CHROMOSOME NUMBERS OF FALKLAND ISLANDS ANGIOSPERMS

By D. M. MOORE*

ABSTRACT. Chromosome numbers are given for 90 of the 143 species of flowering plants native in the Falkland Islands, many karyotypes being illustrated by photographs or camera lucida drawings. 73 species have not previously been counted, including the first counts reported for the genera *Abrotanella*, *Chevreulia*, *Chiliotrichum*, *Enargea*, *Gaimardia*, *Hamadryas*, *Leuceria*, *Marsippospermum*, *Myrteola*, *Nassauvia* and *Schizeilema*. Ten species already known cytologically are here counted on South American material for the first time. The lists include species at the highest level of polyploidy yet recorded in *Pratia*, *Euphrasia* and *Lilaeopsis*, while a new basic chromosome number ($x = 4$ or 6) is reported for *Aster*. About 66 per cent of the Falkland Islands angiosperm species known cytologically are polyploid, thus being closely comparable to similar data from the New Zealand region.

ALTHOUGH many data on chromosome numbers exist for various taxonomic groups occurring in the Southern Cool Temperate Zone, there are as yet relatively few cytological studies on the floras of particular areas within that zone. The New Zealand region is partly covered by the work of Rattenbury (1957), Hair (1963), Hair and Beuzenberg (1958, 1959, 1960), Beuzenberg and Hair (1959, 1963) and Moore (1960), while the New Guinea studies of Borgmann (1964) are relevant, but the South American sector has had much less attention (Rahn, 1960).

The Falkland Islands, lying about 320 miles (515 km.) east of the Straits of Magellan, have a native vascular flora of 162 species, most of which also occur in southern South America. This paper documents data on chromosome numbers obtained during studies of the flora of the Falkland Islands. Most of the counts were made on material from the islands, but in some instances material from southernmost South America was used.

METHODS AND RESULTS

The material used in this study consisted of buds collected in the field, or either buds or root tips taken from plants in cultivation at Leicester which were derived from field collections of seeds or living plants. Material was fixed in one of the modifications of Carnoy's solution and subsequently stored in 70 per cent ethanol. Meiosis was examined in microsporocyte squashes and mitotic configurations were largely derived from squashes of root tips pretreated with paradichlorobenzene, but unpretreated stylar tissue was used in some instances. All preparations were stained with aceto-orcein. Voucher herbarium specimens for all counts are deposited in the herbarium of the University of Leicester. Permanent slides, as well as drawings and photographs not published here, are also available.

Chromosome numbers have been determined for 90 of the 143 species of flowering plants native in the Falkland Islands. They are documented in Table I, and meiotic or mitotic chromosome complements of many species are illustrated by photographs (Figs. 1–3) or camera lucida drawings (Figs. 4–6). The nomenclature used throughout is that adopted in the forthcoming "Vascular flora of the Falkland Islands" (Moore, in press).

COMMENTS

Chromosome numbers are available for *c.* 63 per cent of the Falkland Islands angiosperm species, and about 66 per cent of these are probably polyploids. This is in remarkably close agreement with the figures of 63 per cent polyploidy in the New Zealand flora (Hair, 1966), of which *c.* 40 per cent is known cytologically, and *c.* 62 per cent polyploidy in the flora of the sub-Antarctic Macquarie Island (Moore, 1960).

Genera not previously counted

As far as I am aware, chromosome numbers for 11 genera are reported here for the first time: *Abrotanella*, *Chevreulia*, *Chiliotrichum*, *Enargea*, *Gaimardia*, *Hamadryas*, *Leuceria*, *Marsippospermum*, *Myrteola*, *Nassauvia* and *Schizeilema*. *Schizeilema ranunculus* has the same number ($2n = 16$) as many species of *Azorella*, a genus of Umbelliferae in which it was formerly included, while it is interesting to note the very close similarity between the karyotype of

* Department of Botany, University of Leicester.

