

Studies in New Zealand Carices IV and V

By B. G. HAMLIN

Dominion Museum, Wellington

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Abstracts—Part IV

Carex forsteri Wahl. and its allies are placed in the Sect. *Elatae* Kukenthal. The New Zealand species are described and illustrated and distributions given. *C. elingamita* sp. nov. is described from Three Kings Islands.

Part V

TYPES of New Zealand species of Sect. *Acutae* Fries with geminate spikes were examined. The nomenclature as previously published (Hamlin, *Trans. Roy. Soc. N.Z.* 82: 49–64, 1954) was found to be incorrect and is revised: *C. geminata* = *C. lessoniana* Steud; *C. confusa* = *C. geminata* Schkuhr; *C. darwinii* var. *aristata* = *C. ternaria* Forst. f. ex Boott in Hook. f. The types are discussed and an amended key given.

PART IV.—THE SECTION *ELATAE* KUKENTHAL

The following group of New Zealand endemic species is placed by Kukenthal (Pflanzenr. Heft 38, 1909) in the Sect. *Pseudocypereae* Tuckerm, but as stated when considering the *Pseudocypereae* (Hamlin, *Trans. Roy. Soc. N.Z.* 84: 683, 1957) there are important differences between that Section and the species under review. It is believed that these species are better placed with the Sect. *Elatae* Kukenthal, with which they agree in the large size, broad leaves, bracts long-sheathing, pedunculate spikes, long brown glumes, large strongly-nerved utricles with long beaks which are scabrid between the "crura" and with the mouth often oblique and the style base often flexuous. The term "crura" is used here, as in "Carices II and III" (*Trans. Roy. Soc. N.Z.* 84: 681–687, 1957) for the "teeth" at the apex of the utricles which are extensions of the lateral bundles beyond the orifice.

Kukenthal separates the *Elatae* and *Echinochlaenae* Holm from the *Pseudocypereae* in his key by the absence of transverse septa in the leaves of the two former sections and by the presence of them in the latter section. I have examined *C. thouarsii* Carm., *C. insularis* Carm., and *C. laevigata* Sm. (*C. helodes* Link), all placed in *Elatae* by Kukenthal, and find all three conspicuously septate-nodulose. This character is also present in some of the larger species of Sect. *Echinochlaenae*, as for example *C. chathamica* Petrie, *C. longiculmis* Petrie and *C. dissita* Boott in Hook. f.

C. kermadecensis and *C. elingamita* usually have the spikes compound—i.e., smaller secondary spikes arise on the peduncle at the base of each main spike. This condition occurs commonly in only one other species of New Zealand sedge—namely, *C. solandri* Boott in Hook. f. of Sect. *Echinochlaenae*. In each of these cases the secondary spike arises in the axil of a glumiform bract, and the secondary peduncle is surrounded at the base by a cladoprophyll, usually utriculiform and different from the ochreiform cladoprophyll surrounding the base of the main peduncle. This is a similar condition to that which occurs in Subgenus *Indocarex* Baill. and is considered by Nelmes (*Reinwardtia* 3: 227, 1951) as indicating the origin of

Subgenus *Carex* (*Eucarex* Coss. & Germ.) from *Indocarex*. He has suggested (l.c. p. 223) that the *Elatae* might be derived from Sect. *Polystachyae* of *Indocarices*; the occurrence of this indocaricoid character in species of *Elatae*, together with the relatively unspecialized organisation of the species of *Elatae* certainly appears to support this view. The *Echinochlaenae*, which will be reviewed in a later part of the present series, show an increasing complexity and diversity of organisation commensurate with an advance in evolution from the *Elatae*.

This view argues a relatively primitive status for the species under review, and I would place the *Elatae* as the most primitive section of Subgenus *Carex* in the New Zealand flora, followed by the secondarily-derived sections *Echinochlaenae* and *Spirostachyae*.

The view of the origin of the *Elatae* and *Echinochlaenae* from the *Polystachyae* is of geographic interest. The *Polystachyae* (and most *Indocarices*) are chiefly Malaysian, being appreciably less abundant in tropical Africa and Australia, and entirely lacking in New Zealand. The *Elatae* on the other hand are chiefly African with one species, *C. longibrachiata* Boeck. (*C. longifolia* R Br. non Tuckerm.) approaching the New Zealand region in Australia. If the New Zealand section *Echinochlaenae* arose from the *Elatae*, then the absence of the latter from the New Zealand region, together with the absence of the former outside that region, would give rise to a problem in distribution. The recognition of several New Zealand species as belonging to the *Elatae* removes this problem and at the same time strengthens the hypothesis of the affinity of the two sections, particularly as two species, *C. cockayniana* and *C. elingamita*, show definite relationships to species of *Echinochlaenae*, the former to *C. solandri* and *C. dissita*, and the latter to *C. neesiana* Endlich.

The position of the New Zealand species within the Section *Elatae* has not been investigated as a knowledge of all the species would be necessary. It appears, however, that, except for *C. forsteri* and *C. cockayniana*, the species are not closely related to each other, being distinguished by characters more conspicuous than those separating species of *Echinochlaenae*. This may, of course, be due to greater stability in a presumably older group.

