

Additions To and Notes On N.Z. Scirpus and Carex

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Abstract

S. lenticularis Poir. is replaced in the N.Z. Flora by *S. crassiusculus* Hook. f. and *S. fluitans* L. *S. merrillii* (Palla) Kukenth is added to the N.Z. Scirpus. Three new species and a variety are also added—viz., *S. pottsii*, *S. caligenis*, and *S. caligenis* var. *tristigmata* and *S. antipodus*. One of the forms placed under *S. inundatus* Poir is restored to the rank of a species of *S. reticularis* Col. *S. antarcticus* L. is not regarded as occurring in N.Z. The spread of the introduced species *S. setaceus* L. is also noted. *Carex inopinata* is added to the N.Z. Carices. The occurrence of *Carex demissa* Hornem, *C. scoparia* Schkuhr, *C. pallescens* L., and *C. capillacea* Boott in N.Z. is noted, as also are new localities for *C. oederi* var. *cataractae* R. Br., *C. buchanani*, *C. carsei*. *Carex ivalii* is removed from the N.Z. Flora.

DESCRIPTIONS OF NEW SCIRPUS SPECIES

Scirpus pottsii sp. nov. aff., *Scirpus sulcatus* Thours var. *distigmata* C. B. Clarke. Planta caespitosa, culmi erecti vel diffusi 10–40 cm. alti, lineares tenues valde caniculata ex una parte et leviter caniculata ex altera parte. Folium unum culmi basi vicinum culmo brevius lineare concavum. Spiculae plerumque 2–6 20–50 flores portantes 3–4 mm. longae 2 mm. latae. Bractea erecta 5–20 mm. longa. Glumae carinatae excurrentes nervosae rubrae pictae apice membraneae. Stigmata 2–3 fid exserta 2-fid creberrime. Stamina 1 lineare apiculatum 0.5 mm. longum. Nux elliptico-obovata apiculata biconvexa, plures acute trigona fusco-fulva mature 1 mm. longa 0.7–0.8 mm. lata cellulae parvae superficiem punctatum praebentes. $\frac{1}{2}$ glumae aequans.

Plant tufted, culms erect or spreading, numerous, 10–40 cm. high, linear; deeply grooved on one side, shallow grooved on the other. Leaves one from near the base of the stem and shorter than it, linear, concave. Spikelets 20–50 flowered, 2–6, seldom more or less. 3–4 mm. long, 2 mm. wide. Bract erect, 5–20 mm. long. Glumes keeled—keel more or less excurrent, nerved, stained red, membraneous at the tips. Styles 2–3 fid, 2 fid predominating. Stamens 1 linear apiculate, 0.5 mm. long. Nut elliptic—obovate, apiculate, biconvex, a few sharply trigonous dull yellow at maturity, 1 mm. long, 0.7–0.8 mm. wide; cells small, giving the nuts a somewhat punctate appearance.

North Island: Waioeka River, 1943, Potts; Te Kuiti, 1945, Cook; Opepe, 1934, Atkinson; Tokaanu, 1940, Cook; Nr. Ruapehu, 1931, Zotov; Manganui a te ao River, 1932, Attwood; Ohakune, 1947, Cook; Waverley, 1914, Allison; Ruahine Mts., ca 4,400 feet, 1940, Zotov; Canyon Creek, Tararua Mts., 1944, Allan; Otaki Gorge (no date), Allan.

South Island: Mt. Peel, 1915, Allan; Broken River, 1947, Cook; Ashley Gorge, 1947, Talbot.

Type Locality. Waimarino Plateau.

Co-type in the Auckland Museum; type in the herbarium of the author; No. 2469. A plant of this species was sent for identification to Kew by Carse, and

is the one referred to by him (*Trans. Roy. Soc. N.Z.*, 1929, Vol 60). The suggestion is there made that the plant may be a hybrid between *S. sulcatus* var. *distigmata* and *S. inundatus*. An examination of Carse's specimen shows that this particular plant is exceptional when compared with other plants of the same species in that the fruits are more mixed than is usually the case.

Trigonus fruits do occur in all specimens so far examined, but are relatively few. This occurrence of mixed fruits is not unusual in many of our *Scirpus* species—a fact which increases the difficulty of identification. How far hybridisation may be a factor can only be cleared by research, but the writer's experience with the plants in the field and with the plants themselves leads him to think there is some other explanation.

