PRELIMINARY CHROMOSOME STUDIES ON THE VASCULAR PLANTS OF TAIWAN (II)

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INTRODUCTION

In the previous paper[2] the chromosome counts of 82 taxa belonging to 75 genera were reported on the vascular plants of Taipei and its vicinity. This is the extension of that work based mainly on the counts of pollen mother cells. Efforts have been made to study plants growing on mountainous regions, represented by Mt. Chihsingshan (七星山) in northern Taiwan and by Mt. Yushanchienshan (玉山前山) in central and Kueihu (龜湖) in southern Taiwan. The coastal collections were made in Yehliu (野柳), Tanshui (淡水), Kenting (墾丁) and Tawu (大武). The former two localities are located on the northern part of the Island, while the latter two are on the west and east sides of the southern Taiwan. The detailed records of the localities, date of the collections together with a listing of elevations are given in Table 2.

MATERIALS AND METHODS

All materials and complete sets of voucher specimens were prepared and deposited in the Herbarium of the National Taiwan University (TAI). The smear techniques were uniformly followed during the preparation of the slides[2]. No pretreatment was applied on flower buds nor on the root tips. The standard 3: 1 alcohol-glacial acetic acid solution was universally used in the fixation of materials in the field. Drawings were reproduced from the microphotos photographed with an aid of Olympus PM-7.

RESULTS

Table 1 shows the results of the present study. The genera and species are arranged alphabetically after the families which are classified according to the Hutchinson system (1959). Following the family name is the Hutchinson's family number, and the number in the parenthesis is the family number proposed by Dalla Torre & Harms (1907) which is also followed by the Cave's Index (1958–1965) and the Ornduff's Index (1967, 1968). Several chromosome counts are listed for a taxon if the plant grows in different localities. An asterisk(*) indicates the first time a count is reported on the chromosome number of a taxon.

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(2) Preliminary Chromosome Studies on the Vascular Plants of Taiwan (I). Taiwania 13: 117-130, 1967.

Table 1. Chromosome Counts in Some Taiwan Vascular Plants

Fig.	Taxon	Voucher	n	2n	Locality	Previous count & authority
	LAURACEAE 15 (103)					
	Persea X=12					
1	*zuihoensis* (Hay.) Li	4246	12		Taipei	*
	ROSACEAE 24 (127)					
	Duchesnea X=7					
2	*chrysantha* Miq.	3108		28	Chinankung	*
	Rubus X=7 (polyploids often apomictic)					
	calycinoides Hay.					
3	var. *macrophyllus* Li	3337		14	Kueihu	*
4	*morii* Hay.	3687	14		Lanshan	*
	PAPILIONACEAE 29 (129′)					
	Alysicarpus X=10*					
5	*nummularifolius* (L.) DC.	3407	10		Chihpen	*
	nummularifolius (L.) DC.	4073	10		Tawu	
	Canavalia X=11					
6	*lineata* (Thunb.) DC.	3877	22		Yehliu	n=11 Jinno ('56).
		4202	11		Kenting	
	Crotalaria X=7, 8					
7	*incana* Linn.	3390	7		Chihpen	2n=14 Atchison ('50); Shibata ('62); Krapov & F. ('57). n=7 5II+4I, 2n=14 Magoon et al. ('63).
	Indigofera X=6, 7, 8					
8	*hirsuta* Linn.	4091	8		Fengkang	2n=16 Sampath & A. ('49); Frahm-Leliveld ('60).
	Kummerowia X=11					
	striata (Thunb.) Schindl.	3485		22	Wulai	2n=22 Sasaki ('51).
	HYDRANGEACEAE 33 (118′)					
	Hydrangea X=18					
9	*chinensis* Maxim.	4306	18		Yinhotung	n=18 Chuang et al. ('62).
	Pileostegia X=18*					
	viburnoides Hook.					
10	et Thoms.	3344	18		Kueihu	*
	ARALIACEAE 47 (227)					
	Schefflera X=12*					
11	*arboricola* Hay.	4104	12		Kenting	*
	CAPRIFOLIACEAE 48(271)					
	Sambucus X=(9), 18, 19					
12	*chinensis* Lindle	3087		36	Chinankung	n=18 Chuang et al. ('62). 2n=36 Hsu ('67).
	Viburnum X=8, 9, 10					
13	*luzonicum* Rolfe	4307	16		Yinhotung	*
	MORACEAE 70 (65)					
	Ficus X=13					
	beecheyana Hook.					
	et Arn.	3216		26	Chihsingshan	*
14	*beecheyana* Hook. et Arn.	3230	13		Chutzuhu	
	URTICACEAE 71 (66)					
	Boehmeria X=7, 13					
	densiflora Hook.					
15	et Arn.	4309		28	Yinhotung	*

