

A New Variety of *Poa acroleuca* (Poaceae) from Okinawa

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新変種オキナワミゾイチゴツナギについて

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Plants of the *Poa acroleuca* aggregate growing in Okinawa do not fall exactly under *P. acroleuca*, *P. hisauchii* and *P. nipponica* in the mainland of Japan. Chromosomes and morphological features of the Okinawa plants were examined with the aim to understand the relationships between them and the mainland species. It was concluded that the plants in Okinawa are one of the extremely deviated populations of *P. acroleuca*.

Introduction

Tateoka and Koba (1988) examined chromosomes and morphological features of 841 individuals belonging to the *Poa acroleuca* aggregate collected from 125 localities ranging from Hokkaido to Kyusyu. They recognized three species in this aggregate; *P. acroleuca* Steud., *P. hisauchii* Honda and *P. nipponica* Koidz. and confirmed that the hairiness on the internerve surface of lemma, ligule hairiness, length ratio of anther to lemma and panicle shape are the most important features for discriminating between these species.

After their work, a supplemental research revealed that plants growing in Okinawa do not fall exactly under any of the three species in the

mainland of Japan. The plants were previously treated as *Poa acroleuca* by several workers (Masamune 1956, Hatusima 1971, Walker 1976, Koyama 1987). Chromosomes and morphological features of the population of Okinawa were examined in order to understand the relationships between it and the mainland species. Results obtained are here reported.

Materials and Methods

Twelve individuals were collected in the rosulate stage from Urazoe City, Okinawa Prefecture in January 1989, and were cultivated in Tsukuba Botanical Garden, National Science Museum. Methods for chromosome and morphological

