

Carex × *bosoensis* (Cyperaceae), a New Hybrid from Central Japan

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A new natural hybrid, *Carex* × *bosoensis*, is described. *Carex meridiana* (Akiyama) Akiyama and *C. fibrillosa* Franch. & Sav. are presumed to be the putative parents. *Carex* × *bosoensis* was found on the sandy coast in Ichinomiya-machi, Chiba Pref., central Honshu, Japan. The hybrid is intermediate in significant characters between the putative parents and shows much lower pollen stainability.

Key words: *Carex* × *bosoensis*, Flora of Japan, natural hybrid, new hybrid.

Carex meridiana (Akiyama) Akiyama and *C. fibrillosa* Franch. & Sav. grow in different habitats: *C. meridiana* is a seashore plant of rocky places while *C. fibrillosa* is a plant of coastal sandy soils (Akiyama 1955, Katsuyama 1993). These two taxa, however, sometimes grew together on sandy seashores in Ichinomiya-machi, Chiba Prefecture, central Honshu, Japan. There were also plants of a *Carex* similar to both *C. meridiana* and *C. fibrillosa* that occurs sporadically. This *Carex* plant was presumed to be a natural hybrid between *C. fibrillosa* and *C. meridiana* (Yashiro 2007).

Carex meridiana has leaves 0.8–2.5 mm wide, smooth culms, sometimes with slightly elongate rhizomes, slightly remote pistillate spikelets 2.6–2.9 mm wide, basally pedunculate lower pistillate spikelets, and sessile and sparsely pubescent perigynia 2.1–2.5 mm long. *Carex meridiana* differs from *C. fibrillosa* by having leaves 1.8–3.3 mm wide, scabrous culms, long creeping rhizomes, usually contracted pistillate spikelets 3.5–4 mm wide, without, or very rarely with, basally pedunculate lower pistillate

spikelets, and shortly stipitate, densely pubescent perigynia 2.9–3.4 mm long (Fig. 1).

The presumed hybrid differs from both putative parents in having leaves 1.2–3.5 mm wide, slightly scabrous culms, occasionally basal pedunculate lower pistillate spikelets, and slightly or scarcely stipitate, densely pubescent perigynia 2.4–3.1 mm long.

The size of the leaves and culms, and



Fig. 1. Perigynia of *Carex fibrillosa* (a, K. Yashiro 31022), *C. × bosoensis* (b, K. Yashiro 31031) and *C. meridiana* (c, K. Yashiro 31012). Scale bar = 1mm.

Table 1. Comparison of morphological features and pollen stainability between *Carex meridiana*, *C. fibrillosa* and *C. ×bosoensis*

	<i>C. meridiana</i>	<i>C. fibrillosa</i>	<i>C. ×bosoensis</i>
Culm	smooth	rough	little rough
Leaf width (mm)*	1.59 ± 0.36	2.39 ± 0.45	2.11 ± 0.35
Perigynium length (mm)*	2.44 ± 0.09	3.02 ± 0.12	2.77 ± 0.20
Total number of perigynium per inflorescence*	29.9 ± 10.07	47.5 ± 14.02	45.6 ± 16.32
Number of individuals examined**	20	22	24
Leaf thickness (mm)*	0.36 ± 0.01	0.46 ± 0.02	0.39 ± 0.01
Upper epidermal cell thickness (µm)*	39.9 ± 3.23	32.9 ± 2.62	37.9 ± 2.82
Number of individuals examined***	5	5	5
Pollen stainability (%)*****	87 (31003)	96 (31010)	7 (31002)
	91 (31042)	93 (31047)	12 (31055)
	95 (31043)	94 (31048)	11 (31057)

*M.v. ± s.d.: Mean value ± Standard deviation.

**Voucher specimens examined are cited in the text.

***Voucher specimens examined: *C. meridiana* (31003, 31007, 31011, 31012, 31038), *C. fibrillosa* (31017, 31023, 31027, 31033, 31039), *C. ×bosoensis* (31025, 31026, 31028, 31032, 31034).