Fig.	Taxon	Voucher	n	2n	Locality	Previous count & authority
16	*Pellionia* X=? *trilobulata* Hay.	3339		16	Kueihu	*
	VIOLACEAE 99 (198) *Viola* X=6, 10, 11, 13, X2=17, X3=27					
	sp.	3359		39	Kueihu	*
17	*confusa* Champ.	4241	13		Yehliu	*
18	*formosana* Hay.	3335		26	Kueihu	*
19	*nagasawai* Mak. et Hay.	3199		40	Chihsingshan	*
20	*verecunda* Gray	3198	12		Chihsingshan	n=12 Chung et al. ('62).
	PASSIFLORACEAE 107 (203) *Passiflora* X=9					
21	*suberosa* Linn.	3371	9		Chihpen	2n=12 Diers ('61).
	CUCURBITACEAE 109 (275) *Melothria* X=11, 12					
22	*heterophylla* (Lour.) Cogn.	3229	11		Chutzuhu	*
	CARICACEAE 112 (205) *Carica* X=9					
23	*papaya* Linn.	3391	9		Chihpen	2n=18 Eichhorn ('37).
	STERCULIACEAE 117 (178) *Kleinhovia* X=12*					
24	*hospita* Linn.	4085	12		Tawu	*
	MALVACEAE 120 (176) *Hibiscus* X=7, 8, 9, 11, 12, 15, 17, 19, 20, 39					
25	*syriacus* Linn.	3881	20		Yehliu	2n=80 Skavsted ('41); 2n=90, Sharma & S. ('62).
26	*tiliaceus* Linn.	4066	20		Tawu	2n=80, 96 Youngman ('31); 2n=ca92, ca96 Skottsberg ('55).
	Sida X=7, 8, 11 *rhombifolia* Linn.					
27	var. *longipedicellata* Mori	3383	7		Chihpen	2n=14+0−1B, 28 Skovsted ('41); 2n=14, Krapovikas ('57); Diers ('61); n=14, 2n=28, Raghavan & Aron ('58).
	EUPHORBIACEAE 133 (148) *Acalypha* X=7					
28	*australis* Linn.	4087	7		Tawu	*
	Ricinus X=10 *communis* Linn.	4065	10		Tawu	2n=20 Hagerup ('32); Jakob ('57). 2n=40 Sidorov & S. ('41). n=10 Jakob ('56).
	Securinega X=12* *virosa* (Roxb.) Pax et Hoffm.					
29		3399	24		Chihpen	*
	THEACEAE 135 (186) *Eurya* X=21					
30	*glaberrima* Hay.	3921	21		Alishan	*
	ERICACEAE 152 (233) *Rhodorendron* X=13					
31	*nakaharai* Hay.	3191		26	Chihsingshan	*

Fig.	Taxon	Voucher	n	2n	Locality	Previous count & authority
	HYPERICACEAE 158 (187′)					
	Hypericum X=7, 8, 9, 10, 12, X2=19 (apomictic)					
32	*nagasawai* Hay.	3891	18		Alishan	*
	CLUSIACEAE 159 (187)					
	Calophyllum X=16					
33	*inophyllum* Linn.	4196	16		Kenting	2n=32 Tixier (′53).
	CELASTRACEAE 180 (159)					
	Tripterygium X=12*					
34	*wildfordii* Hook.f.	3255		24	Shiting	*
	VITACEAE 202 (171)					
	Ampelopsis X=20					
	brevipedunculata (Maxm.) Traut.					
35	var. *hancei* (Planch) Li	3104		40	Chinankung	2n=40 Mitsukuri & H. (′61) as *A. heterophylla*
	MYRSINACEAE 403 (236)					
	Maesa X=6*					
36	*japonica* Mor. et Zoll.	3223		12	Chutzuhu	*
	japonica Mor. et Zoll.	4299		12	Yinhotung	
	RUTACEAE 209 (138)					
	Evodia X=9					
37	*confusa* Merr.	3482	12		Huoshaochang	*
	STAPHYLEACEAE 221 (162)					
	Turpinia X=11*					
	formosana Nakai	4316	11		Yinhotung	*
38	*formosana* Nakai	4304	11			
	APOCYNACEAE 233 (247)					
	Ecdysanthera X=10*					
39	*rosea* Hook. et Arn.	4317	10		Yinhotung	*
	RUBIACEAE 237 (270)					
	Galium X=10, 11, 12					
40	*rotundifolium* Linn.	3333	11		Kueihu	2n=22 Piotrowicz (′58); Kliphuis (′62). n=11 Khoshoo & B. (′63).
	Hedyotis X=9, 8					
41	*uncinella* Hook. et Arn.	3435	18		Chusuipo	*
	Mussaenda X=11					
42	*pubescens* Ait.f.	3370	11		Chihpen	*
	Psychotria X=11					
43	*rubra* (Lour.) Poir.	3071	11		Taipei	n=11, 2n=22, Hsu (′67).
44	*serpens* Linn.	3227		22	Chutzuhu	*
	Rubia X=11					
45	*cordifolia* Linn.	3345	11		Kueihu	n=11 Khoshoo & B. (′63). 2n=22 Hara & Kurosawa (′63).
	VERBENACEAE 243 (253)					
	Clerodendron X=12, 23					
46	*crytophyllum* Turcz.	3221	12		Chutzuhu	*
	crytophyllum Turcz.	3387	12		Chihpen	
	Vitex X=6, 8					
47	*rotundifolia* Linn.f.	4064	16		Tawu	n=16, Jinno (′56); Chuang et al. (′62)
	RANUNCULACEAE 249 (92)					
	Clematis X=8					
48	*formosana* O. Ktze.	3375	8		Chihpen	*

Fig.	Taxon	Voucher	n	2n	Locality	Previous count & authority
	Ranunculus X=7, 8					
	cantoniensis DC.	3899	48		Alishan	2n=32 Kurita ('65).
49	*cantoniensis* DC.	4380	48		Tanshui	
	ARISTOLOCHIACEAE 260 (75)					
	Heterotropa X=12					
50	*hayatana* F. Maek.	3207	12		Chihsingshan	*
	hayatana F. Maek.	4321	48		Yinhotung	
51	*infrapurpura* F. Maek.	3353		24	Kueihu	*
	infrapurpura F. Maek.	3355		24	Kueihu	
	SAURURACEAE 265 (53)					
	Houttuynia X=?					
52	*cordata* Thunb.	3222		24	Chutzuhu	n=c. 96, Okabe ('34); Kurosawa ('66). 2n=48, Mihara ('60).
	CHLORANTHACEAE 266 (55)					
	Sarcandra X=15*					
	glabra (Thunb.) Nakai	3224	15		Chutzuhu	*
53	*glabra* (Thunb.) Nakai	3228		30	Chutzuhu	
	Chloranthus X=15					
54	*oldhamii* Maxim.	3301	15		Kueihu	*
	CRUCIFERAE 269 (106)					
	Arabis X=6, 7, 8					
55	*morrisonensis* Hay.	4018	12		Yushanchien-shan	*
	Capsella X=8					
56	*bursa-pastoris* Medik.	4289	16		Taipei	2n=32 Vaarama ('43); Löve & L. ('56); Mulligan ('57); Böcher & L. ('58). n=8, 16 Easterly ('63). n=16 Raj ('65).
	Cardamine X=7, 8, 15					
57	*parviflora* Linn.	4285	8		Taipei	2n=16 F. H. Smith ('38); Mulligan ('65).
	Eutrema X=7					
58	*wasabi* Maxim.	3930	14		Alishan	*
	Rorippa X=8					
59	*indica* Hiern.	3910	16		Alishan	*
	indica Hiern.	4313	16		Yinhotung	
	CARYOPHYLLACEAE 273 (88)					
	Arenaria X=10, 11					
60	*subpilosum* Ohwi	4019	20		Tungpu	*
	Dianthus X=15					
61	*pygmaeus* Hay.	4230	15		Yushanchien-shan	*
	Drymaria X=19					
62	*cordata* Willd.	3367	18		Kueihu	*
	Stellaria X=10, 11, 12, 13					
63	*arisanensis* Hay.	3907	10		Alishan	*
64	*aquatica* Scop.	4293	10		Taipei	*
	FICOIDACEAE (AIZOACEAE) 274 (85)					
	Tetragonia X=8					
65	tetragonoides (Pall.) O.K.	4243	8		Yehliu	n=16 Hair & B. ('59).

