. 2637, 250 m); Yano-cho, Oi (May 26, 1957, n. 2676, 20 m); Egedani (May 26, 1957, n. 2673, 200 m); Saka-cho, Yokohama (May 26, 1957, n. 305, 4054, 4059, 50 m); Senogawa-cho, Mt. Tengubo (June 9, 1957, n. 2653, 150 m); Sasa-toge (Apr. 1, 1960, n. 507, 300 m); Mt. Chausu (Apr. 15, 1958, n. 33, 41, 45, 47, 48, 150-200 m); Mt. Hebiiwa (Apr. 3, 1960, n. 2631, 150 m); Hataka-Mizutani (Apr. 1, 1960, n. 533, 140 m); Kumanoato-mura (May 22, 1961, n. 1112, 1114, 170 m); Kurahashi-cho (Apr. 23, 1961, n. 982, 983, 140 m, May 23, 1962, n. 2824, 2825, 0 m); Ondo-cho (Apr. 23, 1961, n. 980, 200 m); Kamagari-cho (Apr. 28, 1961, n. 940 941 200 m); Shimokamagari-cho (Apr. 28, 1961, n. 937, 761, 220 m). Saeki-gun: Itsukaichi-cho (June 18, 1961, n. 1422, 80 m); Hatsukaichi-cho, Mt. Gokurakuji (June 18, 1961, n. 1439, 200 m); Hatsukaichi (June 18, 1961, n. 1420, 50 m); Nomi-cho (Apr. 16, 1961, n. 915, 100 m); Okimi-cho (Apr. 16, 1961, n. 920, 922, 4679, 200 m); Ogaki-cho (Apr. 16, 1961, n. 921, 925, 40 m); Saeki-cho, Watanosedamu (Nov. 22, 1959, n. 4583, 280 m); Hara (May 5, 1962, n. 2795-2797, 300 m). Asa-gun: Kabe-cho, Nabarakyo (Apr. 17, 1960, n. 586, 589, 616, Apr. 22, 1962, n. 2704, 300-400 m); Mt. Kanmuri (Apr. 22, 1962, n. 2756, 400-500 m); Mt. Bizenbo (June 11, 1961, n. 1403, 220 m). Yamagata-gun: Togochi-cho, Sandankyo (May 24, 1958, n. 2445, 500 m). Takata-gun: Yoshida-cho, Mt. Kohori (July 8, 1961, n. 1653, 280 m); Yachiyo-cho, Mt. Dotoko (June 11, 1961, n. 1382, 620 m); Koda-cho, Mt. Otsuchi (July 1, 1961, n. 1741, 300 m); Shiraki-cho, Mt. Shiraki (June 19, 1960, n. 890, 600 m). Kamo-gun: Kurose-cho, Kamijo (May 21, 1961, n. 2581, 200 m); Takaya-cho, Nishitakaya (May 30, 1961, n. 1254, 1256, 1258, 200 m); Shiwa-cho, Namitakiji (May

15, 1959, n. 349, 417, 4700, 400 m); Fukutomi-cho, Matsuzaki (June 2, 1961, n. 2569, 400 m); Mt. Nishihara (June 2, 1961, n. 1273, 400-500 m); Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1279, 400 m); Daiwa-cho, Kamikusai (June 2, 1961, n. 1280, 320 m). Toyota-gun: Kawajiri-cho, Mt. Noro (June 4, 1961, n. 1363, 200 m); Yasuura-cho (June 4, 1961, n. 1319, 400 m); Akitsu-cho (June 4, 1961, n. 1331, 80 m); Hongo-cho (May 30, 1961, n. 1250, 120 m); Yutaka-cho (May 24, 1961, n. 2098, 160 m); Osaki-cho (May 23, 1961, n. 1129, 200 m); Kinoe-cho, Mt. Kanmine (May 23, 1961, n. 2105, 350 m); Setoda-cho, Mt. Kannon (May 30, 1961, n. 1233, 1234, 300 m). Mitsugi-gun: Mitsugi-cho, Ichi (July 16, 1961, n. 1521, 120 m); Kui-cho, Ishibashiri (July 16, 1961, n. 1500, 320 m); Mukaihigashi-cho (July 2, 1961, n. 1710, 40 m); Mukaijima-cho, Mt. Takami (July 2, 1961, n. 1687, 140 m); Enooku (July 2, 1961, n. 1936, 40 m). Sera-gun: Kozazn-cho, Mt. Shin (June 23, 1961, n. 1474, 420 m); Imaichi (June 23, 1961, n. 5016, 400 m); Mt. Une (June 23, 1961, n. 5017, 600 m); Sera-cho, Hongo (June 23, 1961, n. 2003, 480 m); Seranishi-cho, Ogauni (June 23, 1961, n. 1468, 380 m); Mt. Hatakoya (June 23, 1961, n. 1452, 480 m); Otsubo (June 23, 1961, n. 4014, 440 m); Oyamadani (June 23, 1961, n. 5015, 480 m). Fukayasu-gun: Kannabe-cho (July 30, 1961, n. 1761, 140 m). Ashina-gun: Kyowamura, Yokodani (July 14, 1961, n. 2022, 300 m); Ashida-cho, Mitogi (Aug. 13, 1961, n. 2031, 280 m); Ekiya-cho, Nakagumi (Aug. 13, 1961, n. 2024, 80 m). Konu-gun: Joge-cho (July 13, 1961, n. 1955, 500 m); Soryo-cho, Mt. Ko (July 13, 1961, n. 1546, 500 m); Konu-cho, Mt. Kobo (July 13, 1961, n. 1555, 500 m). Futami-gun: Sanwa-cho, Itagi (July 1, 1961, n. 1962, 320 m).

Shimane Pref. Matsue: Rakusan (May 13, 1960, n. 3110, 3115, 3118, 20 m); Jozan (May 14, 1960, n. 3138, 20 m).

Yamaguchi Pref. Hagi: Mt. Kasa (Aug. 16, 1960, n. 3082, 100 m); Mt. Tatoko (May 20, 1957, n. 3064, 3065, 300 m); Chinto (May 20, 1957, n. 3066, 3068, 4037, 4053, 100 m). Oshima-gun: Tachibana-cho, Yura (K. Okudomi, Oct. 6, 1960, 60 m); Nishiagenosho (K. Okudomi, Oct. 20, 1960, 30 m). Kuga-gun: Mikawa-cho, Jotobata (May 3, 1963, n. 3455, 3456, 500 m); Negasa-Yamanouchi (May 3, 1963, n. 3475, 100-300 m); Iwayakannon (May 3, 1963, n. 3508, 300-400 m).

67. *Carex stenostachys* Franch. et Savat., Enum. Pl. Jap. 2: 142 et 569. 1879. (Map 68, Fig. 33)

Rhizome densely tufted, stolonless. Culms 20-55 cm tall, obtusely 3-angled, scabrous. Leaves oblate, stiff, green, 2-6 mm wide, scabrous-margined. Basal sheaths dark brown or blackish-brown, lusterless, splitting-fibrous. Spikelets 3-4, erect; terminal spikelet staminate (rarely androgynous: pistillate at apex,) linear, 1.7-3.3 cm long, 2-2.5 mm thick; lateral spikelets pistillate, terete, 0.5-3 cm long, 2.5-3 mm thick, peduncled. Bracts long-sheathed, the upper setaceous, the lower short-foliaceous. Scales yellowish-brown, short-bearded, whitish membranous-margined; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales obovate, 2-2.5 mm long, 1.5 mm wide; staminate scales oblong, 4.5-5 mm long, 1.5-2 mm wide. Utricles ovate-elliptic, greenish, 3 mm long, 1.5 mm thick, hairy, nerved, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes ovate, 1.5 mm long, 1 mm wide, obtusely 3-angled, small discoid-beaked at apex, truncate-stipitate at base; the style short, conic at base; stigmas 3.

Nom. Jap.: Nishinohonmonji-suge.

Hab.: Rather dry or moist soil, usually along pass-sides or in forests; common; frequent in sunny places.

Distr.: Japan (Honshu).

Specimens examined. Okayama Pref. Niimi (H. Ando, May 21, 1960, 200 m). Kawakami-Gun: Bichu-cho, Iwayadani (May 15, 1961, n. 3026-3028, 400 m).

Hiroshima Pref. Kure: Nikokyo (June 25, 1960, n. 2405, 300 m); Tenno-cho, Yakeyama (June 26, 1960, n. 2411, 300 m). Miyoshi: Chuo-koen (July 13, 1961, n. 1507, 180 m);

Awaya (July 13, 1961, n. 1516, 220 m). Aki-gun; Aki-cho, Mt. Takao (May 3, 1960, n. 2634, 200 m); Fuchu-cho, Mikumari-kyo (June 27, 1958, n. 2626, 30 m); Funakoshi-cho, Mt. Iwataki (Apr. 1, 1958, n. 428, 100 m); Takeura (Apr. 29, 1958, n. 106, 30 m); Kaita-cho, Mt. Hinoura (Apr. 5, 1958, n. 275, 150 m); Higashikaita-Nishitani (Apr. 2, 1960, n. 2661, 50 m); Furu-toge (Apr. 2, 1960, n. 548, 550, 553-555, 300 m); Higashikaita (Apr. 2, 1960, n. 556, 569, 120 m); Mt. Kingatoro (Apr. 20, 1958, n. 2687, 350 m); Kumano-cho, Akaho-toge (July 12, 1958, n. 441, 450 m); Mt. Jo (Apr. 2, 1960, n. 2621, 350 m); Nakamizo (Apr. 2, 1960, n. 2641, 250 m); Senogawa-cho, Mt. Tengubo (June 9, 1957, n. 315, 316, 319, 4036, 4057, 500 m); Mt. Dosho (June 9, 1957, n. 2685, 400 m); Mt. Hebiwa (Apr. 3, 1960, n. 4146, 150 m); Seno (Mar. 28, 1960, n. 478, 200 m); Hataka (Apr. 2, 1958, n. 1-15, 130 m); Hataka-Mizutani (Apr. 1, 1960, n. 529, 535, 140 m); Mt. Chausu (Apr. 15, 1958, n. 19, 21, 23, 25, 28-30, 37, 509, 510, 150-200 m); Sasa-toge (Apr. 1, 1960, n. 502, 505, 506, 300 m); Kamagari-cho (Apr. 28, 1961, n. 954, 200 m); Shimokamagari-cho (Apr. 28, 1961, n. 955, 220 m). Saeki-gun: Yuki-cho, Mt. Togo (May 29, 1960, n. 2593, 300 m); Yuki (May 24, 1960, n. 2602, 380 m); Ishigayakyo (Apr. 24, 1960, n. 2605, 300 m); Saeki-cho, Kuroutsukyo (May 22, 1960, n. 2095, 500 m); Yoshiwa-mura, Kanmuri-kogen (May 22, 1960, n. 815, 800 m). Asa-gun: Sato-cho, Mt. Abu (Apr. 21, 1957, n. 4011, 4012, 200 m); Kabe-cho, Nabarakyo (Apr. 17, 1960, n. 576, 584, 591, 602, 603, 615, 620, Apr. 22, 1962, n. 2718, 2719, 2723, 2727, 300-400 m); Mt. Bizenbo (June 11, 1961, n. 1400, 220 m); Nenotani (June 11, 1961, n. 1416, 240 m). Yamagata-gun: Kabe-cho, Kisuien (June 12, 1959, n. 2447, 200 m); Kawanoboridani (May 18, 1958, n. 4079, 4107, 350 m); Tsutsuga mura, Nunohara (July 9, 1961, n. 1643, 1644, 420 m); Mt. Ichima (July 9, 1961, n. 1614, 500 m); Togochi-cho, Sandankyo (May 24, 1958, n. 442, 4105, 600 m); Mt. Shinnyu (Nov. 12, 1959, n. 2516, 900 m); Geihoku-cho, Mt. Uzuki (June 12, 1960, n. 848, 850 m); Odomaridamu (June 12, 1960, n. 2474, 640 m); Oasa-cho, Mt. Kanbiki (May 28, 1961, n. 1189, 700 m); Otsuka (May 28, 1961, n. 1170, 440 m). Takata-gun: Yachiyo-cho, Mt. Dotoko (June 11, 1961, n. 1377, 620 m); Shiraki-cho, Mt. Shiraki (June 19, 1960, n. 874, 878-880, 895, 897, 600 m). Jinseki-gun: Yuki-cho, Ueno (July 30, 1961, n. 1804, 1805, 400 m); Jinseki-cho, Shinryuko (Aug. 11, 1961, n. 2220, 400 m). Konu-gun: Joge-cho (July 13, 1961, n. 1954, 500 m); Soryo-cho, Mt. Ko (July 13, 1961, n. 1547, 500 m). Futami-gun: Sanwa-cho, Itagi (July 1, 1961, n. 1970, 320 m); Funo-mura, Mt. Menkame (July 21, 1961, n. 1598, 1606, 500-600 m); Sakugi-mura, Okamibuchi (July 21, 1961, n. 1578, 760 m); Kimita-mura, Kamiizumi (July 24, 1961, n. 1879, 1882, 300 m). Hiba-gun: Saijo-cho, Hirako (Apr. 30, 1961, n. 2286, 340 m); Mt. Hiba (Aug. 8, 1961, n. 2313, 700-900 m); Bingoochiai (H. Ando, May 22, 1960); Tojo-cho, Takewatashi (Apr. 30, 1961, n. 1044, 1066, 560 m); Shiju (Apr. 30, 1961, n. 1042, 1052, 1057, 1071, 1072, 480 m), Taishakukyo (Aug. 9, 1961, n. 2143, 2178, 2181, 2212, 2246, 2266, 400-500 m); Kuchiwa-cho, Mt. Kamamine (July 24, 1961, n. 1914, 1924, 480 m); Takano-cho, Mt. Saru masa (July 28, 1961, n. 1852, 800 m); Mt. Kenashi (July 28, 1961, n. 1860, 600 m); Oka (July 28, 1961, n. 1829, 1832, 600 m); Hiwa-cho, Mt. kuroishi (July 28, 1961, n. 1847, 700 m); Konomura (July 28, 1961, n. 1888, 1896, 500 m).

Tottori Pref. Tottori: Mt. Hisamatsu (H. Yokogawa, Apr. 15, 1959, n. 821, 955, 200 m). Iwami-gun: Kamao-toge (H. Yokogawa, Apr. 9, 1959, n. 325, 440 m); Amedaki (H. Yokogawa, May 10, 1959, n. 1973, 300 m). Yazu-gun: Wakasa-cho, Kadotani (H. Yokogawa, Apr. 7, 1960, n. 878, 400 m); Chizu-cho (H. Yokogawa, May 7, 1954, n. 1908, 380 m). Saihaku-gun: Mt. Daisen (Sept. 23, 1960, n. 3171, 800 m); Mt. Goen (Sept. 23, 1960, n. 3177, 800 m).

Shimane Pref. Matsue: Rakusan (May 13, 1960, n. 3116, 20 m); Josan (May 14, 1960, n. 3133, 3135, 20 m). Oda: Mt. Sanbe (June 5, 1960, n. 3076, 3077, 3088-3091, 1100 m). Yatsuka-gun: Mihonoseki (K. Okudomi, Aug. 22, 1960, 100 m). Iishi-gun: Akagi-cho, Akanas-toge (June 21, 1961, n. 3018, 500 m).

Yamaguchi Pref. Abu-gun: Ato-cho (Sept. 23, 1961, n. 3184-3186, 3194, 3198, 220 m); Kawakami-mura, Chomonkyo (Sept. 23, 1961, n. 3208, 3209, 3213, 3219, 3220, 220 m). Kuga-gun: Mikawa-cho, Jotobata (May 3, 1963, n. 3448, 500 m); Negasa-Yamanouchi (May 3, 1963,

n. 3485, 3486, 100-300 m); Iwayakannon (May 3, 1963, n. 3491-3493, 300-400 m). Hagi: Mt. Hakusui (Aug. 4, 1962, n. 3381, 3385, 3388, 3389, 3392, 200 m).

68. **Carex tashiroana** Ohwi in Mem. Coll. Sc. Kyoto Imp. Univ. ser. B, 5: 267. 1930. (Map 69, Fig. 33)

Rhizome densely tufted, stolonless. Culms 10-28 cm tall, obtusely 3-angled, smooth. Leaves oblate, light green, stiffish, 1.5-2 mm wide, scabrous-margined. Basal sheaths yellowish-brown, lusterless, splitting-fibrous. Spikelets 2-3, erect; terminal spikelets staminate, linear, 1-1.5 cm long, 1-1.5 mm thick; lateral spikelets pistillate, cylindric, 0.5-1.5 cm long, 2 mm thick, short-peduncled or not peduncled. Bracts sheathed setaceous. Scales glaucous, bearded whitish membranous-margined; the scale shoulder serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales obovate, 3 mm long, 1.5-2 mm wide; staminate scales oblong, 3.5-4 mm long, 1.5-2 mm wide. Utricles obovate, green, 2.5-3 mm long, 1 mm thick, hairy, nerved, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes obovate obtusely 3-angled, 2 mm long, 1 mm wide, discoid-beaked at apex; the style short, thickened at base; stigmas 3.

Nom. Jap.: No-suge.

Hab.: Moist soil, usually along pass-sides; very rare; frequent in shady places.

Distr.: Japan (Honshu).

Specimens examined. Hiroshima Pref. Asa-gun: Kabe-cho, Nabarakyo (Apr. 17, 1960, n. 624-629, 631, 632, 635, 4171, 300-400 m).

69. **Carex kamagariensis** K. Okamoto sp. nov. (Map 70, Fig. 32, 45)

Rhizoma dense caespitosum. Culmus 20-35 cm altus obtuse triqueter scabris. Folia 1.5-3 mm lata plana subviridia trinevosi marginibus scabris. Vaginae basilares brunneae vel luteo-brunneae lucidae fibrillosae. Spiculae 3-4 erectae; terminalis mascula linearis 1-2.5 mm longa 1.5 mm crassa; laterales femineae lineo-cylindricae 0.5-2.5 cm longae 2 mm crassae pedunculatae. Bractae vaginatae, superiores setaceae inferiores foliaceae. Squamae brunneo-virides brevis aristatae marginibus serrulatis; dorso virides uninerviae; squamae femineae obovatae 2-2.5 mm longae 1.5 mm latae; squamae masculae oblongae 2.5-4.5 mm longae 1.5-2 mm ataelmarginibus membranaceis. Utriculi squamas superius ovato-fusiformes subvirides 2-3 mm longi; 1 mm lati plurinervioli hispidi, basi in stipitem attenuati, apice in rostrum brevis bidentati. Nux oblonga obtuse triqueter 2 mm longa 1 mm lata, basi truncato-stipitata, apice dilatatoannulata; styli brevis erecti basis incrassati; stigmata 3.

Typus: Japan, Honshu, Hiroshima Pref., Aki-gun, Kamagari-cho, 200 m, moist soil along pass-sides (Apr. 28, 1961, Leg. K. Okamoto, HIRO-Ok. no. 934)

Nom. Jap.: Akiito-suge. nov.

Hab.: Rather dry or moist soil, usually along pass-sides; very rare; frequent in sunny places.

Distr.: Japan (Honshu).

Other specimens. Hiroshima Pref. Aki-gun: Kamagari-cho (Apr. 28, 1961, n. 943, 944, 200 m). This species is closely related to *C. alterniflora*, but can be separated from the latter by the rhizome without stolon.

Table 26.

Parts	Taxa	<i>C. pisiformis</i>	<i>C. stenostachys</i>
Rhizome		stoloniferous	stolonless
Culms		smooth	scabrous
Basal sheaths		brownish	dark brown or blackish-brown

Table 27.

Parts	Taxa	<i>C. kamagariensis</i>	<i>C. alterniflora</i>
Rhizome		stolonless	stoloniferous
Culms		scabrous	smooth
Scales		brownish-green	light green

Table 28.

Parts	Taxa	<i>C. alterniflora</i>	<i>C. fernaldiana</i>	<i>C. sikokiana</i>	<i>C. tashiroana</i>
Rhizome		stoloniferous	stoloniferous	stoloniferous	stolonless
Basal sheaths		light yellowish-brown, lusterless	light yellowish-brown, lustered	reddish-purple, lustered	yellowish-brown, lusterless
Scales		light green, staminate scales bearded	greenish or brownish, staminate scales beardless	reddish-brown, staminate scales beardless	glaucous, staminate scales bearded
Scale shoulders		serrulate-margined	not serrulate-margined	serrulate-margined	serrulate-margined
Utricles		hairy	glabrous	glabrous	hairy

Subsect. 4. **Foliosissimae** Akiyama, Caric. Far East. Reg. As. 205. 1955.

Rhizome tufted, stoloniferous or stolonless. Culms obtusely 3-angled, smooth. Leaves oblate, stiff, scabrous-margined. Basal sheaths lustered or lusterless, splitting-fibrous. Spikelets erect, peduncled; terminal spikelet staminate; lateral spikelets pistillate. Bracts sheathed, mostly foliaceous. Scales bearded; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex. Utricles hairy or glabrous, nerved, short-beaked, short-stiped or sessile. Stigmas 3.

Key to the species

1. Rhizome stolonless *C. morrowii*
1. Rhizome stoloniferous 2
2. Scale shoulders serrulate-margined *C. conica*
2. Scale shoulders not serrulate-margined *C. foliosissima*

70. **Carex morrowii** Boott in A. Gray, Narr. Exped. Perry 2: 326. 1857.
(Map 71, Fig. 34-35)

Rhizome densely tufted, stolonless. Culms 20-40 cm tall, obtusely 3-angled, smooth. Leaves oblate, stiff, dark green, lustered, scabrous-margined; the section of the leaf M-typed. Basal sheaths purplish-black, splitting-fibrous. Spikelets 4-6, erect; terminal spikelet staminate, clavate, 3-6 cm long, 3-5 mm thick; lateral spikelets pistillate, terete, 2.5-5 cm long, 5-6 mm thick, peduncled. Bracts long-sheathed, reddish-brown, foliaceous. Scales reddish-brown, bearded; the scale shoulders serrulate-margined; the midrib greenish, conspicuously 1-nerved;

the nerve reaching to apex; pistillate scales ovate, 3.5 mm long, 2 mm wide; staminate scales narrow oblong, 7-9 mm long, 1.5-2 mm wide. Utricles oblong, yellowish-green, 3.5 mm long, 1 mm thick, glabrous, nerved, extrorse short-beaked with bidentate mouth at apex, short-stiped at base. Achenes cylindric-ovate, obtusely 3-angled, about 2 mm long, 1 mm wide, short-stiped at base; the style short, slightly thickened at base; stigmas 3.

Nom. Jap. Kan-suge.

Hab.: Very wet soil, usually along streams or moist soil in forests; common; frequent in sunny places.

Distr.: Japan (Honshu, Shikoku, Kyushu).

Specimens examined. Okayama Pref. Tomata-gun: Kamisaibara-mura (H. Yokogawa, May 17, 1959, n. 462, 800 m).

Hiroshima Pref. Saeki-gun: Yuki-cho, Yuki (Apr. 24, 1960, n. 2600, 380 m); Mt. Togo (May 29, 1960, n. 735, 738, 764, 768, 600 m). Yamagata-gun: Kake-cho, Kawanoboridani (May 18, 1958, n. 60, 67, 68, 74, 76, 78, 81, 83, 89, 92, 93, 4074, 4077, 4108, 280-400 m); Takiyamakyo (June 12, 1960, n. 2480, 400 m); Tsutsuga-mura, Nunohara (July 9, 1961, n. 1631, 420 m); Mt. Ichima (July 9, 1961, n. 1615, 500 m); Togochi-cho, Sandankyo (May 24, 1958, n. 244, 443, 500-600 m). Futami-gun: Sakugi-mura, Okamibuchi (July 21, 1961, n. 1574, 760 m); Funo-mura, Mt. Menkame (July 21, 1961, n. 1590, 1605, 800 m). Hiba-gun: Saijo-cho, Mt. Hiba (Aug. 8, 1961, n. 2304, 2310, 700 m); Hirako (Apr. 30, 1961, n. 2278, 2280, 340 m); Tojo-cho, Taishakukyo (Aug. 9, 1961, n. 2165, 2166, 2258, 2259, 400 m); Shiju (Apr. 30, 1961, n. 1045-1047, 1049, 480 m); Takewatashi (Apr. 30, 1961, n. 1026, 1041, 1054, 1055, 560 m); Kuchiwa-cho, Mt. Kamamine (July 24, 1961, n. 1961, 1917, 480 m); Takano-cho, Oka (July 28, 1961, n. 1863, 600 m); Mt. Kenashi (July 28, 1961, n. 1866, 600 m); Mt. Sarumasa (July 28, 1961, n. 1823, 800 m); Hiwa-cho, Konomura (July 24, 1961, n. 1886, 500 m); Mt. Kuroishi (July 28, 1961, n. 1845, 700 m).

