

## Distribution of sex forms in the phanerogamic flora

by

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The question of sex determination is one that has received much attention with the increase of researches along breeding and cytological lines. With the discovery of sex chromosomes in insects and other animal forms the theory of the alternative inheritance of sex in dioecious forms has been almost universally accepted by animal and plant breeders. The wide distribution of dioecism in the animal kingdom is more or less in harmony with such an interpretation. In the plant kingdom, particularly in the phanerogamic flora, hermaphroditism is by far the most common, yet the number of other sex forms is not negligible. The increasing interest in the problems of sex in the higher plants has called for a closer examination of other than hermaphroditic forms. These problems have great economic significance in connection with the production of seedless fruits. The seedless fruit whether parthenocarpic or requiring pollination for its production is to be interpreted as showing a grade of femaleness differing from the fruit which contains seed. The self-incompatibilities which play such an important rôle in fruit setting in pears and many other food plants will also doubtless be found to be the expressions of grades of strength or weakness in one or the other sex. This study was undertaken with the view of ascertaining the relative proportions in which such sex forms occur. For this purpose Engler and Prantls „Natürliche Pflanzenfamilien“ with all the Nachträge (which are complete up to 1912) have been used. The lists that follow are the results of this examination. The lists have been made by genera and species. Obviously these lists are by no means complete. Recent researches have discovered sex forms not noted in the systematic

descriptions in Engler and Prantl, to which we have for the present limited ourselves. This work in the main is in the nature of a statistical study and the biologic factors for sex distribution have not been examined. A continuation study of individual families is planned with a view of determining the relation of sex form distribution and environment. It is hoped that the lists will prove useful to investigators interested in questions of sex and will stimulate a more intensive study of the sex characters of the species of seed plants.

That dioecism is obligate in the animal kingdom has been recently questioned notably as a result of the work of Goldschmidt (1916a), Banta (1916, 1918), Riddle (1917), and others. The appearance of sex intergradations measured in terms of intergrading secondary as well as primary sex characters has been described in insects, crustaceans, and in doves and pigeons. This intergradation of the characters of both sexes, which characters are believed to be so intimately associated with sex determiners, has called for a revision or perhaps an amplification of the conception of alternative inheritance in dioecious forms. In marked contrast with the conditions in plants, sex intergradation in animals is sometimes associated with varying degrees of sterility.

Sex intergradation in plants, as has already been pointed out (Yampolsky 1919, 1920), is a condition that has long been known though not recognized by that name. Pistillody of stamens, staminody of pistils, the occurrence of unisexual flowers in individuals otherwise hermaphrodite and the reverse, are well known in botanical literature. It is particularly striking that such changes in form and function are not necessarily associated with sterility as seems to be the case in the animal forms which show sex intergradation, though in staminody and pistillody we have abundant illustrations of intersex phenomena involving more or less complete sterility of the particular organ though not necessarily of the flower or the individual plant.

Even if we disregard the above phenomena and relegate them to the realm of abnormalities and monstrosities and turn to the terminology used by systematic workers in describing the various sex forms, we find a bewildering array of combinations of the sexes, hermaphrodite, monoecious, polygamous, andromonoecious, gynomonoecious, dioecious etc., etc. The multiplicity of sex forms brings out strikingly the degree of sex intergradation that exists in the plant kingdom, obviously as a normal condition. The significance of these sex forms may be debatable but their existence, nevertheless, is recognized. Are they to be interpreted

as transition forms from hermaphroditism towards dioecism or do they also show tendencies to a return to hermaphroditism? Perhaps they merely indicate that sex like any other characters such as shape of leaf, habit of plant, color etc. is a highly variable condition. While it is true that genera and even species may include diverging lines of descent differing in the sex combinations they show, it must be remembered, that close observation of individual forms and their behavior in inheritance brings out the fact that gradations in sex within a race or line pass through a wealth of „Zwischenstufen“ (Yampolsky l. c.).

We have not only grades of sex differentiation based on visible anatomical differences but recent studies of cross and self fertility and sterility have shown abundant instances of functional sex intergradation. The evidence that functional dioecism exists and that it is an adaptation to secure cross pollination has its strongest exponent in Darwin. Jost, Correns, East, Stout and Tischler have brought out in their researches not only that there is functional dioecism, but one can further conclude from their results (varying degrees of self and cross fertility and sterility within a species) that there is functional sex intergradation. An hermaphroditic plant that is partially self-fertile and more strongly cross-fertile is functionally a polygamous plant. An hermaphrodite that is partially self-fertile and for the rest functionally male is an andromonoecious plant. Without for the present enumerating the many possible combinations it is obvious that we may have as many physiologically intergrading conditions of sex as there are morphologically intergrading sexes.

As noted the data presented in this paper have been obtained by a systematic survey of the phanerogamic flora of the world as listed in Engler and Prantls „Natürliche Pflanzenfamilien“. The names of the genera together with the numbers of species reported, were separately listed under the sex forms given by the authors. When the lists were completed they were separated according to the various sex characteristics shown by them. The families were then arranged in the order given in Engler and Gilg's „Syllabus der Pflanzenfamilien“. The hermaphroditic forms, however, have been listed by us only under the families together with the total number of genera and species. In the Sapindaceae where so very many monoecious genera occur we have also given only the total number of genera and species.

Table 1.

	Monocotyledons		Dicotyledons	
	Gen.	Sp.	Gen.	Sp.
Hermaphrodite . . . . .	1389	18373	6017	68840
Monoecious . . . . .	264	2516	469	3815
Andromonoecious . . . . .	84	1547	44	486
Gynomonoecious . . . . .	3	24	422	3424
Polygamous . . . . .	28	167	136	1132
Dioecious . . . . .	79	652	581	4093
Androdioecious . . . . .	—	—	1	10
Gynodioecious . . . . .	—	—	5	97
Polygamodioecious . . . . .	2	20	47	629
Hermaph. + mon. . . . .	2	7	62	1566
" + andromon. . . . .	7	130	4	32
" + gynomon. . . . .	3	26	36	2811
" + polygamous . . . . .	1	4	68	2295
" + dioecious . . . . .	—	—	20	758
" + androdi. . . . .	—	—	3	27
" + polydi. . . . .	—	—	23	723
" + trioecious . . . . .	—	—	1	1
Mon. + andromon. . . . .	2	18	—	—
" + gynomon. . . . .	—	—	3	36
" + polygam. . . . .	3	8	8	179
" + dioecious . . . . .	20	1155	122	3253
Androm. + androdi. . . . .	—	—	1	1
Gynomon. + polygam. . . . .	—	—	2	8
" + gynodi. . . . .	—	—	3	52
Polygam. + polydi. . . . .	—	—	5	115
Dioec. + polygam. . . . .	8	441	20	414
" + gynodi. . . . .	—	—	4	112
" + polygamodi. . . . .	—	—	10	108
Hermaphr., mon., polygam. . . . .	—	—	9	138
" " dioec. . . . .	1	15	2	284
" " polygamodi. . . . .	—	—	2	11
" andromon., polygam. . . . .	—	—	2	42
" " androdi. . . . .	—	—	4	10
" polygam., dioec. . . . .	—	—	10	329
" " polygamodi. . . . .	—	—	4	135
" dioec., gynodi. . . . .	—	—	1	6
Mon., polygam., polygamodi. . . . .	—	—	1	25
" dioec., polygam. . . . .	—	—	5	50
Andromon., androdi., dioec. . . . .	—	—	2	121
Dioec., polygamodi., hermaph. . . . .	—	—	1	40
Hermaph., mon., polygam., dioec. . . . .	2	41	2	23
Mon., polygam., dioec., polygamodi. . . . .	—	—	1	120
Gynomon., gynodi., andromon., androdi. . . . .	—	—	1	1
Total	1898	25145	8215	96347

Table 1a  
Percent of Total Genera and Species

	Monocotyledons		Dicotyledons	
	Gen.	Sp.	Gen.	Sp.
Hermaphrodite . . . . .	74	73	73	71
Monoecious . . . . .	14	10	07	04
Polygamous . . . . . (including andro + gynomonoecious)	06	07	08	07
Dioecious . . . . .	04	03	06	04
Polyoecious . . . . .	02	07	06	14

Glossary of terms used in this paper:

- Hermaphrodite — male and female elements in same flower
- Monoecious — " " " flowers distinct, but in same plant
- Andromonoecious — plant with hermaphrodite and male flowers
- Gynomonoecious — " " " " female " "
- Polygamous — " " " , male and female flowers  
in same plant
- Dioecious — male and female flowers in separate plants
- Androdioecious — group of plants containing hermaphrodite and male  
individuals
- Gynodioecious — group of plants containing hermaphrodite and  
female individuals
- Polygamodioecious — plants of different sex, male and female, where one  
or the other or both have a few flowers of the  
opposite sex or hermaphrodite flowers or both
- Trioecious — group of plants containing, male, female and hermaphrodite  
individuals
- Polyoecious — group of plants containing two or more sex forms
- Proterandrous — anthers dehisce before stigmas are receptive
- Proterogynous — stigmas are receptive before anthers dehisce
- Self-fertile — plants whose pollen fertilizes its own eggs
- " sterile — " " " and eggs are not capable of  
self fertilization but are capable of uniting with  
eggs and pollen of other plants

Before discussing in detail the charts appended, we may consider the more general tables which have been derived from them. In Table 1 have been listed the total number of genera and species occurring for

each of the 43 classes of sex combinations described for single genera and species of phanerogamic plants and which are recorded in the charts. From Table 1a can be seen that somewhat less than 75 per cent of the forms among the monocotyledons and dicotyledons are listed as being strictly hermaphrodite. The remaining sex combinations have been divided into four groups. Among approximately one-fourth of the genera of the phanerogamic flora manifold sex combinations occur. If among the monocotyledons we total all the species that show monoecism of some kind but no dioecism, we find that they include 24 per cent of the 27 per cent which show sex forms other than pure hermaphrodites. In contrast, among the dicotyledons, there are only 18 per cent of such monoecious forms among a total of 29 per cent which are other than hermaphroditic. Of the remaining 11 per cent 7 per cent show dioecism in some form or other, not combined with monoecism, so that we may say that dioecism is more prevalent among the dicotyledons, while monoecism is more prevalent among the monocotyledons.

In Table 2 the number of genera and species making up the different orders have been listed under five different categories, hermaphroditic, monoecious, dioecious, polygamous, including andro- and gynomonocious, and polyoecious (including the remaining groups given in the charts).

Table 2

<i>Monocotyledons</i>	No. families	Hermaphrodite		Monoecious		Polygamous		Polyoecious		Dioecious		Total	
		Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.
Pandanales . . .	3	—	—	2	24	—	—	2	219	1	1	5	244
Helobiae . . .	7	20	143	6	69	5	8	10	19	12	37	53	276
Triuridales . . .	1	—	—	1	1	—	—	2	41	1	3	4	45
Glumiflorae . . .	2	277	3347	44	*294*	87	*1602*	14	*962*	11	23	433	6228
Principes . . .	1	20	107	105	686	6	19	9	*250*	20	*133*	160	1195
Synanthae . . .	1	—	—	6	43	—	—	—	—	—	—	6	43
Spathiflorae . . .	2	28	774	81	*810*	4	23	3	73	—	—	116	1680
Farinosae . . .	13	113	*899*	15	563	3	22	5	72	19	*179*	155	1735
Liliiflorae . . .	9	385	*4141*	1	1	7	25	3	203	15	*276*	411	4646
Scitamineae . . .	4	83	918	2	24	1	1	—	—	—	—	86	943
Microspermae . . .	2	463	*8045*	1	1	2	33	3	26	—	—	469	8110

(Cont. p. 7)

Table 2 cont.

<i>Dicotyledons</i>	No. families	Hermaphrodite		Monoecious		Polygamous		Polyoecious		Dioecious		Total	
		Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.
Verticillataeae	1	—	—	1	25	—	—	—	—	—	—	1	25
Piperales	4	11	804	2	8	—	—	4	126	2	4	19	942
Salicales	1	—	—	—	—	—	—	—	—	2	178	2	178
Garryales	1	—	—	—	—	—	—	—	—	1	13	1	13
Myricales	1	—	—	—	—	—	—	1	50	2	5	3	55
Balanopsidales	1	—	—	—	—	—	—	—	—	2	8	2	8
Leitneriales	1	—	—	—	—	—	—	—	—	1	1	1	1
Juglandales	1	—	—	6	33	—	—	—	—	—	—	6	33
Batidales	1	—	—	—	—	—	—	—	—	1	1	1	1
Julianiales	1	—	—	—	—	—	—	—	—	2	5	2	5
Fagales	2	—	—	7	279	—	—	4	146	—	—	11	425
Urticales	3	—	—	40	297	—	—	39	1038	48	202	127	1537
Proteales	1	50	818	1	2	2	2	2	6	1	65	56	893
Santales	8	47	488	16	133	—	—	19	407	14	94	96	1122
Aristolochiales	3	10	213	—	—	—	—	3	9	5	20	18	242
Polygonales	1	21	223	1	1	1	15	7	417	4	34	34	690
Centrospermae	9	247	3178	17	52	32	191	16	308	5	10	317	3739
Ranales	18	175	2272	19	105	12	22	28	794	125	896*	359	4089
Rhoecadales	6	319	2986	—	—	1	1	4	72	3	4	327	3063
Sarraceniales	3	9	105	—	—	—	—	—	—	1	58	10	163
Rosales	17	781	4711	7*	18*	15	186	26*	1175*	18	152	847	6242
Pandales	1	—	—	—	—	—	—	—	—	1	1	1	1
Geraniales	20	270*	3974*	119*	953*	16	106	79	2570	118*	505*	602	8108
Sapindales	22	99	698	141*	1030*	22	223	45*	583*	44	311	351	2845
Rhamnales	2	45	418	—	—	6	94	11	450	—	—	62	962
Malvales	8	169	1967	12	159	—	—	6	72	10	13	197	2211
Parietales	29	197	2394	11	415	9	109	44	782	48	250	309	3950
Opuntiales	1	22	1500	—	—	—	—	—	—	—	—	22	1500
Myrtiflorae	19	399*	7298*	—	—	13	158	14	328	8	39	434	7823
Umbelliflorae	3	261	2014	2	27	48*	530*	17	136	11	24	339	2731
Ericales	6	122	1737	—	—	—	—	—	—	—	—	122	1737
Primulales	3	52	894	—	—	—	—	8	430	5	56	65	1380
Plumbaginales	1	10	283	—	—	—	—	—	—	—	—	10	283
Ebenales	4	48	661	1	5	3	8	7	43	6*	247*	60	964
Contortae	5	543	4044	—	—	—	—	9	211	—	—	552	4255
Tubiflorae	20	1240*	13436*	1	1	3	21	7	144	12	165	1263	13767
Plantaginales	1	1	190	1	1	1	1	2	2	1	7	6	201
Rubiales	5	383	5231	3	5	6	21	26*	710*	19	111	437	6018
Cucurbitales	1	1	1	52	207	1	1	11	229	41	198	106	636
Campanulatae	6	490	6302	9	59	411*	3353*	51	3324	19	416	980	13454

Here again it is apparent that hermaphroditism is very wide-spread. There are only few orders, with small numbers of families of few forms, which have no representatives in the hermaphroditic group. In both monocotyledons and dicotyledons about 70 per cent of the orders have representatives in the hermaphroditic group. If we now turn to the dioecious forms we find their occurrence as widespread as that of the hermaphrodites, though in smaller numbers. Thirty-one of the 40 orders (77 per cent) of the dicotyledons have dioecious forms, 6 of the 11 orders (55 per cent) of the monocotyledons. Monoecism occurs in all the orders of the monocotyledons, while in the dicotyledons it occurs in, about 52 per cent of the orders. Here too, then, it is apparent that monoecism is of wider distribution among the monocotyledons than among the dicotyledons, while the opposite is true of dioecism.

The polygamous forms are more widespread among the monocotyledons than among the dicotyledons, appearing in 73 and 42 per cent of the orders respectively. The same is true of the polyoecious forms which appear in 82 and 68 per cent of the orders respectively. From this it will be seen that different sex forms, as given in this table (excepting the dioecious) are more widely distributed among the monocotyledonous than among the dicotyledonous orders. However, it will be seen from the charts that the variety of combinations of different sex forms is much greater in the dicotyledons than in the monocotyledons.

It seemed of interest to determine, if possible, the relative distribution of the groups of sex forms (given in Table 2) in the evolutionary scheme. In order to do this, the middle value, that is the point below and above which 50 per cent of the forms occur, was determined for each group. Further the first and third quartiles; the points up to which 25 and 75 per cent respectively occur, were determined in order to get an idea of the range of distribution in the various groups. The species were used for this calculation.

The numbers of species in the families are, of course, very unequal. However, for the most part the inequalities are distributed quite uniformly throughout the whole evolutionary line and while we may not, of course, say that hermaphroditism or some other sex form has reached its highest development at any particular point, yet we may say approximately how far along in the evolutionary scale we have to go to find a certain percent of the various sex forms and thus have some sort of a basis of comparison as to the distribution of hermaphroditism, monoecism, etc.



In Table 2 have been indicated in which orders the middle point (•), and the first and third quartile (\*) fall. The rectangles bound the portions in each group below and above which 25 per cent of the forms lie. Below are given, in summary form, the families of monocotyledons and dicotyledons below which  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$  of the forms are found for the various sex groups. Occasionally two families are given when the figure desired fell within the two.

	Monocotyledons	Dicotyledons
Hermaphrodites	$\frac{1}{4}$ Rapataceae, Bromeliaceae (Farinosae)	Cneoraceae, Rutaceae (Geraniales) Melastomaceae, Oenotheraceae (Myrtiflorae)
	$\frac{1}{2}$ Dioscoreaceae, Iridaceae (Liliiflorae)	
	$\frac{3}{4}$ Orchidaceae (Microspermae)	Solanaceae, Scrophulariaceae (Tubiflorae)
Monoecious	$\frac{1}{4}$ Cyperaceae, Palmae (Glumiflorae, Principes)	Platanaceae (Rosales)
	$\frac{1}{2}$ Araceae, Lemnaceae (Spathiflorae)	Callitrichaceae (Geraniales)
	$\frac{3}{4}$ Araceae, Lemnaceae (Spathiflorae)	Hippocastanaceae (Sapindales)
Polygamous	$\frac{1}{4}$ } $\frac{1}{2}$ } $\frac{3}{4}$ }	Araliaceae (Umbelliflorae) Compositae (Campanulatae) Compositae (Campanulatae)
	$\frac{1}{4}$ Gramineae, Cyperaceae (Glumiflorae)	Leguminosae (Rosales)
	$\frac{1}{2}$ Cyperaceae (Glumiflorae)	Anacardiaceae (Sapindales)
Polyoecious	$\frac{3}{4}$ Palmae (Principes)	Valerianaceae (Rubiales)
	$\frac{1}{4}$ Palmae (Principes)	Menispermaceae (Ranales)
	$\frac{1}{2}$ Centrolepidaceae (Farinosae)	Euphorbiaceae (Geraniales)
Dioecious	$\frac{3}{4}$ Haemadoraceae (Liliiflorae)	Symplocaceae (Ebenales)

Several points of interest are apparent from these results. In both the monocotyledons and the dicotyledons the larger percentage of hermaphrodites are distributed among the newer orders, i. e. those nearer the end of the evolutionary series. From this alone, if we consider that the sexes have been developed independently along several lines, we might argue that hermaphroditism is the primitive condition. — these orders are not yet old enough to have developed much beyond hermaphroditism. In the monoecious group the point up to which there are 50 per cent of the species in both monocotyledons and dicotyledons falls approximately at the center of the series of orders and there is a fairly uniform distribution of monoecious forms in both directions from this point. Polygamy is more restricted. In the monocotyledons by far the largest per cent of all polygamous forms are found in one family, the Gramineae. In the dicotyledons half of the total polygamous forms are distributed through the entire series of orders, the other half are included in one

family, the Compositae. It is interesting that in both large classes of flowering plants we have polygamy represented in so pronounced a degree in two families with such large numbers of species. In the Gramineae, the forms are mostly andromonoecious in the Compositae gynomonoecious. The polyoecious group is made up of a heterogeneous combination of sex forms which include, as we have already stated, the other groups and whose presence masks the values given in the table. In the monocotyledons the third quartile occurs in the order next to the one in which the middle point is found, while in the dicotyledons the forms making up the third quartile are distributed through 14 orders, so that 75 per cent is not reached until the Rubiales, almost the end of the series. In the monocotyledons the first 25 per cent of the dioecious forms fall below the order Principes. The middle point is in the Farinosae, almost as far along as the middle point for the hermaphrodites which falls in the next order, the Liliiflorae. The third quarter of the dioecious forms falls in this latter order, so that in the monocotyledons dioecious forms are well represented in old and new orders, although a larger percentage falls in the older orders than in the newer ones. In the dicotyledons the first quartile is in the Centrospermae further down in the scale of evolution than any other group, that is the dicotyledons have comparatively greater numbers of dioecious representatives in the older orders. However they are well represented in the newer orders too, as can be seen by the fact that 75 per cent of the forms are distributed as far along the evolutionary series as the Ebenales.