Fig.	Taxon	Voucher	n	2n	Locality	Previous count & authority
	PORTULACACEAE 275 (86)					
	Portulaca X=4, 9					
66	*pilosa* Linn.	4210	18		Kenting	2n=16 Steiner ('59). 2n=18 Diers ('61).
	POLYGONACEAE 276 (78)					
	Polygonum X=10, 11, 17					
67	*chinense* Linn.	3101		22	Chinankung	2n=26 Sharma & C. ('60). n=11 Gajapathy ('61).
68	*thunbergii* S. et Z.	3293	20		Kueihu	2n=22 Sugiura ('36) as *P. maackianum.*
69	*thunbergii* S. et Z.	3931		40	Alishan	2n=40 Okura & K. ('60); Doida ('60, '62). 2n=c. 44 Sokolovskaya ('63).
70	*runcinatum* Buch-Hamilt. ex D. Don	3953	11		Yushanchien-shan	2n=22 Sharma & C. ('60).
	CHENOPODIACEAE 283 (79)					
	Chenopodium X=9 (8)					
71	*ambrosioides* Linn.	3413	16		Chihpen	2n=36 Kjellmark ('34)
		4296	16		Taipei	2n=32 Woroschilov ('42). n=16, 2n=36 Raghavan & Arora ('58); Mehra & M. ('63).
	AMARANTHACEAE 284 (80)					
	Achyranthus X=7					
72	*obtusifolia* Lamk.	3409	14		Chihpen	*
	obtusifolia Lamk.	4061	14		Tawu	
73	*ogatai* Yamamoto	3268	28		Kueihu	*
	Deeringia X=10*					
74	*polysperma* (Roxb.) Miq.	3386	10		Chihpen	*
	LYTHRACEAE 288 (216)					
	Rotala X=8*					
75	*rotundifolia* Koehne	3173	8		Chihsingshan	*
	ONAGRACEAE 289 (224)					
	Epilobium X=18					
76	*roseum* Schreb.	3289	18		Kueihu	*
	HALORRHAGIDACEAE 291 (225)					
	Halorrhagis X=6*					
77	*micrantha* R. Br.	3166	6		Chihsingshan	n=6 Chuang et al. ('62) 2n=12 Larsen ('66).
	GENTIANACEAE 293 (246)					
	Crawfurdia X=10*					
78	*japonica* S. et Z.	3193	10		Chihsingshan	2n=46 Wada ('56).
	japonica S. et Z.	3214		20	Chihsingshan	
79	*lanceolata* Hay.	3318	10		Kueihu	*
	Gentiana X=13					
	formosana Hay.	3172		26	Chihsingshan	*
80	*formosana* Hay.	3189	13		Chihsingshan	
81	*scabrida* Hay.	3312		44	Kueihu	n=22 Chuang et al. ('62).
	Swertia X=9, 12					
82	*randaiensis* Hay.	4008	20		Tungpu	*

Fig.	Taxon	Voucher	n	2n	Locality	Previous count & authority
	PRIMULACEAE 295 (273)					
	Androsace X=9, 10					
83	*umbellata* Merr.	4238	9		Yehliu	*
	Lysimachia X=10*					
84	*mauritiana* Lamk.	3282		20	Kueihu	n=11, 2n=20 Jinno ('56). n=10 Chuang et al. ('62).
	PLANTAGINACEAE 297 (269)					
	Plantago X=4, 5, 6, X2=9 (4+5)					
85	*formosana* Tateishi et M.	3202		12	Chihsingshan	*
	formosana Tateishi et M.	3895	12		Alishan	
	SAXIFRAGACEAE 300 (118)					
	Mitella X7*					
86	*japonica* Miq. var. *formosana* Hay.	3320	7	14	Kueihu	*
	UMBELLIFERAE 311 (228)					
	Centella X=9					
87	*asiatica* (L.) Urban	3153		18	Chihsingshan	n=9 Liu et al. ('61); Bell & C. ('60). 2n=33 Mits. & K. ('59). 2n=18 Hsu ('67).
	Hydrocotyle X=8, 9, 11, 12					
88	*dichondroides* Makino	3342	12		Kueihu	n=11 Liu et al. ('61).
89	*sibthorpoides* Lamk.	4286	12		Sunmoon Lake	n=12 Liu et al. ('61). 2n=48, 64 Borgmann ('64). 2n=24 Hsu ('67).
	Oenanthe X=11					
90	*javanica* (Bl.) DC.	3152	11		Chihsingshan	n=10 Bell & C. ('60); Liu et al. ('61). 2n=22 Hsu ('67).
	CAMPANULACEAE 315 (276)					
	Adenophora X=17					
91	*morrisonensis* Hay.	3969	17		Yushanchien-shan	*
	morrisonensis Hay.	4003	17		Yushanchien-shan	
	Wahlenbergia X=(8?) 9					
92	*gracilis* Schrad	3964	18		Yushanchien-shan	2n=18 Hsu ('67).
	GOODENIACEAE 317 (277)					
	Scaevola X=8					
93	*sericea* Vahl	4207	16		Kenting	*
	SOLANACEAE 321 (256)					
	Solanum X=12, 13					
94	*lysimachioides* Wall	3325		24	Kueihu	*
95	*nigrum* Linn.	3885	12		Taipei	n=36 Gottschalk ('54); Baylis ('58); Masubuch ('61). 2n=72 Mulligan ('61). n=20 Rai ('59). 2n=24 Borgmann ('64). n=12 Chuang et al. ('62); Baquar et al. ('65); Nanda ('62). n=12, 24, 36 Tandon & Rao ('64). n=12, 2n=24, Hsu ('67).