TABLE I. DOCUMENTED CHROMOSOME NUMBERS IN FALKLAND ISLANDS ANGIOSPERMS

Species	*n*	2*n*	*Locality**	*Collection number*†
Polygonaceae				
Polygonum maritimum L.	10		E.F.: San Carlos; Black Rincon	665
Portulacaceae				
Calandrinia feltonii Skottsb.		24	W.F.: West Point Island (cultivated)	915
Caryophyllaceae				
Colobanthus crassifolius (D'Urv.) Hook. f.		*c.* 80	Chile: Magallanes; Punta Arenas	380
subulatus (D'Urv.) Hook. f.		*c.* 80	E.F.: Mount Usborne (summit area)	597
Spergularia media (L.) Presl	18		E.F.: Goose Green (settlement)	634
Cerastium arvense L.		36	E.F.: Darwin; Carcass Bay	1276
		36	W.F.: West Point Island; Waterfall Valley	899
Chenopodiaceae				
Chenopodium macrospermum Hook. f.		36	E.F.: Darwin; Carcass Bay	629
Ranunculaceae				
Caltha appendiculata Pers.		48	E.F.: Port Stanley; Tumbledown Mountain	1259
sagittata Cav.		48	E.F.: Cape Pembroke	1253
Hamadryas argentea Hook. f.		*c.* 92	W.F.: Port Stephens; Stephens Peak	732
Ranunculus acaulis Banks & Sol.		48	W.F.: Roy Cove; Grave Cove	916
biternatus Sm.		48	E.F.: San Carlos; White Rincon	1271
hydrophilus Gaudich.		32	Chile: Magallanes; Puerto Natales	1031
maclovianus D'Urv.		48	E.F.: Goose Green; Bodie Creek	632
pseudotrullifolius Skottsb.		48	W.F.: West Point Island; Lion Cove	910
sericocephalus Hook. f.		48	E.F.: Port Stanley; Tumbledown Mountain	1260
trullifolius Hook. f.		32	E.F.: Cape Pembroke; Whalebone Cove	525
Cruciferae				
Cardamine glacialis (Forst. f.) DC.		*c.* 48	E.F.: Mount Usborne (south slopes)	584
Draba funiculosa	8		Chile: Magallanes; Estancia Punta Delgado	1050
	8		E.F.: Goose Green; Bodie Inlet	631
magellanica	24		Chile: Magallanes; Estancia Punta Delgado	1049
Saxifragaceae				
Saxifraga cordilleranum Presl		76	Chile: Magallanes; Ultima Esperanza, Cerro Guido	1020
Rosaceae				
Acaena lucida (Lam.) Vahl		42	Chile: Magallanes; Estancia Cerro Castillo	930
magellanica (Lam.) Vahl		84	W.F.: Port Stephens; Ryans Creek	1272
Rubus geoides Sm.		28	E.F.: Port Stanley; Tumbledown Mountain	515
Thymelaeaceae				
Drapetes muscosus Lam.		20	E.F.: Port Stanley; Tumbledown Mountain	511
Violaceae				
Viola tridentata Menz.	20		E.F.: Mount Usborne (summit area)	593

Species	*n*	*2n*	*Locality**	*Collection number†*
Myrtaceae				
Myrteola nummularia (Poir.) Berg		44	E.F.: Port Sanley; Tumbledown Mountain	508
Onagraceae				
Epilobium cunninghamii Hausskn.		36	E.F.: Darwin; Burnside Creek	640
		36	E.F.: Goose Green; Bodie Creek	612
Haloragaceae				
Gunnera magellanica Lam.		34	W.F.: Cape Meredith; Kits Creek	1261
Umbelliferae				
Apium australe Thouars		22	E.F.: San Carlos; White Rincon	1277
	11		E.F.: Port Stanley; Eliza Cove	554
Azorella filamentosa Lam.	8		E.F.: Cape Pembroke	927
lycopodioides Gaudich.	8		W.F.: Cape Meredith; Kits Creek	1262
		16	E.F.: Mount Usborne (summit)	605
Lilaeopsis macloviana (Gandoger) A. W. Hill		44	E.F.: Goose Green; Bodie Creek	1263
		44	E.F.: San Carlos; White Rincon	649
Hydrocotyle chamaemorus Cham. & Schlecht.	36		E.F.: Goose Green; Bodie Creek	1238
Oreomyrrhis hookeri Mathias and Constance	6		W.F.: Port Stephens; Ten Shilling Bay	1264
Schizeilema ranunculus (D'Urv.) Domin		16	E.F.: Port Stanley; Tumbledown Mountain	499
Ericaceae				
Gaultheria antarctica Hook. f.		44	E.F.: Port Stanley; Tumbledown Mountain	1265
Pernettya pumila (L. f.) Hook.		44	E.F.: Port Stanley; Tumbledown Mountain	513
Empetraceae				
Empetrum rubrum Vahl		26	E.F.: Port Stanley	1256
Primulaceae				
Anagallis alternifolia Cav.	22		E.F.: Cape Pembroke; Whalebone Cove	527
Primula decipiens Duby		72	Chile: Tierra del Fuego; Estancia Cameron	1077
Plumbaginaceae				
Armeria macloviana Cham.	9		E.F.: Port Stanley; Hooker's Point	542
Rubiaceae				
Galium antarcticum Hook. f.		*c.* 22	E.F.: Port Stanley; Eliza Cove	553
		22	W.F.: Port Stephens; Cape Meredith	785
Callitrichaceae				
Callitriche antarctica Engelm.		40	E.F.: Port Stanley; Hooker's Point	540
Scrophulariaceae				
Calceolaria fothergillii Sol. ex Ait.		18	W.F.: Hill Cove; Foot Point	829
Euphrasia antarctica Benth.	44		E.F.: Goose Green	624
Hebe elliptica (Forst. f.) Pennell		40	W.F.: Port Stephens; Carew Harbour	811
Limosella australis R. Br.		48	Argentina: Tierra del Fuego; Estancia Viamonte	1274

