Phytologia (March 1993) 74(3):193-202.

AUTOMATICALLY TYPIFIED SUPERORDINAL AND ORDINAL NAMES FOR THE FLOWERING PLANTS (MAGNOLIOPHYTA) AS RECOGNIZED BY THORNE (1992) AND ARRANGED FOLLOWING THE PRINCIPLES OF PRIORITY, AUTONYMY, AND THE SUBSTITUTION OF ALTERNATIVE NAMES

James L. Reveal

Department of Botany, University of Maryland, College Park, Maryland 20742-5815 U.S.A.

ABSTRACT

Using the most recent system of classification for flowering plants (Magnoliophyta) proposed by Thorne (1992), superordinal and ordinal names and their synonyms are arranged according to the principles of priority, autonymy, and the substitution of alternative names.

KEY WORDS: Magnoliophyta, nomenclature, classification, ordinal names

INTRODUCTION

Names above the rank of family are not subject to the rules of priority (Art. 11.4; Greuter *et al.* 1988). Nonetheless, Thorne (1992) has attempted to apply priority to ordinal names starting with Lindley (1833) even though he was aware that the majority of the names proposed by Lindley had been validly published by Dumortier (1829) four years earlier. The list of names presented below follows Thorne's classification scheme, but adopts a modified principle of priority and the notion of autonymy. The concept of substituting alternative names at the family level (Art. 18.5) is applied to superordinal and ordinal names. Also, I have retained technically illegitimate ordinal and superordinal names if the formerly illegitimate family name upon which they were based has been conserved (see App. IIB).

Thorne (1992) adopted the concept of autonyms for ordinal names even though this is not mandated by the present *Code* for names above the rank

of family. Thus, he took up Magnoliales (1838) rather than the earlier Laurales (1826) within Magnolianae. I have maintained this principle. Finally, an ordinal name is adopted only if the family name itself is accepted either because a particular family name is conserved (*e.g.*, Saxifragales [1829] over Sedales [1828]) or because of a taxonomic decision (*e.g.*, Asparagales [1838] over Asteliales [1829]). A series of footnotes is appended to the end of the catalogue justifying why a particular name was adopted, or noting names accepted here which are different from those given by Thorne.

The purpose of this exercise is to ascertain the nomenclatural affect of priority on names at the rank of order. If the concept of "names in current use" (Greuter 1991; Hawksworth 1991) is added to the *Code* at the forthcoming International Botanical Congress, then perhaps, in time, this concept can be expanded to include names above the rank of family. Having concentrated recently on vascular plant nomenclature at the family rank and above, I can attest to the difficulty of finding the earliest places of valid publication for these names. Rules in the *Code* are vague for names above the rank of family and will require some revision.

Thorne's (1992) treatment is particularly useful for this nomenclatural experiment in that he recognized fewer superorders and orders than his contemporaries, thereby making the impact of priority more significant on a case-by-case basis. By adopting the principle of priority, but considering it secondary to the principle of autonymy, and then accepting the principle that ordinal names based on alternative family names have equivalent priority as their alternative ordinal names, there is only minimal nomenclatural disruption. The most unfortunate name changes encountered using Thorne's (1992) recent system of classification is that Dioscoreales (1876) must be replaced by Taccales (1829). Problems such as these can be addressed by conservation and/or the establishment of a names in current use list for ordinal names. In short, priority has little significant nomenclature impact upon the established nomenclature of ordinal names.

A catalogue of ordinal names with their full citation is now in its final stages of preparation and review. It is requested that additional names and/or corrections to the dates of publication given here be forwarded to me.

CATALOGUE OF SUPERORDINAL AND ORDINAL NAMES

I. **Magnolianae** Takhtajan, 1967
Nelumbonanae Takhtajan *ex* Reveal, 1992
Ranunculanae Takhtajan *ex* Reveal, 1992

1. **Magnoliales** Bromhead, 1838[1]
Laurales Perleb, 1826
Aristolochiales Dumortier, 1829
Gyrocarpales Dumortier, 1829
Monimiales Dumortier, 1829

Piperales Dumortier, 1829
Annonales Lindley, 1833
Calycanthales C. Martius, 1835
Asarales Burnett, 1835
Canellales Cronquist, 1957
Illiciales H.H. Hu *ex* Cronquist, 1981
Austrobaileyales Takhtajan *ex* Reveal, 1992
Chloranthales Conzatti & L.C. Smith *ex* Reveal, 1992
Eupomatiales Takhtajan *ex* Reveal, 1992
Lactoridales Takhtajan *ex* Reveal, 1993
Winterales A.C. Smith *ex* Reveal, 1993