It is obvious from the foregoing discussion and from the distribution of the figures in Table 2 that the different groups of sex forms are not distributed equally throughout the entire series of orders but that each exhibits certain tendencies. As has been pointed out before, in the case of the hermaphrodites, for example, the large percentage of forms is distributed in the newer orders, in the case of the dioecious types the distribution is more uniform.

Up to the present we have grouped the sex forms under five separate headings. As has been stated before and as is evident from the charts many more categories and combinations have been described. The sex categories listed in the charts have been compiled from the descriptions given by the authors in Engler and Prantl. Two authors may mean different things when they employ the same terms and for this reason it was not always easy to place the species in the proper

sex categories. Students of „Blütenbiologie“ have made many classifications. Darwin (1889), Knuth (1898), Lotsy (1911) and others list the sex categories in more or less detail so that there now exists an extensive list and synonymy.

From the point of view of sex, plants may occur in monomorphic, dimorphic, or polymorphic groups. If we list the monomorphic and dimorphic groups as they have been described we have two distinct groups which we may designate as Groups I and II. If we consider that the forms occurring in these groups may be combined inter-se and between the two groups we can perhaps begin to have some judgment as to how widespread we may expect to find sex combinations in nature.

Group I: Hermaphrodite, monoecious, polygamous, gynomonoeious, andromonoecious.

Group II: Dioecious, gynodioecious, androdioecious, polygamodioecious.  
Combinations inter-se:

Group I:

Hermaphrodite and monoecious,  
Hermaphrodite and polygamous,  
Hermaphrodite and gynomonoeious.  
Hermaphrodite and andromonoecious,  
Monoecious and polygamous,  
Monoecious and gynomonoeious,  
Monoecious and andromonoecious,  
Polygamous and gynomonoeious,  
Polygamous and andromonoecious,  
Gynomonoeious and andromonoecious.

Group II:

Dioecious and gynodioecious,  
Dioecious and androdioecious,  
Dioecious and polygamodioecious,  
Gynodioecious and androdioecious,  
Gynodioecious and polygamodioecious,  
Androdioecious and polygamodioecious.

Combinations between Groups I and II:

Hermaphrodite and dioecious,  
Hermaphrodite and polygamodioecious,  
Monoecious and dioecious,  
Monoecious and gynodioecious,

Monoecious and androdioecious,  
 Monoecious and polygamodioecious,  
 Polygamous and dioecious,  
 Polygamous and gynodioecious.  
 Polygamous and androdioecious,  
 Polygamous and polygamodioecious,  
 Gynomonoecious and dioecious,  
 Gynomonoecious and gynodioecious,  
 Gynomonoecious and androdioecious,  
 Gynomonoecious and polygamodioecious,  
 Andromonoecious and dioecious,  
 Andromonoecious and gynodioecious,  
 Andromonoecious and androdioecious,  
 Andromonoecious and polygamodioecious.

It is not necessary to enumerate further combinations. It will be seen that there are a great many additional possibilities involving larger numbers of combinations of forms. It is interesting to note that a large number of these combinations have been described. More than forty have been listed in Engler and Prantl and will be found recorded in Table 1 and in the charts.

That many different kinds of combinations may occur within a species is well known. Schulz (1892) lists ten distinct types of individuals in *Fraxinus*. Engler in his general discussion of the genus *Saxifraga* lists the following sex forms other than hermaphrodite, that have been described for the different species of *Saxifraga*: gynomonoeocious — *S. stellaris*; polygamous — *S. macrostigma*; monoecious — *S. saginoides*; dioecious — *S. Eschscholtzia*; gynodioecious — *S. oppositifolia*. In cultures of *Mercurialis annua* we have observed male, female, monoecious, gynomonoeocious, polygamous, and andromonoecious plants.

We have thus far examined morphological sex categories and it will be interesting in view of the prevalence of proterandry, proterogyny, self and cross fertility and sterility, as well as partial fertility and sterility to briefly point out the many possibilities of categories based on function when morphologically the plants appear to be normal hermaphrodites. The distribution of these functional intersexes is of great interest. The correlation between functional intersexualism and morphological intersexualism is one that needs further investigation. The question naturally arises whether functional intersexualism precedes in

a given case morphological intersexualism. Functional dioecism has been most widely investigated by Darwin in his studies on pollination and it is his contention that functional dioecism precedes morphological dioecism. Whether a similar contention can be made for functional intersexualism in relation to morphological intersexualism the more recent studies on intersexualism should show. Stout (1916) in his work on *Cichorium*, although he has varying degrees of cross and self-sterility, finds no evidence of morphological degeneracy of floral parts. A question that naturally arises is whether morphological and functional intersexualism are mutually exclusive or are substitutes for each other. Or are they correlated so as to naturally appear together. The work of Correns on *Plantago* and the more recent work of Stout on the same form may throw light on these questions. Functionally morphological hermaphrodites may be divided into the same two groups noted above.

#### Group I:

- |                 |   |
|-----------------|---|
| Hermaphrodite   | — pollen and eggs functional, flowers self-fertile.   |
| Monoecious      | — pollen incapable of fertilizing egg of same flower or egg incapable of being fertilized by pollen of own flower, but flowers own plant cross fertile. |
| Gynomonoecious  | — flowers for the greater part self-fertile, other flowers with egg only functional.  |
| Andromonoecious | — flowers for the greater part self-fertile, other flowers with pollen only functional.   |
| Polygamous      | — flowers for the greater part self-fertile, other flowers function as males or females.  |

#### Group II:

- |                   |  |
|-------------------|--|
| Dioecious         | — plants that are totally self-sterile but cross-fertile.  |
| Gynodioecious     | — self-fertile plants and plants whose pollen is functionless.   |
| Androdioecious    | — self-fertile plants and plants whose eggs are functionless.  |
| Polygamodioecious | — plants functionally dioecious, on the male few flowers functionally hermaphrodite or female, on the female few flowers functionally hermaphrodite or male. |

Group I may be considered as a monomorphic group and group II as a dimorphic group and the same combinations are possible as noted for the sex combinations based on morphological structures.

Up to the present we have limited our discussion to a general survey of hermaphroditism, monoecism, polygamy, dioecism and polyoecism. The charts themselves are intended to give a general survey of the phanerogamic flora listed under the various sex categories and show in greater detail what has been summarized in Table 2. If we piece the charts together beginning with the Pandanales and ending with the Campanulatae we find a number of outstanding features. As noted before we shall not here discuss the ecological and biological characteristics of these orders though any thorough treatment would require this. For the present, however, we shall merely treat them as statistical units.

In the monocotyledons (Chart 1) the largest number of sex forms occur in the beginning of the list and are found in the families that are lower in the scale of evolution. The higher orders show fewer variations in sex, hermaphroditism is very much in evidence. The Orchidaceae at the end of the series, containing the largest number of genera and species, 450 genera and from 6000 to 10000 species, have only 2 genera and 38 species that are reported as polygamous and no other intergrading forms. The Cyperaceae, Gramineae, Palmae, and Araceae show the greatest tendency towards intersexuality having a great diversity of forms.

Chart 2 beginning with the dicotyledons brings out strikingly that in the more primitive families and orders there is a more or less absolute separation of the sexes. This is true for the first twelve orders. The number of individuals comprising the families of these orders is, to be sure, relatively small, the orders, as a rule, contain only one family with few genera and species. The Santalales, with eight families, show twelve different sex forms. In the order Centrospermae the Chenopodiaceae and Polygonaceae have a large number of representatives among the different sex forms. The Ranales (Charts 2 and 3) with 18 families are distributed among fifteen distinct sex categories. In the Rosales (Chart 3) a very large number of hermaphrodites appear and dioecism is not pronounced. The Rosaceae and Leguminosae, besides a large number of hermaphrodites, show the largest number of other sex forms. In this order there are 13 distinct sex categories, the family Rosaceae alone contains ten. The functional grades of intersex are being recognized as of more and more importance in the case of cherries, plums, apples, pears, etc. In the Geraniales (Chart 3) hermaphroditism is almost universal in the first eight families. Then follow the Rutaceae, Simarubaceae, Bur-

seraceae, and the Meliaceae where there is the largest amount of sex variation in the family. Of the remaining families the Euphorbiaceae and the Callitrichaceae have no hermaphroditic forms at all.

The Sapindales (Charts 3 and 4) with 20 families are distributed between 20 different sex categories. This order contains many families that show the various sex combinations. Hermaphroditism is not as prevalent as in the Geraniales. The total number of hermaphrodites is less than the total number of other forms. The Anacardiaceae, Celastraceae, and Icacinaceae show the largest number of different sex forms. The Parietales (Charts 4 and 5) with the largest number of families, 29 have forms other than hermaphrodite distributed in the main in only two families, the Guttiferae and the Flacourtiaceae.

Interpolated between the orders showing more or less variability in the disposition of the sex forms are the Opuntiales (Chart 5) with but a single family of 1500 species all hermaphrodite. In the Myrtiflorae with 19 families (Chart 5) strictly monoecious forms are lacking. Dioecism is only sparingly represented. The various sex forms are distributed rather irregularly throughout the order, with the exception of the Thymeleaceae which show a number of sex forms there is not much intergradation in the single families. There are, however, 15 different categories represented in this order. The Umbelliflorae with 3 families have a large number of forms, ten in all. In contrast are the Ericales, 6 families, in which all the forms are apparently obligate hermaphrodites. The next large order the Tubiflorae (Charts 5 and 6) with 20 families is poor in the number of sex forms. Hermaphroditism is well represented. In only one family, the Gesneriaceae there are monoecious forms. The Labiatae is the only family that is strikingly different from the other families in the number of sex forms.

The Plantaginales and Rubiales following this order contrast strikingly with the preceding forms. In the Rubiales 15 different sex categories occur. The family Rubiaceae of 357 genera and 4700 species of hermaphrodites shows besides 12 other sex categories. The Cucurbitales (Chart 6) are interesting because of the almost total absence of hermaphrodites, which are present in only one genus and one species. The condition here is very much like that in the Euphorbiaceae. This absence of hermaphroditism in an order between the Rubiales strikingly hermaphroditic and the Campanulatae with many hermaphrodites is very noticeable. The Compositae, the newest family shows an interesting display of sex forms, 13 altogether. In contrast to the andromonoecious

forms in the Gramineae there are a very large number of gynomonocious forms in the Compositae.

In order to bring the lists up to date as far as possible the monographs of Englers „Pflanzenreich“ were used. They do not, of course, cover by any means all the orders described in Engler and Prantl. In a number of instances the descriptions of the sex of the plants given in the monographs differ from those given in the „Pflanzenfamilien“. These were added to the lists, with an asterisk before them, so that a genus may be found under two sex categories. The numbers in the lists with asterisks before them are the numbers of the species as they are given in the „Pflanzenreich“. In the charts the numbers of species were not changed, only those forms listed under different categories were recorded (figures enclosed in circles). Thus in Chart 1 the Aponogetonaceae heretofore described as hermaphroditic are not purely hermaphroditic but have one genus with one species each under the category hermaphrodite, monoecious and dioecious. The Alismataceae have two new categories added, the Araceae, Eriocaulaceae, and Zingiberaceae one each. The Erythroxylaceae (Chart 3) which are described as hermaphroditic in Engler and Prantl are characterized in the „Pflanzenreich“ as having besides two genera and eight species that are polygamodioecious. The Euphorbiaceae (Chart 3) have two new categories added. In Chart 5 the Lythraceae characterized in Engler and Prantl as hermaphroditic have two genera and three species placed among the polygamous forms. In the Alangiaceae the one genus is placed in the group hermaphrodite and gynomonocious in the „Pflanzenreich“, while in Engler and Prantl it is placed in the group hermaphrodite and polygamous. The Halorrhagaceae and the Umbelliflorae have two additional categories, the Myrsinaceae one. In the Styracaceae one genus with two species is described as polygamodioecious while in Engler and Prantl the family is described as hermaphroditic. In Chart 6, or the Styliaceae, there is an entirely new category — monoecious and gynodioecious.

It is interesting to note that with additions taken from the „Pflanzenreich“ four families heretofore described as only hermaphroditic have been taken out of that list. The description of new genera and species under different categories brings out in a small measure that it is to be expected that gaps in the charts will in many instances be filled.



It is obvious from the data here presented in the form of tables and charts that our knowledge, in spite of the intensive work that has been done in many directions, is fragmentary. Until there shall be a greater accumulation of data it will be difficult to say with any degree of exactness what the sex tendencies in the flowering plants are. The conclusions arrived at in this paper are of necessity bounded by our data. Our original thesis, namely, an examination of forms other than hermaphroditic has brought out the interesting facts that while hermaphroditism is numerically by species and by genera by far the most common condition, the tendency for sex separation (assuming hermaphroditism as the primitive condition) is present in all the orders and in (63%) of the families. Such an assumption, however, does not preclude the possibility of reversions from sex separation to hermaphroditism. One may, if one wishes, from the tables and charts make out an equally strong case for reversion to hermaphroditism from dioécism. From the charts and from Table 2 it is evident that hermaphroditism with the exception of the narrow gap between the Salicales and Urticales is represented in practically every order. Dioecism, numerically not as great as hermaphroditism, is of even wider distribution. With hermaphroditism and dioecism at the extremes of an evolutionary series we can conceive of development in either direction. Such development may be likened to a chemical mass action. Some change in the balance may shift the action in one or the other direction. We may perhaps express this action in the conventional manner, thus hermaphroditism  $\rightleftharpoons$  dioecism.

It is quite apparent from the charts that no single family contains forms in all the sex categories and that as a rule they do not represent continuous transition stages between hermaphroditism and dioecism. It is hardly conceivable that all the gaps in the charts will be filled. It is true, however, as we have pointed out from the data taken from the „Pflanzenreich“, that sex forms other than those described up to the present will be added so that obligate hermaphroditism, obligate monoecism, or obligate dioecism will become more restricted.

It is believed that a closer examination of species in the field and under experimental conditions, a more thorough investigation of flowers entailing their seasonal behavior will show as has already been shown for very many forms and recently for *Dryas octopetala* (Harms 1918) that sex in plants is a variable condition whose limits are revealed only by a close examination of the forms.

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## Hermaphrodites

Family	Genera	Species	Family	Genera	Species
Potamogetonaceae . . . . .	2	51 about	Cannaceae . . . . .	1	25 about
Aponogetonaceae . . . . .	1	25	Marantaceae . . . . .	26	272 about
Scheuchzeriaceae . . . . .	3	15 about	Burmaniaceae . . . . .	13	45 about
Alismataceae . . . . .	6	32	Orchidaceae . . . . .	450	6000 bis 10 000
Butomaceae . . . . .	5	5	Saururaceae . . . . .	3	4
Hydrocharitaceae . . . . .	31	15—17	Piperaceae . . . . .	6	780
Gramineae . . . . .	239	2219 about	Chloranthaceae . . . . .	1	10
Cyperaceae . . . . .	38	1128 about	Lacistimaceae . . . . .	1	10
Palmae . . . . .	20	107 about	Proteaceae . . . . .	50	818
Araceae . . . . .	28	774 about	Santalaceae . . . . .	12	184
Flagellariaceae . . . . .	2	2—5	Opiliaceae . . . . .	6	16
Centrolepidaceae . . . . .	1	2	Grubbiaceae . . . . .	1	3
Mayacaceae . . . . .	1	7	Olcaceae . . . . .	18	115
Xyridaceae . . . . .	2	48 about	Lorantaceae . . . . .	10	170
Thurniaceae . . . . .	1	2	Aristolochiaceae . . . . .	7	202 about
Rapataceae . . . . .	7	22	Rafflesiaceae . . . . .	1	1
Bromeliaceae . . . . .	60	461 about	Hydnoraceae . . . . .	2	10
Commelinaceae . . . . .	30	323 about	Polygonaceae . . . . .	21	223
Pontederiaceae . . . . .	5	22	Chenopodiaceae . . . . .	33	173
Cyanastraceae . . . . .	1	4	Amarantaceae . . . . .	45	393
Philydraceae . . . . .	3	4	Nyctaginaceae . . . . .	16	84
Juncaceae . . . . .	5	225 about	Phytolaccaceae . . . . .	17	61
Stemonaceae . . . . .	3	8 about	Aizoaceae . . . . .	37	850
Liliaceae . . . . .	216	2223 about	Portulacaceae . . . . .	19	202
Haemodoraceae . . . . .	9	33 about	Basselaceae . . . . .	5	15
Amaryllidaceae . . . . .	84	797 about	Caryophyllaceae . . . . .	75	1400
Velloziaceae . . . . .	2	70 about	Nymphaeaceae . . . . .	8	52 about
Taccaceae . . . . .	2	10	Trochodendraceae . . . . .	2	2
Dioscoraceae . . . . .	4	6	Ranunculaceae . . . . .	30	970
Iridaceae . . . . .	60	772 about	Berberidaceae . . . . .	11	172
Musaceae . . . . .	5	48	Magnoliaceae . . . . .	12	64
Zingiberaceae . . . . .	41	573	Calycanthaceae . . . . .	1	4
			Anonaceae . . . . .	73	718
			Eupomatiaceae . . . . .	1	1
			Gomortegaceae . . . . .	1	1
			Lauraceae . . . . .	31	268
			Hernandiaceae . . . . .	1	12

Family	Genera	Species	Family	Genera	Species
Papaveraceae . . . . .	33	510	Dichapetalaceae . . . . .	2	5
Capparidaceae . . . . .	39	370	Limnanthaceae . . . . .	2	5
Cruciferae . . . . .	242	2100	Anacardiaceae . . . . .	11	47
Tovariaceae . . . . .	1	1 or 2	Cyrillaceae . . . . .	3	5
Resedaceae . . . . .	3	4	Pentaphragaceae . . . . .	1	1
Moringaceae . . . . .	1	1	Corynocarpaceae . . . . .	1	3
Sarracinaceae . . . . .	3	8	Celastraceae . . . . .	32	142
Droseraceae . . . . .	6	97	Hippocrateaceae . . . . .	4	150
Podostemonaceae . . . . .	28	180			about
		about	Stackhousiaceae . . . . .	2	14
Crassulaceae . . . . .	24	500	Staphyleaceae . . . . .	5	21
		about	Icacinaceae . . . . .	30	69
Cephalotaceae . . . . .	1	1	Akaniaceae . . . . .	1	1
Saxifragaceae . . . . .	65	487	Sabiaceae . . . . .	2	2
Pittosporaceae . . . . .	9	105	Meliastaceae . . . . .	3	17
		about	Balsaminaceae . . . . .	2	221
Cunoniaceae . . . . .	16	104	Rhamnaceae . . . . .	43	361
Bruniaceae . . . . .	12	50	Vitaceae . . . . .	2	57
		about	Elaeocarpaceae . . . . .	6	55
Hamamelidaceae . . . . .	12	32	Chlaenaceae . . . . .	7	21
Crossosomataceae . . . . .	1	2	Gonystilaceae . . . . .	1	7
Rosaceae . . . . .	66	1800	Tiliaceae . . . . .	36	385
		about			about
Connaraceae . . . . .	17	250	Malvaceae . . . . .	51	790
					about
rarely monoecious through abortion			Bombacaceae . . . . .	23	113
Leguminosae . . . . .	530	12000			about
		about	Sterculiaceae . . . . .	40	580
Geraniaceae . . . . .	11	500			about
		about	Scytopetalaceae . . . . .	5	16
Oxalidaceae . . . . .	7	250	Dilleniaceae . . . . .	9	173
		about			about
Tropaeolaceae . . . . .	1	50	Eucryphiaceae . . . . .	1	4
Linaceae . . . . .	12	125	Ochnaceae . . . . .	19	200
Humiriaceae . . . . .	2	18			about
Erythroxylaceae . . . . .	2	200	Caryocaraceae . . . . .	2	13
		about	Marcgraviaceae . . . . .	5	39
Zygophyllaceae . . . . .	24	160	Theaceae . . . . .	19	136
		about	Guttiferae . . . . .	18	60
Cneoraceae . . . . .	2	12	Dipterocarpaceae . . . . .	16	313
Rutaceae . . . . .	71	587	Elatinaceae . . . . .	2	30
		about			about
Simarubaceae . . . . .	16	50	Frankeniaceae . . . . .	4	33
Burseraceae . . . . .	3	12	Tamaricaceae . . . . .	4	90—100
Meliaceae . . . . .	38	544	Fouquieriaceae . . . . .	1	3—5
		about	Cistaceae . . . . .	7	157
Malpighiaceae . . . . .	57	675			about
		about	Bixaceae . . . . .	4	19
Trigoniaceae . . . . .	3	29			about
Vochysiaceae . . . . .	5	93	Winteranaceae . . . . .	5	8
Tremandraceae . . . . .	3	23			
Polygalaceae . . . . .	11	651			