The group is characterised by the following:—

Section *Elatae* Kuenthal, Pflanzenz. Heft 38: 645 1909; forest species, densely caespitose; basal sheaths aphyllous, brown or reddish, often with reticulate fibrils ("herring-bone shaped"—Nelmes); leaves 0.5–1.2 cm wide, flat or slightly keeled, prominently 3-ribbed, septate-nodulose, usually longer than the culms; culms trigonous, usually smooth bracts leafy, long-sheathing; spikes pedunculate, often compound, stout or slender. terminal 1–4 male, remainder usually with male flowers at the base and/or apex; glumes brownish or reddish, acute or truncate or emarginate, awn up to 3 mm long; utricles membranous or subcoriaceous, nerved or costate, more or less stipitate. beak prominent, smooth or scabrid mouth oblique or straight, crura conspicuous (except in *C. cockayniana*) scabrid; nut trigonous, style straight or flexuous at the base, stigmas 3

The following abbreviations (Index Herbariorum, Part I, Utrecht) are used for herbaria from which specimens have been seen:—AK, Auckland Institute and Museum; WELT, Dominion Museum, Wellington; CHR, Botany Division, D.S.I.R., Christchurch; OTAGO, Botany Department, Otago University, Dunedin (not listed in the Index Herbariorum).

KEY TO THE SPECIES

- | | | |
|---|--------------------|---|
| 1. Mouth of the utricle oblique, awns less than 1 mm long | <i>forsteri</i> | |
| Mouth of the utricle straight, awns more than 1 mm long | | 2 |
| 2. Crura less than 0.5 mm long, utricles shorter than the glumes, smooth and turgid when ripe | <i>cockayniana</i> | |
| Crura 0.5 mm long or more, utricles as long or longer than the glumes, nerved | | 3 |
| 3. Spikes slender, nodding on filiform peduncles | <i>vacillans</i> | |
| Spikes and peduncles stout, erect | | 4 |

4. Utricles 5 mm long, margins smooth, spikes conspicuously male at the apices
 Utricles 4 mm long, margins scabrid, spikes without male flowers at the apices

*elingamita**kermadecensis**Carex forsteri* WAHLENBERG

Carex forsteri Wahlenberg, Vet. Akad. Nya Handl. Stockholm 24: 154, 1803; (*Forsteri*) based on *C. recurva* Schkuhr, Riedgr. 120, Pl. Z and Nn. Fig. 84, 1801; non Huds. (Lectotype: New Zealand, Forster (K! photo)).

C. punctulata A. Rich. Fl. Nouv. Zel. 119, Pl. 22. 1832 (Havre del' Astrolabe).

C. sexspicata Colenso, Trans. N.Z. Inst. 16: 342. 1884 [?].

C. semi-Forsteri C. B. Clarke in Cheeseman, Man. N.Z. Flora 836, 1906 (*Colenso* 1622!)

Leaves much longer than the culms, up to 1.2 cm wide; culms up to 70 cm tall; spikes 5-8, upper 1-3 wholly or partly male, remainder female with some male flowers at the bases, (5-) 6-8 (-10) cm long, 1 cm wide, green or grey-green; glumes 3-4 mm long, lanceolate, acute, awns \pm 0.5 mm long; utricles 4-5 mm long, 1-1.2 mm wide, lanceolate, subcoriaceous, nerves 6-7, strongly ridged, green becoming grey between the ridges, tapering to a beak \pm 1.5 mm long, abaxial surface scabrid below the mouth, crura 0.25 mm long, mouth distinctly oblique ventrally, 0.5 mm from ventral base to dorsal apex. Text-fig. 1, A-D.

NORTH AUCKLAND BOTANICAL DISTRICT: Whangarei, *Carse* (AK 2841).

SOUTH AUCKLAND BOTANICAL DISTRICT: Waikato, *Kirk* (WELT 1169).

THAMES BOTANICAL DISTRICT: Karaka Creek, Thames, *Cheeseman* (AK 2842); Paeroa, *Petrie* (WELT 1170).

EAST CAPE BOTANICAL DISTRICT: Te Whaiti, Whakatane County, *Petrie* (WELT 1171); Waikaremoana, *Mason* (CHR 54043).

WELLINGTON BOTANICAL DISTRICT: Te Puna, Wanganui County, coastal forest, *Healy* (CHR 37043, 37051, 90338A); Sandon Road Bush near Feilding, *Zotov* (CHR 288); Waterworks Reserve, Palmerston North, *Carse* (WELT 1172); Kapiti Island, no collector cited (CHR 1689); Norsewood, *Colenso* (WELT 1176); Porirua, *Kirk* (WELT 1173); Mungaroa [*Kirk*] (WELT 1174); Haywards, streamside in forest remnant, *Allan* (CHR 25404); Gollans Valley [*Aston*] (WELT 1175); Mt. Hawtrey, Days Bay, Wellington, 1,000 feet, *Poole* (CHR 64320); Matthews Station, Wairarapa, *Mason* (CHR 56267); Mt. Matthews, Rimutaka Range, 1,000 feet, *Zotov* (CHR 6530); coast north of Mukumuku Stream, Palliser Bay, streambank, *Hamlin* (CHR 82968); Mt. Ross, Aorangi Mts., *Zotov* (CHR 59205); Aorangi Mts., c. 660 m alt., *Hamlin* 590 (WELT 1177).