2. **Ceratophyllales** Bischoff, 1840
3. **Nelumbonales** Burnett, 1835
4. **Paeoniales** Heintze, 1927
Glaucidiales Takhtajan *ex* Reveal, 1992
5. **Berberidales** Dumortier, 1829
Podophyllales Dumortier, 1829
Ranunculales Dumortier, 1829
Papaverales Dumortier, 1829
Menispermales Bromhead, 1838
Helleborales Nakai, 1949

II. **Nymphaeanae** Thorne *ex* Reveal, 1992

6. **Nymphaeales** Dumortier, 1829
Euryalales H.-L. Li, 1955

III. **Rafflesianae** Thorne *ex* Reveal, 1992

7. **Rafflesiales** Oliver, 1895[2]
Cytinales Dumortier, 1829
Mitrastemonales Makino, 1911
Hydnorales Takhtajan *ex* Reveal, 1992

IV. **Caryophyllanae** Takhtajan, 1967

8. **Caryophyllales** Perleb, 1826
Amaranthales Dumortier, 1829
Cactales Dumortier, 1829
Chenopodiales Dumortier, 1829
Nyctaginales Dumortier, 1829
Portulacales Dumortier, 1829
Scleranthales Dumortier, 1829
Petiveriales Lindley, 1833
Silenales Lindley, 1833
Dianthales Burnett, 1835
Atriplicales Horaninow, 1847
Opuntiales Willkomm, 1854

V. **Theanae** Thorne *ex* Reveal, 1992
Lecythidanae Takhtajan *ex* Reveal, 1992
Nepenthanae Takhtajan *ex* Reveal, 1992
Plumbaginanae Takhtajan *ex* Reveal, 1992
Polygonanae Takhtajan *ex* Reveal, 1992
Primulanae R. Dahlgren *ex* Reveal, 1992
Sarracenianae Thorne *ex* Reveal, 1992
Dillenianae Takhtajan *ex* Reveal & Takhtajan, 1993

9. **Theales** Lindley, 1833[3]
Hypericales Dumortier, 1829
Nepenthales Dumortier, 1829
Camelliales Burnett, 1835
Illicales Burnett, 1835
Sarraceniales Bromhead, 1838
Aquifoliales Senft, 1856
Elatinales Nakai, 1949
Dilleniales Hutchinson, 1924
Medusagynales Brenan, 1952
Lecythidales Cronquist, 1957
Ancistrocladales Takhtajan *ex* Reveal, 1992
Actinidiales Takhtajan *ex* Reveal, 1993
Dioncophyllales Takhtajan *ex* Reveal, 1992