Species	*n*	2*n*	*Locality**	*Collection number*†
Plantaginaceae				
Plantago barbata Forst. f.		48	W.F.: Port Stephens; Ten Shilling Bay	754
		48	Chile: Magallanes; Ultima Esperanza, Salto del Paine	987
		48	Chile: Magallanes; Punta Arenas, Fuerte Bulnes	1126
maritima		12	Chile: Tierra del Fuego; Bahía Inútil	1083
		12	Chile: Magallanes; Punta Arenas, Fuerte Bulnes	1125
Valerianaceae				
Valeriana sedifolia D'Urv.		32	E.F.: Mount Usborne (summit area)	598
Lobeliaceae				
Pratia repens Gaudich.		84	E.F.: Cape Pembroke	522
Calyceraceae				
Nastanthus falklandicus D. M. Moore	*c.* 20		W.F.: Port Stephens; Ten Shilling Bay	707
Compositae				
Abrotanella emarginata Cass.		18	E.F.: Cape Pembroke	1267
Agoseris coronopifolium (D'Urv.) Chambers	9		E.F.: Cape Pembroke	1268
		18	W.F.: Port Stephens; Ten Shilling Bay	701
		18	W.F.: Port Stephens; Fegen Inlet	745a
	9		W.F.: Port Stephens; Cape Meredith	774
		18	W.F.: Port Stephens; Mount Lewis	800
		18	W.F.: Roy Cove; Hope Harbour	917
Aster vahlii (Gaudich.) Hook. & Arn.	12		E.F.: Cape Pembroke; Whalebone Cove	524
		24	W.F.: Port Stephens; Ten Shilling Bay	720
Baccharis magellanica Pers.	9		E.F.: Port Stanley; Eliza Cove	561
Chevreulia lycopodioides (D'Urv.) DC.	14		E.F.: Goose Green; Bodie Creek	622
Chiliotrichum diffusum (Forst. f.) Dusén		54	Chile: Tierra del Fuego; Estancia Cameron	1082
Cotula scariosa (Cass.) Franch.		*c.* 200–220	E.F.: Port Stanley; Moody Valley	1273
Erigeron incertus (D'Urv.) Skottsb.	18		W.F.: Port Stephens; Fegen Inlet	804
Gnaphalium affine D'Urv.	14		E.F.: Mount Usborne	585
Hieracium antarcticum D'Urv.		18	E.F.: Port Stanley; Surf Bay	537
patagonicum Hook. f.	9		W.F.: Hill Cove; Foot Point	835
Hypochoeris arenaria Gaudich.		8	W.F.: Port Stephens; Mount Lewis	799
		8	W.F.: Roy Cove; Hope Harbour	918
Leuceria suaveolens (D'Urv.) Hook. & Arn.	20		W.F.: Port Stephens	746
Nassauvia gaudichaudii Cass.	22		E.F.: Port Stanley; Eliza Cove	559
	22		W.F.: Port Stephens; Fegen Inlet	747
serpens D'Urv.		22	E.F.: Mount Usborne (south side)	583
Senecio candicans (Vahl) DC.	20		E.F.: Port Stanley; Hooker's Point	543
		40	E.F.: San Carlos; White Rincon	661
litoralis (Gaudich.) Hook. f.	*c.* 78		E.F.: Mount Usborne; Cerritos Rocks	566
vaginatus Hook. & Arn.	20		E.F.: Mount Usborne; Cerritos Rocks	565
Liliaceae				
Astelia pumila (Forst. f.) Gaudich.		64	E.F.: Port St[illegible]y; Tumbledown Mountain	505

Species	*n*	2*n*	*Locality**	*Collection number*†
Philesiaceae				
Enargea marginata Banks & Sol. ex Gaertn.		20	E.F.: Port Stanley; Stanley Common	544
Iridaceae				
Sisyrinchium filifolium Gaudich.		18	W.F.: Port Stephens; Ten Shilling Bay	700
Juncaceae				
Juncus scheuzerioides Gaudich.		40	Chile: Magallanes; Puerto Natales, Dos Lagunas	1255
Luzula alopecurus Desv.		24	E.F.: Port Stanley; Tumbledown Mountain	514
Marsippospermum grandiflorum (L. f.) Hook. f.		*c.* 50	Chile: Magallanes; Puerto Natales, Lago Escondida	1266
Centrolepidaceae				
Gaimardia australis Gaudich.		16	E.F.: Mount Usborne; near Cerritos Rocks	592
Gramineae				
Cortaderia pilosa (D'Urv.) Hack.		36	W.F.: Hill Cove; French Peaks	873
Deschampsia antarctica Desv.		26	E.F.: Mount Usborne	593
Hierochloe redolens (Sol. ex Vahl) Roem. & Schult.		56	E.F.: Port Stanley; Tumbledown Mountain	1257
Poa alopecurus (Gaudich.) Kunth.		28	W.F.: Mount Adam	1258
robusta Steud.		*c.* 70–80	W.F.: Port Stephens; Ten Shilling Bay	726
Cyperaceae				
Carex acaulis D'Urv.		50	E.F.: Cape Pembroke; Whalebone Cove	1240
curta Good.		56	E.F.: Port Stanley (racecourse)	562
fuscula D'Urv.		*c.* 50	E.F.: Port Stanley; Tumbledown Mountain	1275
Eleocharis melanostachys (D'Urv.) C. B. Clarke	12		E.F.: Darwin; Burnside Creek	641
	12		W.F.: Port Stephens; Flat Paddock	810
Isolepis cernua (Vahl) Roem. & Schult.		48	W.F.: Port Stephens; Carew Harbour	1270
Oreobolus obtusangulus Gaudich.		48	E.F.: Port Stanley; Tumbledown Mountain	1269
Uncinia brevicaulis Thouars		38	W.F.: Port Stephens; Hoste Inlet	791

* E.F. East Falkland; W.F. West Falkland.