SOUNDS BOTANICAL DISTRICT: Stephen Island, *Gibbs* (CHR 68558) & *Hamlin* 398 (WELT 2287); Wainui Reserve, D'Urville Island, *Oliver* (WELT 1178); Point Hardy, D'Urville Island, coastal scrub, *Moore* (CHR 28726); French Pass, *Oliver* (WELT 1179); Akatoa Valley, Sounds, Marlborough, *McMahon* (WELT 1180); Akatoa Saddle track, Mt. Stokes, *Healy* (CHR 25122); Ship Cove, Queen Charlotte Sound, *Druce* (CHR 84641); Okaramio, Kaituna Valley, 2,000 feet, *Healy* (CHR 37047).

NORTH-EASTERN BOTANICAL DISTRICT: Mt. Fyffe, Kaikoura Mts. [*Kirk*] (WELT 1181).

NORTH-WESTERN BOTANICAL DISTRICT: Wangapeka Valley, *Cheeseman* (AK 2843); Paturau River, N.W. Nelson, *Hamlin* 479 (WELT 1183); valley of the Buller, *Kirk* 889 (WELT 1182); S.W. Nelson, *Townson* (WELT 1184); vicinity of Westport, *Townson* 26B (AK 2844).

EASTERN BOTANICAL DISTRICT: Akaroa, *Kirk* (WELT 1186) and *Healy* 55/112 coastal forest along creek (CHR 91456B); Springfield, Canterbury, *Talbot* (CHR 51062); eastern South Island, *Allan* (CHR 1738); Geraldine Reserve, bush remnant, *Mason* 3264 (CHR 89335).

SOUTH OTAGO BOTANICAL DISTRICT: Dunedin, *Thomson* (AK 2845); Ross Creek, Dunedin, *Holdsworth* (OTAGO 3004); Whisky Gully, Blue Mountains, *Cockayne* (WELT 1185).

HERB. COLENZO: No localities (AK 2834); 1622 (AK 2838); 4189 (AK 2833).

There are further specimens labelled "Kermadec Islands, Cheeseman" in Petrie's collection (WELT 1168); Cheeseman's herbarium contains only *C. kermadecensis* Petrie from this locality and there may have been some mixing of labels. Until the occurrence of both species is confirmed, the record must remain doubtful.

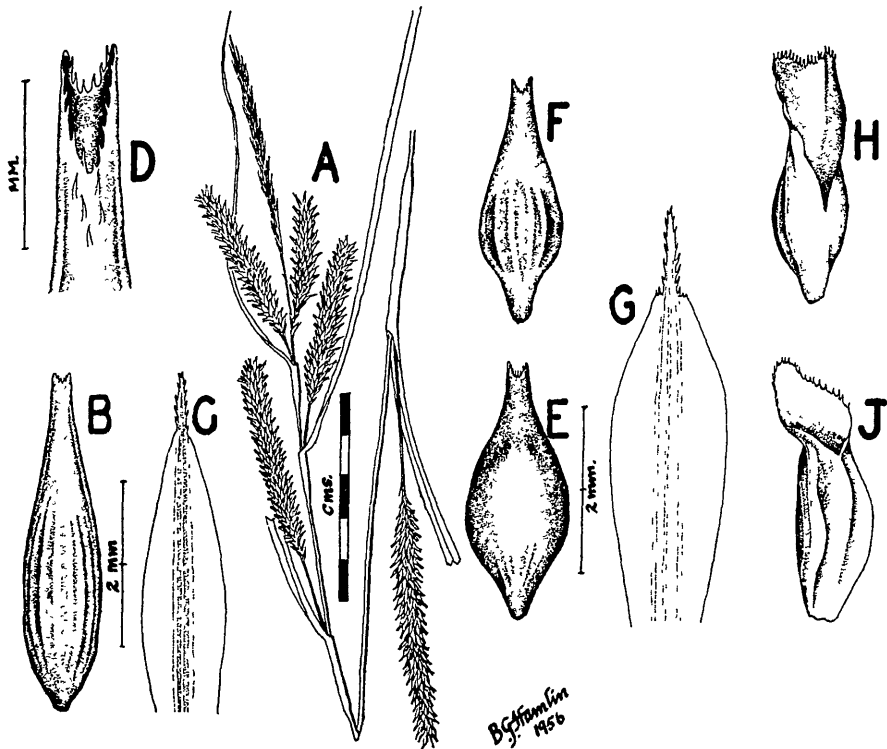
The name *C. forsteri* Wahl. is based on *C. recurva* Schkuhr, the latter being founded on Forster's specimens received by Schkuhr under the MS. names of *C. hamata* (in flower) and *C. debilis* (in fruit). Neither of these specimens is now in the herbarium of the University of Halle (K. Werner, pers. comm.). There is a Forster specimen in the herbarium of Royal Botanic Gardens, Kew, of which I have a photograph by courtesy of Mr. V. D. Zotov, and this, together with the illustrations accompanying Schkuhr's description, leave no doubt as to the identity of the species. The mature culm on the Kew sheet is therefore selected as the lectotype.