****Number in parentheses indicates voucher specimen.

the length and total number of perigynia per inflorescence were measured 20 individuals in *C. meridiana*, 22 individuals in *C. fibrillosa*, and 24 individuals in the presumed hybrid. The leaf thickness at the widest portion, and upper epidermal cell thickness were also measured in each five individuals, three leaves from each individual was collected, of the presumed hybrid and in the putative parents (Table 1). The transverse view was observed in thin sections (Fig. 2). The results indicate that the hybrid is intermediate in all quantitative characters between the parents.

Pollen viability was estimated by stainability of the pollen grains by the aniline blue lactophenol method (Hauser and Morrison 1964). The pollen stainability of the three taxa of *Carex* was determined by the ratio of the number of stained grains to the total number of

grains in over 300 grains from the flowers of one inflorescence. Two types of pollen grains were observed; stained (Fig. 3C, a), and unstained and shrunken (Fig. 3C, b). The voucher specimens for plants used to determine pollen stainability are listed in Table 1. Pollen stainability were 87, 91 and 95% in *C. meridiana*, 93, 94 and 96% in *C. fibrillosa*, and only 7, 11 and 12% in the hybrid.

Based on these results the presumed hybrid is described as a new natural hybrid between *Carex fibrillosa* and *C. meridiana*, with epithet *bosoensis* indicating the region where the hybrid was found.

Carex ×bosoensis Yashiro, hybr. nov.

Carex fibrillosa Franch. & Sav. × *C. meridiana* (Akiyama) Akiyama

Planta inter *Caricem fibrillosam* Franch.

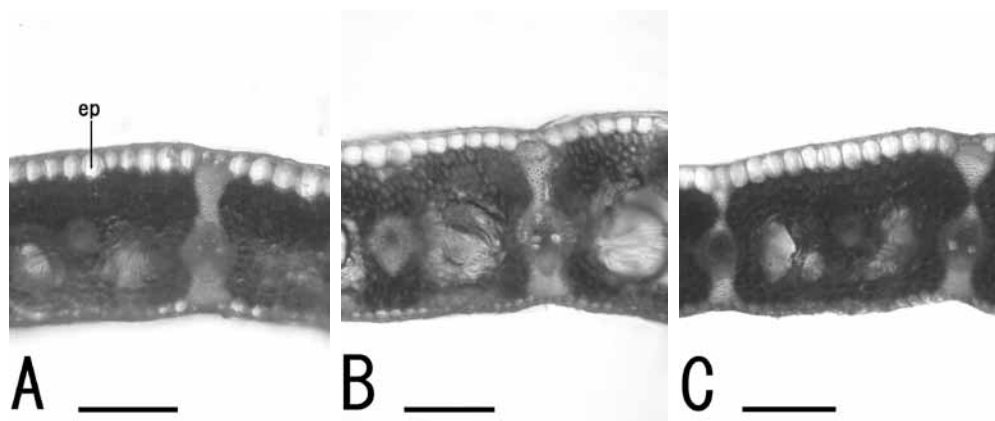


Fig. 2. Transverse sections of leaf of *Carex meridiana* (A, K. Yashiro 31011), *C. fibrillosa* (B, K. Yashiro 31023), and *C. x bosoensis* (C, K. Yashiro 31034). ep. Epidermis. Scale bars = 0.2 mm.

