

Notes on the *Puccinelliae* of New Zealand.

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PARLATORE (*Fl. Ital.*, 1, 1848, 366) when erecting the genus *Puccinellia* described four species, of which *P. distans*, based on *Poa distans* L., is commonly accepted as the type. Cheeseman (*Man. N.Z. Flora*, ed. 2, 1925, p. 202) places the New Zealand species under the synonym *Atropis* Rupr. Here we make the necessary new combinations, add descriptions of new species and varieties, and list the species known to occur as introduced plants. We have examined the material to be found in the following herbaria: Royal Botanic Gardens, Kew; The Memorial Museum, Auckland; The Dominion Museum, Wellington; the Plant Research Bureau, Wellington. The collections are too incomplete, and the specimens for the most part (owing to the special difficulties of preserving good fruiting material) too imperfect for a thorough revision to be made at present. It is also very desirable that the Australian species should receive fuller attention and comparison with New Zealand ones. However, the present paper should prove a useful preliminary to detailed studies.

1. *P. stricta* (Hook. f.). Blom, *Acta horti gotoburgensis*, V, 1929, p. 89.

*Glyceria stricta* Hook. f., *Flora Nov.-Zel.*, 1, 1855, 304.

*Atropis stricta* Hack. ex Cheeseman, *Man. N.Z. Flora*, 1906, 202; non *Glyceria stricta* Buckl. *Proc. Acad. Sci. Philad.*, 1863, 95; non *Puccinellia stricta* Keng., *Sinensia*, 4 (11), 1934, 321.

Hooker in his original account cited specimens collected by Raoul at Akaroa, South Island, New Zealand, and remarked: "Mr. Gunn has also sent me specimens of this plant from Tasmania; they are much larger than the New Zealand ones, but not otherwise different." There are, however, a number of points of difference. An examination of the specimens in the herbarium of the Royal Botanic Gardens, Kew, showed that Gunn's specimens are more in accord with the original description than Raoul's and must be taken as the type. The Director of the Royal Botanic Gardens, Kew, has kindly informed us that both Dr. T. A. Sprague and Mr. C. E. Hubbard have closely examined the material and fully concur in this view. To the latter we are indebted for the following comparative table.

<i>Raoul's Specimens.</i>	<i>Hooker's Description.</i>	<i>Gunn's Specimens.</i>
Culms 4-10 in. high; slender.	1½-2 ft. high; stout	8-22 in. high; relatively stout.
Sheaths rather short. not swollen.	long; rather swollen.	long; rather swollen.
Lamina short, 1½-3 in.	short, 2-4 in.	3-7 in.
Panicle 1½-4 in. long.	4-6 in. long.	4-7 in. long.
Spikelets rather loose; rather dull.	rather crowded; almost shining.	rather crowded; almost shining.
Florets 6-8.	6-14	6-10.

An important difference between all New Zealand and Australian specimens that we have seen is that the lemmas of the New Zealand forms are always relatively broader. Gunn's specimens are, therefore, accepted as the type. The species in Australia is polymorphic, but our material is insufficient for a full varietal treatment. So far none of the Australian forms have been met with in New Zealand.

Cheeseman (*Man. N.Z. Flora*, 1906, p. 915) published the variety *suborbicularis* Hack., from the manuscript name of Hackel, based on specimens collected near Oamaru by Petrie: "Flowering glume much broader than in the type, in outline almost orbicular. Leaves weaker and thinner." In the second edition of his *Manual* (1925, p. 202) Cheeseman adds to the variety specimens collected by Laing on Banks Peninsula. An examination of the populations in both localities shows that they present no significant differences from the New Zealand forms in general, and we adopt the varietal name, *suborbicularis* for the whole New Zealand group in contrast with the Tasmanian type. While further study will probably reveal greater polymorphy, our material does not allow us to do more than separate the New Zealand variety into two forms, both of widespread distribution.

f. *luxurians* Allan et Jansen. Culmi 3-4 dm. longi, laminae usque ad 15 cm. longae; paniculae, statu maturo, ramulis aliquanto longis.

f. *pumila* Allan et Jansen. Culmi  $\pm$  1 dm. longi, laminae breviores, paniculae subspiciformibus, ramulis brevibus, spiculae paucae.

It should be pointed out that in the illustration of Buchanan (*Man. Indig. Grasses N.Z.*, 1880, t., XLI) the spikelet details of A (*Glyceria stricta*) and B (*Catabrosa antarctica*) have been transposed.