Fig.	Taxon	Voucher	n	2n	Locality	Previous count & authority
96	*torvum* Sw.	3447	12		Chusuipo	n=12 Heiser ('56). n=12, 2n=24 Bez. & B. ('63).
97	*xanthocarpus* Schrad et Wendl.	4053	12		Tawu	n=12 Baquar at al. ('65)
	CONVOLVULACEAE 322 (249)					
	Ipomoea X=15					
98	*congesta* R. Br.	4033	15		Chihpen	*
	pescaprae (Linn.) Sweet subsp. *brasiliensis* Ooststr.	4076	15		Tawu	2n=30 Miege ('60). n=15 Chuang et al. ('62) n=15, 2n=30, A. Jones ('64).
	SCROPHULARIACEAE 324 (257)					
	Digitaris X=7 or 28					
99	*purpurea* Linn.	3896	28		Alishan	2n=56 Buxton & N. ('28); Love & L. ('56); Angulo-Carpio ('57). n=28 Angulo-Carpio & S. ('64).
	Mazus X=12*					
	fauriei Bon	3205		24	Chihsingshan	*
100	*pumilus* van Steenis	3051		24	Taipei	n=12, 2n=24 Hsu ('67).
101	*pumilus* van Steenis	4292	12		Taipei	
	Torenia X=8, 9					
	concolor Lindl. var. *formosana* Yamazaki	3143		16	Yangmingshan	*
102	*Veronica* X=7, 8, 9 X2=15, 17 X3=26					
	undulata Wall.	4368	16		Tanshui	*
103	ACANTHCEAE 325 (266)					
	Justicia X=(7) 14					
	procumbens Linn.	3085	28		Chinankung	2n=28, Grant ('56).
104	*Strobilanthes* X=8					
	flaccidifolius Nees	3261	8		Kueihu	*
105	GESNELIACEAE 326 (262)					
	Chirita X=9*					
106	*bicornuta* Hay.	3327	18		Kueihu	*
	LABIATAE 342 (254)					
	Ajuga X=7, 8					
107	*pygmaea* A. Gray	4239	16		Yehliu	*
	Clinopodium X=10					
108	*laxiflora* Hay.	3996	20		Yushanchien-shan	*
	Origanum X=8?					
	vulganum Linn.					
109	var. *formosanum* Hay.	3965	16		Yushanchien-shan	2n=30 Gadella & K. ('63).
	Suzukia X=12*					
110	*shikikunensis* Kudo	3332	12		Kueihu	*

Table 2. A List of Collections[3]

Alishan (阿里山)—CHIAYI CO.: 23°32′-120°47′, Alt. 2,230 m.
Sept. 28, 1967—3891, 3895, 3896, 3899, 3907, 3910, 3921, 3930, 3931.
Chihpen (知本)—TAITUNG CO.: 22°42′-121°01′.
July 30, 1967—3370, 3371, 3375, 3383, 3386, 3387, 3389, 3390, 3391, 3399, 3407, 3409, 3413.
Oct. 1, 1967—4033.
Chinankung (指南宮)—TAIPEI CO.: 24°51′-121°24′, Alt. 230 m.
July 11, 1967—3085, 3087, 3101, 3104, 3108.
Chihsingshan (七星山)—TAIPEI CO.: 25°10′-121°33′, collected from elevation of about 700 m to mountain top Alt. 1, 113 m.
July 15, 1967—3152, 3153, 3166, 3172, 3173, 3189, 3191, 3193, 3198, 3199, 3202, 3205, 3207, 3214, 3216.
Chutzuhu (竹子湖)—TAIPEI CO.: 22°12′-121°34′, collected from elevation of about 600 m.
July 15, 1967—3221, 3222, 3223, 3224, 3227, 3228, 3229, 3230.
Chusuipo (出水坡): TAITUNG CO.: 22°23′-120°49′, collected from elevation of about 400 m to 550 m.
Jy'y 31, 1967—3433, 3435, 3447.
Huoshaochang (火燒場)—TAIPEI CO.: 24°55′-121°35′, collected from elevation of about 200 m.
Aug. 5, 1967—3482.
Fengkang (楓港)—PINGTUNG CO.: 22°12′-120°41′.
Oct. 2, 1967—4091.
Kenting (墾丁)—PINGTUNG CO.: 21°57′-120°47′.
Oct. 3, 1967—4104.
Oct. 5, 1967—4196, 4202, 4207, 4210.
Kueihu (龜湖)—TAITUNG CO.: ca. 22°46-120°53′, collected from elevation of about 1,600 m to 2,000 m.
July 27, 1967—3261, 3268, 3282, 3289, 3293.
July 28, 1967—3312, 3318, 3320, 3325, 3327.
July 29, 1967—3332, 3333, 3335, 3337, 3339, 3342, 3344, 3345, 3353, 3355, 3359.
July 30, 1967—3367.
Lanshan (嵐山)—HUALIEN CO.: ca. 23°55′121°26′, collected from elevation of about 1,800 m to 2,100 m.
Aug. 18, 1967—3687.
Shiting (石碇)—TAIPEI CO.: 25°00′-121°39′, collected from elevation of about 400 m.
July 22, 1967—3255.
Sun-moon Lake (日月潭)—NANTOU CO.: 23°52′-120°50′, collected from elevation of about 600 m.
March 20, 1967—4286 (Kao 7154)
Taipei (臺北)—TAIPEI CITY: 25°03′-121°-31′, collected from University Campus, NTU.
June 7, 1967—3051, 3071.
Sept. 20, 1967—3885.
Feb. 14, 1968—4246.
March 7, 1968—4285.
March 11, 1968—4289, 4292, 4293, 4296.
Tanshui (淡水)—TAIPEI CO.: 25°11′-121°26′, collected from opposite side, across the Tanshui River.
Apr. 9, 1968—4368, 4380.
Tawu (大武)—TAITUNG CO.: 22°22′-120°54′, collected from coastal region.
Oct. 2, 1967—4053, 4061, 4064, 4065, 4066, 4073, 4076, 4085, 4087.
Tungpu (東埔)—NANTOU CO.: 23°32′-120°53′, collected from elevation of about 2,500 m.
Sept. 30, 1967—4008, 4019.
Wulai (烏來)—TAIPEI CO.: 24°52′-121°33′, Alt. 145 m.
Aug. 13, 1967—3485.
Yangmingshan (陽明山)—TAIPEI CO.: 25°09′-121°42′, collected from elevation of about 400 m.
June 17, 1967—3143.

