SEED-SET IN SOME NATIVE LEGUMES

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When reviewing our knowledge of the biology of our native flowers (Godley 1979), I brought up the question of the relation between the number of ovules in a flower and the number of these that set seed. This ratio gives a measure of the efficiency of fertilization. After referring to some published examples I added five new counts. These included a count for *Carmichaelia kirkii*, and I want to begin the present note by giving two further counts from the same plant. These are given in Table 1, together with counts from seven other species of native legumes.

The ovule numbers for *Carmichaelia kirkii* were obtained from the flowers, while the seed numbers were counted from later-produced fruits. All the other counts in the table were obtained from fruits, the ovule number being the sum of the seeds and the undeveloped ovules.

Seed and/or ovule numbers for the species discussed here have also been given by Dr Peter Heenan (1996, 1998a, 1998b, 2000). I have referred to these when there is a distinct difference from the counts in this note.

The following points could be noted:

1. *Carmichaelia kirkii*: the single cultivated plant, scored in 1967, 1968 and 1973, set fruit well in each season with seed-ovule ratios of 0.23, 0.23 and 0.21. No insect visitors were seen and I consider it self-fertile. The single cultivated plant of *C. petriei* with a ratio of 0.32 is also considered self-fertile.

2. *Carmichaelia williamsii*: a plant cultivated at Massey University flowered profusely in October 1969, but in January 1970 Dr Ian Atkinson could only find a few pods. In the following season Mr R. M. Greenwood reported that the plant "flowered well but set very few pods" and he sent four. The ovule numbers in these two seasons were 12-16 and 11-15 respectively, which agree well with the figure of (12)14-16(17) given by Heenan (1996): but the seed numbers of 2-9 and 1-8 are lower than Heenan's figure of (5)8-15. This plant was either highly self-sterile or lacked a pollinator.

Table1: Seed and ovule numbers in some native legumes. * *Swainsona novae-zelandiae* has been transferred to *Montinegra* an endemic, monotypic genus (Heenan 1998b).

Species	**Locality**	**No of pods/fls**	**Ovule no per fl.**
Carmichaelia kirkii	West Melton (cult)	20	8-11
		20	7-10
		50	7-12
Carmichaelia petriei	Lincoln (cult)	30	2-6
Carmichaelia williamsii	Massey (cult)	10	12-16
		4	11-15
Carmichaelia stevensonii	Christchurch (cult)	94	3-7
Carmichaelia crassicaule	Porters Pass 1	20	4-8
	Porters Pass 2	20	5-7
	Porters Pass 3	20	6-9
	Porters Pass 4	20	5-7
Swainsona* novae-zelandiae	Molesworth	8	11-20
	Mt Terako	10	18-21
Clianthus puniceus	West Melton (cult)	20	42-74
	Lincoln (cult)	20	57-76
Sophora microphylla	Ohingaiti (cult 1)	20	11-14
	Ohingaiti (cult 2	20	14-17
	Halkett 1	20	8-13
	Halkett 2	20	10-16
	Halkett 3	20	9-13

Table 1: (contd)

Seed no per pod	Total ovules	Total seeds	Seed:ovule ratio	Total seeds upper half	Total seeds lower half
1-4	187	43	0.23	-	-
1-5	168	38	0.23	-	-
1-6	473	97	0.21	84	13
1-2	107	35	0.32	-	-
2-9	139	61	0.44	41	20
1-8	52	16	0.31	-	-
1-(2)	524	97	0.19		
1-(2)	113	21	0.18	19	2
1	116	20	0.17	16	4
1	149	20	0.13	18	2
1-(2)	118	21	0.18	17	4
3-10	123	48	0.39		
3-10	194	50	0.26		
1-24	1279	142	0.13	129	13
3-46	1314	485	0.37	319	166
2-5	256	65	0.25	37	28
1-5	299	51	0.17	44	7
2-7	221	76	0.34	34	42
3-10	263	125	0.47	58	67
2-9	221	107	0.48	53	54

Carmichaelia stevensonii and *C. crassicaule*: the fact that only one seed is usually produced in these species leads to low ratios of 0.19-0.13. If the seed restriction is under genetic control (and not a question of space) it does not neutralize specific ovules. In *C. crassicaule*, at least, seed can be produced in either upper or lower halves of the fruit.

3. *Clianthus puniceus* is self-fertile. The ovule numbers is larger than in Heenan's material.

5. The two species of *Sophora* differ from four other species counted in producing similar numbers of seed in the upper and lower halves of the pod.

These counts were made from time to time at Botany division, DSIR. I am indebted to Ms Diane Smith for collecting *Carmichaelia crassicaule* and for help with counts.

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