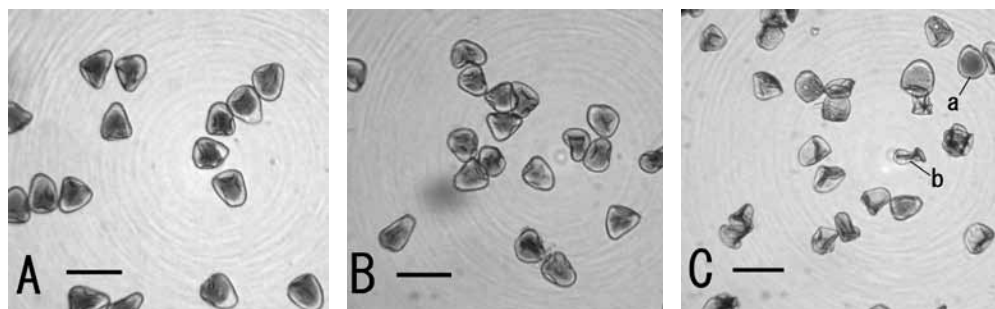


Fig. 3. Pollen grains stained with aniline blue lactophenol solution of *Carex meridiana* (A, K. Yashiro 31042), *C. fibrillosa* (B, K. Yashiro 31017), and *C. x bosoensis* (C, K. Yashiro 31032). a. Stained pollen grain. b. Non-stained and shrunken pollen grain. Scale bars = 50 μ m.

& Sav. et *C. meridianam* (Akiyama) Akiyama, quasi intermedia versimiliterque. Differt ab *C. fibrillosa* foliis angustioribus caulibus lucidis et pergyniis minoribus paucioribusque; ab *C. meridiana* foliis latioribus caulibus scabris et pergyniis majoribus pluribusque.

Type: Japan. Honshu: Chiba Pref., [Boso region] Chosei-gun, Ichinomiya-machi, Torami, among seaside pine thicket. Katsuhiko Yashiro 31014, May 12, 2007 (fl.) (TI-holo; TNS, CBM-iso; Fig. 4).

Rhizomes shortly creeping, ascending, covered with fibrous remains of leaf sheaths. Leaf blade linear, 15–30 cm long at flowering, elongating later, 1.2–3.5 mm wide, margins slightly scabrous. Stems 13–27 cm long, almost

smooth, as tall as or slightly taller than basal leaves. Spikes 2–5, erect; terminal spikelet staminate, linear-clavate, 7–18 mm long, 1.0–2.7 mm wide, taller than lower spikelets; staminate scales oblanceolate, 4.6–5.2 mm long, apex acute or awned; lateral spikes pistillate, lower one basally radiate, occasionally with basally pedunculate, cylindrical, 6–18 mm long, somewhat densely 20–100-flowered; pistillate scales ovate, 3.5–5.5 mm long, apex awned; Stamens 3. Perigynium obovoid, with thick stipe, 2.4–3.1 mm long, 0.6–1.3 mm wide, indistinctly trigonous, thickly nerved, densely pubescent. Anthers 2.6–2.9 mm long. Achenes almost immature.

Japanese name: Isohama-aosuge (nov.).