Tottori Pref. Tohaku-gun: Mt. Mitoku (Y. Sasaki, Nov. 3, 1957, 800 m).

Shimane Pref. Iishi-gun: Akagi-cho, Akana-toge (July 21, 1961, n. 3016, 3012, 500 m); Tonbara cho, Mt. Kotobiki (July 27, 1961, n. 3007, 3012, 700 m).

Yamaguchi Pref. Kuga-gun: Mt. Jakuchi (Aug. 3, 1957, n. 4661, 800 m); Mikawa-cho, Negasa-Yamanouchi (May 3, 1961, n. 3473, 300 m); Iwayakannon (May 3, 1963, n. 3501, 3502, 300-400 m).

71. **Carex conica** Boott in A. Gray, Narr. Exped. Perry 2 : 325. 1857.
(Map 72, Fig. 34-35)

Rhizome sparsely tufted in small clump, stoloniferous. Culms 10-40 cm tall, obtusely 3-angled, smooth. Leaves oblate, stiff, dark green, 2-4 mm wide, scabrous-margined. Basal sheaths dark reddish-purple or blackish-brown, splitting-fibrous. Spikelets 3-5, erect; terminal spikelet staminate, clavate, 1.5-2.5 cm long, 2-2.5 mm thick; lateral spikelets pistillate, short terete, 1-2.7 cm long, 2.5-3 mm thick, peduncled. Bracts sheathed, 1-2.5 cm long, setaceous or short foliaceous. Scales bearded; the scale shoulder serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales obovate, reddish-brown, 4.5-5 mm long, 2-2.5 mm wide; staminate scales oblong, light brown or dark reddish-purple, 5-7 mm long, 2-2.5 mm wide. Utricles ovate-elliptic, light yellowish-green, 2-2.5 mm long, 1 mm thick, hairy, nerved, short-beaked with slightly truncate mouth at apex, obtuse, thickened at base. Achenes obovate-elliptic, obtusely 3-angled, 2 mm long, 1 mm wide, small discoid-beaked at apex, curved short-stiped at base; the style short, erect, thickened at base; stigmas 3.

Nom. Jap.: Himekan-suge.

Hab.: Rather wet or moist soil, usually along pass-sides or in forests; very common, variable; frequent in sunny places.

Distr.: Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Okayama Pref. Okayama: Mt. Kyo (May 14, 1961, n. 3040, 80 m). Niimi: Atetsukyo (H. Ando, June 22, 1960, 300 m).

Hiroshima Pref. Hiroshima: Yamate-cho (May 30, 1958, n. 4198, 100 m); Ninoshima (July 29, 1957, n. 2397, 50 m); Ushida-cho (Apr. 30, 1960, n. 2394, 100 m); Mt. Futaba (Apr. 20, 1960, n. 2389, 100 m). Kure: Nikokyo (June 25, 1960, n. 861, 865, 866, 200 m); Nikyukyo (Apr. 19, 1960, n. 515, 517, 300 m); Aga-cho (Apr. 29, 1961, n. 2426, 180 m); Kure (June 25, 1960, n. 2427, 200 m); Tenno-cho, Yaakeyama (June 26, 1960, n. 2413, 300 m). Mihara: Mt. Sakura (May 30, 1961, n. 1242, 1243, 1245, 180 m); Butsuji (K. Okudomi, Oct. 18, 1953, 160 m); Mt. Omine (July 16, 1961, n. 1559, 500 m); Onomichi: Onomichi (July 15, 1961, n. 2054, 170 m); Momoshima (July 15, 1961, n. 2050, 50 m); Mitsukoshi (July 15, 1961, n. 2046, 120 m). Fukuyama: Kumagamine (July 31, 1961, n. 1702, 200 m); Akasaka (July 16, 1961, n. 1495, 1498, 80 m); Mt. Hiko (July 31, 1961, n. 1751, 300 m); Daimon-cho (July 30, 1961, n. 1757, 60 m). Innoshima: Habu (May 26, 1961, n. 1148, 100 m); Mt. Oku (May 26, 1961, n. 1149, 300 m); Sannosho (May 26, 1961, n. 2439, 120 m); Mukunoura (May 26, 1961, n. 2440, 60 m). Miyoshi: Awaya (July 13, 1961, n. 2431, 220 m); Chuokoen (July 13, 1961, n. 1517, 180 m). Matsunaga: Higashi-cho (July 16, 1961, n. 2036, 60 m). Fuchu: Shimokawabe (July 16, 1961, n. 1491, 1494, 150 m). Shobara: Nanatsuhara (June 1, 1958, n. 153, 157, 158, 160, 4123, 300 m); Ueno park (Aug. 8, 1961, n. 2368, 160 m). Takehara: Mt. Asahi (May 24, 1961, n. 1134, 200 m); Takehara (May 24, 1961, n. 1140, 180 m); Aki-gun; Aki-cho, Umagi (May 4, 1957, n. 297, 4040, 400 m); Fuchu-cho, Fuchu (June 27, 1958, n. 4148, 50 m); Mikumarikyo (May 8, 1960, n. 694-696, 50-80 m); Funakoshi-cho, Mt. Iwataki (May 5, 1958, n. 98, 429, 100 m); Takeura (Apr. 29, 1958, n. 113, 30 m); Nishi (Apr. 1, 1960, n. 498, 30 m); Kumano-cho, Akaho-toge (July 12, 1958, n. 434, 450 m); Mt. Jo (July 12, 1958, n. 435, 500 m); Nakamizo (Apr. 2, 1960, n. 2638, 250 m); Yano-cho, Mt. Ege (May 26, 1957, n. 2672, 200 m); Saka-cho, Yokohama (May 26, 1957, n. 306, 307, 50 m); Etajima-cho, Kirikushi (Apr. 19, 1959, n. 333, 334, 4729, 40 m); Kumandake (Apr. 19, 1959, n. 329, 332, 4728, 300 m); Kaita-cho, Mt. Hinoura (Apr. 5, 1958, n. 269-273, 150 m, n. 4135, 4137-4129, 300 m); Higashikaita-Nishitani (Apr. 2, 1960, n. 2658, 50 m); Higashikaita-Hatadani (Apr. 2, 1960, n. 537, 538, 542, 545, 130 m); Furu-toge (Apr. 2, 1960, n. 549, 300 m); Higashikaita (Apr. 2, 1960, n. 557, 559-563, 568, 570, 573, 400 m); Mt. Kingatoro (Apr. 20, 1958, n. 391-400, 350 m); Higashikaita-Terasako (Apr. 2, 1960, n. 2690, 120 m); Senogawa-cho, Mt. Tengubo (June 9, 1957, n. 317, 388, 4114, 500 m); Mt. Dosho (Apr. 2, 1960, n. 4143, 460 m); Mt. Chausu (Apr. 15, 1958, n. 31, 35, 39, 44, 49, 508, 510, 4131, 4142, 150-200 m); Hataka (Apr. 2, 1958, n. 16, 130 m); Mt. Heibwa (Apr. 3, 1960, n. 4145, 150 m); Hataka-Mizutani (Apr. 2, 1960, n. 2649, 250 m); Kamagari-cho (Apr. 28, 1961, n. 930, 931, 200 m); Shimokamagari-cho (Apr. 28, 1961, n. 933, 220 m); Ondo-cho (Apr. 23, 1961, n. 975, 995, 200 m); Kurahashi-cho (Apr. 23, 1961, n. 985, 986, 140 m); Kumanoato-mura (May 22, 1961, n. 1097, 1101, 170 m). Saeki-gun: Yuki-cho, Ishigayakyo (Apr. 24, 1960, n. 663, 400 m); Saeki-cho, Kuroutsukyo (May 22, 1960, n. 2093, 500 m); Watanosedamu (Nov. 22, 1959, n. 2597, 280 m); Miyajima (June 27, 1961, n. 2362, 300 m); Okimi-cho (Apr. 16, 1961, n. 914, 916, 4678, 4680, 300 m); Nomi-cho (Apr. 16, 1961, n. 912, 913, 100 m); Ogaki-cho (Apr. 16, 1961, n. 919, 40 m); Hatsukaichi-cho, Hara (May 5, 1962, n. 2793, 2794, 300 m). Asa-gun: Numata-cho, Tomo (H. Ando, June 10, 1951); Asa-cho, Suzuhari (May 29, 1961, n. 2338, 300 m); Sasahara (May 29, 1961, n. 2337, 300 m); Imuro (May 29, 1961, n. 2348, 200 m); Kabe-cho, Mt. Bieznbo (June 11, 1961, n. 1398, 220 m); Nenotani (June 11, 1961, n. 1412, 240 m); Nabarakyo (Apr. 17, 1960, n. 577, 600, 604, 605, 611, 612, 614, 617, 633, 300 m); Mt. Fukuoji (Apr. 11, 1961, n. 2327, 280 m); Koyo-cho, Mt. Takahachi (Apr. 20, 1958, n. 276, 277, 279, 282, 283, 285, 286, 288, 291, 295, 400 m). Yamagata-gun: Kake-cho, Kisuien (June 12, 1959, n. 2448, 200 m); Chiyoda-cho, Mt. Ogake (May 24, 1959, n. 477, 4714, 500 m); Yae (May 28, 1961, n. 2494, 350 m); Togochi-cho, Sandankyo (May 24, 1958, n. 228, 258, 4081, 500 m); Geihoku-cho, Mt. Uzuki (June 21, 1960, n. 850, 800 m); Oasa-cho,

Mt. Kanbiki (May 28, 1961, n. 1186, 500 m); Kayahara (May 28, 1961, n. 2453, 400 m); Yoko-gawa (May 28, 1961, n. 2471, 440 m); Tahara (May 28, 1961, n. 2462, 500 m); Toyohira-cho, Shirobara (May 28, 1961, n. 2507, 420 m). Takata-gun: Yachiyo-cho, Kamine-toge (June 11, 1961, n. 2127, 300 m); Mt. Dotoko (June 11, 1961, n. 1380, 620 m); Sasai (June 11, 1961, n. 1391, 240 m); Midori-cho, Mt. Inufushi (July 8, 1961, n. 1662, 600 m); Yokota (July 8, 1961, n. 1673, 340 m); Takamiya-cho, Rokurohara (July 8, 1961, n. 1679, 300 m); Harada (July 8, 1961, n. 2128, 300 m); Koda-cho, Mt. Otsuchi (July 1, 1961, n. 1729, 1740, 300 m); Kotachieki-guchi (July 1, 1961, n. 2129, 280 m); Yoshida-cho, Mt. Kohori (July 8, 1961, n. 1649, 280 m); Mukaiharu-cho, Mt. Hiraune (July 1, 1961, n. 1720, 320 m). Kamo-gun: Saijo-cho (Apr. 29, 1957, n. 4034, 300 m); Hachihonmatsu-cho (June 5, 1961, n. 2549, 280 m); Kurose-cho, Kamijo (May 21, 1961, n. 997, 998, 200 m); Mt. Kota (May 21, 1961, n. 1008, 1023, 300 m); Takaya-cho, Nishitakaya (May 30, 1961, n. 1255, 200 m); Zoka (June 2, 1961, n. 2561, 300 m); Koochi-cho, Onishi (June 2, 1961, n. 2536, 400 m); Nyuno (Mar. 27, 1960, n. 898, 200 m); Fukutomi-cho, Mt. Nishihara (June 2, 1961, n. 1268, 1270, 400 m); Kuba (June 2, 1961, n. 2546, 360 m); Matsuzaki (June 2, 1961, n. 2567, 400 m); Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1275, 1314, 400 m); Nakaonchi (June 2, 1961, n. 2528, 400 m); Daiwa-cho, Kamikusai (June 2, 1961, n. 1299, 320 m). Toyota-gun: Kawajiri-cho, Mt. Noro (June 4, 1961, n. 1333, 1338, 1359, 800 m); Yasuura-cho (June 4, 1961, n. 2111, 400 m); Akitsu-cho (June 4, 1961, n. 1327, 80 m); Hongo-cho (May 30, 1961, n. 1251, 120 m); Toyohama-mura (May 24, 1961, n. 1124, 200 m); Osaki-cho (May 23, 1961, n. 1121, 200 m); Higashino-mura (May 23, 1961, n. 2108, 150 m); Yutaka-cho (May 24, 1961, n. 1128, 160 m); Kinoe-cho, Mt. Kanmine (May 23, 1961, n. 2102, 350 m); Setoda-cho, Mt. Kannon (May 30, 1961, n. 1213, 1219, 300 m). Mitsugi-gun: Mitsugi-cho, Ichi (July 16, 1961, n. 1529, 120 m); Kui-cho, Ishibashiri (July 16, 1961, n. 1505, 320 m); Egi (July 16, 1961, n. 1938, 380 m); Mukaihigashi-cho (July 2, 1961, n. 1708, 40 m); Mukaishima-cho, Mt. Takami (July 2, 1961, n. 1686, 140 m); Enooku (July 2, 1961, n. 1937, 40 m). Sera-gun: Kozan-cho, Mt. Shin (June 23, 1961, n. 1471, 420 m); Imaichi (June 23, 1961, n. 1476, 400 m); Mt. Une (June 23, 1961, n. 1996, 600 m); Otani (June 23, 1961, n. 1994, 380 m); Sera-cho, Tsuguchi (June 23, 1961, n. 1992, 420 m); Hongo (June 23, 1961, n. 1993, 480 m); Seranishi-cho, Roppongi (June 23, 1961, n. 1997, 500 m); Oguni (June 23, 1961, n. 1463, 1479, 380 m); Mt. Hatakoya (June 23, 1961, n. 1451, 480 m); Otsubo (June 23, 1961, n. 1998, 440 m); Oyamadani (June 23, 1961, n. 1995, 480 m). Numakuma-gun: Utsumi-cho, Mt. Taka (July 2, 1961, n. 1688-1690, 1697, 160 m); Yokojima (July 2, 1961, n. 1717, 200 m); Numakuma-cho, Habu (July 2, 1961, n. 1711, 120 m). Fukayasu-gun: Kannabe-cho. (July 30, 1961, n. 1759, 140 m); Kamo-cho, Ryuzunotaki (July 30, 1961, n. 1771, 300 m); Enmeikyo (July 30, 1961, n. 1785, 240 m). Ashina-gun: Kyowa-mura, Yokodani (July 17, 1961, n. 2017, 300 m); Fujio-mura, Kawaidani (Aug. 12, 1961, n. 2010, 200 m); Ashida-cho, Mitogi (Aug. 13, 1961, n. 2033, 280 m); Ekiya-cho, Nakagumi (Aug. 13, 1961, n. 2025, 80 m); Shinichi-cho, Kamitode (Aug. 13, 1961, n. 2028, 150 m). Jinseki-gun: Yuki-cho, Mt. Gongen (Aug. 12, 1961, n. 2067, 540 m); Ueno (July 30, 1961, n. 1800, 400 m); Sanwa-cho, Inuzuka (Aug. 12, 1961, n. 2062, 400 m); Toyomatsu-mura, Mt. Yonami (Aug. 12, 1961, n. 2069, 600 m). Konu-gun: Joge-cho (July 13, 1961, n. 1948, 500 m); Soryo-cho, Mt. Ko (July 13, 1961, n. 1551, 500 m); Konu-cho, Mt. Kobo (July 13, 1961, n. 1553, 1557, 500 m). Futami-gun: Sanwa-cho, Itagi (July 1, 1961, n. 1969, 320 m); Kisa-cho (July 13, 1961, n. 1542, 240 m); Mirasaka-cho (July 13, 1961, n. 1526, 240 m). Hiba-gun: Tojo-cho, Taishakukyo (Aug. 9, 1961, n. 2267, 400-500 m); Mt. Dogo (Sept. 25, 1960, n. 868, 900 m); Takano-cho, Mt. Kenashi (July 28, 1961, n. 1864, 600 m).

Tottori Pref. Tottori: Utsumi (K. Okudomi, Aug. 29, 1960, 40 m). Saihaku-gun: Mt. Daisen (Sept. 23, 1960, n. 3170, 700 m).

Shimane Pref. Iishi-gun: Tonbara-cho, Mt. Kotobiki (June 27, 1961, n. 3011, 700 m).

Yamaguchi Pref. Iwakuni (K. Okudomi, Nov. 17, 1952, 60 m), Kuga-gun: Kuga-cho, Mt. Renge (Dec. 11, 1960, n. 3150, 500 m); Yazu (Dec. 11, 1960, n. 3149, 100 m). Mine-gun:

Akiyoshi-cho, Akiyoshidai (Aug. 9, 1959, n. 3059, 200 m). Abu-gun: Ato-cho, (Sept. 23, 1961 n. 3189, 220 m).

72. *Carex foliosissima* Fr. Schm., Reis. Amurl, u. Ins. Sachal. 195. 1868.
(Map 73, Fig. 34-35)

Rhizome densely tufted, stoloniferous. Culms 15-40 cm tall, obtusely 3-angled, smooth. Leaves oblate, dark green, stiff, 5-8 mm wide, scabrous-margined. Basal sheaths blackish-purple, lusterless, splitting-fibrous. Spikelets 3-5, erect; terminal spikelet staminate, clavate, 2.5-4.5 cm long, 2-4 mm thick; lateral-spikelets pistillate, terete, 1.5-3 cm long, 4-5 mm thick, peduncled. Bracts sheathed (1.5-3.5 cm long), brownish, foliaceous. Scales reddish-brown, bearded; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales ovate, 2-3 mm long, 1-2 mm wide; staminate scales narrow oblong, 8-9 mm long, 1.5 mm wide. Utricles oval, light green, 3-3.5 mm long, 1 mm thick, glabrous, nerved, extrorse short-beaked with bidentate mouth at apex, short-stiped at base. Achenes oval, obtusely 3-angled, 1.5 mm long, about 1 mm wide, truncate-stipitate at base; the style short, thickened at base; stigmas 3.

Nom. Jap.: Okunokan-suge.

Hab.: Rather wet or moist soil, usually in forests; rare common; frequent in shady places.

Distr.: Saghalien, Japan (Hokkaido, Honshu).

Specimens examined. Okayama Pref. Tomata-gun: Kamisaibara-mura (H. Yokogawa, May 17, 1959, n. 446, 800 m).

Hiroshima Pref. Saeki-gun: Yoshiwa-mura, Mt. Kanmuri (May 22, 1960, n. 2083, 900 m). Yamagata-gun: Togochi-cho, Sandankyo (May 24, 1958, n. 186, 194, 211, 222, 226, 229, 251, 259, 444, 4106, 600-900 m); Geihoku-cho, Mt. Uzuki (June 12, 1960, n. 849, 850 m). Futami-gun: Funomura, Mt. Menkame (July 21, 1961, n. 1585, 1586, 700 m). Hiba-gun: Saijo-cho, Mt. Hiba (Aug. 8, 1961, n. 2309, 700-1000 m).

Tottori Pref. Saihaku-gun: Mt. Daisen (Sept. 29, 1960, n. 3107, 1300 m).

Shimane Pref. Naka-gun: Kanagi-mura, Yune (June 12, 1960, n. 3044, 500 m).

Table 29.

Taxa	<i>C. conica</i>	<i>C. foliosissima</i>	<i>C. morrowii</i>	<i>C. multifolia</i>
Parts				
Rhizome	stoloniferous	stoloniferous	stolonless	stolonless
Basal sheaths	dark reddish-purple or blackish-brown, lusterless	blackish-purple, lusterless	blackish-purple, lusterless	dark reddish-purple, lustered
Bracts	reddish-green, setaceous or foliaceous	brownish, foliaceous	reddish-brown, foliaceous	light reddish-purple, setaceous
Scales	reddish-brown	reddish-brown	reddish-brown	purplish-brown
Scale shoulders	serrulate-margined	not serrulate-margined	serrulate-margined	not serrulate-margined
Utricles	light yellowish-green, hairy, truncate mouth, sessile	light green, glabrous, bidentate mouth, short-stiped	yellowish-green, glabrous, bidentate mouth, short-stiped	dark green, hairy, bidentate mouth, short-stiped

Sect. 24. **Rhomboidales** Kükenth., Cyper.-Caric. 622. 1909.

Rhizome tufted, stolonless. Culms acutely or obtusely 3-angled, scabrous or smooth. Leaves oblate, scabrous-margined. Basal sheaths bladeless, lusterless, splitting-fibrous. Spikelets erect, peduncled; terminal spikelet staminate; lateral spikelets pistillate. Bracts sheathed, foliaceous. Scales bearded or beardless. Utricles glabrous or hairy, nerved, long or short-beaked with emarginate or bidentate mouth, short-stiped or sessile. Stigmas 2 or 3.

73. **Carex matsumurae** Franch. in Bull. Soc. Philom. Paris. 8. sér 7: 50. 1895.
(Map 74, Fig. 36)

Rhizome densely tufted, stolonless. Culms 30-40 cm tall, acutely 3-angled, smooth. Leaves oblate, dark green, stiffish, 8-10 mm wide, conspicuously 3-nerved, scabrous-margined. Basal sheaths bladeless, lusterless, yellowish-brown, splitting blackish-brown fibrous. Spikelets 3-4, erect; terminal spikelet staminate, linear-terete, 3.5-4 cm long, 3-4 mm thick; lateral spikelets pistillate, terete, 2-2.5 cm long, 4.5-5 mm thick, peduncled. Bracts sheathed, foliaceous. Scales light green, bearded; the scale shoulder serrulate-margined; the midrib greenish, conspicuously 3-nerved; the nerve reaching to apex; pistillate scales oval 3-3.5 mm long, 2 mm wide; staminate scales linear-lanceolate, 6-8 mm long, 1.5-2 mm wide. Utricles obovate, light green, 3-3.5 mm long, 1-1.5 mm thick, glabrous, nerved, short-beaked with emarginate mouth at apex, short-stiped at base. Achenes obovate, 2 mm long, 1 mm wide, discoid-beaked at apex, truncate-stiped at base; the style short, thickened at base; stigmas 2.

Nom. Jap.: Kinokuni-suge (Kuroshima-suge, Kishu-suge).

Hab.: Sand or sandy soil, usually near the coast; rather rare; frequent in sunny places.

Distr.: Japan (Honshu, Shikoku, Kyushu), Korea.

Specimens examined. Yamaguchi Pref. Shimonoseki: Manjūjima (K. Okudomi, Mar. 9, 1959, 25 m); Chofu-cho, Matsubara (K. Okudomi, Mar. 8, 1959, 20 m).

Sect. 25. **Siderostictae** Franch. in Nouv. Arch. Mus. Paris 3. sér. 10: 106. 1898.

Rhizome horizontal long creeping, stoloniferous or stolonless. Culms obtusely 3-angled, smooth. Leaves oblate, mostly lanceolate, thin, stiffish, hairy, conspicuously 3-nerved, scabrous-margined. Basal sheaths lusterless, not splitting-fibrous. Spikelets androgynous, erect, peduncled. Bracts bladeless, sheathed. Scales bearded or beardless, ciliate-margined or not ciliate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex. Utricles hairy or glabrous, nerved, short-beaked or beakless with truncate mouth, short-stiped. Stigmas 3.

Key to the species

- | | |
|--|-----------------------------|
| 1. Rhizome stolonless | <i>C. pachygyna</i> |
| 1. Rhizome stoloniferous | 2 |
| 2. Terminal spikelet staminate | <i>C. ciliato-marginata</i> |
| 2. Terminal spikelet androgynous | <i>C. siderosticta</i> |

74. **Carex pachygyna** Franch. et Savat., Enum. Pl. Jap. 2: 133 et 560. 1879.
(Map 75, Fig. 37)

Rhizome stolonless, clothed with reddish-brown scales, globose-thickened. Culms 10-25 cm tall, obtusely 3-angled, smooth. Leaves oblate, broad lanceolate, green, 1-2 cm wide, conspicuously 3-nerved, downy at the reverse. Basal sheaths reddish-brown, lusterless, not splitting-fibrous. Spikelets 4-6, androgynous (indistinctly staminate at apex), bearing 2-3 in the bract sheath, globose, erect, peduncled, 4-6 mm long, 3 mm thick. Bracts sheathed (1-2 cm long), bladeless. Scales light green, not ciliate-margined, whitish membranous-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales ovate-

orbicular, 2 mm long, 1.5 mm wide; staminate scales narrow ovate, 1.5 mm long, 1 mm wide. Utricles elliptic, light green, 1.5-2 mm long, 1 mm thick, glabrous, nerved, beakless with truncate mouth at apex, short-stiped at base. Achenes elliptic, obtusely 3-angled, about 1.5 mm long, 1 mm wide, slightly cylindric-stipitate at base; the style short, not thickened at base; stigmas 3.