CAREX COCKAYNIANA Kukenthal

Carex cockayniana Kukenthal in Cheeseman, Man. N.Z. Flora 836, 1906 (*Cockayniana*) based on *C. cinnamomea* Cheeseman, Trans. N.Z. Inst. 14: 301, 1882·non Olney.

C. Forsteri var. *Cockayniana* (Kukenth. in Cheeseman) Kukenthal, Pflanzenr. Heft 38: 695, 1909 (Takaka River, Cheeseman (AK 2828) !)

Leaves longer than the culms, up to 0.6 cm wide; culms up to 60 cm tall; spikes 5-8, terminal 1 or 2 wholly or largely male, female up to 6 cm long, 0.5 cm wide, yellow-brown, peduncles rather slender; glumes 4 mm long, obovate, \pm acute, awn 1 mm long; utricles 3 mm long, ovate, subcoriaceous, conspicuously 4-5-costate when young, turgid and smooth when ripe, yellowish, beak \pm 0.5 mm long, crura \pm 0.2 mm long, mouth equal. Text-fig. 1 E-G.



TEXT-FIG. 1.—*Carex forsteri*—A, part of inflorescence; B, utricle; C, glume; D, mouth of utricle (adaxial view). *Carex cockayniana*—E, mature utricle; F, immature utricle; G, glume. *Carex elingamita*—H, cladophyll. *Carex kermadecensis*—J, cladophyll.

SOUNDS BOTANICAL DISTRICT: Mt. Stokes, *McMahon* (WELT 1187, CHR 33868); same locality, c.3950, *Healy 1037* (CHR 33867); Laverique, Beatrix Bay, Pelorus Sound, c.2500 feet, *Healy 1032* (CHR 33870).

NORTHWESTERN BOTANICAL DISTRICT: Anatoki River, grassy clearing, *Mason* (CHR 34841); Takaka River, 3,000 feet, *Cheeseman* (AK 2828, WELT 1189); same locality, *Wall 53* (WELT 1192); Six Mile Creek near Mt. Lodestone, *Mason* (CHR 28891); Karamea River, *Mason* (CHR 58619); source of River Palmer, 3,200 feet, *Cockayne 1572* (WELT 1190); Cedar Creek near Denniston, *Townson 25B* (AK 2831); Mt. Kelvin near Westport, 4,000 feet, *Townson 777* (AK 2829); Rangi Taipo, 2,000 feet, *Cockayne 1571* (WELT 1188); Jackson's, Teremakau River, 2,500 feet, *Petrie* (WELT 1191, CHR 73155); Kelly's Hill, 2,000 feet, *Petrie* (AK 2830).

WESTERN BOTANICAL DISTRICT: Franz Josef Glacier, *Allan* (CHR 3967) and *M. J. A. Simpson* (CHR 77761).

FIORDS BOTANICAL DISTRICT: Nancy Fiord, *Harris* (CHR 72193); Clinton Valley, Lake Te Anau, *Petrie* (WELT 1193); Milford Sound, *Kirk* (WELT 1194–1195); Bowen Falls, Milford Sound, *Cockayne 8343* (WELT 1196); Gertrude Saddle, no collector cited (CHR 22023).

This species shows an approach to Sect. *Echinochlaenae* particularly in the rather small, turgid utricles with very short crura and it has frequently been mistaken for *C. solandri* Boott in Hook. f. The affinity is nevertheless with *C. forsteri* Wahl., and I regard the septate-nodulose leaves, long glumes and non-shining, subcoriaceous, rather long-beaked utricles as placing it outside the *Echinochlaenae*.

CAREX VACILLANS Boott in Hook. f.

Carex vacillans Sol. ex Boott in Hook. f. Fl. Nov. Zel. 1: 285, 1853 (New Zealand, *Banks & Solander*)

C. spirostris Colenso, Trans. N.Z. Inst 15: 335, 1883 (Norsewood, *Colenso* (WELT 1213) !)

Leaves equalling the culms, 0.5 cm wide; culms up to 60 cm tall, spikes 5, terminal male sometimes compound, female to 5 cm long, 0.5 cm wide, red-brown, on long filiform peduncles, glumes 3–4 mm long, lanceolate, subacute or almost emarginate, awn 1 mm long, utricles 3–4 mm long, 1 mm wide, narrow-elliptic, subcoriaceous, 5–7-nerved, ± stipitate, beak 1.5 mm long, smooth, crura 0.5 mm long, mouth equal. Text-fig. 2, G–J.

NORTH AUCKLAND BOTANICAL DISTRICT: Herekino Gorge Road, Mangonui, *Petrie* (WELT 1197); Pukekokoromiko, 1,000 feet, Kaitaia district, *Matthews and Carse* (WELT 1198); Taranga (Hen) Island, *Oliver* (WELT 1199); same locality, *Cranwell and Moore* (CHR 91819); Chicken Island, *Oliver* (WELT 1200); same locality, *Cranwell and Moore* (CHR 91821).