† All collecting numbers of D. M. Moore.

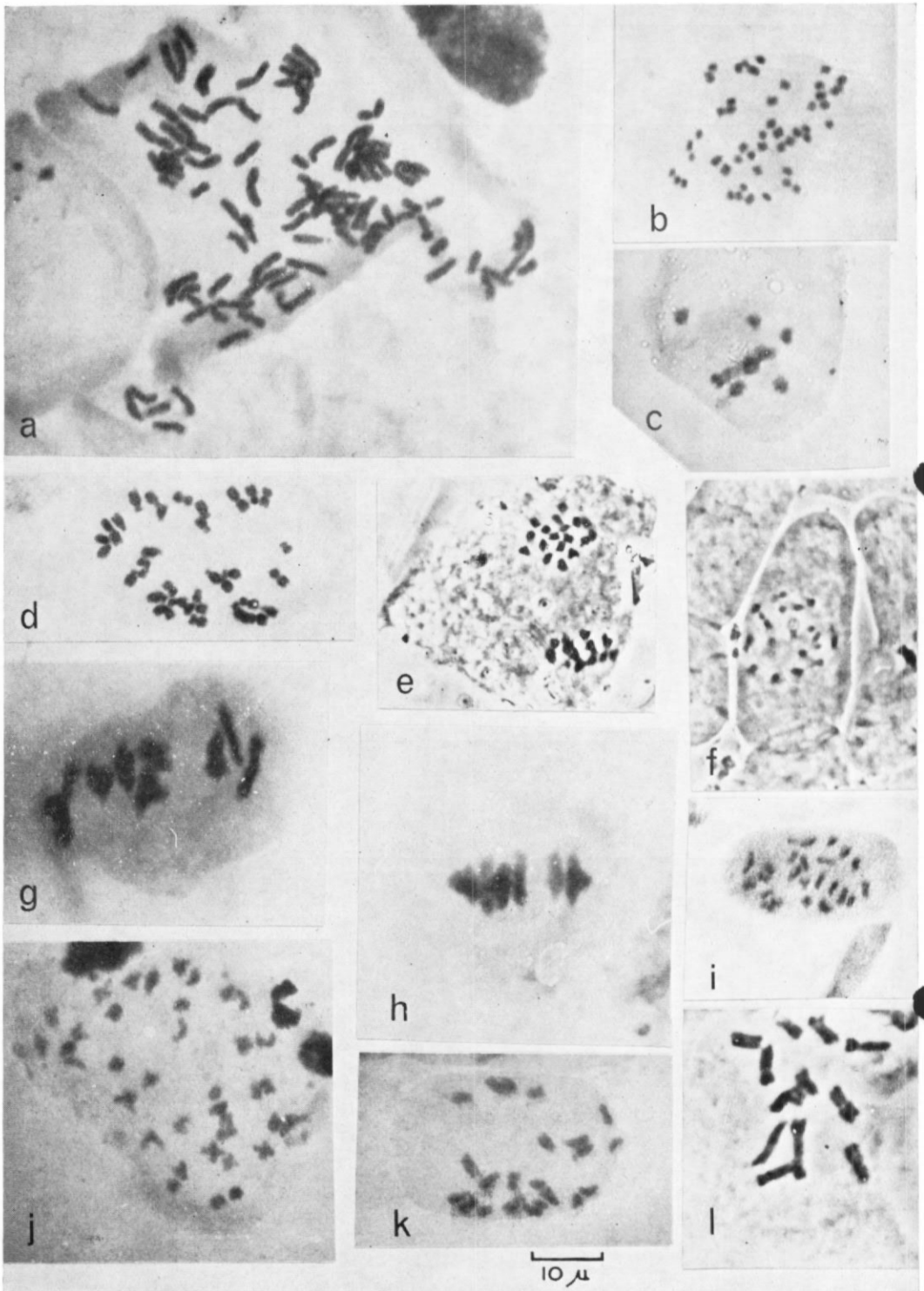

Fig. 1. a, b, d, f, i, k and l at mitotic metaphase in root tips; the remainder at the stage of meiosis indicated. a. *Hamadryas argentea* ($2n$ = *c.* 92). b. *Caltha sagittata* ($2n$ = 48). c. *Draba funiculosa* (8_{II}, first metaphase). d. *Ranunculus hydrophilus* ($2n$ = 32). e. *Spergularia media* (n = 18, first anaphase). f. *Drapetes muscosus* ($2n$ = 20). g. *Azorella filamentosa* (8_{II}, first metaphase). h. *Oreomyrrhis hookeri* (6_{II}, first metaphase). i. *Calandrinia feltonii* ($2n$ = 24). j. *Hydrocotyle chamaemorus* (36_{II}, diakinesis). k. *Apium australe* ($2n$ = 22). l. *Plantago maritima* ($2n$ = 12).