Nom. Jap.: Sasanoha-suge.

Hab.: Rather wet or moist soil, usually along pass-sides or in forests; rather common; frequent in shady places.

Distr.: Japan (Honshu, Shikoku).

Specimens examined. Okayama Pref. Niimi: Atetsukyo (H. Ando, June 22, 1960, 300 m); Umatsunagi-Rashomon (H. Ando, May 21, 1960); Ikura (H. Ando, May 21, 1960, 200 m).

Hiroshima Pref. Saeki-gun: Yuki-cho, Mt. Togo (May 29, 1960, n. 741, 600 m). Asa-gun: Kabe-cho, Nabarakyo (Apr. 22, 1962, n. 2717, 2726, 300-400 m); Mt. Kanmuri (Apr. 2736, 2737, 400-500 m). Yamagata-gun: Kake-cho, Kawanoboridani (May 18, 1958, n. 91, 4070, 400 m); Togochi-cho, Sandankyo (May 24, 1958, n. 238. July 17, 1962, n. 2772, 500-600 m). Hiba-gun: Tojo-cho, Takewatashi (Apr. 30, 1960, n. 1042, 560 m); Shiju (Apr. 30, 1960, n. 1084, 480 m); Taishakukyo (Aug. 8, 1961, n. 2164, 2179, 2183, 2209, 2210, 400-500 m); Mt. Hiba (Aug. 10, 1961, n. 2315, 600-700 m); Kuchiwa-cho, Mt. Kamamine (July 24, 1961, n. 1922, 480-600 m); Hiwa-cho, Konomura (July 24, 1961, n. 1889, 500 m); Saijo-cho, Hirako (Apr. 30, 1961, n. 2273, 340 m). Jinseki-gun: Jinseki-cho, Shinryuko (Aug. 11, 1961, n. 2217, 400 m). Fukayasu-gun: Kamo-cho, Enmeikyo (July 30, 1961, n. 1782, 200-300 m); Ryuzunotaki (July 30, 1961, n. 1763, 300 m).

Yamaguchi Pref. Kuga-gun: Mikawa-cho, Jotobata (May 3, 1963, n. 3446, 3447, 500 m); Negasa-Yamanouchi (May 3, 1963, n. 3477, 100-300 m); Iwayakannon (May 3, 1963, n. 3494, 3495, 300-400 m).

75. **Carex ciliato-marginata** Nakai in Fedde, Repert. 13: 244. 1916.
(Map 76, Fig. 37)

Rhizome densely tufted in small clump, stoloniferous. Culms 5-10 cm tall, obtusely 3-angled, downy. Leaves narrow lanceolate, 0.7-1.8 cm wide, the surface greenish, the reverse light green, purplish-punctulate at the leaf sheath. Basal sheaths short, light yellowish-brown, lusterless, not splitting-fibrous. Spikelets 3-5, erect, the lower peduncled; terminal spikelet staminate, ovate, 0.5-0.8 cm long, 3-4 mm thick; lateral spikelets androgynous (staminate at apex), 4-8 mm long, 4 mm thick. Bracts bladeless, sheathed. Scales light green whitish membranous-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales ovate, 3 mm long, 1.5-2 mm wide, conspicuously ciliate-margined; staminate scales elliptic, 4-4.5 mm long, 1-1.5 mm wide, ciliate-margined. Utricles obovate, greenish, 3-3.5 mm long, 1 mm thick, hairy, nerved, purplish-punctulate, short-beaked with truncate mouth at apex, short-stiped at base. Achenes ovate-elliptic, obtusely 3-angled, 1.6 mm long, about 1 mm wide, emarginate, truncate at base; the style short, not thickened at base; stigmas 3.

Nom. Jap.: Ke-taganeso.

Hab.: Rather dry or moist soil, usually near forests or in grasslands; rather rare; frequent in sunny places.

Distr.: Japan (Honshu, Shikoku, Kyushu), Korea, Manchuria.

Specimens examined. Hiroshima Pref. Asa-gun: Mt. Bizenbo (June 11, 1961, n. 1401, 500 m). Yamagata-gun: Chiyoda-cho, Mt. Ogake (May 24, 1959, n. 476, 4713, 610 m); Geihoku-cho, Yawata-kogen (Aug. 24, 1957, n. 4662, 800 m); Oasa-cho, Mt. Kanbiki (May 28, 1961, n. 1193, 1194, 500 m). Takata-gun: Yachiyo-cho, Mt. Dotoko (June 11, 1961, n. 1386, 620 m); Mukaihara-cho, Mt. Hiraune (June 1, 1961, n. 1727, 320 m). Kamo-gun: Shiwa-cho,

Namitakiji (May 4, 1958, n. 350, 4699, 400 m); Fukutomi-cho, Mt. Nishihara (June 2, 1961, n. 1263, 400 m). Sera-gun: Seranishi-cho, Oguni (June 23, 1961, n. 1461, 1481, 380 m); Oyamadani (June 23, 1961, n. 1991, 500 m). Ashina-gun: Kyowa-mura, Yokodani (July 14, 1961, n. 2021, 300 m); Fujio-mura, Kawaidani (Aug. 12, 1961, n. 2104, 200 m). Hiba-gun: Tojo-cho, Taishakukyo (S. Tanabe, Aug. 3, 1961).

75. **Carex siderosticta** Hance in Journ. Linn. Soc. 13: 89. 1873. (Map 77, Fig. 37)

Rhizome slender stoloniferous, thickened. Culms 10-35 cm tall, obtusely 3-angled smooth. Leaves oblate, broad lanceolate, greenish, thin, 0.6-3 cm wide, conspicuously 3-nerved, the reverse sparsely downy, purplish-punctulate at the leaf sheath. Basal sheaths bladeless, yellowish-brown, lusterless, not splitting-fibrous. Spikelets 4-5, androgynous (staminate at apex), 1-1.5 cm long, 3-4 mm thick, erect, peduncled, usually bearing 1 in the bract sheath. Bracts bladeless, sheathed. Scales oblong, light green, whitish membranous-margined, not ciliate-margined; the scale shoulder not serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales 3 mm long, 3 mm wide; staminate scales 4-4.5 mm long, 2 mm wide, the midrib ferruginous-punctulate, cuspidate at base. Utricles elliptic, dark green, 2 mm long, 1.5 mm thick, blabrous, nerved, conspicuously short-beaked with truncate mouth at apex, short-stiped at base. Achenes elliptic, acutely 3-angled, sessile, truncate at base; the style short, erect, not thickened at base; stigmas 3.

Nom Jap.: Taganeso (Sasa-suge).

Hab.: Rather wet or moist soil, usually near forests or in grasslands; common; frequent in sunny places.

Distr.: China, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea, Manchuria.

Specimens examined. Hiroshima Pref. Saeki-gun: Yoshiwa-mura, Mt. Kanmuri (May 22, 1960, n. 2081, 900 m); Kanmuri-kogen (May 22, 1960, n. 790, 807, 800 m). Yamagata-gun: Kake-cho, Takiyamakyo (June 12, 1960, n. 2481, 400 m); Geihoku-cho, Sayoto (June 10, 1958, n. 2514, 800 m); Mt. Uzuki (June 12, 1960, n. 838, 900 m); Yawata-kogen (Aug. 12, 1958, n. 2518, 800 m); Oasa-cho, Mt. Kanbiki (May 28, 1961, n. 1192, 700 m). Takata-gun: Midori-cho, Mt. Inufushi (July 8, 1961, n. 1655, 600 m); Koda-cho, Mt. Otsuchi (July 1, 1961, n. 1730, 1732, 1746, 300 m); Takamiya-cho, Rokurohara (July 8, 1961, n. 1681, 300 m). Kamo-gun: Shiwa-cho, Namitakiji (May 4, 1958, n. 4061, 400 m); Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1284, 500 m); Daiwa-cho, Kamikusai (June 2, 1961, n. 1292, 300 m). Ashina-gun: Kyowa-mura, Yokodani (July 14, 1961, n. 2020, 300 m); Fujio-mura, Kawaidani (Aug. 12, 1961, n. 2007, 200 m). Konu-gun: Mt. Ko (July 13, 1961, n. 1549, 500 m); Joge-cho (July 13, 1961, n. 1949, 500 m); Konu-cho, Mt. Kobo (July 13, 1961, n. 1556, 500 m). Jinseki-gun: Sanwa-cho, Inutsuka (Aug. 12, 1961, n. 2063, 400 m); Toyomatsu-cho, Mt. Yonami (Aug. 12, 1961, n. 2066, 600 m). Futami-gun: Funo-mura, Mt. Menkame (July 21, 1961, n. 1592, 1600, 600 m); Sakugi-mura, Okamibuchi (July 21, 1961, n. 1571, 760 m); Kisa-cho, Yasuda (July 13, 1961, n. 1530, 1535, 360 m). Hiba-gun: Tojo-cho, Mt. Dogo (Sept. 25, 1960, n. 871, 1200 m); Takano-cho, Oka (July 28, 1961, n. 1828, 600 m); Mt. Kenashi (July 28, 1961, n. 1862, 800 m); Mt. Sarumasa (July 28, 1961, n. 1821, 900 m); Hiwa-cho, Mt. Kuroishi (July 28, 1961, n. 1841, 700 m).

Tottori Pref. Tottori: Mt. Hisamatsu (H. Yokogawa, May 6, 1959, 200 m). Saihaku-gun: Mt. Daisen (Sept. 23, 1960, n. 3166, 800 m).

Shimane Pref. Oda: Mt. Sanbe (June 5, 1960, n. 3075, 3087, 3096, 1100 m). Iishi-gun: Akagi-cho, Akana-toge (July 21, 1961, n. 3019, 500 m). Naka-gun: Kanagi-mura, Yune (June 12, 1961, n. 3019, 500 m).

Yamaguchi Pref. Abu-gun: Kawakami-mura, Chomonkyo (Sept. 23, 1961, n. 3205, 200 m); Ato-cho. (Sept. 23, 1961, n. 3180, 220 m).

Table 30.

Parts	Taxa	<i>C. pachygyna</i>	<i>C. ciliato-marginata</i>	<i>C. siderosticta</i>
Rhizome		stolonless	stoloniferous	stoloniferous
Length of the internode in the rhizome		short	short	long
Thickening of the rhizome		conspicuous	indistinct	indistinct
Leaf sheaths		not punctulate	purplish-punctulate	purplish-punctulate
Basal sheaths		reddish-brown	light brown	yellowish-brown
Spikelets		globose, terminal spikelet androgynous, lateral spikelets bearing 2-3 in the bract sheath	ovate, terminal spikelet staminate, lateral spikelets bearing 1 in the bract sheath	short-terete, terminal spikelet androgynous, lateral spikelets bearing 1 in the bract sheath
Scales		light green, beardless, not ciliate-margined, staminate scales not punctulate	light brown, bearded, ciliate-margined, staminate scales not punctulate	light green, beardless, ciliate-margined, staminate scales ferruginous-punctulate
Utricles		glabrous, beakless, not punctulate	hairy, short-beaked, purplish-punctulate	glabrous, short-beaked, purplish-punctulate

Note: *C. ciliato-marginata*, as compared with the other two species, has more conspicuous cilia at leaves, leaf sheaths, basal sheaths, scales and utricles.

Sect. 26. **Montanae** Fries, Corp. Fl. Suec. 188. 1835.

Rhizome densely tufted, stoloniferous. Culms acutely 3-angled scabrous. Leaves oblate, scabrous-margined. Basal sheaths bladeless, splitting-reticulate. Spikelets erect, not peduncled; terminal spikelet staminate; lateral spikelets pistillate. Bracts sheathless, setaceous or scaly. Scales bearded or beardless; the scale shoulder serrulate-margined or not serrulate-margined. Utricles hairy, nerved, short-beaked with bidentate mouth, short-stiped. Stigmas 3.

77, **Carex mira** Kükenth. in Bull. Herb. Boiss. 2. sér. 5: 1161. 1905.
(Map 78, Fig. 38)

Rhizome densely tufted, stoloniferous. Culms 11-20 cm tall, acutely 3-angled, scabrous. Leaves oblate, stiffish, light green, 1.5-2 mm wide, scabrous-margined; the dead leaf persistent. Basal sheaths bladeless, lustered, reddish-purple, splitting-reticulate. Spikelets 2-3, erect, not peduncled; terminal spikelet staminate, broad linear, 1.2-1.5 cm long, 2-2.5 mm thick; lateral spikelets pistillate, elliptic, 7-8 mm long, 2.5-3 mm thick. Bracts sheathless, scaly. Scales blackish-purple, bearded, whitish membranous-margined; the scale shoulder serrulate-margined; the midrib light greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales elliptic, 3-3.5 mm long, 2 mm wide; staminate scales oblong, 4-4.5 mm long, 2 mm wide. Utricles ovate-fusiform, the upper blackish-purple, the lower yellowish-brown, 3 mm long, 1 mm thick hairy, slightly nerved, short-beaked with bidentate mouth at apex, short-stiped at base. Achenes fusiform, obtusely 3-angled, about 2 mm long, 1 mm thick truncate at base;

the style, slender, erect, not thickened at base; stigmas 3.

Nom. Jap.: Sawahime-suge (Sawahina-suge, Koraihina-suge).

Hab.: Rather wet or moist soil, usually near streams or in cliffy places; very rare; frequent in sunny places.

Distr.: Japan (Honshu), Korea.

Specimens examined. Hiroshima Pref. Asa-gun: Kabe-cho, Nabarakyo (Apr. 17, 1960, n. 630, 4747, 300 m).

Sect. 27. **Digitatae** Fries, Corp. Fl. Suec. 187. 1835.

Rhizome densely tufted, stolonless. Culms slenderly 3-angled, scabrous or smooth. Leaves oblate, scabrous-margined. Basal sheaths lusterless, splitting-fibrous or reticulate. Spikelets erect; terminal spikelet staminate; lateral spikelets pistillate, peduncled. Bracts cylindric-sheathed. Scales: the scale shoulder serrulate-margined; the nerve mostly reaching to apex; pistillate scales bearded. Utricles hairy, nerved, short-beaked, short-stiped. Stigmas 3.

78. **Carex lanceolata** Boott in A. Gray, Narr. Exped. Perry 2: 326. 1857.
(Map 79, Fig. 39)

Rhizome densely tufted, clothed with blackish-brown fibers, stolonless. Culms 10-40 cm tall, slenderly 3-angled, scabrous. Leaves oblate, thin, green, 1-2 mm wide, scabrous-margined; the dead leaf spiral, blackish-punctulate. Basal sheaths reddish-brown, splitting-fibrous or reticulate. Spikelets 3-6, erect; terminal spikelet staminate, clavate-linear, 1-1.5 cm long, 1.5-2 mm thick; lateral spikelets pistillate, short-terete, 1-3 cm long, 2.5-3 mm thick, peduncled. Bracts bladeless, cylindric-sheathed, 1-3 cm long, the dorsal light reddish-brown, whitish membranous-margined. Scales reddish-brown; the scale shoulder serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; the margin whitish membranous; pistillate scales ovate, bearded, 5 mm long, 2-2.5 mm wide; staminate scales oblong, beardless, 5-7 mm long, 2 mm wide. Utricles obovate, light green, 3 mm long, 1-1.5 mm thick, hairy, nerved, roundish short-beaked with truncate mouth at apex, extrorse thick-stiped at base. Achenes obovate, obtusely 3-angled, 2 mm long, about 1 mm wide, truncate-stipitate; the style short, slightly curved, not thickened at base; stigmas 3.

Nom. Jap.: Hikage-suge.

Hab. Rather wet or moist soil, usually in forests, in fields and in cliffy places; common; frequent in sunny places.

Distr.: China, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Korea, Manchuria, Siberia.

Specimens examined. Okayama Pref. Kojima: Shimotsui (K. Okudomi, July 29, 1960, 20 m) Niimi: Atesukyo (H. Ando, June 22, 1960, 300 m).

Hiroshima Pref. Hiroshima: Mitaki-cho (May 24, 1959, n. 4194, 120 m); Koi-cho, Yuzukidani (June 22, 1957, n. 268, 200 m); Motoujina-cho (Apr. 5, 1957, n. 4195, 50 m); Yamate-cho (May 3, 1959, n. 4204, 100 m); Ninoshima (July 29, 1957, n. 2395, 50 m); Ushida-cho (Apr. 30, 1960, n. 2393, 100 m). Kure: Nikokyo (June 25, 1960, n. 2406, 200 m); Tenno-cho, Yakeyama (June 26, 1960, n. 2412, 300 m); Aga-cho (Apr. 29, 1961, n. 2425, 180 m); Kure (June 25, 1960, n. 2421, 200 m); Nigata-cho (Apr. 29, 1961, n. 2420, 200 m). Mihara: Mt. Omine (July 16, 1961, n. 1562, 500 m); Sasaki-jima (May 30, 1961, n. 2435, 200 m); Mt. Sakura (May 30, 1961, n. 1241, 180 m). Onomichi: Momoshima (July 15, 1961, n. 2051, 50 m); Mitsukoshi (July 15, 1961, n. 2048, 120 m); Onomichi (July 15, 1961, n. 2055, 170 m); Fukuyama: Akasaka (July 16, 1961, n. 1497, 80 m); Kumagamine (July 31, 1961, n. 1703, 200 m); Mt. Hiko (July 31, 1961, n. 1749, 300 m); Daimon-cho (July 30, 1961, n. 1755, 60 m). Innoshima: Habu (May 26, 1961, n. 1163, 100 m); Mt. Oku (May 26, 1961, n. 1157, 300 m); Sannosho (May 26, 1961, n. 1158, 120 m); Mukunoura (May 26, 1961, n. 1153, 60 m);

Miyoshi: Awaya (July 13, 1961, n. 2430, 220 m). Matsunaga: Higashi-cho (July 16, 1961, n. 2040, 60 m). Fuchu: Shimokawabe (July 16, 1961, n. 1490, 150 m). Shobara: Nanatsukahara (June 1, 1958, n. 2376, 300 m); Ueno-koen (Aug. 8, 1961, n. 2368, 160 m); Akagawa (Aug. 8, 1961, n. 2379, 300 m); Motomura (Aug. 8, 1961, n. 2381, 300 m); Haruta (Aug. 8, 1961, n. 2383, 300 m). Otake: Ogata-cho (May 26, 1961, n. 2400, 100 m). Takehara: Mt. Asahi (May 24, 1961, n. 1972, 200 m); Takehara (May 24, 1961, n. 1973, 180 m). Aki-gun: Aki-cho, Mt. Takao (May 3, 1960, n. 2639, 200 m); Umagi (May 4, 1957, n. 2678, 200 m); Fuchu-cho, Mikumari-kyo (June 27, 1958, n. 185, 50 m, May 3, 1960, n. 697, 698, 704, 50-80 m); Fuchu (June 27, 1958, n. 2640, 30 m); Funakoshi-cho, Funakoshi-toge (Apr. 1, 1960, n. 2653, 20 m); Mt. Iwataki (Apr. 1, 1958, n. 422, 423, 4063, 100 m, May 5, 1958, n. 96, 50 m); Takeura (Apr. 29, 1958, n. 4167, 30 m); Nishi (Apr. 1, 1960, n. 500, 300 m); Kumano-cho, Nakamizo (May 3, 1960, n. 2639, 200 m); Mt. Jo (July 12, 1958, n. 439, 40 m); Akaho-toge (July 12, 1958, n. 433, 436, 450 m); Yano-cho, Mt. Ege (May 26, 1957, n. 2671, 300 m); Egedani (May 26, 1957, n. 2668, 200 m); Etajima-cho, Kirikushi (Apr. 19, 1959, n. 4732, 40 m); Kumandake (Apr. 19, 1959, n. 327, 300 m); Kaita-cho, Mt. Kingatoro (Apr. 20, 1958, n. 4066, 350 m); Higashikaita-Terasako (Apr. 2, 1960, n. 2691, 120 m); Higashikaita (Apr. 2, 1960, n. 564, 571, 120 m); Higashikaita-Nishitani (Apr. 2, 1960, n. 2662, 50 m); Higashikaita-Hatadani (Apr. 2, 1960, n. 539-541, 544, 130 m); Furu-toge (Apr. 2, 1960, n. 2692, 120 m); Kaitaichi (Apr. 2, 1960, n. 2693, 40 m); Mt. Hinoura (Apr. 5, 1958, n. 4065, 150 m); Senogawa-cho, Mt. Hebiwa (Apr. 3, 1960, n. 2633, 150 m); Hataka (Apr. 2, 1958, n. 2648, 100 m); Mt. Dosho (June 9, 1957, n. 2686, 400 m); Mt. Chausu (Apr. 1, 1960, n. 513, 170 m); Hataka-Mizutani (Apr. 1, 1960, n. 531, 532, 140 m); Mt. Tengubo (June 9, 1957, n. 2652, 500 m); Sasa-toge (Apr. 1, 1960, n. 503, 300 m); Kamagari-cho (Apr. 28, 1961, n. 2688, 200 m); Shimokamagari-cho (Apr. 28, 1961, n. 2689, 220 m); Kurahashi-cho (Apr. 23, 1961, n. 969, 140 m); Ondo-cho (Apr. 23, 1961, n. 970, 200 m); Kumanoato-mura (May 22, 1961, n. 1110, 170 m). Saeki-gun: Itsukaichi-cho (June 18, 1961, n. 2358, 140 m); Hatsukaichi-cho, Mt. Gokurakuji (June 18, 1961, n. 1437, 600 m); Hatsukaichi (June 18, 1961, n. 1437, 600 m); Yuki-cho, Yuki (Apr. 24, 1961, n. 2604, 380 m); Mt. Togo (May 29, 1960, n. 2596, 300 m); Go (Apr. 24, 1960, n. 2609, 340 m); Ishigayakyo (Apr. 24, 1960, n. 652, 665, 400 m); Saiki-cho, Watanosedamu (Nov. 22, 1959, n. 2598, 280 m); Kuroutsukyo (May 22, 1960, n. 2094, 500 m); Yoshiwamura, Mt. Kanmuri (May 22, 1960, n. 344, 900 m); Kanmuri-kogen (May 22, 1960, n. 343, 4708, 800 m); Miyajima (June 27, 1961, n. 2364, 300 m); Nomi-cho (Apr. 16, 1961, n. 909, 910, 100 m); Okimi-cho (Apr. 16, 1960, n. 911, 300 m); Ogaki-cho (Apr. 16, 1961, n. 917, 40 m). Asa-gun: Sato-cho, Mt. Abu (Apr. 21, 1957, n. 2323, 200 m); Numata-cho, Tomo (H. Ando, June 10, 1951); Asa-cho, Imuro (May 29, 1961, n. 2347, 200 m); Kabe-cho, Nabarakyo (Apr. 17, 1960, n. 588, 599, 601, 619, 300 m); Nenotani (June 11, 1961, n. 1414, 240 m); Mt. Bizenbo (June 11, 1961, n. 1409, 220 m); Koyo-cho, Mt. Takahachi (Apr. 20, 1958, n. 289, 400 m); Yamagata-gun: Kake-cho, Takiyamakyo (June 12, 1960, n. 2485, 400 m); Tsutsuga-mura, Mt. Ichima (July 9, 1961, n. 2506, 600 m); Togochi-cho, Sandankyo (May 24, 1958, n. 447, 500 m); Mt. Shinyu (Nov. 12, 1959, n. 431, 4757, 900 m); Geihoku-cho, Mt. Uzuki (June 21, 1960, n. 834, 800 m); Odomaridamu (June 21, 1960, n. 2476, 640 m); Yawata-kogen (Aug. 10, 1959, n. 2519, 800 m); Oasa-cho, Mt. Kanbiki (May 28, 1961, n. 1187, 700 m); Yokogawa (May 28, 1961, n. 2470, 440 m); Tahara (May 28, 1961, n. 2461, 500 m); Toyohira-cho, Shirobara (May 28, 1961, n. 2508, 420 m). Takata-gun: Yoshida-cho, Mt. Kohori (July 8, 1961, n. 1651, 280 m); Yachiyo-cho, Mt. Dotoko (June 11, 1961, n. 1388, 620 m); Kamine-toge (June 11, 1961, n. 2135, 300 m); Koda-cho, Mt. Otsuchi (July 1, 1961, n. 1728, 1742, 300 m); Kotachieki-guchi (July 1, 1961, n. 2137, 280 m); Mukaihara-cho, Mt. Hiraune (July 1, 1961, n. 1721, 320 m). Kamo-gun: Saijo-cho (Apr. 29, n. 2582, 300 m); Hachihonmatsu-cho (June 5, 1961, n. 2553, 280 m); Kurose-cho, Kamijo (May 21, 1961, n. 999, 200 m); Mt. Kota (May 21, 1961, n. 1002, 300 m); Takaya-cho, Inagi (June 2, 1961, n. 2573, 280 m); Zoga (June 2, 1961, n. 2562, 300 m); Shiwa-cho, Namitakiji (May 15, 1959, n. 348, 4702, 400 m);