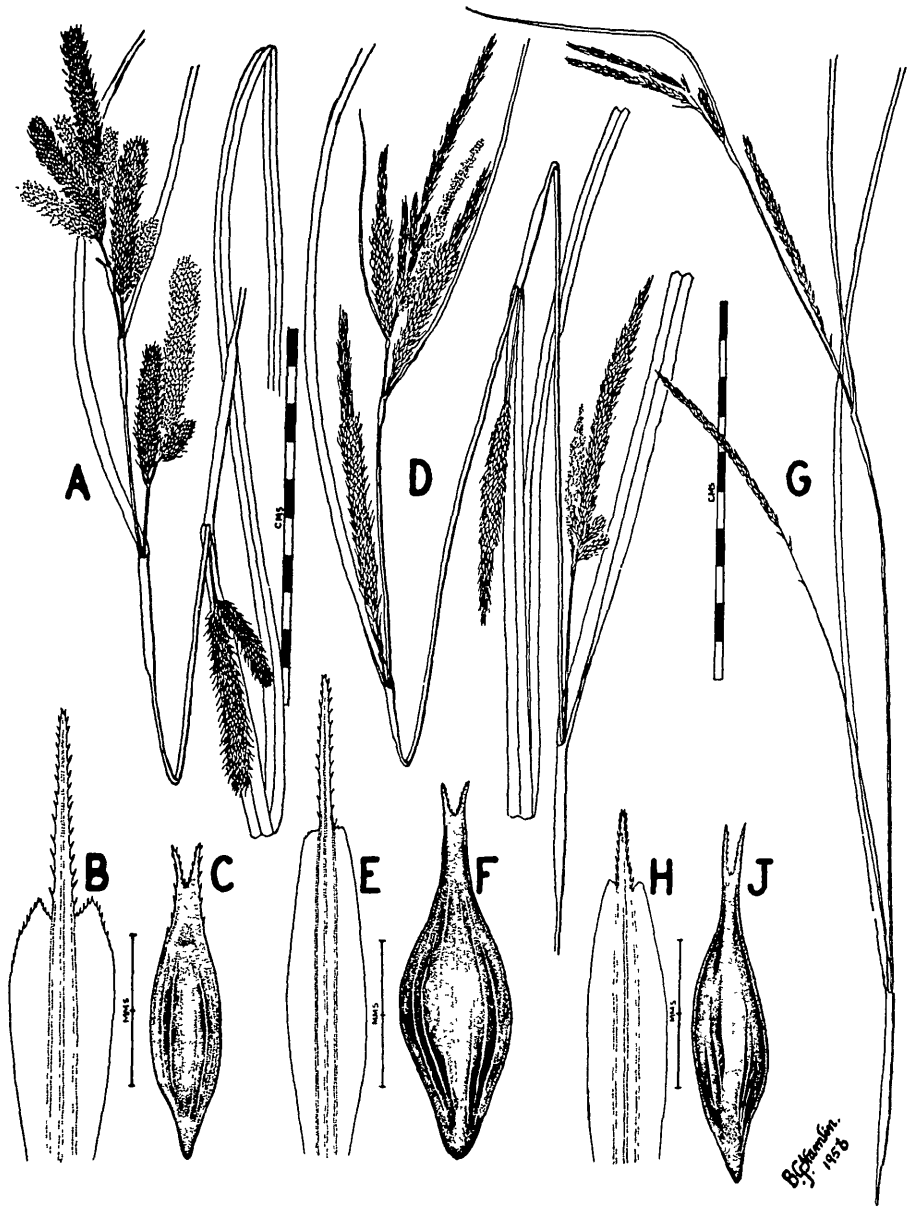
SOUTH AUCKLAND BOTANICAL DISTRICT: Parahake, Whangarei, *Carse* (AK 2824); Manukau, North Heads, *Petrie* (WELT 1203); Karekare, Waitakerei West, *Petrie* (WELT 1205); Leigh near Rodney Point, *Oliver* (WELT 1206); Kawau Island, *Kirk* (WELT 1207); Bald Hills, Mauku, *Carse* (CHR 1769); Orakei near Auckland, *Cheeseman* (AK 2825) and in *Herb. Cockayne 1647* (WELT 1201); Waingaro Hot Springs, *Petrie* in *Herb. Cockayne 1671* (WELT 1202).

THAMES BOTANICAL DISTRICT: Great Barrier Island, *Kirk* (WELT 1210); Shoe Island near Tairua, *Adams* (AK 2826); Thames goldfields, *Cheeseman* (AK 2827).

EAST CAPE BOTANICAL DISTRICT: Pohue, Hawke's Bay, *Hamilton* (WELT 1211); Portland Island, *Sainsbury* (WELT 1212); Big Hill Station, N.E. Ruahine Mts., c.1,500 feet, *Druce* (CHR 63082); Pukeamaru Range, c.200 feet, foot of cliff in forest, *Druce* (CHR 70768).

WELLINGTON BOTANICAL DISTRICT: Norsewood, Hawke Bay, *Colenso* (WELT 1213).

I have not seen the Type of this species but the Director of Royal Botanic Gardens, Kew, has kindly supplied me with a photograph of the unpublished plate prepared for Boott's "Illustrations of the Genus *Carex*".



TEXT-FIG 2—*Carex kermadecensis*—A, inflorescence; B, glume, C, utricle *Carex elingamita*—D, inflorescence; E, glume, F, utricle *Carex vacillans*—G, inflorescence, H, glume, J, utricle

Cheeseman mis-spells the name "vaccilans" in the *Trans. N.Z. Inst.* 16: 440, 1884 and the first edition (1906) of the "Manual", and "vacilans" in the second edition (1925).