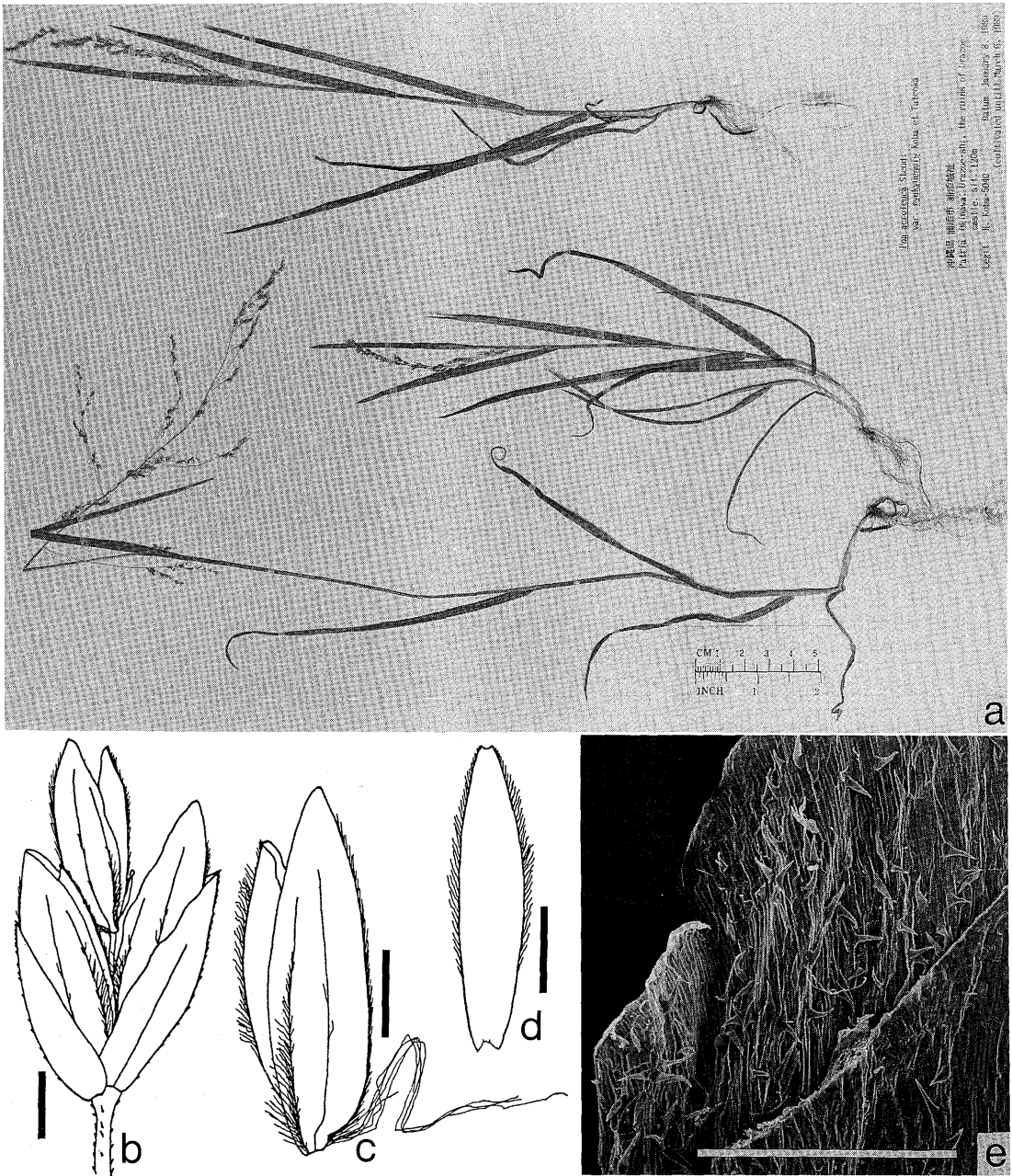


Fig. 1. a: Type specimen of *Poa acroleuca* var. *ryukyuensis*.; b: spikelet; c: floret; d: palea (abaxial view); e: SEM photograph of ligule. Scales indicate 0.5 mm for b-e.

observations are the same as those described by Tateoka (1985). Specimens preserved in KAG, KYO, TKB, TI and TNS were examined.

Results

Chromosome number. Counts of $2n = 28$ were invariably made for 12 collections.

Morphological observation. The 12 plants in

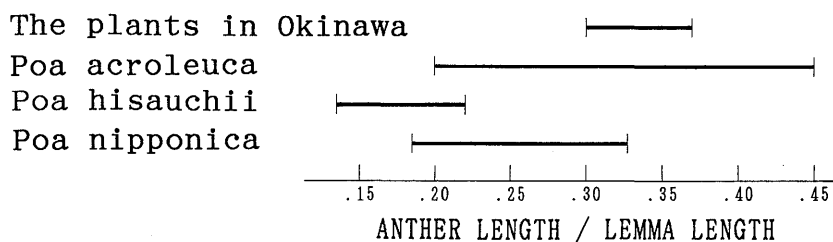


Fig. 2. Ranges of the length ratio of anther to lemma.

question were very similar in such diagnostic characters as the hairiness on the internerve surface of lemma, ligule hairiness, shape of panicle and length ratio of anther to lemma (Fig. 1a). The plants were glabrous or sparsely hairy on the internerve surface of lemma (Fig. 1c) and had clearly hairy ligules (Fig. 1e). Panicle branches spread before caryopses matured. Panicles therefore became elliptic. Values of length ratios of anther to lemma of the plants were larger than those of *Poa hisauchii* growing in the mainland and were overlapped in the ranges of *P. nipponica* and *P. acroleuca* (Fig. 2).

Habitat. In the mainland of Japan, *Poa nipponica* and *P. acroleuca* mainly occur around human habitations. They also grow even in city areas. Although *P. hisauchii* sometimes occurs around human habitations, it more often grows in hilly areas that were less disturbed. *Poa hisauchii* is rarer than the other two species in Kyusyu (Tateoka unpublished). The collection site of the population of Okinawa was situated in a city area.

Pollen grains. Good pollen grains with almost 100% stainability were found in all the 12 individuals examined. This means that these plants have high pollen fertility.

Herbarium specimens. As a result of the examination in the herbaria, four specimens of the present species aggregate collected in Okinawa were found (*vide infra*). The oldest was the one collected in 1923. Morphological features of these specimens

were quite similar to those of the plants which we collected in the field.

Discussion

Table 1 shows differences between the plants from Okinawa and the three species growing in the mainland of Japan. *Poa nipponica* was different from the plants in question in chromosome number and the hairiness of abaxial surfaces of ligules. *Poa hisauchii* was different from the plants in the shape of panicles, length ratio of anther to lemma and habitat preference. The Okinawa plants were in accord with the ordinary form of *P. acroleuca* in morphological characters except for the hairiness on internerve surfaces of lemma, which is one of the most important features for the identification of the plants concerned. All the individuals from Okinawa examined were different from *P. acroleuca* in the mainland in this character.