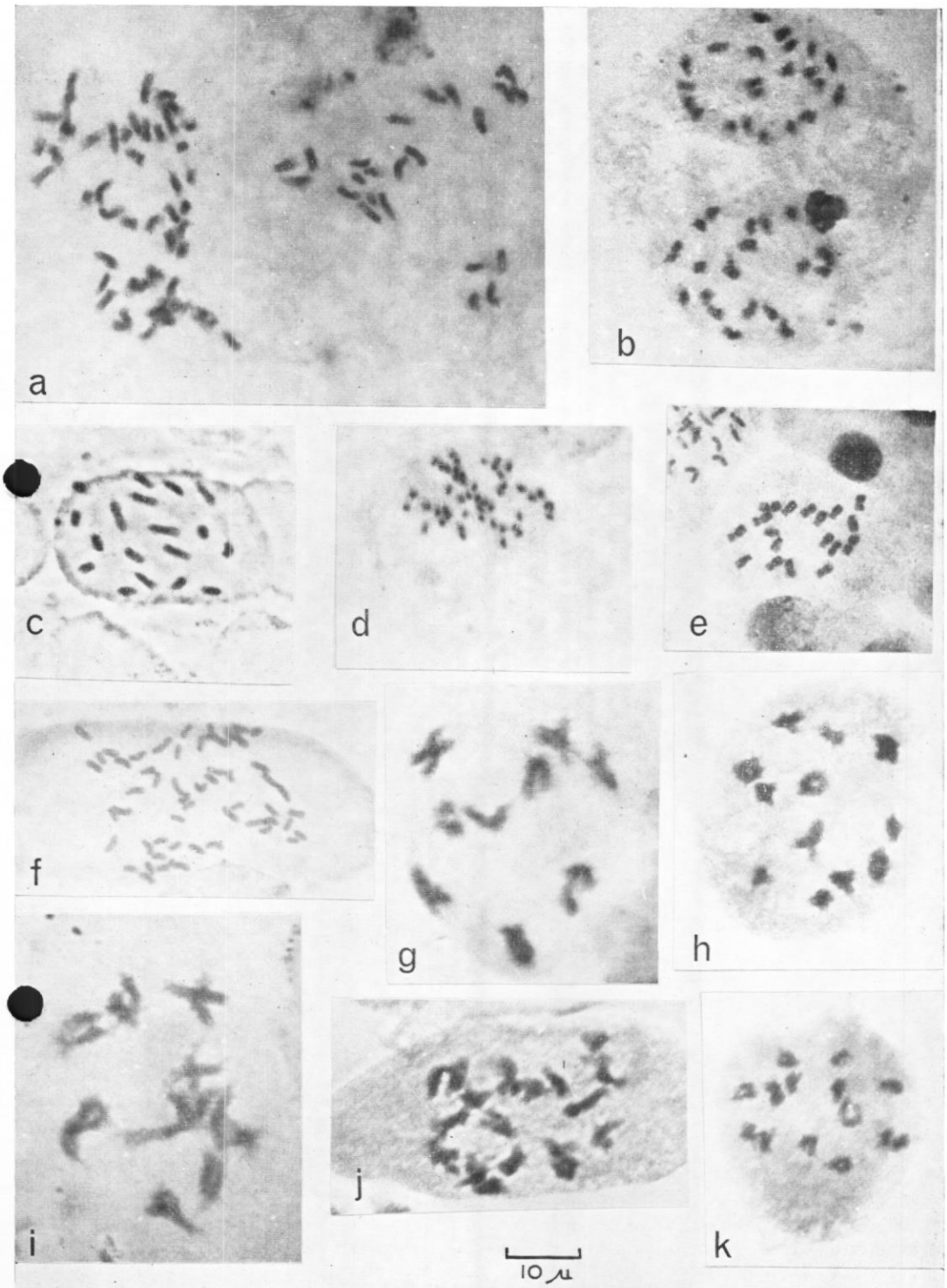

Fig. 2. a and c–f at mitotic metaphase in root tips; b at first anaphase of meiosis; g–k at diakinesis.
a. *Primula decipiens* ($2n = 72$). b. *Anagallis alternifolia* ($n = 22$). c. *Calceolaria fothergillii* ($2n = 18$). d. *Limosella australis* ($2n = 48$). e. *Abrotanella emarginata* ($2n = 18$). f. *Chiliotrichum diffusum* ($2n = 54$). g. *Baccharis magellanica* (9_{II}). h. *Aster vahlii* (12_{II}). i. *Hieracium patagonicum* (9_{II}). j. *Erigeron incertus* (18_{II}.) k. *Chevreulia lycopodioides* (14_{II}).