Family	Genera	Species	Family	Genera	Species
Violaceae . . . . .	15	297 about	Oleaceae . . . . .	18	281
Flacourtiaceae . . . . .	40	307	Loganiaceae . . . . .	28	128
Malesherbiaceae . . . . .	1	18	Gentianaceae . . . . .	69	700 about
Passifloraceae . . . . .	10	278 about	Apocynaceae . . . . .	150	1085 about
Loasaceae . . . . .	14	202	Asclepiadaceae . . . . .	278	1900 about
Ancistrocladaceae . . . . .	1	8	Convolvulaceae . . . . .	44	453
Cactaceae . . . . .	22 more than	1500 more than	Polemoniaceae . . . . .	10	168
Geissolomaceae . . . . .	1	1	Hydrophyllaceae . . . . .	18	171
Penaeaceae . . . . .	5	22	Borraginaceae . . . . .	88	1700 about
Oliniaceae . . . . .	1	6	Verbenaceae . . . . .	76	733
Thymelaeaceae . . . . .	31	261 about	Labiatae . . . . .	257	2811
Lythraceae . . . . .	25	360	Nolanaceae . . . . .	3	50
Puniaceae . . . . .	1	1	Solanaceae . . . . .	86	1638
Sonneratiaceae . . . . .	2	24	Scrophulariaceae . . . . .	209	1461
Lecythidaceae . . . . .	19	252 about	Bignoniaceae . . . . .	110	733
Rhizophoraceae . . . . .	15	49	Pedaliaceae . . . . .	16	47
Combretaceae . . . . .	12	305	Martyniaceae . . . . .	3	9
Myrtaceae . . . . .	72	2800 about	Orobanchaceae . . . . .	4	4
Melastomaceae . . . . .	170	2780	Gesneriaceae . . . . .	92	1049
Oenotheraceae . . . . .	40	370	Columelliaceae . . . . .	1	2
Halorrhagidaceae . . . . .	4	66	Lentibulariaceae . . . . .	5	250
Hippuridaceae . . . . .	1	1	Globulariaceae . . . . .	3	20
Araliaceae . . . . .	45	260	Acanthaceae . . . . .	299	2050 about
Umbelliferae . . . . .	211	1700 about	Myoporaceae . . . . .	5	86
Cornaceae . . . . .	5	54	Phrymaceae . . . . .	1	1
Clethraceae . . . . .	1	24	Plantaginaceae . . . . .	1	190
Pirolaceae . . . . .	10	30	Rubiaceae . . . . .	351	4700 about
Lennoaceae . . . . .	3	4—5	Caprifoliaceae . . . . .	12	350
Ericaceae . . . . .	79	1363	Adoxaceae . . . . .	1	1
Epacridaceae . . . . .	23	306	Valerianaceae . . . . .	12	100 about
Diapensiaceae . . . . .	6	9	Dipsacaceae . . . . .	7	80
Theophrastaceae . . . . .	4	37	Cucurbitaceae . . . . .	1	1
Myrsinaceae . . . . .	20	357	Campanulaceae . . . . .	60	855 about
Primulaceae . . . . .	28	500	Goodeniaceae . . . . .	13	320
Plumbaginaceae . . . . .	10	283	Brunoniaceae . . . . .	1	1
Sapotaceae . . . . .	32	273	Stylidiaceae . . . . .	3	106
Ebenaceae . . . . .	1	1	Calyceraceae . . . . .	5	20
of questionable relationship with Ebenaceae			or more (possibly andromonoecious)		
Symplocaceae . . . . .	1	283	Compositae . . . . .	408	5000 about
Styracaceae . . . . .	9	104			

## Monoecious

	Species		Species
Typhacéae		* Carex . . . . .	775 about
Typha . . . . .	9	Cephalocarpus . . . . .	1
Sparganiaceae		Chorisandra . . . . .	4
Sparganium . . . . .	15	Chrysithrix . . . . .	2
Potamogetonaceae		Cryptangium . . . . .	10
Zannichellia . . . . .	1 * 2	Diplasia . . . . .	2
Najadaceae		Elyna . . . . .	4—5
Najas . . . . .	31	Eriospora . . . . .	4
Sec. II		Everardia . . . . .	1
Alismataceae		Exocarya . . . . .	1
Sagittaria . . . . .	31	Fintelmannia . . . . .	2
almost always monoecious		Hoppia . . . . .	3
Wiesneria . . . . .	3	Kolresia . . . . .	4—5
Hydrocharitaceae		Lagenocarpus . . . . .	8
Halophila . . . . .	2	Lepironia . . . . .	1
Limnobium . . . . .	1	Mapania . . . . .	34
Triuridaceae		Microschoenus . . . . .	1
Seychellaria . . . . .	1	Pteroscleria . . . . .	3
Gramineae		Schoenoxiphium . . . . .	1 * 6
Asprella . . . . .	1	Scirpodendron . . . . .	1—2
Chionachne . . . . .	3	Scleria . . . . .	100
Coix . . . . .	3—4	Uncinia . . . . .	30
Diandrolyra . . . . .	1	Palmae	
Euchlaena . . . . .	1	Acanthococos . . . . .	1
Germania . . . . .	1	Acanthophoenix . . . . .	3
Hydrochloa . . . . .	1	Acrocomia . . . . .	7
Leptaspis . . . . .	3	Actinokentia . . . . .	2
Luziola . . . . .	6	Actinorhytes . . . . .	1
Mniochloa . . . . .	2	Adelodopsis . . . . .	2
Olyra . . . . .	20	Aeria . . . . .	1
Pariana . . . . .	10	Amylocarpus . . . . .	19?
Pharus * . . . . .	5	Archontophoenix . . . . .	8
Polytoea . . . . .	3	Areca . . . . .	14
Potamophila . . . . .	1	Arenga . . . . .	7
Sclerachne . . . . .	1	Asterogyne . . . . .	2
Thuarea . . . . .	1	Astrocaryum . . . . .	29
Tripsacum . . . . .	2—3	Attalea . . . . .	28
Zea . . . . .	1	Bactris . . . . .	90
Zizania . . . . .	1	Barbosa . . . . .	1
Zizaniopsis . . . . .	1	Barcella . . . . .	1
Cyperaceae		Barkerwebbia . . . . .	1
Becquerelia . . . . .	3	Bentinckia . . . . .	1
Calyptrocarya . . . . .	4		

	Species		Species
Calyptrocalyx . . . . .	2	Neodypsis . . . . .	2
Calyptrogyne . . . . .	3	Neonicholsonia . . . . .	2
Calyptronoma . . . . .	4	Neophloga . . . . .	1
Caryota . . . . .	9	Nephrocarpus . . . . .	1
Catoblastus . . . . .	3	Nephrosperma . . . . .	1
Clinostigma . . . . .	3	Nipa . . . . .	1
Cocops . . . . .	1	Oenocarpus . . . . .	8
Cocos . . . . .	30	Oncocalamus . . . . .	1
Cyphokentia . . . . .	10	Oncosperma . . . . .	5
Cyphophoenix . . . . .	2	Orania . . . . .	5
Cyrtostachys . . . . .	2	Orbignya . . . . .	6
Deckenia . . . . .	1	Oreodoxa . . . . .	6
Desmoncus . . . . .	28	Phloga . . . . .	4-5
Dictyosperma . . . . .	3	Phlogella . . . . .	4-5
Didymosperma . . . . .	8	Phoenicophorium . . . . .	1
Diplothemium . . . . .	5	Pinanga . . . . .	40
Drymophloeus . . . . .	12	Podococcus . . . . .	1
Dypsis . . . . .	10	Polyandrococcos . . . . .	1
Elaeis . . . . .	2	Prestoea . . . . .	1
Euterpe . . . . .	10	Pseudophoenix . . . . .	1
Gaussia . . . . .	1	Ptychococcus . . . . .	3
Genoma . . . . .	80	Ptychosperma . . . . .	13
Gigliolia . . . . .	2	Ptychoraphis . . . . .	3
Haplodypsis . . . . .	1	Ptychandra . . . . .	2
Haplophloga . . . . .	2	Raphia . . . . .	6
Heterospathe . . . . .	1	Reinhardtia . . . . .	8
Howea . . . . .	2-3	Rhopaloblaste . . . . .	2
Hydriastele . . . . .	1	Rhyticoccus . . . . .	1
Hyophorbe . . . . .	3	Roscheria . . . . .	1
Hyospathe . . . . .	3	Sclerosperma . . . . .	1
Iguanura . . . . .	10	Sommieria . . . . .	2
Iriartea . . . . .	10	Synechanthus . . . . .	3
Jessenia . . . . .	3	Trichodypsis . . . . .	1
Juania . . . . .	1	Veitchia . . . . .	4
Jubaea . . . . .	1	Verschaffeltia . . . . .	1
Kentia . . . . .	10	Vonitra . . . . .	1
Kentiopsis . . . . .	2	Wallichia . . . . .	3
Kunthia . . . . .	1	Welfia . . . . .	2
Linospadix . . . . .	6	Wettinia . . . . .	3
Leopoldinia . . . . .	4	Cyclanthaceae	
Loxococcus . . . . .	1	Carludovica . . . . .	34
Manicaria . . . . .	1	Cyclanthus . . . . .	4
Martinezia . . . . .	7	Evodianthus . . . . .	1
Maximiliana . . . . .	3	Ludovia . . . . .	2
Mischophloeus . . . . .	1	Saracanthus . . . . .	1
Nenga . . . . .	11	Stelestylis . . . . .	1

	Species		Species
Araceae		Philonotium . . . . .	1
Adelonema . . . . .	1	Pinellia . . . . .	3
Aglaodorum . . . . .	1	Piptospatha . . . . .	1 * 8
Aglaonema . . . . .	20 * 41	Pista . . . . .	1
Alocasia . . . . .	50	Plesmonium . . . . .	3
Alocasiophyllum . . . . .	1	Porophyrospatha . . . . .	2
* Amauriella . . . . .	1	Protarum . . . . .	1
Ambrosinia . . . . .	1	Pseudodracontium . . . . .	2 * 3
Amorphophallus . . . . .	61 * 74	Pseudohydrosme . . . . .	2
Anchomanes . . . . .	5—6 * 4	Remusatia . . . . .	2
Anubias . . . . .	10 * 12	Rhektophyllum . . . . .	1
Aphyllarum . . . . .	1	Rhynchopyle . . . . .	4
Ariopsis . . . . .	1	Sauromatum . . . . .	5
Arisarum . . . . .	2	Scaphispatha . . . . .	1
Arum . . . . .	15	Schismatoglottis . . . . .	75
Asterostigma . . . . .	3	Schizocasia . . . . .	3
Biarum . . . . .	4	Spathantheum . . . . .	2
Bucephalandra . . . . .	1	Spathicarpa . . . . .	5
Caladiopsis . . . . .	1	Stuednera . . . . .	5
Caladium . . . . .	20	Stylochiton . . . . .	17
Calopsis . . . . .	1	Synantherias . . . . .	1
Cercestis . . . . .	6 * 9	Syngonium . . . . .	15
Chamaecladon . . . . .	20	Taccarum . . . . .	3
Chlorospatha . . . . .	1	Thaumatophyllum . . . . .	1
Colocasia . . . . .	6	Theriophonum . . . . .	5
Cryptocoryne . . . . .	20	Thomsonia . . . . .	2
Culcasia . . . . .	15	Typhonium . . . . .	13
Diandriella . . . . .	1	Typhonodorum . . . . .	1
Dieffenbachia . . . . .	24 * 27	Ulearum . . . . .	1
Dracunculus . . . . .	2	Xanthosoma . . . . .	32
Gamogyne . . . . .	1	Xenophya . . . . .	1
Gearum . . . . .	1	Zantedeschia . . . . .	10 * 8
Gonatanthus . . . . .	2	Zomicarpa . . . . .	3
Gorgonidium . . . . .	1	Zomicarpella . . . . .	1
Hapaline . . . . .	2	Lemnaceae	
Helicodiceros . . . . .	1	Lemna . . . . .	4
Helicophyllum . . . . .	5	Spirodela . . . . .	2
Homalomena . . . . .	40 * 78	Wolffia . . . . .	12
Hydrosme . . . . .	4	Restionaceae	
Lagenandra . . . . .	4	Ecdsiocolea . . . . .	1
Mangonia . . . . .	1	Phyllocomos . . . . .	1
Microcasia . . . . .	2	Centrolepidaceae	
Montrichardia . . . . .	3—4 * 2—8	Alepyrum . . . . .	1
Nephtytis . . . . .	4	Brizula . . . . .	5
Peltandra . . . . .	2	Hydatella . . . . .	2
Philodendron . . . . .	200 * 220	Juncella . . . . .	2



	Species		Species
<b>Eriocaulaceae</b>		<b>Parasponia</b>	2
Blastocaulon . . . . .	3	Pteroceltis . . . . .	1
Eriocaulon . . . . .	200 * 195	Trema . . . . .	30
Lachnocaulon . . . . .	2 * 4	Zelkova . . . . .	4
Leiothrix . . . . .	28	<b>Moraceae</b>	
Mesanthemum . . . . .	4	Antiaris . . . . .	5-6
Paepalanthus . . . . .	230 * 224	Artocarpus . . . . .	40
Philodice . . . . .	3	Bosquiea . . . . .	3-4
Syngonanthus . . . . .	80	Bosqueiopsis . . . . .	1
Tonina . . . . .	1	Brosimopsis . . . . .	1
<b>Dioscoreaceae</b>		Brosimum . . . . .	8
Dioscora . . . . .	1	Castilloa . . . . .	2-3
<b>Musaceae</b>		Cyathanthus . . . . .	1
Musa . . . . .	23	Dorstenia . . . . .	70
usually monococious		Helicostylis . . . . .	2
<b>Zingiberaceae</b>		Lanessania . . . . .	1-2
Achilus . . . . .	1	Mesogyne . . . . .	2
<b>Burmanniaceae</b>		Olmedia . . . . .	5
Arachnites . . . . .	1	Olmediella . . . . .	2
<b>Casuarinaceae</b>		Olmediophaena . . . . .	1
Casuarina . . . . .	25	Perebea . . . . .	7
<b>Piperaceae</b>		Poulsenia . . . . .	1
Macropiper . . . . .	6	Prainea . . . . .	1
Nematanthera . . . . .	2	Pseudolmedia . . . . .	5
<b>Juglandaceae</b>		Scyphosyce . . . . .	1
Carya . . . . .	11	Sloetia . . . . .	1
Engelhardtia . . . . .	9	Sloetiopsis . . . . .	1
Juglans . . . . .	7-8	Teonangia . . . . .	1
Oreomunnea . . . . .	1	Trymatococcus . . . . .	2
Palatycarya . . . . .	1	<b>Urticaceae</b>	
Pterocarya . . . . .	3-4	Australina . . . . .	5
<b>Betulaceae</b>		Boehmeriopsis . . . . .	1
Alnus . . . . .	17	Droguetia . . . . .	4
Betula . . . . .	33	Forskahlea . . . . .	5
Carpinus . . . . .	18	Gesnouinia . . . . .	1
Corylus . . . . .	8	Helxine . . . . .	1
Ostryopsis . . . . .	1	Hemistylis . . . . .	4
Ostrya . . . . .	2	<b>Proteaceae</b>	
<b>Fagaceae</b>		Franklandia . . . . .	2
Quercus . . . . .	200	<b>Santalaceae</b>	
<b>Ulmaceae</b>		Phacellaria . . . . .	2
Ampelocera . . . . .	1	<b>Olacaceae</b>	
Aphananthe . . . . .	3-4	Harmandia . . . . .	2
Celtis . . . . .	60	<b>Loranthaceae</b>	
Chaetacme . . . . .	1	Antidaphne . . . . .	1
Gironniera . . . . .	7-8	Eubrachion . . . . .	2

	Species		Species
Ginalloa . . . . .	4	Menispermaceae	
Korthalsella . . . . .	1	Albertisia . . . . .	1
Notothixos . . . . .	1	Anonaceae	
Phoradendron . . . . .	100	Uranopsis . . . . .	1
Balanophoraceae		Monimiaceae	
Corynaea . . . . .	4	Anthobembix . . . . .	2
Dactylanthus . . . . .	1	Ephippiandra . . . . .	1
Helosis . . . . .	3	Hennecartia . . . . .	1
Lathrophytum . . . . .	1	Kibara . . . . .	30
Lophophytum . . . . .	4	Levieria . . . . .	4
Mystropetalon . . . . .	2	Matthaea . . . . .	11
Ombrophytum . . . . .	1	Stegantthera . . . . .	15 * 7
Scybalium . . . . .	4	Tambourissa . . . . .	14
Polygonaceae		Tetrasyandra . . . . .	3
Emex . . . . .	1	Wilkiea . . . . .	2—3 * 2
Chenopodiaceae		Hernandiaceae	
Axyris . . . . .	5—6	Hernandia . . . . .	8
Borsezowia . . . . .	1	Saxifragaceae	
Ceratocarpus . . . . .	1	Broussaissia . . . . .	2
Cypselocarpus . . . . .	1	Grevea . . . . .	1
Halophytum . . . . .	1	Hamamelidaceae	
Microgynoecium . . . . .	1	Altingia . . . . .	2
Suckleya . . . . .	1	Liquidambar . . . . .	4
Amarantaceae		Sycopsis . . . . .	2
Dicraurus . . . . .	1	Platanaceae	
Digera . . . . .	1	Platanus . . . . .	6
Pleuropterantha . . . . .	1	Rosaceae	
Nyctaginaceae		Poterium . . . . .	1
Neea . . . . .	30	Rutaceae	
Phaeoptilon . . . . .	1	Melicope . . . . .	10
Cynocranibaceae		Oricia . . . . .	3
Cynocrambe . . . . .	2	Pitavia . . . . .	1
Phytolaccaceae		Toddalia . . . . .	1
Didymotheca . . . . .	1	Toddaliopsis . . . . .	1
Monococcus . . . . .	1	Vepris . . . . .	5
Phaulothamnus . . . . .	1	Xanthoxylum . . . . .	9
Tersonia . . . . .	1	Euphorbiaceae	
Ceratophyllaceae		Acidocroton . . . . .	1 * 2
Ceratophyllum . . . . .	3	Acidoton . . . . .	1
Lardizabalaceae		Actinostemon . . . . .	24 * 30
Akebia . . . . .	2	rarely dioecious?	
Hollboellia . . . . .	2	Adenochlaena . . . . .	4 * 2
Parvatia . . . . .	1	Adenocline . . . . .	3
Sinofranchetia . . . . .	1	Adenopeltis . . . . .	1
Stauntonia . . . . .	2	* Afrotrewia . . . . .	1

	Species		Species
Agyneia . . . . .	2	Dysopsis . . . . .	1 * 4
Alcoceria . . . . .	1	• Elaterospermum . . . . .	1
Algernonia . . . . .	2	* Eleutherostigma . . . . .	1
Allenia . . . . .	1	* Epiprinus . . . . .	1
Alphandia . . . . .	2	* Erismanthus . . . . .	2
Amanoa . . . . .	6	* Fragariopsis . . . . .	1
* Anabaenella . . . . .	1	Glochidion . . . . .	135
Andrachne . . . . .	8	* Grimmeodendron . . . . .	2
* Angostylis . . . . .	1	* Haematostemon . . . . .	1
Anthostema . . . . .	3	Hevea . . . . .	10 * 17
Aonikena . . . . .	1	Hippomane . . . . .	1
Apodandra . . . . .	1	Homalanthus . . . . .	8
Apodiscus . . . . .	1	Humblotia . . . . .	1
Argithamnia . . . . .	2 * 6	Hura . . . . .	2—3
Argomuelleria . . . . .	1	* Hypocoton . . . . .	1
Aristogeitonina . . . . .	1	Jatropha . . . . .	156
Astrococcus . . . . .	2 * 1	Joannesia . . . . .	1
Avellantia . . . . .	1	Julocroton . . . . .	20
Baliospermum . . . . .	4	* Klaineanthus . . . . .	1
Bertya . . . . .	1 * 19	Lasiococca . . . . .	1
* Blachia . . . . .	7	Leidesia . . . . .	2 * 4
* Bonania . . . . .	3	Longetia . . . . .	2
Breynia . . . . .	15	Lortia . . . . .	1
* Bridellia . . . . .	56	Mabea . . . . .	16 * 29
Calpigyne . . . . .	1	Manihot . . . . .	80 * 125
Cephalocroton . . . . .	2 * 8	Maprounea . . . . .	3
Cephalocrotonopsis . . . . .	1	Mareya . . . . .	2
Cephalomappa . . . . .	1	Megistostigma . . . . .	1
Chiropetalum . . . . .	13 * 18	Micrantheum . . . . .	2 * 3
Chloradenia . . . . .	1	Micrococca . . . . .	1
* Chondrostylis . . . . .	1	Monadenium . . . . .	1
Chrozophora . . . . .	7 * 9	Monotaxis . . . . .	7 * 9
Cladogynos . . . . .	1	Necepsia . . . . .	1
Clavistylis . . . . .	1	* Neopalissya . . . . .	1
Cluytiandra . . . . .	1	Neopyenocoma . . . . .	1
Cnesmone . . . . .	1	Neoroepera . . . . .	2
Codiaeum . . . . .	4	Nepenthandra . . . . .	1
Colliguaya . . . . .	5	Nymania . . . . .	5
Corythea . . . . .	1	Omphalea . . . . .	10 * 15
* Crotongynopsis . . . . .	1	Ophthalmoblaptan . . . . .	3—4
Crotonopsis . . . . .	1	Pachystroma . . . . .	1
Dalechampia . . . . .	60 * 88	Pachystylidium . . . . .	1
Dalembertia . . . . .	4	Palissya . . . . .	1
Dichostemma . . . . .	1	Paracroton . . . . .	1
Dicoelia . . . . .	1	Pedilanthus . . . . .	15
Ditaxis . . . . .	39	Petalodiscus . . . . .	5