Yehliu (野柳)—TAIPEI CO.: 25°13′-121°42′, collected from coastal region.
Sept. 10, 1967—3877, 3881.
Feb. 13, 1968—4238, 4239, 4241, 4243.
Yinhotung (銀河洞)—TAIPEI CO.: ca. 24°57′-121°36′, collected from elevation of about 100 m.
March 16, 1968—4299, 4304, 4306, 4307, 4309, 4313, 4316, 4317, 4321.
Yushanchienhan (玉山前山)—CHIAYI CO.: 23°28′-120°54′, Alt. 3,242 m., collected from elevation of about 3,000 to 3,200 m.
Sept. 29, 1967—3964, 3965, 3969, 3996, 4003, 4018.
Nov. 21, 1967—4230.

(3) All collections have been fixed in the field by the auther, except no. 4286 which was collected at Sun-moon Lake by Mr. M. T. Kao.

SUMMARY

1. This is a second a study on the chromosome counts on the vascular plants of Taiwan. The cytological studies of 112 taxa belonging to 93 genera and 55 families are recorded in this paper.
2. Of these chromosome observations, a total of 68 taxa are presented here for the first time and not found in previous records.
3. An effort has been made to study the plants from mountainous as well as coastal areas of Taiwan. But there still is a large gap in our knowledge when it comes to the total flora of Taiwan.
4. The basic chromosome number of the following genera is proposed to be:

Alysicarpus (Papilionaceae)	X=10.
Pileostegia (Hydrangeaceae)	X=18.
Schefflera (Araliaceae)	X=12.
Kleinhova (Sterculiaceae)	X=12.
Securinega (Euphorbiaceae)	X=12.
Tripterygium (Celastraceae)	X=12.
Maesa (Myrsinaceae)	X= 6.
Turpinia (Staphyleaceae)	X=11.
Ecdysanthera (Apocynaceaea)	X=10.
Sarcandra	X=15.
Deeringia (Amaranthaceae)	X=10.
Rotala (Lythraceae)	X= 8.
Halorrhagis (Halorrhagidaceae)	X= 6.
Crawfurdia (Gentianaceae)	X=10.
Lysimachia (Primulaceae)	X=10.
Mitella (Saxifragaceae)	X= 7.
Mazus (Scrophulariaceae)	X=12.
Strobilanthes (Acanthaceae)	X= 8.
Chirita (Gesneliaceae)	X= 9.
Suzukia (Labiatae)	X=12.

5. One of the largest families, the Compsitae, and the monocotyledons are excluded from this report. They will be presented in the coming series of papers.

ACKNOWLEDGEMENTS

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Explanation of Plate Figures

