

New Cyperaceae from Nepal and Adjoining Tibet

TETSUO KOYAMA

The New York Botanical Garden, New York 10458, U.S.A.

Described as new are *Carex hemineuros* of the affinity of *C. jaluensis*, *Carex himalaica* of the affinity of *C. circinata*, *Kobresia williamsii* of the section *Kobresia*, *Scirpus subbisetosus* as an ally of *S. lineolatus*, and a new subspecies, *Carex dispalata* subsp. *laxiflorens*. The author has come across these new entities while preparing a taxonomic treatment of the Cyperaceae for the Flora of Nepal Project of the Anglo-Japanese Cooperative Scientific Program.

An up-to-date flora of Nepal is being compiled under the auspices of the Anglo-Japanese Cooperative Scientific Program. To prepare a taxonomic treatment of the Cyperaceae for the Program I have made a thorough investigation on the ample collections of the Himalayan Cyperaceae housed in the herbarium of the British Museum (Natural History). While the results are incorporated in the whole treatment of the family, together with the data gathered elsewhere, for inclusion in the flora in due time, it is attempted here to publish the descriptions of four new species and one new subspecies, which the author has detected from the British collections. The author wishes to express his sincere thanks to Mr. L.H.J. Williams of the Botany Department of the British Museum (Natural History) for his thoughtful assistance in the herbarium. His appreciation is due also to the authorities of the Museum for the generous grant, which enabled him to visit London to carry out this study.

***Carex dispalata* Boott ex A. Gray subsp. *laxiflorens* T. Koyama subsp. nova.**

Glumae foemineae basi ellipticae ovatoellipticaeve purpureo-fuscae vel atrobrunneae, costa viridi ex apice glumarum excisso vel truncato in aristam rectam 1–2 mm longam excurrente; spiculae foemineae laxius florentes, tantum 4–5 mm crassae, utriculis erectopatentibus numquam recurvis; vaginae basilares brunneae vel fuscobrunneae nullo tempore rubentes; ceteroquin sicut subsp. *dispalata*.

Type collection. NEPAL: *L.H.J. Williams* 398 (BM, holotype; NY, isotype) from Mai Pokhari, West of Ilam, 7,000 ft. alt.; in *Sphagnum* bog.

Carex dispalata is a rather common sedge in temperate Far Eastern Asia with its range extending from Japan eastwards to Korea and adjoining Chinese Northeast and southeastwards to southern Shensi and Hupeh of the China Proper. The finding of its subspecies in Himalaya, as described above, constitutes another example of plants that show the so-called Himalayan-Japanese floristic link. Subspecies *laxiflorens* differs from subsp. *dispalata* principally in its slenderer spikes more loosely bearing

flowers, and in its shorter glumes with an awn prolonged beyond the shallowly bilobed apex. In subsp. *dispalata* its longer glumes are scarcely truncate at the apex without markedly prolonged awn. Series of the type collection showed that the leafy bracts of subsp. *laxiflorens* consistently much surpass the inflorescence itself, while in subsp. *dispalata* such leafy bracts are mostly shorter than to equalling the inflorescence.

Carex (§Maximae) **hemineuros** T. Koyama, spec. nova (Fig. 1). *Carici jaluensis* similis est, ab ea tamen recedit spicula terminali semper gynaeandra, squamis apice aristatis, et utriculis plurinervosis atque paulo longioribus.