	Species		Species
Petalostigma	1	Anacardiaceae	
Monocism questioned		Dobinea	2
Philyra	1	Celastraceae	
Platygyne	1	Menepetalum	6
Pluckenetia	12 * 6	Icacinaceae	
Poranthera	5 * 6	Rhyticarium	2—3
Pseudanthus	2 * 7	Sapindaceae	
* Pterococcus	3	133 genera	993
Pycnocomma	8 * 12	really polygamous — male and female elements not functional — see description	
Ramelia	1	Sterculiaceae	
Ricinocarpus	13 * 15	Acropogon	3
Ricinus	1	Basiloxylon	1
Sagotia	1	Brachychiton	11
Sauropus	20	Cola	34
* Schizostigma	1	Dicarpidium	1
Sebastiania	40	Firmiana	10
Seidelia	1	Heritiera	4
Senefeldera	4	Octolobus	1
Speranskia	1 * 3	Pterocymbium	3
Sphaerostylis	1 * 2	Pterygota	2
Stachystemon	3	Sterculia	80—90
Stenadenium	1	Tarrietia	4
Stillingia	15 * 26	Quinaceae	
Strophoblachia	1 * 2	Touroulia	3
Sumbavia	2	Flacourtiaceae	
Sumbaviopsis	1	Grandidiera	1
Symphyllia	2	Achariaceae	
Synadenium	3	Acharia	1
Syndyophyllum	1—2 * 1	Ceratiosicyos	1
Tannodia	1	Guthriea	1
Tetraplandra	2 * 4—5	Caricaceae	
* Tragiella	3	Cylicomorpha	2
Trigonostemon	10 * 20	Begoniaceae	
Trisyngyne	2	Begonia	400
Tritaxis	3—4	Begoniella	3
* Wetraria	7	Hillebrandia	1
Wielandia	1	Semibegoniella	2
Zimmermannia	1	Symbegonia	1
Callitrichaceae		Araliaceae	
Callitriche	25	Bonnierella	1
hermaphrodite flowers described		Tieghemopanax	26
Buxaceae		Sapotaceae	
Buxus	19	Lucuma	5
Macropodandra	1	Sections 2 and 9	about
Notobuxus	1	Gesneriaceae	
Pachysandra	2	Cyrtandropsis	1
Sarcococca	4		

	Species
Plantaginaceae	
Litorella . . . . .	1
Rubiaceae	
Atractogyne . . . . .	2
Siphonandrium . . . . .	1
Vaillantia . . . . .	2
Cucurbitaceae	
Actinostemma . . . . .	4
Benincasa . . . . .	2
Blastania . . . . .	2
Brandegea . . . . .	2
Bryonia . . . . .	1
Bryonopsis . . . . .	2
Calycophysum . . . . .	2
Cerasiocarpum . . . . .	1
Cionosicyos . . . . .	1
Citrullus . . . . .	4
Corallocarpus . . . . .	15 about
Cucumeropsis . . . . .	2
Cucurbita . . . . .	10
Cyclanthera . . . . .	20
Cyclantheropsis . . . . .	1
Dactyliandra . . . . .	1 * 2
Delognaea . . . . .	1
question as to monoecism	
* Dendrosicyos . . . . .	1
Dicaelosperma . . . . .	1
Ecballium . . . . .	1
Echinocystis . . . . .	25
Elateriopsis . . . . .	6
Elaterium . . . . .	12
Frantzia . . . . .	2
Gomophogyne . . . . .	1—2 * 3
Guraniopsis . . . . .	1
Gymnopetalum . . . . .	4
Sektion 2	
Hanburia . . . . .	1
Lagenaria . . . . .	1

	Species
Luffa . . . . .	7
Melancium . . . . .	1
Melothria . . . . .	10 about
Microsechium . . . . .	2
Muellerargia . . . . .	1
Oreosyce . . . . .	1 * 4
Peponium . . . . .	11
Pisosperma . . . . .	1
Pittiera . . . . .	1
Polakowskia . . . . .	1
Posadea . . . . .	1
Pteropepon . . . . .	2
Raphanocarpus . . . . .	3
Raphidiocystis . . . . .	3
Roseanthus . . . . .	1
Sechiopsis . . . . .	1
Sechium . . . . .	1
Selysia . . . . .	2
Schizocarpum . . . . .	2
Sicana . . . . .	1
Sicyos . . . . .	30 about
Sicyosperma . . . . .	1
Toxanthera . . . . .	1 * 3
Tumamoca . . . . .	1
Vaseyanthus . . . . .	1
Compositae	
Ainsliaea . . . . .	16
Ambrosia . . . . .	15
Catamixis . . . . .	1
Dinoseris . . . . .	1
Erodiophyllum . . . . .	2
Franseria . . . . .	16
Hyaloseris . . . . .	2
Hymenoclea . . . . .	2
hermaphrodite flowers function as males	
Xanthium . . . . .	3—4

**Andromonoecious**

Potamogetonaceae	
Posidonieae . . . . .	2
Alismataceae	
* Lophocarpus . . . . .	2

Gramineae	
Aegopogon . . . . .	2
Andropogon . . . . .	181
Apluda . . . . .	1
Apocopis . . . . .	3—4

	Species		Species
Arrhenatherum . . . . .	3	Pectinaria . . . . .	1
Arthropogon . . . . .	3	Pennisetum . . . . .	40
Arthraxon . . . . .	9	Pentarraphis . . . . .	2
Arundinella . . . . .	24	rarely androm.	
Bouteloua . . . . .	43	Periedema . . . . .	3
rarely androm.		Perotis . . . . .	3
Cenchrus . . . . .	12	Phragmites . . . . .	3
Chaetium . . . . .	2	Plagiosetum . . . . .	1
Chamaeraphis . . . . .	5	Ratzeburgia . . . . .	1
Chloris . . . . .	40	Rhytachne . . . . .	3
rarely androm.		Rottboellia . . . . .	33
Otenium . . . . .	7	Schaffnera . . . . .	1
rarely androm.		Setaria . . . . .	10
Cutandra . . . . .	1	about	
subtribe E Meliceae (rarely andromon.)		Stenotaphrum . . . . .	3
Cyphochlaena . . . . .	1	Tetrachaete . . . . .	1
Dignathia . . . . .	2	Thelepogon . . . . .	1
Dissochondrus . . . . .	1	Themeda . . . . .	9
Ectrosia . . . . .	4	Trachypogon . . . . .	1
Elionurus . . . . .	15	Trachys . . . . .	1
Enteropogon . . . . .	4	Tragus . . . . .	2
rarely androm.		Trichloris . . . . .	2
Fingerhuthia . . . . .	1	rarely androm.	
Gymnopogon . . . . .	6	Tricholaena . . . . .	10
rarely androm.		Tripogon . . . . .	8
Harpechloa . . . . .	2	rarely androm.	
rarely androm.		Urelytrum . . . . .	2
Hierochloë . . . . .	13	Vossia . . . . .	1
Hilaria . . . . .	5	Xerochloa . . . . .	3
Holcus . . . . .	1	Zeugites . . . . .	5
Homopogon . . . . .	1	Zoysia . . . . .	2—3
Ichnanthus . . . . .	20		
Ischaemum . . . . .	34	Cyperaceae	
Ixophorus . . . . .	2	Caustis . . . . .	5
Kerinozoma . . . . .	1	Courtoisia . . . . .	1
Latipes . . . . .	1	Dichromena . . . . .	5
Leptothrium . . . . .	1	Elynanthus . . . . .	30
Lophopogon . . . . .	1	Evandra . . . . .	2
Lopholepis . . . . .	1	Fimbrystilis . . . . .	200
Lycurus . . . . .	2	Gahnia . . . . .	30
Manisuris . . . . .	1	Kyllingia . . . . .	30—40
Melanocenchris . . . . .	3	occasionally androdioecious	
rarely androm.		Araceae	
Microcalamus . . . . .	1	Calla . . . . .	1
Monelytrum . . . . .	1	Centrolepidaceae	
Neurachne . . . . .	3	Aphelia . . . . .	1
Oplismenus . . . . .	4	Chenopodiaceae	
Oxytenantha . . . . .	5	Pachycornia . . . . .	1
Panicum . . . . .	300		

	Species		Species
Aizoaceae		Araliaceae	
Tetragonia . . . . .	1	Heteropanax . . . . .	1
Caryophyllaceae		Umbelliferae	
Dichranthus . . . . .	1	Actinotus . . . . .	8
Ranunculaceae		Anisosciadium . . . . .	1
Anemone . . . . .	1	Anthriscus . . . . .	13
Capparidaceae		Astrantia . . . . .	7 * 9
Haptocarpum . . . . .	1	Biazolettia . . . . .	8
Hamamelidaceae		Contella . . . . .	20
Distylium . . . . .	4	Chaerophyllum . . . . .	36
Rosaceae		Dicyclophora . . . . .	1
Cydonia . . . . .	3	Didiscus . . . . .	12—14
Osteomeles . . . . .	10	Echinophora . . . . .	8
Leguminosae		Grammosciadium . . . . .	8
Desmanthus . . . . .	9	* Hacquetia . . . . .	1
Dussia . . . . .	1	Heterosciadium . . . . .	1
Neptunia . . . . .	8	Melopospermum . . . . .	1
Parkia . . . . .	19	Myrrhis . . . . .	2
Rutaceae		Osmorhiza . . . . .	13
Empleurum . . . . .	1	Physocaulis . . . . .	1
Hippocastanaceae		Pyconcycla . . . . .	7
Aesculus . . . . .	14	Rhabdosciadium . . . . .	3
Billia . . . . .	2	Scandix . . . . .	15
Combretaceae		Theocarpus . . . . .	1
Bucida . . . . .	1	Tinguarra . . . . .	3
Conocarpus . . . . .	1	Symplocaceae	
Laguncularia . . . . .	1	* Symplocos . . . . .	8
Pteleopsis . . . . .	1	Calyceraceae	
Terminalia . . . . .	105	Boopsis . . . . .	10
Thiloa . . . . .	5		

Gynomonoecious

Gramineae		Kalidium . . . . .	4
Coelachne . . . . .	3	Microcnemum . . . . .	1
Araceae		Monolepis . . . . .	3
Epipremnum . . . . .	16	Osteocarpum . . . . .	5
Heteropsis . . . . .	6	Salicornia . . . . .	9
Rhaphidophora . . . . .	20	Spirostachys . . . . .	3
Rhodospatha . . . . .	1	Suaeda . . . . .	40
Chenopodiaceae		Secticornia . . . . .	1
Arthrocnemum . . . . .	7—8	Threlkeldia . . . . .	2
Didymanthus . . . . .	1	Caryophyllaceae	
Halocnemum . . . . .	1	Dysphania . . . . .	3
Halopeplis . . . . .	3	Polemoniaceae	
Heterostachys . . . . .	1	Polemonium . . . . .	14

	Species		Series
Compositae			
Abrotanella . . . . .	12	Bidens . . . . .	90
Acanthospermum . . . . .	3	Bi-Leveillea . . . . .	5
Acamptopappus . . . . .	2	Blainvillea . . . . .	9
Achaetogeron . . . . .	7	Blennosperma . . . . .	2
Achillea . . . . .	80	Blepharispermum . . . . .	4
Achmophora . . . . .	1	Blepharizonia . . . . .	2
Achyrachaena . . . . .	1	Boltonia . . . . .	8
Achyrocline . . . . .	15	Borrichia . . . . .	5
Adelostigma . . . . .	2	Brachychaeta . . . . .	1
Adenocaulon . . . . .	2	Brachyclados . . . . .	1
Aganippea . . . . .	2	Brachycome . . . . .	50
Aiolotheca . . . . .	1	Brachyglottis . . . . .	1
Allendea . . . . .	1	Bradburia . . . . .	1
Aniauria . . . . .	1	Bryomorphe . . . . .	1
Amblyocarpum . . . . .	1	Bupthalmum . . . . .	7
Amblyopappus . . . . .	1	Burrielia . . . . .	1
Amellus . . . . .	9	Cacosmia . . . . .	1
Amphidoxa . . . . .	4	Cadiscus . . . . .	1
Amphiglossa . . . . .	3	Calendula . . . . .	15
Amphoricarpus . . . . .	1	Callilepis . . . . .	3
Anaglypha . . . . .	1—2	Callistephus . . . . .	1
Anaxeton . . . . .	7	Calostephane . . . . .	3
Anisopappus . . . . .	3	Calotis . . . . .	16
Antithrixia . . . . .	3	Calyptrocarpus . . . . .	1
Aphanactis . . . . .	2	Carpesium . . . . .	8
Aphanostephus . . . . .	5	Cassinia . . . . .	18
Agyroxiphium . . . . .	2	Celmisia . . . . .	27
Arnica . . . . .	18	Centipeda . . . . .	5
Arnicastrum . . . . .	1	Ceratogyne . . . . .	1
Arrowsmithia . . . . .	1	Ceruana . . . . .	1
Asteropsis . . . . .	1	Chaetanthira . . . . .	30
Astephania . . . . .	2	Chaetopappa . . . . .	3
Asteromoea . . . . .	3	Chaptalia . . . . .	21
Athrixia . . . . .	15	Chardinia . . . . .	1
Athroisma . . . . .	1	Charieis . . . . .	1
Axiniphyllum . . . . .	2	Chiliophyllum . . . . .	1
Baeria . . . . .	20	Chiliotrichium . . . . .	3
Balleya . . . . .	2	Chionolaena . . . . .	8
Balsamorhiza . . . . .	8	Chlamydites . . . . .	1
Baltimora . . . . .	1	Chroilema . . . . .	1
Bartlettia . . . . .	1	Chromolepis . . . . .	1
Bellida . . . . .	1	Chrysactinia . . . . .	1
Bellium . . . . .	6	Chrysanthellum . . . . .	3
Bellis . . . . .	10	Chrysogonum . . . . .	1
Berlandiera . . . . .	4	Chrysoma . . . . .	8
		Chrysopsis . . . . .	10



	Species		Species
Cineraria . . . . .	25	Faceles . . . . .	2—3
Clappia . . . . .	2	Faujasia . . . . .	3
Clibadium . . . . .	19	Felicia . . . . .	50
Cnicothamnus . . . . .	1	Filago . . . . .	12
Coleocoma . . . . .	1	Fresenia . . . . .	3
Commidendron . . . . .	5	Gamolepis . . . . .	12
Conyza . . . . .	50	Garcilassa . . . . .	1
Corethrogyne . . . . .	3	Garuleum . . . . .	5
Cosmos . . . . .	15	Geigeria . . . . .	18
Crocidium . . . . .	1	Gerbera . . . . .	32
Crossostephium . . . . .	1	Glossocardia . . . . .	1
Crupina . . . . .	2	Glossogyne . . . . .	5
Cyathocline . . . . .	2	Glycideras . . . . .	1
Cylindrocline . . . . .	1	Gnaphalium . . . . .	120
Cypselodontia . . . . .	1	Goldmanella . . . . .	1
Delamerea . . . . .	1	Golionema . . . . .	1
Denekia . . . . .	2	Grangea . . . . .	1
Dichaetophora . . . . .	1	Grantia . . . . .	3
Dichrocephala . . . . .	5	Gratwickia . . . . .	1
Dicranocarpus . . . . .	1	Greenella . . . . .	3
Dimorphocoma . . . . .	1	Grypocarpha . . . . .	1
Dimorphotheca . . . . .	20	Guardiola . . . . .	3
Diplostephium . . . . .	13	Guizotia . . . . .	5
Dipterocome . . . . .	1	Gundlachia . . . . .	1
Disparago . . . . .	5	Gundelia . . . . .	25
Doronicum . . . . .	25	Gutierrezia . . . . .	20
Dugesia . . . . .	1	Gymnarrhena . . . . .	1
Eclipta . . . . .	4	Gymnodiscus . . . . .	2
Egletes . . . . .	6	Gymnosperma . . . . .	1
Elachanthus . . . . .	1	Gymnostephium . . . . .	6
Elvira . . . . .	3	Haastia . . . . .	3
Engelmannia . . . . .	1	Hazardia . . . . .	3
Enydra . . . . .	6—9	Helichrysum . . . . .	300
Epallage . . . . .	5	Heliopsis . . . . .	7
Erechthites . . . . .	12	Hemizonella . . . . .	2
Eremothamnus . . . . .	1	Hemizonia . . . . .	25
Eriachaenium . . . . .	1	Henricia . . . . .	1
Ericameria . . . . .	9	Heptanthus . . . . .	2—3
Erigeron . . . . .	150	Hertia . . . . .	8
Eriocephalus . . . . .	19	Heterolepis . . . . .	3
Eriothrix . . . . .	1	Heteropappus . . . . .	3—5
Ermeiastrum . . . . .	1	Heterospermum . . . . .	6
Espeletia . . . . .	11	Heterotheca . . . . .	5
Euryops . . . . .	26	Hidalgoa . . . . .	1
Eutetras . . . . .	1	Hinterhubera . . . . .	3
Evax . . . . .	15	Hippia . . . . .	4

	Species		Species
Homochaete . . . . .	1	Melanodendron . . . . .	1
Homochroma . . . . .	1	Melanthera . . . . .	15
Homogyne . . . . .	3	Merrittia . . . . .	?
Hysterionica . . . . .	5—6	Micraetis . . . . .	1
Ichthyothere . . . . .	11	Microglossa . . . . .	9
Ifloga . . . . .	8	Microlecan . . . . .	1
Inula . . . . .	90	Micropsis . . . . .	1
Inulopsis . . . . .	1	Micropus . . . . .	5
Ischnea . . . . .	1	Microtrichia . . . . .	1
Isocarpha . . . . .	5	Milleria . . . . .	1
Isoetopsis . . . . .	1	Minuria . . . . .	4
Isostigma . . . . .	7	Minurothamnus . . . . .	1
Ixiolaena . . . . .	5	Mollera . . . . .	1
Jaegena . . . . .	16	Monactis . . . . .	2
Jaegeria . . . . .	6	Monarrhenus . . . . .	2—3
Jasonia . . . . .	2	Monolopia . . . . .	5
Keerlia . . . . .	3	Monoptilon . . . . .	1
Koehneola . . . . .	1	Moonia . . . . .	5
Lachnophyllum . . . . .	2	Montanoa . . . . .	20
Laestadia . . . . .	4	Mutisia . . . . .	50
Lagenophora . . . . .	13	Myriactis . . . . .	3
Laggera . . . . .	10	Nananthea . . . . .	1
Lagophylla . . . . .	6	Nannoglottis . . . . .	1
Lantanopsis . . . . .	2	Nanothamnus . . . . .	1
Lasiocoma . . . . .	1	Narvalina . . . . .	1
Lasiopogon . . . . .	2	Nerrittia . . . . .	1
Lasthenia . . . . .	5	Nestlera . . . . .	10
Lecocarpus . . . . .	1	Nicolasia . . . . .	1
Leontonyx . . . . .	5	Nidorella . . . . .	18
Lepidophyllum . . . . .	7	Nolletia . . . . .	4
Lepidostephium . . . . .	1	Odontospermum . . . . .	12
Leptocarpha . . . . .	1	Oedera . . . . .	4
Leptorhynchus . . . . .	8	Olearia . . . . .	92
Lessingia . . . . .	9	Oligocarpus . . . . .	3
Leucopholis . . . . .	3	Olivaea . . . . .	1
Leyssera . . . . .	4	Ondetia . . . . .	1
Liabum . . . . .	40	Onoseris . . . . .	18
Lifago . . . . .	1	Oreochrysum . . . . .	1
Lindheimera . . . . .	1	Osmites . . . . .	6
Lipochaeta . . . . .	12	Osmitopsis . . . . .	11
Lucilia . . . . .	25	Osteospermum . . . . .	38
Macowania . . . . .	1	Othonna . . . . .	80
Madia . . . . .	12	Otochlamys . . . . .	1
Mairia . . . . .	9	Oxypappus . . . . .	2
Melalema . . . . .	1	Pachylaena . . . . .	1
Melampodium . . . . .	25	Pachyrhynchus . . . . .	1