Kochi-cho, Onishi (June 2, 1961, n. 2537, 400 m); Toyosaka-cho, Mt. Itanabe (June 2, 1961, n. 1277, 1282, 400 m); Nakaonchi (June 2, 1961, n. 2529, 400 m); Daiwa-cho, Kamikusai (June 2, 1961, n. 1318, 320 m); Atodani (June 24, 1961, n. 2557, 360 m). Toyota-gun: Kawajiri-cho, Mt. Noro (June 4, 1961, n. 1342, 1353, 1372, 800 m); Akitsu-cho (June 4, 1961, n. 1329, 80 m); Yasuura-cho (June 4, 1961, n. 2112, 400 m); Hongo-cho (May 30, 1961, n. 2113, 120 m); Toyohama-mura (May 24, 1961, n. 1123, 200 m); Yutaka-cho (May 24, 1961, n. 2099, 160 m); Osaki-cho (May 23, 1961, n. 2096, 200 m); Higashino-mura (May 23, 1961, n. 2109, 150 m); Kinoe-cho, Mt. Kanmine (May 23, 1961, n. 2104, 350, m); Setoda-cho, Mt. Kannon (May 30, 1961, n. 1215, 300 m). Mitsugi-gun: Kui-cho, Egi (July 16, 1961, n. 1941, 380 m); Mukaihigashi-cho (July 2, 1961, n. 1709, 40 m); Mukaijima-cho, Mt. Takami (July 2, 1961, n. 1686, 140 m); Enooku (July 2, 1961, n. 1937, 40 m). Sera-gun: Kozan-cho, Mt. Shin (June 23, 1961, n. 1473, 420 m); Imaichi (June 23, 1961, n. 5012, 400 m); Otani (June 23, 1961, n. 5013, 380 m); Mt. Une (June 23, 1961, n. 2002, 600 m); Sera-cho, Hongo (June 23, 1961, n. 2001, 480 m); Seranishi-cho, Roppongi (June 23, 1961, n. 5008, 500 m); Oguni (June 23, 1961, n. 1464, 380 m); Mt. Hatakoya (June 23, 1961, n. 1454, 480 m); Otsubo (June 23, 1961, n. 5009, 440 m); Oyamadani (June 23, 1961, n. 5010, 480 m); Iwayadani (June 23, 1961, n. 5011, 420 m). Numakuma-gun: Utsumi-cho, Mt. Taka (July 2, 1961, n. 1694, 160 m); Yokojima (July 2, 1961, n. 1715, 200 m); Numakuma-cho (July 2, 1961, n. 1711, 120 m). Fukayasu-gun: Kannabe-cho (July 30, 1961, n. 1760, 140 m); Kamo-cho, Enmeikyo (July 30, 1961, n. 1779, 240 m). Ashina-gun: Kyowa-mura, Yokodani (July 14, 1961, n. 2018, 300 m); Fujio-mura, Kawaidani (Aug. 12, 1961, n. 2011, 200 m); Ashida-cho, Mitogi (Aug. 13, 1961, n. 2034, 280 m); Ekiya-cho, Nakagumi (Aug. 13, 1961, n. 2023, 80 m); Shinichi-cho, Kamitode (Aug. 13, 1961, n. 2027, 150 m). Konu-gun: Joge-cho (July 13, 1961, n. 1947, 500 m); Soryo-cho, Mt. Ko (July 13, 1961, n. 1545, 500 m); Konu-cho, Mt. Kobo (June 13, 1961, n. 1554, 500 m). Futami-gun: Sanwa-cho, Itagi (July 1, 1961, n. 1960, 320 m); Kimita-mura, Kamiizumi (July 24, 1961, n. 1875, 300 m); Funo-mura, Mt. Menkame (July 21, 1961, n. 1599, 500 m); Sakugi-mura, Okamibuchi (July 21, 1961, n. 1579, 760 m); Kisa-cho, Kisa (July 13, 1961, n. 1543, 240 m); Yasuda (July 13, 1961, n. 1536, 360 m); Mirasaka-cho (July 13, 1961, n. 1523, 1525, 240 m). Hiba-gun: Saijo-cho, Mt. Hiba (Aug. 8, 1961, n. 2314, 700 m); Hirako (Apr. 30, 1961, n. 2275, 2285, 340 m); Tojo-cho, Taishakukyo (Aug. 9, 1961, n. 2145, 2175, 2204, 2233, 400-500 m); Takewatashi (Apr. 30, 1961, n. 1025, 560 m); Shiju (Apr. 30, 1961, n. 1069, 480 m); Kuchiwa-cho, Mt. Kamamine (July 24, 1961, n. 1911, 1923, 480 m); Takano-cho, Mt. Kenashi (July 28, 1961, n. 1863, 600 m); Oka (July 28, 1961, n. 1831, 600 m); Mt. Sarumasa (July 28, 1961, n. 1820, 800 m); Hiwa-cho, Konomura (July 28, 1961, n. 1898, 500 m).

Tottori Pref. Saihaku-gun: Mt. Daisen (Sept. 23, 1960, n. 3104, 800 m); Mt. Goen (Sept. 23, 1960, n. 3176, 800 m).

Shimane Pref. Ooda: Mt. Sanbe (June 5, 1960, n. 3094, 900 m). Iishi-gun: Akagi-cho, Akana-toge (July 21, 1961, n. 3020, 500 m); Tonbara-cho, Mt. Kotobiki (July 27, 1961, n. 3008, 700 m). Naka-Pgun: Kanagi-mura, Yune (June 12, 1960, n. 3050, 500 m).

Yamaguchi Pref. Hagi: Mt. Kasa (Aug. 16, 1960, n. 3083, 100 m). Kuga-gun: Kuga-cho, Yazu (Dec. 11, 1960, n. 3142, 100 m). Yoshiki-gun: Ogori-cho, Kamagabuchi (Sept. 24, 1961, n. 3234, 20 m). Mine-gun: Akiyoshi-cho, Akiyoshidai (Aug. 9, 1959, n. 3058, 3 224, 220 m); Akiyohido (Sept. 24, 1961, n. 3229, 100 m). Abu-gun: Kawakami-mura, Chomonkyo (Sept. 23, 1961, n. 3207, 200 m); Ato-cho (Sept. 23, 1961, n. 3191, 220 m).

Sect. 28. *Hirtae* Tuckerm., Enum. Meth. 14. 1843.

Rhizome sparsely tufted, stoloniferous or stolonless. Culms acutely 3-angled, scabrous. Leaves oblate, scabrous-margined. Basal sheaths bladeless, lustered, mostly splitting-reticulate. Spikelets erect, peduncled; terminal spikelets (rarely 2-3) staminate; lateral spikelets

pistillate. Bracts sheathed or sheathless, foliaceous. Scales bearded or beardless; the scale shoulder serrulate-margined or not serrulate-margined; the midrib greenish, 1-nerved; the nerve reaching to apex. Utricles hairy, nerved, long-beaked with bidentate mouth, short-stiped. Stigmas 3.

Key to the species.

1. Rhizome stolonless *C. ligulata*
 1. Rhizome stoloniferous *C. miyabei*

79. *Carex ligulata* Nees in Wight, Contr. Bot. Ind. 127. 1834. (Map 80, Fig. 40)

Rhizome sparsely tufted, stolonless. Culms 40-80 cm tall, acutely 3-angled, downy. Leaves oblate, thin, stiffish, 0.4-1 cm wide, the surface dark green, the reverse glaucous, scabrous-margined; the leaf sheath hairy, purplish-punctulate, bearing the ferruginous tongue of the leaf. Basal sheaths dark reddish-purple, lustered, not splitting-fibrous. Spikelets 5-8, erect, peduncled; terminal spikelets staminate, linear, 1.5 cm long, 1-1.5 mm thick; lateral spikelets pistillate, terete, 2-4.5 cm long, 4-6 mm thick. Bracts sheathed foliaceous. Scales whitish membranous-margined; the scale shoulder serrulate-margined; the midrib greenish, conspicuously 1-nerved; the nerve reaching to apex; pistillate scales ovate, light ferruginous, bearded, 3 mm long, 1.5 mm wide; staminate scales lanceolate-oblong, brown, beardless, 3 mm long, 2 mm wide. Utricles broad obovate, hairy, nerved, 3-4 mm long, 1-1.5 mm thick, dark green, long-beaked with bidentate mouth at apex, truncate short-stiped at base. Achenes obovate, obtusely 3-angled, 2.5 mm long, about 1 mm wide, truncate at base; the style short, globose at base; stigmas 3.

Nom. Jap.: Satsuma-suge.

Hab.: Wet or moist soil, usually near forests; rather rare; frequent in shady places.

Distr.: Ceylon, India, Himalaya, China, Formosa, Japan (Honshu, Shikoku, Kyushu).

Specimens examined. Hiroshima Pref. Hiroshima: Koi-cho, Yuzukidani (June 22, 1957, n. 267, 4006, 4020, 200 m). Fukayasu-gun: Kamo-cho, Ryuzunotaki (June 30, 1961, n. 1765-1768, 300 m).

Yamaguchi Pref. Oshima-gun: Oshima-cho, Mt. Kano (Dec. 15, 1957, n. 4016, 500 m). Tsuno-gun: Tsuno-cho, Hirase-Kindake (Apr. 22, 1962, n. 3286, 300-400 m).

80. *Carex miyabei* Franch. in Bull. Soc. Philom. Paris. 8. sér. 7: 52. 1895. (Map 81, Fig. 40)

Rhizome sparsely tufted, long-stoloniferous. Culms 50-65 cm tall, slightly acutely 3-angled, the upper scabrous. Leaves oblate, dark green, slightly stiff, 3-5 mm wide, scabrous-margined; the leaf sheath long. Basal sheaths bladeless, reddish-purple, lustered, splitting-reticulate, thready-netted. Spikelets 5-6, erect, the upper not peduncled, the lower peduncled; terminal spikelets 2-3, staminate, linear, 1.5-2.5 cm long, 2-3 mm thick; lateral spikelets 2-3, pistillate, short or long cylindric, 1.5-3.5 cm long, 4-5 mm thick. Bracts sheathless, the upper setaceous, the lower foliaceous. Scales: the midrib greenish, conspicuously 1-nerved; pistillate scales narrow ovate, dark reddish-brown, 2.5-3 mm long, about 1.5 mm wide, bearded, the scale shoulder not serrulate-margined, the nerve reaching to apex; staminate scales oblong, beardless, reddish, 4-4.5 mm long, 2 mm wide, the scale shoulder serrulate-margined, the nerve reaching to apex. Utricles broad obovate dark green, 3.5-4 mm long, about 1 mm thick, hairy, nerved, long-beaked with reddish-brown bidentate mouth at apex, slightly short-stiped at base. Achenes elliptic-ovate, obtusely 3-angled, 2 mm long, about 1 mm wide, short-stiped at base; the style short, erect, not thickened at base; stigmas 3.

Nom. Jap.: Birodo-suge.

Hab.: Rather wet or moist soil, usually near marshy places; rather rare; frequent in sunny places.

Distr.: Japan (Hokkaido, Honshu, Kyushu).

Specimens examined. Hiroshima Pref. Yamagata-gun: Oasa-cho, Otsuka (May 28, 1961, n. 1168, 1180, 440 m). Jinseki-gun: Jinseki-cho, Fukunaga (S. Tanabe, May 18, 1961, 400 m).

Distribution patterns of the Carices in Hiroshima Prefecture

In this chapter were treated the distribution patterns of the Carices in Hiroshima Prefecture. The distribution patterns presently known of the 72 species and 5 varieties found in the prefecture are grouped into 8 patterns, and these patterns are summarized as follows:

Pattern 1. The species of this pattern are widely distributed in all over the areas. They include *C. biwensis* (Map 4), *C. coonica* (Map 72), *C. dikinsii* (Map 48), *C. dispalata* (Map 36), *C. hakonensis* (Map 6), *C. heterolepis* (Map 14), *C. ischnostachya* (Map 37), *C. lanceolata* (Map 79), *C. leucochlora* (Map 57), *C. maximowiczii* (Map 20), *C. maculata* (Map 29), *C. nakiri* (Map 27), *C. nervata* (Map 49), *C. omiana* (Map 10), *C. otaruensis* (Map 16), *C. stenostachys* (Map 68) and *C. thunbergii* (Map 13).

Pattern 2. The species of this pattern are mostly distributed in mountainous areas. They are *C. blepharicarpa* (Map 30), *C. ciliato-marginata* (Map 76), *C. curvicolis* (Map 28), *C. daisenensis* (Map 66), *C. foliosissima* (Map 73), *C. morrowii* (Map 71), *C. multifolia* (Map 65), *C. nubigena* (Map 8), *C. pachygyna* (Map 75), *C. phacota* var. *gracilispica* (Map 22), *C. reinii* (Map 31) and *C. siderosticta* (Map 77).

Pattern 3. The species of this pattern are found in the western half of the prefecture, ranging from coastal areas to mountainous areas. They are *C. dispalata* var. *takeuchii* (Map 35), *C. flabellata* (Map 18) and *C. shimidzensis* (Map 24).

Pattern 4. The species of this pattern are mainly distributed from coastal areas to inland areas and rather rare in mountainous areas. They are *C. forficula* (Map 15), *C. gibba* (Map 12) and *C. pocilliformis* (Map 67).

Pattern 5. The species of this pattern are distributed separately in the northeastern part and southwestern part, and less frequent in mountainous areas. Its members are *C. alterniflora* (Map 62), *C. bostrichostigma* (Map 40), *C. dimorpholepis* (Map 23), *C. doniana* (Map 45), *C. duvaliana* (Map 63), *C. fernaldiana* (Map 61), *C. incisa* (Map 17), *C. japonica* (Map 44), *C. ligulata* (Map 80), *C. macroglossa* (Map 42), *C. mitrata* var. *aristata* (Map 50), *C. miyabei* (Map 81), *C. scabriculum* (Map 26) and *C. sikokiana* (Map 60).

Pattern 6. The species of this pattern are distributed in western mountainous areas. They are *C. confertiflora* (Map 32), *C. grallatoria* (Map 2), *C. kiotensis* (Map 21), *C. mira* (Map 78), *C. mollicula* (Map 46), *C. pisiformis* (Map 64), *C. geihokuensis* (Map 53), *C. tashiroana* (Map 69) and *C. vesicaria* (Map 47).

Pattern 7. The species of this pattern are distributed in eastern mountainous areas. *Carex aphanolepis* (Map 43), *C. autumnalis* (Map 25), *C. fulva* (Map 5), *C. mitrata* var. *bingoensis* (Map 51) and *C. planata* (Map 11) are included in this pattern.

Pattern 8. The species of this pattern are distributed from coastal areas to a part of inland areas. They include *C. akiensis* (Map 56), *C. discoidea* (Map 54), *C. fibrillosa* (Map 55), *C. horikawae* (Map 58), *C. kamagariensis* (Map 70), *C. leucochlora* var. *setouchiensis* (Map 59), *C. nipposinica* (Map 33), *C. phacota* (Map 19), *C. pumila* (Map 39), *C. rhizopoda* (Map 3), *C. rugata* (Map 52) and *C. scabrifolia* (Map 38).

The distribution of every species known at present is, of course, not complete, and further studies of the *Carex* flora of this prefecture would give more localities for each species, resulting in some modification of the distribution patterns described above.

Distribution of the Carices in relation to geological conditions

To know the relation between geological conditions and the distribution of Carices, 216 localities in Hiroshima Prefecture were investigated. These localities were grouped into three geological areas, namely, granitic area, quartz-porphyrific area and limestone area. Fifty-four species observed are shown in table 31. *Carex doniana*, *C. japonica*, *C. lanceolata*, *C. nakiri*, *C. stenostachys* and *C. thunbergii* show almost similar frequencies in three areas. *Carex forficula*, *C. leucochlora*, *C. pocilliformis* and *C. rugata* are more frequent in the granitic area, but *C. incisa*, *C. ischnostachya*, *C. macroglossa*, *C. morrowii*, *C. multifolia*, *C. nubigena*, *C. pachygyna*, *C. reinii* and *C. sikokiana* are less frequent there. In the quartz-porphyrific area, *C. blepharicarpa*, *C. curvicolis* and *C. siderosticta* show high frequencies, but *C. conica* and *C. dispalata* show lower than in other areas. *Carex heterolepis*, *C. gibba*, *C. ischnostachya*, *C. macroglossa* and *C. sikokiana* are more frequent in the limestone area. The results of each area are summarized as follows:

1. The granitic area

This area occupies most portions of Hiroshima Prefecture. 125 localities of granite rock were studied and 48 *Carex* species were found there. Table 31 shows 10 species which are closely connected with this area. *Carex discoidea* and *C. dispalata* var. *takeuchii* are estimated to be a species characteristic of the granitic area. *Carex flabellata*, *C. phacota*, *C. fibrillosa*, *C. daisenensis*, *C. dissitiflora*, *C. mira*, *C. pumila*, *C. scabrifolia* and *C. tashiroana* were collected only in this area, although frequency of occurrence of every species is quite low.

2. The quartz-porphyrific area

This area occupies most of the mountainous regions and also some parts of the coastal regions along the Inland Sea of Seto. Localities investigated are 44, in which 38 *Carex* species were collected. Table 31 shows 2 species which are closely connected with this area. *Carex dickinsii* is estimated to be a quartz-porphyrific species. *Carex fulta* was once collected in this area but never found in other geological areas.

3. The limestone area

Limestone area occupies some parts of the eastern district, the western district and of the coastal regions along the Inland Sea of Seto. 43 localities were explored, and 35 *Carex* species were collected. Table 31 shows 4 species which are closely connected with this area. *Carex autumnalis* and *C. duvaliana* are estimated to be a typical limestone species. *Carex aphanolepis* and *C. planata* have never been collected in the other areas. These species seem to be also limestone species.

In conclusion, most of the species collected are almost indifferent to the geological area, but some ones are closely connected with a certain geological area.

Table 31. Frequencies of Carices' occurrence in three geological areas

Species	Granitic	Quartz-porphyrific	Limestone
	(%)	(%)	(%)
<i>C. leucochlora</i>	96 (77)	19 (43)	25 (58)
<i>C. conica</i>	93 (74)	14 (54)	31 (71)
<i>C. pocilliformis</i>	61 (49)	14 (32)	16 (37)
<i>C. forficula</i>	23 (18)	6 (14)	—
<i>C. rugata</i>	18 (14)	2 (5)	2 (5)
<i>C. mitrata</i> var. <i>aristata</i>	16 (13)	5 (11)	—
<i>C. dispalata</i> var. <i>takeuchii</i>	14 (11)	—	—
<i>C. japonica</i>	12 (10)	3 (7)	3 (7)
<i>C. discoidea</i>	9 (7)	—	—

<i>C. flabellata</i>	5 (4)	—	—
<i>C. phacota</i>	3 (2)	—	—
<i>C. fibrillosa</i>	2 (2)	—	—
<i>C. daisenensis</i>	1 (1)	—	—
<i>C. dissitiflora</i>	1 (1)	—	—
<i>C. mira</i>	1 (1)	—	—
<i>C. pumila</i>	1 (1)	—	—
<i>C. scabrifolia</i>	1 (1)	—	—
<i>C. tashiroana</i>	1 (1)	—	—
<i>C. maximowiczii</i>	28 (22)	17 (39)	15 (35)
<i>C. stenostachys</i>	37 (30)	14 (32)	7 (16)
<i>C. maculata</i>	21 (16)	14 (32)	12 (28)
<i>C. curvicollis</i>	16 (13)	13 (30)	7 (16)
<i>C. multifolia</i>	11 (9)	13 (30)	10 (23)
<i>C. nubigena</i>	8 (6)	12 (27)	9 (21)
<i>C. blepharicarpa</i>	14 (11)	11 (25)	6 (14)
<i>C. incisa</i>	1 (1)	10 (23)	6 (14)
<i>C. morrowii</i>	5 (4)	9 (20)	5 (12)
<i>C. siderosticta</i>	5 (4)	9 (20)	—
<i>C. pachygyna</i>	6 (5)	7 (16)	6 (14)
<i>C. dickinsii</i>	—	7 (16)	—
<i>C. reinii</i>	5 (4)	6 (14)	3 (7)
<i>C. fernaldiana</i>	2 (2)	5 (11)	1 (2)
<i>C. shimidzensis</i>	10 (8)	5 (11)	—
<i>C. doniana</i>	7 (6)	5 (11)	3 (7)
<i>C. scabriculumis</i>	3 (2)	4 (9)	1 (2)
<i>C. pisiformis</i>	1 (1)	2 (5)	—
<i>C. foliosissima</i>	2 (2)	2 (5)	—
<i>C. fulta</i>	—	1 (2)	—
<i>C. lanceolata</i>	98 (78)	37 (84)	38 (88)
<i>C. gibba</i>	33 (26)	15 (34)	19 (44)
<i>C. nakiri</i>	49 (39)	17 (39)	18 (42)
<i>C. heterolepis</i>	30 (24)	14 (32)	17 (40)
<i>C. dispalata</i>	26 (21)	5 (11)	11 (26)
<i>C. duvaliana</i>	—	—	8 (19)
<i>C. sikokiana</i>	3 (2)	3 (7)	6 (14)
<i>C. macroglossa</i>	1 (1)	2 (5)	6 (14)
<i>C. thunbergii</i>	15 (12)	5 (11)	6 (14)
<i>C. ischnostachya</i>	6 (5)	4 (9)	5 (12)
<i>C. autumnalis</i>	—	—	5 (12)
<i>C. bivensis</i>	3 (2)	1 (2)	3 (7)
<i>C. nervata</i>	3 (2)	2 (5)	3 (7)
<i>C. transversa</i>	3 (2)	—	3 (7)
<i>C. planata</i>	—	—	1 (2)
<i>C. aphanolepis</i>	—	—	1 (2)
Number of localities	125	44	43

Habitat conditions of the Carices studied

This chapter was designed to described the relation between occurrence of the Carices and their habitat conditions. The stands investigated total 296 and the Carices observed are 60 species. The stands were grouped into six habitats, namely, stream side, marshy place, pass-side, grassland, forest floor and sandy place. Table 32 shows frequencies of the Carices in each habitat. Results obtained are summarized as follows:

Table 32. Frequencies of Carices' occurrence in six different habitats

Species	Habitats	Stream side	Marshy place	Pass-side	Grassland	Forest floor	Sandy place
		(%)	(%)	(%)	(%)	(%)	(%)
<i>C. heterolepis</i>		26 (74)	5 (21)	—	—	—	—
<i>C. dispalata</i>		19 (54)	4 (17)	—	—	—	—
<i>C. curvicollis</i>		16 (46)	—	—	—	—	—
<i>C. blepharicarpa</i>		13 (37)	—	—	3 (21)	—	—
<i>C. forficula</i>		7 (20)	5 (21)	—	—	—	—
<i>C. dispalata</i> var. <i>takeuchii</i>		7 (20)	—	—	—	—	—
<i>C. thunbergii</i>		7 (20)	3 (13)	—	—	—	—
<i>C. shimidzensis</i>		5 (14)	—	—	—	—	—
<i>C. morrowii</i>		5 (14)	—	—	—	17 (10)	—
<i>C. scabriculumis</i>		4 (11)	—	—	—	—	—
<i>C. biwensis</i>		2 (6)	3 (13)	—	—	—	—
<i>C. rhizopoda</i>		2 (6)	1 (4)	—	—	—	—
<i>C. flabellata</i>		2 (6)	—	—	—	—	—
<i>C. maculata</i>		—	21 (88)	—	—	—	—
<i>C. maximowiczii</i>		20 (57)	21 (88)	—	—	—	—
<i>C. otaruensis</i>		—	13 (54)	—	—	—	—
<i>C. omiana</i>		—	13 (54)	—	—	—	—
<i>C. hakonensis</i>		2 (6)	9 (38)	—	—	—	—
<i>C. macroglossa</i>		—	6 (25)	1 (2)	—	—	—
<i>C. dickinsii</i>		—	3 (13)	—	—	—	—
<i>C. dimorpholepis</i>		—	2 (8)	—	—	—	—
<i>C. phacota</i>		—	2 (8)	—	—	—	—
<i>C. phacota</i> var. <i>gracilispica</i>		—	1 (4)	—	—	—	—
<i>C. miyabei</i>		—	1 (4)	—	—	—	—
<i>C. vesicaria</i>		—	1 (4)	—	—	—	—
<i>C. leucochlora</i>		—	—	35 (70)	2 (14)	1 (1)	—
<i>C. nakiri</i>		—	—	22 (44)	—	11 (7)	—
<i>C. gibba</i>		—	—	22 (44)	2 (14)	—	—
<i>C. conica</i>		—	—	21 (42)	—	30 (18)	—
<i>C. pachygyna</i>		—	—	7 (14)	—	2 (1)	—
<i>C. doniana</i>		2 (6)	—	5 (10)	—	—	—
<i>C. ciliato-marginata</i>		—	—	5 (10)	—	4 (2)	—
<i>C. incisa</i>		—	—	5 (10)	—	—	—
<i>C. rugata</i>		—	—	5 (10)	—	—	—
<i>C. transversa</i>		—	—	5 (10)	—	—	—
<i>C. japonica</i>		—	—	4 (8)	—	1 (1)	—
<i>C. ischnostachya</i>		—	—	4 (8)	—	1 (1)	—