Herba perennis subdense caespitosa, rhizomate breve squamis brunneis integris oblecto. Culmi 55–80 cm alti, 1.5–3 mm crassi, acute triquetri, laevi, interdum medio monophylli. Folia 4–6, ad basin culmorum aggregata; laminae lineares, culmo paulo breviores, 40–60 cm longae, 5–7 mm latae, herbaceae, flaccidae, tricostatae, planiusculae, praeter margines superiores scaberulos laevissimae, ad apicem acutum sensim attenuantes; vaginae elongatae, summa ca. 30 cm longa, pallida, caeterae 7–10 cm longae, antice membranaceae, dorso rufo- vel fusco-brunneae, integrae vel sparse fibrosolutae, apice oblique sectae, ligula 0.5 mm longa ferruginea. Spicae 4–6, subcontiguae vel ima aliquando remotiusculae; racemi axis scaber. Spica terminalis gynaeandra 2–5 cm longa, parte mascula 2–3.5 cm longa ca. 3 mm lata brunnea vel rufo-brunnea, parte foeminea ea mascula brevior 6–8 mm crassa; pedunculus 0.5–3 cm longus. Spicae laterales foemineae, interdum superiores 1 vel 2 basi cum parte mascula brevis, 2.5–4 cm longae, 5–8 mm crassae, dense multiflorae, olivaceo-brunneae, ima pedunculo longe (5–10 cm) exserto inclinata, superiores breviter (0.3–2 cm) pedunculatae, erecto-patentes. Bractae 2 inferiores foliaceae, inflorescentiam superantes; ima 14–17 cm longa, basi breviter (0.7–1.5 cm) vaginans; secunda vix vaginans; caeterae multo reductae, setaceae, evaginantes. Glumae foemineae ovatae, 2–3 mm longae, 1.2–1.5 mm latae, membranaceae, brunneae, costa viridi trinervata ex apice glumae aristas rectas scabras ca. 1.5 mm longas excurrentes. Utriculi glumis paulo breviores, obovati vel late obovati, 2.8–3 mm longi, 1.5–2 mm lati, apice rotundo-contracti brevi-rostrati, basi sensim cuneto-attenuati, compressi trigoni, leviter inflati, herbacei, glabri, glauco-virides, valide bicostati, nervis 4 vel 5 tantum dimidio attingentibus; rostrum breve, ore truncato haud bidentato. Achaenia laxè inclusa, obovata, 1.5–2 mm longa, 1–1.5 mm lata, trigona, basi cuneata, apice subito contracta mucronata, faciebus flavescentia; stylus 1.8 mm longus, basi aequalis, supra basin profunde trifidus (stigmatibus 3, 1.5 mm longis).

Type collection. NEPAL: *Poonin, Sykes & Williams 2399* (BM, holotype; NY, isotype) from Bheri River, near Tarakot, ca. 10,000 ft. alt.; among deciduous and coniferous forest. Paratype. CHINA: Southeastern Tibet, Kongbo Province, Lusha, Tsangpo Valley, 9,500 ft. alt. *Ludlow, Sherriff & Taylor 4817* (BM).

As a sole representative of the section Maximae in the Himalayas *Carex hemineuros* shows a rather unusual floristic link between the Himalayas and northeastern China, for its only taxonomic ally is *C. jaluensis* known only from Manchuria and northern Korea. In spite of the similarity between the two in general appearance, the



Fig. 1. *Carex hemineuros* T. Koyama, from type.
 a: habit; b, c: two views of utricle; d: pistillate glume; e: dorsal view of achene. Scales for utricular parts = 1 mm. Drawn by H.M. Fukuda.