新和名：イソハマアオスゲ

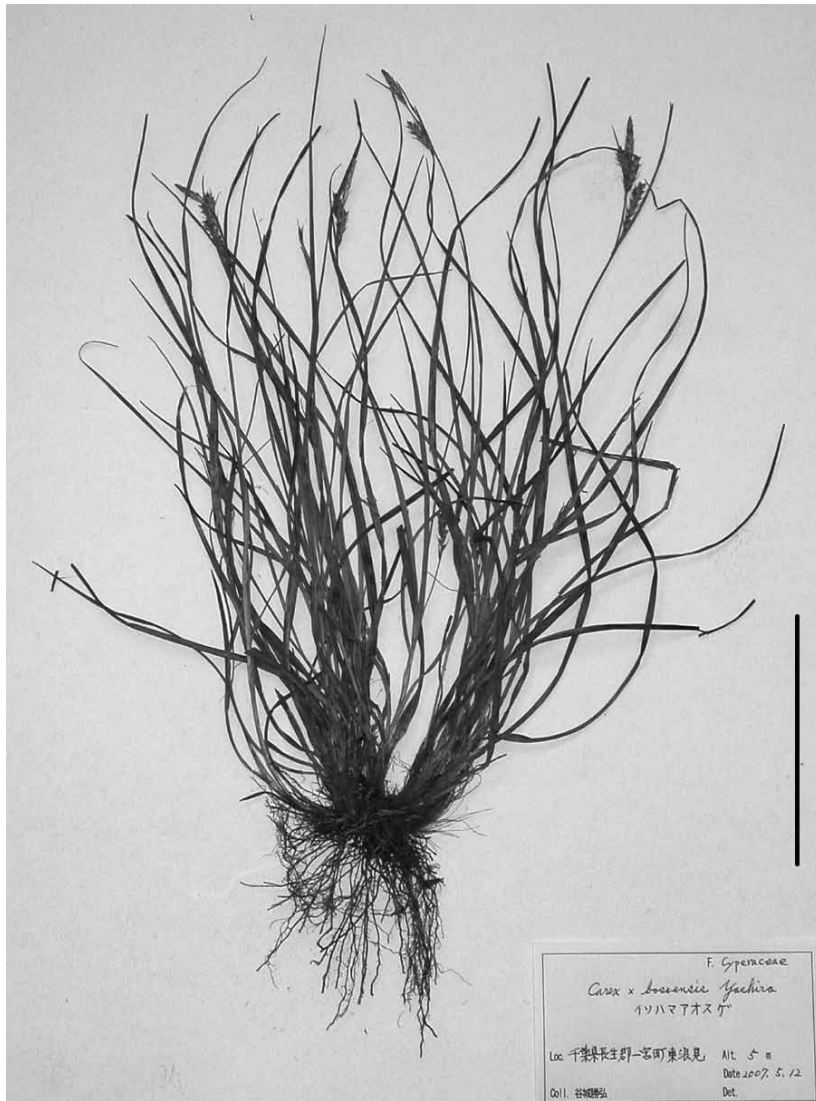


Fig. 4. Holotype of *Carex x bosensis* (K. Yashiro 31014, TI). Scale bar = 5 cm.

Other specimens examined. Japan. Honshu: Chiba Prefecture, Chosei-gun, Ichinomiya-machi, Torami, K. Yashiro 31002, 31005, May 3, 2006; *ibid.*, K. Yashiro 31013, 31014 (TI), 31015, 31019–31021, 31024–31026, 31028–31032, 31034–31037, May 12, 2007; *ibid.*, K. Yashiro 31040, Apr. 20, 2008 (from cultivated stock); *ibid.*, K. Yashiro 31055–31057, May 5, 2009.

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Appendix. Specimens examined of *Carex meridiana* and *C. fibrillosa* from Chiba Prefecture. All specimens are deposited in CBM.

Carex meridiana (Akiyama) Akiyama

Chiba Pref.: Chosei-gun, Ichinomiya-machi, Torami, K. Yashiro 31003, 31006, 31007, May 3, 2006; K. Yashiro 31011, 31012, May 12, 2007; K. Yashiro 31038 (cult.), Apr. 20, 2008; K. Yashiro 31041–31044, May 5, 2009; K. Yashiro 31060–31065, 31072–31074, May 22, 2009.

Carex fibrillosa Franch. & Sav.

Chiba Pref.: Chosei-gun, Ichinomiya-machi, Torami, K. Yashiro 31001, May 3, 2006; K. Yashiro 31008–31010, 31016–31018, 31022, 31023, 31027, 31033, May 12, 2007; K. Yashiro 31039 (cult.), Apr. 20, 2008; K. Yashiro 31045–31049, May 5, 2009; K. Yashiro 31067–31071, May 22, 2009.

谷城勝弘：イソアオスゲとハマアオスゲの推定雑種

イソアオスゲ *Carex meridiana* (Akiyama) Akiyama とハマアオスゲ *C. fibrillosa* Franch. & Sav. の雑種と推定される個体を千葉県で見出した。イソアオスゲは葉幅が狭く茎は滑らかで果胞は小型で少数つき、ハマアオスゲは葉幅が広く茎はざらつき果胞は大型で多数つくことで特徴づけられる。これに対し、雑種と推定される個体の茎はややざらつき、

葉幅、果胞の数と大きさ、葉と表皮細胞の厚さはイソアオスゲとハマアオスゲの中間となり、花粉の染色性はこれらに比べ著しく低く、ほとんど稔性がないものと推定される。この推定雑種をイソハマアオスゲ *Carex* × *bosoensis* Yashiro と命名した。

(千葉県立佐原高等学校)