<i>C. kiotensis</i>	1 (4)	—	2 (4)	—	—	—
<i>C. alterniflora</i>	—	—	2 (4)	—	—	—
<i>C. aphanolepis</i>	—	—	1 (2)	—	—	—
<i>C. mitrata</i> var. <i>aristata</i>	—	—	1 (2)	—	—	—
<i>C. mollicula</i>	—	—	1 (2)	—	—	—
<i>C. tashirona</i>	—	—	1 (2)	—	—	—
<i>C. ligulata</i>	—	—	1 (2)	—	—	—
<i>C. lanceolata</i>	—	—	5 (10)	6 (43)	38 (23)	—
<i>C. nervata</i>	—	—	2 (4)	6 (43)	1 (1)	—
<i>C. nubigena</i>	—	—	12 (24)	5 (36)	1 (1)	—
<i>C. stenostachys</i>	—	—	9 (18)	4 (29)	6 (4)	—
<i>C. sidersticta</i>	—	—	5 (10)	2 (14)	4 (2)	—
<i>C. multifolia</i>	—	—	7 (14)	—	34 (20)	—
<i>C. pocilliformis</i>	—	—	4 (8)	—	25 (15)	—
<i>C. reinii</i>	—	—	—	—	23 (14)	—
<i>C. foliosissima</i>	—	—	—	—	23 (14)	—
<i>C. sikokiana</i>	—	—	—	—	3 (2)	—
<i>C. duvaliana</i>	—	—	—	—	3 (2)	—
<i>C. fernaldiana</i>	—	—	—	—	3 (2)	—
<i>C. fibrillosa</i>	—	—	—	—	—	7 (50)
<i>C. pumila</i>	—	—	—	—	—	7 (50)
<i>C. kobomugi</i>	—	—	—	—	—	6 (43)
<i>C. arenicola</i>	—	—	—	—	—	3 (21)
<i>C. scabrifolia</i>	—	—	—	—	—	1 (7)
Number of stands	35	24	50	14	169	14

1. Stream side

This place usually consists of very wet soil near streams and is often washed away by the flood. Consequently, this place is almost unstable, especially in open place. The habitats investigated total 35 and the Carices collected are 17 species. In this place, *C. heterolepis* is most frequent, and *C. dispalata* and *C. curvicolis* follow it with a almost similar frequency. *Carex curvicolis*, *C. dispalata* var. *takeuhii*, *C. shimidzensis*, *C. scabriculumis* and *C. flabellata* were found only in this place, and these species are most closely connected with this place.

2. Marshy place

This place is usually wet, sometimes with Sphagnum and is almost stable. *Carex maculata*, *C. maximowiczii*, *C. otaruensis* and *C. omiana* show a higher frequency in this place. *Carex rhizopoda*, *C. phacota* var. *gracilispica*, *C. miyabei* and *C. vesicaria* show a lower frequency. *Carex dickinsii*, *C. dimorpholepis*, *C. maculata*, *C. miyabei*, *C. omiana*, *C. otaruensis*, *C. phacota*, *C. phacota* var. *gracilispica* and *C. vesicaria* were found only in this place, and these species seem to be closely connected with this place.

3. Pass-side

This include pass-sides in mountains and roadsides near houses and is dry or moist in sunny or shady place. This place is often wasted with biotic factors. Therefore, this place is rather unstable. The habitats investigated total 50 and the Carices observed include 27 species. *Carex leucochlora* is most frequent, and *C. gibba*, *C. conica* and *C. nakiri* follow it with a almost similar frequency. *Carex incisa*, *C. rugata*, *C. transversa*, *C. alterniflora*, *C. aphanolepis*, *C. mitrata* var. *aristata*, *C. mollicula*, *C. tashiroana* and *C. ligulata* were found only in this place. These species seem to be closely connected with this place.

4. Grassland

This place is sunny, dry or moist and is comparatively stable. The habitats investigated total 14 and the *Carex* species collected are 8 species. *Carex lanceolata*, *C. nervata* and *C. nubigena* show a higher frequency in this place. *Carex nervata* seems to be closely connected with this place.

5. Forest floor

This place is shady, usually moist, and is almost stable. The habitats investigated total 169 and the *Carex* species observed are 20 species. *Carex lanceolata*, *C. multifolia* and *C. conica* show a higher frequency in this place. *Carex reinii*, *C. foliosissima*, *C. sikokiana*, *C. duvaliana* and *C. fernaldiana* were found only in this place and seem to be closely connected with this place.

6. Sandy place

This place is usually near the coast of sea or rivers, rather unstable, and often becomes dry. The habitats investigated total 14, in which were collected 5 *Carex* species. *Carex fibrillosa*, *C. pumila*, *C. kobomugi*, *C. arenicola* and *C. scabrifolia* were found in this place, of which *C. fibrillosa*, *C. pumila* and *C. kobomugi* are most frequent.

Floral aspect of the Carices in several kinds of forests

The present chapter gives data of the relation between the forest and the Carices. For this investigation, 169 stands of forests were selected, each of which seemed to have characteristic Carices in it. The forests investigated are as follows:

- 1) Evergreen coniferous forests: forest respectively of *Pinus densiflora*, *Cryptomeria japonica*, *Chamaecyparis obtusa*, *Tsuga sieboldii* and others.
- 2) Evergreen broad-leaved forests: forest respectively of *Shiia sieboldii*, *Quercus senophylla*, *Quercus glauca* and others.
- 3) Deciduous broad-leaved forests: forest respectively of *Castanea pubinervis*, *Aesculus turbinata*, *Fagus crenata*, *Fagus japonica* and others.

The Carices found in these forests are 20 species. Table 33 was designed to describe the relation between the three forest groups and the occurrence of *Carex* species. It is apparent that *Carex* species are closely connected with a certain forest group. Results obtained are summarized as follows:

1) Evergreen coniferous forests

From the 73 forests investigated were collected 10 *Carex* species, of which *C. lanceolata*, *C. conica* and *C. pocilliformis* show higher frequencies. *Carex ciliato-marginata* is most closely connected with these forests.

2) Evergreen broad-leaved forests

The forests investigated total 42 and the Carices found are 11 species. *Carex reinii* shows the highest frequency.

3) Deciduous broad-leaved forests

54 forests were investigated and 17 *Carex* species were found there. *Carex multifolia*, *C. foliosissima* and *C. morrowii* show higher frequencies. *Carex morrowii*, *C. sikokiana* and *C. pachygyna* were found only in these forests and seem to be closely connected with this group. Among the *Carex* species listed in Table 33, *C. conica*, *C. ischnostachya*, *C. japonica*, *C. lanceolata*, *C. leucochlora*, *C. morrowii*, *C. nakiri*, *C. nervata*, *C. nubigena* and *C. siderosticta* occur more frequently in open sites as far as my observation are concerned.

Table 34 shows frequencies of occurrence of the Carices found in the forests classified in more detail.

Table 33. Frequencies of Carices' occurrence in three forest groups

Species	Forest groups	Evergreen coniferous forest	Evergreen broad-leaved forest	Deciduous broad-leaved forest
		(%)	(%)	(%)
<i>C. lanceolata</i>		30 (41)	3 (10)	5 (9)
<i>C. conica</i>		21 (29)	5 (12)	4 (7)
<i>C. pocilliformis</i>		19 (26)	6 (4)	—
<i>C. ciliato-marginata</i>		4 (5)	—	—
<i>C. reinii</i>		9 (12)	12 (27)	2 (4)
<i>C. nakiri</i>		5 (7)	4 (10)	2 (4)
<i>C. stenostachys</i>		2 (3)	3 (10)	1 (2)
<i>C. leucochlora</i>		—	1 (2)	—
<i>C. foliosissima</i>		3 (4)	1 (2)	19 (35)
<i>C. multifolia</i>		9 (12)	9 (21)	16 (30)
<i>C. morrowii</i>		—	—	17 (31)
<i>C. sikokiana</i>		—	—	3 (6)
<i>C. siderosticta</i>		1 (1)	—	3 (6)
<i>C. duvaliana</i>		—	1 (2)	2 (4)
<i>C. fernaldiana</i>		—	1 (2)	2 (4)
<i>C. pachygyne</i>		—	—	2 (4)
<i>C. japonica</i>		—	—	1 (2)
<i>C. nervata</i>		—	—	1 (2)
<i>C. ischnostachya</i>		—	—	1 (2)
<i>C. nubigena</i>		—	—	1 (2)
Number of stands		73	42	54

Table 34. Frequencies of Carices' occurrence in 11 kinds of forests

Species	Forests	<i>Pinus densiflora</i>	<i>Cryptomeria japonica</i>	<i>Chamaecyparis obtusa</i>	<i>Tsuga sieboldii</i>	<i>Shiwa sieboldii</i>	<i>Quercus stenophylla</i>	<i>Quercus glauca</i>	<i>Castanea pubinervis</i>	<i>Aesculus turbinata</i>	<i>Fagus crenata</i>	<i>Fagus japonica</i>
<i>C. lanceolata</i>		28	1	—	—	—	—	1	3	—	—	—
<i>C. conica</i>		19	1	—	—	1	—	3	4	—	—	—
<i>C. pocilliformis</i>		18	1	—	—	3	—	2	—	—	—	—
<i>C. nakiri</i>		—	4	1	—	1	—	1	—	—	—	—
<i>C. ciliato-marginata</i>		1	—	3	—	—	—	—	—	—	—	—
<i>C. reinii</i>		—	2	1	6	—	8	—	—	1	—	1
<i>C. multifolia</i>		—	2	3	1	—	3	—	—	1	5	6
<i>C. foliosissima</i>		—	—	—	—	—	—	—	—	5	5	5
<i>C. morrowii</i>		—	—	—	—	—	—	—	—	3	—	—
<i>C. stenostachys</i>		—	—	1	—	2	—	—	1	—	—	—
<i>C. siderosticta</i>		—	—	1	—	—	—	—	1	—	—	—
<i>C. leucochlora</i>		—	—	—	—	—	—	1	—	—	—	—
Number of stands		44	9	7	6	10	8	6	6	6	6	6

1. *Pinus densiflora* forest

The forests investigated total 44 and the Carices collected are 4 species. In this forest, *C. laceolata* is most frequent, and *C. pocilliformis* and *C. conica* follow it with a almost similar frequency. These species are much rarer in the other forests and seem to be closely connected with the floor under *Pinus densiflora*.

2. *Cryptomeria japonica* forest

The forests investigated total 9 and the Carices observed include 6 species. It seems that *C. nakiri* is more closely connected with this forest.

3. *Chamaecyparis obtusa* forest

The forests investigated total 7, in which 6 *Carex* species were found. *Carex multifolia* and *C. ciliato-marginata* show a higher frequency in this forest.

4. *Tsuga sieboldii* forest

The forests investigated total 6 and only 2 *Carex* species were found there. *Carex reinii* shows a comparatively high frequency and is more closely connected with this forest as well as with *Quercus stenophylla* forest.

5. *Shiia sieboldii* forest

The forests investigated total 10. Of the 4 *Carex* species found in this forest, *C. pocilliformis* is most frequent.

6. *Quercus stenophylla* forest

The forests investigated total 8 and the *Carex* species observed are only 2 species. It seems that *C. reinii* is most closely connected with this forest.

7. *Quercus glauca* forest

The forests investigated total 6, in which were collected 5 *Carex* species. *Carex conica* shows a higher frequency.

8. *Castanea pubinervis* forest

The forests investigated total 6. There were found 4 species, of which *C. conica* and *C. lanceolata* are more frequent.

9. *Aesculus turbinata* forest

The forests investigated total 6 and 4 *Carex* species were observed there. *Carex foliosissima* shows the highest frequency and it seems that this species is connected with this forest as well as with next two forests.

10. *Fagus crenata* forest

The forests investigated total 6 in which were found 2 species with the same frequency: *C. foliosissima* and *C. multifolia*.

11. *Fagus japonica* forest

The forests investigated total 6 and 3 species were collected. *Carex multifolia* with the highest frequency seems to be most closely connected with this forest.

Summary

1) The present study was designed to know the flora and distribution of *Carex* species occurring in western Honshu of Japan, including Okayama, Hiroshima, Tottori, Shimane and Yamaguchi Prefectures. Most of the specimens were collected by the author himself during 1957-1963.

2) The total number of species treated in the present study is 75 species and 5 varieties. They are belonging to 28 sections as follows:

Section	Species	Varieties
1. Grallatoriae	1	—

2.	Rhizopodae	1	—
3.	Capitellatae	4	—
4.	Foetidae	1	—
5.	Multiflorae	1	—
6.	Macrocephalae	1	—
7.	Stellulatae	1	—
8.	Planatae	1	—
9.	Gibbae	1	—
10.	Acutae		
	Subsect. 1. Thunbergiae	1	—
	Subsect. 2. Forficulae	3	—
	Subsect. 3. Plaelongae	7	1
11.	Graciles	3	—
12.	Atratae	1	—
13.	Anomalae	1	—
14.	Ferrugineae	1	—
15.	Decorae	1	—
16.	Confertiflorae	5	1
17.	Paludosae	2	—
18.	Debiles	2	—
19.	Macroglossae	1	—
20.	Molliculae	4	—
21.	Physocarpae	1	—
22.	Tentaculatae	1	—
23.	Praecoces		
	Subsect. 1. Nervatae	1	2
	Subsect. 2. Leucochlorae	7	1
	Subaect. 3. Pisiformes	11	—
	Subsect. 4. Foliosissimae	3	—
24.	Rhomboidales	1	—
25.	Siderostictae	3	—
26.	Montanae	1	—
27.	Digitatae	1	—
28.	Hirtae	2	—
Total:		75	5

3) Four species and 2 varieties were described by the author as new to science. They are as follow:

C. akiensis K. Okamoto (Akiao-suge) sp. nov., *C. horikawae* K. Okamoto (Misenao-suge) sp. nov., *C. kamagariensis* K. Okamoto (Akiito-suge) sp. nov., *C. geihokuensis* K. Okamoto (Geihoku-suge) sp. nov., *C. leucochlora* Bunge var. *setouchiensis* K. Okamoto (Setouchikoao-suge) var. nov., *C. mitrata* Franch. var. *bingoensis* K. Okamoto (Bingonuka-suge) var. nov.

4) Distributions of the Carices found in Hiroshima Prefecture are grouped into 8 patterns as follows:

- Pattern 1: *C. conica*, *C. lanceolata*, etc.
- Pattern 2: *C. morrowii*, *C. multifolia*, etc.
- Pattern 3: *C. flabellata*, *C. shimidzensis*, etc.
- Pattern 4: *C. gibba*, *C. pacilliformis*, etc.
- Pattern 5: *C. duvaliana*, *C. japonica*, etc.

Pattern 6: *C. kiotensis*, *C. mollicula*, etc.

Pattern 7: *C. autumnalis*, *C. planata*, etc.

Pattern 8: *C. discoidea*, *C. phacota*, etc.

5) To know the relation between the geological conditions and the Carices, 216 localities in Hiroshima Prefecture were investigated. These localities were grouped into three geological areas, namely, granitic area, quartz-porphyrific area and limestone area. Most of the species collected are almost indifferent to the geological area, but some ones are closely connected with a certain geological area.

6) Occurrence of the Carices and habitat conditions are closely related with each other. Representative species characteristic of respective habitat are as follows:

Stream side: *C. curvicolis*, *C. shimidzensis*

Marshy place: *C. omiana*, *C. otaruensis*

Pass-side: *C. incisa*, *C. leucochlora*

Grassland: *C. lanceolata*, *C. nervata*

Forest floor: *C. foliosissima*, *C. multifolia*

Sandy place: *C. kobomugi*, *C. pumila*

7) To know the relation between the kind of forest and the Carices, 169 stands of forest in the western Honshu were observed. Several species are connected with a certain forest. Examples of such fastidious species are as follows:

Pinus densiflora forest: *C. lanceolata*

Tsuga sieboldii forest: *C. reinii*

Quercus stenophylla forest: *C. reinii*

Fagus crenata forest: *C. foliosissima*, *C. multifolia*

Fagus japonica forest: *C. multifolia*

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摘 要

この研究は、本州西部産スゲ属植物を分類学的立場から追究し、その記載と生態分布を取扱つたものである。本文はスゲ類の形態学的特徴、種の記載と産地、広島県内のスゲ類の分布、地質とスゲ類分布との関係、スゲ類の生育環境、数種の森林とスゲ類の出現状態について論じた。その概要は次の通りである。

1) スゲ類の形態学的特徴

スゲ類の分類には、従来の形態学上の特徴の中で、特に穎を中心に用いて、分類を試みた。穎の観察は、今までに補足的な識別点として扱われていたが、当地域で確認されたスゲ類は穎の形態学的特徴を用いることにより、分類することができた。従つて、穎はスゲ類の分類学上の特徴として重要な識別点の一つである。更に各穎の形態学的特徴を記載、図示した。

2) スゲ類のリストと記載

本地域産のスゲ類として75種 5変種を確認した。これらのスゲ類を各節ごとに、種の検索表を作成し、各種については、原文献、記載文、生育環境、分布域、産地及び近似種との識別点を記し、更に広島大学教授堀川芳雄博士の「地理方形区法」によるスゲ

類の分布図を作成した。

3) 新種と新変種

本地域産のスゲ類中に次の4新種と2新変種が認められたので、それを記載、図示した。

新種：

Carex akiensis K. Okamoto

Carex horikawae K. Okamoto

Carex kamagariensis K. Okamoto

Carex geihokuensis K. Okamoto

新変種：

Carex leucochlora Bunge var. *setouchiensis*
K. Okamoto

Carex mitrata Franch. var. *bingoensis*
K. Okamoto

4) 広島県内のスゲ類の分布

調査地点が全般にわたっている広島県を対象として、スゲ類の分布図を比較検討した結果、次のような8群に分けられることができた。

第1群：全地域に分布するもの

ヒカゲスゲ・ヒメカンスゲなど17種

第2群：殆んど山岳地域に分布するもの

カンスゲ・ミヤマカンスゲなど12種

第3群：西部半分に分布するもの

ミヤマナルコスゲ・ヤマテキリスゲなど3種

第4群：内海沿岸地域やまれに山岳地域に分布するもの

ヒメモエギスゲ・マスクサなど3種

第5群：北東部及び南東部やまれに山岳地域に分布するもの

ケスゲ・ヒゴクサなど14種

第6群：西部山岳地域に分布するもの

テキリスゲ・ヒメシラスゲなど9種

第7群：東部山岳地域に分布するもの

オオナキリスゲ・タカネマスクサなど5種

第8群：内海沿岸地域に分布するもの

ヒメアオスゲ・ホナガヒメゴウソなど12種

5) 地質とスゲ類分布との関係

広島県内におけるスゲ類の分布と地質状態との関係を知るために、花崗岩地域・石英斑岩地域・石灰岩地域の3地域について調査した。ヒカゲスゲなど6種は3地域に、アオスゲなど4種は花崗岩地域に、ショウジョウスゲなど3種は石英斑岩地域に、ベニイトスゲなど5種は石灰岩地域に出現度が高い。特にこれらの3地質地域と密接な関係があると推定されたスゲ類は、花崗岩地域でヒメアオスゲ・キンキカサスゲ、石英斑岩地域でオニスゲ、石灰岩地域でオオナキリスゲ・ケスゲがある。いずれも各地質地域だけに生ずる。

6) スゲ類の生育環境

スゲ類の生育状況を観察した結果、6つの生育環

境に分けられた。それぞれの環境を特徴づけるスゲ類は次の通りである。

溪畔生：ナルコスゲ・ミヤマナルコスゲなど

沼沢地生：オタルスゲ・ヤチカワズスゲなど

路傍生：アオスゲ・カワラスゲなど

草原生：シバスゲ・ヒカゲスゲなど

林床生：オクノカンスゲ・ミヤマカンスゲなど

砂地生：コウボウシバ・コウボウムギなど

7) 数種の森林とスゲ類の出現状態

本州西部にみられる主な森林とスゲ類との関係を調査した。常緑針葉樹林ではヒカゲスゲ・ヒメカンスゲ・ヒメモエギスゲ、常緑広葉樹林ではコカンスゲ、落葉広葉樹林ではオクノカンスゲ・ミヤマカンスゲ・カンスゲの出現度が大きい。各森林についてのスゲ類は次の通りである。

アカマツ林：ヒカゲスゲ・ヒメカンスゲなど

スギ林：ナキリスゲ・コカンスゲなど

ヒノキ林：ケタガネソウ・ミヤマカンスゲなど

ツガ林：コカンスゲ・ミヤマカンスゲなど

シイ林：ヒメモエギスゲ・ニシノホンモンジスゲなど

ウラジロガシ林：コカンスゲ・ミヤマカンスゲなど

アラカシ林：ヒメカンスゲ・ヒメモエギスゲなど

クリ林：ヒカゲスゲ・ヒメカンスゲなど

トチノキ林：オクノカンスゲ・カンスゲなど

イヌブナ林：オクノカンスゲ・ミヤマカンスゲなど

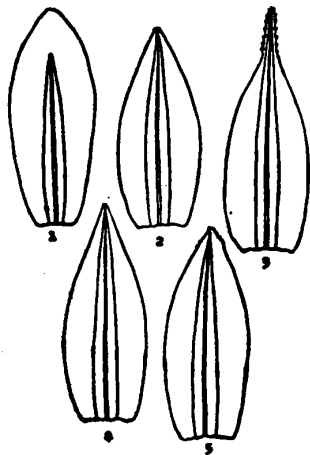


Fig. 1

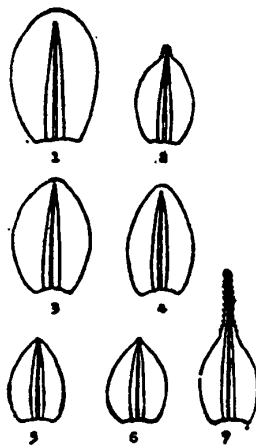


Fig. 2

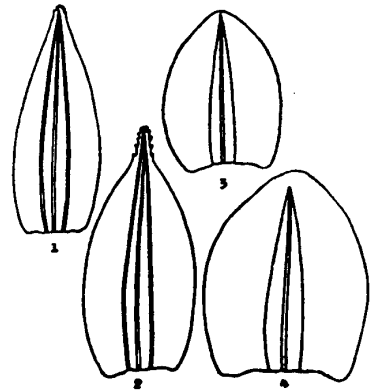


Fig. 3

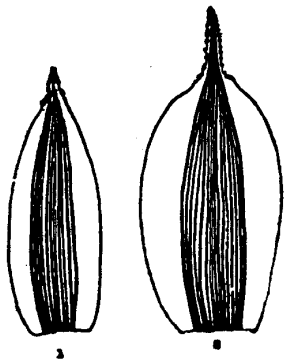


Fig. 4

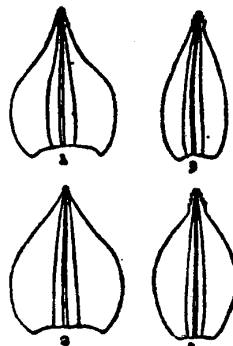


Fig. 5

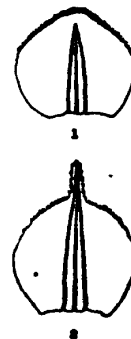


Fig. 6

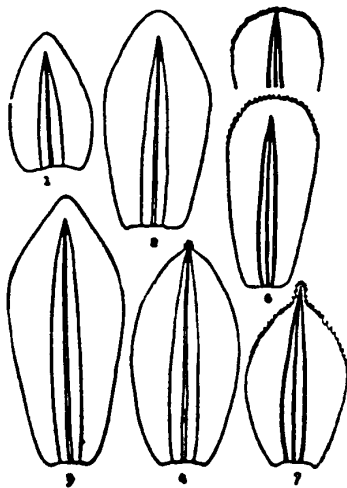


Fig. 7

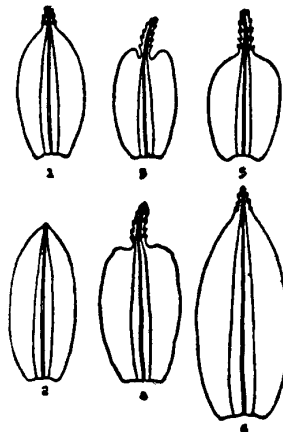


Fig. 8

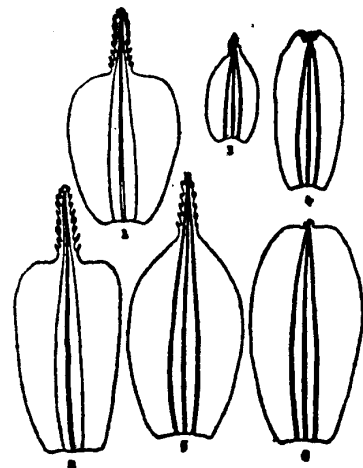


Fig. 9

Fig. 1. Scales of Grallatoriae and Rhizopodae: 1-3. *Carex grallatoria*, 4-5. *C. rhizopoda*. 1, 4. Staminate scales, $\times 7$; 2, 3, 5. Pistillate scales, $\times 7$. Fig. 2. Scales of Capitellatae: 1-2. *C. hakonensis*, 3-4. *C. biwensis*, 5-7. *C. fulta*. 1, 3, 5. Staminate scales, $\times 7$; 2, 4, 6, 7. Pistillate scales, $\times 7$. Fig. 3. Scales of Foetidae and Multiflorae: 1-2. *C. arenicola*, 3-4. *C. nubigena*. 1, 3. Staminate scales, $\times 6$; 2, 4. Pistillate scales, $\times 6$. Fig. 4. Scales of Macrocephalae: 1-2. *C. kobomugi*. 1. Staminate scale, $\times 3$; 2. Pistillate scale, $\times 3$. Fig. 5. Scales of Stellulatae and Planatae: 1-2. *C. omiana*, 3-4. *C. planata*. 1, 3. Staminate scales, $\times 6$; 2, 4. Pistillate scales, $\times 6$. Fig. 6. Scales of Gibbae: 1-2. *C. gibba*. 1. Staminate scale, $\times 6$; 2. Pistillate scale, $\times 6$. Fig. 7. Scales of Acutae (1): 1-2. *C. thunbergii*, 3-4. *C. heterolepis*, 5-7. *C. forficula*. 1, 4, 7. Pistillate scales, $\times 7$; 2, 3, 5, 6. Staminate scales, $\times 7$. Fig. 8. Scales of Acutae (2): 1-2. *C. otaruensis*, 3-4. *C. incisa*, 5-6. *C. flabellata*. 1, 3, 5. Pistillate scales, $\times 7$; 2, 4, 6. Staminate scales, $\times 7$. Fig. 9. Scales of Acutae (3): 1-2. *C. phacota*, 3-4. *C. kiotsensis*, 5-6. *C. maximowiczii*. 1, 3, 5. Pistillate scales, $\times 7$; 2, 4, 6. Staminate scales, $\times 7$.