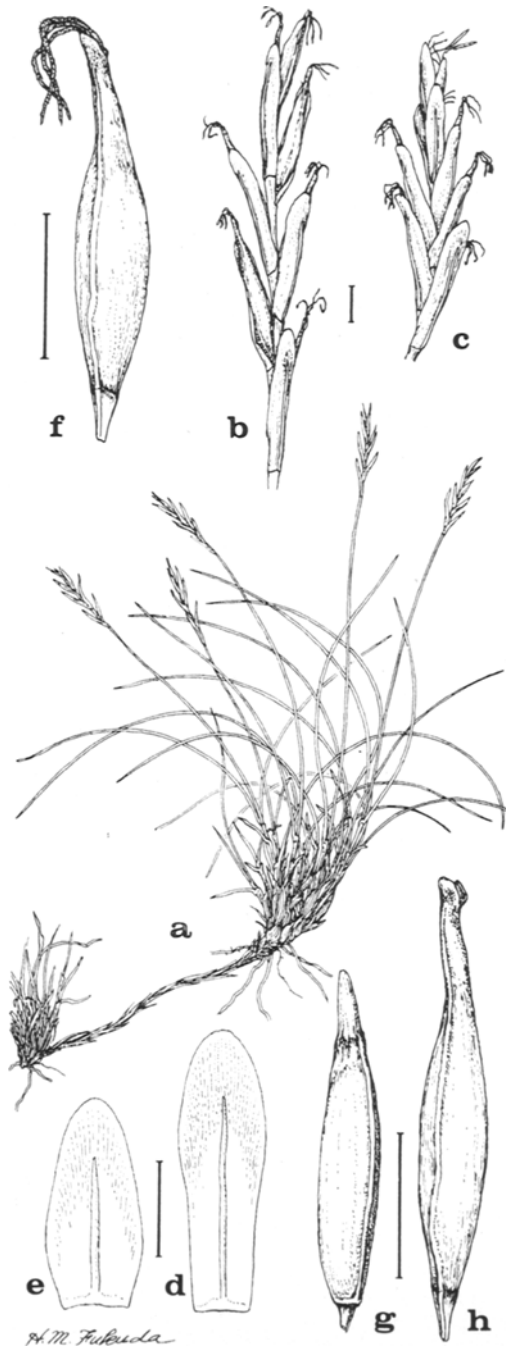


Fig. 2. *Carex himalaica* T. Koyama, from type.

a: habit; b: pistillate spikelet; c: androgynous spikelet; d: pistillate glume; e: staminate glume; f: utricle; g: achene; h: utricle with stigmas removed. Scales for spikelets glumes and utricular parts = 1 mm. Drawn by H.M. Fukuda.

utricles that are conspicuously several-veined below the midway portion as well as the gynaeandrous terminal spikes in *C. hemineuros* sufficiently differentiate it from *C. jaluensis* bearing bicostate utricles and always unisexual spikes.

Carex (§Circinatae) **himalaica** T. Koyama, spec. nova (Fig. 2) ob spicas gynae-

candras facile cognoscenda. *Caricis circinatae* tantum remote affinis, sed valde diversa est utriculis minoribus 3 vs. 5 mm longis et spicis paucifloris.

Herba perennis parva subdense caespitosa; rhizoma subrepens, 1–2 cm longum, 2–3 mm crassum, squamis fibrisque brunneis vestitum, interdum stolones 1 mm crassos 3–5 cm longos emittens. Culmi graciles, erecti, 3.5–7 cm alti, 0.5 mm crassi, obtuse trigoni, laevissimi, basi 2- vel 3-foliati. Folia suberecta vel curvula, culmo longiora breviorave; laminae filiformes, 2–8 cm longae, 0.3–0.5 mm latae, canaliculatae, rigidulae, laevissimae, apice obtusiusculae; vaginae 1.5–2.5 cm longae, pallide fulvescentes, antice tenuiter membranaceae, apice ligulam hyalinam ferruginescentem truncatam productae. Vaginae basillares 3 vel 4 aphyllae, 5–10 mm longae, membranaceae, brunneae, apice mucronatae, demum plus minus fibroso-solutae. Spica unica terminalis, gynaeandra raro foeminea, clavata vel anguste obovata 6–15 mm longa, 2.5–4 mm lata, fulva vel brunnescens, subdense 5–10-flora et basin versus laxa, ebracteata, floribus basilaribus 1–3 plerumque masculis. Glumae foemineae et masculae similes, oblanceolato-oblongae vel lanceolato-oblongae, 3–4.2 mm longae, ca. 2/3 mm latae, apice obtusae vel obtusiusculae, tenuiter membranaceae, fulvae vel castaneo-brunneae, costa viridi 1-nervi sub apice terminata. Utriculi squamam parum superantes, erecto-patentes, lineari-oblanceolati vel fusiformes, 3.5–5.2 mm longi, 0.5 mm lati, longe rostrati, tenuiter membranacei, glabri, fulvescentes, praeter costas duas laeves virescentes enervi, basi in stipitem 1/3 mm longum sensim attenuantes, apice gradatim longi-rostrati, rostro 1–1.5 mm longo recto laevissimo, ore oblique secto ferrugineo hyalino. Achaenia sublaxe inclusa, oblanceolata, trigona, 2.7–3 mm longa, 0.4–0.5 mm lata, basi sensim attenuata, apice contracta, stylopodio subulato subpersistente mucronata; stylus filiformis 1.5 mm longus; stigmata 3, 1 mm longa.