Field work and a study of plants collected from various areas do not point to the species here described being a hybrid.

The following table shows the main differences between *Scirpus pottsii* and *Scirpus sulcatus* var. *distigmata*.

<i>S. pottsii</i>	<i>S. sulcatus</i> var. <i>distigmata</i>
Range: South of lat. 38deg., sea level to 4,400 feet.	Range: N. and S. Islands; sea level to 2,000 feet.
Spikelets: 2-6.	Spikelets: 10-20.
Glumes: Narrow, lanceolate.	Glumes: Broadly-elliptic, obtuse.
Styles: 2 and 3.	Styles: 2.
Fruit: Apiculate, broadly obovoid, surface cells indistinct.	Fruit: Not apiculate, elliptic, surface cells distinct.
Leaves: One.	Leaves: None.

Scirpus caligenis sp. nov. affinis *S. aucklandicus* Boeck. Planta caespitosa vel culmi relative longinquis e rhizomate distincto. Culmi erecti rigidiusculi 2-5 cm. alti. *Folia* 2-5 non aequalia plerum uno culmum excedente. *Vagina* rufo-castanea fibrillosa. *Stamina* 2-3 mm. longa linearis valde apiculata, apice interdum 0.4 mm. longo. *Stigmata* 2 *Spicula* una erecta stramines cum pollet 3 mm. longa 2 5 mm. lata flores 10-20 portans. *Glumae* carinatae praesertim inferiores carinis excurrentibus; marginibus spicem lanceolatum productis; gluma externa saepe carinata, carina spiculam aequante vel excedente 4-5 mm. longa. *Bractea* erecta tandem obliqua 5-20 mm. longa. *Nux* orbiculata vel obovata biconvexa vix apiculata cellulis distinctis 0.9-1.1 mm. longa, 0.8 mm. lata $\frac{1}{2}$ glumae aequans nigro-brunnea mature var. *tristigmata* similis sed nux trigona obovata basi tenuis, stigmata 3.

Plant tufted or stems relatively distant from a distinct rhizome. *Culms* erect, somewhat rigid, 2-5 cm. high. *Leaves* 2-5 unequal, generally one exceeding the culm, concave, obtuse at the tip. *Sheath* brownish, fibrillose. *Stamens* 2-3 mm. long, linear markedly apiculate, tip sometimes 0.4 mm. long. *Styles*, 2. *Spikelets*, 1, erect, straw-coloured when ripe, 3 mm. long, 2.5 mm. wide, 10-20-flowered. *Glumes* keeled, and particularly in the lower ones the keel excurrent and the margins narrowing to give the glume a lanceolate appearance. Outer glume often with the keel produced equalling or exceeding the spikelets 4-5 mm. long. *Bract* erect, later becoming oblique, 5-20 mm. long. *Nut* orbicular or obovate, narrowed towards the base, biconvex scarcely apiculate, cells distinct from brown to black, when mature 0.9-1.1 mm. long, 0.8 mm. wide. var. *tristigmata* similar to the above but somewhat smaller in size. *Style* 3 fid—nut obtusely trigonous. A variable species of which the most distinctive characteristics are the erect stramineous

solitary spikelet, the prominently apiculate stamens, the brownish fibrillose sheath, and the prominent cell outline in the surface of the fruit.

The above species well illustrates the difficulties associated with the determination of *Scirpus* species. H. Talbot, who has had considerable experience with the plants in the field, considers that there are two distinct species involved, but the differences are not, in my opinion, constant enough to warrant this view. What I regard as typical *S. caligenis* is larger than the variety in both the fruit and the spikelet, and the elongated glume is more frequently present. Some specimens, however, approach the variety *tristigmata* in the fruit and in the smaller size. On the other hand, some specimens of the variety have the elongated glume, and fruits similar in shape to those of the species though smaller in size. The species and the variety differ in that the former possesses mostly 2 fid styles and a broadly elliptic biconvex fruit, while in the latter the styles are mostly 3 fid and the nut is trigonous and obovate and at maturity darker in colour. In habit the plants are not materially different. Both forms are distinct from *S. aucklandicus* and *S. basilaris* with which they have been confused. *S. aucklandicus* has fewer flowers (6–8), a more compressed spikelet and a larger fruit (1.5 mm.). *S. basilaris*, with which it has also been confused, has a much smaller fruit (0.8 × 0.5 mm.) and smaller spikelets (2.5 × 1.7 mm.) which are concealed by the leaves.