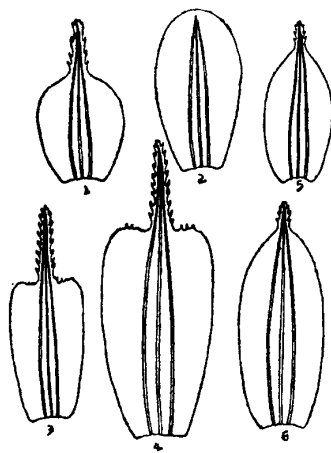


Fig. 10

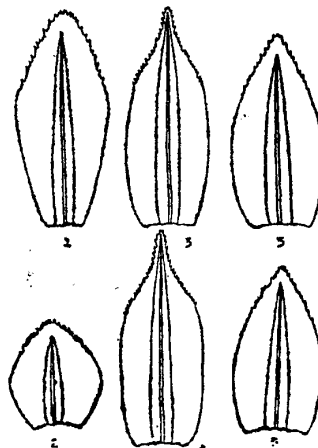


Fig. 11

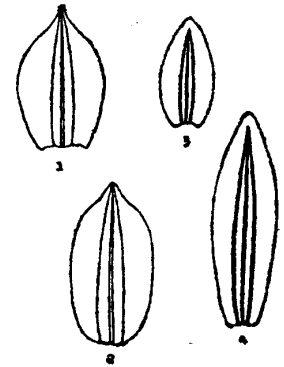


Fig. 12

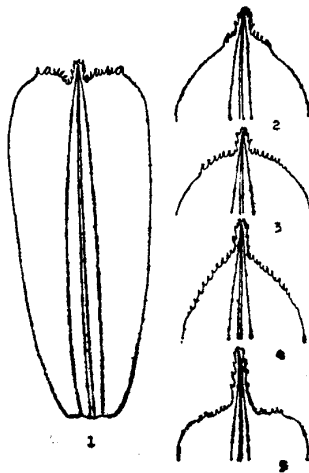


Fig. 13

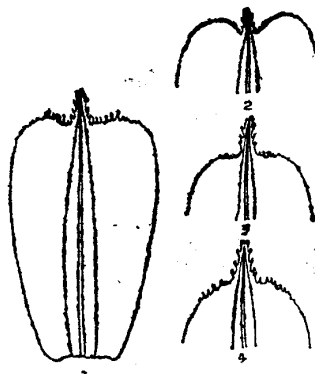


Fig. 14

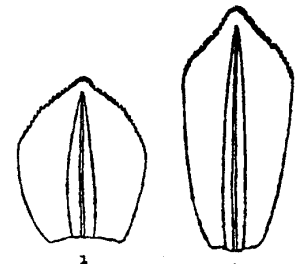


Fig. 15

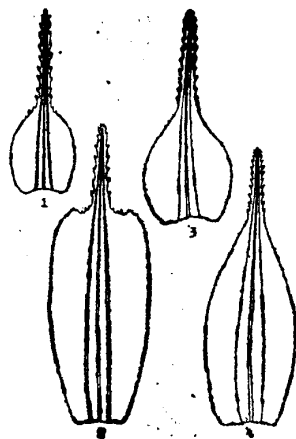


Fig. 16

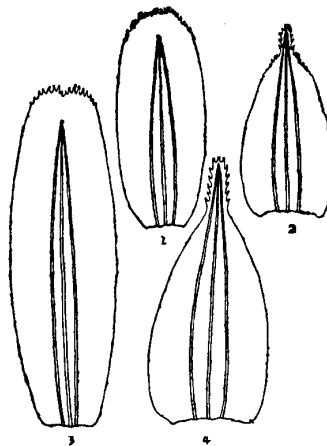


Fig. 17

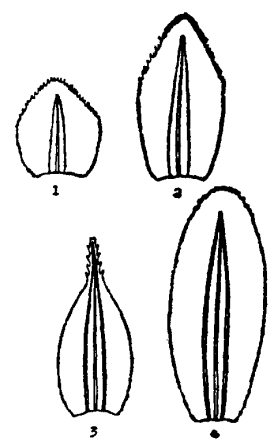


Fig. 18

Fig. 10. Scales of *Acutae* (4): 1-2. *Carex phacota* var. *gracilis*, 3-4. *C. dimorpholepis*, 5-6. *C. shimidzensis*. 1, 3, 5. Pistillate scales, $\times 6$; 2, 4, 6. Staminate scales, $\times 6$. Fig. 11. Scales of *Graciles*: 1-2. *C. autumnalis*, 3-4. *C. scabriculum*, 5-6. *C. nakiri*. 1, 3, 5. Staminate scales, $\times 6$; 2, 4, 6. Pistillate scales, $\times 6$. Fig. 12. Scales of *Atratae* and *Anomaleae*: 1-2. *C. curvicolis*, 3-4. *C. maculata*. 1, 3. Pistillate scales, $\times 6$; 2, 4. Staminate scales, $\times 6$. Fig. 13. Scales of *Ferrugineae* (1): *C. blepharicarpa*. 1-5. Staminate scales, $\times 6$. Fig. 14. Scales of *Ferrugineae* (2): *C. blepharicarpa*. 1-4. Pistillate scales, $\times 6$. Fig. 15. Scales of *Decoratae*: 1-2. *C. reinii*. 1. Pistillate scale, $\times 6$; 2. Staminate scale, $\times 6$. Fig. 16. Scales of *Confertiflorae* (1): 1-2. *C. nipposinica*, 3-4. *C. transversa*. 1, 3. Pistillate scales, $\times 6$; 2, 4. Staminate scales, $\times 6$. Fig. 17. Scales of *Confertiflorae* (2): 1-2. *C. dispalata* var. *takeuchii*, 3-4. *C. dispalata*. 1, 3. Pistillate scales, $\times 6$; 2, 4. Staminate scales, $\times 6$. Fig. 18. Scales of *Confertiflorae* (3): 1-2. *C. ischnostachya*. 3-4. *C. confertiflora*. 1, 3. Pistillate scales, $\times 6$; 2, 4. Staminate scales, $\times 6$.

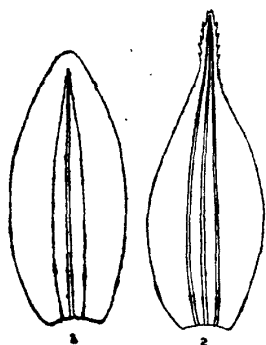


Fig. 19

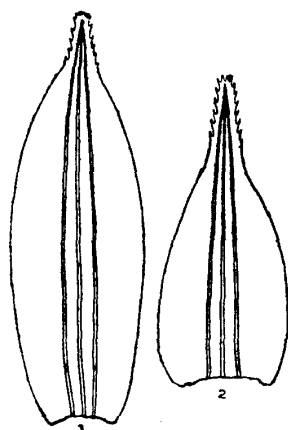


Fig. 20

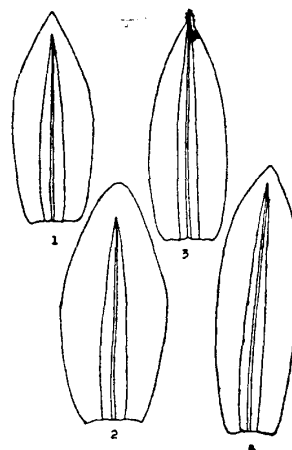


Fig. 21

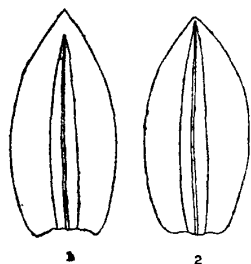


Fig. 22

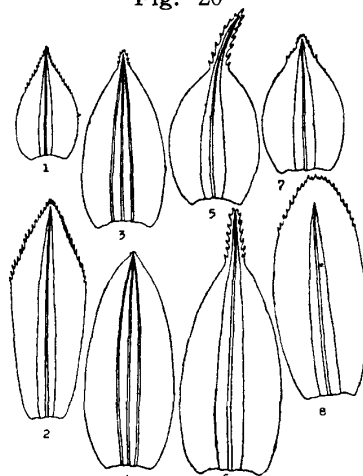


Fig. 23

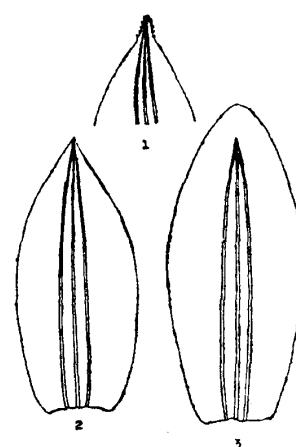


Fig. 24

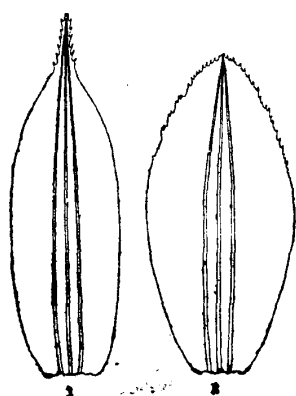


Fig. 25

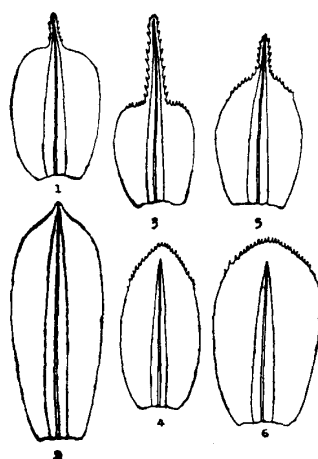


Fig. 26

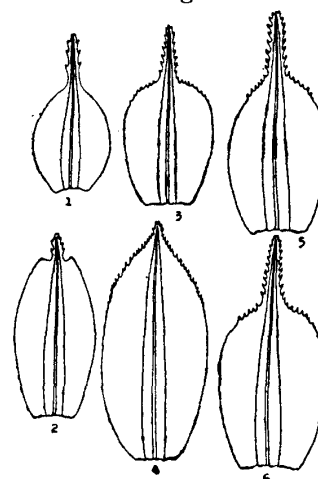


Fig. 27

Fig. 19. Scales of Paludosae (1): 1, 2. *Carex scabrifolia*. 1. Staminate scale, $\times 6$; 2. Pistillate scale, $\times 6$. Fig. 20. Scales of Paludosae (2): 1-2. *C. pumila*. 1. Staminate scale, $\times 6$; 2. Pistillate scale, $\times 6$. Fig. 21. Scales of Debriles: 1-2. *C. bostrychostigma*, 3-4. *C. dissitiflora*. 1, 3. Pistillate scales, $\times 6$; 2, 4. Staminate scales, $\times 6$. Fig. 22. Scales of Macroglossae: 1-2. *C. macroglossa*. 1. Pistillate scale, $\times 6$; 2. Staminate scale, $\times 6$. Fig. 23. Scales of Molliculae: 1-2. *C. aphanolepis*, 3-4. *C. japonica*, 5-6. *C. doniana*, 7-8. *C. mollicula*. 1, 3, 5, 7. Pistillate scales, $\times 6$; 2, 4, 6, 8. Staminate scales, $\times 6$. Fig. 24. Scales of Physocarpae: 1-3. *C. vesicaria*. 1, 3. Staminate scales, $\times 6$; 2. Pistillate scale, $\times 6$. Fig. 25. Scales of Tentaculatae: 1-2. *C. dickinsii*. 1. Pistillate scale $\times 6$; 2. Staminate scale, $\times 6$. Fig. 26. Scales of Praecoces (1): 1-2. *C. nervata*, 3-4. *C. mitrata* var. *aristata*, 5-6. *C. mitrata* var. *bingoensis*. 1, 3, 5. Pistillate scales, $\times 7$; 2, 4, 6. Staminate scales, $\times 7$. Fig. 27. Scales of Praecoces (2)-1: 1-2. *C. rugata*, 3-4. *C. leucochlora* var. *setouchiensis*, 5-6. *C. fibrillosa*. 1, 3, 5. Pistillate scales, $\times 6$; 2, 4, 6. Staminate scales, $\times 6$.

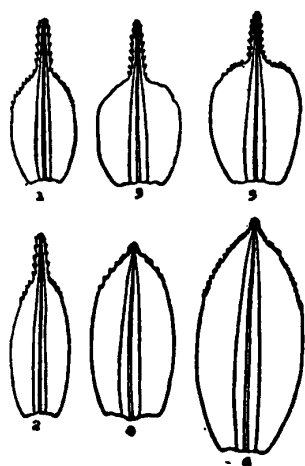


Fig. 28

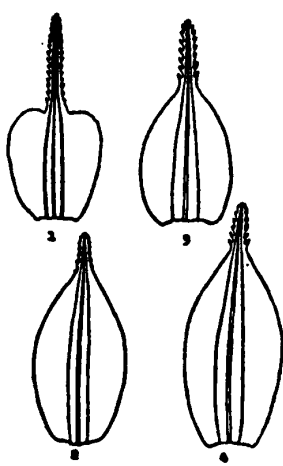


Fig. 29

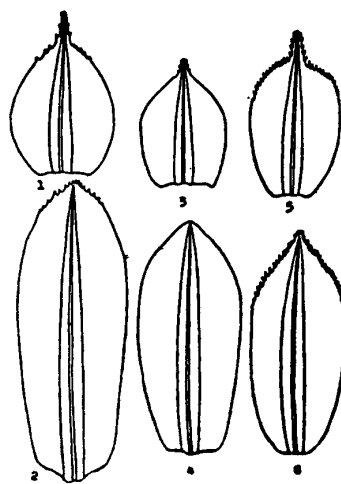


Fig. 30

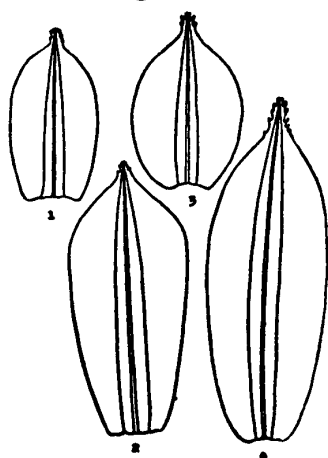


Fig. 31

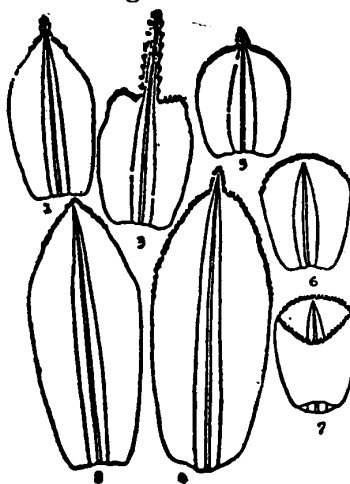


Fig. 32

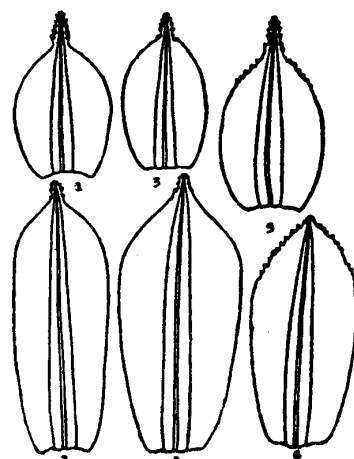


Fig. 33

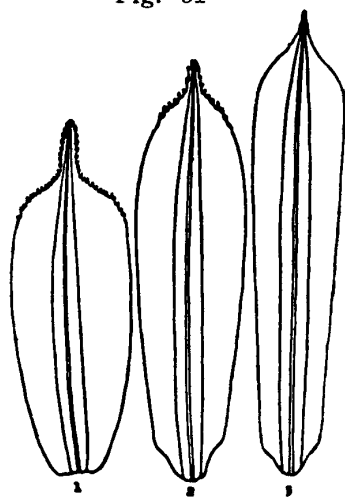


Fig. 34

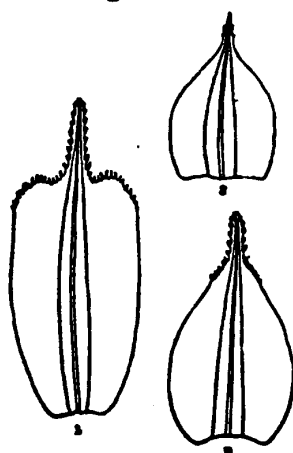


Fig. 35

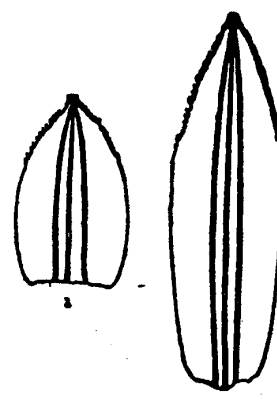


Fig. 36

Fig. 28. Scales of *Praecoces* (2)-2: 1-2. *C. discoidea*, 3-4. *C. geihokuensis*, 5-6. *C. horikawae*. 1, 3, 5. Pistillate scales, $\times 6$; 2, 4, 6. Staminate scales, $\times 6$. Fig. 29. Scales of *Praecoces* (2)-3: 1-2. *C. akiensis*, 3-4. *C. leucochlora*. 1, 3. Pistillate scale, $\times 6$; 2, 4. Staminate scales, $\times 6$. Fig. 30. Scales of *Praecoces* (3)-1: 1-2. *C. sikokiana*, 3-4. *C. fernaldiana*, 5-6. *C. alterniflora*. 1, 3, 5. Pistillate scales, $\times 6$; 2, 4, 6. Staminate scales, $\times 6$. Fig. 31. Scales of *Praecoces* (3)-2: 1-2. *C. pisiformis*, 3-4. *C. multifolia*. 1, 3. Pistillate scales, $\times 7$; 2, 4. Staminate scales, $\times 7$. Fig. 32. Scales of *Praecoces* (3)-3: 1-2. *C. daisenensis*, 3-4. *C. kamagariensis*, 5-7. *C. pocilliformis*. 1, 3, 5. Pistillate scales, $\times 7$; 2, 4, 6, 7. Staminate scales, $\times 7$. Fig. 33. Scales of *Praecoces* (3)-4: 1-2. *C. duvaliana*, 3-4. *C. stenostachys*. 5-6. *C. tashiroana*. 1, 3, 5. Pistillate scales, $\times 6$; 2, 4, 6. Staminate scales, $\times 6$. Fig. 34. Scales of *Praecoces* (4)-1: 1. *C. conica*, 2. *C. morrowii*, 3. *C. foliosissima*. 1-3. Staminate scales, $\times 6$. Fig. 35. Scales of *Praecoces* (4)-2: 1. *C. conica*, 2. *C. foliosissima*, 3. *C. morrowii*. 1-3. Pistillate scales, $\times 6$. Fig. 36. Scales of *Rhomboidales*: 1-2. *C. matsumurae*. 1. Pistillate scale, $\times 6$; 2. Staminate scale, $\times 6$.

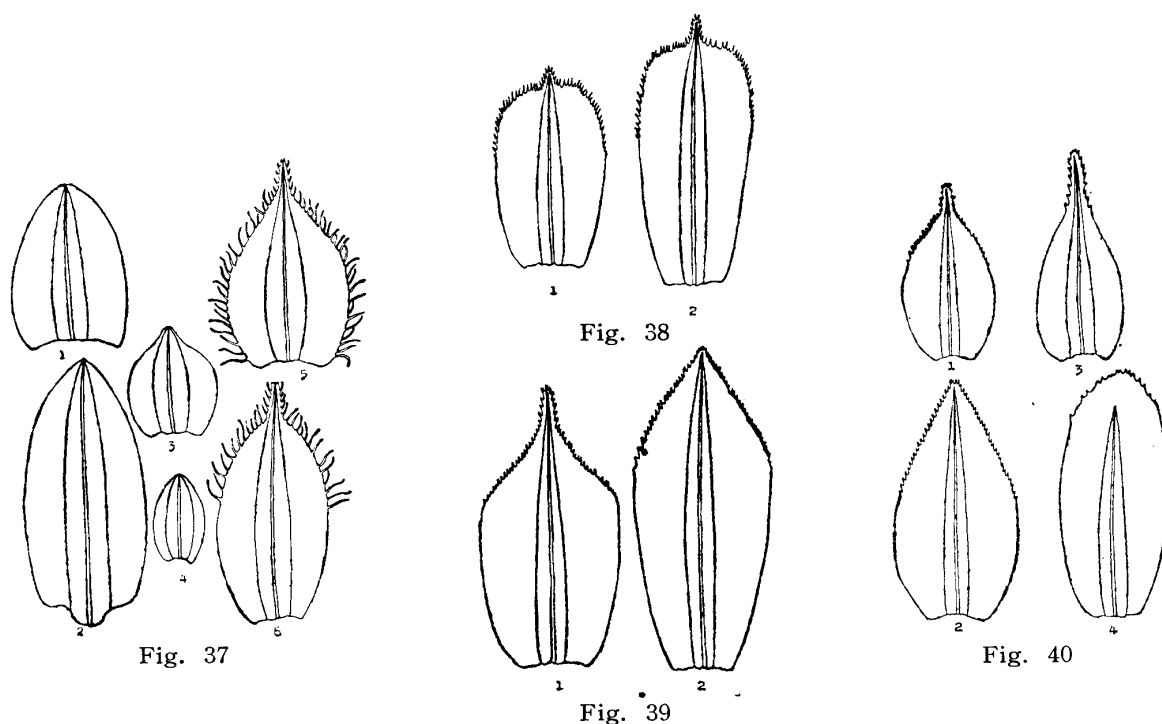


Fig. 37. Scales of *Siderostictae*: 1-2. *Carex siderosticta*, 3-4. *C. pachygyna*, 5-6. *C. ciliato-marginata*. 1, 3, 5. Pistillate scales, $\times 6$; 2, 4, 6. Staminate scales, $\times 6$. Fig. 38. Scales of *Montanae*: 1-2. *C. mira*. 1. Pistillate scale, $\times 6$; 2. Staminate scale, $\times 6$. Fig. 39. Scales of *Digitatae*: 1-2. *C. lanceolata*. 1. Pistillate scale, $\times 6$; 2. Staminate scale, $\times 6$. Fig. 40. Scales of *Hirtae*: 1-2. *C. ligulata*, 3-4. *C. miyabei*. 1, 3. Pistillate scales, $\times 6$; 2, 4. Staminate scales, $\times 6$.