Type collection. NEPAL: *Stainton 522* (BM, holotype; NY, isotype) from Arun Valley, Kasuwa Khola, north of Num, 12,000 ft. alt.; on grass amongst shrubs. Paratype. NEPAL: Central Nepal, Langtang, 11,500 to 12,500 ft. alt.; small *Carex* forming tuft on very wet ground. *Pollin 464* (BM).

Carex himalaica is remarkable by the gynaeandrous spikes, and consequently is readily distinguishable from all the species of the section *Circinatae* having androgynous spikes. Although the gynaeandrous spikes are quite extraordinary in *Circinatae* the long-beaked, lanceolate utricles in association with trigynous achenes and brown glumes leave no doubt that the new species properly belongs here. With the small utricles that are only 3 to 4 mm long *C. himalaica* comes close to *C. christii* of Nilagiri Mts.

Kobresia (§ Kobresia) **Williamsii** T. Koyama, spec. nova (Fig. 3) e vicinia *Kobresiae curticepidis*, a qua recedit rhizomate stolonifero, inflorescentia magis brevior, bractea etiam brevior inflorescentiam numquam superante, perigynio etiam multo brevior, et gluma apice non aristata nec cuspidata.

Herba perennis laxa caespitosa; rhizoma horizontaliter repens, stolonibus 3–6 cm longis 1.5–2 mm crassis squamis dilute brunneis oblecto, collo oblique ascendente vaginis foliorum mortuorum fulvo-brunneis circumdante. Culmi erecti 20–40 cm