	Species		Species
Pallenis . . . . .	1	Rhynchospermum . . . . .	1
Parthenice . . . . .	1	Riddellia . . . . .	3
Parthenium . . . . .	9	Riencourtia . . . . .	5-6
* Parantennaria . . . . .	1	Rigiopappus . . . . .	1
Pechuel-Löschea . . . . .	1	Rochonia . . . . .	2
Pectis . . . . .	40-50	Rosenia . . . . .	1
Pentachaeta . . . . .	6	Ruckeria . . . . .	3
Perityle . . . . .	12	Rumfordia . . . . .	1
Perralderia . . . . .	2	Sabazia . . . . .	1
Perymenium . . . . .	13	Sachsia . . . . .	2-3
Petalacte . . . . .	1	Sanvitalia . . . . .	7-18
Petalactella . . . . .	1	Sartwellia . . . . .	2
Petrollinia . . . . .	1	Schistocarpha . . . . .	5
Phacellothrix . . . . .	1	Schistostephium . . . . .	6
Phaenocoma . . . . .	1	Schizoptera . . . . .	1
Phagnalon . . . . .	20	Schizotrichia . . . . .	1
Phalacrocarpum . . . . .	1	Schkuhria . . . . .	11
Phemmera . . . . .	1	Schoenia . . . . .	1
Philactis . . . . .	2	Sclerocarpus . . . . .	6-7
Philoglossa . . . . .	1-2	Scyphocoronis . . . . .	1
Philyrophyllum . . . . .	1	Selloa . . . . .	1
Phymaspermum . . . . .	3-4	Sericocarpus . . . . .	5
Pinillosia . . . . .	2	Sheareria . . . . .	1
Plagiocheilus . . . . .	6-7	Siebera . . . . .	1
Plazia . . . . .	8	Siegesbeckia . . . . .	4
Pleurophyllum . . . . .	2	Silphium . . . . .	12-13
Podochaenium . . . . .	1	Soliva . . . . .	6
Podocoma . . . . .	6	Sommerfeltia . . . . .	1
Podolepis . . . . .	13	Sphacophyllum . . . . .	1
Polygyne . . . . .	1	Sphaeranthus . . . . .	17
Polymnia . . . . .	12-13	Sphaeromorphaea . . . . .	1
Porphyrostemma . . . . .	1	Sphagneticola . . . . .	1
Postia . . . . .	4	Spilanthus . . . . .	20-30
Printzia . . . . .	5	Stachycephalum . . . . .	2
Psiadia . . . . .	25-30	Staurochlamys . . . . .	1
Psila . . . . .	1	Steirodiscus . . . . .	2
Psilactis . . . . .	3	Stenachaenium . . . . .	3
Psilocarpus . . . . .	3	Stemmatella . . . . .	1
Pterigeron . . . . .	7	Stenocline . . . . .	11
Pulicaria . . . . .	30	Stephanodoria . . . . .	1
Raillardella . . . . .	4	Stilpnogyne . . . . .	1
Raoulia . . . . .	18	Stuartina . . . . .	1
Relhania . . . . .	16-18	Styloclyne . . . . .	4
Remya . . . . .	2	Symphyllocarpus . . . . .	1
Rhantherium . . . . .	3	Syncephalantha . . . . .	1
Rhodogeron . . . . .	1	Syntrichopappus . . . . .	2

	Species		Species
Tessaria . . . . .	4	Urbinella . . . . .	1
Tetracanthus . . . . .	1	Vanclevea . . . . .	1
Tetragonotheca . . . . .	3	Varilla . . . . .	2
Tetramolopium . . . . .	7	Venegazia . . . . .	1
Tetranthus . . . . .	4	Vieraea . . . . .	1
Tetraperone . . . . .	1	Villanova . . . . .	8
Thelesperma . . . . .	7	Vittadinia . . . . .	7
Thespidium . . . . .	1	Waitzia . . . . .	6
Thespis . . . . .	1	Wedelia . . . . .	50-60
Thymopsis . . . . .	1	Welwitschiella . . . . .	1
Tolbonia . . . . .	1	Whitneya . . . . .	1
Townsendia . . . . .	17	Wyomingia . . . . .	2
Tragoceros . . . . .	4	Xanthisma . . . . .	1
Trichocline . . . . .	28	Xeranthemum . . . . .	6
Trigonospermum . . . . .	2	Zaluzania . . . . .	8
Triplocephalum . . . . .	1	Zexmenia . . . . .	37
Tripteris . . . . .	32	Zinnia . . . . .	12
Tussilago . . . . .	1	Zoega . . . . .	5

### Polygamous

Scheuchzeriaceae		Centrolepidaceae	
Lilaea . . . . .	1	Alepyrum . . . . .	1
Alismataceae		Centrolepis . . . . .	20
Limnophyton . . . . .	2	Liliaceae	
Lophocarpus . . . . .	2	Bowia . . . . .	1
Hydrocharitaceae		Melanthium . . . . .	3
Elodea . . . . .	2	Oceanoros . . . . .	1
Gramineae		Schoenocaulon . . . . .	5
Atractocarpa . . . . .	1	Stenanthium . . . . .	5
Bambusa . . . . .	46	Veratrum . . . . .	9
Gigantochloa . . . . .	4-5	Zygadenus . . . . .	1
Puelia . . . . .	1	Zingiberaceae	
Saccharum . . . . .	4	Siphonochilus . . . . .	1
Section III		Orchidaceae	
Palmae		Catasetum . . . . .	30 about
Ancistrophyllum . . . . .	3	Cycnoches . . . . .	8
Ceratolobus . . . . .	2	Proteaceae	
Coleococcus . . . . .	3	Brabeiium . . . . .	1
Metroxylon . . . . .	7	Xylomelum . . . . .	1
Nannorhops . . . . .	1	Polygonaceae	
Rigafetta . . . . .	3	Oxygonum . . . . .	15
Araceae		Chenopodiaceae	
* Gonatopus . . . . .	2	Agathophora . . . . .	1
Synandrospadix . . . . .	1	Alexandra . . . . .	1
* Zamioculcas . . . . .	1		

	Species		Species
Bassia . . . . .	30	Rutaceae	
Bienertia . . . . .	1	Acronichia . . . . .	17
Camphorosma . . . . .	7	Boninia . . . . .	2
Chenolea . . . . .	3	Helietta . . . . .	2
Enchylaena . . . . .	1	Pelea . . . . .	22
Exomis . . . . .	1	Ptelea . . . . .	7
Halogeton . . . . .	4-5	Skimmia . . . . .	1
Hypocylix . . . . .	1	Simarubaceae	
Kirilowia . . . . .	1-2	Ailanthus . . . . .	4
Kochia . . . . .	30	Brucea . . . . .	5
Panderia . . . . .	1	Neocastela . . . . .	1
Amarantaceae		Picrasma . . . . .	8
Iresine . . . . .	2	Pongelion . . . . .	7
Section II		Soulamea . . . . .	8
Nyctaginaceae		Burseraceae	
Andradaea . . . . .	1	Santiria . . . . .	29
Trochodendraceae		Santiriopsis . . . . .	1
Euptelea . . . . .	5	Meliaceae	
Ranunculaceae		Cedrelopsis . . . . .	1
Xanthorrhiza . . . . .	1	Anacardiaceae	
Lardizabalaceae		Anacardium . . . . .	8
Decaisnea . . . . .	1	Antrocaryon . . . . .	2
Menispermaceae		Cotinus . . . . .	2
Parabaena . . . . .	1	Cyrtocarpa . . . . .	1
Lactoridaceae		Drimycarpus . . . . .	1
Lactoris . . . . .	1	Fegimanra . . . . .	1
Hernandiaceae		Loxopterygium . . . . .	4
Gyrocarpus . . . . .	1	Magnifera . . . . .	27
Sparattanthelium . . . . .	4-5	Melanochyla . . . . .	4
Monimiaceae		Metopium . . . . .	2
Piptocalix . . . . .	1	Nothopegia . . . . .	3
Trimenia . . . . .	1	Rhus . . . . .	120
Xymalos . . . . .	3	Schenopsis . . . . .	5
Saxifragaceae		Sclerocarya . . . . .	3
Choristylis . . . . .	1	Spondias . . . . .	6
Hamamelidaceae		Swintonia . . . . .	8
Bucklandia . . . . .	1	Thyrosodium . . . . .	4
Hamamelis . . . . .	3	Aquifoliaceae	
occasionally polygamous		Nemopanthes . . . . .	4
Rosaceae		Salvadoraceae	
Cowania . . . . .	3	Dobera . . . . .	1
occasionally polygamous		Icacinaceae	
Stylobasium . . . . .	3	Hosiea . . . . .	1
Leguminosae		Sapindaceae . . . . .	133 Gen. 993
Calliandra . . . . .	100	really polygamous — although listed as	
Gleditschia . . . . .	11	monoe. — see monoecious	
Lysiloma . . . . .	10		

	Species		Species
Rhamnaceae		Cynomoraceae	
Mailothia . . . . .	7	Cynomorium . . . . .	1
Vitaceae		Umbelliferae	
Ampelocissus . . . . .	60	Actenolema . . . . .	2
Ampelopsis . . . . .	20	Alepidea . . . . .	4 * 20
Clematicissus . . . . .	1	Asteriscium . . . . .	17
Landukia . . . . .	1	Diplotaenia . . . . .	1
Pterisanthes . . . . .	11—12	Diposis . . . . .	1
Guttiferae		Ferula . . . . .	50
Calophyllum . . . . .	55	Ferulago . . . . .	40
Mammea . . . . .	1	Frommia . . . . .	1
Ochrocarpus . . . . .	12	Hacquetia . . . . .	1
Frankeniaceae		Hermas . . . . .	7
Niederleinia . . . . .	1	Kenopleurum . . . . .	1
Flacourtiaceae		Laretia . . . . .	1
Calencob . . . . .	14	Mulenum . . . . .	17
Lindackeria . . . . .	12	Petagnia . . . . .	1
Microsemma . . . . .	1	Portenschlagia . . . . .	1
Psiloxylon . . . . .	1	Sanicula . . . . .	20 * 40
Xylothea . . . . .	12	Xanthosia . . . . .	15
Lythraceae		Sapotaceae	
* Adenaria . . . . .	1	Diploknema . . . . .	1
imperfectly polyg.		Labatia . . . . .	6
* Cuphea . . . . .	2	Pouteria . . . . .	1
imperfectly polyg.		Labiatae	
Rhizophoraceae		Nepeta . . . . .	6
Anisophyllea . . . . .	5	Orobanchaceae	
Poga . . . . .	1	Epiphegus . . . . .	1
Nyssaceae		Plantaginaceae	
Campotheca . . . . .	1	Bougeria . . . . .	1
Davidia . . . . .	1	Rubiaceae	
Myrtaceae		Galium . . . . .	11
Kunzea . . . . .	17	Section IX, X, XI, XIII	
Halorrhagidaceae		Phyllis . . . . .	1
Laurembergia . . . . .	18	Caprifoliaceae	
Araliaceae		Memecylanthus . . . . .	1
Anomopanax . . . . .	4	Pachydiscus . . . . .	1
Brassaiopsis . . . . .	12	Valerianaceae	
Gumblea . . . . .	1	Stangea . . . . .	5
Hedera . . . . .	3	Cucurbitaceae	
Mackenlaya . . . . .	1	Homenosicyos . . . . .	1
Panax . . . . .	6	Compositae	
Polyscias . . . . .	35	Dicoria . . . . .	2
Porospermum . . . . .	1	Euphrosyne . . . . .	1
Pseudosciadium . . . . .	1	Iva . . . . .	13—14
		Oxytenia . . . . .	1

Dioecious

	Species		Species
Pandanaceae		Palmae	
* Freycinetia . . . . .	62 R.	Borassus . . . . .	1
* Pandanus . . . . .	140 R. + 16	sex dimorphism	
sterile (cultivate)		Chamaedorea . . . . .	60
Sararanga . . . . .	1	about	
Potamogetonaceae		Cyclospathe . . . . .	1
Cymodocea . . . . .	7	Eugeissona . . . . .	2
Diplanthera . . . . .	2	Hyphaene . . . . .	9
* Phyllospadix . . . . .	3	sex dimorphism	
Najadaceae		Kinetostigma . . . . .	1
Najas . . . . .	1	Latania . . . . .	3
Section I Eunajas		sex dimorphism	
Scheuchzeriaceae		Lepidocaryum . . . . .	5
Tetroncium . . . . .	1	sex dimorphism	
Alismataceae		Lodoicea . . . . .	1
Burnatia . . . . .	1	sex dimorphism	
Hydrocharitaceae		Mauritia . . . . .	9
Boottia . . . . .	8-9	sex dimorphism	
Halophila . . . . .	2	Medemia . . . . .	3
question whether one of these is always		sex dimorphism	
dioecious		Morenia . . . . .	5
Hydrocharis . . . . .	2	Phoenix . . . . .	11
Lagarosiphon . . . . .	9	sex dimorphism	
	about	Pholidocarpus . . . . .	5
Stratiotes . . . . .	1	sex dimorphism	
Vallisneria . . . . .	2	Phytelephas . . . . .	3
Xystrolobos . . . . .	1	or more	
Triuridaceae		Plectocomia . . . . .	6
Triuris . . . . .	3	Plectocomiopsis . . . . .	5
Gramineae		Ravenia . . . . .	1
Aciachne . . . . .	1	Solfa . . . . .	1
only female known		only female known	
Distichlis . . . . .	4	Wendlandiella . . . . .	1
Fourniera . . . . .	1	only female known	
Gynerium . . . . .	2	Flagellariaceae	
Jouvea . . . . .	1	Susum . . . . .	2
only female known		Restionaceae	
Lamprothyrsus . . . . .	1	Askidiosperma . . . . .	1
only female known		Cannomois . . . . .	3
Monanthochloë . . . . .	1	Chaetanthus . . . . .	1
Scleropogon . . . . .	3	Dielsia . . . . .	1
sex dimorphism		Dovea . . . . .	6
Spinifex . . . . .	4	Harperia . . . . .	1
Cyperaceae		Hopkinsia . . . . .	1
Carex . . . . .	4	Hypodiscus . . . . .	11
Section II Dioica * 6		Hypolaena . . . . .	17
about		Lepidobolus . . . . .	3
Didymia . . . . .	1	Lyginia . . . . .	1
only female known			

	Species		Species
Onychos . . . . .	1	Balanopsidaceae	
Restio . . . . .	100 about	Balanops . . . . .	7
Staberona . . . . .	6	Trilocularia . . . . .	1
Thamnochartus . . . . .	10	Leitneriaceae	
Willdenowia . . . . .	10	Leitneria . . . . .	1
Eriocaulaceae		Batidaceae	
* Eriocaulon . . . . .	2	Batis . . . . .	1
one of these?		Julianiaceae	
Bromeliaceae		Juliania . . . . .	4
Hechtia . . . . .	2-3	Orthopterygium . . . . .	1
Commelinaceae		Ulmaceae	
Spatholirion . . . . .	1	Barbeya . . . . .	1
Juncaceae		Lozanella . . . . .	1
Distichia . . . . .	3	Moraceae	
Oxychloë . . . . .	1	Acanthosphaera . . . . .	1
Patosia . . . . .	1	Acanthotreculia . . . . .	1
Liliaceae		Allacanthus . . . . .	2
Astelia . . . . .	9	Ampalis . . . . .	1
Calibanus . . . . .	1	Antiariopsis . . . . .	1
Chamaelirium . . . . .	1	Bagassa . . . . .	2-3
Dasytirion . . . . .	10	Balanostreblus . . . . .	1
Heterosmilax . . . . .	5	Balansaephytum . . . . .	1
Lomandra . . . . .	29	Batocarpus . . . . .	1
Ruscus . . . . .	3	Broussonetia . . . . .	2-3
Smilax . . . . .	200 about	Cannabis . . . . .	1
Dioscoreaceae		Cardiogyne . . . . .	1
Epipetrum . . . . .	3	Cecropia . . . . .	30-40
Rajania . . . . .	6	Clarisia . . . . .	2
Tamus . . . . .	2	Clorophora . . . . .	2
Testudinaria . . . . .	2	Conocephalus . . . . .	10
Zingiberaceae		Coussapoa . . . . .	15
* Kaempferia . . . . .	1	Cudrania . . . . .	24
natalensis, only female flowers known		Dammaropsis . . . . .	1
Piperaceae		Gymnartocarpus . . . . .	1
Symbryon . . . . .	1	Helianthostylis . . . . .	1
only female known		Hullettia . . . . .	2
Chloranthaceae		Humulus . . . . .	2
Ascarina . . . . .	3	Maclura . . . . .	1
Salicaceae		Maillardia . . . . .	1
Populus . . . . .	18	Malaisia . . . . .	1
Salix . . . . .	160	Musanga . . . . .	1
Garryaceae		Myrianthus . . . . .	4
Garrya . . . . .	13	Pachytrophe . . . . .	2
Myricaceae		Paratrophis . . . . .	4
Comptonia . . . . .	1	Parartocarpus . . . . .	2
Gale . . . . .	4	Phyllochlamys . . . . .	1



	Species		Species
Plecosperrnum . . . . .	1	Richthofenia . . . . .	1
Pourouma . . . . .	20	Sapria . . . . .	1
Pseudotrophis . . . . .	1	Polygonaceae	
Sahagunia . . . . .	3	Harfordia . . . . .	2
Sorocea . . . . .	12	Ruprechtia . . . . .	20
Sparattosyce . . . . .	2	Symmeria . . . . .	2
Streblus . . . . .	1	Triplaris . . . . .	10
Taxotrophis . . . . .	3-4	Amarantaceae	
Treculia . . . . .	2-3	Acanthochiton . . . . .	3
Trophis . . . . .	5-6	Acnida . . . . .	1
Urticaceae		Iresine . . . . .	3-7
Astrothalamus . . . . .	1	Section III	
Elatostematoides . . . . .	5	Phytolaccaceae	
Neraudia . . . . .	2-3	Achatocarpus . . . . .	7 * 12
Obetia . . . . .	2	* Didymotheca . . . . .	5
Pellionia . . . . .	15	* Grostemon . . . . .	5
Sarcopilea . . . . .	1	* Monococcus . . . . .	1
only female known		* Phaulothamnias . . . . .	1
Proteaceae		* Tersonia . . . . .	2
Lencadendron . . . . .	60-70	Aizoaceae	
Myzodendraceae		Glischrothamnus . . . . .	1
Myzodendron . . . . .	9 * 10-11	Caryophyllaceae	
Santalaceae		Melandryum . . . . .	2
Anthobolus . . . . .	5	Cercidiphyllaceae	
Buckleya . . . . .	3	Cercidiphyllum . . . . .	2
Thesidium . . . . .	6	Ranunculaceae	
Opiliaceae		Clematis . . . . .	1
Agonandra . . . . .	1	Sec. Flammula, C. dioecia	
Octoknemataceae		Hamadryas . . . . .	4
Octoknema . . . . .	4	Thalictrum . . . . .	3
Loranthaceae		Lardizabalaceae	
Antidaphne . . . . .	1	Boquila . . . . .	1-2
A. Fendleri only female known	Section III	Lardizabala . . . . .	2
Arceuthobium . . . . .	9-10	Menispermaceae	
Lepidoceras . . . . .	1	Abuta . . . . .	23 * 14
Oryctanthus . . . . .	1	about	
O. scabrides, Section III		Adeliopsis . . . . .	1
Struthanthus . . . . .	40	Anamirta . . . . .	3 * 1
Balanophoraceae		about	
Balanophora . . . . .	11	Anisocycla . . . . .	1 * 7
Hachettea . . . . .	1	Anomospermum . . . . .	3 * 5
Sarcophyte . . . . .	1	Antizoma . . . . .	5 * 4
Rafflesiaceae		Arcangelisia . . . . .	2 * 3
Apodanthes . . . . .	2	Aristega . . . . .	1
only female known		Aspidocarya . . . . .	1
Pilostyles . . . . .	8	Bania . . . . .	1
Rafflesia . . . . .	8 * 7	Burasia . . . . .	3 * 4

	Species		Species
Calycocarpum . . . . .	1	Platytnospora . . . . .	1
Carronia . . . . .	1 * 3	Pleogyne . . . . .	1 about
Chasmanthera . . . . .	3 * 2	Psellium . . . . .	1
Chelonecarya . . . . .	1	Pycnarrhena . . . . .	80 * 17 about
Chlaenandra . . . . .	1	Pycnostyles . . . . .	1
Chondrodendron . . . . .	8 * 6 about	Rameya . . . . .	2
Cissampelos . . . . .	70 * 20 about	Rhaptonea . . . . .	1 * 5
Cocculus . . . . .	30 * 11 about	Rhigiocarya . . . . .	1
Coscinium . . . . .	2-3 * 6	Rhopalandria . . . . .	1
Cyclea . . . . .	11 * 19	Sarcopetalum . . . . .	1
Desmonema . . . . .	1 * 7	Sciadotaenia . . . . .	6 * 10 about
Dioscoreophyllum . . . . .	3 * 5	Sinomenium . . . . .	1
Diploclesia . . . . .	4 * 3	Somphoxylon . . . . .	1
Disciphania . . . . .	2 * 8	Sphenocentrum . . . . .	1
Elissarrhena . . . . .	1	* Spirospermum . . . . .	1
Epinetrum . . . . .	1 * 2	Stephania . . . . .	30 about
Fawcettia . . . . .	1	Strychnopsis . . . . .	1
Fibraurea . . . . .	4	Sychnosepalum . . . . .	2
Gamopoda . . . . .	1	Synclisia . . . . .	1
Glossopholis . . . . .	2	Syntriandrum . . . . .	2 * 3
Haematocarpus . . . . .	3 * 2	Syrrheinema . . . . .	1 * 2
Heptacyclum . . . . .	1	Taubertia . . . . .	1
Husemannia . . . . .	1	Telotia . . . . .	1
Hyperbaena . . . . .	15 * 10	Tiliacora . . . . .	4
Hypserpa . . . . .	16 * 17	Tinomisium . . . . .	3-4 * 6-8
Hypsiodes . . . . .	1	Tinospora . . . . .	14 * 20-25
Jateorhiza . . . . .	2	Trichlisia . . . . .	4 * 12
Kolobopetalum . . . . .	1 * 4	Tripodandra . . . . .	1
* Legnephora . . . . .	2	Welwitschiina . . . . .	1
Leichhardtia . . . . .	1	Anonaceae	
Limacia . . . . .	20 * 25	Ephedranthus . . . . .	1
Limaciopsis . . . . .	1	only male known	
Macrococculus . . . . .	1	Stelechocarpus . . . . .	2
Miersiophytum . . . . .	1	Thonnera . . . . .	1
Menispermum . . . . .	3 * 2	Tetrastemma . . . . .	1
Odontocarya . . . . .	7 * 4 about	Myristicaceae	
Orthogynium . . . . .	1	Brochoneura . . . . .	4
Pachygone . . . . .	10 * 11 about	Cephalosphaera . . . . .	1
Parabaena . . . . .	1 * 10	Coelocaryon . . . . .	1
Penianthus . . . . .	1 * 2	Componeura . . . . .	4
Peraphora . . . . .	1	Dialyanthera . . . . .	2
Pericampylus . . . . .	4 * 5-6	Gymnacranthera . . . . .	11
Perichasma . . . . .	1	Horsfieldia . . . . .	50
		Iryanthera . . . . .	4