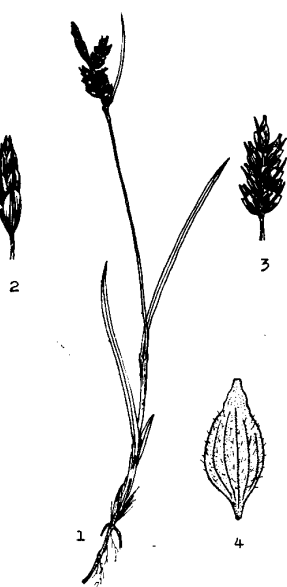


Fig. 41

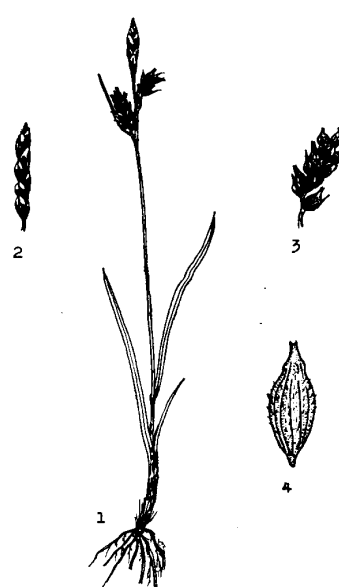


Fig. 42

Fig. 41. *Carex geihokuensis* K. Okamoto Fig. 42. *Carex mitrata* Franch. var. *bingoensis* K. Okamoto 1. Whole plant, $\times 1/5$ ($\times 2/5$ in Fig. 42); 2. Staminate spikelet, $\times 2$; 3. Pistillate spikelet, $\times 2$; 4. Utricles, $\times 8$ ($\times 7$ in Fig. 42).

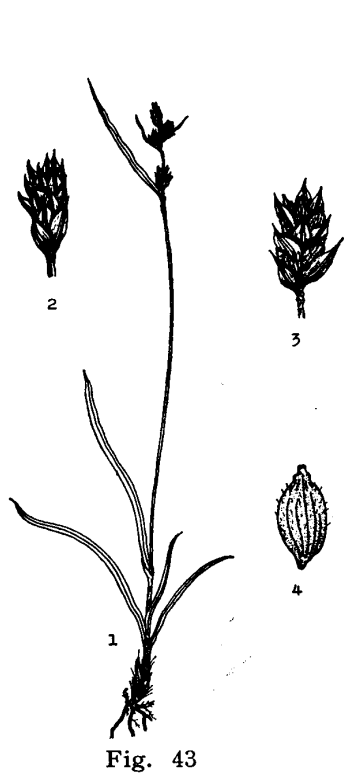


Fig. 43

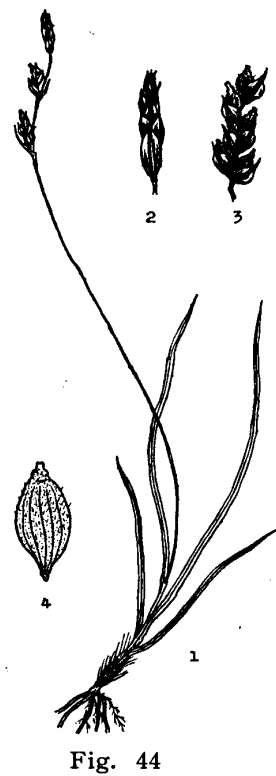


Fig. 44



Fig. 45

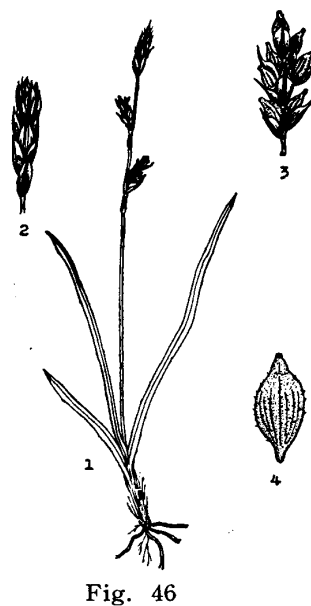
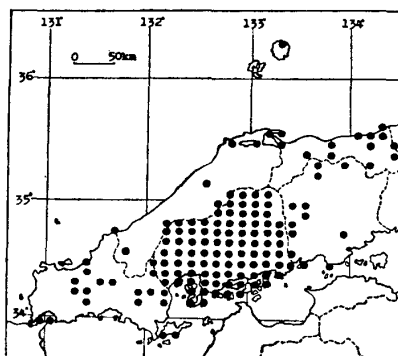
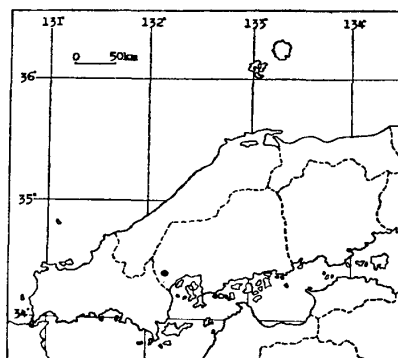
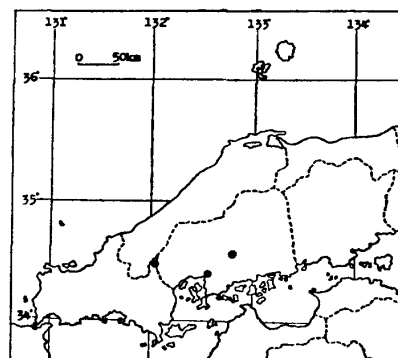
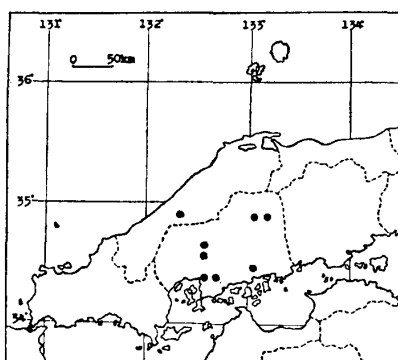
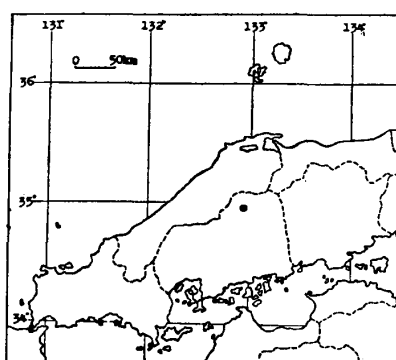
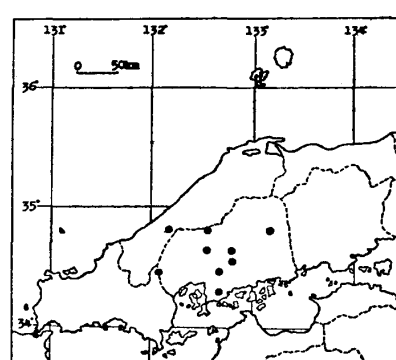
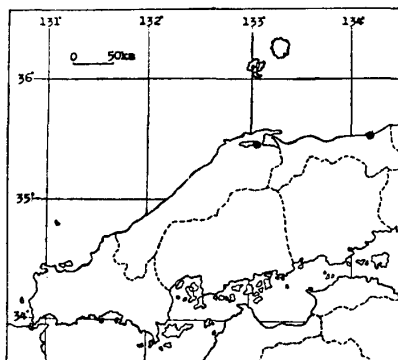
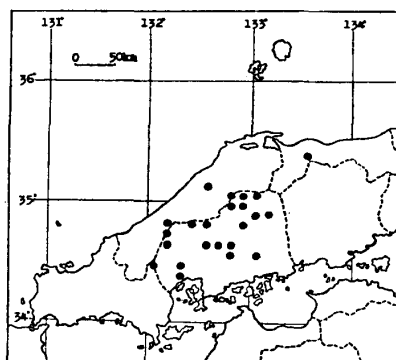
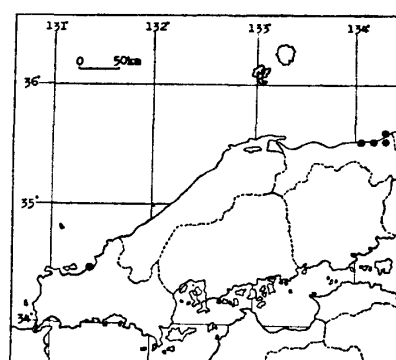
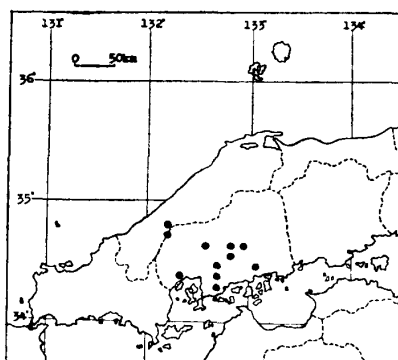
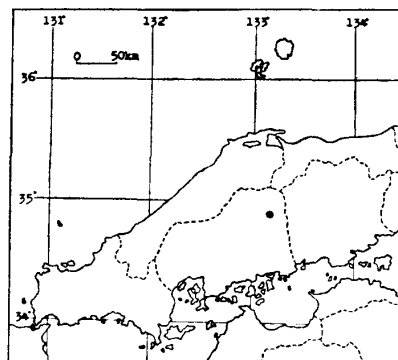
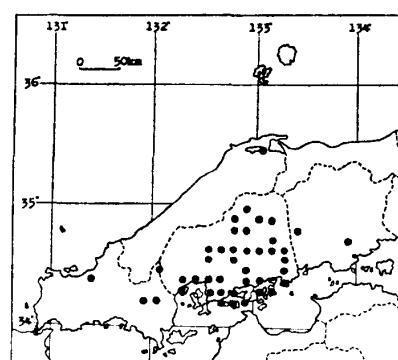


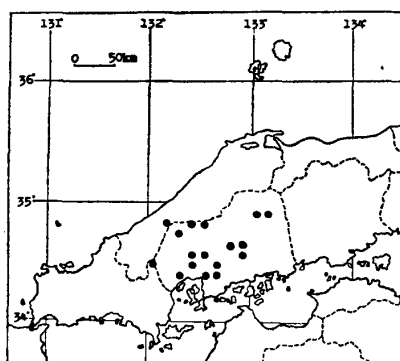
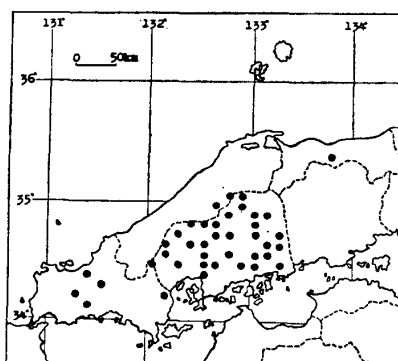
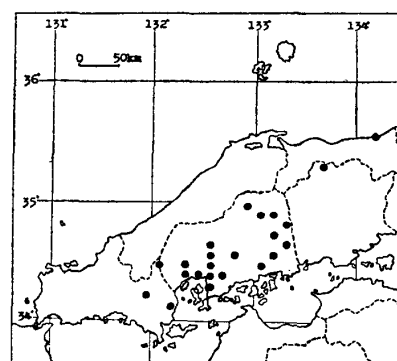
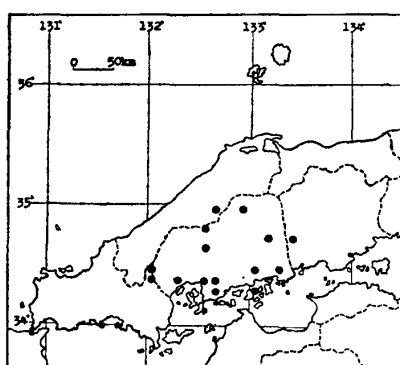
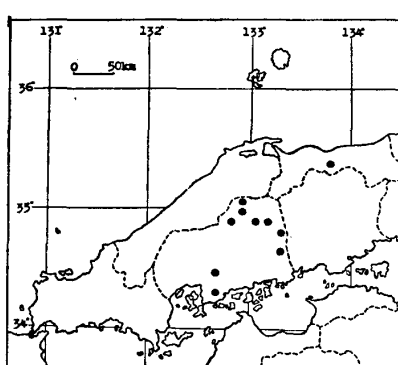
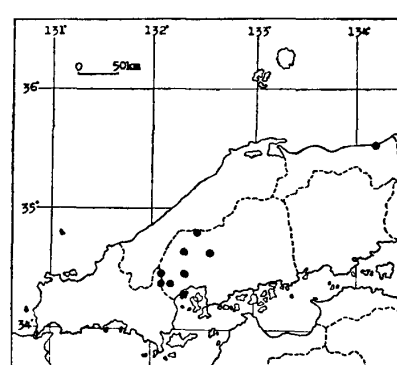
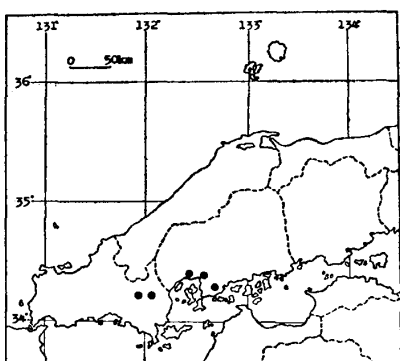
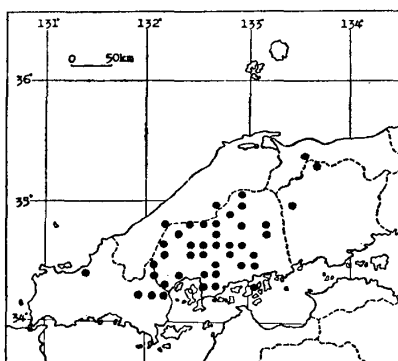
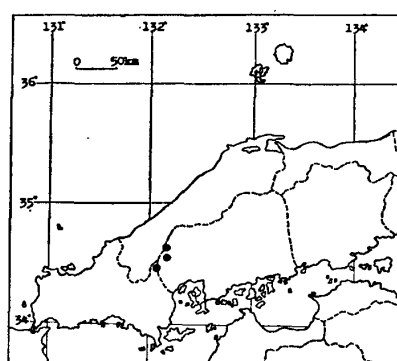
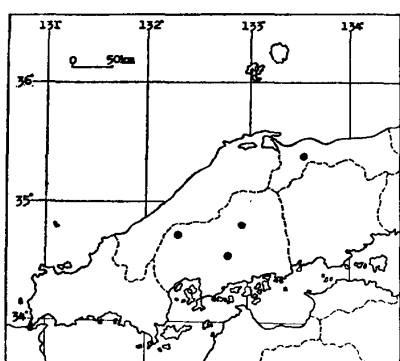
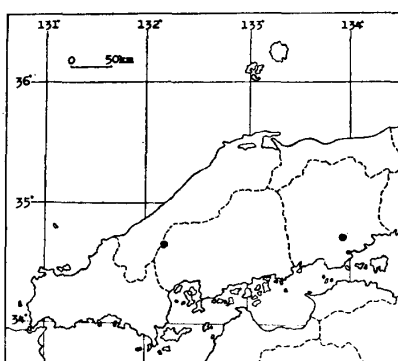
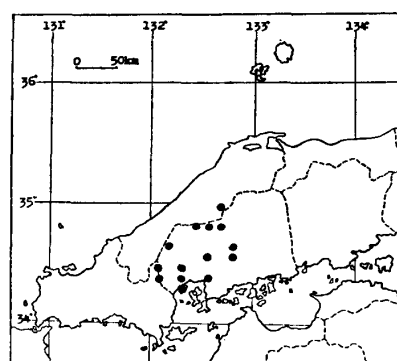
Fig. 46

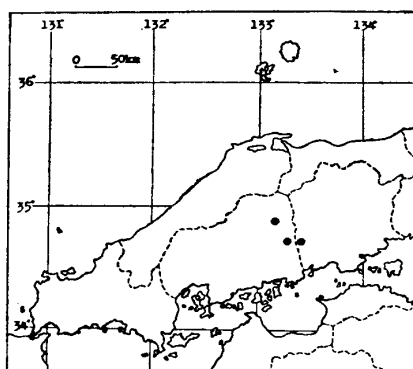
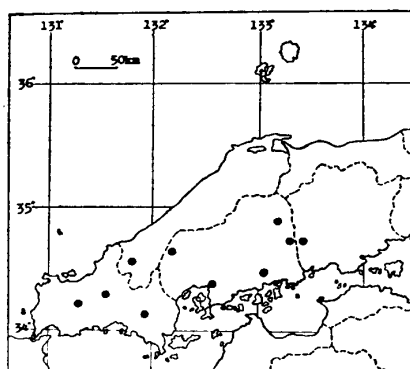
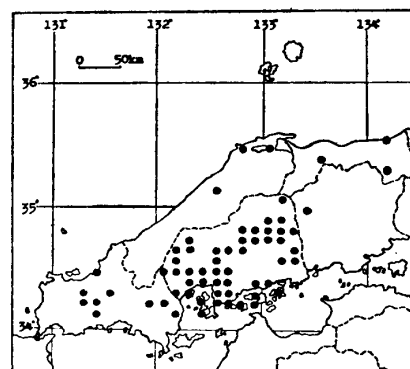
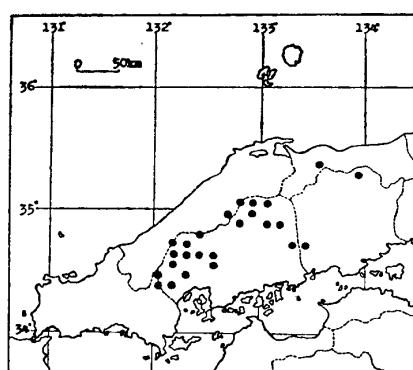
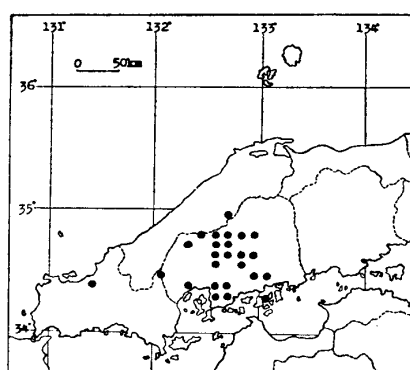
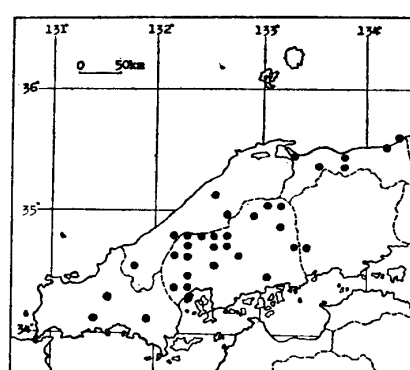
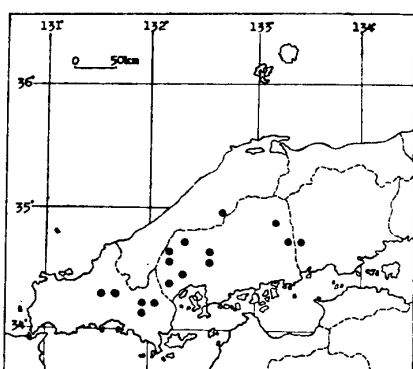
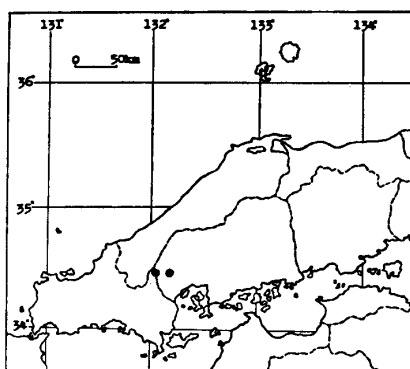
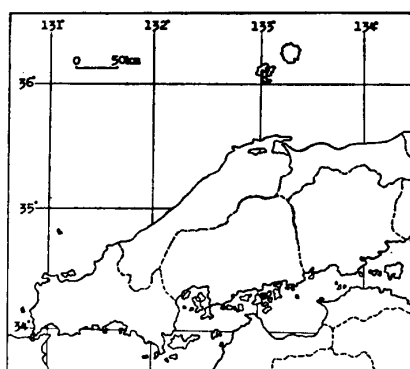
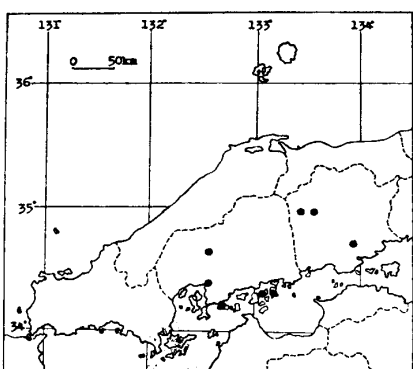
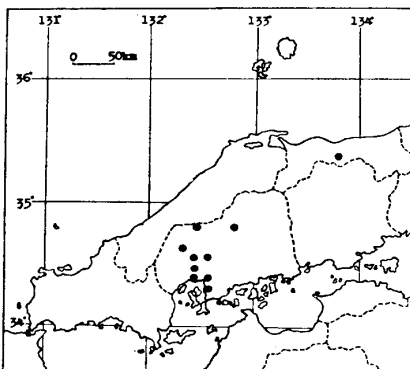
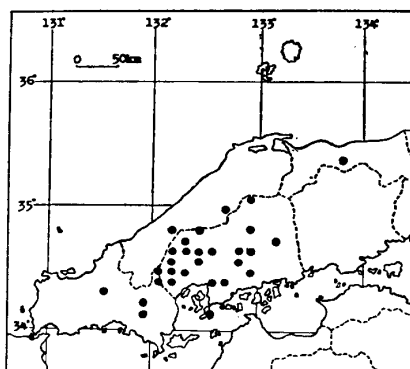
Fig. 43. *Carex akiensis* K. Okamoto Fig. 44. *Carex horikawae* K. Okamoto Fig. 45. *Carex kamagariensis* K. Okamoto Fig. 46. *Carex leucochlora* Bunge var. *setouchiensis* K. Okamoto
 1. Whole plant, $\times 1/5$; 2. Staminate spikelet, $\times 1.6$ ($\times 2$ in Fig. 43); 3. Pistillate spikelet, $\times 1.6$ ($\times 2$ in Fig. 43); 4. Utricle, $\times 6$.