Ochnales Hutchinson *ex* Reveal, 1993
Paracryphiales Takhtajan *ex* Reveal, 1992
10. **Ericales** Dumortier, 1829
Vacciniales Dumortier, 1829
Rhodorales Horaninow, 1847
Empetrales Nakai, 1930
11. **Fouquieriales** Takhtajan *ex* Reveal, 1992
12. **Styracales** Burnett, 1835
Sapotales J.D. Hooker *in* W.H. Harvey, 1868
Diospyrales Prantl, 1874
Ebenales Engler, 1892
13. **Primulales** Dumortier, 1829
Samolales Dumortier, 1829
Plumbaginales Lindley, 1833
Myrsinales Bromhead, 1838
14. **Polygonales** Dumortier, 1829
Rumicales Burnett, 1835
VI. **Celastranae** Takhtajan, 1967
15. **Celastrales** Baskerville, 1839
VII. **Malvanae** Takhtajan, 1967
Euphorbianae Takhtajan *ex* Reveal, 1992
Rhamnanae Takhtajan *ex* Reveal, 1992
Urticanae Takhtajan *ex* Reveal, 1992
16. **Malvales** Dumortier, 1829
Tiliales Hutchinson, 1924
17. **Urticales** Dumortier, 1829
Ficales Dumortier, 1829
Ulmales Lindley, 1833
18. **Barbeyales** Takhtajan *ex* Reveal & Takhtajan, 1993
19. **Rhamnales** Dumortier, 1829
Elaeagnales Bromhead, 1838
20. **Euphorbiales** Lindley, 1833
Daphnales Lindley, 1833
Crotonales Horaninow, 1847
Thymelaeales Willkomm, 1854
Pandales Engler & Gilg, 1912-1913
Simmondsiales Reveal, 1992
VIII. **Violanae** R. Dahlgren *ex* Reveal, 1992
21. **Violales** Perleb, 1826
Cistales Reichenbach, 1828
Begoniales Dumortier, 1829
Cucurbitales Dumortier, 1829
Datiscales Dumortier, 1829
Passiflorales Dumortier, 1829
Samydales Dumortier, 1829
Turnerales Dumortier, 1829
Bixales Lindley, 1833
Salicales Lindley, 1833
Homaliales Bromhead, 1838
Lacistematales Baskerville, 1839
Tamaricales Hutchinson, 1924
Flacourtiales Heintze, 1927
Caricales L. Benson, 1957
22. **Brassicales** Bromhead, 1838[4]
Resedales Dumortier, 1829
Capparales Hutchinson, 1924
Tovariales Nakai, 1943
Salvadorales R. Dahlgren *ex* Reveal, 1993
23. **Batales** Engler, 1907
IX. **Santalanae** Thorne *ex* Reveal, 1992
Balanophoranae R. Dahlgren *ex* Reveal, 1992
24. **Santalales** Dumortier, 1829
Anthobolales Dumortier, 1829
Loranthales Dumortier, 1829
Olacales Bentham, 1862
Medusagynales Brenan, 1952
25. **Balanophorales** Dumortier, 1829
Cynomoriales Burnett, 1835
X. **Geranianae** Thorne *ex* Reveal, 1992
26. **Linales** Baskerville, 1839
27. **Rhizophorales** Tieghem

ex Reveal, 1993
28. **Geraniales** Dumortier, 1829
Balsaminales Lindley, 1833
Oxalidales Heintze, 1927
Limnanthales Nakai, 1930
Tropaeolales Takhtajan *ex* Reveal, 1992
29. **Polygalales** Dumortier, 1829
Vochysiales Dumortier, 1829
Malpighiales C. Martius, 1835

XI. **Rutanae** Takhtajan, 1967
Fabanae R. Dahlgren *ex* Reveal, 1992
30. **Rutales** Perleb, 1826[5]
Papilionales Batsch, 1802
Citrales Dumortier, 1829
Sapindales Dumortier, 1829
Terebinthales Dumortier, 1829
Acerales Lindley, 1833
Coriariales Lindley, 1833
Meliales Lindley, 1833
Connarales Burnett, 1835
Lotales Burnett, 1835
Mimosales Burnett, 1835
Aesculales Bromhead, 1838
Fabales Bromhead, 1838
Burserales Baskerville, 1839
Cassiales Horaninow, 1847
Leitneriales Engler, 1897
Julianales Engler, 1907
Moringales Nakai, 1943

XII. **Proteanae** Takhtajan, 1967
31. **Proteales** Dumortier, 1829

XIII. **Rosanae** Takhtajan, 1967
Hamamelidanae Takhtajan, 1967
Juglandanae Takhtajan *ex* Reveal, 1992
Podostemonanae R. Dahlgren *ex* Reveal, 1992
Trochodendranae Takhtajan *ex* Reveal, 1992
32. **Hamamelidales** Grisebach, 1854
Trochodendrales Takhtajan *ex* Cronquist, 1981
Cercidiphyllales H.-H. Hu *ex* Reveal, 1993
Eupteleales H.-H. Hu *ex* Reveal, 1993
33. **Casuarinales** Lindley, 1833
34. **Balanopales** Engler, 1897
Didymelales Takhtajan, 1967
Daphniphyllales Pulle *ex* Cronquist, 1981
Buxales Takhtajan *ex* Reveal, 1992
35. **Bruniales** Dumortier, 1829
Roridulales Nakai, 1943
Geissolomatales Takhtajan *ex* Reveal, 1992
Hydrostachyales Diels *ex* Reveal, 1993
Myrothamnales Nakai *ex* Reveal, 1993
36. **Juglandales** Dumortier, 1829
Myricales Engler, 1897
Rhoipteleales Novák *ex* Reveal, 1992
37. **Betulales** Burnett, 1835[6]
Corylales Dumortier, 1829
Quercales Burnett, 1835
Fagales Engler, 1892
38. **Rosales** Perleb, 1826
Sanguisorbales Dumortier, 1829
Crossosomatales Takhtajan *ex* Reveal, 1993
39. **Saxifragales** Dumortier, 1829[7]
Sedales Reichenbach, 1828
Crassulales Lindley, 1833
Grossulariales Lindley, 1833
Droserales Grisebach, 1854
Diapensiales Engler & Gilg, 1924
Cephalotales Nakai, 1943
Parnassiales Nakai, 1943
Stylidiales Takhtajan *ex* Reveal, 1992