2. **P. antipoda** (Petrie) Allan et Jansen *comb. nov.*

*Atropis antipoda* Petrie, *Subantarct. Is. N.Z.*, 1909, p. 480.

3. **P. novae-zealandiae** (Petrie) Allan et Jansen *comb. nov.*

*Poa walkeri* Kirk, *Trans. N.Z. Inst.*, vol. 17, 1885, p. 224 (*nomen nudum*).  
*Glyceria novae-zealandiae* Petrie, *Trans. N.Z. Inst.*, vol. 33, 1901, p. 329.  
*Atropis novae-zealandiae* Hack. ex Cheesem., *Man. N.Z. Flora*, 1906, p. 915.  
*A. walkeri* Cheesem., *Man. N.Z. Flora*, 1925, p. 203.

4. **P. chathamica** (Cheesem.) Allan et Jansen *comb. nov.*

*Atropis chathamica* Cheesem., *Man. N.Z. Flora*, 1925, p. 203.

Petrie based his *A. antipoda* on specimens collected by Aston on Antipodes Island, but did not discuss its affinities. Cheeseman added specimens from Auckland Islands and remarked, "closely allied to *A. walkeri*, but appears to differ in the smaller size and more slender habit, 2-noded culm, and in the larger number of florets in the spikelets." Cheeseman based his *A. chathamica* on specimens collected by Cox in Chatham Islands, and remarked, "This appears to be a distinct species, easily recognized by its stout, loosely tufted habit, long, narrow panicle, and narrow, many-flowered spikelets." Our examination leads us to consider it highly probable that a thorough analysis of the populations would lead to *P. antipoda*, *P. chathamica* and *P. novae-zealandiae* being united into one species. The differences relied on by Cheeseman are inconstant, as is seen in his own specimens.

His description of the glumes of *P. chathamica*: "two outer glumes unequal, the longer one about  $\frac{1}{2}$  the length of the spikelet, lanceolate, 3-nerved; the shorter broader, 1-nerved," as against *P. novae-zealandiae*: "Two outer glumes slightly unequal, about  $\frac{1}{2}$  the length of the whole spikelet; lower narrow, lanceolate, acute, 1-nerved, sometimes with a short lateral nerve on each side; upper broader and more obtuse, 3-nerved" is particularly faulty. The relative lengths and number of nerves of the glumes are variable, often in the same panicle. The lemma of *P. chathamica* is 5- not 3-nerved as stated, thus removing another difference. The central nerve in *P. chathamica* is distinctly excurrent, so that the three groups may be distinguished as follows:

1. Median lemma-nerve not excurrent .. .. .	<i>novae-zealandiae</i>
Median lemma-nerve excurrent .. .. .	2
2. Plant small, slender .. .. .	<i>antipoda</i>
Plant, tall, stouter .. .. .	<i>chathamica</i>

*P. antipoda* appears to be confined to the Subantarctic Islands, and *P. chathamica* has hitherto been considered endemic to Chatham Islands, but certain immature specimens recently collected by Messrs. J. Scott-Thomson and G. Simpson near Dunedin appear referable to *P. chathamica* rather than to *P. novae-zealandiae*. This last is known from a number of stations on the eastern and southern coasts of Otago, and from Stewart Island. Certain imperfect specimens collected near Napier also appear to belong to *P. novae-zealandiae*. Obviously, the whole group needs much further work.

##### 5. *P. scott-thomsonii* n.sp.

Dense caespitosa. Culmi erecti, ad 30–40 cm. alti (e vagina superiore) exserti, basi innovationibus intra vaginalibus brevibus paucinodis circumdati. Folia inferiora vagina lata laxa hyalina, lamina stricta, 6–10 cm. longa, 1–1.5 mm. lata, anguste lineari, statu sicco convoluta setacea, ligula 1–1.5 mm. longa, hyalina, rotundata; folia caulina 3 vel 4, sursum gradatim breviora, suprema lamina 2.5–3 cm. longa (quam vagina brevior), 2 mm. lata, conduplicata. Panicula pyramidata, 6–8 cm. alta, rhachi stricta, angulata, scabra, semiverticillis distantibus sursum ramis gradatim brevioribus, plerumque e ramis 3 compositis ante anthesin erectis, sub anthesi erecto-patentibus vel patulis, non reflexis, spiculis subsessilibus vel breviter pedicellatis, 5–6 mm. longis, oblongo-linearibus, 4–5 floris. Glumae valde inaequales, inferior ovalis, 1–1.2 mm. longa, uninervia, superior ovata, acuta, distincte trinervia, 2.5 mm. longa; glumella cymbiformis, apice rotundata, a latere visa acuta, 2.5 mm. longa, margine hyalino angusto, rubro tincta, basin versus breviter pilosa, ceterum glabra, nervis medianis 3 distinctis et nervis lateralibus 2 debilibus, costa apicem non attingente; palea quam glumella brevior, marginibus ciliatis: stamina filamentis brevibus, antheris ad 1 mm. longis; styli 2 ad basin divisi. Caryopsis linearis, hilo parvo ovato.