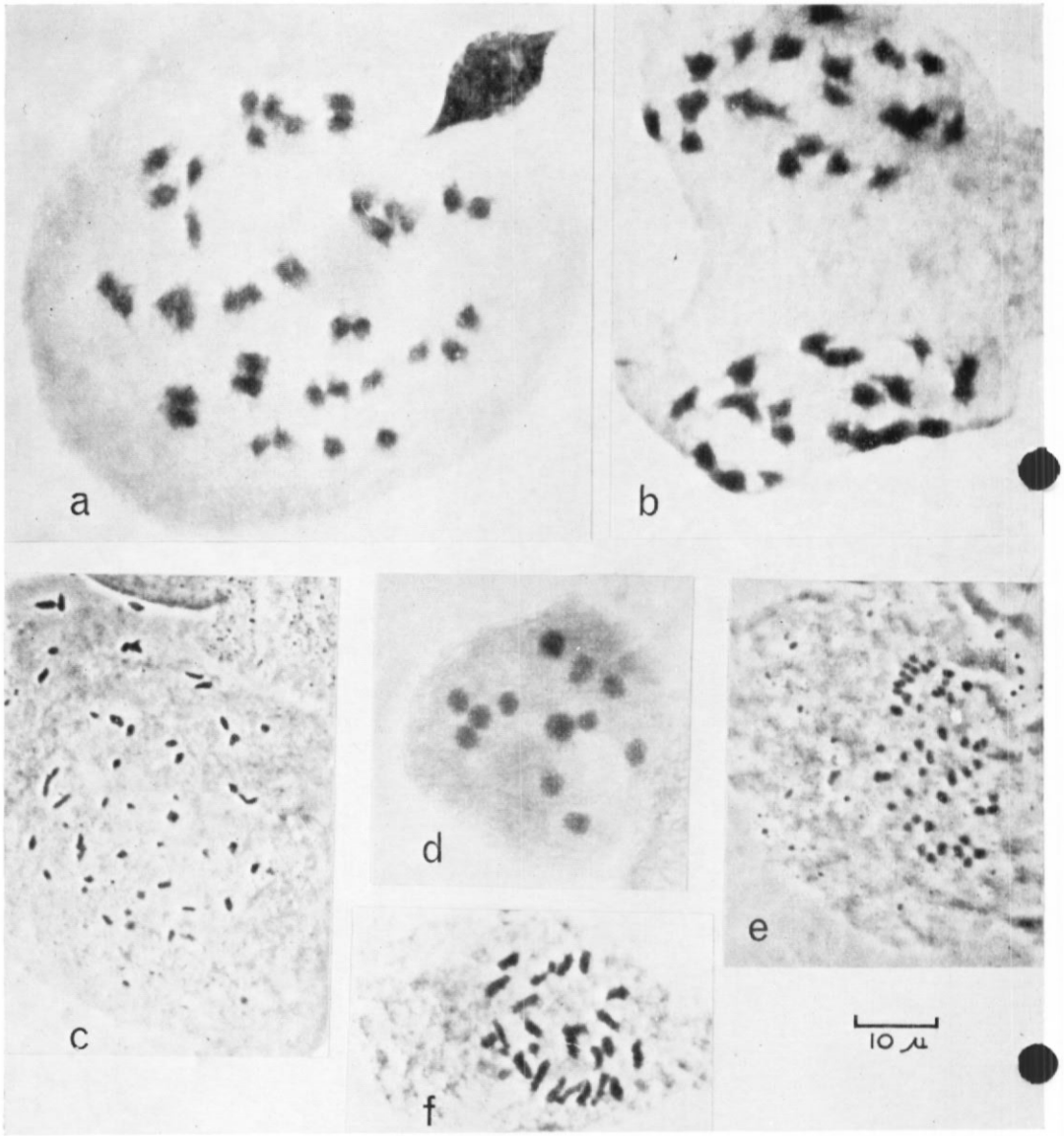

Fig. 3. a and d at diakinesis; b at first anaphase of meiosis; c, e and f at mitotic metaphase in root tips.
a. *Leuceria suaveolens* (20_{II}). b. *Senecio candicans* ($n = 20$). c. *Isolepis cernua* ($2n = 48$). d. *Eleocharis melanostachys* (12_{II}). e. *Oreobolus obtusangulus* ($2n = 48$). f. *Luzula alopecurus* ($2n = 24$).

Enargea marginata (Fig. 6a) and that of *Luxuriaga parviflora* (Beuzenberg and Hair, 1963, fig. 23), another member of the small family Philesiaceae. *Myrteola*, like several members of Myrtaceae, tribe Myrtoideae (e.g. Smith-White, 1957) is tetraploid ($x = 11$). Three genera of Compositae accord with the commonest basic numbers known in the tribes to which they belong: *Chiliotrichum* ($n = 27$) in Astereae ($x = 9$; Solbrig and others, 1964), *Chevreulia* ($n = 14$) in Inuleae ($x = 7$; Darlington and Wylie, 1955) and *Abrotanella* ($n = 9$) in Anthemideae ($x = 9$; Darlington and Wylie, 1955); on the other hand, *Leuceria* ($n = 10$) and *Nassauvia* ($n = 11, 22$) show that the basic numbers $x = 10$ and 11 must be added to those

Fig. 4. Chromosome configurations at diakinesis or first metaphase of meiosis. Camera lucida drawings. All $\times 1{,}400$.

a. *Draba magellanica* (24_{II}). b. *Viola tridentata* (20_{II}). c. *Azorella lycopodioides* (8_{II}). d. *Anagallis alternifolia* (22_{II}). e. *Armeria macloviana* (9_{II}). f. *Euphrasia antarctica* (44_{II}). g. *Gnaphalium affine* (14_{II}). h. *Senecio vaginatus* (20_{II}). i. *Agoseris coronopifolium* (9_{II}). j. *Nassauvia gaudichaudii* (22_{II}).