Type Locality. Jackson, Teramakau River, Westland.

Type. Auckland Museum, No. 2079.

Distribution. South Island.

S. caligenis: Lake Tekapo, 1946, Talbot; Nr. Ashburton, (no date), Allan; Jackson, Teramakau River, 1893, Petrie; 1949, Cook, Talbot.

Var. tristigmata: Broken River, 1947, H. Talbot, Cook; Lake Brunner, 1944, Brookie; Lake Lyndon, 1946, Talbot; Lake Tekapo, 1883, Cheeseman; 1946, Talbot.

Scirpus antipodius sp. nov. cernuo Vahl affinis, sed apiculis minoribus et nucibus minoribus et trigonis manifeste differt. *Culmi* dense caespitose, virides, tenuissimi, interdum ramosi usque ad 16 cm. alti, supra sulcati. *Folia* ad vaginam unicum redacta, tenuiter striata, truncata, mucronata, raro in laminam angustam producta. *Bractea* unica erecta, culmo similis, usque ad 8 mm. longa, ad basem dilatata. *Inflorescentia* lateralis. *Spiculae* 1–3 ovoideae, obtusae, virides vel nigrantes, 1.5–2.5 mm. longae, 1.1 mm. latae, cum floribus circiter 12, subteretes. *Glumae* valde nervosae, carinatae, carina viridis, curvata, ad apicem vix mucronata, ± recurvata; margines angusti, hyalini, 1.1–2 mm. longi. *Stigmata* 3. *Setae* hypogynae nullae. *Stamina* 2. *Anterae* late oblongae, ad apicem subobtusae, 0.3 mm. longae. *Nux* evidenter trigona, elliptica, breviter lateque stipitata, nigrans vel fusca mature 0.6–0.8 mm. longa, 0.3–0.4 mm. lata, minute apiculata.

Culms densely tufted, green, very slender, sometimes branched, up to 16 cm high, channelled above. *Leaves* reduced to one, finely striate, sheath with a truncate mouth which is furnished with a short, erect mucro, rarely the sheath extending into a longer narrow leaf blade. *Bract*: One, more or less erect, similar to the culm, up to 8 mm. long, base dilated in the manner of a glume. *Inflorescence* quasilateral. Spikelets 1–3 ovoid, obtuse, green or dark-coloured 1.5–2.5 mm. long, 1.1 mm. broad, about 12-flowered, almost terete. *Glumes* strongly nerved, apex scarcely mucronate, keeled, the keel green, curved, the apex more or less

curved out, with narrow hyaline margins, 1.1–2 mm. long. *Stigmata* 3 Hypogynous bristles none. *Nut* conspicuously trigonous, elliptic, shortly and broadly stipitate, black or dark coloured at maturity, 0.6–0.8 mm. long, 0.3–0.4 mm. broad, minutely apiculate. Type in herbarium of the author, No. 1764. Co-type in the Auckland Museum.

Type Locality. Lake Waahi, near Huntly.

Scirpus reticularis Colenso.

The plants classified under the name of *S. inundatus* Poir. var. *gracillima* should be maintained as a distinct species, in which case the name *S. reticularis* Col. should be restored. Differences between *S. inundatus* and plants at present classified under the varietal name are as follows:—

<i>Scirpus inundatus</i> Poir.	<i>Scirpus reticularis</i> Col.
Spikelets ovoid, short, cylindrical, 2–3 mm.	Spikelets compressed, 3–5 mm. long.
Glumes obtuse, dark coloured, short, 1.2–1.5 mm.	Glumes pale, subacute, 1.8–2 mm. long.
Fruit narrow, oblong, not apiculate.	Fruit obovoid, apiculate, ribbed on the dorsal face.
Many flowered, 10–12.	Few flowered, 6–10.

Mr. S. T. Blake, of the Brisbane Herbarium, agrees with the view of the writer in restoring this variety to specific rank.

NOTES ON OTHER SCIRPUS SPECIES

Scirpus merrillii (Palla) Kukenth.

