Rytidosperma (Gramineae) in the Auckland region

Rhys Gardner

In the early days of European settlement the "danthonia" grasses, as they were then known, were plentiful in dry, open infertile places on the isthmus and around the Gulf, and would have played an important if short-lived role in pasture establishment. Today however these modest-sized, thrifty plants are being outdone by rank newcomers like kikuyu grass (*Pennisetum clandestinum*) and veldt grass (*Ehrharta erecta*), so it seems a good time to review their identification, before they become truely rare.

According to Wilcox (2000) ten *Rytidosperma* species have been recorded in the Auckland region. I shall omit discussion of the two least frequent, the adventives *R. laeve* and *R. tenuius*. This leaves four adventives and the four native species *R. biannulare*, *R. clavatum*, *R. gracile* and *R. unarede* (Zotov 1963; Connor & Edgar 1979; Edgar & Connor 2000). Also omitted is the related *Danthonia decumbens* (formerly, *Sieglingia decumbens*), a plant which is common locally on winter-wet open clay ground, e.g. at Waikumete Cemetery. It looks very much like a rytidosperma in habit, ligule (a line of hairs) and inflorescence, but its florets are nearly glabrous and are barely lobed apically.

The typical floret of a rytidosperma is a dart-like object nearly a centimeter long. It has three conspicuous apical prolongations (a central long awn and two lateral lemma-lobes), two bands of tufted hairs across the lemma's middle, and a tuft each side of the rather pointed callus. The matured floret with its grain might be thought of as a kind of miniature shuttlecock, and presumably wind does play a major role in dispersal, but the stiff pointed callus of some suggests that here animals are being targeted too.

The key of Edgar & Connor (2000) focuses on two aspects of these plants. The first is a vegetative feature, whether or not the basal branching is intravaginal or extravaginal. (It is of the former type in *R. biannulare*, *R. caespitosum* and *R. pilosum*, so these have a relatively dense habit). The second concerns the floret: the degree of development of the hairs on the callus and lemma, the length of the dark tightly twisted basal part of the awn (its "column") and whether or not the ventral scale of the floret, the palea, reaches up beyond the base of the awn column.

The synopsis below emphasises just the height of the lemma hairs relative to that of the awn column and palea tip. In using it note the warning of Connor & Edgar (1979: 314): "it is preferable to use the second or third floret from a spikelet; basal florets have a shorter callus than the others, and apical florets are subject to progressive reduction in size".

The sketches of the eight species (Fig. 1) are idealized from examination of AK specimens and study of the descriptions (Edgar & Connor 2000), so they are not vouchered. For a beautiful set of coloured illustrations see the two plates by Keith West in the above reference (also unvouchered); an earlier set of line drawings by the same artist is to be found in the revision of Zotov (1963).

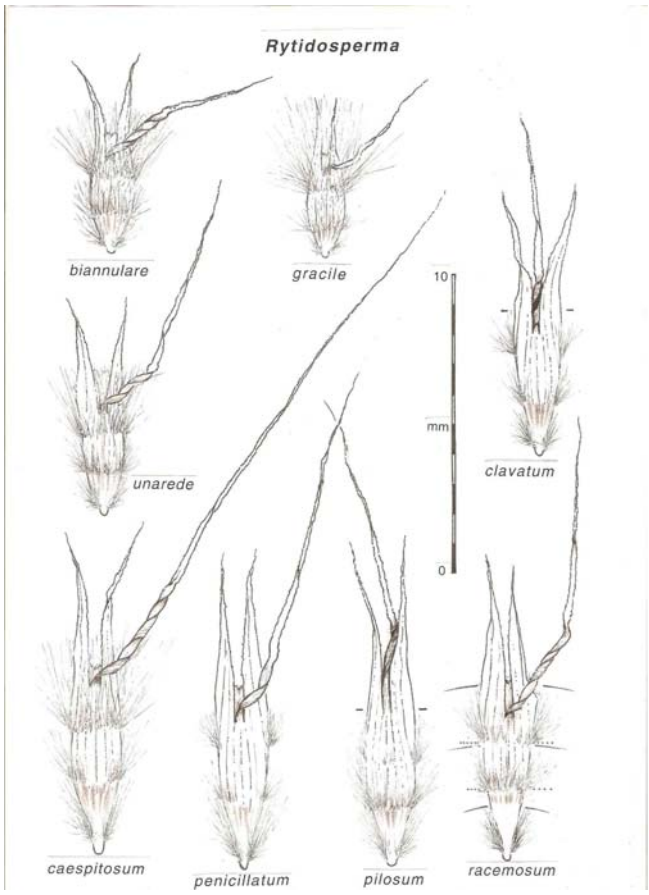

Fig. 1: Florets of *Rytidosperma* spp. Dorsal view, showing the three bands of hairs, the lowest band on the callus, the upper two on the body of the lemma. For *R. racemosum* the extent of the zones of hair-bands are indicated. Tip of palea appears in the awn-sinus between the lemma lobes, or (*R. clavatum*, *R. pilosum*) is hidden by the awn column, when its level is shown by the dashed line.