CAREX ELINGAMITA Hamlin

Carex elingamita sp. nov.

(Three Kings Islands, *Cheeseman* (WELT 2703))

Caespitosa; folia culmum breviora, 0.8–1 cm lata; culmus 100 cm altus, triqueter, bractea longae vaginatae; spicae 10, compositae, longae pedunculatae, terminalis masculis, reliquae feminae, usque ad 7 cm longae, apicae (2 cm) masculae, squamae 5 mm longae, truncatae, aristae 2 cm longae; utriculi 4–4.5 mm longi ovati-lanceolati, membranacei, pallidi, 7-nervi, erecti vel subpatentei, rostrum 1.5 mm longum, crura 0.5 mm intus scabra; nux trigona, stigmata 3.

Caespitose; leaves shorter than the culms, 0.8–1 cm wide; culms 100 cm tall; spikes 10, compound or simple, on long stout peduncles, terminal male, remainder female, up to 7 cm long, 0.5 cm wide, terminal 2 cm of female spikes with male flowers; glumes 5 mm long, linear-lanceolate, truncate, awns 2 cm long; utricles 4–4.5 mm long, membranous, pale-green, 7-nerved, erect or scarcely spreading, beak 1.5 mm long, crura 0.5 mm long, mouth equal. Text-fig. 1. H & 2. D-F.

THREE KINGS ISLANDS: Nov. 1889, *Cheeseman* (WELT 2703, AK 2839, 2940); Great Island, *Baylis* (AK 22879); Northeast Island, *Buddle* (AK 22896); same locality, forest floor, *Baylis* (OTAGO 3713); West Island, *Baylis* (OTAGO 3857); South West Island, 300–600 feet, floor of *Meryta* forest—the only sedge present—plentiful where shade not too great, *Baylis* (OTAGO 3003, 3814).

Identified as *C. forsteri* Wahl. by Cheeseman but not included in his lists of species (*Trans. N.Z. Inst.* 20: 141–150, 1888; 23: 408–424, 1891). It is presumably the "*Carex neesiana* Endl. (?)" of the second list. Oliver and Baylis both identify it as *C. forsteri* Wahl. (*Rec. Auckl. Inst. Mus.* Vol. 3, 1948).

CAREX KERMADECENSIS Petrie

Carex kermadecensis Petrie, *Trans. N.Z. Inst.* 47: 56, 1915; based on *C. Forsteri* ssp. *insularis* Oliver, *Trans. N.Z. Inst.* 42: 164, 1910. (Kermadec Islands, *Oliver* (WELT 1214) !)

C. semi-Forsteri C. B. Clarke in Cheeseman. *Man. N.Z. Flora*, 836, 1906; *Kew Bull.* Add. Ser. 8: 78, 1908; pro parte *Diagn. excl.*

Leaves much longer than the culms, up to 1 cm wide; culms up to 45 cm tall, 2 mm wide, trigonous, scabrid on the angles above; spikes 7–9, mostly compound, green, 3–6 cm long, 0.5–0.7 cm wide, approximate or the lower ones distant, terminal one wholly or partly male or almost completely female; glumes 3–4 mm long, ovate-oblong, emarginate or acute, fimbriate on the upper margins, awns up to 3 mm long from the base of the sinus; utricles 3.5–4 mm long, narrow-elliptic or ovate, 1.2–1.5 mm wide, trigonous, membranous, 5–7-nerved, beak 1–1.5 mm long, scabrid or smooth on the margins, crura 0.5 mm long, mouth equal. Text-fig. 1. J and 2. A–C.

KERMADEC ISLANDS: Denham Bay, Sunday Island, *Oliver* (WELT 1214, 1215; AK 2837); *Miss Shakespear* (AK 2836); Raoul (Sunday) Island, in forest, *Gilmour* (WELT 2985).

C. B. Clarke cited the Shakespear collection under *C. semi-Forsteri* but his description does not include the characters of *C. kermadecensis*. I have therefore restricted his name to the mainland collections cited by him, which in my opinion are referable to *C. forsteri* Wahl.

ACKNOWLEDGMENTS

I wish to express my sincere thanks to the Directors and staffs of Auckland Museum and Botany Division, Christchurch, and Dr. G. T. S. Baylis, Otago University, Dunedin, for the loan of material; the Director, Royal Botanic Gardens, Kew, for copies of descriptions not available in New Zealand; and K. Werner, University of Halle, for information respecting the Type of *C. recurva* Schkuhr.

PART V.—SUPPLEMENT TO THE SECTION *ACUTAE* FRIESSubsect. *CRYPTOCARPAE* Tuckerm.

Since preparing a review of the Sect. *Acutae* Fries (Trans. Roy. Soc. N.Z. 82: 49–64, 1954), the author has been able, through the co-operation of the individuals and institutions acknowledged below, to examine the Types (lodged in overseas herbaria) of all named species of the *Carex* "*ternaria*" group—i.e., those species with geminate spikes, as a result of which certain changes in nomenclature must be made. At the same time a discussion of the Types is given.