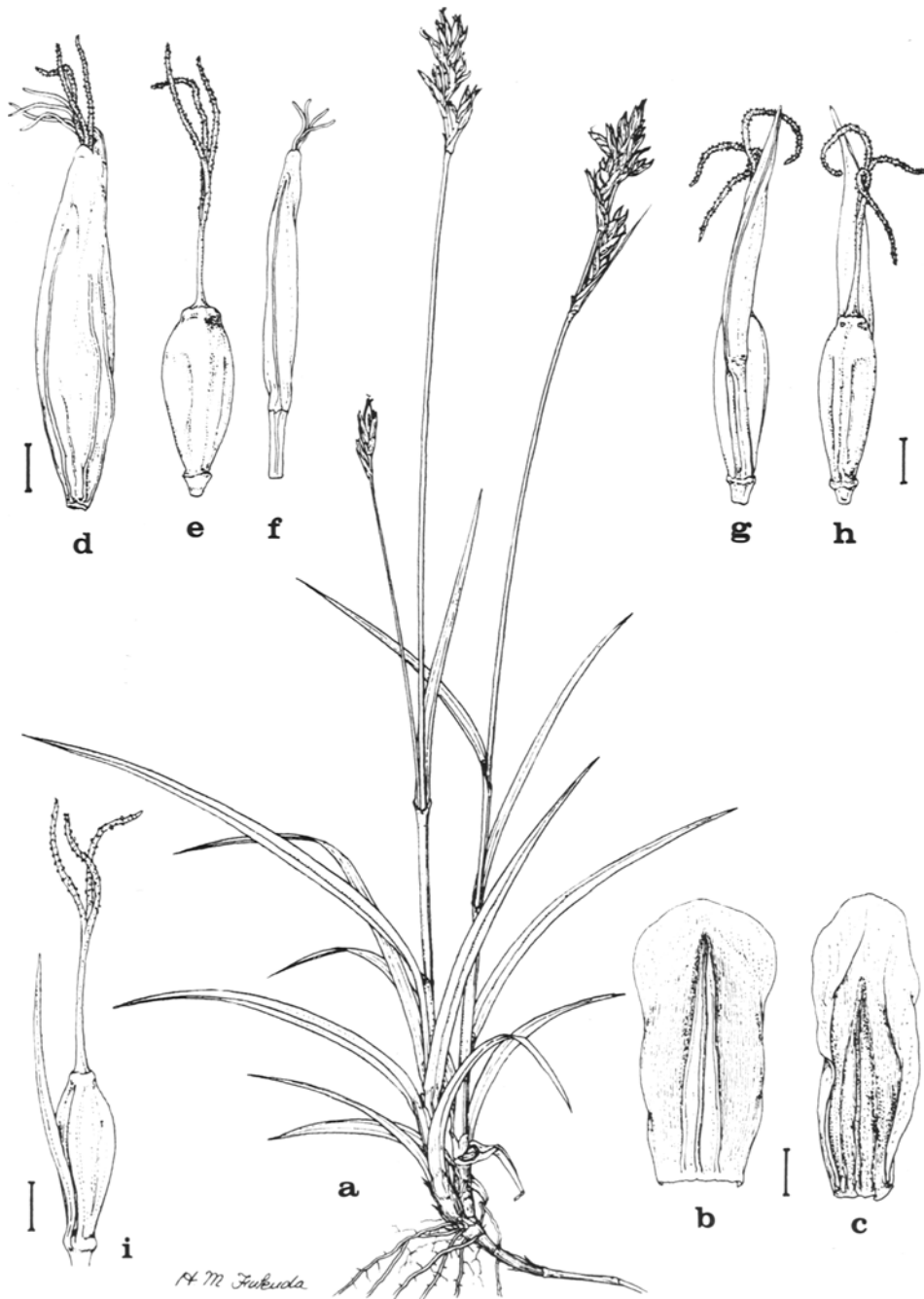


Fig. 3. *Kobresia Williamsii* T. Koyama, from type.

a: habit; b: abaxial side of glume subtending a prophyll; c: adaxial side of glume subtending a prophyll; d: prophyll of bisexual spikelet; e: achene with style and stigmas; f: staminate partial spikelet; g, h: adaxial (g) and abaxial (h) views of a bisexual spikelet; i: pistil with a neutral rhacheola. Scales for utricular parts = 1 mm. Drawn by H.M. Fukuda.

alti, 0.5–1 mm crassi, triquetri, laevissimi, ad medium usque 3- vel 4-foliati. Foliorum laminae lineares, 4–20 cm longae, 2.5–5 mm latae, planae, glabrae, herbaceae, praeter margines scabros laeves, laete virides, ad apicem longe acuminatum sensim attenuantes; vaginae 2–8 cm longae, membranaceae, dorso pallide virentes, antice hyalinae pallide brunnescentes, ligulis 3–4 mm longis hyalinis ferruginescentibus ore oblique sectis; vaginae basilares aphyllae vel brachyphyllae, fulvo-brunneae vel brunneo-cinnamomeae, haud vel sparse fibroso-solutae. Inflorescentia erecta, spiciformis vel partim racemosa, oblonga vel oblanceolata, 2.5–7 cm longa, 7–15 mm lata, fere contigua, raro spicam unicam subradicalem longe exserte pedunculatam addita, brunnescens; axis inflorescentiae laevis. Bractea ima suberecta, linearis, 3.5–7 cm longa, minus quam 1 mm lata, evaginans, basi marginibus hyalinis ferrugineis dilatatis auriculata; bracteae superiores squamiformes, marginibus late hyalinis ferrugineis, costa viridi ex apice in aristam 3–15 mm longam excurrente. Spicae 4–10, sessiles, raro ima breviter pedunculata, oblongae vel ellipticae, 1–2 cm longae, ca. 5 mm latae, androgynae, spicula terminali mascula et spiculis lateralibus prophyllatis compositae. Spicula mascula linearis, 5–7 mm longa, pluriflora. Spiculae laterales, prophyllatae, aut androgynae aut foemineae. Glumae late ellipticae vel oblongo-ellipticae, 5.5–7 mm longae, hyalinae, fulvo-brunneae, apice rotundo-truncatae, costa viridi trinervia sub apice terminata. Prophylla oblongo-lanceolata, ad apicem connata, 7–8.5 mm longa, 1.5–2 mm lata, membranacea, pallide viridescens, 2–5-nervia, glabra, levissima, apice sensim attenuantia, rostro elongatulo sursum brunnescente, ore oblique secto. Achaenia anguste obovata, 3.2–3.5 mm longa, 1.3–1.5 mm lata, trigona, maturitate lutescentia, basi cuneato-attenuata, apice contracta annulata, disco 1/2–2/3 mm lato; stylus rectus, 6 mm longus, a medio trifidus (stigmatibus 3–4 mm longis). Rhacheola compressa 3–7 mm longa, laevis, interdum flores masculos 2 vel 3 gerens.