One would guess that the Okinawa plants might have arisen from hybridization. For example, the plants might be hybrids between *Poa acroleuca* and *P. hisauchii*. The character of *P. hisauchii* would appear in the lemma and that of *P. acroleuca* in the other parts (*cf.* Table 1). Though quite infrequent, interspecific hybrids were actually detected in all combinations between the three species concerned (Tateoka and Koba 1988). Very low pollen fertility was constantly found in these interspecific hybrids, however. Because of their high pollen stainability, it is unlikely that the plants

Table 1. Major differences between *Poa acroleuca*, *P. hisauchii* and *P. nipponica* growing in the mainland of Japan and the plants from Okinawa

	<i>Poa acroleuca</i>	<i>Poa hisauchii</i>	<i>Poa nipponica</i>	the plants in Okinawa
Chromosome number	2n = 28	2n = 28	2n = 42	2n = 28
Internerve surface of lemma	densely hairy or somewhat sparsely hairy	glabrous or sparsely hairy	glabrous or sparsely hairy, rarely densely hairy	glabrous or sparsely hairy
Abaxial surface of ligule	hairy in all ligules of an individual, rarely sparsely hairy ligules and glabrous ligules mixed in an individual	same as left	glabrous in all ligules of an individual, rarely sparsely hairy ligules and glabrous ligules mixed within an individual	hairy in all ligules of an individual
Panicle	elliptic or narrowly ovate; branches spreading at obtuse angles or reflexed*	narrowly elliptic or narrowly ovate; branches ascending along the main axis or obliquely ascending	ovate or elliptic, rarely narrowly elliptic at obtuse angles or reflexed*	elliptic or narrowly ovate, branches spreading at obtuse angles
Length ratio of anther to lemma	1/5-1/2	less than 1/5**	1/5-1/3**	1/4-2/5
Habitat	around human habitations	less disturbed hilly areas	around human habitations	around human habitation

* Except for panicles at the early flowering stage of some strains.

** With scanty exceptions.

in Okinawa arose from recent hybridization.

It is evident from the examination of herbarium specimens that the plants have existed in Okinawa since at least 1923. This means that they are not ephemeral being but propagating for many generations in the Okinawa island.

No taxon corresponding to the plants in Okinawa was reported in the literature concerning Chinese (including Taiwan), Korean, North American and European floras (Chung, 1965; Edmondson, 1980; Hitchcock, 1950; Hsu, 1975; Keng, 1959; Lee, 1966). Therefore, it is unlikely that the plants have been introduced.

Thus, it seems to be most plausible that the plants in Okinawa represent an extremely deviated population of *Poa acroleuca*. It is here described as a new variety of *P. acroleuca*.

Poa acroleuca Steud. var. *ryukyuensis* Koba et Tateoka, var. nov. (Fig. 1).

A typo pagina inter nervos lemmatis glabriuscula differt.

Annual or shortlived perennial, without rhizomes. Stems 30–50 cm, smooth. Leaves 2–5 mm wide; ligule 0.6–1.2 mm, apex acute, hairy on the abaxial surface. Panicle-branches patent before anthesis, scabrid, the lower 1–3. Spikelets 2–3 mm with 2–3 florets. Glumes unequal, acute, the lower 1-veined. Lemma glabrous or sparsely hairy on internerve surface, hairy on keels and marginal veins, base lanate, the lowest 1.6–2.2 mm, longer than the lower glume. Palea ciliate along the whole length of keels. Anthers 0.5–0.7 mm long. $2n = 28$.

Type: Okinawa Pref., Urazoe-shi, the ruins of Urazoe castle, alt. 120 m, Jan. 8, 1989, H. Koba 5040 (TI).

Distribution: Endemic to Okinawa Island.

Specimen examined: Liukiu isl. castle Shuri, May 13, 1923, G. Koidzumi (KYO); Okinawa Pref., Nakagami-gun, Nakagusuku-mura, the ruin

of castle Nakagusuku, Apr. 6, 1934, S. Tawada 78 (KYO); Nakagami-gun, Misato-mura, Nishihara, Jan. 27, 1934, S. Tawada 83 (KYO); Riukiu island Feb. 1935, Y. Taira (KYO); Okinawa Pref., Urazoe-shi, the ruins of Urazoe castle, alt. 120 m, Jan. 30, 1988, T. Makuchi (TNS-9019581, 9019582); Jan. 8, 1989, H. Koba 5037-5047 (TI).

Jap. Name: Okinawa-mizo-ichigotsunagi (nov.)

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要旨

沖縄に産する *Poa acroleuca* 群植物は、日本本土のミゾイチゴツナギ *P. acroleuca* Steud. に

もヤマミゾイチゴツナギ *P. hisauchii* Honda にもオオイチゴツナギ *P. nipnica* Koidz. にも一致しない。本土の種との類縁を解明するために沖縄産の植物の染色体数と形態的特徴を調べた。そ

の結果、この植物は、*P. acroleuca* の極端な変異集団であるとの結論が得られ、新変種として記載した。