None of the three Types examined is entirely "typical" of the taxa they represent, but in the cases of *C. polystachya* A. Rich. and *C. geminata* Schkuhr they are sufficiently complete to be easily recognisable as part of the populations to which I here assign them. Photographs are in the Dominion Museum, Wellington, of all specimens borrowed from overseas herbaria for the present study.

The following key is an amendment to that on page 50 of Transactions 82, 1954. The numbering of the binaries and sequence of species is the same as before but some alterations have been made in the diagnostic characters used.

- | | | |
|--|-------|-------------------|
| 4. Glumes truncate or emarginate | | 5 |
| Glumes entire | | 6 |
| 5. Utricles contracted above into a minute beak, upper spikes usually erect | | <i>lessoniana</i> |
| Utricles tapering evenly above, beak absent, all spikes pendulous or nodding | | <i>geminata</i> |
| 6. Glumes lanceolate, acute, sheaths (and leaves usually) membranous, septate-nodulose | | <i>ternaria</i> |
| Glumes ovate, obtuse or subacute, sheaths and leaves coriaceous, not septate-nodulose | | <i>coriacea</i> |

CAREX LESSONIANA Steudel

The Type represents a small state approaching *C. ternaria* var. *minor* Boott in which the spikes are fewer, narrower and the plant somewhat more stunted than is usual. The utricles are not quite ripe, but are recognisable by the many prominent nerves and short beak.

The Type is Herb. Mus. Paris No. 2563 "Havre del' Astrolabe, N'lle Zelande, 1827". The complete specimen on the left of the sheet is recognisable as the model for Richard's plate and has therefore been selected from the Type suite. Nos. 2561 and 2564 are co- or syntypes as is a further specimen in Herb. Kew.

The revised synonymy is:—

C. lessoniana Steudel, Nomencl. Bot. ed. 2: 292, 1840 (*Lessoniana*) based on *C. polystachya* A. Rich. Fl. Nouv. Zel. 118, t. 21, 1832 non Sw. ex Wahlenb.

It has been wrongly referred to *C. ternaria sensu stricto* by the following:—

Boott in Hook. f. Fl. Antarct. 1: 89, 1844 and Fl. Nov. Zel. 1: 282, 1853; Hook. f. Handb. N.Z. Fl. 1: 314, 1864; Cheeseman, Trans. N.Z. Inst. 16: 431, 1884; Man. N.Z. Fl. 820, 1906 and ed. 2: 265, 1925; Kukenthal, Pflanzenr. Heft 38: 369, 1909.

It has been confused with *C. geminata* Schkuhr *sens. str.* by:—Schkuhr, Riedgr. t. Pp. 1801 and Nachtr. 28, 1806 (see under *C. geminata* below); Wahl. Vet. Akad. Nya Handl. Stockholm 24: 160, 1803; Willd. Sp. Pl. ed. 4, 4: 249, 1805; Steud. Synops. Plant. Cyper. 206, 1855; Hamlin, Trans. Roy. Soc. N.Z. 82: 56, Fig. 3, 1954.

I wish to express my thanks to the Museum National d'Histoire Naturelle, Paris for the loan of the Type suite including Steudel's specimen, Paris No. 2564.

CAREX GEMINATA Schkuhr

The Type (in Herb. Botanische Anstalten der Universität, Halle (Saale), Germany) is a rather poor specimen with male, and some female, spikes missing, but the

utricles are fully mature, leaving no doubt as to its placing. The label reads as follows:

“C. Ternaria Forster. n.75 SK.
von Prof. Sprengel d. 29. April. 98.
hiervon Wunschte ich noch ein besseres
Exemplar zu erhalten.”

and on the reverse side of the sheet:

“N. 75 Carex geminata SK.
Carex ternaria Forster
gepaartes Riedgrass.”

Schkuhr states (l.c. 1801, p. 65) that he received the specimen from Sprengel who sent it to him from the Forster Herbarium. The Type locality therefore would be either Dusky Sound or Queen Charlotte Sound.

A further specimen with male spikes was received by Schkuhr (*ibid.*) and illustrated on Tab. Pp. but this specimen is no longer in the herbarium at Halle (K. Werner, pers. comm.). Wahlenberg (Vet. Akad. Nya Handl. Stockholm 24: 160, 1803) apparently chose this second, more complete specimen as representing Schkuhr's species and his description applies to it only (“... capsulis ovato-globosis cum acumine.”). Subsequently Willdenow (Sp. Plant. ed. 4, 4: 249, 1805) adopted Wahlenberg's view and described the utricles as “. . . subglobosis brevissimis rostratis . . .” His description is copied almost verbatim by Schkuhr (Nachtr. 28, 1806) and Steudel (Syn. Plant. Cyper. 206, 1855). The second specimen seems to be referable to *C. lessoniana* Steud.; that Forster collected both species is proved by the Type of *C. geminata* and a specimen of *C. lessoniana* in the Herbarium at Kew.

Therefore, the name *C. geminata* Schkuhr *sens. str.* must be applied to the original description and Tab. W. No. 75. Tab. Pp. and subsequent descriptions refer to the species now known as *C. lessoniana* Steudel. The synonymy is amended to:

C. geminata Schkuhr, Riedgr. 65, Tab. W, f. 75, 1801. excl. Tab. Pp.

Syn. *C. confusa* Hamlin, l.c. p. 58, Fig. 4, 1954 based on *C. ternaria* var. *gracilis* Cheeseman, Trans. N.Z. Inst. 16: 432, 1884.