For the identification of this species I am indebted to S. T. Blake, referred to above, who records it for Australia, with the note that he has seen specimens from N.Z. (*Proc. Roy. Soc. Queensland*, 1947, Vol. LVIII, No. 2, p. 38). This plant has been confused in N.Z. herbaria with both *S. inundatus* Poir. and *S. aucklandicus* Boeck. It is common in damp ground on the Waimarino Plateau, ascending to 3,500 feet or more on Mt. Ruapehu, and in elevated swamps in Canterbury and Nelson. In height it varies from 2in to 6in. In smaller plants the leaves overtop the culms, but in the taller specimens the reverse is more often true.

The typical form resembles *S. inundatus* in the number of stamens and in the trigonous fruit, but differs in the usually solitary spikelet, the leafy habit, its paler, less nerved glumes, in the nut being almost as long as the glume and distinctly ribbed on the dorsal face. From *S. aucklandicus* it differs in the number of stamens, the more oblong anthers, the number of flowers, the less obvious rhizome and the smaller nut, which is not compressed. Examples of its occurrence are as follows:—

North Island. Te Whaiti, 1920, Petrie, Matthews; Atiamuri, 1921, 1929, Allison; Tokaanu, 1941, Cook; Waimarino Plateau, 1921, 1924, Carse; 1922, Wall; 1940, Cook; (no dates), Matthews; East Coast N.I. (no date), Petrie.

South Island. Near Lake Rotoiti, 1947, Talbot, Cook; Marlborough, 1926, McMahon; Nelson (no date), Townson; 1947, Talbot; Dun Mts., 1923, Saintsbury; Broken River, 1947, Talbot, Cook; Doubtful River, 1942, Potts; Lake Brunner, 1944, Brockie; Castle Hill, 1946, Brockie.

Scirpus lenticularis Poir.

Recent research, particularly by S. T. Blake, of the Brisbane Herbarium, indicates that the plant to which this name has been applied is a terrestrial form

of *Scirpus fluitans* L. (*S. fluitans* var. *terrestris* Mey.). In N.Z. the plants included under the name of *S. lenticularis* Poir. are in fact two distinct species. One, *S. crassiusculus* Hook. f. has already been noted by Allan (*Trans. Roy. Soc. N.Z.*, Vol. 69, p. 227). The other species is *S. fluitans* L. Both have a floating and terrestrial form.

The two species are most readily distinguished by the size of the spikelet, that of the *S. crassiusculus* being stouter (5–6 mm. \times 2.2–3 mm.) than that of the *S. fluitans* (3–4 mm. \times 1–1.5 mm.) and the flowers more numerous. The fruits, too, are different. That of the former is broader and more elliptical. There is a plant in the herbarium of the Plant Research Bureau labelled *S. productus* C. B. Clarke, a species closely allied to *S. fluitans* L. and according to S. T. Blake distinguished from it mainly by the darker glumes and the thickened edge to the nut. I must confess my inability, however, to separate the specimen so labelled from *S. fluitans* L.

Scirpus antarcticus L.

C. B. Clarke, in *Flora Capensis* VII (1898) 233, records this species for S. Africa. In a recent paper Mrs. M. R. Levyns, of the University of Capetown, points out that the name is applied to two distinct plants, differing mainly in size, number of spikelets, and in the fruit (*Journ. S. Af. Bot.* 1944, p. 28). The writer has, through the generosity of Mrs. Levyns, been able to examine plants of the two forms, and there can be little doubt that they are specifically distinct. The taller plant appears to be the one to which the name *S. antarcticus* L. was originally applied. The smaller form is the one to which the name has been applied in N.Z. and by right of priority is really *S. cartilagineus* (R. Br.) Poir. The South African forms of this species are identical with the New Zealand forms except for slight differences in the markings on the nut. The true *S. antarcticus* L. does not appear to occur in New Zealand.

Scirpus setaceus L.

This introduced species was first recorded by Allan in the *Naturalised Flora of New Zealand*, 1940, p. 309, a specimen having been collected by him from the vicinity of Ashburton. It appears to have spread rapidly through certain areas in New Zealand. Healy records its occurrence near Lake Wakatipu (*Trans. Roy. Soc. N.Z.*, 74, 230). It has since been collected by the writer and H. Talbot in a number of other districts cited below.