Plate I

Fig. 1. *Persea zuihoensis* (Hay.) Li, early diakinesis with 12 bivalents.
Fig. 2. *Duchesnea chrysantha* Miq., somatic anaphase showing 28: 28 distribution of chromosomes.
Fig. 3. *Rubus calycinoides* Hay. var. *macrophyllus* Li, somatic anaphase showing 14: 14 distribution of chromosomes.
Fig. 4. *Rubus morii* Hay., diakinesis with 14 bivalents.
Fig. 5. *Alysicarpus nummularifolius* (L.) DC., diakinesis with 10 bivalents.
Fig. 6. *Canavalia lineata* (Thunb.) DC., diakinesis with 22 bivalents.
Fig. 7. *Crotalaria incana* Linn., early diakinesis with 7 bivalents.
Fig. 8. *Indigofera hirsuta* Linn., anaphase I showing 8: 8 distribution of bivalents.
Fig. 9. *Hydrangea chinensis* Maxim., early metaphase I with 18 bivalents.
Fig. 10. *Pileostegia viburnoides* Hook. et Thom., anaphase I showing 18: 18 distribution of bivalents.
Fig. 11. *Schefflera arboricola* Hay., anaphase I showing 12: 12 distribution of bivalents.
Fig. 12. *Sambucus chinensis* Lindle, somatic anaphase showing 36: 36 distribution of chromosomes
Fig. 13. *Viburnum luzonicum* Rolfe, diakinesis with 16 bivalents.
Fig. 14. *Ficus beecheyana* Hook. et Arn., diakinesis with 13 bivalents.
Fig. 15. *Boehmeria densiflora* Hook. et Arn., early metaphase I with 28 bivalents.
Fig. 16. *Pellionia trilobulata* Hay., somatic early metaphase with 16 chromosomes.
Fig. 17. *Viola confusa* Champ., early metaphase I with 13 bivalents.
Fig. 18. *Viola formosana* Hay., somatic early metaphase with 26 chromosomes.
Fig. 19. *Viola nagasawai* Mak. et Hay., somatic early metaphase with 18 chromosomes.
Fig. 20. *Viola verecunda* Gray, diakinesis with 12 bivalents.
Fig. 21. *Passiflora suberosa* Linn., diakinesis with 9 bivalents.
Fig. 22. *Melothria heterophylla* (Lour.) Cogn., anaphase I showing 11: 11 distribution of bivalents.
Fig. 23. *Carica papaya* Linn., diakinesis with 9 bivalents.
Fig. 24. *Kleinhovia hospita* Linn., diakinesis with 12 bivalents.
Fig. 25. *Hibiscus syriacus* Linn., early metaphase I with 20 bivalents.
Fig. 26. *Hibiscus tiliaceus* Linn., diakinesis with 20 bivalents.
Fig. 27. *Sida rhombifolia* Linn. var. *longipedicellata* Mori, early diakinesis with 7 bivalents.
Fig. 28. *Acalypha australis* Linn., diakinesis with 7 bivalents.
Fig. 29. *Securinega virosa* (Roxb.) Pax et Hoffm., diakinesis with 24 bivalents.
Fig. 30. *Eurya glaberrima* Hay., diakinesis with 21 bivalents.
Fig. 31. *Rhododendron nakaharai* Hay., somatic early metaphase with 26 chromosomes.
Fig. 32. *Hypericum nagasawai* Hay., diakinesis with 18 bivalents.
Fig. 33. *Calophyllum inophyllus* Linn., diakinesis with 16 bivalents.
Fig. 34. *Tripterygium wildfordii* Hook.f., somtaphase with 24 charomosomes.
Fig. 35. *Ampelopsis brevipedunculata* (Maxim.) Traut. var. *hancei* (Planch.) Li, somatic late metaphase with 40 chromosomes.
Fig. 36. *Maesa japonica* Mor. et Zoll., somatic mataphase with 24 chromosomes.
Fig. 37. *Evodia confusa* Merr., anaphase I showing 12: 12 distribution of bivalents.
Fig. 38. *Turpinia formosana* Nakai, diakinesis with 11 bivalents.

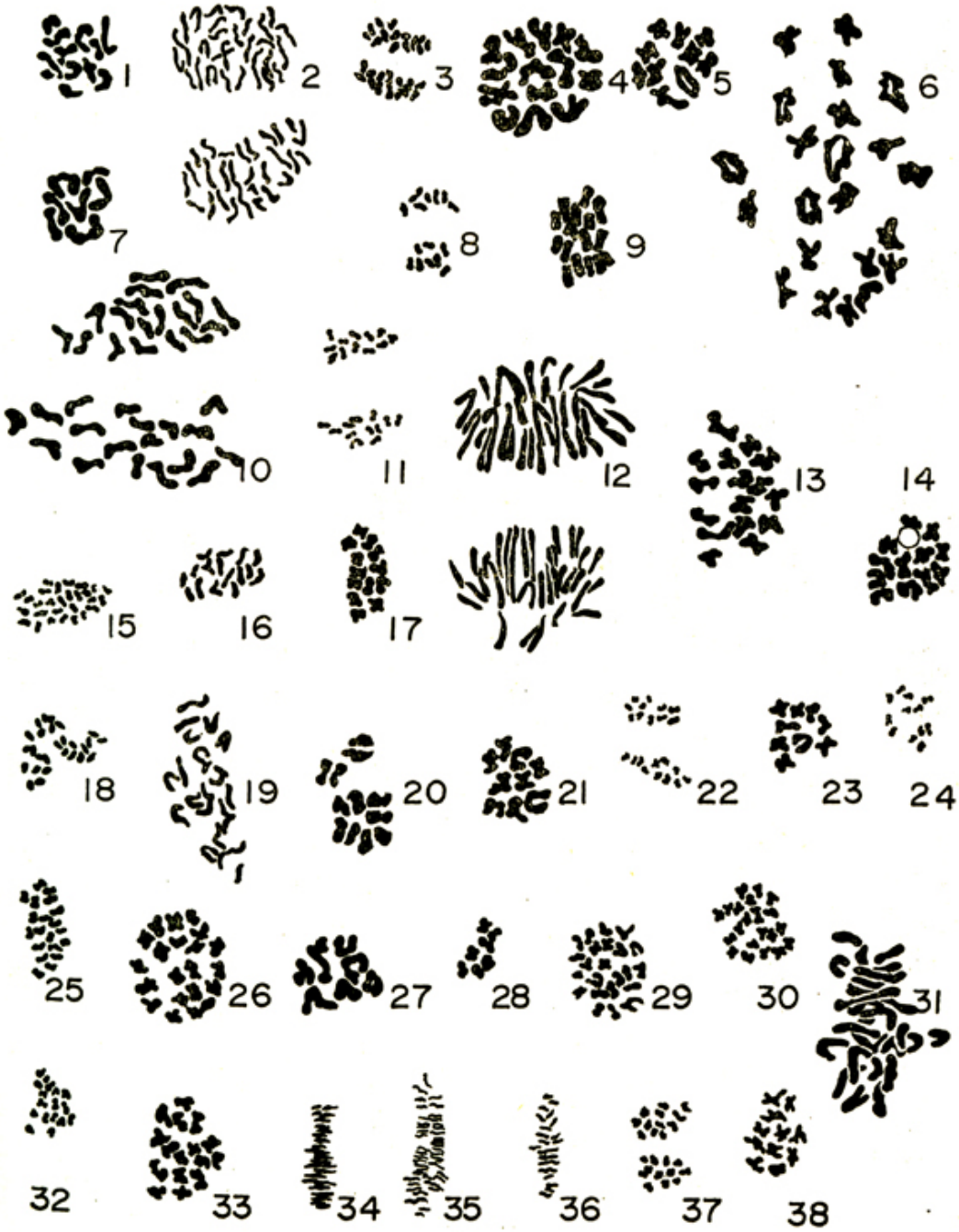
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Plate I