Fig. 5. Somatic karyotypes. Mitotic metaphase or prometaphase; root tips except where indicated. Camera lucida drawings. All ×1,400.
a. *Caltha appendiculata* ($2n = 48$). b. *Ranunculus pseudotrullifolius* ($2n = 48$). c. *Ranunculus sericocephalus* ($2n = 48$). d. *Schizeilema ranunculus* ($2n = 16$). e. *Acaena lucida* ($2n = 42$). f. *Ranunculus biternatus* ($2n = 48$). g. *Valeriana sedifolia* ($2n = 32$, stylar tissue). h. *Plantago barbata* ($2n = 48$). i. *Callitriche antarctica* ($2n = 40$). j. *Nassauvia serpens* ($2n = 22$, stylar tissue). k. *Hieracium antarcticum* ($2n = 18$). l. *Hypochoeris arenaria* ($2n = 8$, stylar tissue).

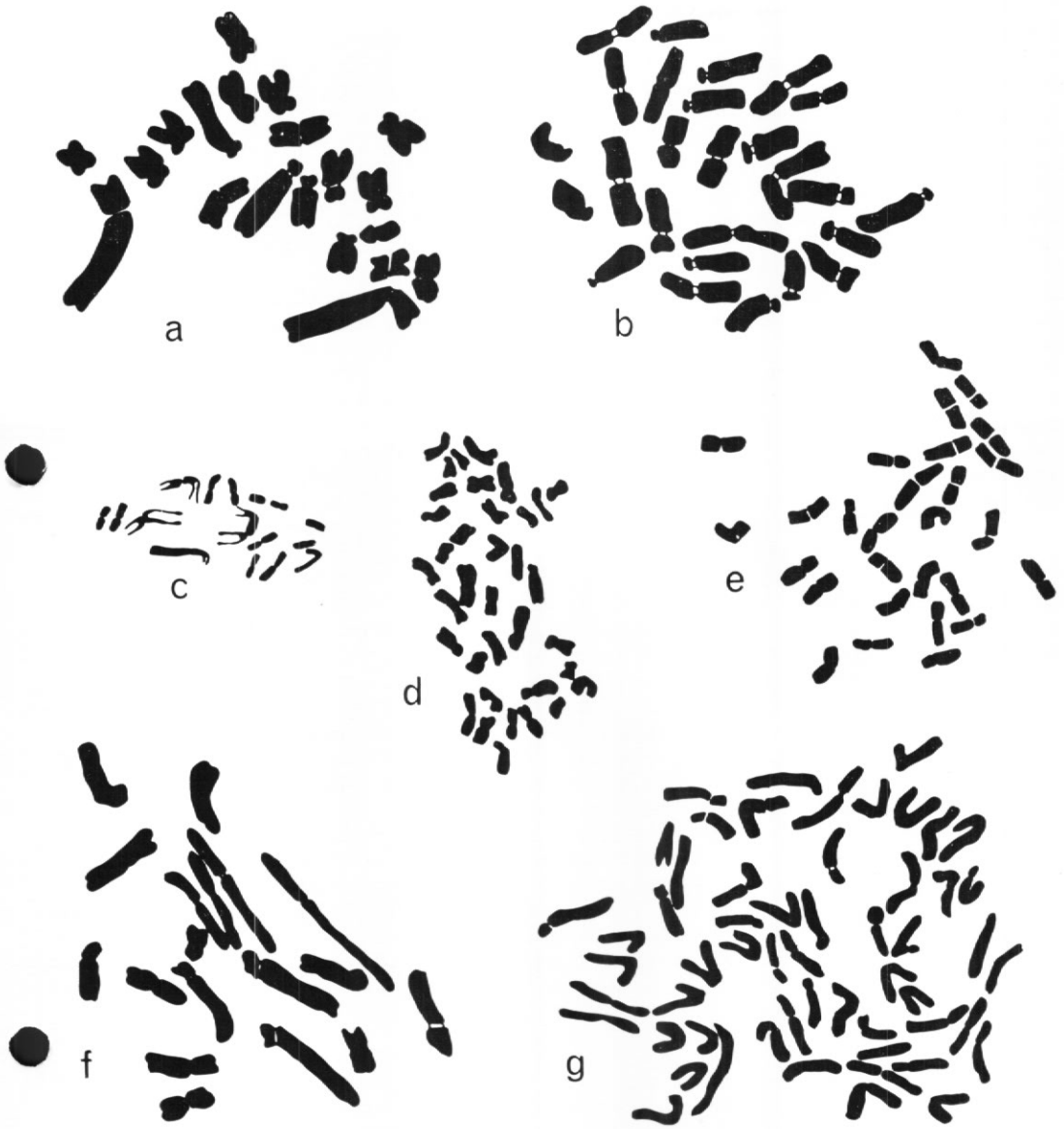

Fig. 6. Somatic karyotypes. Mitotic metaphase or prometaphase; root tips. Camera lucida drawings. All ×1,500.
a. *Enargea marginata* ($2n = 20$). b. *Deschampsia antarctica* ($2n = 26$). c. *Gaimardia australis* ($2n = 16$). d. *Cortaderia pilosa* ($2n = 36$). e. *Poa alopecurus* ($2n = 28$). f. *Sisyrinchium filifolium* ($2n = 18$). g. *Hierochloe redolens* ($2n = 56$).

already known in the Mutiseae ($x = 8, 9, 12$; Diers, 1961). *Hamadryas*, a highly derived, dioecious genus of Ranunculaceae, is undoubtedly at the 12-ploid level ($x = 8$), despite some uncertainty as to the exact number. Close relatives of *Marsipposperma* (Juncaceae) and *Gaimardia* (Centrolepidaceae) are not known cytologically, but the latter probably has a basic number of $x = 8$, compared with $x = 10$ and perhaps 8 in *Centrolepis* (Hamann, 1960; Larsen, 1963).