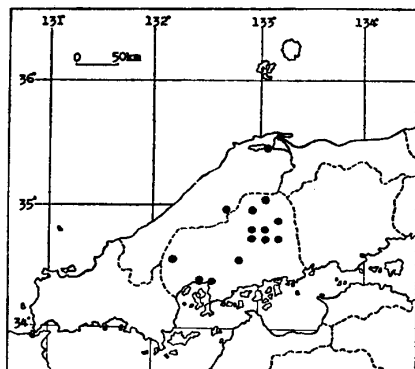
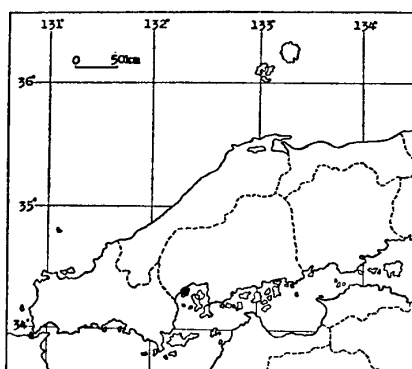
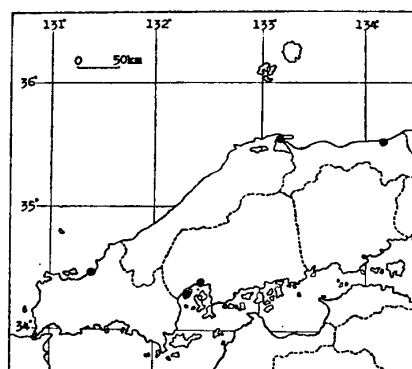
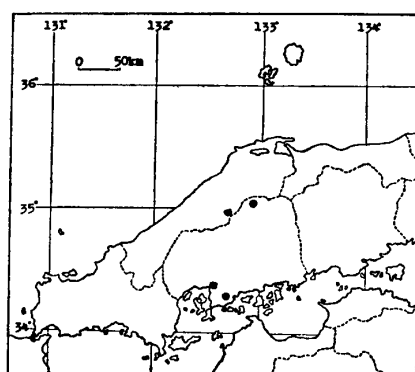
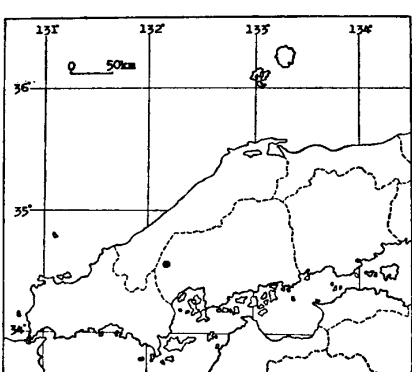
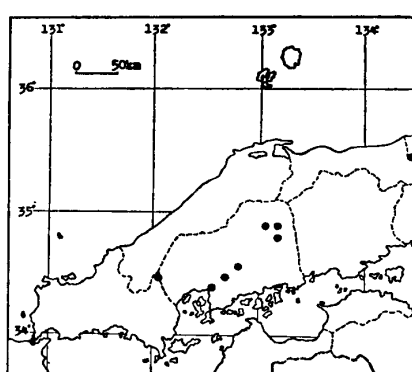
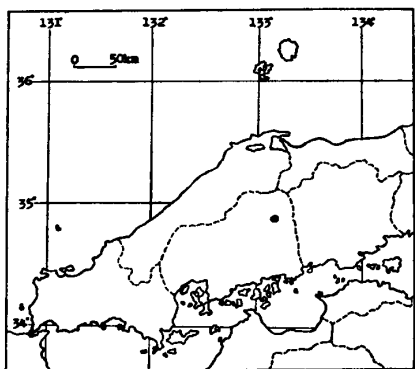
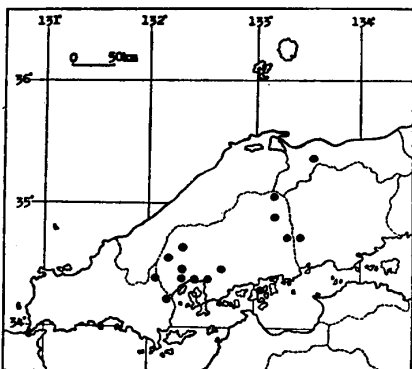
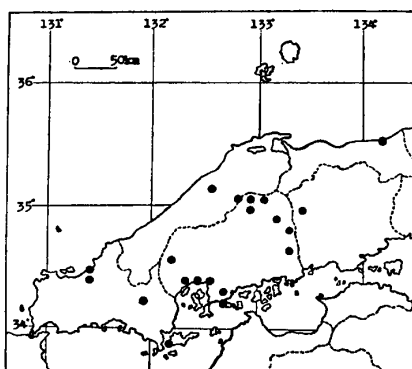
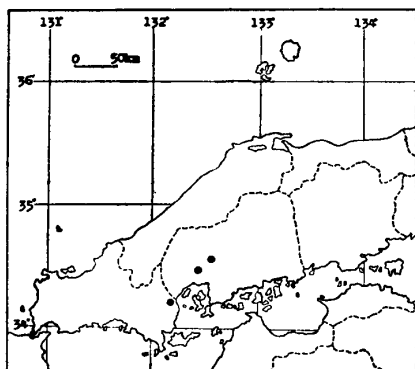
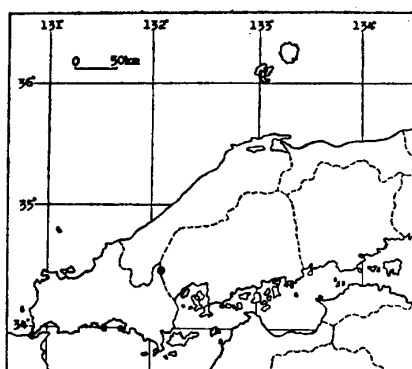
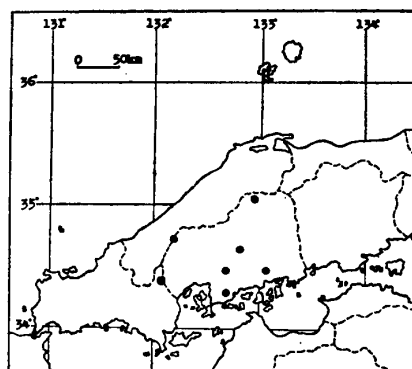


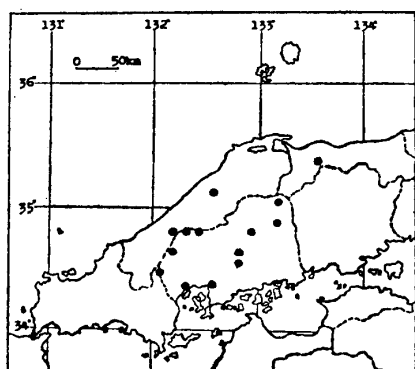
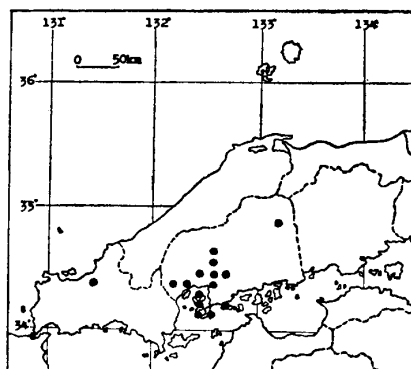
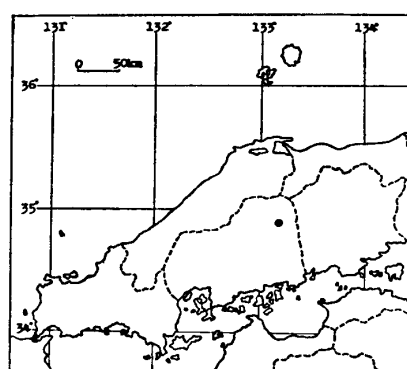
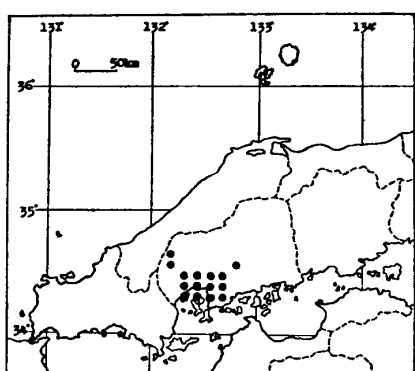
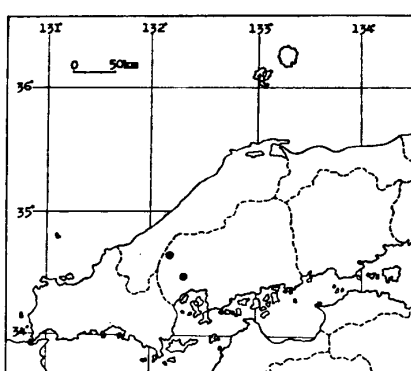
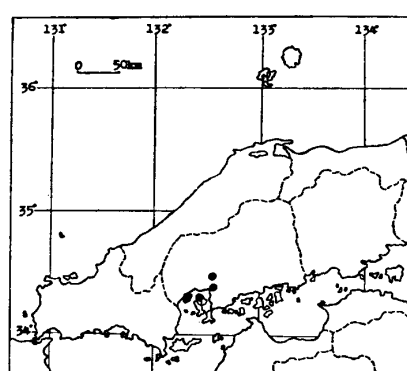
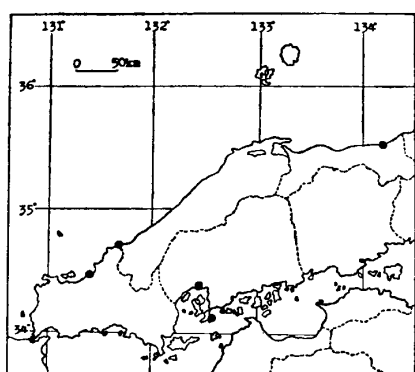
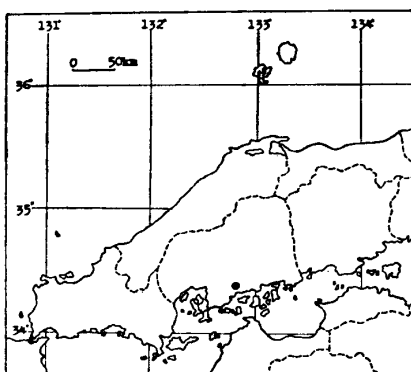
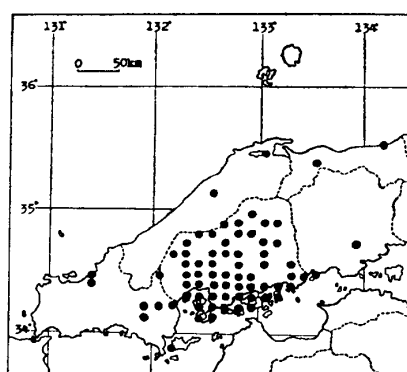
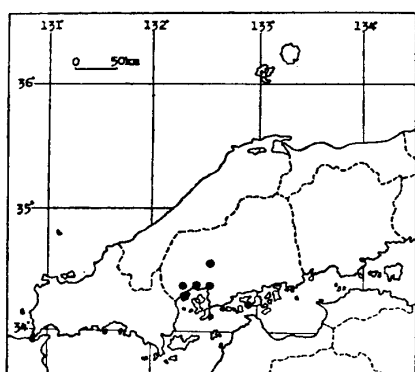
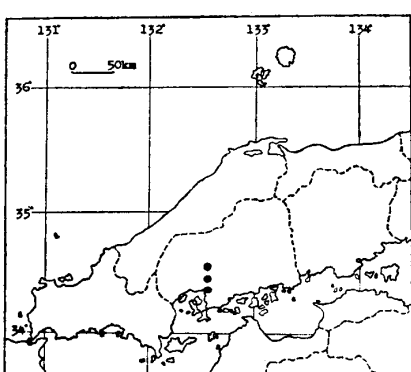
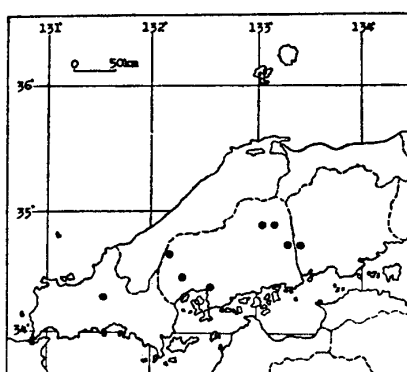
Map 1. All localities explored.

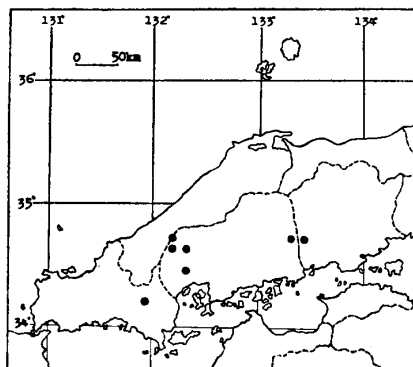
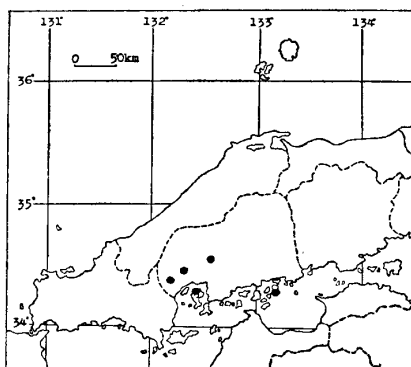
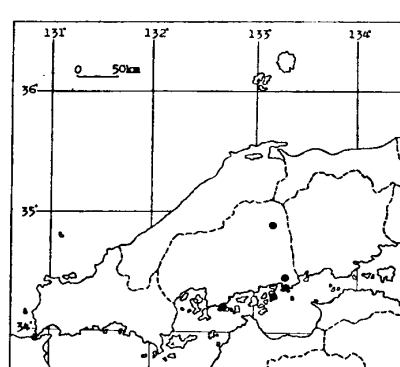
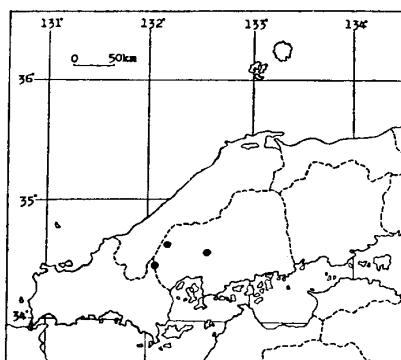
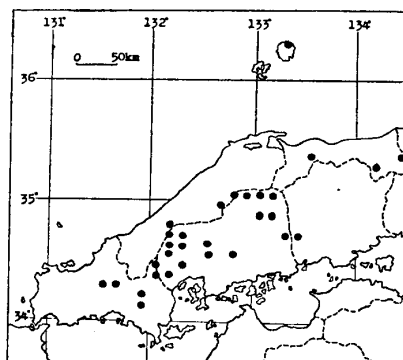
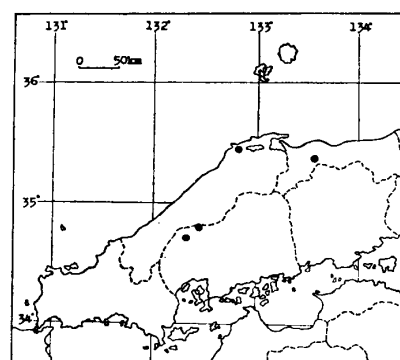
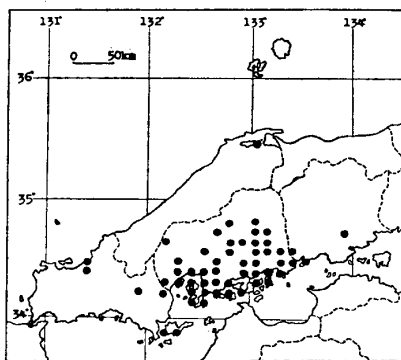
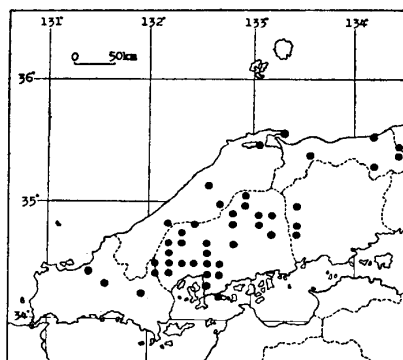
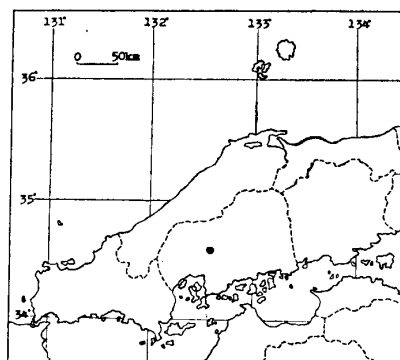
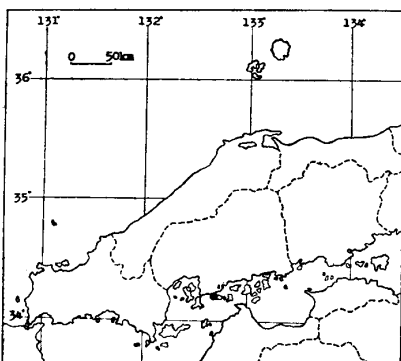
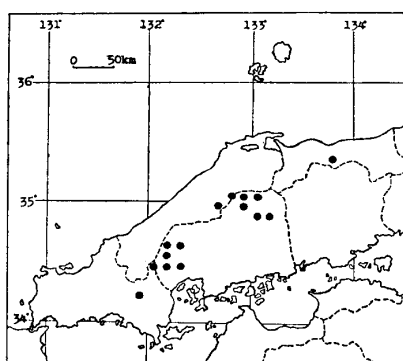
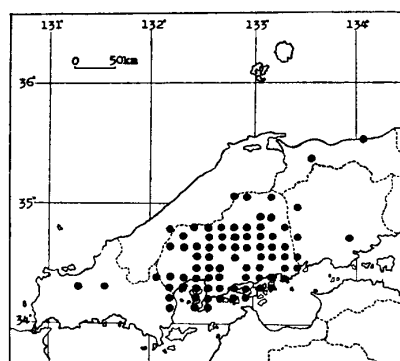
Map 2. *Carex grallatoria*Map 3. *Carex rhizopoda*Map 4. *Carex biwensis*Map 5. *Carex fulta*Map 6. *Carex hakonensis*Map 7. *Carex arenicola*Map 8. *Carex nubigena*Map 9. *Carex kobomugi*Map 10. *Carex omiana*Map 11. *Carex planata*Map 12. *Carex gibba*

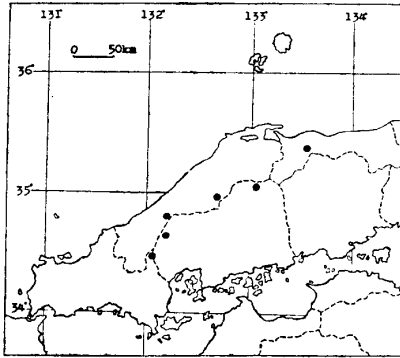
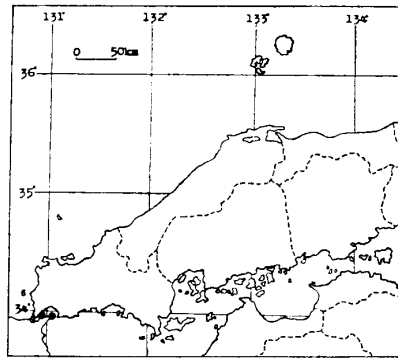
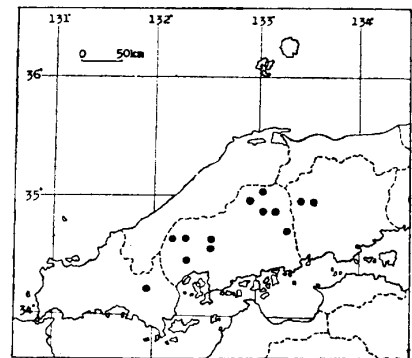
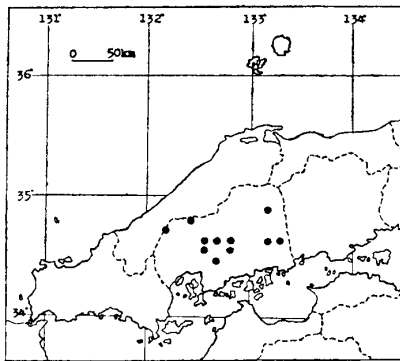
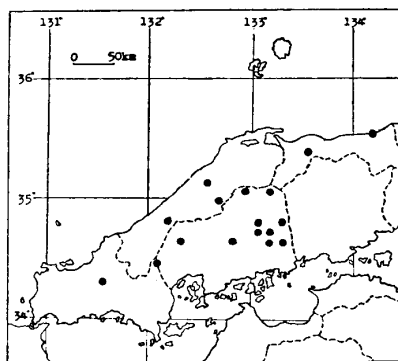
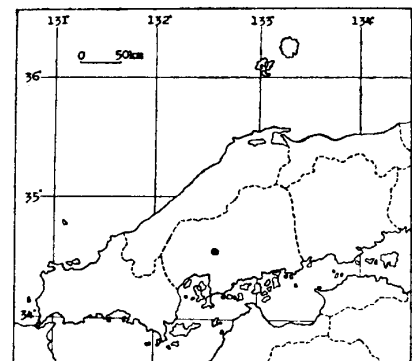
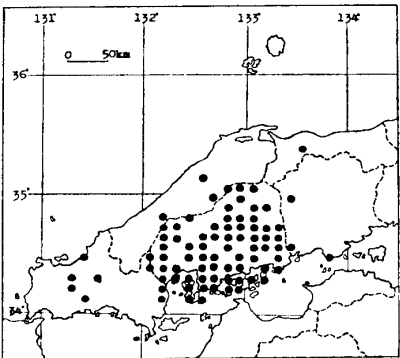
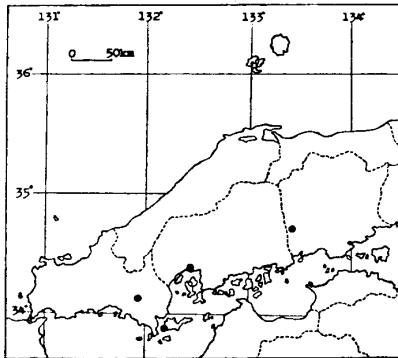
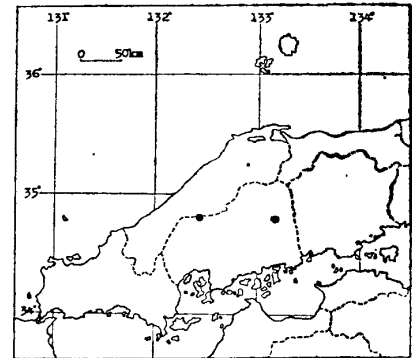
Map 13. *Carex thunbergii*Map 14. *Carex heterolepis*Map 15. *Carex forficula*Map 16. *Carex otaruensis*Map 17. *Carex incisa*Map 18. *Carex flabellata*Map 19. *Carex phacota*Map 20. *Carex maximowiczii*Map 21. *Carex kiotensis*Map 22. *Carex phacota* var.
gracilispicaMap 23. *Carex dimorpholepis*Map 24. *Carex shimidzensis*

Map 25. *Carex autumnalis*Map 26. *Carex scabriculumis*Map 27. *Carex nakiri*Map 28. *Carex curvicolis*Map 29. *Carex maculata*Map 30. *Carex blepharicarpa*Map 31. *Carex reinii*Map 32. *Carex confertiflora*Map 33. *Carex nipposinica*Map 34. *Carex transversa*Map 35. *Carex dispalata* var.
takeuchiiMap 36. *Carex dispalata*

Map 37. *Carex ischnostachya*Map 38. *Carex scabrifolia*Map 39. *Carex pumila*Map 40. *Carex bostrychostigma*Map 41. *Carex dissitiflora*Map 42. *Carex macroglossa*Map 43. *Carex aphanolepis*Map 44. *Carex japonica*Map 45. *Carex doniana*Map 46. *Carex mollicula*Map 47. *Carex vesicaria*Map 48. *Carex dickinsii*

Map 49. *Carex nervata*Map 50. *Carex mitrata* var. *aristata*Map 51. *Carex mitrata* var. *bingoensis*Map 52. *Carex rugata*Map 53. *Carex geihokuensis*Map 54. *Carex discoidea*Map 55. *Carex fibrillosa*Map 56. *Carex akiensis*Map 57. *Carex leucochlora*Map 58. *Carex horikawae*Map 59. *Carex leucochlora* var. *setouchiensis*Map 60. *Carex sikokiana*

Map 61. *Carex fernaldiana*Map 62. *Carex alterniflora*Map 63. *Carex duvaliana*Map 64. *Carex pisiformis*Map 65. *Carex multifolia*Map 66. *Carex daisenensis*Map 67. *Carex pocilliformis*Map 68. *Carex stenostachys*Map 69. *Carex tashiroana*Map 70. *Carex kamagariensis*Map 71. *Carex morrowii*Map 72. *Carex conica*

Map 73. *Carex foliosissima*Map 74. *Carex matsumurae*Map 75. *Carex pachygyna*Map 76. *Carex cillato-marginata*Map 77. *Carex siderosticta*Map 78. *Carex mira*Map 79. *Carex lanceolata*Map 80. *Carex ligulata*Map 81. *Carex miyabei*