In appearance it resembles stouter forms of *S. cernuus* Vahl., but whereas this species is restricted to littoral areas, *S. setaceus* L. is more commonly found inland. Where the latter does occur, near the sea in sandy hollows, for example, it has a depauperated appearance and bears little resemblance to the typical form. It is best distinguished by the ribbed and transversely striate nut. Examples of its occurrence are as follows:—

North Island. National Park, 1947, Cook; Erua, 1947, Cook; Ohakune, 1947, Cook.

South Island. Farewell Spit, 1947, Talbot; Nelson, Sherry River, 1947, Talbot; Nr. St. Arnaud Mts., 1947, Talbot, Cook; Broken River, 1947, Talbot, Cook; Lake Lyndon, 1946, Talbot; Springfield, 1946, Talbot; Lake Tekapo, 1945, Talbot; Nr. Greymouth, 1949, Cook.

Scirpus aucklandicus (Hook. f.) Boeck.

This species has not been satisfactorily understood in New Zealand, and has been confused with a number of other species, particularly *S. merrillii* (Palla) Kukenth and forms of *S. pottsii* V. J. Cook.

The chief distinguishing characteristics of this plant are the very few flowers, 6-8, the solitary, semi-erect spikelet with the elongated lowest glume equalling the spike, and the relatively long, narrow, elliptical fruit 1.5 mm. long \times 0.8 mm. broad which frequently exceeds the glume. Forms similar to those of the Auckland Islands and the Campbell Islands occur in New Zealand, usually at an altitude of 4,000 feet or more, but descending to lower levels in the extreme south of New Zealand. Specimens have been found in the North Island in the Ruahine Mts., but although Cheeseman says that the plant is plentiful around Tongariro and Ruapehu I have seen no specimens from those areas.

At lower altitudes in the South Island is what I regard as a form of *S. aucklandicus* Boeck, but it possesses more slender and narrower leaves, and the rhizome is not so well developed. The glumes are few and the nut is similar in shape to that of the typical form, but smaller.

Scirpus prolifer Rottb.

Cheeseman (*Man. N.Z. Fl.* 224) records this species only for the North Island. It is abundant, however, on the west coast of the South Island, having been noted or collected by the writer and H. Talbot at various places between Jackson and the Buller Gorge in December, 1949. In damp situations the plant attains the height mentioned by Cheeseman (1-2 feet), and has the characteristic long, narrow spikelet, but in drier areas the height is only 3-4 inches, the spikelets may be only 3-4. The culms, which in the taller forms are somewhat compressed and soft, are almost terete, slender and rigid. Because of these differences the smaller forms are often difficult to identify and could easily be confused with smaller forms of *S. inundatus* Poir. var. *major*. The latter species differs in the number of stamens -1. The fruit of *S. prolifer* is smaller and paler than that of *S. inundatus* Poir.

Scirpus nodosus Rottb.

The fruits of this species have not the flat face next the glume as stated by Cheeseman *op. cit.*, p. 224. According to Mr. E. Nelmes, of Kew, the original description says simply "capsula triquetra, semen unicum continens."

Scirpus basilaris (Hook. f.) C. B. Clarke.

Unrecorded localities for this species are Kaikoura, 1947, Cook; Amberly Beach, 1949, Cook, Talbot. This species may prove to be not uncommon in coastal areas along the east coast

DESCRIPTION OF NEW SPECIES OF CAREX

Carex inopinata sp. nov.

Rhizoma longa. *Folia* laxae caespitosa in parte superiore marginis scabrida, rigida vel flaccida, plana, graminea, usque ad 10 cm. longa, usque ad 1 mm. lata *Spiculae* 3, pauciflorae, unisexualiae; suprema mascula, tenuissima, fere compressa, 7-10 mm. longa, 0.7-1 mm. lata, glumae infimae aristula longa, spiculam aequans vel excedens; inferiora feminea, velut in base sita culmi breves, in

foliorum vaginis latentes. *Utriculi* 7–8 mm. longi, laxi pauci, 5–7 nigrantes, valde nervosi, pedunculati, biconvexi, recti, rostro longo angustoque, ore valde bidentato, dentes 0.3–0.4 mm. longi. Glumae utriculis pares, aristulatae nervosae; aristulae longae, hispidae. *Stamina* 3. *Stigmata* 3. *Nux* oblonga, trigona.