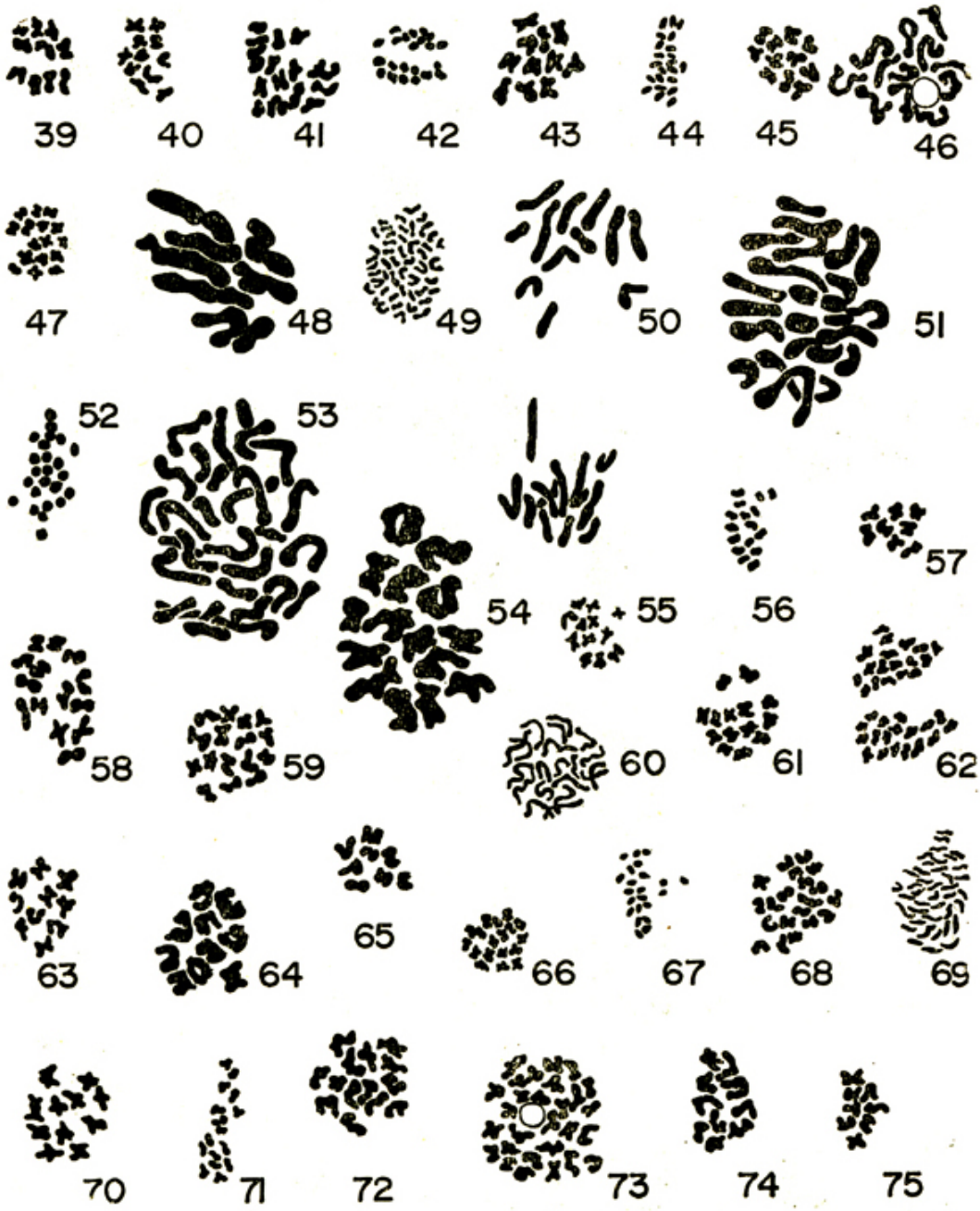
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Plate II