Species not previously counted

Several genera occurring in the Falkland Islands are known to have little or no variation in chromosome number and the counts for the species listed here are in accord with the earlier studies cited for the genera: *Armeria* (Baker, 1948), *Baccharis* (Solbrig and others, 1964), *Epilobium* (Hair, 1966; Lewis and others, 1958), *Gunnera* (Beuzenberg and Hair, 1963) and the cushion forms of *Valeriana* (Diers, 1961). The diploid number 48, which is most frequent in Falkland Islands species of *Ranunculus*, has been commonly encountered in Southern Hemisphere studies of the genus (e.g. Smith-White, 1957; Fisher, 1965) but the number $2n = 32$ appears to be much less frequent. It is perhaps rather surprising that *R. pseudotrullifolius* is one of the hexaploid ($x = 8$) species referred to above, while its closest morphological relative, *R. trullifolius*, is tetraploid. The Falkland Islands species of *Oreomyrrhis* and *Erigeron* have the same numbers as their close relatives, respectively *O. andicola* (Bell and Constance, 1960) and *E. myosotis* (Solbrig and others, 1964). *Empetrum rubrum* is diploid, like its Northern Hemisphere counterpart *E. nigrum* (e.g. Hagerup, 1927), while *Cotula scariosa* appears to be 16-ploid, as indicated by Hair (1962) for other members of the subgenus *Leptinella* ($x = 13$).

Several species reported here are at higher ploidy levels than hitherto recorded for their genera. *Pratia repens* is 12-ploid ($x = 7$), New Zealand species being diploid, hexaploid or decaploid (Beuzenberg and Hair, 1959), while *Euphrasia antarctica* is octoploid ($x = 11$), compared with the diploids and tetraploids known previously (personal communication from P. Yeo). Only diploid species have previously been reported in *Lilaeopsis* (Bell and Constance, 1960) but some Californian species are now known (personal communication from L. Constance) to be tetraploid ($x = 11$) like *L. macloviana*.

Aster has been shown to have three basic numbers, $x = 5, 8, 9$, by Solbrig and others (1964) but the discovery of 12 bivalents at meiosis in *A. vahlii* indicates that either $x = 4$ or 6 must be added to this list. The only species of *Drapetes* hitherto counted, from New Guinea (Borgmann, 1964), had $2n = 18$ and the basic number $x = 9$ appears to be common elsewhere in the Thymelaeaceae (e.g. Cruickshank, 1953; Nevling, 1964). The present report of $2n = 20$ for *D. muscosa* must, therefore, be rather unexpected and further material will be required before deciding whether to attribute another basic number to the family or whether there has been confusion with satellites in the present study. The preparations of *Nastanthus falklandicus* only permitted the approximate count given and it may have a haploid complement of 21 chromosomes as found in another species by Rahn (1960).

Lourteig (1964) has united all the austral populations of *Limosella* in a single species, *L. australis*, which also extends north through the Americas to Canada and which occurs in Africa and western Europe. Of the species which she has thus united, *L. subulata* has been shown to have $2n = 20$ (Blackburn, 1939) in Europe, *L. lineata* from New Zealand has $2n = 60$ (Hair and Beuzenberg, 1960) and the southern South American material reported in this paper, which was formerly referred to *L. aquatica* ($2n = 40$; e.g. Blackburn, 1939), has $2n = 48$. Clearly, there is need for more extensive cytological study of this widespread group of populations.

Species previously counted

The chromosome numbers of 17 species documented in this paper have been counted previously and all the earlier records are confirmed here. Six of these species occur in temperate regions of both hemispheres and, while counts from both Northern (e.g. Hagerup, 1941) and Southern (Böcher and others, 1963) Hemispheres are available for *Plantago maritima*, counts for five species were available hitherto only from the Northern Hemisphere: *Carex curta* (e.g. Löve and Löve, 1956), *Cerastium arvense* (e.g. Söllner, 1952), *Chenopodium macrospermum* (Homsher, 1963), *Polygonum maritimum* (e.g. Styles, 1962) and *Spergularia media* (Blackburn and Morton, 1957), although the latter species is apparently normally diploid ($2n = 18$) in Europe and North Africa (Ratter, 1964). Five species were known cytologically only from the Australian-Neozeelandic region: *Callitriche antarctica* (Moore, 1960; Beuzenberg and Hair, 1963), *Hebe elliptica* (personal communication from O. Frankel), *Hierochloe redolens* (Borgmann, 1964), *Juncus scheuzerioides* (Moore, 1960) and *Ranunculus biternatus* (Moore, 1960). Chromosome counts for the remaining seven species are already available from South America: *Acaena magellanica* (Moore, 1964), *Agoseris coronopifolia* (Chambers, 1963), *Apium*

australe (Bell and Constance, 1960; also from New Zealand by Beuzenberg and Hair, 1963), *Draba magellanica* (Heilborn, 1927), *Hydrocotyle chamaemorus* (Bell and Constance, 1957), *Plantago barbata* (Böcher and others, 1963) and *Primula decipiens* (Bruun, 1932).

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