Rhizome long, creeping. *Leaves* green, loosely tufted, flat, grasslike, tips acute, margins serrate above, rigid or flaccid, up to 10 cm. long, up to 1 mm. broad, sheaths brown, fibrillose. *Spikelets* 3 unisexual, terminal one male, 7–10 mm. long, 0.7–1.1 mm. broad, very slender, few flowered, somewhat compressed on an erect peduncle up to 2 cm. long. Lowest glume with a long awn equalling or exceeding the spikelet. Female spikelets at the base of the leaves on slender peduncles, which are concealed by the leaf bases. *Utricles* few, 5–7, dark-coloured, stipitate, loosely-packed, erect, 7–8 mm. long, strongly nerved, biconvex, elliptical with a long narrow bidentate beak, teeth 0.3–0.4 mm. long, spreading. Glumes about equalling the utricle, nerved awned, awns long, hispid. *Stamens* 3, *Styles* 3, *Nut* oblong, trigonous.

This is unique among New Zealand Carices in that the utricles are erect and loosely packed. They are also few in number and relatively large for the size of the plant. They are frequently distinctly stalked. The male spikelet is more slender than in other New Zealand species, with few glumes, the lowest with a long awn.

Locality. Castle Hill, Canterbury, 1946, Talbot; 1947, Cook. Type in Auckland Museum. No. 24076.

It is known from only one locality, but is an easily overlooked plant because of its small size, its grasslike, sparsely tufted leaves, and the basal situation of the female spikelets, which are obscured by the lower part of the leaves. The male spikelet, which is the only portion of the inflorescence above ground, is almost indiscernible. The discovery of this plant is a tribute to Mr. H. Talbot's painstaking method of collecting. Mr. Nelmes, of Kew, who has done considerable revision work in the Carices, including Australian species, agrees with the view of the writer that this is a new species.

NOTES ON OTHER SPECIES OF CAREX

Carex capillacea Boott.

Plants of this species, previously not recorded in New Zealand, have been found by H. Talbot and the writer in the localities cited below. It is possibly introduced. It is best recognised by its solitary terminal spikelet about 6 mm. long, the male portion above, and by the fact that only the lowest glume is awned, the remainder being obtuse. The filiform leaves are usually shorter than the culms, the utricles have a few prominent nerves and are broader than those of *Carex pyrenaica* Wahl and *Carex acicularis* Boott. From Petrie's description and from the material in Cheeseman's collection I have little doubt that *C. wallii* Petrie is in fact *Carex capillacea* Boott, and should be removed from the Flora.

Locality. Broken River, 1945, Talbot; 1947, Cook; Swamps at base of St. Arnaud Mts., 1947, Talbot, Cook.

The species also occurs in Australia and according to Bentham in parts of S.E. Asia. (*Flora Australiensis* VII, p. 438.)

The following two carices hitherto known only from the South Island in New Zealand have recently been collected in the North Island.

Carex buchanani Berggr.

Sandhills near Turakina, 1948, Major Wilson. Except for the broader utricles this plant is similar to South Island specimens.

Carex oederi Retz var. *cataractae* Kukenth.

Vicinity of the Waimarino River, Waimarino Plateau, 1947, Cook. "This variety also occurs in Australia. Mr. E. Nelmes, referred to above, lists it as a species *Carex cataractae* R.Br. in his key to the Australian species."

Carex carsei Petrie.

Lake Brunner, 1946, W. B. Brockie

This species has been previously described from plants found on the Waimarino Plateau, by Carse and H. B. Matthews, and at Lake Tennyson by W. G. Morrison.

Carex demissa Hornem.

Plants of this species, which is allied to *Carex oederi* Retz and *Carex cataractae* R.Br. have been collected near Greymouth by A. Pullar, 1940. It has apparently been introduced.

Carex pallescens L. and *Carex scoparia* Schuhr.

These species probably introduced, occur near Ohakune, where they have been collected recently by the writer. *C. pallescens* has also been collected at Waitomo, by Mrs. K. Wood, 1951.

Carex vulpinoides.

An introduced species already recorded by Allan in his "Naturalised Flora of New Zealand," is abundant in certain areas near Ohakune.

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