Explanation of Plate Figures

Plate II

Fig. 39. *Ecdysanthera rosea* Hook. et Arn., diakinesis with 10 bivalents.
Fig. 40. *Galium rotundifolium* Linn., diakinesis with 11 bivalents.
Fig. 41. *Hedyotis uncinella* Hook. et Arn., diakinesis with 18 bivalents.
Fig. 42. *Mussaenda pubescens* Ait.f., anaphase I showing 11: 11 distribution of bivalents.
Fig. 43. *Psychotria rubra* (Lour.) Poir., diakinesis with 11 bivalents.
Fig. 44. *Psychtria serpens* Linn., somatic metaphase with 22 chromosomes.
Fig. 45. *Rubia cordifolia* Linn., diakinesis with 11 bivalents.
Fig. 46. *Clerodendron crytophyllum* Turcz., early diakinesis with 12 bivalents.
Fig. 47. *Vitex rotundifolia* Linn.f., diakinesis with 16 bivalents.
Fig. 48. *Clematis formosana* O. Ktze., early diakinesis with 8 bivalents.
Fig. 49. *Ranunculus cantoniensis* DC., diakinesis with 48 bivalents.
Fig. 50. *Heterotropa hayatana* F. Maek., somatic anaphase showing 12: 12 distribution of chromosomes.
Fig. 51. *Heterotropa infrapurpura* F. Maek., somatic early metaphase with 24 chromosomes.
Fig. 52. *Houttuynia cordata* Thunb., somatic mataphase with 24 chromosomes.
Fig. 53. *Sarcandra glabra* (Thunb.) Nakai, somatic early mataphase with 30 chromosomes.
Fig. 54. *Chloranthus oldhamii* Maxim., diakinesis with 15 bivalents.
Fig. 55. *Arabis morrisonensis* Hay., diakinesis with 12 bivalents.
Fig. 56. *Capsella bursa-pastoris* Medik., mataphase I with 16 bivalents.
Fig. 57. *Cardamine parviflora* Linn., diakinesis with 8 bivalents.
Fig. 58. *Eutrema wasabi* Maxim., diakinesis with 14 bivalents.
Fig. 59. *Rorippa indica* Hiern., diakinesis with 16 bivalents.
Fig. 60. *Arenaria subpilosum* Ohwi, diplonema with 20 thread-like bivalents.
Fig. 61. *Dianthus pygmaeus* Hay., diakinesis with 15 bivalents.
Fig. 62. *Drymaria cordata* Willd., anaphase I showing 18: 18 distribution of bivalents.
Fig. 63. *Stellaria arisanensis* Hay., diakinesis with 10 bivalents.
Fig. 64. *Stellaria aquatica* Scop., diakinesis with 10 bivalents.
Fig. 65. *Tetragonia tetragonoides* (Pall.) O. K., diakinesis with 8 bivalents.
Fig. 66. *Portulaca pilosa* Linn., diakinesis with 18 bivalents.
Fig. 67. *Polygonum chinense* Linn., somatic metaphase with 22 chromosomes.
Fig. 68. *Polygonum thunbergii* S. et Z., diakinesis with 20 bivalents.
Fig. 69. *Polygonum thunbergii* S. et Z., somatic early metaphase with 40 chromosomes.
Fig. 70. *Polygonum runcinatum* Buch-Hamilt. ex D. Don, diakinesis with 11 bivalents.
Fig. 71. *Chenopodium ambrosioides* Linn., metaphase I with 16 bivalents.
Fig. 72. *Achyranthus obtusifolia* Lamk., diakinesis with 14 bivalents.
Fig. 73. *Achyranthus ogatai* Yamamoto, diakinesis with 28 bivalents.
Fig. 74. *Deeringia polysperma* (Roxb.) Miq., diakinesis with 10 bivalents.
Fig. 75. *Rotala rotundifolia* Koehne, diakinesis with 8 bivalents.

Explanation of Plate Figures

Plate III

Fig. 76. *Epilobium roseum* Schreb., diakinesis with 18 bivalents.
Fig. 77. *Halorrhagis micrantha* R. Br., diakinesis with 6 bivalents.
Fig. 78. *Crawfurdia japonica* S. et Z., diakinesis with 10 bivalents.
Fig. 79. *Crawfurdia lanceolata* Hay., diakinesis with 10 bivalents.
Fig. 80. *Gentiana formosana* Hay., diakinesis with 13 bivalents.
Fig. 81. *Gentiana scabrida* Hay., somatic anaphase showing 44: 44 distribution of chromosomes.
Fig. 82. *Swertia randaiensis* Hay., diakinesis with 20 bivalents.
Fig. 83. *Androsace umbellata* Merr., diakinesis with 9 bivalents.
Fig. 84. *Lysimachia mauritiana* Lamk., somatic early metaphase with 20 chromosomes.
Fig. 85. *Plantago formosana* Tateishi et Mas., somatic early metaphase with 12 chromosomes.
Fig. 86. *Mitella japonica* Miq., var. *formosana* Hay., diakinesis with 7 bivalents.
Fig. 87. *Centella asiatica* (L.) Urban, somatic anaphase showing 18: 18 distribution of chromosomes.
Fig. 88. *Hydrocotyle dichondroides* Makino, mataphase I with 12 bivalents.
Fig. 89. *Hydrocotyle sibthorpoides* Lamk., diakinesis with 12 bivalents.
Fig. 90. *Oenanthe javanica* (Bl.) DC., diakinesis with 11 bivalents.
Fig. 91. *Adenophora morrisonensis* Hay., diakinesis with 17 bivalents.
Fig. 92. *Wahlenbergia gracilis* Schrad, diakinesis with 18 bivalents.
Fig. 93. *Scaevola sericea* Vahil, early metaphase I with 16 bivalents.
Fig. 94. *Solanum lysimachioides* Wall, somatic metaphase with 24 chromosomes.
Fig. 95. *Solanum nigrum* Linn., diakinesis with 12 bivalents.
Fig. 96. *Solanum torvum* Sw., diakinesis with 12 bivalents.
Fig. 97. *Solanum xanthocarpus* Schrad et Wendl., diakinesis with 12 bivalents.
Fig. 98. *Impomoea congesta* R. Br., diplonema with 15 bivalents.
Fig. 99. *Digitaris purpurea* Linn., diakinesis with 28 bivalents.
Fig. 100. *Mazus fauriei* Bon, somatic early metaphase with 24 chromosomes.
Fig. 101. *Mazus pumilus* van Steenis, somatic metaphase with 24 chromosomes.
Fig. 102. *Torenia concolor* Lindl. var. *formosana* Yamazaki, somatic metaphase with 16 chromosomes.
Fig. 103. *Veronica undulata* Wall., diakinesis with 16 bivalents.
Fig. 104. *Justicia procumbens* Linn., diakinesis with 28 bivalents.
Fig. 105. *Strobilantheo flaccidifolius* Nees, diakinesis with 8 bivalents.
Fig. 106. *Chirita bicornuta* Hay., diakinesis with 18 bivalents.
Fig. 107. *Ajuga pygmaea* A. Gray, early metaphase I with 16 bivalents.
Fig. 108. *Clinopodium laxiflora* Hay., diakinesis with 20 bivalents.
Fig. 109. *Origanum vulganum* Linn. var. *formosanum* Hay., diakinesis with 16 bivalents.
Fig. 110. *Susukia shikikunensis* Kudo, diakinesis with 12 bivalents.


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Plate III