Type collection. NEPAL: *Stainton, Sykes & L.H.J. Williams 3255* (BM, holotype; NY, isotype) from grassy slope by Pass, above Seng Khola, 13,000 ft. alt. Paratype. NEPAL: East Nepal, between Thudam and Lama Chungbu, 3,600 m alt., *H. Kanai et al. 720681* (TI).

Besides the stoloniferous rhizomes, which have so far not been seen in any species of the section *Kobresia*, this new species differs from both *K. curticeps* and *K. uncinoides* in the completely glabrous prophylla and rhacheolae in contrast to the pubescent prophylla and the ciliate rhacheolae in the latter two. In comparison with *K. curticeps*, which is the closest ally of the present species, it can easily be discerned by the shorter leafy bract, which never exceeds the inflorescence, as the much longer leafy bract of *K. curticeps* always stands straight and is much surpassing the inflorescence that is normally inclined. It gives me much pleasure to be able to name this clearcut species in honor of Mr. L.H.J. Williams, who is a co-collector of the type specimen, and with whom I studied Nepalese Cyperaceae in London.

Scirpus (§ *Actaeogeton*) **subbisetosus** T. Koyama, spec. nova (Fig. 4) ex affinitate *Scirpi lineolati* Franch. & Savat., a quo diversa est rhizomate decumbente crassiusculo non stolonifero, inflorescentia plerumque distachya tantum 5 mm longa, et glumis