40. **Podostemales** Lindley, 1833[8]
Marathrales Dumortier, 1829
41. **Cunoniales** Hutchinson, 1924
XIV. **Aralianae** Takhtajan, 1967[9]
Cornanae Thorne *ex* Reveal, 1992
Eucommianae Takhtajan *ex* Reveal, 1992
Vitanae Takhtajan *ex* Reveal, 1992
42. **Brexiales** Lindley, 1833[10]
Hortensiales Grisebach, 1854
Hydrangeales Nakai, 1943
43. **Cornales** Dumortier, 1829
Vitales Burnett, 1835
Haloragales Bromhead, 1838
Garryales Lindley, 1846
Eucommiales Nemejc *ex* Cronquist, 1981
Aralidiales Takhtajan *ex* Reveal, 1992
Gunnerales Takhtajan *ex* Reveal, 1992
44. **Pittosporales** Lindley, 1833
Byblidales Nakai *ex* Reveal, 1993
45. **Araliales** Burnett, 1835
Angelicales Burnett, 1835
Ammiales J.K. Small, 1903
Apiales Nakai, 1930
Torricelliales Takhtajan *ex* Reveal, 1992
46. **Dipsacales** Dumortier, 1829
Viburnales Dumortier, 1829
Caprifoliales Lindley, 1833
Valerianales Burnett, 1835
Lonicerales C. Baenitz, 1877
Adoxales Nakai, 1949
XV. **Asteranae** Takhtajan, 1967
Campanulanae Takhtajan *ex* Reveal, 1992
47. **Asterales** Lindley, 1833[11]
Ambrosiales Dumortier, 1829
Calycerales Burnett, 1835
Carduales J.K. Small, 1903
48. **Campanulales** Reichenbach 1828
Brunoniales Lindley, 1833
Goodeniales Lindley, 1833
XVI. **Solananae** R. Dahlgren *ex* Reveal, 1992
49. **Solanales** Dumortier, 1829
Boraginales Dumortier, 1829
Convolvulales Dumortier, 1829
Nolanales Lindley, 1833
Polemoniales Bromhead, 1838
Echiales Lindley, 1846
XVII. **Loasanae** R. Dahlgren *ex* Reveal, 1992
50. **Loasales** Bessey, 1907
XVIII. **Myrtanae** Takhtajan, 1967
51. **Myrtales** Reichenbach, 1828
Onagrales Reichenbach, 1828
Penaeales Lindley, 1833
Oenotherales Bromhead, 1838
Combretales Baskerville, 1839
Lythrales Oliver, 1895
Melastomatales Oliver, 1895
XIX. **Lamianae** Takhtajan, 1967[12]
Gentiananae Thorne *ex* Reveal, 1992
52. **Rubiales** Dumortier, 1829
Asclepiadales Dumortier, 1829
Cinchonales Lindley, 1833
Gentianales Lindley, 1833
Loganiales Lindley, 1833
Apocynales Bromhead, 1838
Galiales Bromhead, 1838
Vincales Horaninow, 1847
Chironiales Grisebach, 1854
Theligonales Nakai, 1942
53. **Lamiales** Bromhead, 1838[13]
Callitrichales Dumortier, 1829
Gesneriales Dumortier, 1829
Globulariales Dumortier, 1829
Jasminales Dumortier, 1829
Pinguicularales Dumortier, 182

Rhinanthales Dumortier, 1829
Veratrales Dumortier, 1829
Acanthales Lindley, 1833
Bignoniales Lindley, 1833
Lentibulariales Lindley, 1833
Oleales Lindley, 1833
Plantaginales Lindley, 1833
Scrophulariales Lindley, 1833
Hippuridales Burnett, 1835
Menthales Burnett, 1835
Ligustrales Bischoff, 1840
Verbenales Horaninow, 1847