Typus in herb. Jansen et Wachter: Nova Zelandia, Waikouaiti, m. Decembrianni, 1935 (coll.) J. Scott-Thomson, sine numero. Cotype in herb. Plant Research Bureau, Wellington.

This species is abundant in salt marshes between Waikouaiti and Dunedin, South Island. It has also been collected near Napier, North Island, and probably occurs elsewhere, being passed over as *P. distans*. It has also been erroneously referred to as *P. festuciformis* Parl. (Allan: *Introduction to Grasses of N.Z.*, 1936, p. 41). A form with the spikelets distinctly reddish-tinged is common.

6. *P. fasciculata* (Torr.) Bicknell, *Bull. Torrey Bot. Club*, 35, 1908, 197.

*Poa fasciculata* Torr., *Fl. U.S.*, I, 1824, p. 107.

This species occurs in salt marshes from Nova Scotia to Delaware, and inland in Utah. It also occurs in Europe. The New Zealand forms, hitherto passed over as *P. distans*, are distinct and fall into two varieties.

var. *novazelandica* nov.

Differt a typo atlantico: culmis ad 70 cm. altis, panicula ad 20 cm. longa, angusta, semiverticillis ad 4 cm. distantibus, ramis brevioribus, nervis obsoletis.

Typus in herb. Jansen et Wachter.

Frequent, in company with *P. scott-thomsonii*, between Waikouaiti and Dunedin. A form with reddish-tinged spikelets is occasional.

var. *caespitosa*. nov.

Caespites densos durosque formans, foliis brevibus angustis involutis, culmis 15–20 cm. altis, panicula 4–5 cm. longa, spicatum contracta.

Typus in herb. Jansen et Wachter.

Originally collected and distributed without name by Petrie from Chatto Creek, Central Otago, 1911. Occasional in "alkali" patches in Central Otago. This variety is very closely allied to South African forms.

7. *P. macquariensis* (Cheesem.) Allan et Jansen.

*Triodia macquariensis* Cheesem., *Vasc. Flora Macquarie Is.*, 1919, p. 34 (*Sc. Rep. Austral. Antarct. Exped.*, 7, 3).

Cheeseman remarks: "a puzzling plant to place. It differs from *Poa* principally in the flowering glumes being rounded on the back, and minutely 3-toothed (or irregularly erose) at the tip. It agrees with *Atropis* in the flowering glumes being rounded on the back, but differs in habit and in the 3-toothed tip of the flowering glume. Although it is not a typical *Triodia*, it must be kept in the vicinity of the New Zealand *T. australis*." The habit is given as "dense caespitosum" and the habitat as "a common coastal grass, found in crevices in bare rock or on the cliffs."

We have seen but little material (that available to Cheeseman), but it is quite certain that the plant does not belong to *Triodia*. The resemblances to *T. australis*, which has the flowering glume with

the mid and lateral nerves prolonged into definite awn-points, are superficial only. In *P. macquariensis* the nerves of the flowering glumes do not attain to the hyaline margin, which becomes irregularly erose when over-mature.

*P. distans* (L.) Parl. This was recorded for New Zealand by Cheeseman (*Man. N.Z. Flora*, 1906, p. 915) as "naturalized in several localities." It is known to us from only one collection, made by Mr. J. Scott-Thomson at Tomahawk Lagoon, near Dunedin. As pointed out above, both *P. scott-thomsonii* and *P. fasciculata* have been confused with it.

*P. rupestris* (With.) Fern. et Weath. This was recorded for New Zealand by A. Wall (*Trans. N.Z. Inst.*, vol. 53, 1921, p. 428) under the synonym *Glyceria procumbens*, for Tomahawk Lagoon, near Dunedin. It still flourishes there, and has spread to other salt marshes in the neighbourhood of Dunedin.