I am deeply indebted to K. Werner, University of Halle, and Prof. Dr. R. Mansfeld, Gatersleben, for their help in clarifying this confusion.

CAREX TERNARIA Hook. f.

Type: Lord Auckland Islands, J. D. Hooker, Ross voyage.

Syntype: 1481, Lord Auckland group. Both in Herb. Kew.

The Type is a young specimen in a preflowering state, and determination of its position must rely on vegetative and glume characters. The sheaths are membranous, and, together with the leaves, are septate-nodulose (i.e., marked by cross-veinlets). The glumes are mostly very young and still largely hyaline, 3–4 mm long, truncate tending to subacute or excurrent along the awn in the oldest examples, awns up to three times the length of the glumes, very hispid.

The only other known taxon of this group which has been collected on the Auckland Islands is *C. darwinii* var. *aristata* C. B. Clarke ex Kukenthal and a comparison was made between Hooker's specimens and all available material of *C. darwinii* var. *aristata*, including a large suite collected on the Chatham Islands by the author in February, 1957.

Specimens growing in fairly dry situations were found to be much smaller and of a more coriaceous texture than plants in permanently wet places. All growth forms have membranous sheaths to the leaves, while plants from wet places were conspicuously septate-nodulose as in Hooker's plant. Neither of these characters is found to the same extent in either *C. geminata* or *C. lessoniana*.

No specimens were found in a similar state of floral development to Hooker's plant, but WELT 2704, Antipodes Islands, *Aston* is in a more advanced flowering condition. One spike from this collection had not been exerted when the plant

was gathered and the glumes of this spike show a development from a truncate glume to an acute glume.

The only mature specimen from Auckland Islands which has been located is Paris 2813 collected by Guillou on the voyage of the "Astrolabe" and "Zelee", 1838-40. The utricles of this specimen (some of them are in a packet on the Type sheet of *C. ternaria*) agree very well with specimens of *C. darwinii* var. *aristata* from dry situations.

On the basis of the above comparisons, *C. ternaria* and *C. darwinii* var. *aristata* are believed to be conspecific and the synonymy is amended below. It has not been possible to take into account the South American plants of *C. darwinii* which in any case do not affect the nomenclature of the New Zealand species, for on the present interpretations, both *C. urolepis* Franch. and *C. darwinii* var. *darwinii* Boott in Hook. f. (also *C. serranoi* Phil.) must be placed under *C. ternaria*, the latter being the oldest name, unless they be proved specifically distinct. The nomenclature given, therefore, applies to New Zealand plants only:—

C. ternaria Forst. f. ex Boott in Hook. f. Fl. Antarct. 1: 89, 1844.

C. Darwinii var. *aristata* C. B. Clarke ex Kukenthal, Bot. Jahrb. 27: 529, 1899 based on *C. urolepis* Franch. Miss. Sc. Cape Horn 5: 376, f. 5. 1889.

C. Darwinii var. *urolepis* (Franch.) Kukenthal, Pflanzenr. Heft 38: 367, 1909.

C. Martini Petrie, Trans. N.Z. Inst. 56: 7, 1926 non Lev. and Van.

C. ternaria, published as a *nomen nudum* by Forster (Prodr. 92, 1786) was referred to *C. geminata* Schkuhr as a synonym by Schkuhr (Nachtr. 28, 1806), Wahlenberg (Vet. Akad. Nya Handl. Stockholm 24: 160, 1803) and Steudel (Nomencl. Bot. ed. 2: 290, 1840), but this does not invalidate Boott's later publication. The present author (Hamlin, Trans. Roy. Soc. N.Z. 82: 56, 1954) also referred it to *C. geminata*, but all other authors, including Boott and Hooker in the original publication, considered the name to be applicable to the plant now called *C. lessoniana* Steudel.

From a field study of the species as it occurs in the Chatham Islands, some amendments and additions can be made to the description as previously published (Hamlin, Trans. Roy. Soc. N.Z. 82: 61, 1954). The smaller measurements are for plants growing in dry situation.

Culms 30-150 cm tall; leaves 6-17 mm wide (when fresh), greatly exceeding the culms; spikes 3-10 cm long, 0.5-1 cm broad, cylindric or lanceolate in large specimens; glumes 3-5 mm long; utricles 3-4 mm long, stipitate, subcoriaceous, not granular-papillose.

Cheeseman (Manual, 1925) states that the basal sheaths are not transversely fibrillose, but the presence of this character as described by Kukenthal is confirmed in recent collections.

The large form of this species was observed in two localities on Pitt Island, both clumps being in standing water. The small form only was collected on the main Chatham Island, each time being in peat on sloping ground. There had been no rain for a considerable period prior to the visit, and the surface of the ground was hard and dry.

My thanks are due to the Director, Royal Botanic Gardens, Kew, for the loan of the Type and other specimens, and much information supplied by correspondence. Mr. V. D. Zotov reported on the Kew material during his recent visit, and this assistance is gratefully acknowledged.

B. G. HAMLIN,
Dominion Museum,
Private Bag,
Wellington.