X. **Lilianae** Takhtajan, 1967

54. **Liliales** Perleb, 1826
Colchicales Dumortier, 1829
Iridales Dumortier, 1829
Paridales Dumortier, 1829
Ixiales Lindley, 1836
Alstroemeriales Hutchinson, 1934
Melanthiales R. Dahlgren *ex* Reveal, 1992
55. **Burmanniales** Heintze, 1927
56. **Asparagales** Bromhead, 1838[14]
Asteliales Dumortier, 1829
Narcissales Dumortier, 1829
Amaryllidales Bromhead, 1840
Agavales Hutchinson, 1934
Alliales Traub, 1972
Hanguanales R. Dahlgren *ex* Reveal, 1992
Velloziales R. Dahlgren *ex* Reveal, 1992
57. **Taccales** Dumortier, 1829[15]
Tamales Dumortier, 1829
Smilacales Lindley, *Nix. Pl.* 23. 1833
Dioscoreales J.D. Hooker, 1876
58. **Orchidales** Dumortier, 1829

XI. **Hydatellanae** Takhtajan *ex* Reveal, 1992

59. **Hydatellales** Cronquist *in* Takhtajan, 1980

XXII. **Triuridanae** Thorne *ex* Reveal, 1992

60. **Triuridales** J.D. Hooker *in* Le Maout & Decaisne, 1876

XXIII. **Alismatanae** Takhtajan, 1967
Butomanae Takhtajan *ex* Reveal, 1992
Najadanae Takhtajan *ex* Reveal, 1992
61. **Alismatales** Dumortier, 1829[16]
Najadales Reichenbach, 1828
Hydrocharitales Dumortier, 1829
Butomales Hutchinson, 1934
Vallisneriales Nakai, 1949
Elodeales Nakai, 1950
62. **Potamogetonales** Dumortier, 1829
Aponogetonales Hutchinson, 1934
Juncaginales Hutchinson, 1934
Cymodoceales Nakai, 1943
Posidoniales Nakai, 1943
Zosterales Nakai, 1943
Ruppiales Nakai, 1950
Scheuchzeriales B. Boivin, 1956

XXIV. **Aranae** Thorne *ex* Reveal, 1992
Cyclanthanae Thorne *ex* Reveal, 1992
63. **Arales** Dumortier, 1829
64. **Cyclanthales** Nakai, 1930
65. **Acorales** Burnett, 1835

XXV. **Pandananae** Thorne *ex* Reveal, 1992
66. **Pandanales** Lindley, 1833

XXVI. **Arecanae** Takhtajan, 1967
67. **Arecales** Bromhead, 1840[17]
Phoenicales Burnett, 1835
Cocosales Nakai, 1930

XXVII. **Commelinanae** Takhtajan, 1967
Bromelianae R. Dahlgren *ex* Reveal, 1992
Juncanae Takhtajan, 1967

Pontederianae Takhtajan *ex* Reveal, 1992
Typhanae Thorne *ex* Reveal, 1992
Zingiberanae Takhtajan *ex* Reveal, 1992
68. **Bromeliales** Dumortier, 1829
69. **Philydrales** Dumortier, 1829
Pontederiales J.D. Hooker, 1876
Haemodorales Hutchinson, 1934
70. **Typhales** Dumortier, 1829
71. **Cannales** Dumortier, 1829[18]
Amomales Lindley, 1833
Musales Burnett, 1835
Zingiberales Grisebach, 1854
72. **Commelinales** Dumortier 1829
Ephemerales Burnett, 1835
Xyridales Lindley, 1846
Eriocaulales Nakai, 1930
Mayacales Nakai, 1943
73. **Juncales** Dumortier, 1829
Cyperales Burnett, 1835
74. **Poales** Burnett, 1835
Graminales Dumortier, 1829
Avenales Bromhead, 1838
Restionales Perleb, 1838

NOTES

[1] The later Magnoliales (1838) is adopted over Laurales (1826) according to the principle of autonymy.

[2] The later Rafflesiales (1895) is adopted over Cytinales (1829) according to the principle of autonymy.

[3] The later Theales (1833) is adopted over the earlier Hypericales (1829) and Nepenthales (1829) according to the principle of autonymy.

[4] Brassicales (1838) is adopted over Resedales (1829) as Brassicales is considered to be an alternative name for the descriptive ordinal name, Cruciferae proposed by Perleb in 1826.

[5] Rutales (1826) is retained over the earlier Papilionales (1802) according to the principle of autonymy.