	Species		Species
Knema . . . . .	40	Montinia . . . . .	1
Mauloutchia . . . . .	1	Ribes . . . . .	61
Myristica . . . . .	81	Untergattung 5 and 6	
Osteophloeum . . . . .	1	Brunelliaceae	
Pycnanthus . . . . .	5	Brunellia . . . . .	10
Scyphocephalum . . . . .	3	Cunoniaceae	
Staudtia . . . . .	1-2	Macro dendron . . . . .	1
Virola . . . . .	27	Pancheria . . . . .	7
Monimiaceae		Spiraeopsis . . . . .	1
Amborella . . . . .	1	Myrothamnaceae	
* Chloropatane . . . . .	1	Myrothamnus . . . . .	2
Conuleum . . . . .	1	Hamamelidaceae	
rarely monoecious!		Sinowilsonia . . . . .	1
Glossocalyx . . . . .	3	only female known	
Hedycaria . . . . .	15 * 6	Eucommiaceae	
Macropephus . . . . .	1	Eucommia . . . . .	1
Macrotorus . . . . .	1	Rosaceae	
Mollinedia . . . . .	75	Aruncus . . . . .	2
Monimia . . . . .	3 * 4	Bencomia . . . . .	2
Palmeria . . . . .	2 * 7	Cliffortia . . . . .	40
Peumus . . . . .	1	Kageneckia . . . . .	3
Scyphostegia . . . . .	1	Rubus . . . . .	4
Tambourissa . . . . .	25	Sections II and VIII	
* Xymalos . . . . .	1	Leguminosae	
Lauraceae		Pogocybe . . . . .	1
Actinodaphne . . . . .	50	only male known	
about		Pandaceae	
Ampelodaphne . . . . .	5	Panda . . . . .	1
Hypodaphnis . . . . .	1	Zygophyllaceae	
Litsea . . . . .	100	Neolüderitzia . . . . .	1
about		Rutaceae	
Paxiodendron . . . . .	1	Araliopsis . . . . .	1
Sassafras . . . . .	1	Empleuridium . . . . .	1
Tetradenia . . . . .	30	Lunasia . . . . .	4
about		Orixa . . . . .	1
Capparidaceae		Phellodendron . . . . .	2
Apophyllum . . . . .	1	Teclea . . . . .	6
Cercopetalum . . . . .	1	Simarubaceae	
Forchhammeria . . . . .	2	Alvaradoa . . . . .	2
Nepenthaceae		Castela . . . . .	2
Nepenthes . . . . .	58	Castalaria . . . . .	8
Hydrostachyaceae		Holacantha . . . . .	1
Hydrostachys . . . . .	12	Marupa . . . . .	1
Saxifragaceae		Picramnia . . . . .	30
Jurraniodendron . . . . .	1	Picrodendron . . . . .	1
Dedeia . . . . .	2	Picrolemma . . . . .	1
		Simaruba . . . . .	6

	Species		Species
Burseraceae			
Crepidospermum . . . . .	2	Cyathogyne . . . . .	1
Euphorbiaceae		Cyclostemon . . . . .	20
Adelia . . . . .	7 * 11	* Cyrtogonone . . . . .	1
Adenophaedra . . . . .	2	Cyrtogyne . . . . .	1
Adriana . . . . .	5	Daphniphyllum . . . . .	12
Aextoxicon . . . . .	1		or more
Agrostistachys . . . . .	7	* Deuteromallotus . . . . .	1
Alchorneopsis . . . . .	2	Discocarpus . . . . .	3
* Alcinaeanthus . . . . .	1	* Discoclaoxylon . . . . .	3
Androstachys . . . . .	1 * 11	* Discocleidion . . . . .	2
Antidesma . . . . .	70	Discoglypremna . . . . .	1
	or more	Ditta . . . . .	1
* Aparisthemium . . . . .	1	only female known	
Aporosa . . . . .	30	Drypetes . . . . .	10
Aporosella . . . . .	1	Erythrocoeca . . . . .	1 * 25
Astrocasia . . . . .	1	Everettiodendron . . . . .	1
* Athroandra . . . . .	17	Fontainea . . . . .	1
Baccaurea . . . . .	40—50	Galearia . . . . .	12 * 16
Baccaureopsis . . . . .	1	Gavarretia . . . . .	2
* Baliospermum . . . . .	4	Givotia . . . . .	1 * 2
Bischofia . . . . .	1	Grossera . . . . .	2 * 3
* Blumeodendron . . . . .	3	Hamilcoa . . . . .	1
Bocquillonia . . . . .	5—6	Hasskarlia . . . . .	1 * 4
Buraeavia . . . . .	2	Hemicyclia . . . . .	9
* Caelebogyne . . . . .	2	Heywoodia . . . . .	1
Caryodendron . . . . .	2	Hieronymia . . . . .	10
Centroplicus . . . . .	1	Holstia . . . . .	2
Chaetocarpus . . . . .	4—5 * 7	Hymenocardia . . . . .	5
Chascotheca . . . . .	2	Klaineanthus . . . . .	1
Cheilosa . . . . .	1	Lachnostylis . . . . .	1
Chlamydojatropha . . . . .	1	Lasiocroton . . . . .	1 * 4
Chondrostylis . . . . .	1	Lepidoturus . . . . .	3
Choriophyllum . . . . .	1	Leptonemea . . . . .	1
* Clarorivinia . . . . .	1	Leucocroton . . . . .	4
Cluytia . . . . .	25	Maesobotrya . . . . .	1
Coccoceras . . . . .	3	Manniophyton . . . . .	1
Cocconerion . . . . .	2	Martretia . . . . .	1
* Codiaem	1	Mettenia . . . . .	3 * 2
luzonicum . . . . .		Microdesmis . . . . .	2
Coelediscus . . . . .	4	Mischodon . . . . .	1
Cometia . . . . .	2	Neoboutonia . . . . .	2
Conceveiba . . . . .	4	Neojatropha . . . . .	2
* Conceveibastrum . . . . .	1	Neomanniophyton . . . . .	10 * 12
Crotonogyne . . . . .	1 * 2	* Neotrawia . . . . .	1
* Cunuria . . . . .	2	* Nulbraedia . . . . .	1
		Oldfieldia . . . . .	1

	Species		Species
Pachystemon . . . . .	6	Anacardiaceae	
Paivausa . . . . .	1	Blepharocarya . . . . .	1
Pausandra . . . . .	2	Catutsjeron . . . . .	5
Pimeleodendron . . . . .	2-3 * 4	Faguetia . . . . .	1
only male known		Haematostaphis . . . . .	1
Piranhea . . . . .	1	Haplorhus . . . . .	1
Plagiostyles . . . . .	1	Harpephyllum . . . . .	1
Platystigma . . . . .	1	Lanea . . . . .	14
Podadenia . . . . .	1 * 2	Loxostylis . . . . .	1
Poggeophyton . . . . .	1	Mosquitoxylum . . . . .	1
Pogonophera . . . . .	1 * 2	Parishia . . . . .	4
Polydragma . . . . .	1	Pegia . . . . .	1
* Poranthera . . . . .	1	Pistacia . . . . .	5
alpina		Pleiogynium . . . . .	1
Protomegabaria . . . . .	2	Poupartia . . . . .	4
Pseudagrostistachys . . . . .	1	Pseudosmodingium . . . . .	3
Pseudocroton . . . . .	1	Pseudospondias . . . . .	1
Pseudolachnostylis . . . . .	2	Spondiopsis . . . . .	1
Richeria . . . . .	3	Tapirira . . . . .	5
Ricinodendron . . . . .	2 * 3		
Savia . . . . .	4	Aquifoliaceae	
Scortechinia . . . . .	3	Ilex . . . . .	170
Secretania . . . . .	1	Phelline . . . . .	12
Sibangea . . . . .	1		
Spondianthus . . . . .	2	Celastraceae	
Staphysora . . . . .	3	Celastrus . . . . .	27
Stenonia . . . . .	1	dioecism in question	
Tannodia . . . . .	1	Gyminda . . . . .	1
Tetracarpidium . . . . .	1	Lauridia . . . . .	1
female only known		dioecism in question	
Tetracoccus . . . . .	1	Peripterygia . . . . .	1
Tetraglochidion . . . . .	1	dioecism in question	
female only known		Schaefferia . . . . .	2-3
Thecacoris . . . . .	4	Tetrasiphon . . . . .	1
Toxicodendron . . . . .	1		
Trewia . . . . .	2 * 1	Salvadoraceae	
Trigonopleura . . . . .	1	Azima . . . . .	2-3
Uapaca . . . . .	11		
* Uranthera . . . . .	1	Icacinaceae	
dioecism ?		Chlamydocarya . . . . .	3
* Veconcitea . . . . .	2	Endacanthus . . . . .	1
Wetria . . . . .	2	Freeria . . . . .	1
		Grisollea . . . . .	1
Buxaceae		Jodes . . . . .	6
Simmondsia . . . . .	1	Miquelia . . . . .	5
Empetraceae		Natsiatum . . . . .	1
Ceratiola . . . . .	1	Natsiatopsis . . . . .	1
Corema . . . . .	2	Phytocrene . . . . .	7
		Polycephalium . . . . .	1
		Polyporandra . . . . .	2

	Species		Species
Pyrenacantha . . . . .	6	Flacourtiaceae	
Sarcostigma . . . . .	3	Bennettia . . . . .	2
Stachyanthus . . . . .	1	Buchnerodendron . . . . .	1
Elaeocarpaceae		Doryalis . . . . .	11
Elaeocarpus . . . . .	1	Gertrudia . . . . .	1
Sect. <i>Acronodia</i>		Gynocardia . . . . .	1
Tiliaceae		Itoa . . . . .	1
Althoffia . . . . .	1	Kiggelaria . . . . .	3
Asterophorum . . . . .	1	Pangium . . . . .	2
only male flowers known		Physena . . . . .	2
Carpodiptera . . . . .	3	Ryparosa . . . . .	8
Christiania . . . . .	1	Solmsia . . . . .	2
Pentadiplandra . . . . .	1	Trichadenia . . . . .	1
Vasivaea . . . . .	1	Trimeria . . . . .	2
Malvaceae		Xymalos . . . . .	1
Kydia . . . . .	2	Turneraceae	
Napaea . . . . .	1	Hyalocalyx . . . . .	1
Sterculiaceae		Mathurina . . . . .	1
Büttneria . . . . .	1	Piriqueta . . . . .	19
<i>B. scabera</i> under Bestäubung		Streptopetalum . . . . .	2
Theaceae		Turnera . . . . .	58
Eurya . . . . .	28	Wormskioldia . . . . .	8
Sect. <i>Proteurya</i> 27 Species		Passifloraceae	
Sect. <i>Ternstroemiopsis</i> 1 Species		Adenia . . . . .	30
Ternstroemia . . . . .	4	Atheranthera . . . . .	1
Guttiferae		only male plant known	
Allanblackia . . . . .	1	Echinothamnus . . . . .	1
Astrotheca . . . . .	1—2	only male plant known	
male flowers known only		Ophiocaulon . . . . .	5—6
Balboa . . . . .	1	Tetrapathaea . . . . .	1
Caraipa . . . . .	8	Caricaceae	
Chrysochlamys . . . . .	8	Jacartia . . . . .	5
Clusianthemum . . . . .	2	Datisceae	
Clusiella . . . . .	1	Octomeles . . . . .	2
Haploclathra . . . . .	2	Tetrameles . . . . .	1
Havetia . . . . .	1	Thymelaeaceae	
Havetiopsis . . . . .	5	Daphnopsis . . . . .	20—25
Leioclusia . . . . .	1	Funifera . . . . .	2
only female flowers known		Goodallia . . . . .	1
Oedematopus . . . . .	3	Hyptiodaphne . . . . .	1
Pentaphalangium . . . . .	1	Elaeagnaceae	
Pilosperma . . . . .	1	Hippophaës . . . . .	2
Quapoia . . . . .	2—3	Lepargyreae . . . . .	3
Tripetalum . . . . .	1	Sonneratiaceae	
Frankeniaceae		Xenodendron . . . . .	1
Frankenia . . . . .	1	only male flowers known	
only female flowers known			
Tamaricaceae			
Tamarix . . . . .	3		

	Species		Species
Melastomataceae		Labiatae	
Lijndenia . . . . .	1	Iboza . . . . .	12
Araliaceae		Moschosma . . . . .	1
Aralidium . . . . .	1—2	Section II	
Strobilopanax . . . . .	2	Scrophulariaceae	
Umbelliferae		Digitalis . . . . .	?
Arctopus . . . . .	3	see under „Bestäubung“	
Ledebouriella . . . . .	2	Orobanchaceae	
Volkensiella . . . . .	1	Aiginetia . . . . .	2
only female known		Boschniakia . . . . .	1
Cornaceae		Christisonia . . . . .	9
Aucuba . . . . .	3	Cistanche . . . . .	11
Cornus . . . . .	1	Conopholis . . . . .	1
only female known		Lathraea . . . . .	5
Griselinia . . . . .	7	Orobanche . . . . .	90
Helwingia . . . . .	2 * 3	Phelipaea . . . . .	2
Kaliphora . . . . .	1	Plantaginaceae	
Torricellia . . . . .	2 * 3	Plantago . . . . .	1
Theophrastaceae		Section XI, Cleiosantha	
Clavija . . . . .	33	Rubiaceae	
Myrsinaceae		Alibertia . . . . .	20
Amblyanthus . . . . .	1	Amajoua . . . . .	3
* Cybianthus . . . . .	35	Anthispermum . . . . .	25
* Embelia . . . . .	92	Basanacantha . . . . .	10
Grenacheria . . . . .	6	Byrsophyllum . . . . .	2
Hymenandra . . . . .	1	Crocylis . . . . .	1
* Maesa . . . . .	102	Danais . . . . .	20
* Monoporus . . . . .	6	Duroia . . . . .	10
* Myrsine . . . . .	4	Garapatica . . . . .	1
Wallenia . . . . .	15	Gynochthodes . . . . .	3
* Weigeltia . . . . .	21	Kotchubaea . . . . .	1
Sapotaceae		Melanopsidium . . . . .	1
Lucunia . . . . .	1	Morindopsis . . . . .	1
Sec. 14, Nachträge II—IV, 1897, p. 274		Nenax . . . . .	6
Sideroxydon . . . . .	1	Praravinia . . . . .	1
Sec. 26, Nachträge II—IV, 1897, p. 277		Prismatomeris . . . . .	1
Ebenaceae		Stachyarrhena . . . . .	3
Diospyros . . . . .	180	Thieleodoxa . . . . .	1
Maba . . . . .	63	Valerianaceae	
Rhaphedanthus . . . . .	1	Phuodendron . . . . .	1
relationship to Ebenaceae questioned		Cucurbitaceae	
Tetraclis . . . . .	1	Abobra . . . . .	1
Convolvulaceae		Acanthosicyos . . . . .	1—2
Cladostigma . . . . .	1	Adenopus . . . . .	4
only female known		Alsomitra . . . . .	11 * 14
Verbenaceae		Ampelosycios . . . . .	1
Aegiphila . . . . .	30		

	Species		Species
Anguria . . . . .	17	Physedra . . . . .	3
mostly dioecious		Sicydium . . . . .	6
Anguriopsis . . . . .	1	Siolmatra . . . . .	2 * 5
Anisosperma . . . . .	1	Sphaerosicyos . . . . .	1
Biswarea . . . . .	1	Telfairia . . . . .	2
Bryonia . . . . .	6	Thladiantha . . . . .	7—8 * 23
mostly dioecious		Trochomeria . . . . .	11
Coccinia . . . . .	14	mostly dioecious	
mostly dioecious		Trochomeriopsis . . . . .	1
Cogniauxia . . . . .	3	Zanonia . . . . .	2 * 1
Dieudonnaea . . . . .	1	Compositae	
Dimorphochlamys . . . . .	1	Antennaria . . . . .	15
Edgaria . . . . .	1	also gynodioecious	
Edmondia . . . . .	1	Arsium . . . . .	1
Eulenburgia . . . . .	1	A. arvense	
Eureiandra . . . . .	1	Astemma . . . . .	1
Fevillea . . . . .	6 * 7	Baccharis . . . . .	350
Gerrardanthus . . . . .	4 * 5	Brachylaena . . . . .	6
Gurania . . . . .	49	Heterothalamus . . . . .	3
mostly dioecious		Luciliopsis . . . . .	2
Gymnopetalum . . . . .	2	Lycoseris . . . . .	10
Gynostemma . . . . .	5	Mniodes . . . . .	2
mostly dioecious		Moquinia . . . . .	9
Helmontia . . . . .	2	Myripnois . . . . .	2
Hemsleya . . . . .	1 * 8	Parastrephia . . . . .	1
Herpetospermum . . . . .	1	Petrobium . . . . .	1
Hodgsonia . . . . .	1	Podanthus . . . . .	2
Macrozania . . . . .	1 * 3	Serratula . . . . .	2
sometimes polygamous-dioecious		Section I	
Maximowiczia . . . . .	2 * 3	Synchodendron . . . . .	1
Melothria . . . . .	20	Tafalla . . . . .	4—5
Sec. II, mostly dioecious	about	Tarchonanthus . . . . .	2—3
Peponopsis . . . . .	1	Vernonia . . . . .	1
Phialocarpus . . . . .	1	Section XIII	

**Androdioecious**

	Species		Species
Myrtaceae		Symplocaceae	
Decaspermum . . . . .	10	Symplocos . . . . .	17
		Section I	

**Gynodioecious**

	Species		Species
Araceae		Origanum . . . . .	5—7
* Pothoidium . . . . .	1	Satureia . . . . .	number not given
Labiatae		Section XI	3 Sub-Species
Colebrookia . . . . .	1		Species
Mentha . . . . .	Many Species	Thymus . . . . .	86
number not given			



**Androdioecious and gynodioecious**

Compositae	Species
Archibaccharis . . . . .	1

**Hermaphrodite or monoecious**

	Species		Species
Potamogetonaceae		Simarubaceae	
Zostera . . . . .	5 * 6	Eurycoma . . . . .	3
Monoecious?		Hannoa . . . . .	2
Polygonaceae		Burseraceae	
Coccoloba . . . . .	125	Bursera . . . . .	40
Rumex . . . . .	100	Canariellum . . . . .	1
Phytolaccaceae		Canarium . . . . .	80
Giesekia . . . . .	5	Commiphora . . . . .	129
Phytolacca . . . . .	11	Garuga . . . . .	3
Caryophyllaceae		Pachylobus . . . . .	7
Illecebrum . . . . .	1	Scutinanthe . . . . .	1
Anonaceae		Tetragastris . . . . .	3
Sphaerothalamus . . . . .	1	Trattinickia . . . . .	2
occasionally monoecious		Dichapetalaceae	
Uvaria . . . . .	70	Tapura . . . . .	3
occasionally monoecious		Anacardiaceae	
Monimiaceae		Sorindeia . . . . .	7
Daphnandra . . . . .	2	Celastraceae	
Doryphora . . . . .	1	Cassine . . . . .	30
Hortonia . . . . .	3	about	
Nemuaron . . . . .	2	Gymnosporia . . . . .	60
Capparidaceae		Maytenus . . . . .	70
Crataeva . . . . .	10	Microtropis . . . . .	9
occasionally monoecious		occasionally monoecious	
Resedaceae		Perrottetia . . . . .	8—10
Ochradenus . . . . .	4	Salvadoraceae	
Oligomeris . . . . .	5	Salvadora . . . . .	2
Reseda . . . . .	53	Icacinaceae	
Saxifragaceae		Lophopyxis . . . . .	3
Astilbe . . . . .	6	Rhamnaceae	
Donatia . . . . .	2	Apteron . . . . .	1
occasionally monoecious		Crumenaria . . . . .	4
Cunoniaceae		Gouania . . . . .	30—40
Spiraeanthemum . . . . .	5	Helinus . . . . .	4
Rutaceae		Pleuranthodes . . . . .	2
Casimiroa . . . . .	4	Reissekia . . . . .	1
Citrus . . . . .	6	Sterculiaceae	
Evodia . . . . .	45	Triplochiton . . . . .	2
Fagara . . . . .	130	Thymelaeaceae	
Feronia . . . . .	1	Lagetta . . . . .	3
Melicope . . . . .	?		