Synopsis

A. Upper lemma hairs equal to the lemma lobes or slightly exceeding them; awn column very short, very much exceeded by the palea: *R. gracile*

B. Upper lemma hairs equal to awn column or exceeding it, but much exceeded by the lemma lobes: *R. biannulare* (lemma short-hairy between its two

bands of hairs; branching intravaginal); *R. unarede* (lemma more or less glabrous between its two bands of hairs; branching extravaginal)
C. Upper lemma hairs exceeding tip of palea but not reaching tip of awn column: *R. caespitosum*
D. Upper lemma hairs more or less equal to tip of palea: *R. pilosum* (palea tip just reaching awn sinus; branching intravaginal); *R. racemosum* (palea tip exceeding awn sinus, callus relatively elongate with the hairs not reaching the lower row of lemma hairs; branching extravaginal)
E. Upper lemma hairs not reaching tip of palea: *R. clavatum* (awn c. 5 mm long); *R. penicillatum* (awn c. 10 mm long).

References
Connor H.E., Edgar, E.E. 1979: *Rytidosperma* Steudel (*Notodanthonia* Zotov) in New Zealand. *New Zealand Journal of Botany 17*: 311-337.
Edgar, E.E., Connor, H.E. 2000: Flora of New Zealand. Vol.5 Gramineae. Manaaki Whenua Press, Lincoln.
Wilcox, M.D. 2000: Observations on grasses in the Auckland region. *Auckland Botanical Socierty Journal 55*: 1-6.
Zotov, V.D. 1963: Synopsis of the grass subfamily Arundinoideae in New Zealand. *New Zealand Journal of Botany 1*: 78-136.

The story of *Sophora godleyi*

Maureen Young

Dr. Eric Godley (1919 - 2010), a past Director of the former Botany Division of DSIR, spent the final years of his life in retirement homes in Christchurch. While visiting that city in October 2008 I called on him in my capacity as vice president of the Auckland Botanical Society (ABS) with an interest in the history of the Society and a desire to contact our oldest members. Eric was a founding member of ABS, joining on its establishment in 1937 when he was an 18 year old university student. One subject I broached with him was a request that he might write something for our *Journal* about his interest in kowhai and the naming of *Sophora godleyi* (we chuckled in relief that it hadn't been named *S. godleyanus* – *Ranunculus godleyanus* was named after John Robert Godley, the founder of the Canterbury settlement); this was to be an addition to the series on plants named after Bot Soc members. Eric explained that he was busy writing a Dictionary of Botanists, but said that he would do his best to fit it in sometime. By the time he came to write for the *Journal* he had forgotten what I had asked for, but with his memory jogged by the publication by ABS of the book "*Natural History of Rangitoto Island*" (Wilcox 2007), he instead wrote the eminently suitable article "*Rangitoto remembered at ninety*" (Godley 2009).

Eric's interest in kowhai had first been an emotional response when he was a member of the Devonport Boy Scout pack, camping in the countryside at Albany and swimming in creeks with kowhai petals scattered over the ground and water. This would have been c. 1931 when he was 11 or 12 years old (pers. comm.). In 1958/59 he took part in an expedition to Southern Chile (Godley 1959) as a centennial celebration of the publishing of Darwin's *On the Origin of Species*. While there it occurred to him that the pelú in Chile seemed to be the same as our New Zealand kowhai, *S. microphylla*. Indeed, pelú was formerly known as a subspecies of *S. microphylla,* was later named *S. macnabiana*, and finally *S. cassioides*. When Eric observed the yellow pelú seeds washed up on the beaches, just as we see kowhai seeds in New Zealand, he wondered about the dispersal possibilities of these seeds floating from country to country in sea water. This led to his well known experiment of leaving kowhai seeds to soak for years in saltwater. On planting some seeds each year he found that although fewer seeds germinated with the passage of time, after ten years there were still a few that were viable.

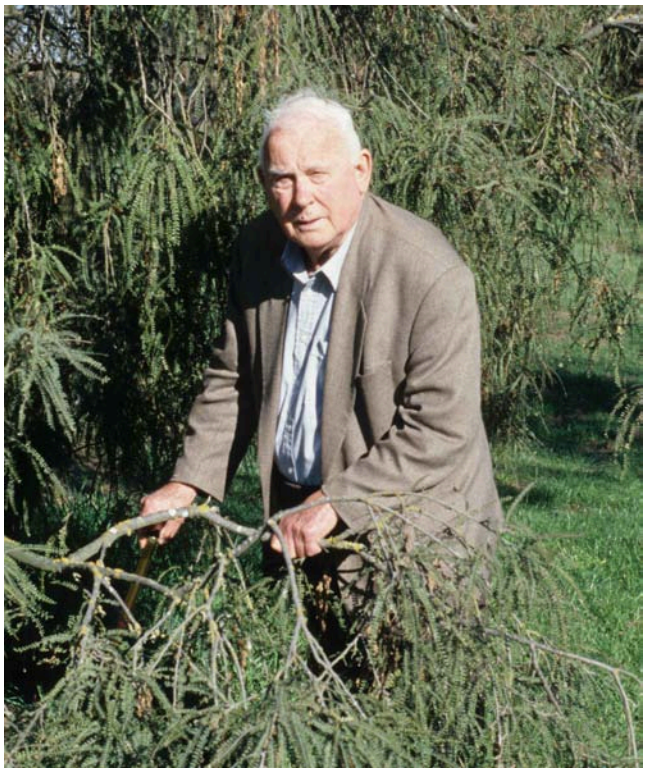

Fig. 1. Eric Godley with *Sophora godleyi* at Lincoln. Photo: Peter Heenan.

Leonard Cockayne, on querying the origin of New Zealand's divaricating shrubs, pondered on why *S. microphylla* as it was then known, sometimes had a divaricating juvenile form and sometimes did not. Eric followed up this question by undertaking a long term study and experimentally grew seedlings at Lincoln of kowhai from a wide range of sites throughout the