[6] Thorne used Betulales (1835), a later name than Corylales (1829), but as he did not accept Corylaceae, this name being rejected if combined with Betulaceae (App. IIB; Greuter *et al.* 1988), Betulales is retained.

[7] Saxifragales (1829) is retained, rather than Sedales (1828) because Thorne did not accept Sedaceae.

[8] Podostemales (1833) is retained, rather than Marathrales (1829) because Thorne did not accept Marathraceae.

[9] Aralianae (1967) has priority over Cornanae (1992), the name adopted by Thorne.

[10] Brexiales (1833) has priority over Hydrangeales (1943), the name adopted by Thorne.

[11] Asterales (1833) is adopted, rather than Ambrosiales (1829), according to the principle of autonymy and because Asteraceae is conserved over Ambrosiaceae (App. IIB; Greuter *et al.* 1988).

[12] Lamianae (1967) has priority over Gentiananae (1992), the name adopted by Thorne.

[13] Lamiales (1838) is adopted over other competing names proposed in 1829 as Lamiales is an autonym of Lamianae. It may also be retained because Lamiales is an alternative name for the descriptive ordinal name, Labiatae, proposed by Dumortier in 1829. In any case, Scrophulariales (1833), adopted by Thorne, is a latter name.

[14] Asparagales (1838) is retained, rather than Asteliales (1829) because Thorne did not accept Asteliaceae.

[15] Taccales (1829) has priority over both Smilacales (1833) and Dioscoreales (1876). The latter name was adopted by Thorne.

[16] The later Alismatales (1829) is adopted over Najadales (1828) according to the principle of autonymy.

[17] Arecales (1840) is adopted over Phoenicales (1835) because Arecales is considered to be an alternative name for the descriptive ordinal name, Palmae, proposed by Perleb in 1826, and Phoenicaceae was not accepted by Thorne.

[18] Cannales (1829) has priority over Zingiberales (1854), the name adopted by Thorne, as does Musales (1835).

ACKNOWLEDGMENT

Thanks are extended to Dr. R.F. Thorne and Dr. J.H. Wiersema for reviewing the manuscript. Work on ordinal and plant family names in Europe was supported by National Science Foundation Grant BSR-8812816. This is Scientific Article A-6404, Contribution No. 8595, of the Maryland Agricultural Experiment Station and Cooperative Extension Service.

LITERATURE CITED

Dumortier, B.C.J. 1829. *Analyse des Familles des Plantes.* J. Casterman, Tournay, France.

Greuter, W. 1991. Proposals to amend the Code, and report of Special Committee 6B: Provisions for granting nomenclatural protection to listed names in current use. Taxon 40:669-677.

Greuter, W., H.M. Burdet, W.G. Chaloner, V. Demoulin, R. Grolle, D.L. Hawksworth, D.H. Nicolson, P.C. Silva, F.A. Stafleu, E.G. Voss, & J. McNeill (editors.). 1988. *International Code of Botanical Nomenclature*, adopted by the Fourteenth International Botanical Congress, Berlin, July–August 1987. Regnum Veg. 118.

Hawksworth, D.L. (ed.). 1991. *Improving the Stability of Names: Needs and Options*. Regnum Veg. 123.

Lindley, J. 1833. *Nixus Plantarum*. Ridgway & Sons, London, Great Britain.

Thorne, R.F. 1992. Classification and geography of the flowering plants. Bot. Rev. 58:225-348.

Reveal, James L. 1993. "Automatically typified superordinal and ordinal names for the flowering plants (Magnoliophyta) as recognized by Thorne (1992) and arranged following the principles of priority, autonymy, and the substitution of alternative names." *Phytologia* 74, 193–202.

View This Item Online: https://www.biodiversitylibrary.org/item/47121
Permalink: https://www.biodiversitylibrary.org/partpdf/175935

Holding Institution
New York Botanical Garden, LuEsther T. Mertz Library

Sponsored by
The LuEsther T Mertz Library, the New York Botanical Garden

Copyright & Reuse
Copyright Status: In copyright. Digitized with the permission of the rights holder.
Rights Holder: Phytologia
License: http://creativecommons.org/licenses/by-nc-sa/3.0/
Rights: https://biodiversitylibrary.org/permissions

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at https://www.biodiversitylibrary.org.

This file was generated 21 April 2024 at 06:06 UTC