	Species		Species
Sapotaceae		Campanulaceae	
Omphalocarpum . . . . .	4	Lobelia . . . . .	200
Sideroxylon . . . . .	3	rarely monoecious	about
Sections 20 and 21			
Loganiaceae		Stylidiaceae	
Geniostoma . . . . .	20	Forstera . . . . .	4
Labordia . . . . .	9	Levenhookia . . . . .	6 * her
Rubiaceae		Phyllachne . . . . .	4
Bataprine . . . . .	2		
Galium . . . . .	200		

## Polygamo-dioecious

	Species		Species
Alismataceae		Malpighiaceae	
Echinodorus . . . . .	1	Microsteira . . . . .	1
Palmae		Ryssopteris . . . . .	7
Korthalsia . . . . .	19	Enphorbiaceae	
Piperaceae		Homonoya . . . . .	3—4
Piper . . . . .	100	Anacardiaceae	
Section IV, Eupiper		Astronium . . . . .	9
Rafflesiaceae		Camptosperma . . . . .	8
Brugmansia . . . . .	2—3	Heeria . . . . .	7
Chenopodiaceae		Laurophyllus . . . . .	1
Spinacia . . . . .	2	Lithraea . . . . .	3
Aizoaceae		Rhodosphaera . . . . .	1
Tetragonia . . . . .	1	Schinus . . . . .	12
Section I		Smodingium . . . . .	1
Portulacaceae		Trichoscypha . . . . .	16
Ceraria . . . . .	1	Sapindaceae	
* Tiliacora . . . . .	15	Distichostemon . . . . .	1
Lauraceae		Dodonaea . . . . .	46
Ocotea . . . . .	200	Vitaceae	
rarely hermaphrodite	about	Tetrastigma . . . . .	40
Rosaceae		Vitis . . . . .	28
Exochorda . . . . .	3	Guttiferae	
Hagenia . . . . .	1	Rheedia . . . . .	17
Maddenia . . . . .	2	Rhizophoraceae	
Nuttalia . . . . .	1	Blepharistemma . . . . .	1
Parastemon . . . . .	1	Nyssaceae	
Sibiraea . . . . .	20	* Davidia . . . . .	1
Erythroxylaceae		Nyssa . . . . .	6
* Erythroxylon . . . . .	7	Umbelliferae	
Sect. Heterogyne		Aciphylla . . . . .	16
* Erythroxylon . . . . .	1	Myrsinaceae	
Meliaceae		Geissanthus . . . . .	10
Clemensia . . . . .	1	Myrsine . . . . .	4
Ptaeroxylon . . . . .	1		

	Species		Species
Styracaceae		Myonima . . . . .	5
* Bruinsmia . . . . .	2	Pachystylus . . . . .	1
Rubiaceae		Timonius . . . . .	20
Allaeophania . . . . .	3	Compositae	
Bobea . . . . .	5	Heterothalamus . . . . .	2
Carpococe . . . . .	3-4	Rhetinodendron . . . . .	1
Cuviera . . . . .	5-6	Robinsonia . . . . .	7-8
Hodgkinsonia . . . . .	1		

**Dioecious or monoecious**

	Species		Species
Potamogetonaceae		Dioscoraceae	
Althenia . . . . .	1 * 4	Borderea . . . . .	2
Hydrocharitaceae		Dioscorea . . . . .	200
Blyxa . . . . .	2	more than 30 known by males only	
Enalus . . . . .	1	Higinbothamia . . . . .	1
dioecious?		Chloranthaceae	
Halophila . . . . .	1	Hedysomum . . . . .	20
Hydrilla . . . . .	1	Myricaceae	
dioecious?		Myrica . . . . .	50
Hydromystria . . . . .	2-3	Fagaceae	
Thalassia . . . . .	2	Nothofagus . . . . .	12
dioecious?		rarely dioecious	
Gramineae		Moraceae	
Buchloë . . . . .	1	Bleekrodia . . . . .	2
rarely monoecious   sex dimorphism		Fatoua . . . . .	1
Cinnagrostis . . . . .	1	Ficus . . . . .	600
monoecious?		rarely dioecious	
Opizia . . . . .	2	Morus . . . . .	10
rarely monoecious   sex dimorphism		Pseudomorus . . . . .	1
Cyperaceae		Pseudostreblus . . . . .	2
Carex . . . . .	800 * 21	Urticaceae	
about		Achudemia . . . . .	1
* Cohesia . . . . .	6	Astrothalamus . . . . .	1
rarely dioecious		Boehmeria . . . . .	45
Hemicarex . . . . .	10	Chamabainia . . . . .	1
monoecious tending to dioecious		Cypholophus . . . . .	9
Araceae		Debregeasia . . . . .	5
Arisaema . . . . .	70	Distemon . . . . .	1
Restionaceae		Elatostema . . . . .	50
Anarthria . . . . .	6	Fleurya . . . . .	8
rarely monoecious		Girardinia . . . . .	6
Elegia . . . . .	13	Gyrotaenia . . . . .	3
rarely monoecious		Hesperocnide . . . . .	2
Leptocarpus . . . . .	21	Laportea . . . . .	25
rarely monoecious			
Loxocarya . . . . .	17		
rarely monoecious			

	Species		Species
Lecanthus . . . . .	1	Magnoliaceae	
Leacosyke . . . . .	9	Kadsura . . . . .	7 about
Maoutia . . . . .	8	Schizandra . . . . .	6—7
Memorialis . . . . .	13	Anonaceae	
Myriocarpa . . . . .	6	Anonidium . . . . .	2
Nanocnide . . . . .	2	dioecious?	
Pilea . . . . .	100	Monimiaceae	
Pipturus . . . . .	8	* Carnegia . . . . .	1
Urticaceae		Carnegieodoxa . . . . .	1
Poikilospermum . . . . .	1	* Hennicartia . . . . .	1
Pouzolzia . . . . .	35	Lauterbachia . . . . .	1
Procris . . . . .	5	* Levieria . . . . .	4
Sarcochlamys . . . . .	1	* Siparuna . . . . .	108
Sceptrocnide . . . . .	1	* Tambourissa . . . . .	18
Touchardia . . . . .	1	Simarubaceae	
Urera . . . . .	18	Amaroria . . . . .	1
Urtica . . . . .	30	Hebonga . . . . .	2
Villebrunea . . . . .	8	dioecious?	
Proteaceae		Picrocardia . . . . .	1
Dilobeia . . . . .	1	dioecious?	
Santalaceae		Euphorbiaceae	
Henslowia . . . . .	13	Acalypha . . . . .	220
Olacaceae		rarely dioecious	
Aptandra . . . . .	1	Actephila . . . . .	10
Loranthaceae		rarely dioecious	
Dendrophthora . . . . .	20	* Adenocline . . . . .	3
rarely monoecious		Alchornea . . . . .	30 * 46
Eremolepis . . . . .	5	Aleurites . . . . .	3—5
Viscum . . . . .	20 about	monoecious tending to dioecious	
Balanophoraceae		Amperea . . . . .	6
Langsdorffia . . . . .	1	* Angostylidium . . . . .	1
Thonningia . . . . .	1	Angostylis . . . . .	1
Rafflesiaceae		dioecious?	
Cytinus . . . . .	3	Baliospermum . . . . .	6
Scytanthus . . . . .	4	Baloghia . . . . .	9
Chenopodiaceae		Bernardia . . . . .	24 * 35
Eurotia . . . . .	2	Beyeria . . . . .	18 * 12
Grayia . . . . .	2	rarely dioecious	
occasionally monoecious		Blachia . . . . .	4—6
Sarcobatus . . . . .	1	monoecious or almost dioecious	
Phytolaccaceae		Bonania . . . . .	6
* Codonocarpus . . . . .	3	dioecious?	
Gyrostemon . . . . .	6	Bridelia . . . . .	31
Menispermaceae		rarely dioecious	
* Albertisia . . . . .	1	Caperonia . . . . .	21 * 33
		rarely dioecious	
		Claoxylon . . . . .	45 * 57
		rarely monoecious	
		Cleidion . . . . .	18 * 17
		oftener dioecious	

	Species
Cleistanthus . . . . .	30 * 106
* Cluytia . . . . .	48
Coelodepas . . . . .	3 * 6
* Cordemoya . . . . .	1
Croton . . . . .	500—600
Dimorphocalyx . . . . .	3—4 * 6
rarely monoecious?	
Dissiliaria . . . . .	2
dioecious?	
* Ditaxis . . . . .	43
* Endospermum . . . . .	10
Excoecaria . . . . .	30 * 26
rarely monoecious	
Flueggea . . . . .	6
Garcia . . . . .	1
dioecious?	
Gelonium . . . . .	15 * 18
rarely monoecious	
Gentilia . . . . .	2
rarely dioecious	
Gymnanthes . . . . .	10 * 11
rarely dioecious	
* Homolanthus . . . . .	19
* Jatropha . . . . .	150—160
Lautenbergia . . . . .	2
rarely monoecious	
Lebidieropsis . . . . .	1
* Leucocroton . . . . .	5
rarely monoecious	
Lingelsheimia . . . . .	5
Macaranga . . . . .	90 * 160—170
very rarely monoecious	
Mallotus . . . . .	80 * 100
or more rarely monoecious	about
* Maprounea . . . . .	4
rarely dioecious	
* Melanolepis . . . . .	1
Mercurialis . . . . .	7 * 8
rarely monoecious	
Micrandra . . . . .	3 * 5
monoecious tending to dioecious	
* Micrococca . . . . .	10
* Neuboutonia . . . . .	3
rarely monoecious	
Ostodes . . . . .	6 * 10
Pera . . . . .	20
Phyllanthus . . . . .	400
Putranjiva . . . . .	4
Reverchonia . . . . .	1
Sapium . . . . .	25 * 95
rarely dioecious	

	Species
* Sebastiania . . . . .	75
Securinea . . . . .	11
* Seidelia . . . . .	2
rarely dioecious	
* Spirostachys . . . . .	4
Tetrorchidium . . . . .	4
Tragia . . . . .	50 * 125
rarely dioecious	
<b>Buxaceae</b>	
Styloceras . . . . .	3
monoecious tending to dioecious	
<b>Empetraceae</b>	
Empetrum . . . . .	1
rarely monoecious	
<b>Flacourtiaceae</b>	
Idesia . . . . .	1
Poliothysis . . . . .	1
Trichostephanus . . . . .	1
<b>Caricaceae</b>	
Carica . . . . .	21
<b>Thymelaeaceae</b>	
Ovidia . . . . .	4
<b>Umbelliferae</b>	
Coxella . . . . .	1
<b>Rubiaceae</b>	
Oldenlandia . . . . .	1
Section XII, dioecious?	
<b>Cucurbitaceae</b>	
* Actinostemma . . . . .	7
rarely dioecious	
* Anguria . . . . .	29
Apodanthera . . . . .	14 * 25
Cayaponia . . . . .	60—70
rarely dioecious	
Cerathosantes . . . . .	8 * 15
* Corallocarpus . . . . .	34
rarely dioecious	
Cucumis . . . . .	26
rarely dioecious	
Cucurbitella . . . . .	4 * 5
* Gurania . . . . .	73
Kedrostis . . . . .	12 * 27
rarely dioecious	
Melothria . . . . .	30 * 85
rarely dioecious	about
Momordica . . . . .	25
Raphanistocarpus . . . . .	1
Trichosantes . . . . .	42
Wilbrandia . . . . .	7 * 8
rarely dioecious	

## Hermaphrodite or polygamous

	Species		Species
Palmae		Meliaceae	
Acanthorhiza . . . . .	4	Aglaia . . . . .	70
Proteaceae		polygamous?	
Simsia . . . . .	5	Ekebergia . . . . .	8—9
Santalaceae		polygamous?	
Pyrularia . . . . .	2	Coriariaceae	
rarely hermaphrodite		Coriaria . . . . .	8
Polygonaceae		Anacardiaceae	
Polygonella . . . . .	5—6	Allospodias . . . . .	1
Polygonum . . . . .	150	polygamous?	
Pteroxygonum . . . . .	1	Comoeladia . . . . .	9
Chenopodiaceae		Celastraceae	
Chenopodium . . . . .	50—60	Plenckia . . . . .	1
Cycloloma . . . . .	1	Icacinaceae	
Anonaceae		Villaresia . . . . .	8
Miliusa . . . . .	24	Sabiaceae	
sometimes polygamous		Sabia . . . . .	17
Polyalthia . . . . .	70	rarely polygamous	
Monimiaceae		Vitaceae	
* Hortonia . . . . .	8	Cissus . . . . .	250
Lauraceae		Elaeocarpaceae	
Cinnamomum . . . . .	54	Aristotelia . . . . .	7
Rosaceae		Elaeocarpus . . . . .	60
Lecostomion . . . . .	6	rarely polygamous	
Rubus . . . . .	4	Quiinaceae	
Section III		Quiina . . . . .	16
Sibbaldia . . . . .	8	occasionally hermaphrodite	
Leguminosae		Flacourtiaceae	
Acacia . . . . .	450	Azara . . . . .	22
Adenantha . . . . .	8	rarely polygamous	
Albizzia . . . . .	50	Dasylepis . . . . .	2
rarely polygamous		Flacourtia . . . . .	15
Bauhinia . . . . .	150	Lunania . . . . .	7
rarely polygamous		rarely polygamous	
Mimosa . . . . .	300	Patrisia . . . . .	10
Newtonia . . . . .	1	rarely polygamous	
Pithecolobium . . . . .	110	Phyllobotryum . . . . .	1
rarely polygamous		Prockiopsis . . . . .	1
Schranckia . . . . .	7	Rawsonia . . . . .	1
Rutaceae		rarely polygamous	
Barosma . . . . .	15	Soyauxia . . . . .	2
Simarubaceae		rarely polygamous	
Kirkia . . . . .	1	Tetrathylacium . . . . .	1
		Passifloraceae	
		Paschanthus . . . . .	1
		Thymelaeaceae	
		Wikstroemia . . . . .	20

Hermaphrodite — Monoecious — Andromonoecious

55

	Species		Species
Alangiaceae		Thapsia . . . . .	6
Alangium . . . . .	15	Tornabenia . . . . .	3
polygamous?		Sapotaceae	
Oenotheraceae		Pouteria . . . . .	1
Fuchsia . . . . .	60	Section I	
Araliaceae		Sideroxylon . . . . .	3
Acanthopanax . . . . .	12	Section 7, occasionally polygamous	
Fatsia . . . . .	1	Oleaceae	
Gilibertia . . . . .	20	Chionanthus . . . . .	2
Umbelliferae		Loganiaceae	
Elaeoselinum . . . . .	8	Logania . . . . .	21
Guillonea . . . . .	2	Dipsacaceae	
Laserpitium . . . . .	30	Knautia . . . . .	30
Margotia . . . . .	1	polygamous?	
Melanoselinum . . . . .	2	Scabiosa . . . . .	53
Polylophium . . . . .	2	polygamous?	
Siler . . . . .	3	Succisa . . . . .	2—4
		polygamous?	

Hermaphrodite, polygamous, andromonoecious

	Species		Species
Piperaceae		Elaeagnaceae	
Verhuellia . . . . .	2	Elaeagnus . . . . .	40

Monoecious, dioecious, polygamous

	Species		Species
Alismataceae		Euphorbiaceae	
* Sagittaria . . . . .	31	* Aluroites . . . . .	4
Piperaceae		* Tanodia . . . . .	2
Piper . . . . .	4	Flacourtiaceae	
Section III		Oncoba . . . . .	25
Santalaceae		Xylothea . . . . .	12
Omphacomeria . . . . .	2	Halorrhagaceae	
		Gunnera . . . . .	30

Andromonoecious, androdioecious, dioecious

	Species
Aceraceae	
Acer . . . . .	120
Dipteronia . . . . .	1

Hermaphrodite, dioecious, gynodioecious

	Species
Rubiaceae	
Bathysa . . . . .	6

Monoecious, dioecious, polygamous, polygamodioecious

	Species
Chenopodiaceae	
Atriplex . . . . .	120

**Hermaphrodite, monoecious, dioecious, polygamous**

	Species		Species
Triuridaceae		Magnoliaceae	
Andruris . . . . .	6	Drimys . . . . .	13 about
Sciaphila . . . . .	35	Rutaceae	
		Amyris . . . . .	10

**Hermaphrodite, androdioecious**

	Species	Theaceae	Species
Anacardiaceae		Ternstroemia . . . . .	24
Nothospondias . . . . .	1	rarely androdioecious	
Spondianthus . . . . .	2		

**Hermaphrodite or trioecious**

Loranthaceae	Species
Tupeia . . . . .	1

**Monoecious or andromonoecious**

	Species		Species
Gramineae		Tristachya . . . . .	8
Trichopteryx . . . . .	10		

**Monoecious or gynomonoecious**

	Species		Species
Compositae		Leontopodium . . . . .	2—4
Anaphalis . . . . .	30	Oligandra . . . . .	3

**Dioecious or gynodioecious**

	Species		Species
Euphorbiaceae		Epaltes . . . . .	10
* Lautembergia . . . . .	3	Pluchea . . . . .	30
Compositae		Pterocaulon . . . . .	11—12
Blumea . . . . .	60		

**Gynomonoecious or polygamous**

	Species		Species
Urticaceae		Rousselia . . . . .	1
Parietaria . . . . .	7		

**Dioecious or polygamous**

	Species		Species
Pandanaceae		Chamaerops . . . . .	2
Freycinetia . . . . .	62 * 62	Rhapidophyllum . . . . .	1
all dioecious		Rhapis . . . . .	5
Pandanus . . . . .	157 * 140	Trachycarpus . . . . .	4
about, dioecious + 16 sterile sp. (cultivates)		Zalacca . . . . .	10
Palmae		Polygonaceae	
Calamus . . . . .	200 about	Muehlenbeckia . . . . .	15



	Species		Species
Amarantaceae		Violaceae	
Amarantus . . . . .	45	Hymenanchera . . . . .	4
Crassulaceae		Flacourtiaceae	
Rhodiola . . . . .	12	Hydnocarpus . . . . .	28
	about	rarely polygamous	
Leguminosae		Myroxylon . . . . .	45
Gymnocladus . . . . .	2	rarely polygamous	
Euphorbiaceae		Datisacaceae	
* Homonoia . . . . .	3	Datisca . . . . .	2
		rarely polygamous	
Anacardiaceae		Araliaceae	
Semecarpus . . . . .	40	Meryta . . . . .	15
Tiliaceae		Umbelliferae	
Heliocarpus . . . . .	1	Trinia . . . . .	12
Dilleniaceae		Ebenaceae	
Actinidia . . . . .	8	Euclea . . . . .	17
		rarely polygamous	
Guttiferae		Oleaceae	
Clusia . . . . .	80	Forestiera . . . . .	14
rarely polygamous	about	Fraxinus . . . . .	39
Tovomita . . . . .	30	Rubiaceae	
about	about	Galopina . . . . .	2
Tovomitopsis . . . . .	8		
about	about		

**Monoecious and polygamous**

	Species		Species
Palmae		Sterculiaceae	
Ceroxylon . . . . .	5	Tetradia . . . . .	1
Fagaceae		Flacourtiaceae	
Castanea . . . . .	30	Camptostylus . . . . .	1
rarely polygamous		Halorrhagidaceae	
Fagus . . . . .	4	* Laurembergia . . . . .	18
rarely polygamous		Myriophyllum . . . . .	40
Pasania . . . . .	100	Araliaceae	
rarely polygamous		Stilbocarpa . . . . .	2
Celastraceae		Valerianaceae	
Phoecea . . . . .	1	Belonanthus . . . . .	2
polygamous?			

**Monoecious and gynodioecious**

	Species
Stylidaceae	
* Donatia . . . . .	2
(♀ rare in gynodioec. forms)	
* Phyllachne . . . . .	4

## Hermaphrodite or gynomonoeious

	Species		Species
Alismataceae		Cremanthodium . . . . .	11
* Limnophyton . . . . .	2	rarely hermaphrodite	
gynomonoeious?		Dahlia . . . . .	9
Burmanniaceae		ray flowers may be sterile	
Cymbocarpa . . . . .	1?	Eatonella . . . . .	2
Dictyostegia . . . . .	5	Flaveria . . . . .	8
Gymnosiphon . . . . .	20	Gaillardia . . . . .	12
	about	rarely gynomonoeious	
Alangiaceae		Galinsoga . . . . .	4
* Alangium . . . . .	21	Geissopappus . . . . .	3
Compositae		Gonospermum . . . . .	4
Actinella . . . . .	17	Gynoxys . . . . .	14
Anacyclus . . . . .	12	Gynura . . . . .	24
Arctotis . . . . .	58	rarely gynomonoeious	
Artemisia . . . . .	200	Haplopappus . . . . .	110
Aster . . . . .	200	Helenium . . . . .	30
mostly gynomonoeious — some with sterile		Jaumea . . . . .	6
ray flowers and disc flowers hermaphrodite		Ligularia . . . . .	30
Blepharipappus . . . . .	1	Matricaria . . . . .	50
Calea . . . . .	65	Oligoithrix . . . . .	3
Carthamus . . . . .	20	Othake . . . . .	6
rarely gynomonoeious		Pericome . . . . .	2
Centaurea . . . . .	470	Senecio . . . . .	1200
Chrysanthemum . . . . .	1	Solidago . . . . .	80
Cladanthus . . . . .	1	Verbesina . . . . .	?
Coreopsis . . . . .	70	ray flowers often sterile	
ray flowers may be sterile		Waldheimia . . . . .	8
Cotula . . . . .	50	Werneria . . . . .	30

## Polygamous or polygamo-dioecious

	Species		Species
Monimiaceae		Rosaceae	
Atherosperma . . . . .	1	Quillaja . . . . .	3
Laurelia . . . . .	2	Rubiaceae	
Siparuna . . . . .	106	Galium . . . . .	3
Halorrhagaceae		Section IX	
* Gunnera . . . . .	30		
(her. mon. di. — An. among either mon.			
or di.)			