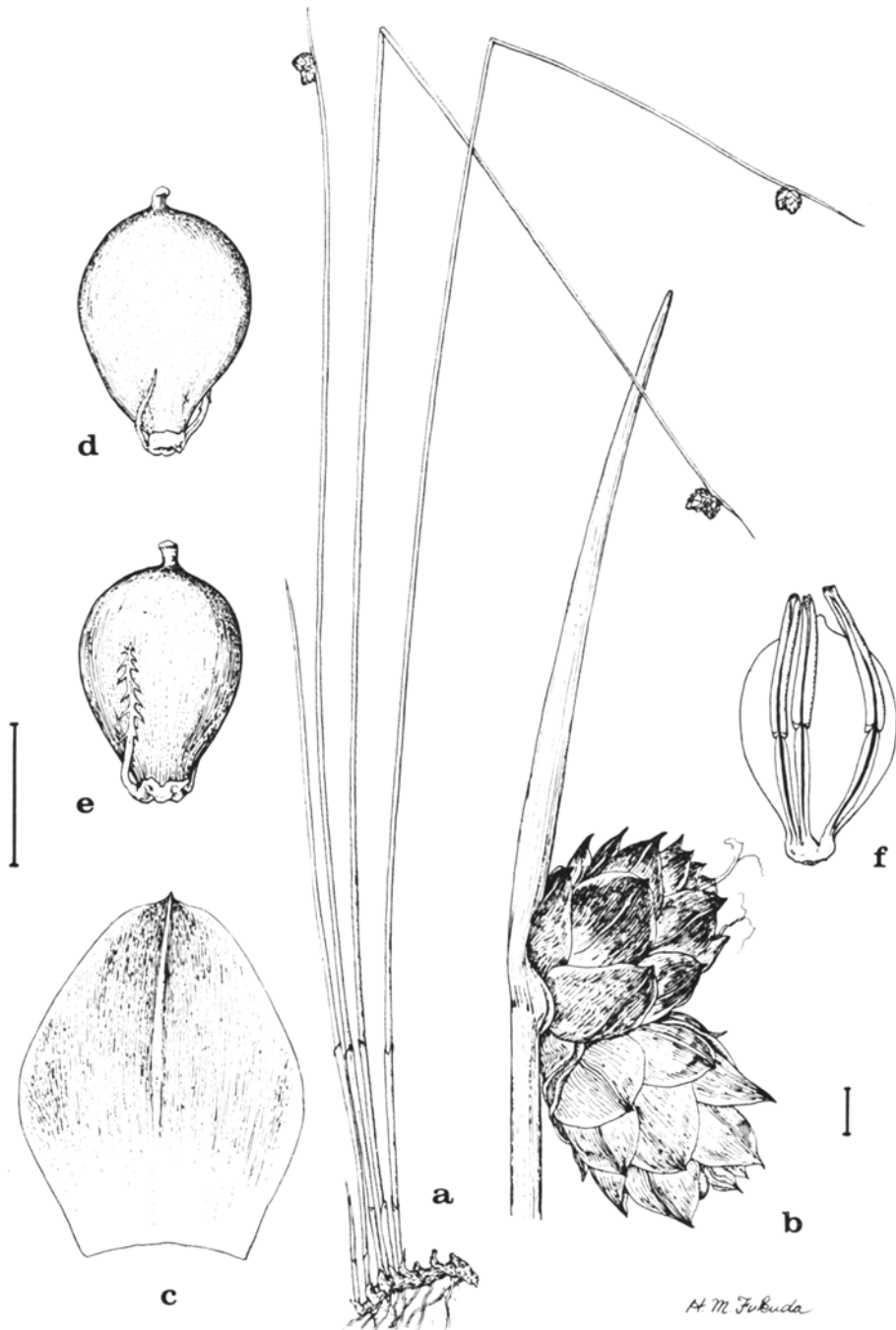


Fig. 4. *Scirpus subbisetosus* T. Koyama, from type.

a: habit; b: head with the involucral bract; c: glume; d, e, achenes; f: stamens with immature achene. Scales for inflorescence, glume and achenes = 1 mm. Drawn by H.M. Fukuda.

multo brevioribus 2.5 vs. 4 mm longis.

Herba perennis laxe caespitosa; rhizoma decumbens, lignescens, 1.5–4 cm longum, ca. 5 mm crassum, ad basin culmorum incrassatum, squamis brunnescentibus sparse fibroso-solutis vestitum. Culmi uniserialiter erecti, aphylli, graciles, 22–40 cm alti, medio 1.5–2 mm crassi, teretes, pallide virides, glabri, laeves; vaginae basillares 2 vel 3, membranaceae, apice oblique sectae mucronulatae, pallide virides et plus minus brunnescentes, summa 3–8 cm longa, media 1–2 cm longa, infima squamiformis 4–6 mm longa fusca. Bractea involucrans unica erecta, 1–3 cm longa, spiculas multo excedens, deorsum antice canaliculata. Inflorescentia pseudo-lateralis 2- vel raro 1-spiculata; spiculae late ovatae, 4–7 mm longae, 3–5 mm latae, teretes, spisse pluriflorae, apice subobtusae, fusco-brunneae. Glumae spiraliter imbricatae, late ovatae, 2.8–3.5 mm longae, 1.5–2 mm latae, versus apicem mucronulatum subito contractae, naviculares, chartaceae, medio fusco-brunneae, latere utrinque pallide brunnescentes, costa 1 gracili, nervulis 4–8 gracillimis obsoletis, marginibus minutissime ciliolatis. Achaenia obovata, biconvexa, 1.6–1.8 mm longa, 1.1–1.25 mm lata, basi cuneato-attenuata, apice rotundo-contracta mucronata, faciebus brunnescentia leviter nitida, vix rugosa; stylus 2–2.3 mm longus, compressus, apice 2-fidus (stigmatibus 2, ca. 1 mm longis). Stamina plerumque 3, antheris 1 mm longis, connectivo vix 0.1 mm longo glabro.

Type collection. CHINA: *Ludlow, Sherriff & Taylor 6165* (BM, holotype) from southeastern Tibet, Kongbo Province, Chomo Dzong, Nyang Chu, 10,000 ft. alt.; around margin of pond.

This new species, thus far known only by the type collection, undoubtedly most closely resembles *Scirpus lineolatus* of Japan and Taiwan in the small, biconvex achenes with an invariably two-cleft style, and in the slender, terete culms. It, however, sharply differs from the latter at least in its smaller inflorescences usually bearing two spikelets, and in the knotty rhizomes, which eventually becomes woody and are not at all stoloniferous. In *S. lineolatus* the soft, slender stolons never become woody nor are thickened in any sense, and its larger inflorescences as a rule bear a single spikelet.

Received August 10, 1973