## Hermaphrodite, polygamous or polygamo-dioecious

	Species		Species
Santalaceae		Dilleniaceae	
Scleromelum . . . . .	1	Saurauia . . . . .	60
Sclerophyron . . . . .	2	Stachyuraceae	
Rhamnaceae		Stachyurus . . . . .	2
Rhamnus . . . . .	70	polygamo-dioecious?	

**Hermaphrodite, polygamous or dioecious**

	Species		Species
Loranthaceae		Ebenaceae	
Phthirusa . . . . .	50	Royena . . . . .	13
rarely hermaphrodite or polygamous		rarely dioecious	
Amarantaceae		Oleaceae	
Aerua . . . . .	10	Osmanthus . . . . .	10
dioecious?		Thymelaeaceae	
Rosaceae		Pimelea . . . . .	70—80
Fragaria . . . . .	8	rarely polygamous to dioecious	
Dichapetalaceae		Flacourtiaceae	
Dichapetalum . . . . .	70	Banara . . . . .	17
Dilleniaceae		rarely polygamous or dioecious *	
Davilla . . . . .	20—25		
often polygamous, rarely dioecious	about		
Tetracera . . . . .	54		
often polygamous, rarely dioecious			

**Hermaphrodite, polygamous or monoecious**

	Species		Species
Nyctaginaceae		Icacinaceae	
Pisonia . . . . .	40	Pennantia . . . . .	4
rarely hermaphrodite		Platea . . . . .	5—6
Burseraceae		Pleurisanthes . . . . .	1
Protium . . . . .	47	Stemonurus . . . . .	10
Icacinaceae		Thymelaeaceae	
Leretia . . . . .	3	Thymelaea . . . . .	20
Mappia . . . . .	7		

**Dioecious or polygamo-dioecious**

	Species		Species
Urticaceae		Flacourtiaceae	
Phenax . . . . .	10	Carpotroche . . . . .	4
rarely polygamo-dioecious		Mayna . . . . .	7—8
Lauraceae		polygamo-dioecious?	
Iteadaphne . . . . .	1	Umbelliferae	
Laurus . . . . .	2	* Trinia . . . . .	11
Lindera . . . . .	60	rarely poly-dioecious	
about		Myrsinaceae	
Polyadenia . . . . .	3	* Geisanthus . . . . .	25
Euphorbiaceae		Compositae	
Endospermum . . . . .	5	Petasites . . . . .	14
occasionally poly-dioecious			
Celastraceae			
Otherodendron . . . . .	1		
rarely poly-dioecious			

**Hermaphrodite or andromonoecious**

	Species		Species
Gramineae		Simarubaceae	
Amphibromus . . . . .	1	Perriera . . . . .	1
Avena . . . . .	50	Vitaceae	
	about	Quinaria . . . . .	10
Corynephorus . . . . .	3	Sterculiaceae	
Deschampsia . . . . .	20	Mansonia . . . . .	1
Gaudinia . . . . .	2	Umbelliferae	
Trisetum . . . . .	50	* Heteromorpha . . . . .	1
	about	(see Bestäubung)	
Ventenata . . . . .	3	* Lichtensteinia . . . . .	7
Polygonaceae		* Rhyticarpus . . . . .	3
Rheum . . . . .	20		

**Hermaphrodite, andromonoecious or androdioecious**

	Species		Species
Santalaceae		Santalaceae	
Campereia . . . . .	2	Fusanus . . . . .	5
Colpoon . . . . .	2—3	Nanodea . . . . .	1
rarely andromonoecious or androdioecious			

**Hermaphrodite, monoecious or dioecious**

	Species		Species
Aponogetonaceae		Loranthaceae	
* Aponogeton . . . . .	1	Loranthus . . . . .	270
(spathaceous)		Halorrhagaceae	
Restionaceae		* Myriophyllum . . . . .	36
Lepyrodia . . . . .	15	(rarely dioecious)	
Santalaceae			
Exocarpus . . . . .	14		

**Hermaphrodite or dioecious**

	Species		Species
Santalaceae		Celastraceae	
Osyris . . . . .	6	Rhacoma . . . . .	14
rarely hermaphrodite		occasionally dioecious	
Balanophoraceae		Ochnaceae	
Rhopalocnemis . . . . .	1	Schnurmansia . . . . .	3—4
Phytolaccaceae		Theaceae	
* Phytolacca . . . . .	26	Eurya . . . . .	20
Anonaceae		Section Freziera, rarely hermaphrodite	
Orphea . . . . .	30	Guttiferae	
sometimes dioecious	about	Kielmeyera . . . . .	17
Leguminosae		Mahurea . . . . .	4
Pentaclethra . . . . .	2		

	Species		Species
Marila . . . . .	4	Oleaceae	
Renggeria . . . . .	2	Olea . . . . .	31
rarely hermaphrodite		Gentianaceae	
Myrsinaceae		Sweertia . . . . .	60—70
Ardisia . . . . .	235	rarely dioecious	
Discocalyx . . . . .	3 * 8	Rubiaceae	
* Grammadenia . . . . .	10	Lasianthus . . . . .	80
(rarely dioecious)		often dioecious	
* Rapanea . . . . .	136	Opercularia . . . . .	14
* Stylogyne . . . . .	40	Valerianaceae	
* Suttonia . . . . .	14	Valeriana . . . . .	144
Sapotaceae		Compositae	
Lucuma . . . . .	2	Carduus . . . . .	80
Section 15		occasionally dioecious	

**Gynomonoecious or gynodioecious**

	Species		Species
Geraniaceae		Plantaginaceae	
Erodium . . . . .	50	Plantago . . . . .	1
Labiatae		P. lanceolata	
Salvia . . . . .	1		
Section VII B			

**Gynomonoecious, gynodioecious or andromonoecious, androdioecious**

	Species
Plantaginaceae	
Plantago . . . . .	1
P. media	

**Hermaphrodite, monoecious, polygamodioecious**

	Species		Species
Icacinaceae		Sonneratiaceae	
Gonocaryum . . . . .	7	Crypteronia . . . . .	4

**Polygamous, polygamodioecious, monoecious**

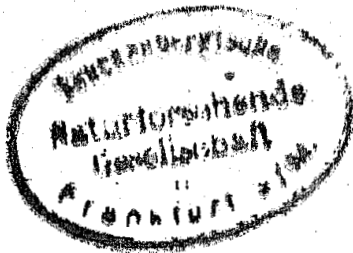
	Species
Flacourtiaceae	
Ophiobotrys . . . . .	1

**Dioecious, polygamodioecious, hermaphrodite**

	Species		Species
Myrsinaceae		Rubiaceae	
* Conomorpha . . . . .	37	Coprosma . . . . .	40

## Hermaphrodite or polygamo-dioecious

	Species		Species
Ranunculaceae		Guttiferae	
Actaea . . . . .	13	Garcinia . . . . .	180 about
Lauraceae		Myrsinaceae	
Ay dendron . . . . .	45	* Ardisia . . . . .	235
Nectandra . . . . .	70	rarely polygamo-dioecious	
Ravensara . . . . .	4	Conomorpha . . . . .	37
Rosaceae		Cybianthus . . . . .	35
Pygeum . . . . .	18	Embelia . . . . .	92
Meliaceae		Suttonia . . . . .	14
Aphanamixis . . . . .	10	Rubiaceae	
dioecious or mostly?		Antirrhoea . . . . .	20
Lansium . . . . .	4	Guettarda . . . . .	40
Anacardiaceae		Nertera . . . . .	6
Euroschinus . . . . .	5	Paederia . . . . .	18
Mauria . . . . .	7	Rubia . . . . .	4
Protorhus . . . . .	9	Section Angustifoliae	
Sabiaceae		Compositae	
Meliosma . . . . .	46	Chuquiragua . . . . .	43
rarely polygamo-dioecious		Doniophyton . . . . .	3











Hermaphrodite Polygamous and Polygamodioecious		Hermaphrodite Dioecious and Gynodioecious		Monoecious Polygamous and Polygamodioecious		Monoecious Dioecious and Polygamous		Andromonoecious Androdioecious and Dioecious		Dioecious Polygamodioecious Hermaphrodite		Hermaphrodite, Mo- noecious, Polygamous and Dioecious		Monoecious, Polyga- mous, Dioecious and Polygamodioecious		Gynomonoeious, Gyno- dioecious, Andromono- ecious, Androdioecious		Androdioecious and Gynodioecious		Monoecious and Gynomonoeious		
Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	





Monocious or Gynomonoecious		Monocious or Polygamous		Monocious or Dioecious		Gynomonoecious or Polygamous		Gynomonoecious or Gynodioecious		Polygamous or Polygamodioecious		Dioecious or Polygamous		Dioecious or Gynodioecious		Dioecious or Polygamodioecious		Hermaphrodite Monoecious and Polygamous		Hermaphrodite Monoecious and Dioecious		Hermaphrodite Monoecious and Polygamodioecious		Hermaphrodite Andromonoecious and Polygamous		Hermaphrodite Andromonoecious and Androdioecious		
p.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.

3 203

1 20

1 50

1 2

Polygamous and Dioecious		Hermaphrodite Polygamous and Polygamodioecious		Hermaphrodite Dioecious and Gynodioecious		Monoecious Polygamous and Polygamodioecious		Monoecious Dioecious and Polygamous		Andromonoecious and Androdioecious and Dioecious		Dioecious Polygamodioecious Hermaphrodite		Hermaphrodite, Monoecious, Polygamous and Dioecious		Monoecious, Polygamous, Dioecious and Polygamodioecious		Gynomonocious, Gynodioecious, Andromonoecious, Androdioecious		Androdioecious and Gynodioecious		Monoecious and Gynomonocious	
Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	

1 4

	Hermaphrodite		Monoecious		Andromonoecious		Gynomonoecious		Polygamous		Dioecious		Androdioecious		Gynodioecious		Polygamodioecious		Hermaphrodite or Monoecious	
	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.
Batidales												1	1							
Batidaceae																				
Julianiales												2	5							
Julianiaceae																				
Fagales			6	79																
Betulaceae			1	200																
Fagaceae																				
Urticales			9	110								2	2							
Ulmaceae												42	180							
Moraceae			24	166								4	20							
Urticaceae			7	21																
Proteales																				
Proteaceae	50	818	1	2					2	2	1	65								
Santalales																				
Myzodendraceae												1	9							
Santalaceae	12	184	1	2								3	14							
Opiliaceae	6	16										1	1							
Grubbiaceae	1	3																		
Olacaceae	18	115	1	2								1	4							
Octoknemataceae												5	53							
Loranthaceae	10	170	6	109								3	13							
Balanophoraceae			8	20																
Aristolochiales																				
Aristolochiaceae	7	202											5	20				1	2	
Rafflesiaceae	1	1																		
Hydnoraceae	2	10																		
Polygonales																				
Polygonaceae	21	223	1	1					1	15	4	34								2
Centrospermae																				
Chenopodiaceae	33	173	7	12	1	1	14	82	13	101								1	2	
Amarantaceae	45	393	3	3						1	2	3	7							
Nyctaginaceae	16	84	2	31						1	1									
Cynocrambaceae			1	2																2
Phytolaccaceae	17	61	4	4								1	1					1	1	
Aizoaceae	37	850			1	1												1	1	
Portulacaceae	19	202																		
Basellaceae	5	15																		1
Caryophyllaceae	75	1400						1	3			1	2							

Andromonoecious		Hermaphrodite or Gynomonoeious		Hermaphrodite or Polygamous		Hermaphrodite or Dioecious		Hermaphrodite or Androdioecious		Hermaphrodite or Polygamodioecious		Hermaphrodite or Triocious		Monoecious or Andromonoecious		Monoecious or Gynomonoeious		Monoecious or Polygamous		Monoecious or Dioecious		Gynomonoeious or Polygamous		Gynomonoeious or Gynodioecious		Polygamous or Polygamodioecious		Dioecious or	
Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	
				1	5														3	134	1	12							
				1	2	1	6														6	616							
																					30	404	2	8					
																						1	1						
																						1	1						
												1	1									3	45						
																						2	2						
																							2	7					
20				3	151																								
				2	61																		3	5					
																							1	6					

(1) (26)



Andromonoecious		Monoecious or Gynomonoeious		Monoecious or Polygamous		Monoecious or Dioecious		Gynomonoeious or Polygamous		Gynomonoeious or Gynodioecious		Polygamous or Polygamodioecious		Dioecious or Polygamous		Dioecious or Gynodioecious		Dioecious or Polygamodioecious		Hermaphrodite Monoecious and Polygamous		Hermaphrodite Monoecious and Dioecious		Hermaphrodite Monoecious and Polygamodioecious		Hermaphrodite		
n.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	
				3	184	1	12																					
						6	616	30	404	2	8							1	10									
						1	1																					
						1	1																	1	14			
						3	45	2	2																1	270		
						2	7																					
								8	5						1	15												
															1	45												
						1	6																					
																					1	40						





Gynomonoecious		Hermaphrodite or Polygamous		Hermaphrodite or Dioecious		Hermaphrodite or Androdioecious		Hermaphrodite or Polygamodioecious		Hermaphrodite or Trioecious		Monoecious or Andromonoecious		Monoecious or Gynomonoecious		Monoecious or Polygamous		Monoecious or Dioecious		Gynomonoecious or Polygamous		Gynomonoecious or Gynodioecious		Polygamous or Polygamodioecious		Dioecious or Polygamous		Dioecious or	
Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	

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(3) 54

3 119

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3 109

Andromonoecious		Monoecious or Gynomonoecious		Monoecious or Polygamous		Monoecious or Dioecious		Gynomonoecious or Polygamous		Gynomonoecious or Gynodioecious		Polygamous or Polygamodioecious		Dioecious or Polygamous		Dioecious or Gynodioecious		Dioecious or Polygamodioecious		Hermaphrodite Monoecious and Polygamous		Hermaphrodite Monoecious and Dioecious		Hermaphrodite Monoecious and Polygamodioecious		Hermaphrodite Andromonoecious and Polygamous		Hermaphrodite Andromonoecious and		
Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.
					2	13																								
					1	2																								
					2	2					3	109																		
																			4	66										

Andromonoecious and Androdioecious		Hermaphrodite Polygamous and Dioecious		Hermaphrodite Polygamous and Polygamodioecious		Hermaphrodite Dioecious and Gynodioecious		Monoecious Polygamous and Polygamodioecious		Monoecious Dioecious and Polygamous		Andromonoecious Androdioecious and Dioecious		Dioecious Polygamodioecious Hermaphrodite		Hermaphrodite, Monoecious, Polygamous and Dioecious		Monoecious, Polygamous, Dioecious and Polygamodioecious		Gynomonoeious, Gynodioecious, Andromonoecious, Androdioecious		Androdioecious and Gynodioecious		Monoecious and Gynomonoeious		
l.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	









Monoecious and Polygamodioecious		Hermaphrodite Andromonoecious and Polygamous		Hermaphrodite Andromonoecious and Androdioecious		Hermaphrodite Polygamous and Dioecious		Hermaphrodite Polygamous and Polygamodioecious		Hermaphrodite Dioecious and Gynodioecious		Monoecious Polygamous and Polygamodioecious		Monoecious Dioecious and Polygamous		Andromonoecious and Androdioecious and Dioecious		Dioecious Polygamodioecious Hermaphrodite		Hermaphrodite, Mo- noecious, Polygamous and Dioecious		Monoecious, Polyga- mous, Dioecious and Polygamodioecious		Gynomonocious, Gyno- dioecious, Andromono- ecious, Androdioecious		Androdioecious and Gynodioecious		Monoecious and Gynomonocious		
Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.		
					1																									

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(2) (6)







Sp.		Gen.		Sp.		Gen.		Sp.		Gen.		Sp.		Gen.		Sp.		Gen.		Sp.		Gen.		Sp.		Gen.		Sp.		Gen.		Sp.		Gen.		Sp.	
and Polygamous																																					
Hermaphrodite Andromonoecious and Androdioecious																																					
Hermaphrodite Polygamous and Dioecious																																					
Hermaphrodite Polygamous and Polygamodioecious																																					
Hermaphrodite Dioecious and Gynodioecious																																					
Monoecious Polygamous and Polygamodioecious																																					
Monoecious Dioecious and Polygamous																																					
Andromonoecious Androdioecious and Dioecious																																					
Dioecious Polygamodioecious Hermaphrodite																																					
Hermaphrodite, Mo- noecious, Polygamous and Dioecious																																					
Monoecious, Polyga- mous, Dioecious and Polygamodioecious																																					
Gynomonocious, Gyno- dioecious, Andromono- ecious, Androdioecious																																					
Androdioecious and Gynodioecious																																					
Monoecious and Gynomonocious																																					

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Hermaphrodite Monoecious and Polygamodioecious		Hermaphrodite Andromonoecious and Polygamous		Hermaphrodite Andromonoecious and Androdioecious		Hermaphrodite Polygamous and Dioecious		Hermaphrodite Polygamous and Polygamodioecious		Hermaphrodite Dioecious and Gynodioecious		Monoecious Polygamous and Polygamodioecious		Monoecious Dioecious and Polygamous		Andromonoecious Androdioecious and Dioecious		Dioecious Polygamodioecious Hermaphrodite		Hermaphrodite, Mo- noecious, Polygamous and Dioecious		Monoecious, Polyga- mous, Dioecious and Polygamodioecious		Gynomonocious, Gyno- dioecious, Andromono- ecious, Androdioecious		Androdioecious and Gynodioecious		Monoecious and Gynomonocious	
Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.

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	Hernaphrodite		Monoecious		Andromonoecious		Gynomonocious		Polygamous		Dioecious		Androdioecious		Gynodioecious		Polygamodioecious		Hernaphrodite or Monoecious		
	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	
Tubiflorae																					
Convolvulaceae . . . . .	44	453									1	1									
Polemoniaceae . . . . .	10	168					1	14													
Hydrophyllaceae . . . . .	18	171																			
Borraginaceae . . . . .	88	1700																			
Verbenaceae . . . . .	76	733									1	30									
Labiatae . . . . .	167	2811							1	6	2	13			5	97+					
Nolanaceae . . . . .	3	50																			
Solanaceae . . . . .	86	1638																			
Scrophulariaceae . . . . .	209	1461									1	?									
Bignoniaceae . . . . .	110	733																			
Pedaliaceae . . . . .	16	47																			
Martyniaceae . . . . .	3	9																			
Orobanchaceae . . . . .	4	4							1	1	8	121									
Gesneriaceae . . . . .	92	1049	1	1																	
Columelliaceae . . . . .	1	2																			
Lentibulariaceae . . . . .	5	250																			
Globulariaceae . . . . .	3	20																			
Acanthaceae . . . . .	299	2050																			
Myoporaceae . . . . .	5	86																			
Phrymaceae . . . . .	1	1																			
Plantaginales																					
Plantaginaceae . . . . .	1	190	1	1					1	1	1	7									
Rubiales																					
Rubiaceae . . . . .	351	4700	3	5					2	12	18	110					8	44	2	20	
Caprifoliaceae . . . . .	12	350							2	2											
Adoxaceae . . . . .	1	1																			
Valerianaceae . . . . .	12	100							1	5	1	1									
Dipsacaceae . . . . .	7	80																			
Cucurbitales																					
Cucurbitaceae . . . . .	1	1	52	207					1	1	41	198									
Campanulatae																					
Campanulaceae . . . . .	60	855																			
Goodeniaceae . . . . .	13	320																			
Brunoniaceae . . . . .	1	1																			
Stylidiaceae . . . . .	3	106																		3	1
Calyceraceae . . . . .	5	20				1	10														
Compositae . . . . .	408	5000	9	59			406	3325	4	18	19	416					3	10			







Hermaphrodite Andromonoecious and Polygamous		Hermaphrodite Andromonoecious and Androdioecious		Hermaphrodite Polygamous and Dioecious		Hermaphrodite Polygamous and Polygamodioecious		Hermaphrodite Dioecious and Gynodioecious		Monoecious Polygamous and Polygamodioecious		Monoecious Dioecious and Polygamous		Andromonoecious and Androdioecious and Dioecious		Dioecious Polygamodioecious Hermaphrodite		Hermaphrodite, Monoecious, Polygamous and Dioecious		Monoecious, Polygamous, Dioecious and Polygamodioecious		Gynomonoeious, Gynodioecious, Andromonoecious, Androdioecious		Androdioecious and Gynodioecious		Monoecious and Gynomonoeious		
en.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	Gen.	Sp.	

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